# **FILE FOLDER**

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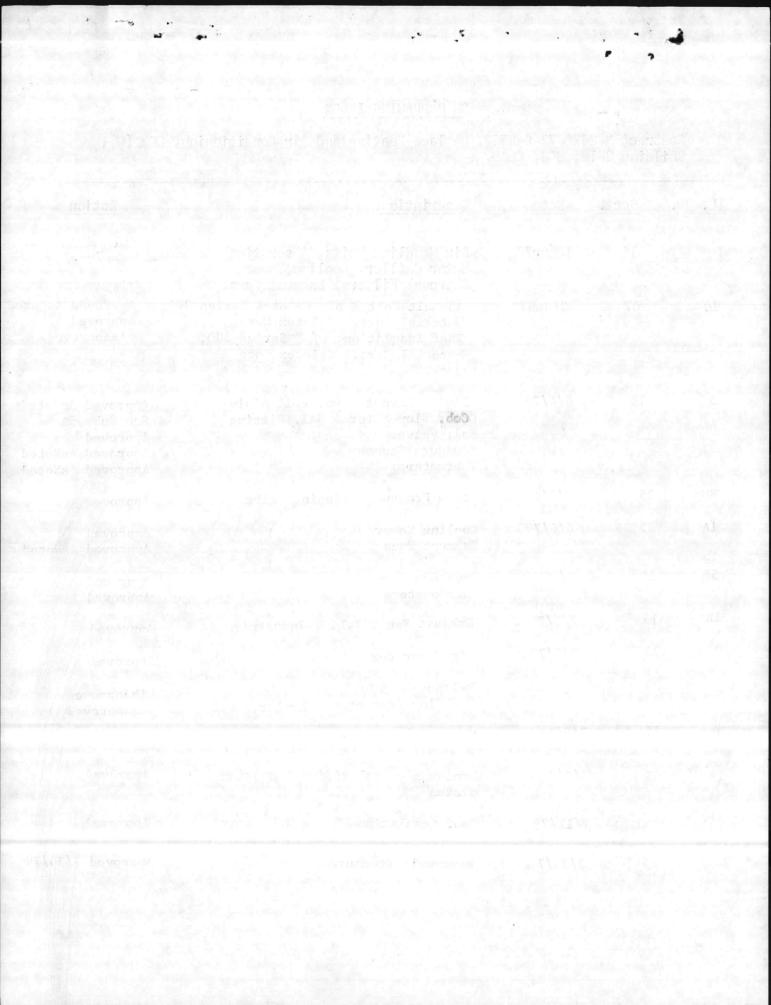
Confidential Records Management, Inc. New Bern, NC 1-888-622-4425 9/08

Shop Dargo

# SHOP DRAWING INDEX

Contract N62470-77-C-2563, Replace Heating and Air Conditioning, COM (0), Building 2615, MCB, CL

<u>TL. NO.</u>	Sect.	Date	Description	Action
1	15	18Apr79	Air Handling Units, Absorption Water Chiller, Cooling Tower, Charcoal Filters, Exhaust Fans	Approved
20	07	26Jun79	Asphalt Felt Roof; Celotex Series 300 Material Cert.: Celotex Corp; Roof Insulation: w/ " Series 300; Material Cert.: Celotex Corp	; Approved AsNoted Approved Disapproved
5	15	6/4/79	Piping Layout: Typ. coil piping Comb. Flow-Meter & Bal. Fitting Bal. Valves Pressure Gauges Thermeters:	Approved AsNoted See Subm 5A Approved Approved AsNoted Approved AsNoted
8B	15	6/4/79	Steam Pressure Reducing Valve	Approved
1A	15	6/6/79	Cooling Tower Exhaust Fans	Approved Approved AsNoted
5B	15	7/5	Pressure Gauges Thermometers	Approved Approved
1B	15	7/5/79	Exhaust Fans: I.L.G. Industries	Approved
2 <b>-</b> A	15	7/5/79	Air Separator	Approved
			P-1 pump: B&G Backflow Preventer: Lawler, BF-4	Disapproved Disapproved
4-A	15	7/5/79	Temp. Control System: Honeywell	Approved AsNoted
19	07	5/6/79	Preformed metal siding & coating system	Approved
20A		7/11/79	Roof insulation	Approved
4-A	15	7/25/79	Honeywell Brochure	Approved 7/30/79



# SHOP DRAWINGS INDEX

Contract N62470-77-C-2563, Replace Heating & Air Conditioning, COM (0), Building 2615, Marine Corps Base

TL NO.	Sect.	Date	Description	Action
12	15	18Apr79	Drain piping for AC units	Approved
11		18Apr79	Cold water piping above grade & below grade	Approved
17	05	18Apr79	Structural steel; Carolina steel shop dwgs	Approved
2	<b>15</b> A	18Apr79	Expansion tanks, air separator; converters etc	Approved
3	15	18Apr79	Volume extractors, air diffusers, supply registers, etc.	Approved
6	15	18Apr79	Duct insulation, piping insulation, lap adhesive	Approved
7	15	18Apr79	Gate, globe, check, butterfly valves	Approved
9	15	18Apr79	All steam, hot & chilled water piping & condenser water piping above grade	Approved
10	15	18Apr79	Condensate, vent & relief piping	Approved
15	16	18Apr79	Circuit breakers, safety switched, transformers, panelboard dwgs	Approved
16	16	18Apr79	Lighting fixtures	Approved
13	15	18Apr79	UNDERGROUND CTS piping	Approved
14	15	18Apr79	Pipe hangers & supports	Approved
8	15	18Apr79	Y-Strainers; F&T traps Steam Valves	Approved Disapproved
8-A	15	4May79	Steam Valves	Disapproved
18	08	1May79	Hdw & sample list, hdw schedule, keying isntructions, shop dwgs.	Approved

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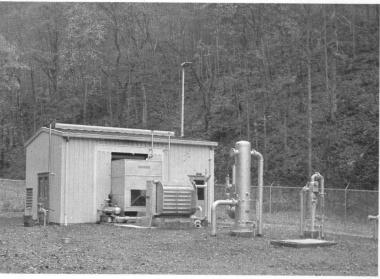
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	07411 2.1.1	Coating	Systems for above		A			
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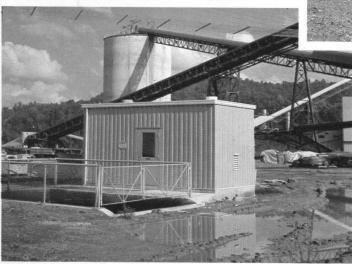
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SORRELLS PLB. & HTG. CO., INC. P. O. BOX 9604 GREENSBORO, N. C. 27408









# BUILDING DESIGN MANUAL

# PREFACE



P.O. Box 65, Winfield, W. Va. 25213 Telephone No. A.C. 304, 586-2113

This manual contains a complete set of building specifications and details necessary to plan in a direct and convenient method the Parkline building which will meet your small metal building needs.

These specifications cover not only the building itself, but also a broad line of accessories along with alternate roof systems and interior finishes to allow you, "the designer," to specify a complete building from one source of supply.

Parkline Buildings feature components which work together in various combinations to allow you the widest choice of size, finish, and accessory combinations available today, and by their unique construction are easier to construct and more economical to heat and cool than ordinary construction.

Parkline has a nationwide network of highly qualified metal building contractors to service your construction needs.

If you require any additional information on Parkline Buildings or product representation in your area, please call Parkline Customer Service, Area Code 304, 586-2113.

# PARKLINE BUILDING SPECIFICATIONS

# A. 1 DRAWINGS AND DESIGN DATA

## A.1.1 General

The buildings covered by these specifications shall be of self-framing design utilizing the roof and wall covering panels as the primary structural supporting members.

Each building shall be supplied complete with all necessary component parts, including foundation anchors, to form a complete building system and all parts shall be new and free from all defects or imperfections.

The building width and length shall be measured from the outside of the building wall panels and the height of the building shall be the distance measured from the bottom surface of the base channel to the exterior juncture of the roof and sidewall panels.

The building supplier shall supply a complete set of building erection drawings and a step-by-step "Erection Procedure" manual illustrating the construction sequence for the erection of the building.

## A.1.2 Design Criteria

All buildings shall be designed in accordance with the applicable sections of the latest edition of the AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and the AISI "Specifications for the Design of Light Gauge Cold Formed Steel Structural Members".

Each building shall be designed for the following loads, in addition to the stationary weight of the building.

- The vertical Live Load of the building shall not be less than W\* pounds per square foot applied on the horizontal projection of the roof.
- The horizontal Wind Load of the building shall not be less than P\* pounds per square foot and shall be distributed and applied in accordance with the applicable edition of the Metal Building Manufactures Association (MBMA) publication titled "Recommended Design Practice Manual" and the U.S. Navy Bureau of Yards and Docks publication titled "NAVFAC DM-2".

All combining and distributing of auxiliary equipment loads imposed on the building system shall be done in accordance with the applicable section of the MBMA publication titled "Recommended Design Practices Manual". NOTE: The building designer is responsible for advising the building supplier of any auxiliary loads intended to be imposed on any building covered by these specifications.

#### \*See the following chart for selection of Live and Wind Loads.

STANDARD DESIGNS AVAILABLE

(To Be Used For Selection Of Live And Wind Loads)

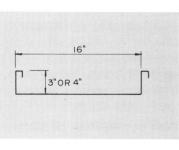
BUILDING TYPE	STANDARD LOADS				
	Live Load	(W)	20#/psf		
AL2 and F2	Wind Load	(P)	15#/psf		
AL2 and F2	Live Load	(W)	30#/psf		
AL3 and F3	Wind Load	(P)	20#/psf		
	Live Load	(W)	40#/psf		
AL4 and F4	Wind Load	(P)	20#/psf		
AL2C and F2C	Live Load	(W)	20#/psf		
ALZC and FZC	Wind Load	(P)	25#/psf		

Loading requirements other than shown above should be referred to Parkline.

### A. 2 ROOF AND EXTERIOR WALL PANELS

## A.2.1 Roof Panel Design

Roof panels shall be supplied in a single continuous length from eave line to ridge line and shall be designed to tightly interlock so that no fasteners are required at intermediate points along the panel side laps.



Roof panels shall be 16" wide with a smooth surface between the interlocking side ribs. The interlocking ribs shall be a minimum 3" high, and shall be turned upward. All roof panels shall be factory punched for connection at the eave line of the building.

#### A.2.2 (Option 1) Roof Panel Material—Painted

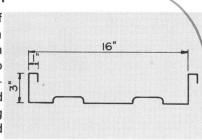
Roof panels shall be minimum 24 gauge galvanized steel conforming to ASTM A525 specifications with the galvanized coating conforming to G90 (1¼ oz.) standards. Minimum yield strength of panel material shall be 40,000 PSI. Roof panels shall be factory painted "White" in accordance with Section A.3 of these specifications.

# A.2.2 (Option 2) Roof Panel Material—Aluminum Coated

Roof panels shall be minimum 24 gauge steel coated on both sides with a coating of corrosion resistant aluminum zinc alloy applied by a continuous hot dipping process. Coating weight shall be a minimum of 0.32 oz. of aluminum-zinc alloy per square foot of coated sheet (both sides)—equivalent to about 0.75 mil thickness on each side. Minimum yield strength of panel material shall be 40,000 PSI.

# A.2.3 Wall Panel Design

Exterior wall panels of the building shall be a single continuous length from the base channel to the roof line of the building at the sidewalls and endwalls of the building except where interrupted by wall openings.



Wall panels shall be 16" wide with a 3" deep inward turned interlocking side rib. Wall panels shall contain two 11/16" deep by 3-1/8" wide fluted recesses, each starting 2-7/16" from the panel edge.

Wall panels shall be fastened internally to the base channel and eave cap of the building with 3/8'' diameter electro galvanized machine bolts placed within the panel interlock. The fastening system shall be designed so that no wall fasteners are exposed on the exterior surfaces of the walls.

## A.2.4 Wall Panel Material

Wall panels shall be minimum 24 gauge galvanized steel conforming to ASTM A-525 specifications with the galvanized coating conforming to G90 (1 1/4 oz.) standards. Minimum yield strength of panel material shall be 36,000 PSI. Panel material shall be embossed with a random pattern pebble embossure of approximately .007-.008 depth.

Wall panels shall be factory painted in accordance with Section A.3 of these specifications.

## A. 3 COLOR COATINGS

All exterior surfaces of the galvanized steel roof covering, wall covering and exterior trim shall receive two factory, roller applied, paint coats having a combined coating thickness of .8 to 1.2 mils of dry film thickness. The finish coat for roof panels shall be a white polyester formulation and the finish coat for wall panels shall be a siliconized polyester formulation of one of the following Parkline colors: Twilight Blue, Desert Tan, Laurel Green, Arctic White or Harvest Gold.

Exterior color coatings shall meet the following performance standards after 10 years continuous exposure in normal \* atmospheric conditions.

- 1. Panels shall show no evidence of blistering, peeling, or chipping.
- Panels shall not show surface chalking in excess of the No. 8 rating D659-44 as established by the American Society of Testing Materials (ASTM).
- Panels, after cleaning, shall not show color change in excess of seven (7) units when measured in accordance with the ASTM-D-2244-64T standard.

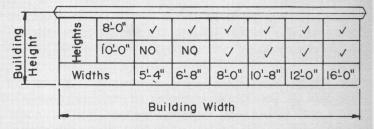
The above performance standards shall not apply where panels have been damaged by fire, radiation or other physical damage.

\* "Normal" atmospheric conditions excludes exposure containing corrosive fumes such as chemical fumes or salt spray.

#### **B. 1 BUILDING TYPE**

**Option 1.** Type F Trimline Building (see chart for sizes available).

#### Flat Roof Type 'F' Building



Building Lengths-Any Multiple Of 16" Increments (Minimum Length Is Equal To Building Width)

### **B.1.1 Roof Design**

- a. Each "Type F" building shall have a zero pitch interlocking panel roof system. Roof panels shall be attached to the wall cap through factory punched holes with 1/4" diameter stainless steel bolts having aluminum backed neoprene washers.
- b. The roof system shall include a gutter and downspout system at each sidewall and matching rake trim at the building endwalls. All gutters and trim shall be minimum 24 gauge galvanized steel prepainted Arctic White or Roman Bronze.

## **B.1.2 Structural Framing**

Transmission of horizontal wind loads across the building shall be made through the panel roof system and no separate roof or wall diagonal bracing shall be required.

Where required for proper transmission of lateral wind loads, structural frame wind bents shall be installed. Wind bents shall consist of a bolted column and rafter assembly of steel conforming to ASTM A-36 specifications.

Option 2. Type AL Styleline Building (see chart for sizes available).

		Gable		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				pe			
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-	Heights	10 <u>+</u> 0"	$\checkmark$	$\checkmark$	~	$\checkmark$	~	~			
ght		12-0"	~	~	1	$\checkmark$	~	~			
Building Height		14'-0"	$\checkmark$	~	1	~	~	~			
	Wid	ths	12-0"	16-0"	20-0	24-0"	28-0"	32-0"			
		Widths 12-0" 16-0" 20-0" 24-0" 28-0" 32-0" Building Width									

Building Lengths—Any Multiple Of 4'-0" Increments, \*32'-0" Wide AL4 Building Is Not Available. (Minimum Length Is Equal To Building Width)

See ATTACKEd TEST REPORT

## **B.2.1 Roof Design**

- a. Each "Type AL" building shall have a gable roof with a slope of 2" in each 12" of building width. Roof panels shall be minimum 24 gauge interlocking panels fastened to a eave cap with 1/4" diameter Type 430 stainless steel bolts through factory punched holes. The ridge of the roof shall be a welded double channel assembly sealed with a minimum 20 gauge steel cover.
- b. The interlocking panel roof system shall extend a minimum of 8" over the endwall panels and a minimum of 6" over the sidewall panels of the building.
- c. The building roof line shall be finished with minimum 24 gauge factory painted rake trim having matching ridge and eave cornices. Color of the rake trim and cornices shall be Arctic White or Roman Bronze.
- d. (Optional). The eaves of the building shall have a gutter and downspout system of 24 gauge factory painted gutters of the same configuration as the building rake trim and 2" x 3" box type galvanized steel downspouts. Gutters and downspouts shall be the same color as the building rake trim and shall be complete with all required outlet drops, elbows and connecting hardware.

## **B.2.2 Structural Framing**

Angle or channel bracing components shall be placed across the building width to allow transmission of horizontal wind loads. All wind bracing components shall be of 14 gauge steel with minimum Grade G60 galvanized coating.

Where required for proper transmission of lateral wind loads, structural frame wind bents shall be installed. Wind bents shall consist of a bolted column and rafter assembly made of steel conforming to ASTM A-36 specifications.

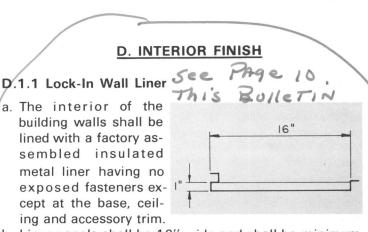
## C. EXTERIOR ROOF OPTIONS

#### C.1 Mansard Facade

The facade system shall consist of minimum 14 gauge galvanized steel framing and 24 gauge embossed facing panels. Facade shall be attached to the upstanding legs of the interlocking roof panels with no penetration of the roof panels. NOTE: The embossed Fascia panels are available in any of Parkline's standard colors. Buildings with Fascias in heavy snow areas should allow 10# additional live load for snow build up. Fascias are not recommended for 40# psf snow load areas. 8'' standard end roof extension not available with Facade.

#### C.2 Sidewall Roof Overhang

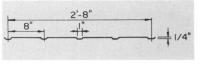
The interlocking roof panels of the building shall overhang \* feet outside of the building sidewalls. The roof overhang shall consist of a continuation of the building roof panels and shall not require any supporting beams, purlins, or columns. All panels shall be prepunched for connection to the building eave cap. \* Standard eave overhang is 1" for Type F buildings and 6" for Type AL buildings. Overhangs can be provided in 1', 2', 3', or 4' widths for all or any 16" length increment of the building sidewall.



- b. Liner panels shall be 16" wide and shall be minimum 24 gauge galvanized steel, prepainted White. Insulation shall be 1" thick rigid glass fiberboard insulation. The liner assembly shall be furnished complete with Tan base molding, White ceiling trim and accessory trim, extruded vinyl thermal clips, fasteners and connectors.
- c. The "U" value of the assembled wall liner at the center of the wall shall be a maximum of 0.17 BTU's @ $75^{\circ}F$ .
- d. (Optional) The wall void between the exterior wall panel and the lock-in-liner assembly shall be insulated with 3" thick unfaced fiberglass insulation.
   "U" value at the center of the finished wall shall be a maximum of .07 BTU's @ 75°F.

# D.1.2 Formed Wall Liner

a. The interior of the metal walls shall be lined with 24 gauge galvanized steel panels, prepainted White.



Panels shall be  $32^{\prime\prime}$  wide and have a  $1/4^{\prime\prime}$  deep by  $1^{\prime\prime}$  wide rib on  $8^{\prime\prime}$  centers.

- b. The liner system shall be furnished complete with Tan base molding and White ceiling and accessory trim.
- c. The liner panels shall be fastened to the wall panel ribs with #8 self drilling fasteners, prepainted White.
- d. All walls with formed wall liner shall be insulated with 3" thick unfaced fiberglass insulation. The "U" value at the center of the finished wall shall be maximum of 0.10 BTU's @75°F.

## D.2.1 Ceilings

- a. The metal ceiling system shall consist of 16" wide interlocking panels of minimum 24 gauge embossed galvanized steel factory painted White. The ceiling system shall be supported at its perimeter by concealed angles and hook bolts. The ceiling system shall be furnished complete with all necessary connectors and fasteners.
- b. (Optional) Ceiling panels shall have acoustical perforations across 14" of panel width. Perforations shall be 1/8" diameter on a patterned spacing of 3/8".

## **D.2.2 Ceiling Insulation**

Metal ceilings shall be insulated with 16" wide by 3" thick unfaced fiberglass insulation laid at right angles to the panel ribs. "U" value through the finished ceiling section shall be approximately 0.10 BTU's @75°F.

## D.3.1 Partitions

Partitions shall be constructed of 3"x16" interlocking flush type smooth surfaced panels in a minimum 24 gauge galvanized steel factory painted White. Partitions will be furnished complete with base channel, partition cap, splices and all required fasteners.

(Optional) Partitions shall have styrofoam base closure at juncture of partition and base channel.

### D.4.1 Sandwich Roof System

The interlocking roof panels shall be insulated and lined on the exterior of the building as follows:

- a. The panel shall be insulated to within 1" of the top of the panel leg with 16" wide, 3.0# density fiberboard insulation.
- b. A 26 gauge galvanized steel, prepainted white, roof panel, 32" wide with 7/8" deep ribs on 8" centers, shall be placed over the interlocking panel ribs and fastened to the panel ribs with #12 stainless steel self drilling fasteners having neoprene washers.
- c. The perimeter of the assembled roof system shall be tightly weathersealed with minimum 24 gauge metal flashing and neoprene closures.

# D.4.2 Roof Insulation.

Roof insulation shall consist of 48" wide, 1 1/2" thick, .6#density fiberglass faced on its exposed side with an embossed white vinyl facing. The faced insulation material shall have a UL Flame Spread Rating of 25 when tested in accordance with UL 723 or ASTM E-84 procedures.

Insulation shall be supported at the roof line by means of mechanical clips spaced on maximum 4' centers and shall be sealed by means of a 2" side tab on the facing.

The ''U'' value at the insulated roof shall be approximately 0.17 BTU's  $@75^\circ\text{F}.$ 

# D.5.1 Wall Insulation

The building walls shall be insulated with 1 1/2'' thick fiberglass faced on its exposed side with an embossed white vinyl facing. The faced insulation shall have a UL Flame Spread Rating of 25 when tested in accordance with UL 723 or ASTM E-84 procedures. The insulation shall be retained between the interlocking panel ribs with a white PVC hat clip over the panel ribs. Hat clips shall be of self extinguishing material per UL Standard 651.

The ''U'' value at the insulated wall shall be approximately 0.15 BTU's  $@75^{\circ}F$ .

# E. ROOF ACCESSORIES

E.1.1 Circular Roof Ventilators (Type F Buildings only)

Stationary ventilators shall be standard 12" diameter gravity type fabricated from minimum 24 gauge galvanized steel, factory painted white, and shall be furnished complete with bird screen and operable disc type damper. The ventilator base shall be minimum 20 gauge galvanized steel factory painted white.

# E.1.2 Ridge Ventilators (Type AL Buildings Only)

Ridge ventilators shall be of gravity type with chain operated vertical lift dampers. Ventilators shall be made of 24 gauge galvanized steel, factory painted white on all visible exterior surfaces. Top of ventilator shall have a bird screen cover.

Ridge ventilators shall have a 4" wide throat and each section shall be 10' in length.

# E.2.1 Skylights

Skylight panels shall be flat translucent reinforced glass fiber factory assembled into standard 16" wide flush interlocking panels. The panels shall be 1/16" thick, neutral in color and have a light factor of approximately 65%.

Panels shall meet or exceed all requirements of Federal Specifications FS-LP-505. When subjected to ASTM-E-55T (Type U Equipment) simulated 1000 hour weather test, the panel shall show no loss of surface gloss or exposed glass fibers.

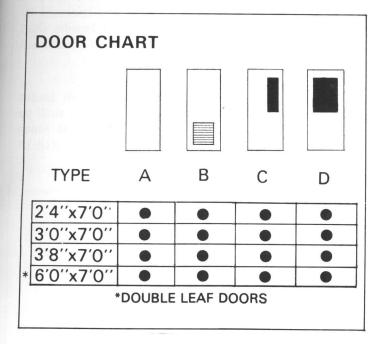
# F. WALL ACCESSORIES

### F.1.1 Hollow Metal Doors

All doors shall be 1 3/4" thick flush construction. Door panels shall be minimum 20 gauge galvanized steel reinforced by lamination to a small cell honeycomb core enclosed with a continuous steel perimeter channel. The hinge edge channel shall be minimum 11 gauge and the lock edge channel shall be minimum 14 gauge. Door panels shall be projection welded to the perimeter channels on maximum 5" centers.

Door frames shall be  $4 \ 3/4''$  deep double rabbeted type of minimum 16 gauge galvanized steel.

Doors and frames shall be factory painted with one coat of baked on primer.



**F.1.2 Door Leaf Types**—Shall be of the types indicated below.

- a. Solid Panel.
- b. Solid top, bottom with adjustable louver. (optional all door types)
- c. Top with 5" x 36", DSB clear or 1/4" wire, preglazed narrow lite, solid bottom.
- d. Top open for glass, solid bottom.

## F.1.3 Door Assembly

All doors shall be preassembled in their frames and hardware installed and tested prior to shipment. Field installation of the door unit shall not require any frame assembly, door hanging or hardware installation.

# F.1.4 Door Hardware

Door hardware shall consist of:

- a. 3-4 1/2" x 4" steel hinges per Govt. Spec. FFH-116C, Type 2127, Aluminum Finish.
- b. (Standard) Mortise cylinder lockset per Govt. Spec.
   86B, US26D Satin Chrome Finish.
- b. (Optional) Cylindrical key in knob lockset per Govt. Spec. 160A, US26D, Satin Chrome Finish.
- b. (Optional) Latch set per Govt. Spec. 160A, US26D Satin Chrome Finish.
- c. 3 11/16" wide x 5/8" high extruded aluminum threshold.
- d. 3/16" x 3/8" polyurethane weatherstripping.
- e. (Optional) Parallel arm door closer per Govt. Spec. 3009-IV, regular arm, Aluminum Finish.
- f. (Optional) Rim type crossbar panic device per Govt. Spec. 810H with US28 Aluminum Finish.
- g. UL approved push bar panic device with aluminum finish (No Govt. Spec.).
- h. (Optional) Adjustable blade louver with thumb screw operation and 18 x 14 mesh insect screen.

# F.2.1 Framed Openings for Overhead Doors

Framed openings shall be constructed from minimum 14 gauge high strength galvanized steel. The jambs and head shall provide a minimum 2 1/2" wide inside surface for field mounting of overhead door track and hardware. All jambs and heads shall receive one shop coat of primer paint.

# F.2.2 Overhead Doors

Overhead doors shall consist of minimum 24 gauge galvanized steel sections, prime painted white. Operation shall be by means of head mounted torsion springs. All meeting rails shall have dual rabbeted type weather joints and bottom section of doors shall have vinyl weatherseal. All doors shall be constructed to withstand minimum windload of 20 pounds per square foot.

# F.2.3 Rolling Steel Doors

Rolling steel doors shall consist of a curtain assembly of minimum 24 gauge galvanized steel slats prime painted white, guides shall be minimum 13 gauge galvanized steel angles or channels. Door operation for doors over 100 square feet in area shall be by chain hoist. Door shall be completely weatherstripped around the door perimeter.

# F.3.1 Horizontal Sliding Windows

Sliding windows shall be furnished factory glazed and complete with all attaching hardware. The window unit shall be factory assembled for single unit installation.

All window sash sections shall be of 6063-T5 extruded aluminum with a minimum thickness of .062". Windows shall meet or exceed Architectural Aluminum Manufacturers Association Specification HS-A2-HP.

All windows preglazed with DSB glass, 1/4" polished wire, 1/4" acrylic or 1/8" obscure glass shall be color finished in White baked enamel. Windows having 1/2" insulated glass shall have Roman Bronze baked enamel finish.

# F.3.2 Window Wall Units

Window wall units of the sizes indicated shall be furnished factory glazed with 1/2" insulating glass set in vinyl glazing channels. Head and sill panels shall be 1" thick panels having an exterior face of Bronze color porcelain enamel fused to steel, 1/8" cement asbestos sub skin, expanded perlite insulating core, 1/8" cement asbestos sub skin and an interior face of prime painted aluminum. All window and panel framing sections shall be made from 6063-T5 extruded aluminum alloy of a minimum .062 thickness. All frame sections shall be finished in a factory applied Bronze color.

Window wall units shall not require field cutting of any type and shall be provided with all connectors required for proper wall installation.

# F.3.3 Project Out Windows

Project out windows shall consist of extruded aluminum sections of 6063-T5 alloy with 1 1/2'' minimum depth and 1/8'' thick webs. Window finish shall be AA-M10 natural aluminum. Windows shall be designed for outside glazing using an aluminum color glazing compound.

Window frame shall be minimum 14 gauge galvanized steel head, sill, and jamb sections, prime painted grey.

(Optional) All windows shall be complete with aluminum framed removable screens over ventilating section with sliding wickets for access to locking handles.

## F.4.1 Adjustable Wall Louvers

Adjustable louvers shall be general purpose type of self framing design. The louver frame shall be of minimum 14 gauge formed aluminum and the louver blades shall be minimum 12 gauge extruded aluminum. Finish shall be natural mill finish and shall not require field painting.

Blades shall be pivoted on 1/2'' diameter aluminum pivot pins through nylon flanged bearings and operated by means of a pull bar operating handle. All louvers shall be complete with an exterior mounted 18 x 14 aluminum mesh insect screen.

# F.4.2 Gable Louvers (Type AL Building Only)

Gable Louvers shall be fixed blade type with blades set on a 45 degree slope. Blades and frames shall be 14 gauge extruded aluminum with natural mill finish and .0004" anodic coating. Louver shall include #18-14 aluminum mesh insect screens.

In keeping with Parkline's policy of continuous product improvement, specifications are subject to change without notice.

# SUGGESTED FOUNDATION DESIGNS

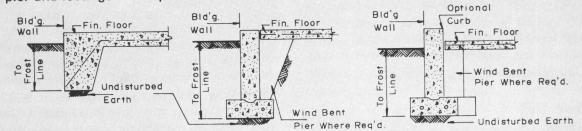
Due to the even distribution of loads into the foundations of Parkline buildings, the designs are usually quite simple when compared to other types of building construction.

In order to achieve the proper foundation design for a specific building, an engineer familiar with the building codes, soil conditions, etc., in the area where the building is to be constructed should be employed.

The below information is offered as general information only regarding foundation designs commonly used for Parkline buildings.

In many applications a combined foundation - floor design can be used. (See Sketch #1). However, in extreme frost conditions, poor soil, etc., it may be necessary to design separate foundation and floor systems. (See Sketch #2)

Separate pier and footings are required where a wind column assembly is used. (See Sketch #3)



Wire mesh reinforcing is recommended in the floor slab under any condition. Additional reinforcing such as rods, may be required to satisfy strength requirements and to prevent cracks due to uneven settlement of soil.

The tabulation below shows the nominal loads induced into the perimeter foundation wall.

# FOUNDATION LOAD REQUIREMENTS

		Horizontal Load				
BLDG.	WIDTH	20/15	20/25	30/20	40/20	
10'-8'' & 16'-0'' TH	RU 8'-0 & 12'-0 IRU 24'-0 IRU 32'-0	" 150 " 300	100 150 300 415	140 210 420 575	180 270 540 735	150# per lineal foot

The values shown include dead load, live load and wind load. Any other loads supported by the building, must be added and the foundation designed accordingly.

To eliminate erection problems, the tolerances listed should be maintained when finishing the perimeter wall and the floor slab to allow the base channel mounting surfaces to be as level as possible.

### TOLERANCES

Width and/or Length

=

<u>+</u> 1/8" under 12'-0" + 1/4" over 12'-0" Out Of Level

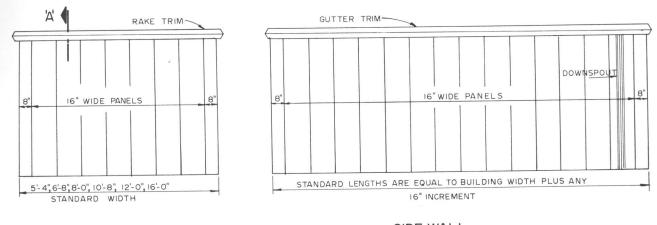
<u>+</u> 1/8" in 20'-0" <u>+</u> 1/4" overall

Out Of Square

= ± 1/2"

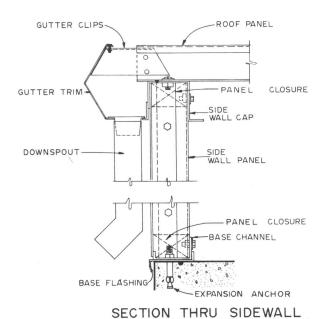
B. 1a (Option 1)

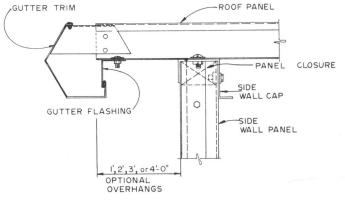
TYPE "F" TRIMLINE BUILDING DETAILS



ENDWALL

SIDE WALL







WHEN THE BUILDING LENGTH IS LONG IN RELATION TO THE BUILDING

WIDTH OR A LARGE NUMBER OF DOORS AND WINDOWS ARE USED,

OCCASIONAL STRUCTURAL WIND BENTS MAY BE REQUIRED. CONTACT PARKLINE FOR WIND BENT LOCATION, DETAILS AND REQUIREMENTS.







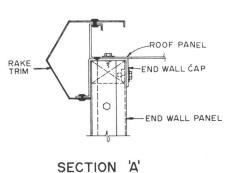






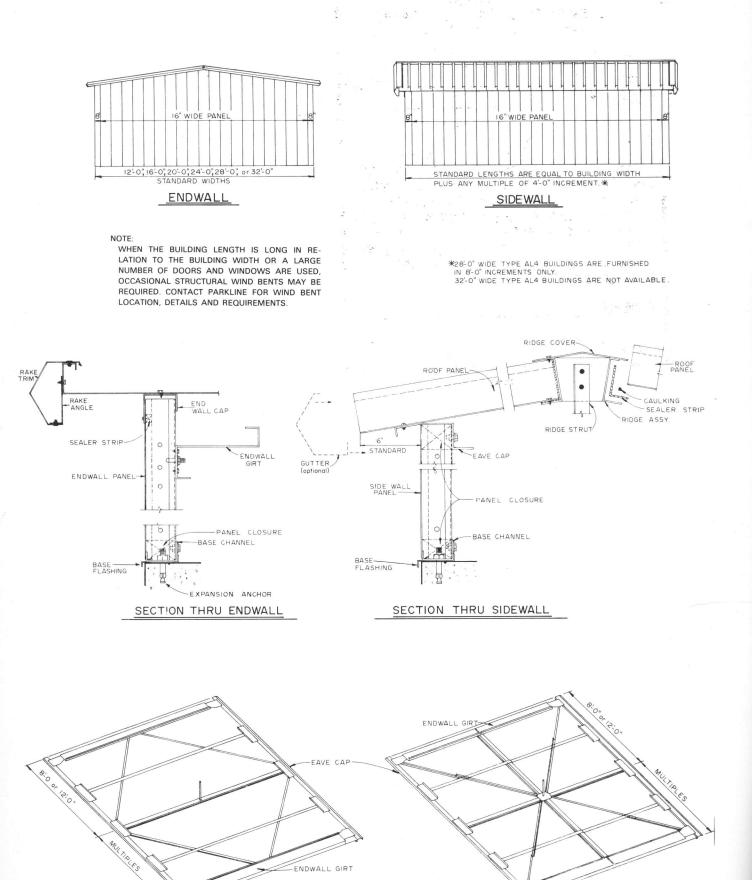






7

NOTE:



WINDBRACING LAYOUT FOR

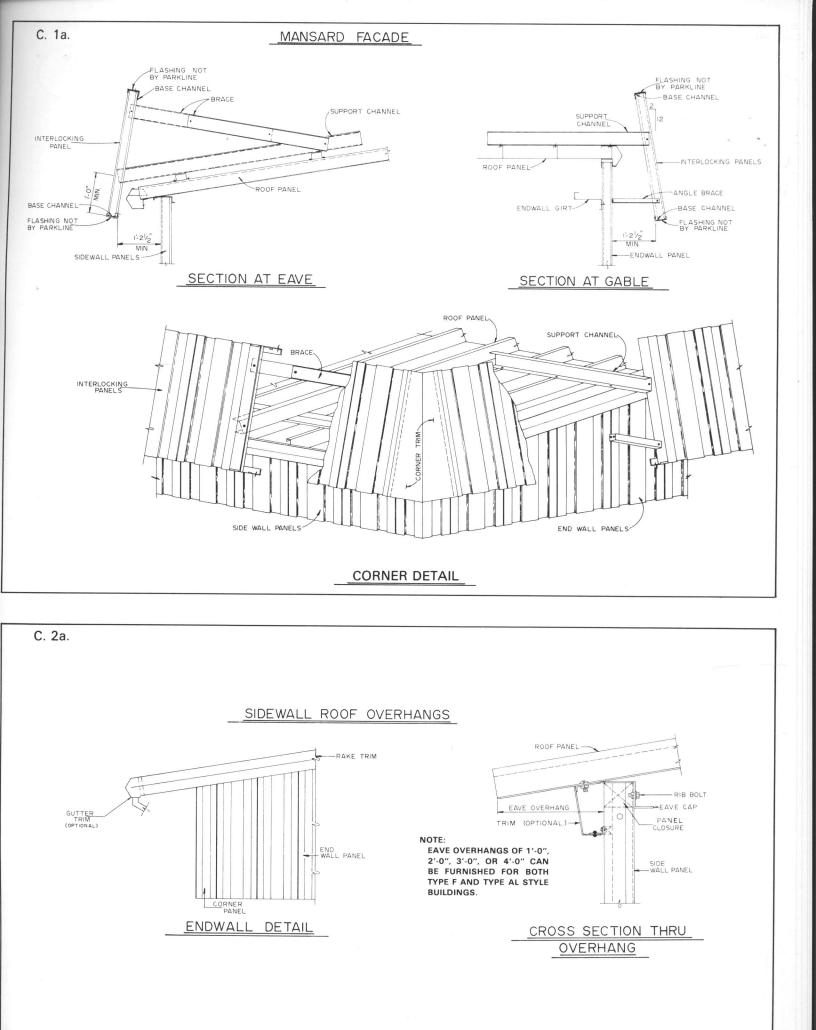
LOCATED AT THE EAVELINE

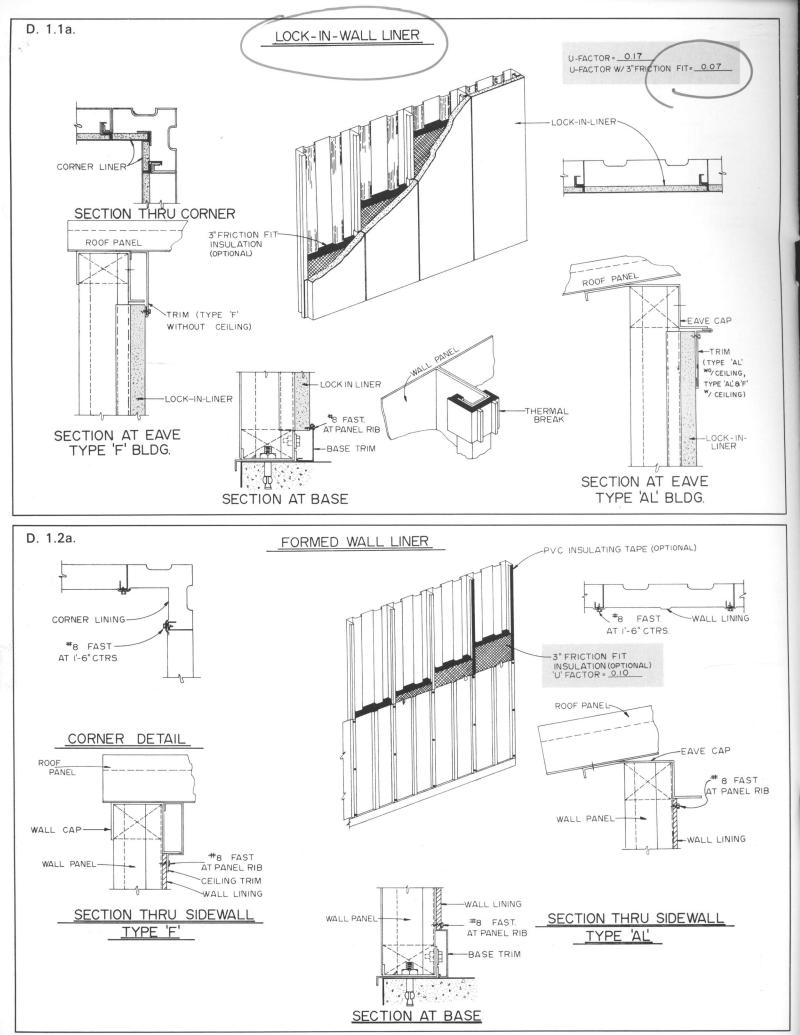
12'-0" AND 16'-0" WIDE BUILDINGS

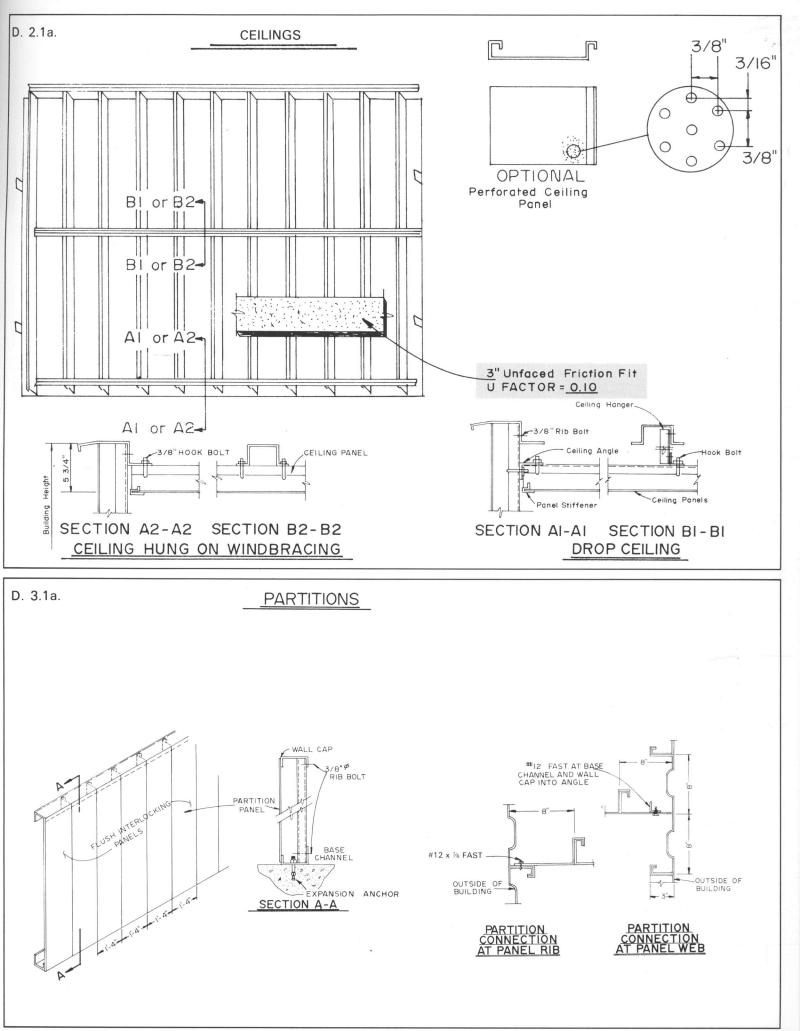
TYPICAL

TYPICAL WINDBRACING LAYOUT FOR

20'-0" THRU 32'-0" WIDE BUILDINGS

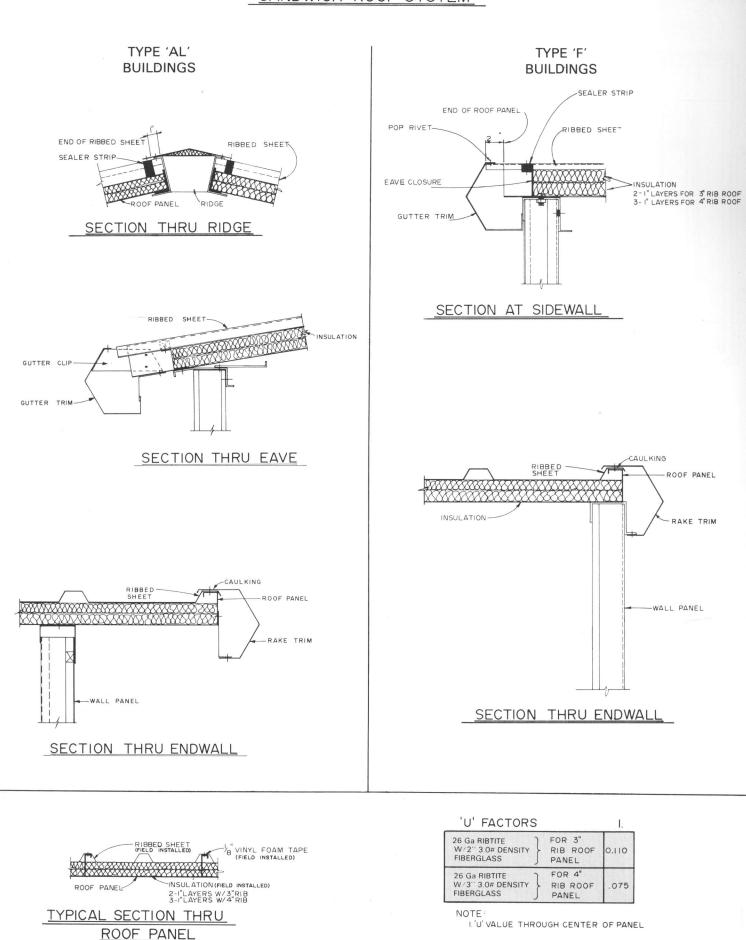


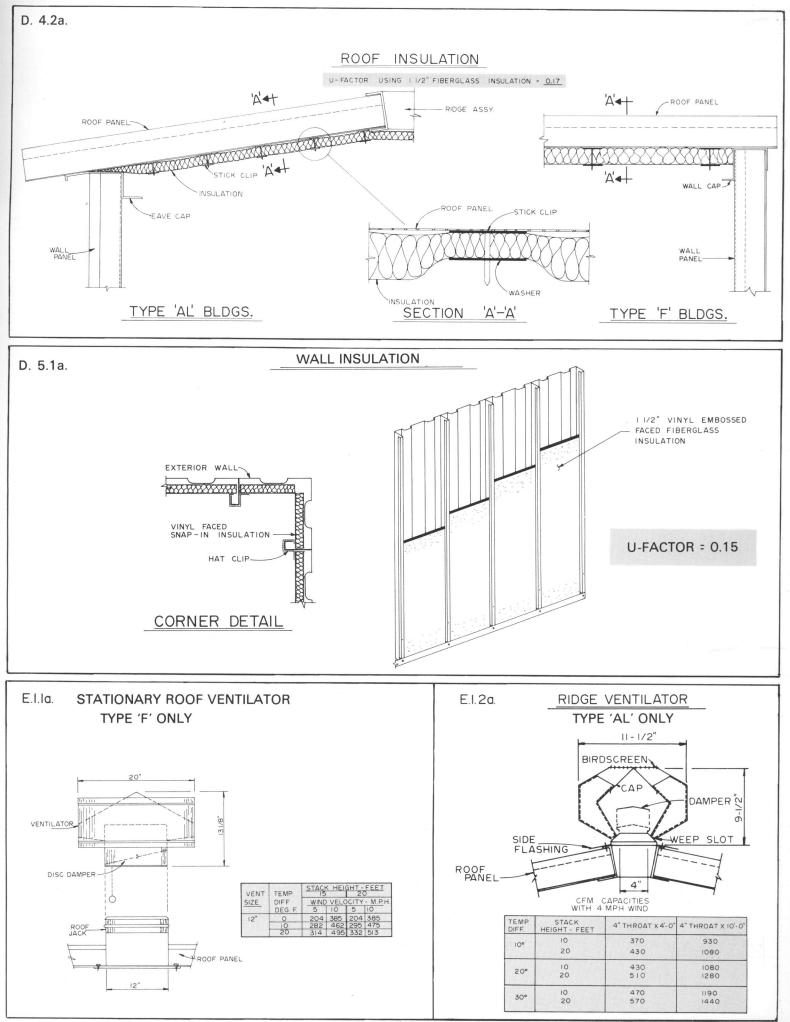


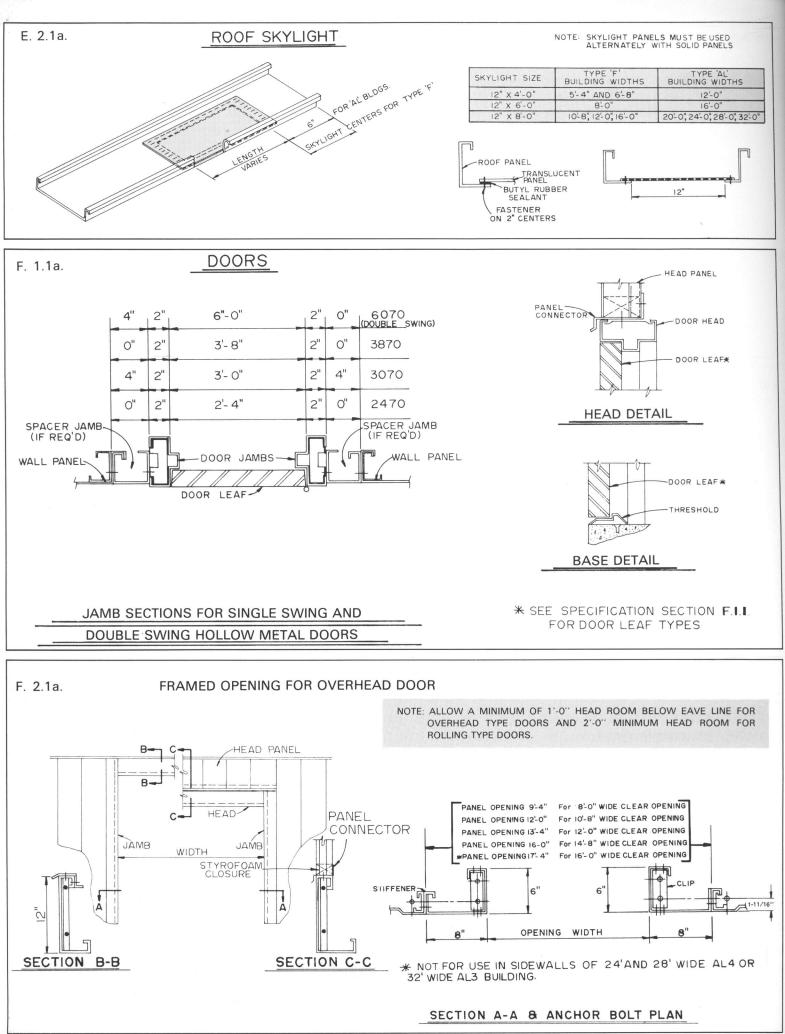


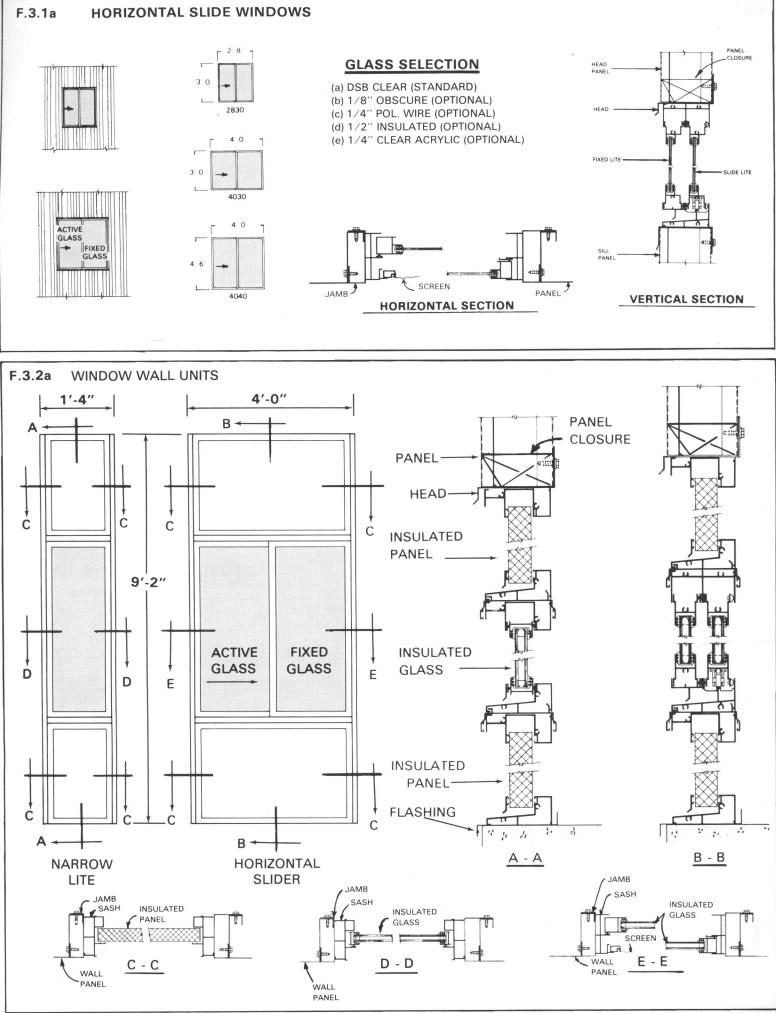
# SANDWICH ROOF SYSTEM

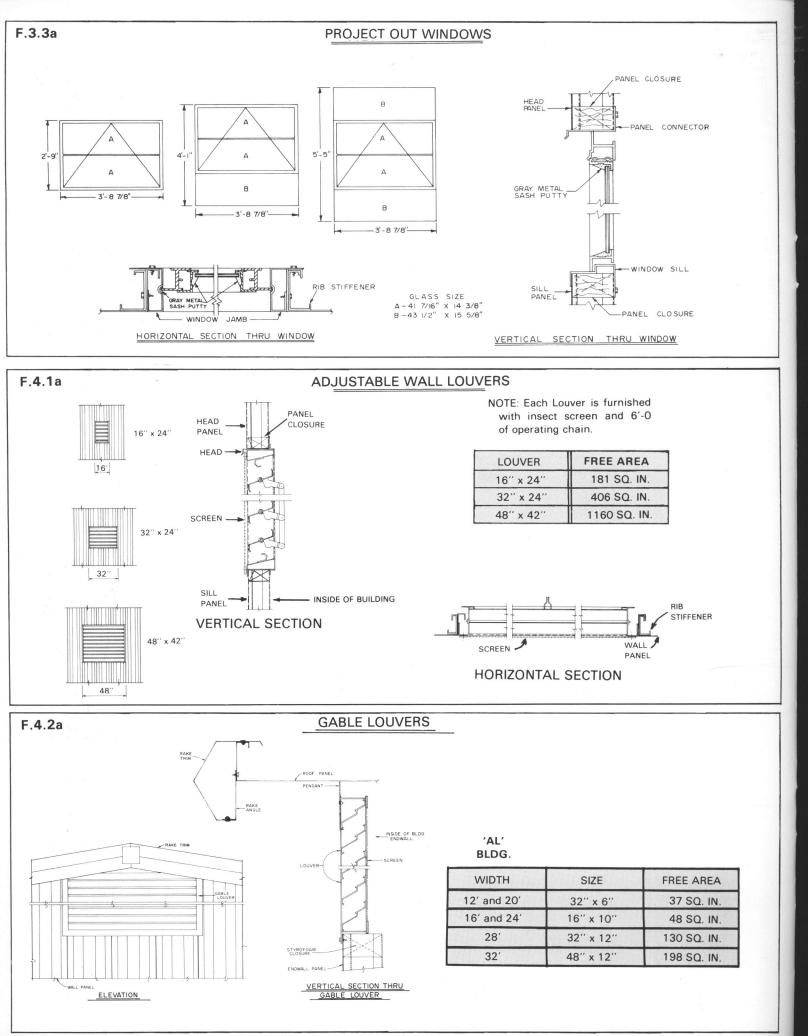
D. 4.1a.



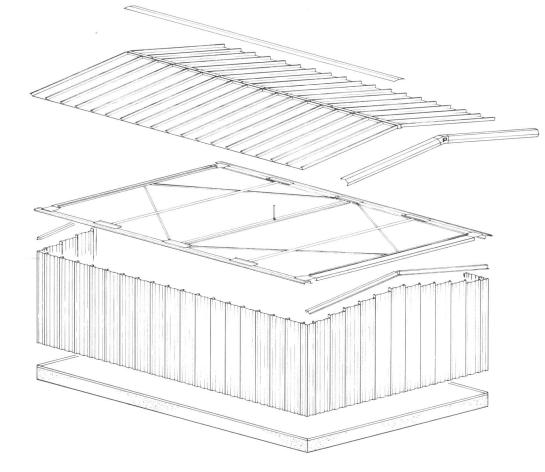


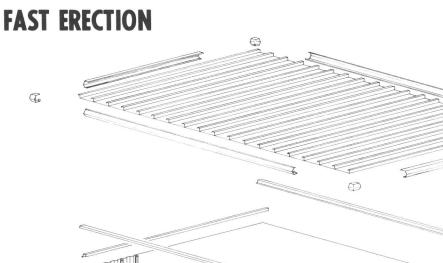






# PRECISION MANUFACTURING ALLOWS FOR:





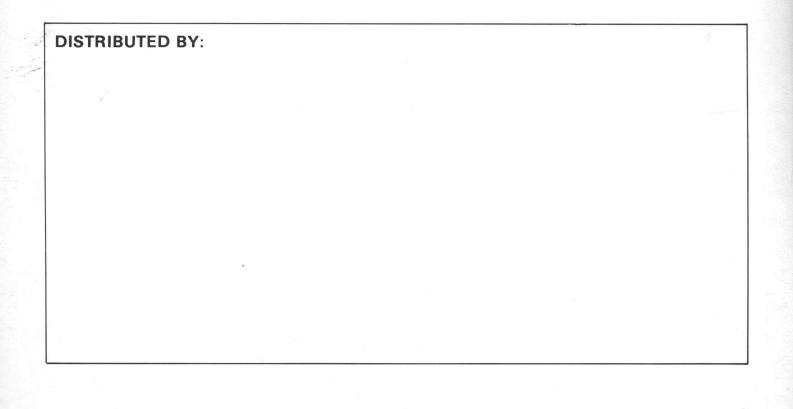
D

TRIMLINE

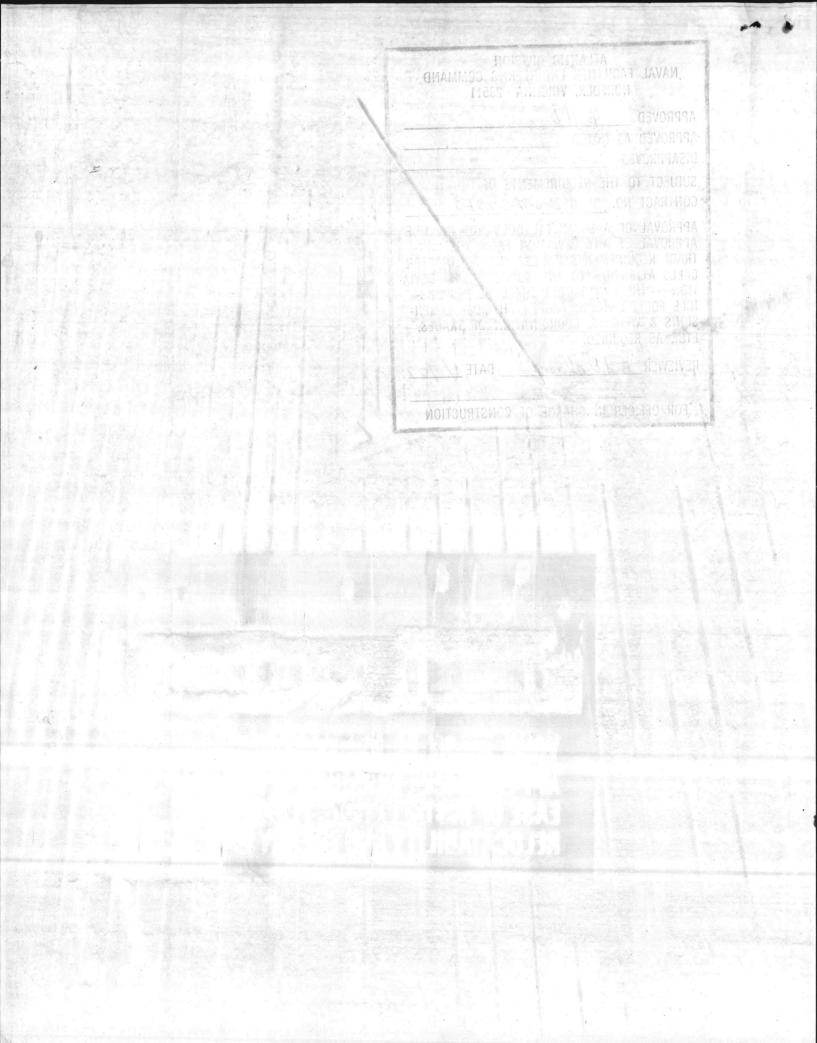
**STYLELINE** 

QUICK DELIVERY

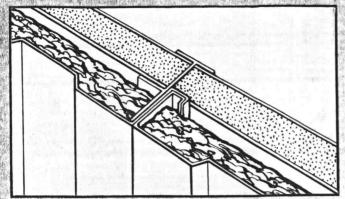
ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511	1. 
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DISAPPROVED	
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM HE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPOR'S HE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER FHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. REVIEWER <u>BHDulare</u> DATE <u>b/y/79</u> FOR OFFICER IN CHARGE OF CONSTRUC	
	PARKLINE INC.™



ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 APPROVED BHD APPROVED AS NOTED SYSTEM DISAPPROVED SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N 62470-77-0-2563 APPROVAL OF A SUBMITTAL DUES NOT INCLUDE APPROVAL OF ANY DEVIATION FIRM + BON-TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORT H DEVIA-TION --- THE CONTRACTOR SHALL BE RESPONS-IBLE FOR PROVIDING PROPER FHISICAL DIMEN-SIONS & WEIGHTS, COORDINATION OF TRADES. ETC., AS REQUIRED. FOR OFFICER IN CHARGE OF CONSTRUCTION **YOUR MARK OF EXCELLENCE FOR... APPEARANCE**, **DURABILITY**, **ECONOMY**, EASE OF INSTALLATION, FLEXIBILITY, **RELOCATABILITY AND ENERGY EFFICIENCY** 



# **PARKLINE WALL SYSTEMS**



Outstanding architectural appearance in a building tailored to your specific needs, together with the highest-quality construction at lowest cost, are yours when you specify a structure using one of Parkline's four pre-engineered metal building wall systems.

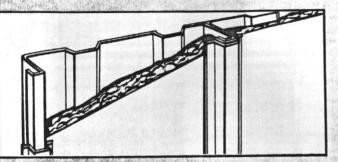
All Parkline wall systems feature extra-strength embossed Interlocking panels which span more than 12 feet without Intermediate supports for both space and cost savings. Parkline's wide choice of long-life factory-applied color finishes — and concealment of all fasteners inside the panels — assure years of top appearance and performance without costly maintenance.

Pre-engineering of Parkline components means that your system goes up fast, with minimum field cutting. Exterior walls are prepunched and precut for standard Parkline accessories.

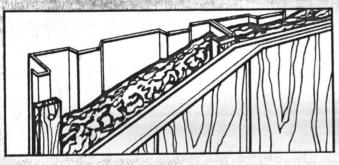
High thermal-resistance characteristics of Parkline panels add up to major heating and cooling cost savings for your building as well.

By whatever criteria you use to evaluate wall panels, Parkline excels!

# PARKLINE MARK I – MARK IV WALL SYSTEMS



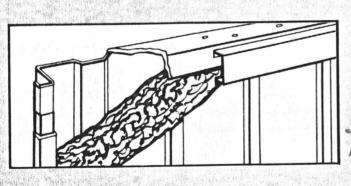
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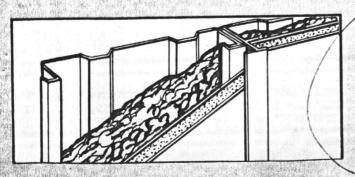


MARK I — For an easy-to-install, economical wall system where condensation control and a hard-surface interior are not critical requirements, Parkline's Mark I wall is the quality solution. Semirigid fiberglass, 1½ inches thick, faced with a white embossed vinyl is retained in place between the panel ribs with a white PVC rib retainer. U. value is 0.20; R value is 4.9.

MARK II — Mark II wall systems have 16-inch exterior panel rib spacing, duplicating standard construction stud spacing and providing a sturdy backup for interior wall materials. Mark II systems may be finished with any type of wallboards or prefinished paneling. Parkline Friction Fit insulation is used to provide high heat transmission resistance factors. With ½" gypsum wallboard, Mark II has an approximate U value of 0.14; R value is 7.1.

MARK III — The Mark III offers high strength and economy to Industrial construction with a combination of the concealed fastener exterior panel, 3" fiber glass insulation and an impact resistant metal liner. All system components, including base and eave trim, are provided by Parkline. The interior liner is also available with a perforated pattern for sound reduction (NRC 90 Rating). U value is 0.16, R value is 6.2. More "U" factor Than Regured See Lock on Liner in Design U" of MANNAC Page 10- W 3" fruction of





MARK IV — The Mark IV is one of the finest modular wall systems available, combining attractive appearance, high insulation efficiency, and low in-place cost. Mark IV systems exceed ASHRAE 90-75 recommendations for single story, non-residential construction by up to 80 per cent. Insulation is 1½-inch-thick reinforced foam board attached to the exterior wall panels with PVC retainers that eliminate through-the-wall metal-to-metal contact. All interior fasteners and panel joints are concealed. Interior can be cleaned with soap and water. Panels are highly impact resistant. With 3" Friction Fit insulation, U value is .045, R value 22.2. Without Friction Fit U value is .07, R value 14.5.

NOTE: U and R values are calculated by ASHRAE "zone" method and includeheat loss at panel ribs. See Look on Liner in Design U" of Manine Pagero W 3" FRIETION FT

# **ALL PARKLINE WALL SYSTEMS FEATURE:**

Quality Appearance: Panels have a rich, textured, embossed look with no exposed fasteners.

Great Durability: Interlocking rib design affords high strength and resistance to impact damage. Galvanizing and silicon polyester coating give maximum exterior color life.

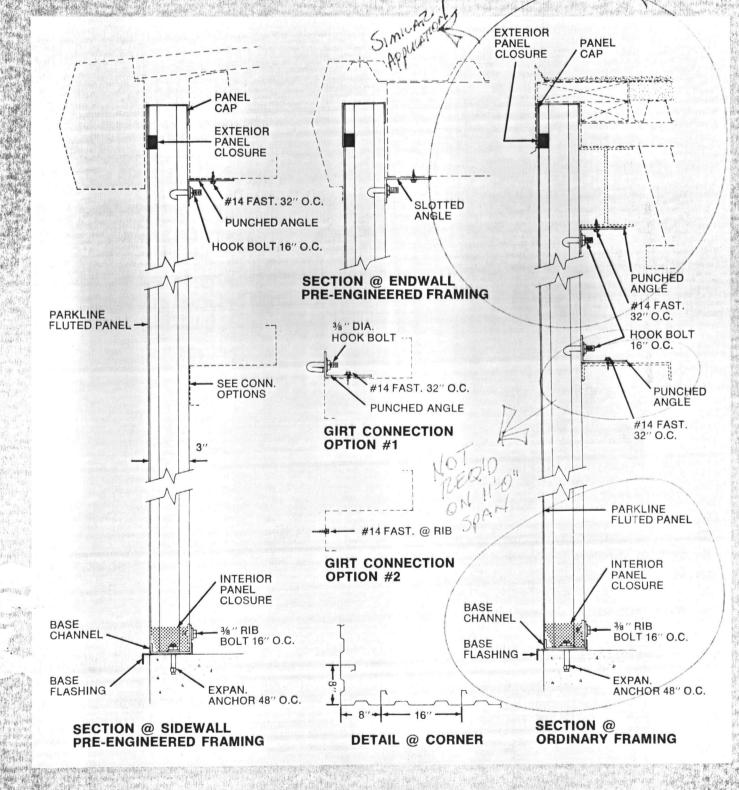
Maximum Economy: Parkline wall systems give lower in-place costs than major competing systems. Their high strength-toweight ratio reduces the need for secondary structural supports.

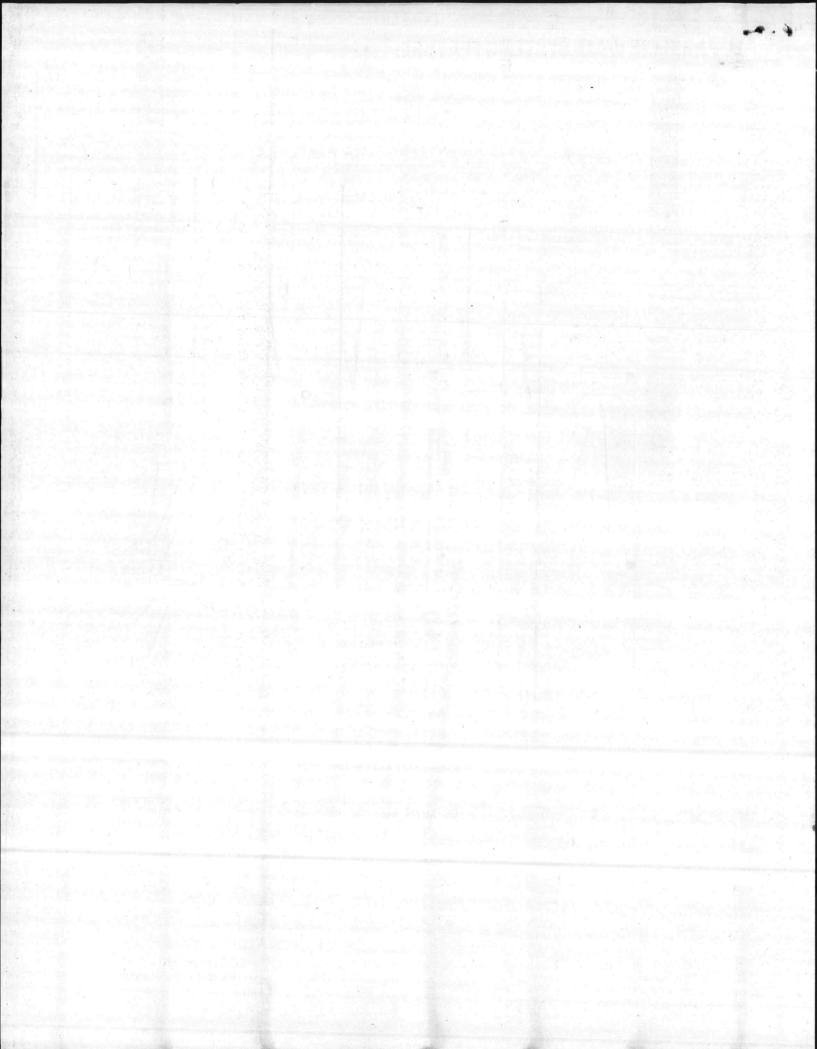
Easy Erection: Panels have factory-punched fastener connections and are factory cut for accessories. Parkline offers single-source responsibility for the entire wall system, including accessories such as doors, windows, etc.

Economical Relocatability: Nearly 100 percent of the materials in a Parkline wall system can be relocated without loss of material or redrilling of holes.

Maximum Flexibility: By varying the insulation materials and interior liners used, a Parkline wall system can be designed to closely fit nearly any individual building need.

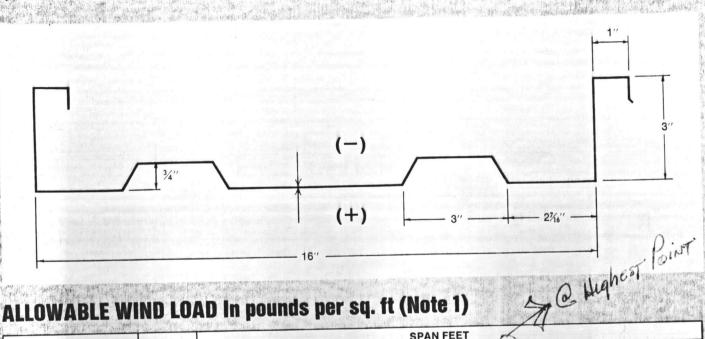
High Energy Efficiency: Parkline's Mark IV wall system is one of the lowest cost wall systems (total life cycle costs) available today and is seven times more efficient than most masonry wall systems.





# ACCESSORIES

Parkline offers a complete line of doors, windows, louvers and other accessories, coordinated to assure you of a complete wall system with all parts designed to work well and look well together.



# ALLOWABLE WIND LOAD In pounds per sq. ft (Note 1)

AN THE SPECTRUM AND		SPAN FEET								
SPAN	LOAD DIRECT.	6	7	8	9	10	(11)	12	13	14
	NEG.	72	62	52	41	33	27	23	20	17
SINGLE or DOUBLE SPAN	POS.	72	62	54	47	42	(35)	29	25	21
DOODEE OF AIL		62	53	46	41	37	33	30	28	and the second
CONTINUOUS SPAN	NEG.	62	53	46	41	36	33	29	25	
	POS.		37	32	28	26	23	21	20	18
FASTENER #1	NEG.	43				35	32	29	27	25
FASTENER #2	NEG.	59	51	44	39		32			

Fastener #1 is a #14 x 1" type A hex head screw. (K1236)

Fastener #2 is a 3/8 " \$ Hook Bolt w/wash. & h

# **SECTION PROPERTIES (Note 2)**

1.1995	States and the	Carl Section	FI	ANGE IN C	OMPRESSIO	N		WEB IN CO	MPRESSION	
WEIGHT Lbs./Ft <sup>2</sup>	AREA A, IN <sup>2</sup>	RAD GY b, IN	MO. INT.	DEFL.	SEC. MOD Sx IN <sup>3</sup>	MAX. Fb KSi	MO. INT. Ix IN⁴	DEF. Ix IN <sup>4</sup>	SEC. MOD Sx IN <sup>3</sup>	MAX. Fb KSi
				0.637	0.294	17.20	0.490	0.538	0.423	15.10
1.62	0.63	1.00	0.637		the papel in			2 Minimu	Im yield point i	s 40.000 P

1. All loads given are allowable wind loads with the panel in a vertical position, allowable wind loads have been increased by  $\frac{1}{3}$  to compensate for permissible increase in allowable stress. NOTES:

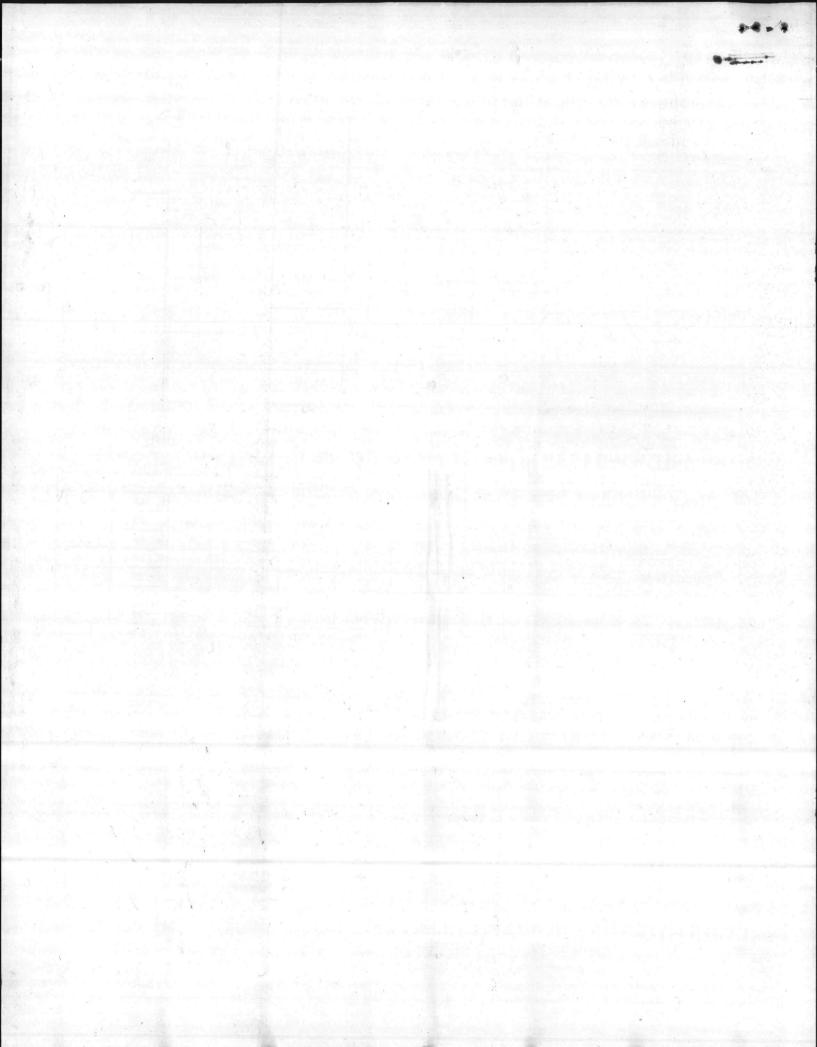
# FOR ADDITIONAL INFORMATION.

on Parkline wall system accessories and components, ask your Parkline builder-dealer for a copy of Parkline's Building Design Manual.

# **OTHER LITERATURE AVAILABLE FROM PARKLINE:**

General Catalog (GSC 76) Building Design Manual (BDM 76) Color Selection Chart (CS-1) Building Spec Data Sheet (13P) Commodity Panel Data Sheet (CP76) Energy Savings Report (ESP 77)





#### HANNA CHEMICAL COATINGS CORPORATION

DK

PERFORMANCE SPECIFICATION FOR POLYSIL 1000

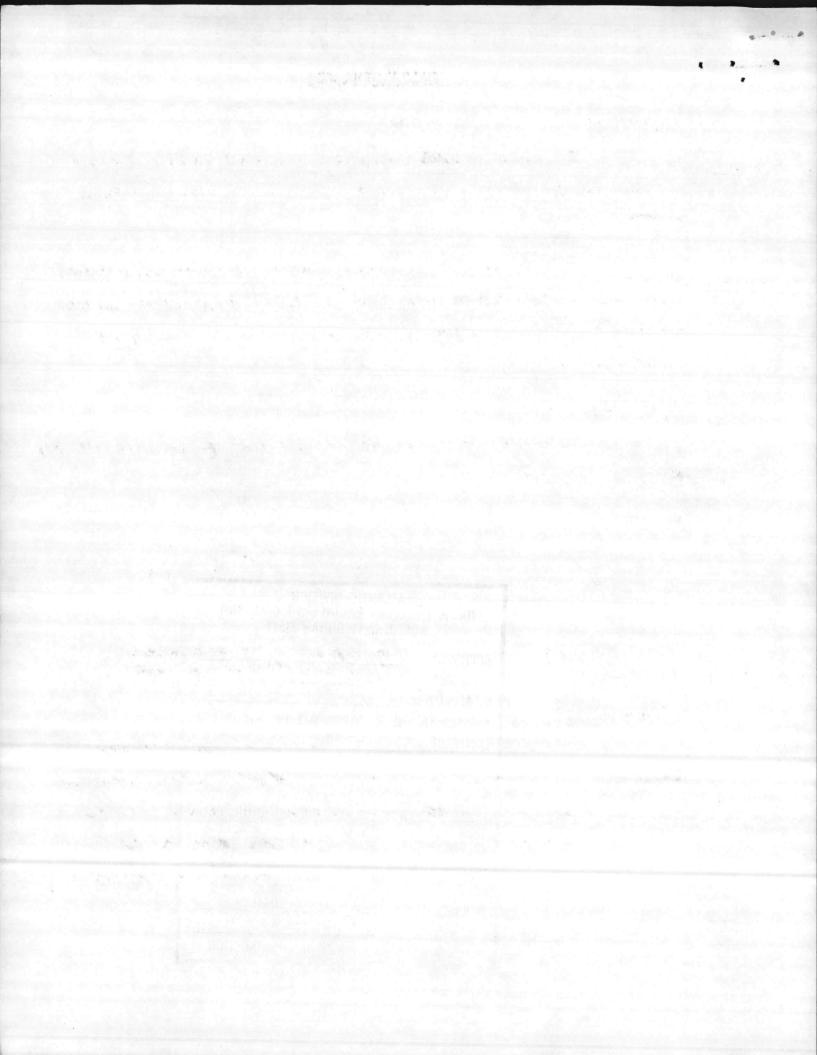
(Two-coat Silicone Polyester Finishing System on Galvanized Steel)

## QUALITY STANDARDS FOR PAINTED GALVANIZED STEEL

## GENERAL QUALITY

Galvanized steel, used in the manufacture of steel buildings because of its superior corrosion resistance and structural strength, is an excellent base for the high quality silicone polyester finishes used in its decoration. The chemical pre-treatment, plus the proper application of an epoxy primer followed by the heat cured silicone polyester enamel assures a finish that will exhibit no cracking, blistering or peeling throughout the lifetime of the coating.

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511	
APPROVED	
SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N62470-77-C-2563	
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVI TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER PHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. REVIEWER B Jb Bulance DATE 6/11/2	? A-
FOR OFFICER IN CHARGE OF CONSTRUCTION	



#### QUALITY STANDARDS

#### PRETREATMENT -

The galvanized steel shall receive a thorough cleaning to remove possible contaminates before it is treated with a uniformly applied chemical conversion coating.

The chemical coating, in conjunction with baked corrosion resistant epoxy primer and Polysil 1000 finish, provides a finishing system that will meet the rigid flexibility, humidity, salt spray and accelerated weathering tests specified herein.

#### SURFACE APPEARANCE -

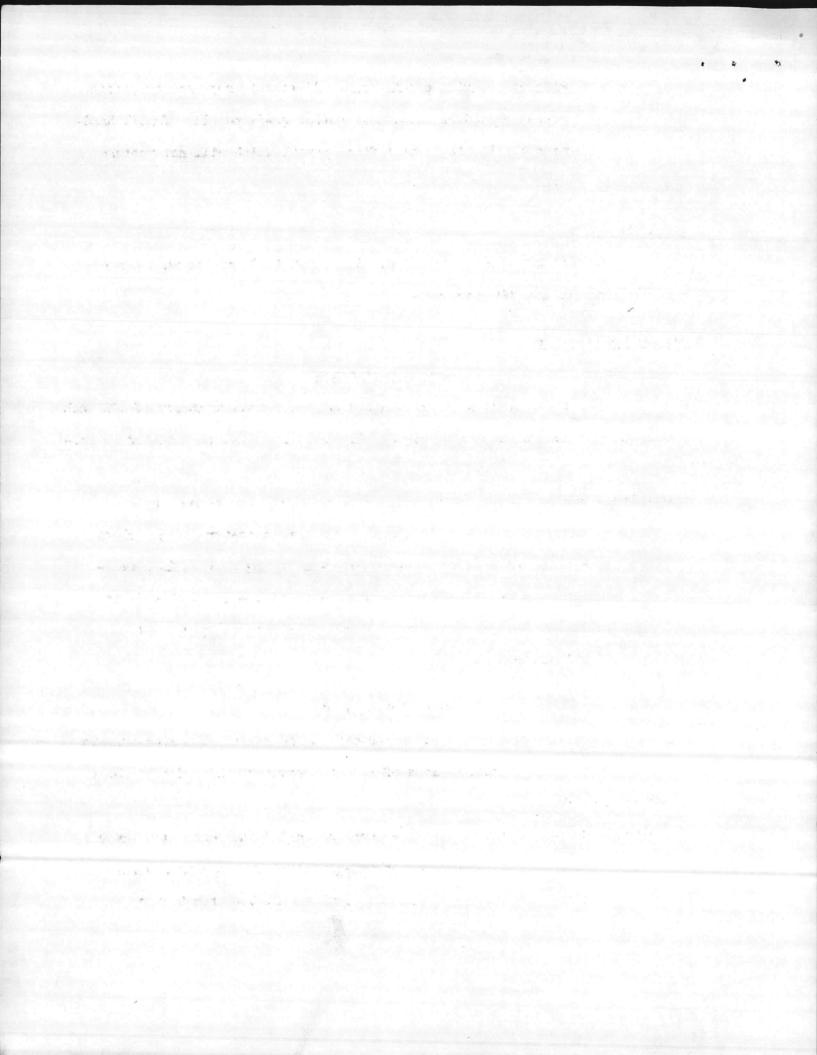
Commercially smooth, and substantially free from flow lines, streaks, blisters, or other surface imperfections.

### DRY FILM THICKNESS -

Exterior Application: plus:	0.2 - 0.05 mil Epoxy Primer 1 mil - 0.2 mil Silicone Polyester
Interior Application:	0.2 mil Epoxy Primer 0.3 mil Polyester Backer
Other Application:	As required for desired appearance, effect, properties or color match.

#### DRY FILM HARDNESS -

Grade H minimum Eagle Turquoise Pencil when tested as follows: Test Method: Strip wood from pencil leaving full diameter of lead. Using fine grit sand or emery paper, flatten end of lead so it is 90° to pencil axis. Hold pencil at 45° to film surface and push forward about 1/4 inch using as much downward pressure as can be applied



without breaking pencil lead. If film is ruptured by pencil, repeat procedure using next softer grade pencil. Pencil hardness of film is that of first pencil which will not rupture film.

#### TABER ABRASER -

Will not lose in excess of 60 mg. per 1,000 cycles when tested with CS-10 wheel and 500 gram load.

#### DRY FILM FLEXIBILITY -

#### Impact Resistance

Painted sheet will withstand direct and reverse impact of 120 inch pounds with no loss of adhesion between film and base sheet when tested as fellows:

Test Method: Subject sample at room temperature to 80 inch pounds impact.

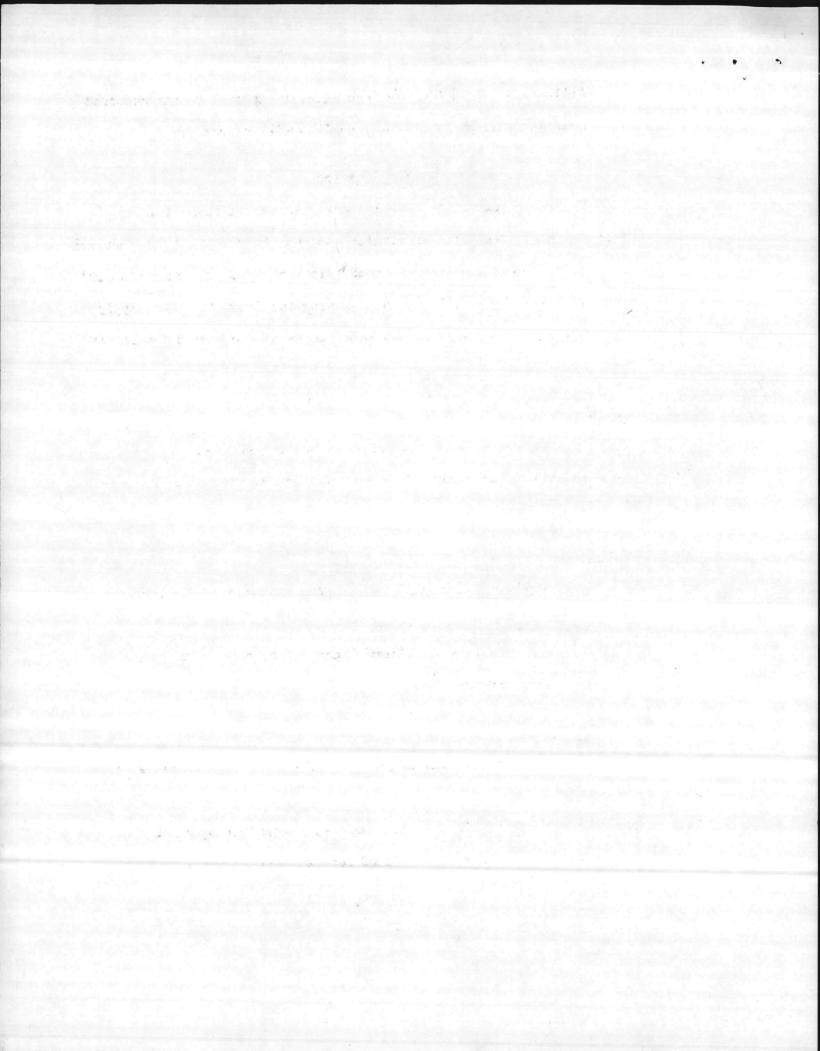
force by use of a Gardner variable impact tester or equivalent, with a 5/8 inch mandrel. Minute fracturing of film is permissible but when Scotch Cellophane Tape #600 - 3/4 inch wide is applied to the deformed area and pulled off sharply, no film will be removed.

#### Olson Button Test

Painted sheet will withstand direct and reverse 0.3 inch draw in the Olson Button Tester with no loss of adhesion between film and base sheet when tested as follows:

Test Method: Subject sample at room temperature to 0.3 inch draw with the use of the Olson Button Tester or equivalent with a 1 inch ball. Minute fracturing of film is permissible, but when Scotch

- 2 -



Cellophane Tape #600, 3/4 inch wide, is applied to the deformed area and pulled off sharply, no film will be removed.

# Film Adhesion

No removal of the film will occur when tested as follows: Test Method: Using a sharp knife or similar instrument, make (10) ten parallel cuts through the film at about 1/16 inch spacing. Make ten (10) similar cuts at 90° to, and crossing the first ten (10), apply #600, 3/4 inch wide Scotch Tape firmly to the area and pull off sharply.

# SPECULAR GLOSS -

The standard 60° specular gloss of a painted sheet is 30 ± 10. Test Method: Method 6101 of Federal Test Method Standard 141 or ASTM Tentative Method D-523.

#### COLOR UNIFORMITY -

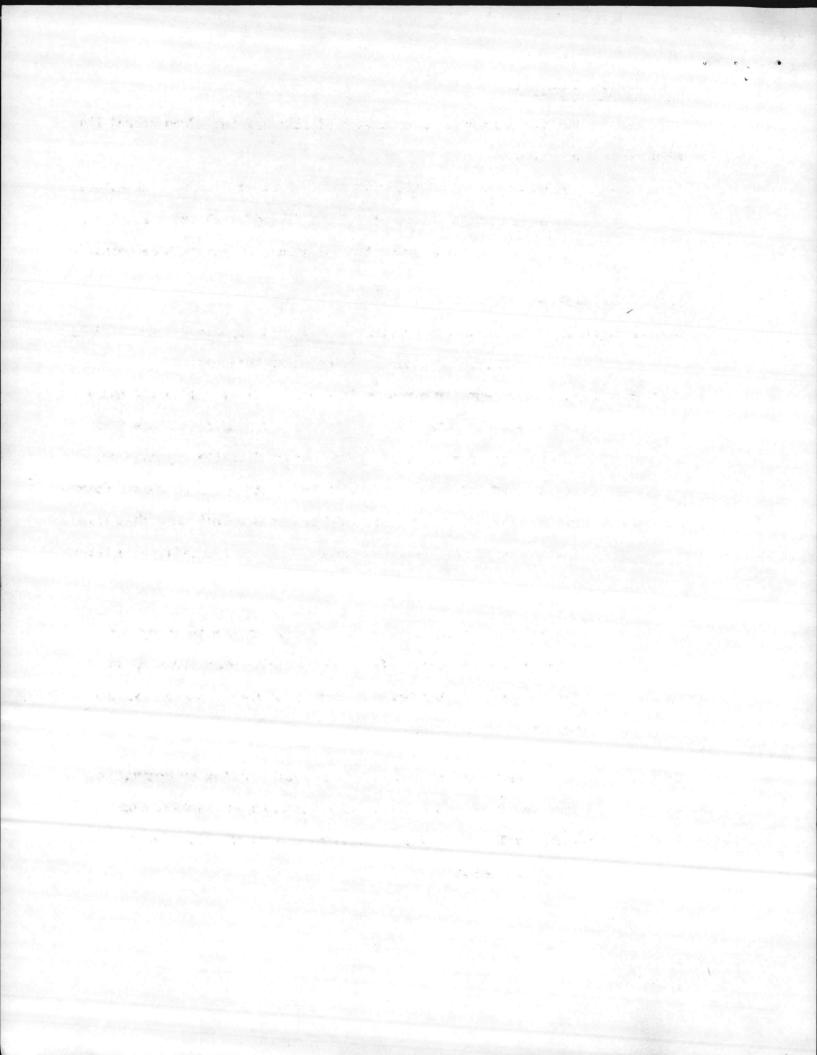
Color will be commercially constant when tested as follows:

- (A) Hunter Color Difference Meter.
- (B) Visually under a uniform light source such as a Macbeth North Daylight Lamp.

## HUMIDITY RESISTANCE -

No dense blisters, lifting or softening of film when tested as follows:

Test Method: 1000 hours at 100% relative humidity in cabinet operated in accordance with Method 6201. of Federal Test Method 141.



#### SALT SPRAY RESISTANCE -

Maximum allowable undercutting of film 1/8 inch from scored line when tested as follows:

Test Method: 500 hours in accordance with Method 6061 of Federal Test Method 141 or ASTM Test Method B117 using 5% sodium chloride solution. Film scored diagonally sufficiently deep to expose base metal.

#### WEATHER EXPOSURE -

Outdoor Exposure: No checking, crazing, adhesion, loss, with minimum fading and loss of gloss when tested as follows:

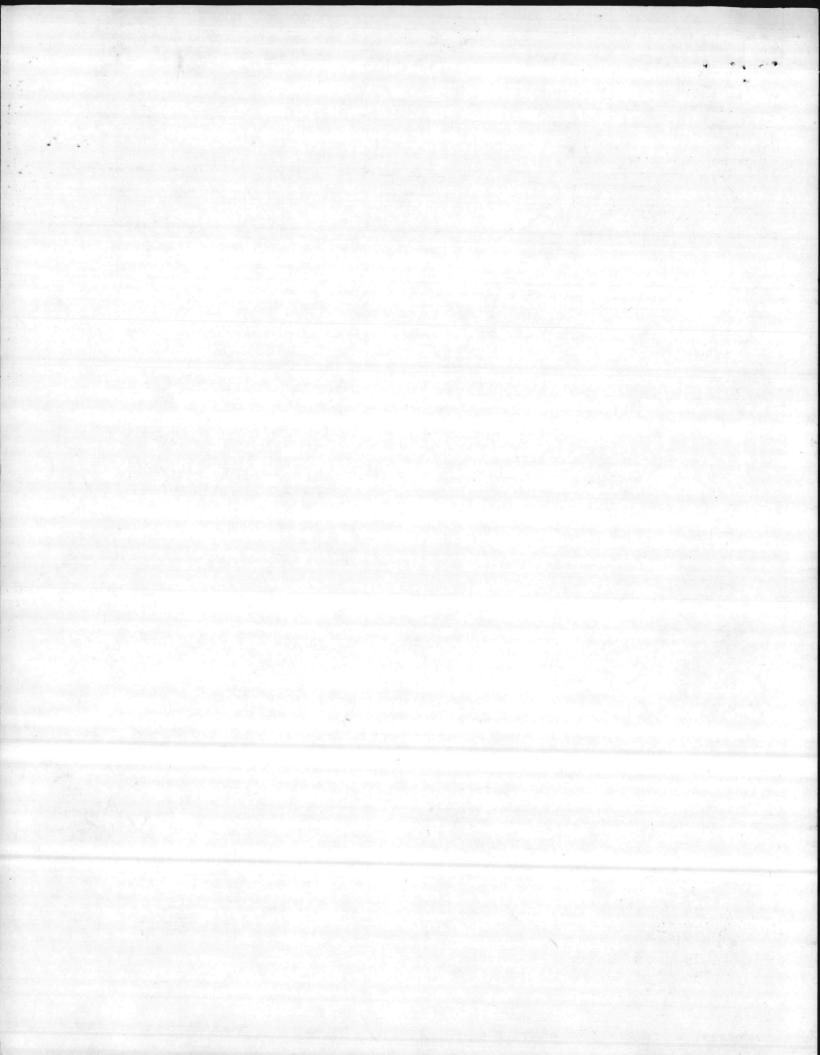
Test Method: Five years outdoor exposure in southern Florida at a 45° angle facing south. Note: Film approval not dependent on this test but failure of a color should be reported to the supplier and revision of film requested prior to additional shipments. Color change after five (5) years outdoor exposure not more than five (5) NBS units when measured on the Hunter Color Difference Meter.

Accelerated Exposure:

No checking, crazing or adhesion loss, minimum chalking and color change not beyond five (5) NES units when measured on the Hunter Color Difference Meter, plus normal water staining when tested as follows:

Test Method: 200 hours in Atlas Type Dew Cycle Weatherometer or equivalent, operated in accordance with ASTM Recommended Practice D822 using cycle of 60 minutes of light and 60 minutes of dark and demineralized water.

- 4 -



NOM CONTRACTOR Sorrells Plumbing & Heating Co., Inc. R. S. Noonan, Inc., Greenville, S. C.			CONTRACT NO. TRANSMITTAL NO. DATE 7/11/			7/11/79
			PROJECT TITLE ANDLOCATION Replace Heating & Air Conditioning Building 2615, Marine Corps Base Camp Lejeune, North Carolina			
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*List only one specification division pe List only one of the following categories on each and indicate which is being submit X Contractor Approved OICC Approval			transmittal form, ted Deviation/	Substitution C Approval	**ACTION CODES A-Approved D-Disapproved AN-Approved as noted RA-Receipt acknowledged. C-Comments R-Resubmit	
PROJ. SPEC. & PARA. ar PROJ. DWG	nd/or	item identific (Type, size, model no., Mr. brochure num	ATION g. name, dwg. of	NO. OF COPIES	ACTION	REVIEWER'S INITIALS CODE AND DATE
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of the life of the	Tutu 0 1	070	Internet Loose	111

Sorrel	Is' P.	Lumbin	g and	Heat	ing Co.	, Inc
P. 0.	Box 9	604	Capital State		and surface with the	and the
Greens	boro,	North	Caro	lina	27408	
Attn:	Lee	Sorrel	15	anti an		

P. O. BOX 128

APPROVED	BHD
APPROVED AS NO	TED
DISAPPROVED	and the second
SUBJECT TO THE	REQUIREMENTS OF
CONTRACT NO.	N 62470-77-C-2563

APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA-TION --- THE CONTRACTOR SHALL BE RESPONS-IBLE FOR PROVIDING PROPER PHYSICAL DIMEN-

REVIEWER B H Pulaney DATE 7/13/29

Re: Building 0461 WEIGHTS, COORDINATION OF TRADES, Camp Leftures NeoUIRED.

Dear Mr. Sorrells:

YE COVER THE STATE

STALLINGS AIR BASE

I have noted the correction made to the Celotex 300 rooting of CONSTRUCTION system concerning the quantities of asphalt required by the specifications. I also noted Mr. Oulaney has approved the specification with this correction noted. We are in agreement with this correction and will install the roofing accordingly.

E.L. SCOTT ROOFING COMPANY

In regard to the roof insulation, we planned to use two layers of perlite insulation, one layer of one inch and one layer of one and one-half inch for a total thickness of two and onehalf inches and a "C" factor of .15.

Please check this with the appropriate people and advise if it is acceptable.

Yours truly,

E. L. SCOTT ROOFING CO., INC.

an

Mike Paschal Project Manager

JMP/nbs

NAVAL FACILITIES ENCINEERIG COMMAND NORFOLK, VIRGINIA 23511 APPROVED OH8 SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. M68470-72-6-2563

APPROVAL OF ANY OLVATION FROM THE BON-BRACT REQUIREMENT OFFICES THE DEVIL CALLS ATTENTION TO AND SUPPORTS THE DEVIA TION --- THE CONTRACTOR STALL BE LEPONS OF IBLE FOR PROVIDING PROPER PHYSICAL DIMEN-SIONS & WEICHTS, COORDINATION OF TRADES, FIG. 745 REQUIRED

REVIEWER B H Puloney OATE Hight

FOR OFFICER IN CHARGE OF CONSTRUCTION

ND LONTDIV 4-4355/3 (Rev. 6/76)	BMITTAL TRANSMITTAL	CONTRACT NO.	TRANSMI	TTAL NO.	DATE
and the second se		N62470-77-C-2	2	apage 18	5-1-79
OM CONTRACTOR		PROJECT TITLE AND LOCAT	ION		
Sorrells Flumbing	& Heating Co., Inc.	Replace Heat			
R. S. Noonan, 1	ne.	Building 261 Camp Lejeune			
Greenville, Son	CONTRACTOR USE ONLY	Centb Tellerne	, NOLOH		
	*List only one specification division per form.				CTION CODES
	transmittal form, ted	A-Approved D-Disapproved AN-Approved as noted RA-Receipt acknowledged.			
Contractor Approved	OICC Approval		Substitution CC Approval	C-Com R-Resul	
PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFIC/ (Type, size, model no., Mfg brochure numi	J. name, dwg. or	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
3 08710 - 3.1 Ha	urdware and Sample List			AN	BHD
4 08710 - 3.3 Ha	urdware Schedule			AN	BHD
5 08710 - 3.3 Ke	ying Instructions			A	BHD
6 08710 - 3.4 Sh	op Drawings (for informa	tion only)		A	BHD
		V			
		1			5
OPY OF TRANSMITTAL AND SUBMIT	TALS TO ROICC	CONTRACTOR REPRESENTA			
	1	S. Fer Sour	elle	Pr	esident
ATE RECEIVED BY REVIEWER	FROM (Reviewer)	ТО			
Submittals are returned wit	th action indicated. Approval of an item does nd supports the deviation.	not include approval of any de	eviation from th	e contract req	uirements unless the c
Submittals are forwarded t transmittal form.		ated in REVIEWER USE ONLY	/ Section and i	n comments b	elow on ONE COPY of
EVIEWER'S COMMENTS	2	1			<u>Alexandras</u>
	3	1	an an an Anna an Anna an Anna Anna an Anna an Anna Anna		٨
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	5			1-101	pang
	6	11		[per]	$\left \right\rangle$ $\left \right\rangle$
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					the second second second second second
and a second	RETU				
PIES TO: ROICC (2) LANTDIV (1)	DATE	SIGNATURE Brian	- 10	<u> </u>	

	5	18	17	9	
173	1	1.1		Same	A ST MAN

Brian H. Dulanez

4 ITRACTOR'S SUBMITTAL TRANSMILTAL Or MAUT

r y y Hardware Schedule

Yale

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HARDWARE DISTRIBUTORS, INC.

0 0 0

**1105 PARK TERRACE** P. O. BOX 20132 GREENSBORO, NORTH CAROLINA 27420 919 - 299 - 7341

Project

**REPLACEMENT BUILDING 2615** 

Location

CAMP LEJEUNE, NORTH CAROLINA

Architect

R. S. NORMAN, INC.

Contractor

SORRELLS PLUMBING & HEATING CO., INC.

Date

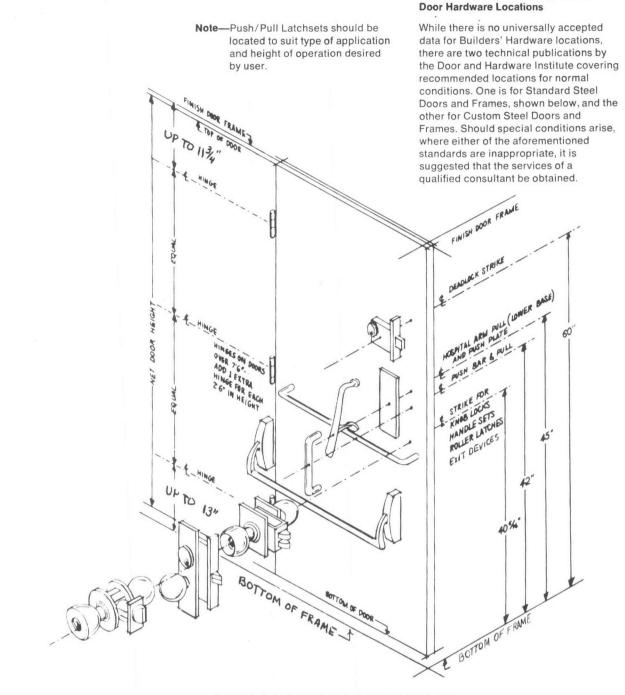
APRIL 17, 1979

**Estimate Number** 

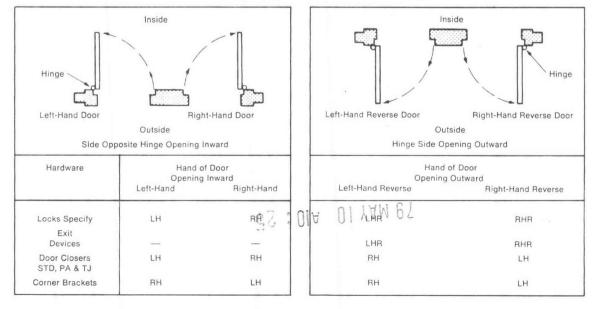
JOB #W-9517

**Contract Number** 

PREPARED BY: STEVEN T. WOODARD



Correctly Specifying Hand Of Door And Hardware



## SCHEIDLE OF FINISH HARDWARE

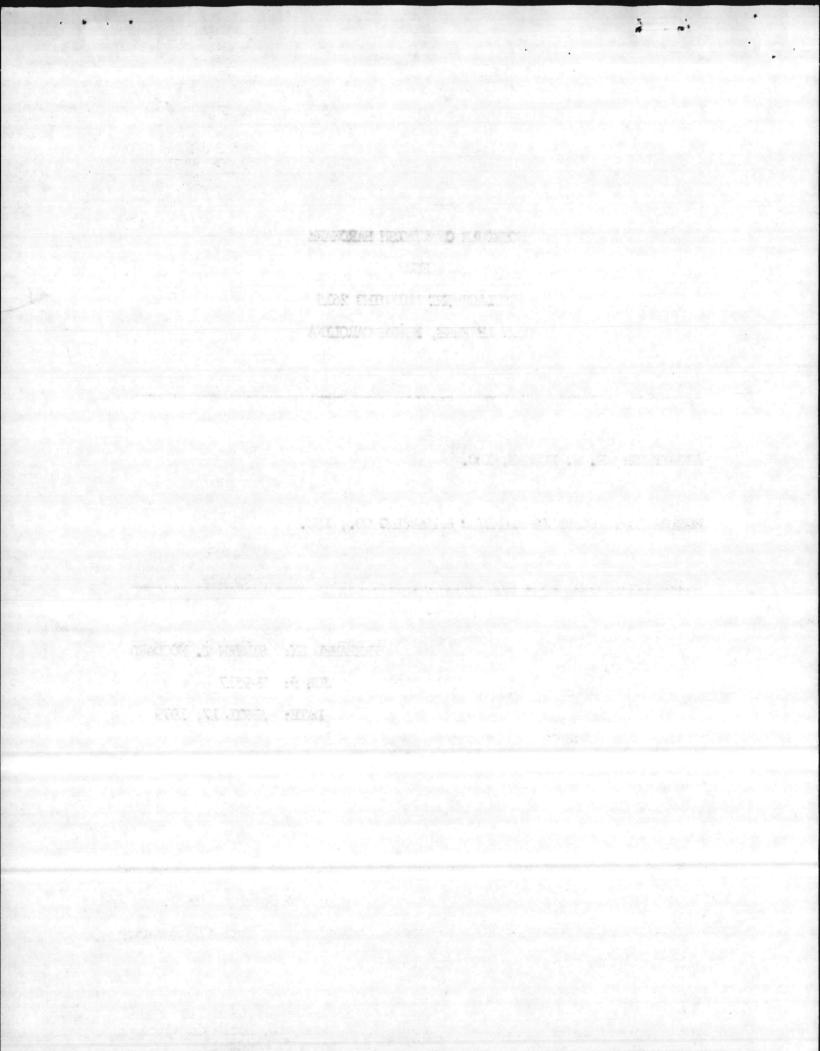
FOR

REFLACEMENT BUILDING 2615 CAMP LEJEUNE, NORTH CAROLINA

ARCHITECT: R. S. NOOVAN, INC.

CONTRACTOR: SORRELLS FILMEING & HEATING CO., INC.

PREPARED HY: SIEVEN T. WOODARD JOB #: W-9517 DATE: APRIL 17, 1979



#### SAMPLE SCHEDULE OF BUILDERS HARDWARE ITEMS

TTEM NO.	SPECIFICATION REFERENCE TYPE OR CATALOG M	INCE D. NAME OF ITEM	MFR'S NAME & CATALOG NO. OF THEM SUPPLIED
*FBB191	Т-2106 43 ж 44	Full Mortise Hinge	Stanley Hardware Co. #150
***LF5407	161A	Lockset	Yale #33
BR85297.DC-11.		Exit Device	Von Duprin #73A
88K	fad ees das	Exit Device	Von Duprin #78A
AL302A	eny 63 da	Edging	Von Duprin #78A
489-в .	608 003 est	Dust Proof Strike	H. B. Ives #21
**458B	1049	Flush Bolts	H. B. Ives #21
407B	60 80 eg	Stop	H. B. Ives #21
****74.	3004	Closer	Yale #33
3413	500 AND 000	Closer	Yale #33
351A x 351AW	60.5 ec; ec;3	Astragal	Parko #79
316AV	eta enjime	Weather Stripping	Penko #79
17947		Inreshold	Penico #79
171A	(C) (T) (S)	Threshold	Penko #79
GJ-64	1337A	Door Silencers	Glynn-Johnson #39

\*FF-H-116C \*\*FF-H-111A \*\*\*FF-H-106A \*\*\*\*FF-H-121C

當行

This is to certify that all items of builders hardware as noted in the above list have been previously approved by the Office of the Chief of Engineers and are on file in Washington, D. C. We are enclosing catalog cuts illustrating the items with no federal specification number.

> HARDWARE DISTRIBUTORS, INC. Greensboro, North Carolina Steven T. Woodard

· A ·

MER'S RIME & CARMOG		ALTERATION INTEREDIEN INTERACIÓN INCONTO	
Stally Badence G. #150	eguli estrait lluis	24 z 24 80.05 45	WEDDE ST
Yale #13			
Va baxta 472A			· EMESZEWDG-TL
Van Deprésa #784			
Van Doporta (784			18022
H. B. IV : MIL	inas iroof secto		
R. B. Tree #21	Turk Folge		
T. L. Tree /21			
Tala fil			
tel dist	(Load)		
Parko #79	Accessol.		
Radio 479	A gridghing Striftphing a		
Notico (179	hlorbstall		TANT
Partos (77)	blocketuil	and I and the	
Glynn-Johnson #39	meneniià xooi	taana 🕺	

This is to carrie that all that of builden heritance or robed in the above Hat have been proviously symmed by the Office of the Chief of Engineens and are on file in Washington, B. C. We are enclosing catelog cute illustrating the items with no federal specification number.

1011-8-37

ATTI JULINE

HARMANE DISTRIBUTORS, INC.

# KEYING INSTRUCTIONS:

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1.

1:1

A. All locks to be master keyed to a new master key.

Sal

- B. Key alike in sets all locks as indicated.
- C. Furnish 4 master keys total.
- D. Fuznish 2 keys per lock.

		1
DOOR NO.	GROUP NO.	KEY SET
1	1	KD
2	2	KD
3	2	KD
4	1	KD
5	i	ŔD
6	2	KD
7	3	KD
8	4	KA-1
9	5	KA-1

# REVINE INSIGNATIONS:

- A. All looks to be master keyed to a new master key.
  - B. Key aline in sets all locks as indicated.
    - C. Rumish 4 meater lage total.
      - D. Furnish 2 keys per lock.

	THE YER	GRADE NO.	DDCR 100.
	QI	<u>.</u>	and the second second
	ŒI.		2
	CN STATES	2	3
	(C)	1	4
	C)I	1	5
	01	2	9
	CI		7
	EA-1		8
	L-Al	5	5
Salara.			

×

GROUP #1 (HN-2)

4

i.

9

	1 Pr. Doors 1 Kitche	n from Mech. Equip. Room	RHR-A			
	1 Pr. Doors 4 Hall f	rom Equip. Room	RHR-A			
	1 Pr. Doors 5 Bar from Equip. Room RHR-A					
		All Doors 2 - 2670 x 1 3/4"	VD x VD			
9 pr.	Butts	FBB191 4½ x 4½	ævs	10B		
3	Dust Proof Strikes	489B		10B		
6	Flush Bolts	4588 - 12"	1997) 1997 - 1977 - 19	108		
3	Locksets	LF5407 x 497	25.78	10B		
3	Astragals	351A x 351AW - 84"		AL		
3 sets	Weather Stripping	316AV (Head & Janb)		AL.		
1	Threshold	179AV - 60" (@ Door 1)		AL		
6	Door Silencers	GJ-64		an ee an		
	3 6 3 3 3 sets 1	1 Pr. Doors 4 Hall f1 Pr. Doors 5 Bar fr9 pr.Butts3Bust Proof Strikes6Flush Bolts33Astragals3 setsWeather Stripping1	All Doors 2 - 2670 x 1 3/4"9 pr.ButtsFBB191 4½ x 4½3Dust Proof Strikes489B6Flush Bolts458B - 12"3LocksetsLF5407 x 4973Astragals351A x 351AW - 84"3 setsWeather Stripping316AV (Head & Janb)1Threshold179AV - 60" (@ Door 1)	1. Pr. Doors 4 Hall from Equip. RoomNHR-A1. Pr. Doors 5 Bar from Equip. RoomNHR-AAll Doors 2 - 2670 x 1 3/4" VD x VD9 pr.Euts9 pr.EutsDust Proof Strikes489B6Flush Bolts458B - 12"3Locksets3Locksets3Stragals3 setsWeather Stripping1Threshold1179AV - 60" (@ Door 1)		

# GROUP #2 (HM-1)

	1 Door 2 Game Roor	n from Stair	RIR	
	1 Door 3 Game Roor	n from Closet	LIR	
	1 Door 6 Stair fre	m Attic	RHR	
		A11 Doors 3070 x 1 3/4"	WD x WF	
43 pr.	Butts	FBB191 43 x 43	£1.13	10B
3	Locksets	lF5407 x 497	E1178	10B
3	Door Stops	407B		10B
2	Thresholds	171A - 36" (@ Door 2, 6)	,	AL.
9	Door Silencere	G1-64		-

April 17, 1979

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. . . . . ... I Fr. Doors 4 Listi from Epuip. Moon r Participation GEOUP (12 (034-12) All Boord 9070 x 1 3/4" ND x W 10.000 kg x 64 1.03 103 103 171A - 26" (@ Door 2, 6) M. Apr. 117, 1979

GROUP #3 (HH-3)

in the

調査

2½ pr.

	1 Pr. Doors 7 Sec	vice Corr. from Ball Room RH	R-A
3 pr.	Butts	2 - 3070 x 1 3/4" WD x WF FBB191 4½ x 4½ 807	0.000
2	Panic Bolts	ER8529WDC-IL x 1/1152	1.0B
2	Edgings	AI.302A - 84" OK BHD	108
2	Door Closers	3413 - 7 model 3410 indicate	BL.
2	Kick Plates	16 ga 8 x 34"	10B
2	Mop Plates	16 ga 4 x 34"	10B
2	Door Silencers	GJ-64	403 est tos

# GROUP #4 (HI-4)

	1 Pr. Doors 8 Exten	rior from Refrigeration Rh.	RIR-A	
5 pr.	Butts	2 - 4090 x 1 3/4" WD x WF FBB191 4½ x 4½	<b>8</b> 13	108
2 .	Flush Bolts	458B - 12"		10B
1	Panic Bolt	88K x 1/1109		10B
1	Door Closer	74 (@ active door) w/hold 351A x 351AW - 108"	open	BL
1	Astragal	351A x 351AW - 108"		AI.
1 set	Weather Stripping	316AV (Head & Janb)		AL.
2	Door Siléncers	GJ-64		415 009 076

# GROUP #5 (117-5)

1 Door 9 Ext.	from Refrigeration Room	LHR
	4090 x 1 3/4" WD x WF	nang nang kanalan sa kata sa
Butts	FEB191 4½ x 4½	ans 10B

# (ROUP #3 (HJ-3)

	I Pr. Dome 7 Servi	ce Corr. from Ball Room	A-SES	
		2 - 3070 x 1 3/4" WD x W		
3 pz.	Butta	FBE191 4% x 4%	awa 10	103
2	Paris Bolts	20.8329900-11, x 1/1152	1.01	1.03
2	References	AL302A - 84"	3.01	3.0B
2	ivor Clesers	3413	II	BL
2	Kick Flates	<b>16 ga 8</b> π 34 <sup>10</sup>	10	103
2	Mop Places	16 ga 4 x 34"	10	103
6	Boor Silleneers	63-64 State	a	10100-021

## (2-11) 44 (10-4)

 1 Fr. Dours a Lineardor from R. Friggereitan M.
 38-8

 2 - 4000 rf 1 3/V" N0 r W
 30

 Frite
 Fridige 64
 58-3

 Fluck Rolin
 680 - 12
 103

 Fluck Rolin
 680 - 12
 103

 Faule Rolin
 680 - 12
 103

 Faule Rolin
 680 - 12
 103

 Faule Rolin
 887 r 1/109
 103

 Door Gloser
 76 (a schus dorf)
 103

 Astragal
 351A r 201AW - 108"
 41

 Machaer Statuping
 41
 41

 Machaer Statuping
 41
 41

 Machaer Statuping
 41
 41

 Machaer Statuping
 41
 41

 Machaer Machaer Stat

April 17, 1979

# GROUP #5 (HAI-5) CONTINUED

5-18

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STANSIES TO -

Ser.

i. . . i

1	Panic Bolt	88K x 1/1109	10B
1	Door Closer	74 w/ hold open feature	BL
1 3	et Weather Stripping	316AV (Head & Janb)	AI.
3	Door Silencers	GJ-64	60 co co

A. . . . . COUR #5 (88-5) CONTRAL 83K x 1/1109 Fande Bolt 3.03 AT. (dml. 3 Leell) VABIE Door Silenerga April 17, 1979

. . . .



The BR85WDC type devices combine the popular 88 series crossbar assembly with concealed vertical rods for use on  $1^{3}$  " and  $2^{1}$  " solid core wood doors.

All lock and hinge stile cases have  $\frac{1}{8''}$ thick walls. Stainless steel lever arms and cases are investment cast. Bronze and aluminum lever arms are drop-forged; cases are pressure cast. All other formed members are pressure or precision castings, or stampings of stainless steel or bronze.

Top and bottom vertical rod controls are drop-forged bronze. The top and bottom  $\frac{1}{2}$ " throw latch bolts have latch retractor feature to hold bolts retracted during door travel.

All devices feature standard dogging. Cylinder dogging functions are available. Specify with prefix "CD." For example, CD BR8527WDC.

Door edge requires  $5 g'' \ge 1^3 4''$  routing in edge of door (see diagram next page). Adjustable edging, with standard bevel is furnished only when specified and ordered. Details, next page.

Finishes: Stainless steel BHMA 630 (US-32D); architectural bronze BHMA 611 (US-9) or BHMA 612 (US-10); all standard plated finishes; and satin aluminum BHMA 627 (US-27).

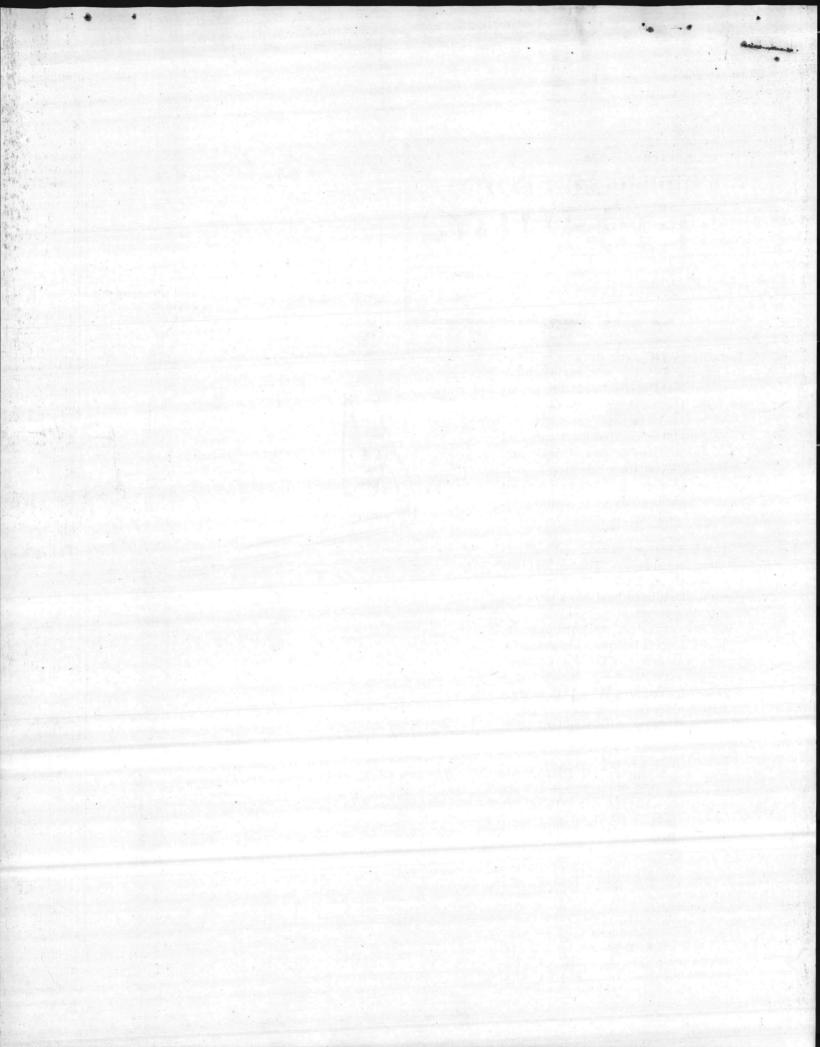
#### DIMENSIONS

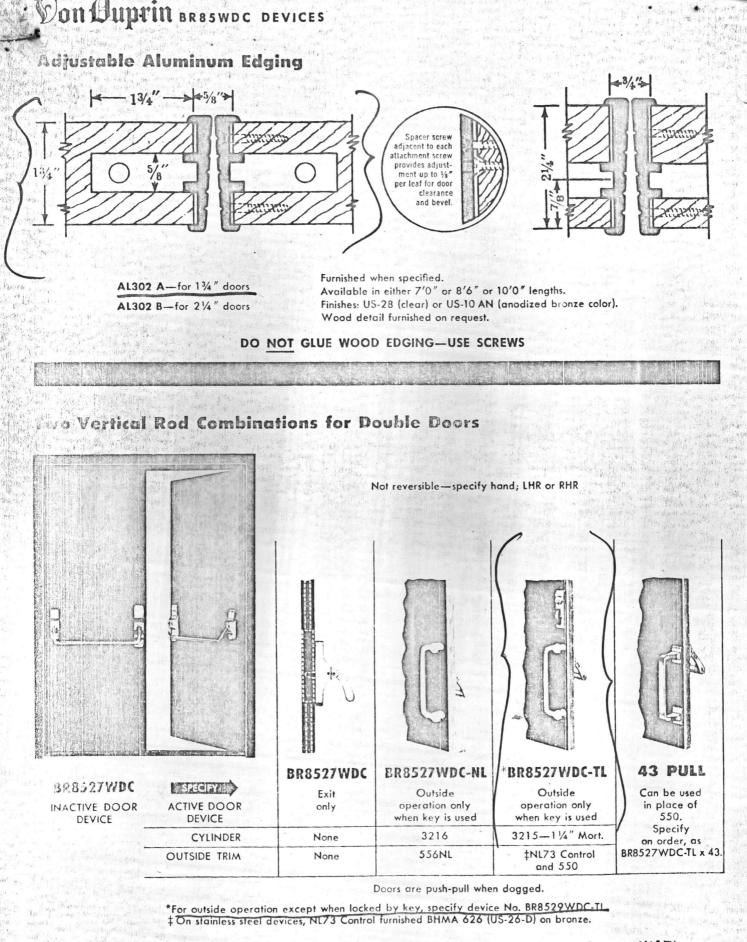
Floating axles	er
Crossbar tubing	
Crossbar height from finished floor	6
Crossbar projection-Neutral	8"
Depressed	
Lock stile case	6
Hinge stile case	16
ertical rods	

Standard telescoping rod adjusts for 6'8" to 8'0" doors.

18 2.94

300L strike



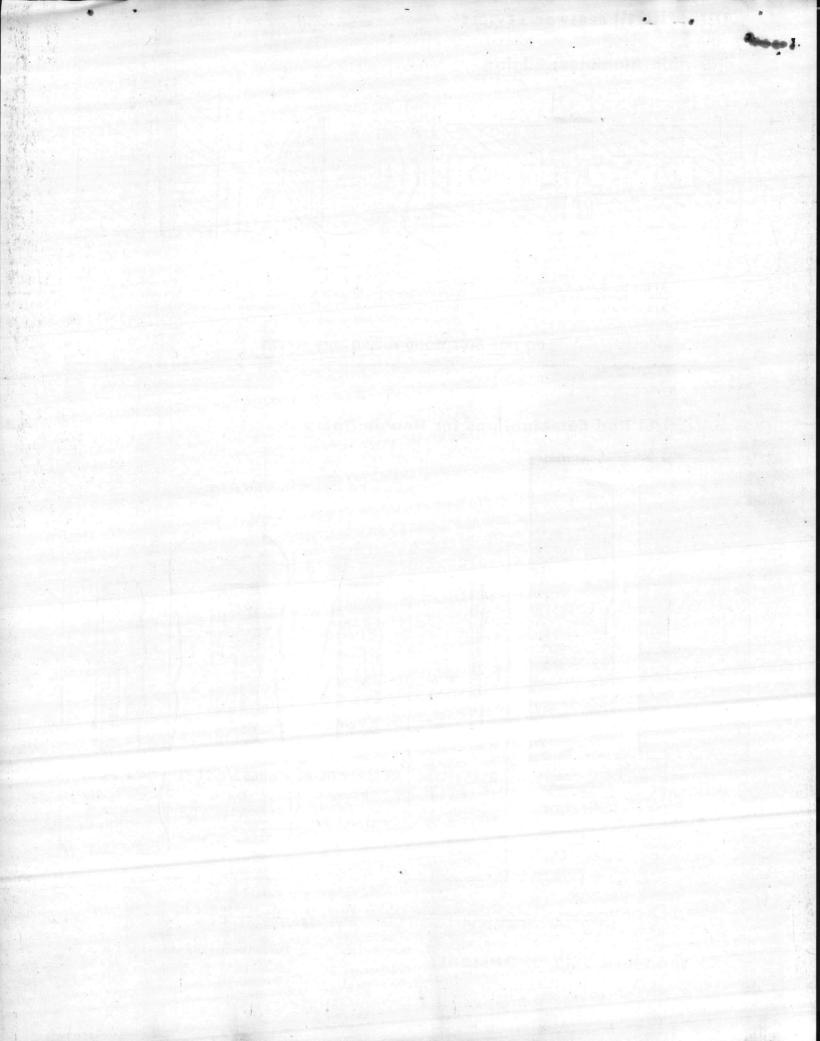


550 and 556NL TRIM DIMENSIONS:

CORD

Overall-11<sup>5</sup>/<sub>8</sub>" Grip centers-10" Top and bottom grip posts-1%" Dia. Offset-1%" Projection-2%"

7/75

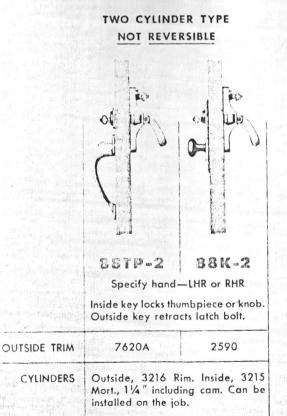


UI Section fo	sted Hardware" r 88 Devices lis XIT HARDW	ted as	Vo	nDuprin ⊧	XIT DEVI	CES TYPE 88
Rim Devices	for Single	Doors or	Double D	oors with	Mullion	an a
	n an			CYLINDER TYPE II when crossbar is		$ \begin{array}{c} \sum_{i=1,\dots,n\\ i=1\\ i\neq i\\ i\neq i$ i= i
	* SBNL Key retracts latch bolt	BSDT Pull when dogged	88EO Exit only	<b>BSTP</b> Key locks thumbpiece	† <b>88K</b> ** Key locks knob	BSNL x 2590 KR Knob rigid Key retracts latch bolt
OUTSIDE TRIM	NL7620	NL7620DT	None	7620A	2590	2590KR
CYLINDER	3216 Rim	None	None	3216 Rim	3216 Rim	3216 Rim
Federal Specification Numbers	810H 450 Trim for rim	devices is 780 1	810 NL-R (page 88-7).			810K

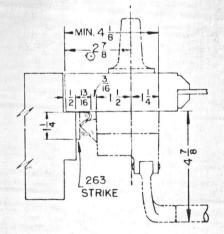
\*Can be furnished with hold-back feature --key sets bolt when held retracted. Specify 88NL-HB. Also can be furnished with cylinder hold-back from inside, inside key sets bolt when held retracted. (Specify 88NL-2HB) inside cylinder is 3215-1¼", including cam.

†If no cylinder operation is desired, specify by adding suffix "BE". Cylinder collar is omitted on TP function; blank escutcheon is furnished for K function.

\*\*63L Control may be used in place of 2590 trim (see catalog page A-15).



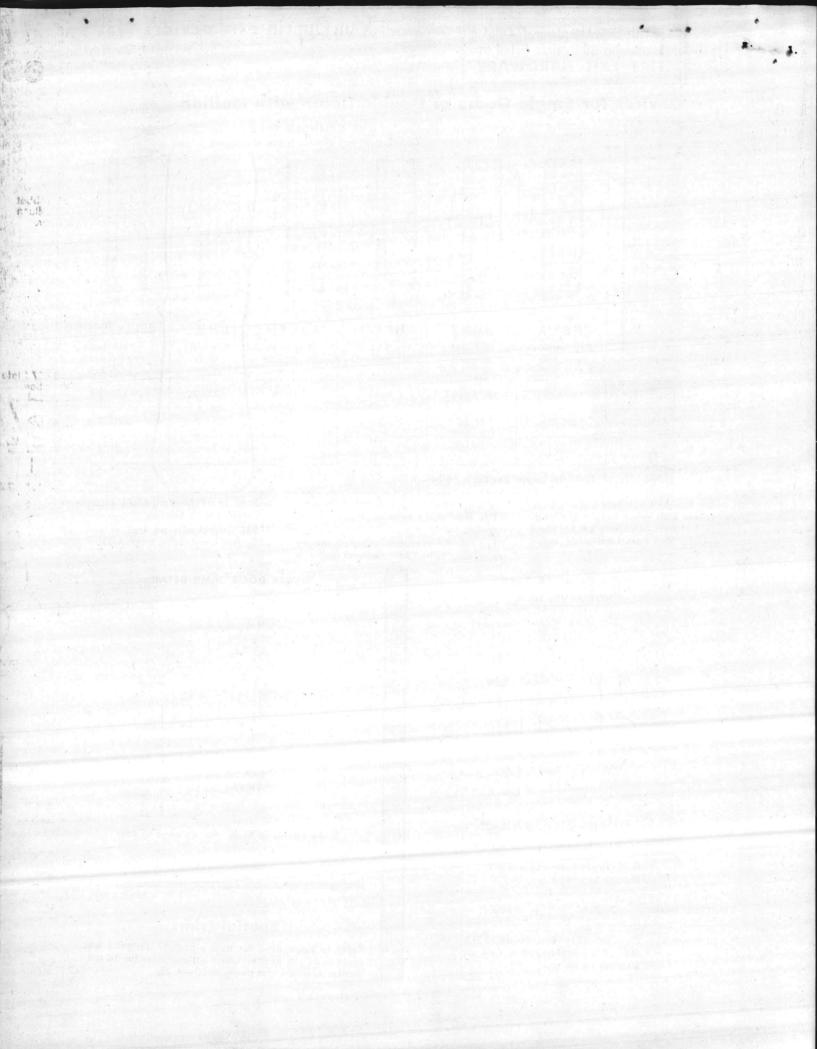
## SINGLE DOOR JAMB DETAIL



Strike adjusts up to 3/8" for warpage of door

# **Special Trims**

Refer to page 88-5 for trims especially designed for use with 88 rim devices. Other optional trims for 88 rim devices are shown on pages A-20—A-26.



## Nos. 57-58, 247-248 RABBET PIECES

Cast	Drass	; or	Dro	nze,	nanu	por	isnea.		
			For	1100	with	Ext	Flush	Bolt	

	TOT USC WITH EAT	. Trush bon	ingi. per wen	
No. 57	No. 457-See	page C-1	2.75 lbs. 1.25 kg	
No. 58	No. 458-See	page C-1	2.19 lbs992 g	
'No. 247	No. 257-See	page C-2	2.75 lbs. 1.25 kg	
No. 248	Nó. 258-See	page C-2	2.19 lbs992 g	
No. 247	Rabbet with No. 257	Extension		

Flush Bolt conforms to Fed. Spec. No. 1045R.

NOTE: RABBETED GUIDE AND STRIKE AVAILABLE ON SPECIAL ORDER, FOR NUMBERS 457, 458, 45712, 45812 ONLY.

PACKAGING: Individually packed with screws. 10 per box.

#### No. 487 PLATE

1

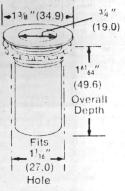
For use with Nos. 488-489 Dust Proof Strikes in concrete floors. Screw holes spaced 234" (69.8) apart for increased holding power.

PACKAGING: Individually packed with screws and lead shields. Wat. per package .25 lbs. 113 g.

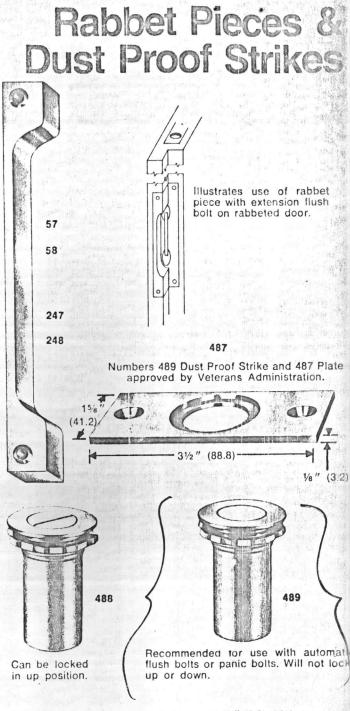
#### Nos. 488-489 DUST PROOF STRIKES

- · Wrought brass, hand polished.
- New design incorporates improved construction—provides positive closing action and eliminates binding.
- For use with all lves extension flush bolts—34 " (19.0) diameter plunger accepts up to 56" (15.9) diameter round bolts or 12" (12.7) square bolts.
- Safety lock-up feature designed into No. 488—eliminates trapping of spike heels. Simple screw driver or coin operation.
- No lock feature of No. 489 makes this the ideal dust proof strike for use with automatic flush bolts. Spring tension specifically calibrated for use with lves Nos. 456 and 459 automatic flush bolts.

PACKAGING: Individually Poly-Bagged 10 per box. Wgt. per box 2 13 lbs 964 g

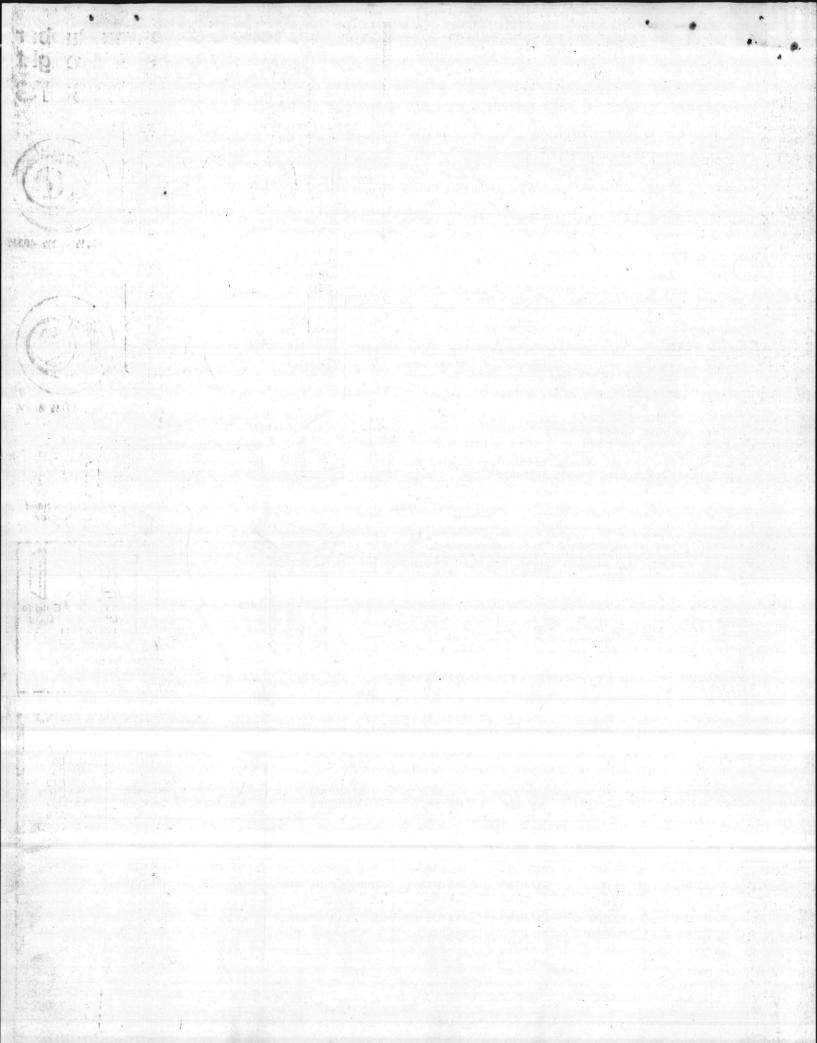


Wat, per box



488, 489 accommodate thresholds up to ¼" (6.3) thick.

				-		Same Same	
No. 57	No. 58	No. 247	No. 248	STANDARD FINISHES	No. 487	No. 488 Lock Up	No. 489 No Lock
57 B3	58 B3	247 B3	248 B3	Bright Brass	487 B3	488 B3	489 B3
57 B5	58 B5	247 B5	248 B5	Antique Brass	487 B5	488 B5	489 B5
57 B10	58 B10	247 B10	248 B10	Dull Bronze	487 B10	488 B10	489 B10
57 B10B	58 B10B	247 B10B	248 B10B	Oil Rubbed Bronze	487 B10B	488 B10B	489 B10B
57 B19	58 B19	247 B19	248 B19	Dead Black		and the state of the state	Anter Maria
57 B26	58 B26	247 B26	248 B26	Bright Chromium		a state of the	
57 B26D	58 B26D	247 B26D	248 B26D	Dull Chromium	487 B26D	488 B26D	489 B26D
		And the second second					

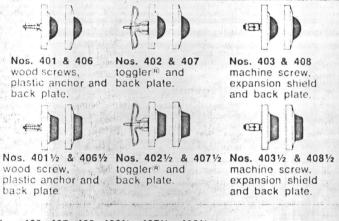


#### Nos. 401, 402, 403, 4011/2, 4021/2, 4031/2

- · Cast brass, bronze or aluminum, hand polished
- Positive attachment to wall by concealed set screw—practically tamper proof,
- SPECIAL RETAINER CUP makes rubber almost impossible to remove from bumper attached to wall.
- KNOB DAMAGE REDUCED TO A MINIMUM—Soft, High-grade, light gray rubber provides extra cushion.
- Concave rubber permits knob to strike bumper without damaging or engaging lock mechanism.
- Weight Brass-Bronze 1.75 lbs. 794 g
- per Box Aluminum 1.25 lbs. 567 g

PACKAGING: Individually Poly-Bagged 5 per box, with socket head set screws.

#### FOR ALL TYPES OF INSTALLATION

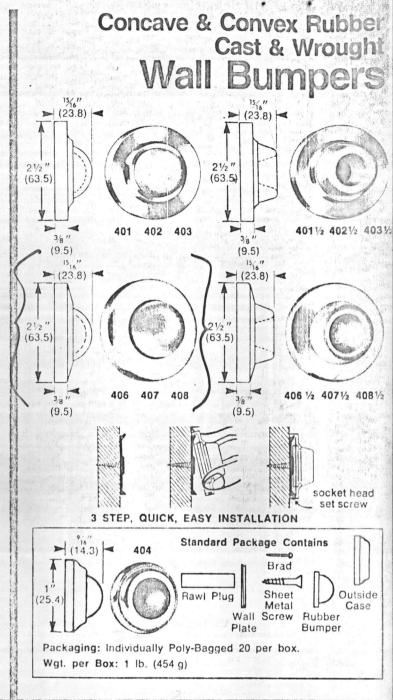


#### Nos. 406, 407, 408, 4061/2, 4071/2, 4081/2

- Wrought brass, bronze, aluminum or stainless steel, hand polished.
- Identical in size, similar in function and installation to Cast 401 Series.
- Features same component parts as 401 Series—concealed set screw standard.
- Ives highest quality finish—Yet lower in cost.

	Brass	1.25 lbs. 567 g
Weight	Bronze	1.25 lbs. 567 g
per Box	Stainless Steel	1.25 lbs. 567 g
	Aluminum	.94 lbs. 425 g

PACKAGING: Individually Poly-Bagged 5 per box, with socket bead set screws.

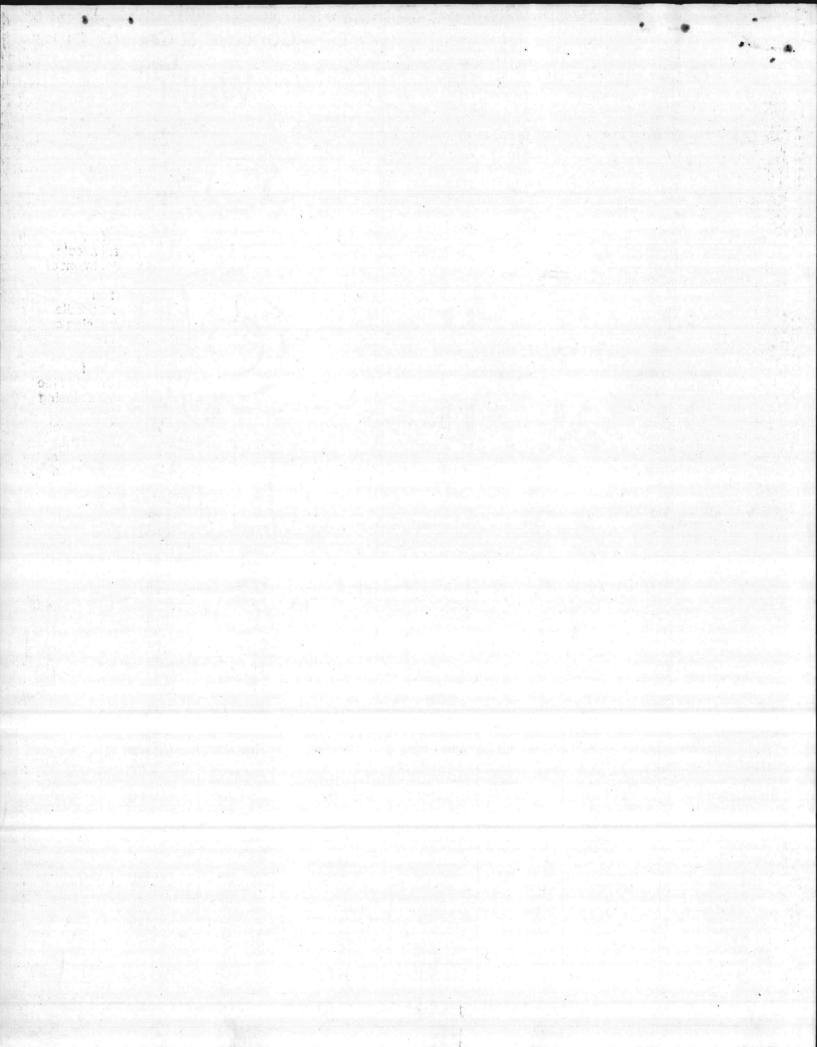


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No. 401	No. 4011/2	No. 402	No. 4021/2	FINISHES	No. 403	No. 4031/2	No. 404
401 B3	40112 B3	402 B3	40212 B3	Bright Brass	403 B3	4031/2 B3	404 B3
401 B5	401½ B5	402 B5	4021/2 B5	Antique Brass	403 B5	403½ B5	404 B5
401 B10	40112 B10	402 B10	402 <sup>1/2</sup> B10	Dull Bronze	403 B10	403 <sup>1</sup> / <sub>2</sub> B10	404 B10
401 B10B	4011/2 B10B	402 B10B	4021/2 B10B	Oil Rubbed Bronze	403 B1()B	4031/2 B10B	404 B10E
401 B19	401½ B19	402 B19	402 <sup>1/2</sup> B19	Dead Black	403 B19	403½ B19	404 B19
401 B26	40112 B26	402 B26	40212 B26	Bright Chromium	403 B26	403½ B26	404 B26
401 B26D	4011/2 B26D	402 B26D	40212 B26D	Dull Chromium	403 B26D	4031/2 B26D	404 B260
401 PA28	401½ PA28	402 PA28	4021/2 PA28	Anod. (Sat. Fin.)	403 PA28	4031/2 PA28	·
	, MAR IN THE CONTRACT OF THE DESCRIPTION OF THE CASE	Markovan or resident some vischen			DETTER GARDENES L'ANTERN MULLING VELT		
No. 406	No. 4061/2	No. 407	No. 4071/2	FINISHES	No. 408	No. 4081/2	
100 00	406½ B3	407 B3	40712 B3	Bright Brass	408 B3	408½ B3	and the second se
406 83					400 00	100 - 00	
406 B3 406 B5			40712 B5	Antique Brass	408 B5	4081/2 B5	
406 B5	406½ B5	407 B5	40712 B5 40712 B10	Antique Brass	408 B5 408 B10	408½ B5 408½ B10	
406 B5 406 B10		407 B5 407 B10	4071/2 B10	Dull Bronze	408 B10	4081/2 B10	
406 B5 406 B10 406 B10B	406 <sup>1</sup> / <sub>2</sub> B5 406 <sup>1</sup> / <sub>2</sub> B10 406 <sup>1</sup> / <sub>2</sub> B10B	407 B5 407 B10 407 B10B	407 <sup>1</sup> / <sub>2</sub> B10 407 <sup>1</sup> / <sub>2</sub> B10B	Dull Bronze Oil Rubbed Bronze	408 B10 408 B10B	408 <sup>1</sup> / <sub>2</sub> B10 408 <sup>1</sup> / <sub>2</sub> B10B	
406 B5 406 B10 406 B10B 406 B19	406 <sup>1</sup> / <sub>2</sub> B5 406 <sup>1</sup> / <sub>2</sub> B10 406 <sup>1</sup> / <sub>2</sub> B10B 406 <sup>1</sup> / <sub>2</sub> B19	407 B5 407 B10 407 B10B 407 B19	407 <sup>1</sup> / <sub>2</sub> B10 407 <sup>1</sup> / <sub>2</sub> B10B 407 <sup>1</sup> / <sub>2</sub> B19	Dull Bronze Oil Rubbed Bronze Dead Black	408 B10 408 B10B 408 B19	408 <sup>1</sup> / <sub>2</sub> B10 408 <sup>1</sup> / <sub>2</sub> B10B 408 <sup>1</sup> / <sub>2</sub> B19	
406 B5 406 B10 406 B10B	406 <sup>1/2</sup> B5 406 <sup>1/2</sup> B10 406 <sup>1/2</sup> B10B 406 <sup>1/2</sup> B19 406 <sup>1/2</sup> B26	407 B5 407 B10 407 B10B 407 B19 407 B26	407 <sup>1</sup> / <sub>2</sub> B10 407 <sup>1</sup> / <sub>2</sub> B10B	Dull Bronze Oil Rubbed Bronze Dead Black Bright Chromium	408 B10 408 B10B 408 B19 408 B26	408 <sup>1</sup> / <sub>2</sub> B10 408 <sup>1</sup> / <sub>2</sub> B10B 408 <sup>1</sup> / <sub>2</sub> B19 408 <sup>1</sup> / <sub>2</sub> B26	
406 B5 406 B10 406 B10B 406 B19 406 B26	406 <sup>1</sup> / <sub>2</sub> B5 406 <sup>1</sup> / <sub>2</sub> B10 406 <sup>1</sup> / <sub>2</sub> B10B 406 <sup>1</sup> / <sub>2</sub> B19	407 B5 407 B10 407 B10B 407 B19	407 <sup>1/2</sup> B10 407 <sup>1/2</sup> B10B 407 <sup>1/2</sup> B19 407 <sup>1/2</sup> B26	Dull Bronze Oil Rubbed Bronze Dead Black	408 B10 408 B10B 408 B19	408 <sup>1</sup> / <sub>2</sub> B10 408 <sup>1</sup> / <sub>2</sub> B10B 408 <sup>1</sup> / <sub>2</sub> B19	

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## Construction Features

The 3000 Series Yale Door Closer offers a wide choice in application. Installed without a cover it's an attractive slimline closer. It is also available with three covers: one to accommodate narrow rails, and two which are compatible with the Yale 400 and 4400 Series closer.

Mounting methods: Standard, Parallel Arm, Top Jamb, with or without Hold-Open Arms. There's even a model to install where there's limited ceiling clearance.

It is available with or without backcheck, with or without 50% spring power adjustment. The closer, arms and covers are all nonhanded (top jamb metal cover is handed). Special installation requirements can be met with a wide variety of brackets and accessories. Adjustable Spring Power: adjustable up to 50% over the minimum closing force for any size closer.

Adjustable Arm Bracket: permits additional 15% power adjustment range on non-hold open in standard or top jamb installations. Non-Handed Closer: can be installed on either right or left-hand doors.

Three Cover Choices: a Slimline Cover and two Full Covers. Non-Handed Covers: can be installed on right or left hand doors, standard, parallel arm or top jamb installations, (top jamb metal cover is handed).

Non-Handed Arms : all arms are non-handed.

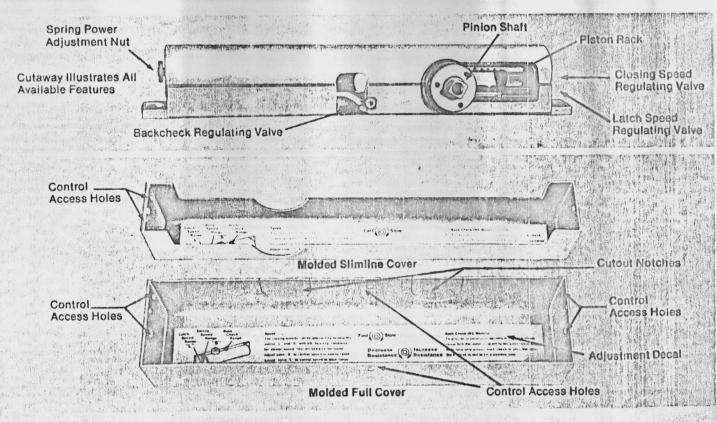
Adjustable Closing Speed: an independent non-critical needle regulating valve for adjustment of the closing speed.

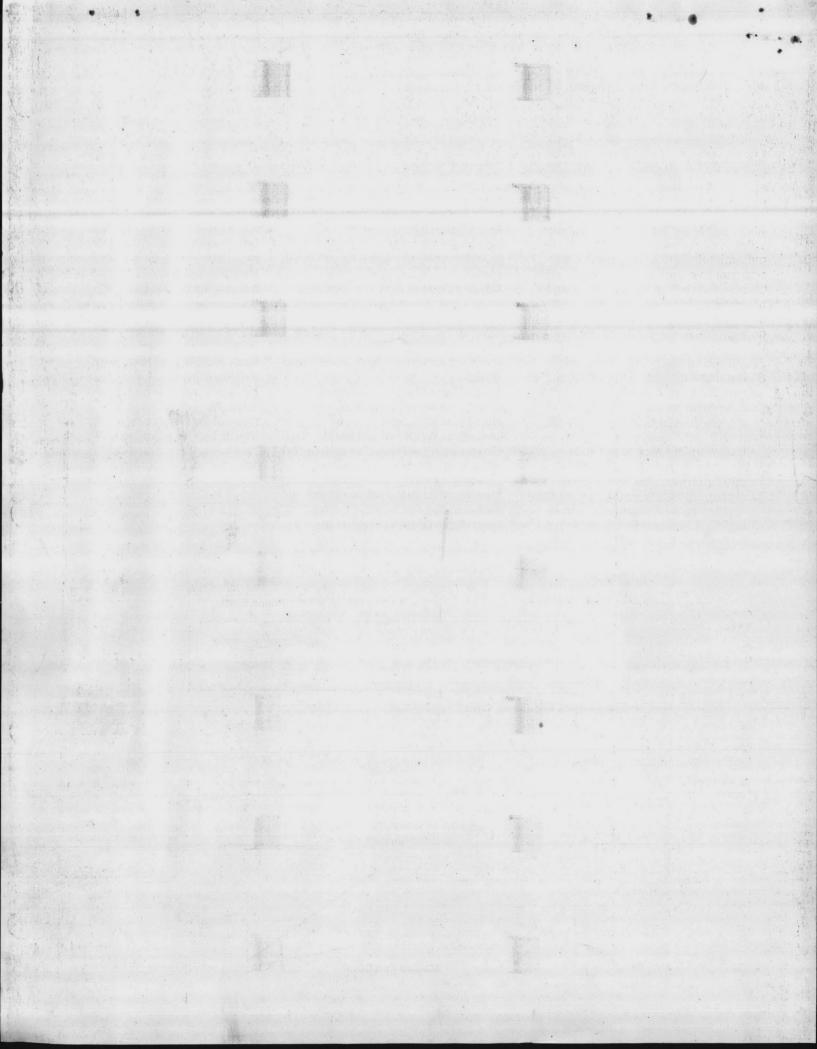
Adjustable Latch Speed: an independent non-critical needle regulating valve for adjustment of the latch speed.

Adjustable Backcheck: an independent non-critical needle regulating valve for increasing or decreasing the amount of backcheck.

Rack and Pinion Operation: provides smooth full control of the door throughout the entire closing cycle.

Control Valve Access: all control valves can be adjusted without removing the molded cover. Allen key control discourages tampering.



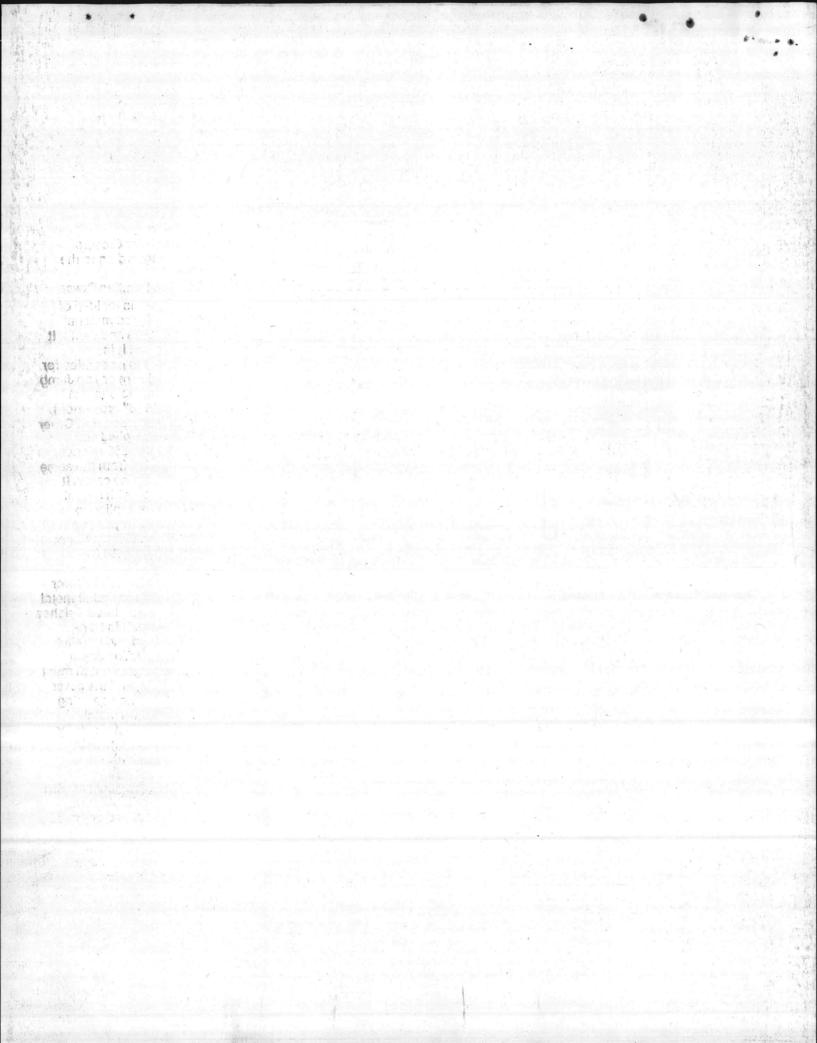


# Reneral

3000 Series Optional Features

Yale<sup>®</sup> Door Closers 3000 Series are available with a wide choice of optional features. Select the closer with the features needed for the installation from the left hand column of the chart; choose the correct List Number based upon the closer cover requirements. Select the closer size from the Sizing Chart on the facing page.

Closer Features	Closer Without Cover		Closer with Slimline Cover			Closer with Full Cover [Molded or Metal]			
Non-Hold-Open Arm	Standard	Parallel Arm	Top Jamb	Standard	Parallel Arm	Top Jamb	Standard	Parallel Arm	Top Jamb
Closer, No Backcheck No Power Adjustment	3000	PA3000	TJ3000	3200	PA3200	TJ3200	3400	PA3400	TJ3400
Closer, With Backcheck No Power Adjustment	3000-BC	PA3000-BC	TJ3000-BC	3200-BC	PA3200-BC	TJ3200-BC	3400-BC	PA3400-BC	TJ3400-BC
Closer, With Backcheck and Power Adjustment	3100	PA3100	TJ3100	3300	PA3300	TJ3300	3500	PA3500	TJ3500
Hold-Open Arm	Standard	Parallel Arm	Top Jamb	Standard	Parallel Arm	Top Jamb	Standard	Parallel Arm	Top Jamb
Closer, No Backcheck No Power Adjustment	3010	PA3010	TJ3010	3210	PA3210	TJ3210	3410	PA3410	TJ3410
Closer, With Backcheck No Power Adjustment	3010-BC	PA3010-BC	TJ3010-BC	3210-BC	PA3210-BC	TJ3210-BC	3410-BC	PA3410-BC	TJ3410-BC
Closer With Backcheck and Power Adjustment	3110	PA3110	TJ3110	3310	PA3310	TJ3310	3510	PA3510	<b>TJ3</b> 510
1" Minimum Ceiling Clearance Arm Non-Hold-Open only	Standard Only	Parailet . Arm	Top Jamb	Standard Only	Parallel Arm	Top Jamb	Standard Only	Persilel Arm	Top Jamb
Closer, No Backcheck No Power Adjustment	3080			3280			3480	n an ann an a	
Closer With Backcheck No Power Adjustment	3080-BC	Not Available	Not Available	3280-BC	Not Available	Not Available	3480-BC	Not Available	Not Available
Closer With Backcheck and Power Adjustment	3180	BI		3380		11. N. 5' 201 T. I. SPILL	3580	I WARMAN CORPORTING BOTT 1940	1000 1000 1000 1000 ATELS



	Maximum Door Size Opening	Standard	Maximum Door Size Opening	Parallel	A CONTRACTOR OF		
Although 1	120° 180°		120° 180°	1.44.944	120° 180°	1 1	
Interior	2'-0" 2'-0" 3'-6" 3'-0" 4'-6" 4'-0" 5'-0" 5'-0"	3002 3003 3004 3005	2'-0' 2'-6'' 2'-6' 3'-6'' 3'-0' 4'-6'' 4'-6'' 5'-0'' 5'-0''	PA3003 PA3004 PA3005	2'-0'' 3'-0'' 3'-0'' 4'-0'' 4'-0'' 5'-0'' 4'-6'' 5'-0''	TJ3002 TJ3003 TJ3004 TJ3005 TJ3006	
Exterior	2'-6'' 2-6'' 3'-6'' 3'-6'' 4'-6'' 4'-6'' 5'-0'' 5'-0''	3003 3004 3005 3006	2'-0" 3'-0" 2'-6" 3'-6" 3'-6" 4'-0" 4'-0"	PA3004 PA3005	2'-0'' 2'-0'' 3'-0'' 3'-0'' 3'-6'' 3'-6'' 5'-0'' 5'-0''	TJ3003 TJ3004 TJ3005 TJ3006	

#### Sizing Chart for Installations

#### 3200/3300 Series Slimline Cover [List No. 3200P]

3400/3500 Series Molded Full Cover [List No. 3400P]

3400/3500 Series Metal Full Cover [List No. 3400M]

Symbol	Description
US3	Bright Brass, Clear Coated
US4	Satin Brass, Clear Coated
US9	Bright Bronze, Clear Coated
US10	Satin Bronze, Clear Coated
US10B	Satin Bronze, Oxidized and Oil Rubbed
US14	Polished Nickel Plate
US15	Dull Nickle Plate
US20A	Plated Dark Oxidized Statuary Bronze, Clear Coated
US26	Bright Chrome Plate
US26D	Satin Chrome Plate
DY80	Satin Black Ebony, Chrome Plate
DZ80	Bright Charcoal Black, Chrome Plate

Available Finishes for Metal Full Covers

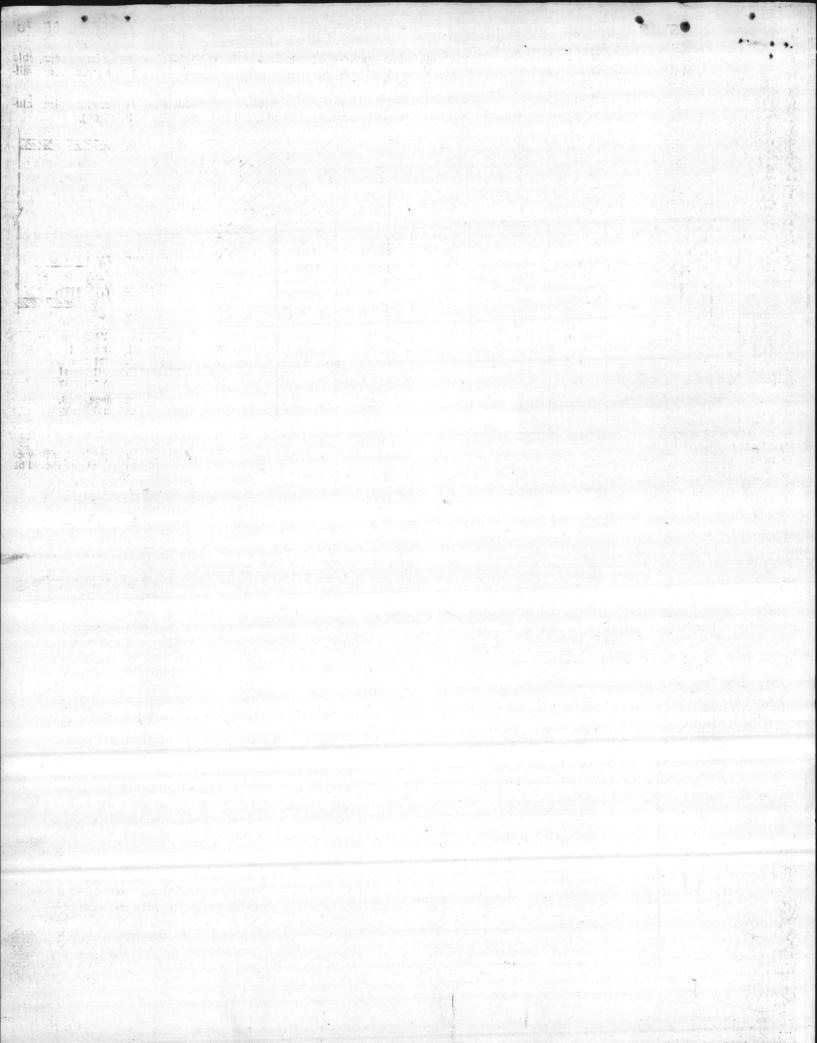
#### 3000 Series Sizing

Yale 3000 Series Door Closers should be sized according to the chart at left.

3200/3300 Series Slimline Cover This Slimline Cover is molded of high impact U.L. listed material and resists scratches and dents. It features cutouts and it is non-handed so it can be applied for Standard, Parallel Arm or Top Jamb Installations. (Dimensions: 13/4" high; 13" wide, 2-1/8" projection). 3400/3500 Series Molded Full Cover This full cover is supplied as standard on all 3400/3500 Series Closers. It is molded from the same material as the Slimline cover. It also is Non-Handed with cutout notches and can be applied to Standard, Parallel Arm, or Top Jamb installations. (Dimensions: 2-7/8" high; 13" wide; 2-1/8" projection).

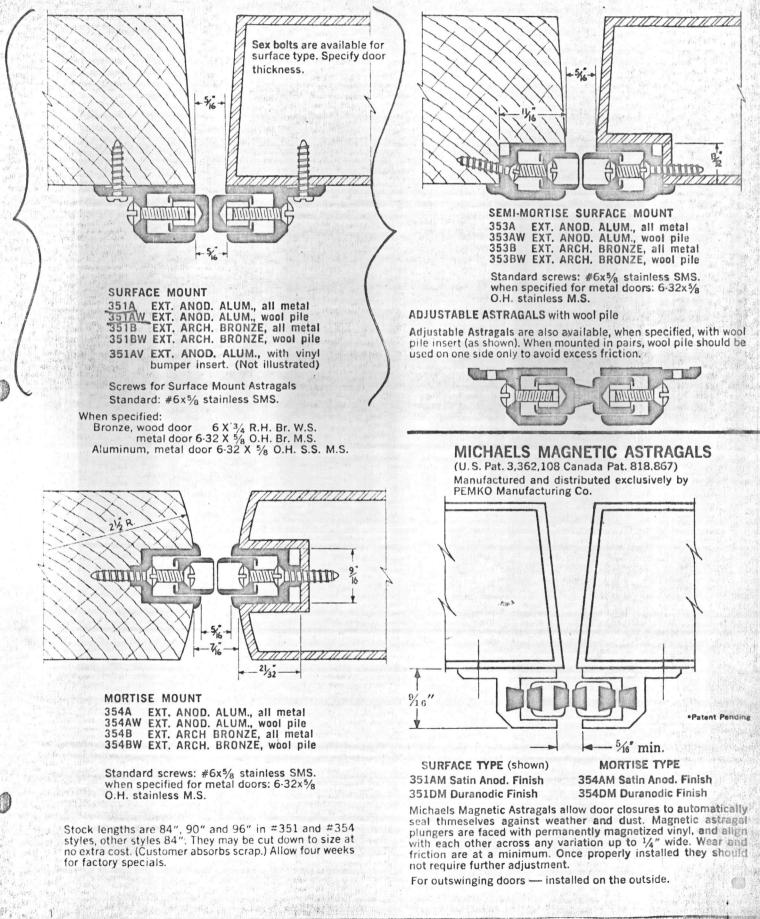
3400/3500 Series Metal Full Cover This full cover is fabricated of metal and is supplied when plated finishes finishes are desired. It is Non-Handed for Standard and Parallel Arm installations. In Top Jamb installation, the bottom notch must be factory prepared, and the cover becomes handed. When ordering Top Jamb closers with metal covers, specify hand on the order. (Dimensions: 33/4" high; 131/2" wide; 2-1/8" projection). **Special Finishes** Yale 3400/3500 Series Closers with metal covers are available with a variety of spray painted or plated finishes. The closer arm will be spray painted to match the finish of the cover. When ordering, suffix the closer List Number with the finish symbol you desire, i.e., 3402 x US26 or 3414-BC x US3. Plated arms are available to special order. If arms are to be plated also, they should be called out in the order.

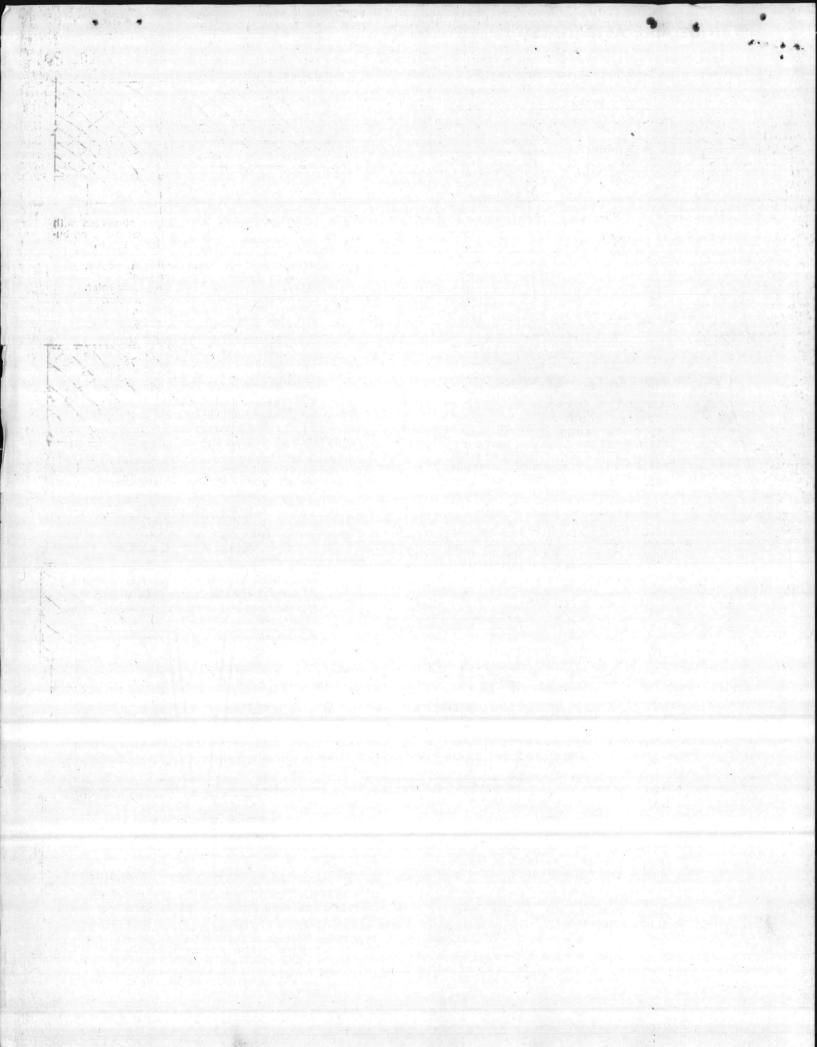
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When used as an astragal on double doors two lengths must be ordered, one for each door. The standard mounting screw for all adjustable astragal styles, both aluminum and bronze, is a #6x% stainless steel sheet metal screws. When specified, other mounting screws are available as described below for wood or metal doors. (Indicate which)

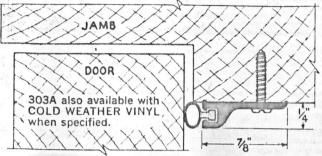
Standard finishes are anodized aluminum, US4 Satin Brass, and Satin Bronze. Gold anodized and duranodic (dark brown) anodized aluminum are available in stock when specified. Allow extra time for oxidized and rubbed finish on bronze (similar to US10B).



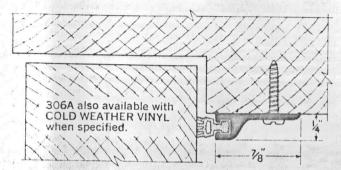


### DOOR WEATHERSTRIP

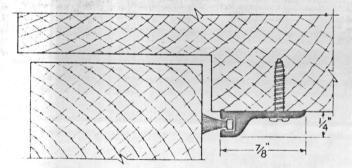
These surface applied strips are particularly effective for LIGHT and SOUND PROOFING. They may be used with either wood or metal doors.



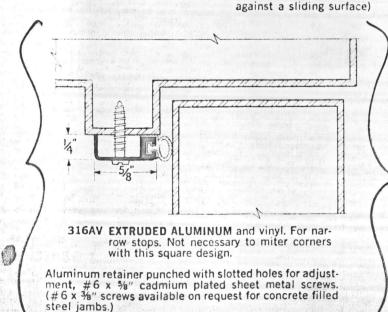
**303AV EXTRUDED ALUMINUM AND VINYL BUBBLE** 



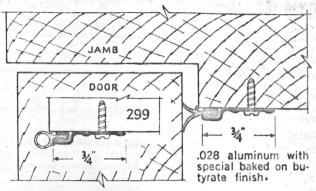
306AV EXTRUDED ALUMINUM AND VINYL BUBBLE WITH FINGERS.



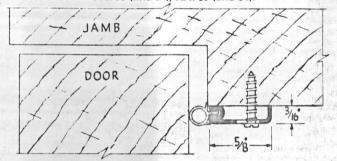
309AW EXTRUDED ALUMINUM AND WOOL PILE (Wool pile works well



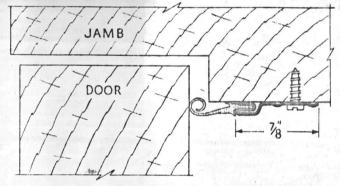
Extruded aluminum strips available in gold anodized or duranodic finish on special order.



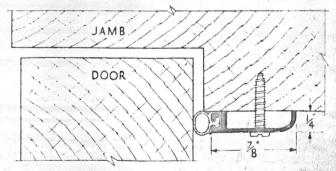
304A ALUM. and VINYL FINGERS, aluminum color. 304G ALUM. and VINYL FINGERS, gold color. 304D ALUM. and VINYL FINGERS, duranodic color. 299A ALUM. and VINYL BULB, aluminum color. 299G ALUM. and VINYL BULB, gold color. 299D ALUM. and VINYL BULB, duranodic color. Stock sets = 36 x 80 (and 84), 72 x 80 (and 84).



292A ALUM. and VINYL BULB, aluminum color. 292D ALUM. and VINYL BULB, duranodic color. 292G ALUM. and VINYL BULB, gold color. Not necessary to miter corners with this design. Stock sets = 36 x 80 (and 84), 72 x 80 (and 84).



399AV PAINTED ALUMINUM (alum. color) Specially designed vinyl compensates for variations in gap around wood door.

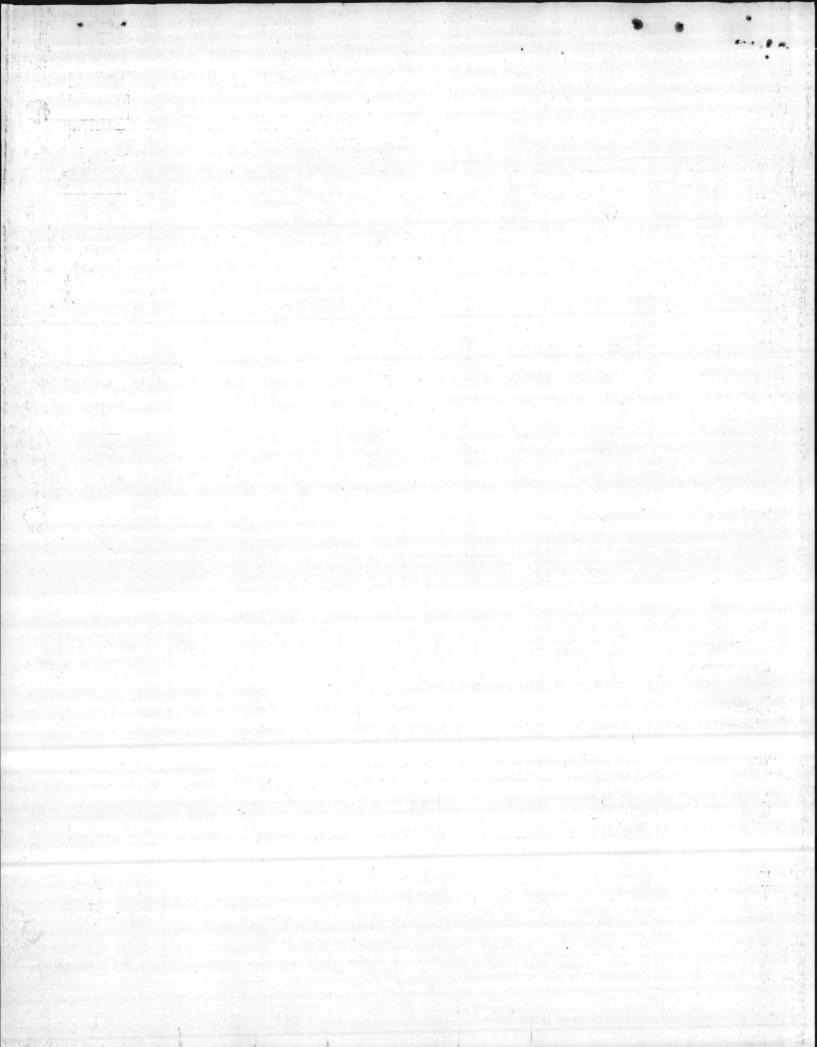


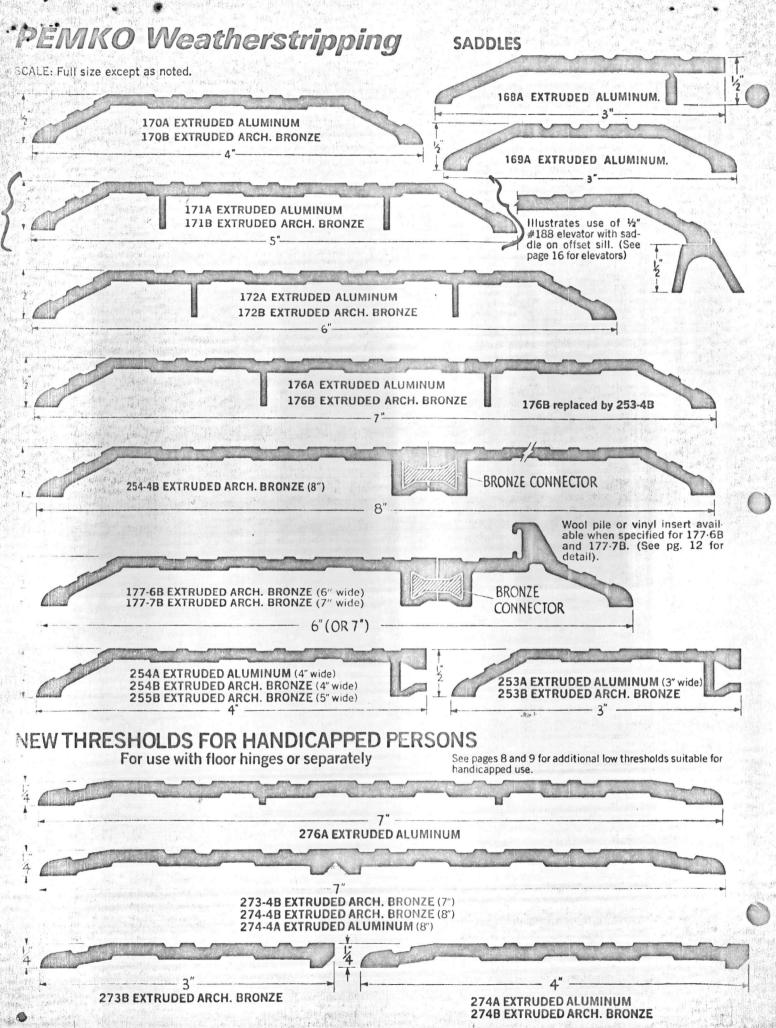
297AV EXTRUDED ALUMINUM AND VINYL BUBBLE

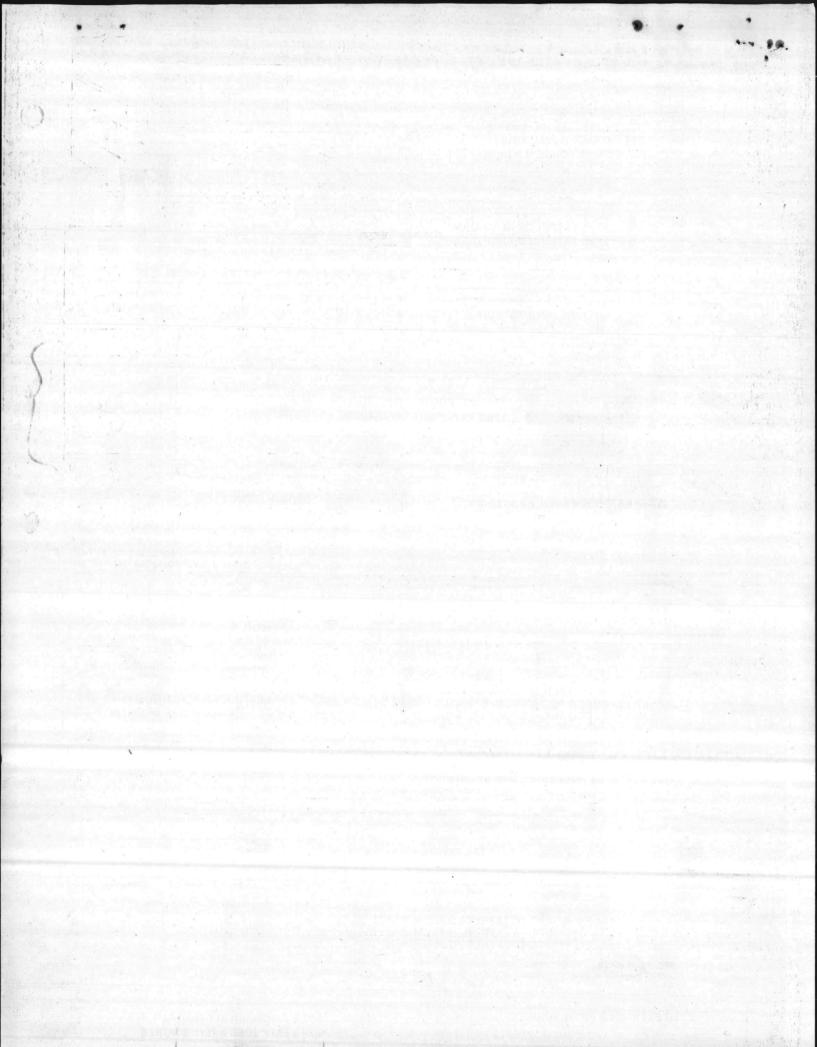
**DOOR BOTTOM IDEAS:** See pages 14 and 15 for various vinyl and aluminum threshold combinations and pages 18 and 19 for additional door bottom suggestions.

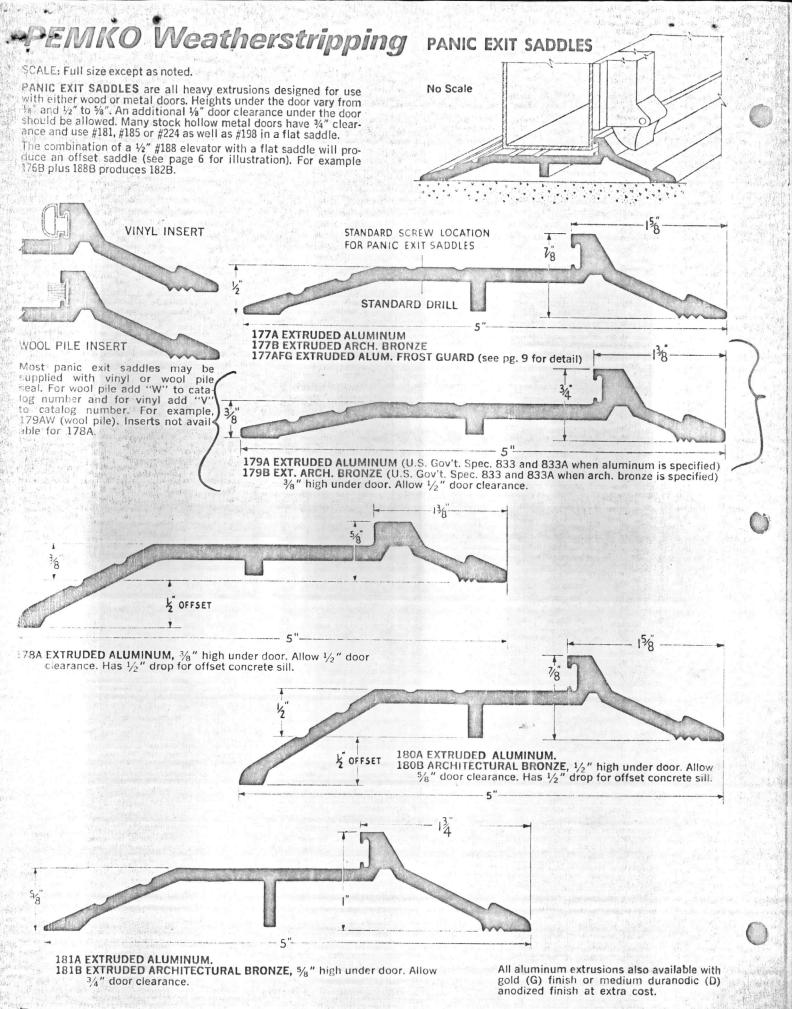
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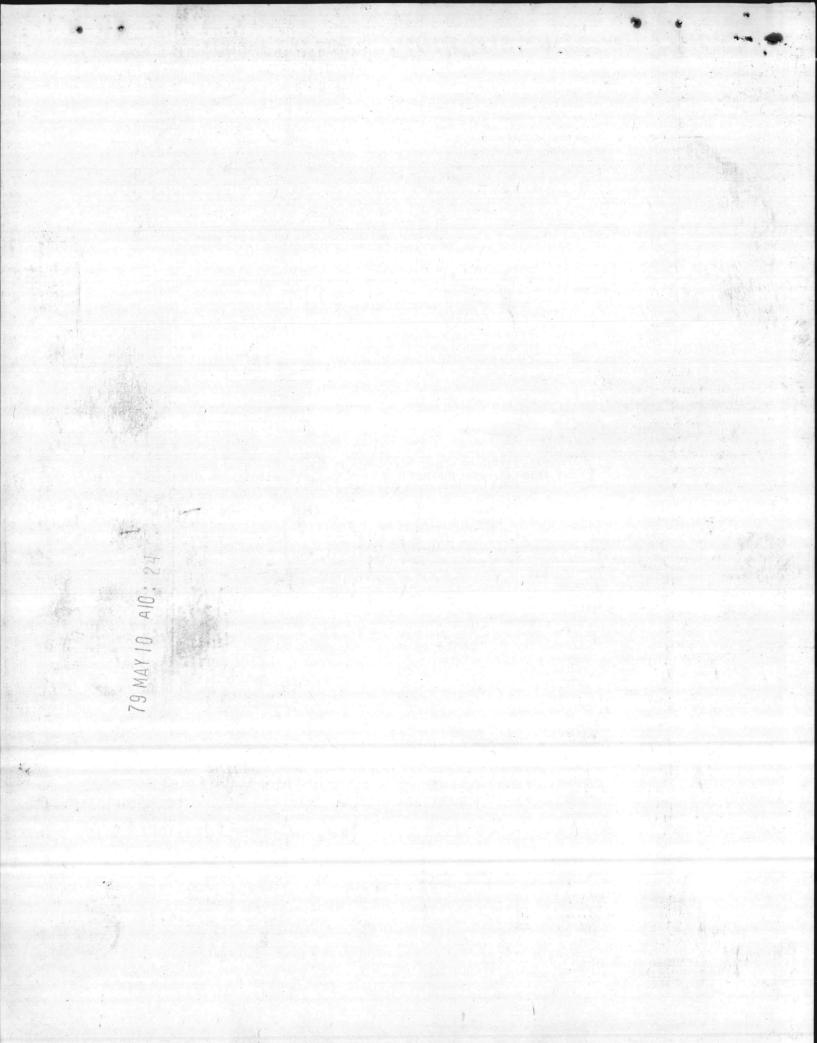
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Standard Finishes							
U. S. Symbol General Description							
USP US1B US3 US4 US9 US10 US10B US26 US26D US28 US32 US32D	Primed for Painting Bright Japanned Bright Brass, Clear Coated Satin Brass, Clear Coated Bright Bronze, Clear Coated Satin Bronze, Clear Coated Satin Bronze, Oxidized & Oil Rubbed Bright Chromium Plated Satin Chromium Plated Satin Aluminum, Clear Anodized Bright Stainless Steel Satin Stainless Steel						
OTHER							
28B 28G DY80 DZ80	Satin Aluminum, Black Anodized Bright Aluminum, Gold Anodized Satin Black Ebony, Chrome Plate Bright Black Charcoal, Chrome Plate						

#### **Common Abbreviations Used on Hardware Schedules**

TMS—To Template with Machine Screws	Rab—Rabbeted Front
JPTMS—Jamb Plate to Template with	Rad—Radius Front
Machine Screws	MK—Master-keyed
STMS—Strike to Template with Machine	GMK—Grand Master-keyed
Screws	GGMK—Great Grand Master-keyed
SMS—Sheet Metal Screws	WD X WD—Wood Door & Wood Frame
TBGN—Thru Bolts by Grommet Nuts	HM X HM—Hollow Metal Door &
SNB—Sex Nut and Bolt	Hollow Metal Frame
Sp. Hd.—Spanner Head Screws	WD X HM—Wood Door & Hollow Metal
WBS—Wrought Box Strike	Frame
NRP-Non-removable Pin	Kal—Kalamein Door
BB—Ball Bearing	CIF—Channel Iron Frame
Bev—Beveled Edge	LH—Left Hand
DA—Double Acting	RH—Right Hand
CB—Cement Box	LHR—Left Hand Reverse
RF—Rounded Front	RHR—Right Hand Reverse

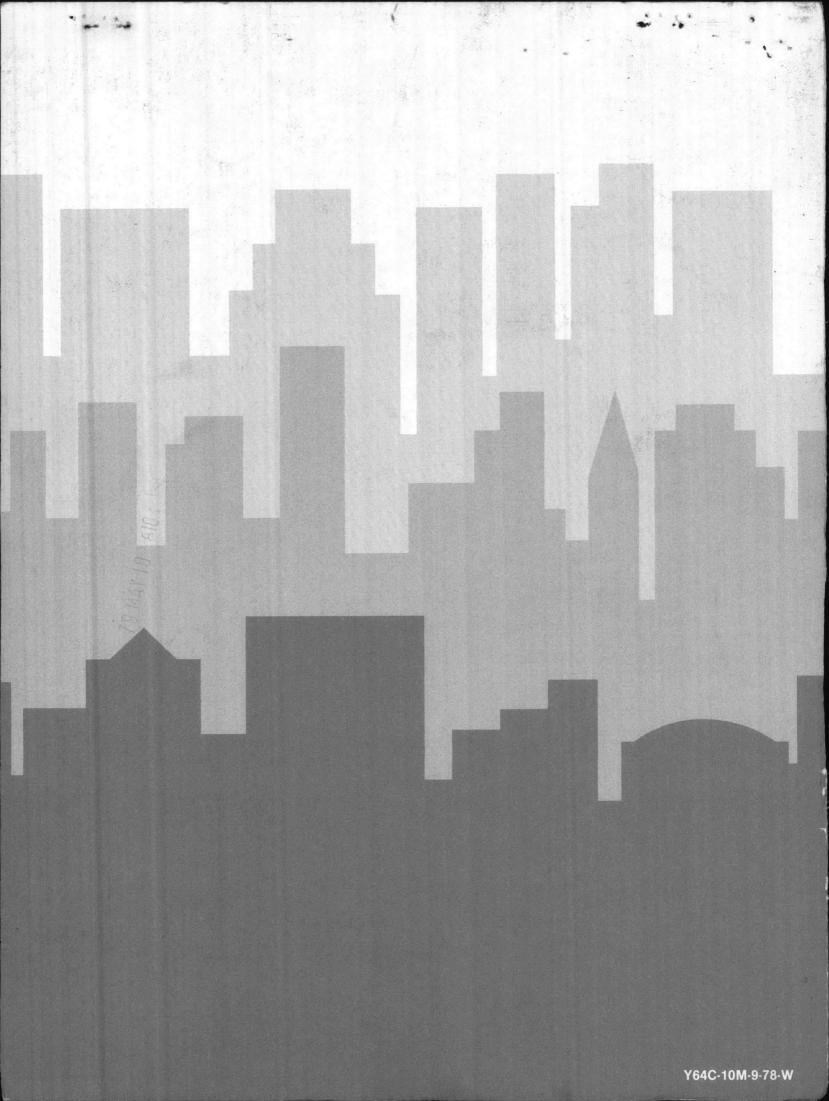
#### Suggested Template Reference on Hardware Schedule

Hardware schedules must employ the same terminology and numbering system for products listed as those used in applicable manufacturers' catalogs.

Product numbers listed in a hardware schedule must agree with the product numbers shown on template drawings furnished for use with that schedule.

Where possible, cross reference hardware schedule with door and frame schedule.

Show hardware template drawing numbers on the hardware schedule.



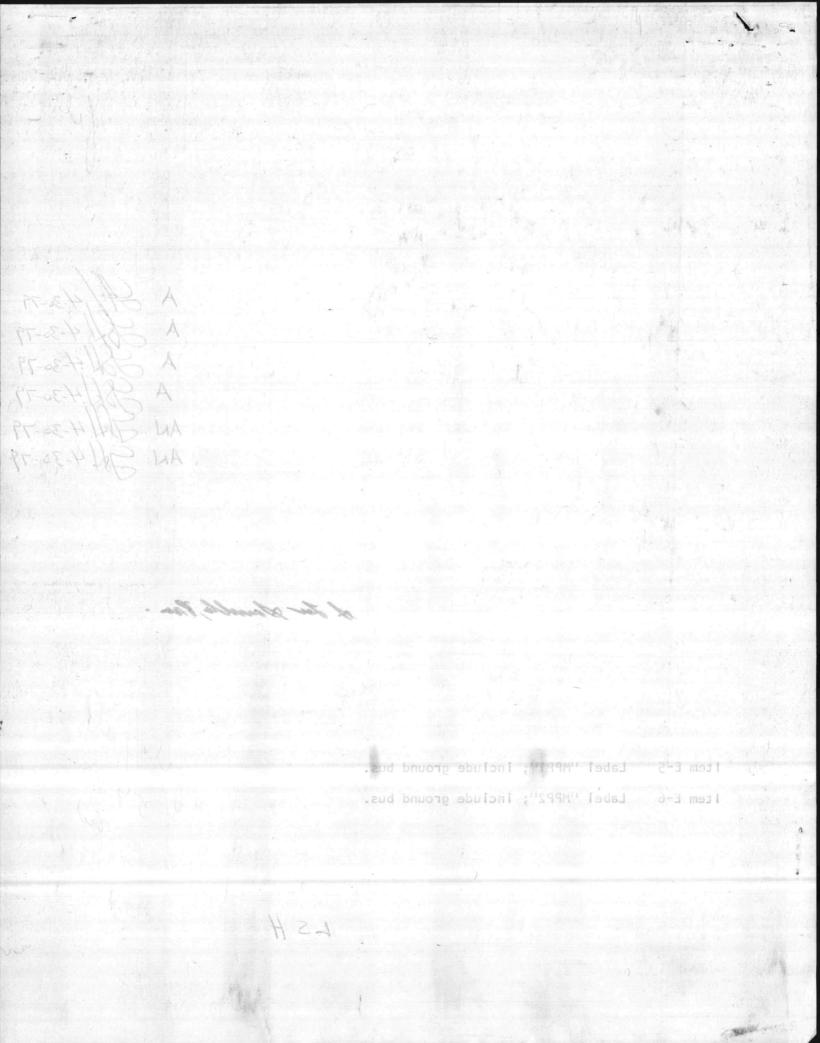
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-2	"do"	6.9	Safety Switches: FPE Class	s 1250		A	St. 4-30-79
-3	"do#	6.14	Transformers: FPE Class 7	715	a Pays	A	JSA 4-30-79
-4	"do"	6.11.6	Comb. Starters: FPE Class	4214		A	Sk 4-30-79
-5	"do"	6.8.3	Panelboard Drawings: FPE	MDP-1	Carl	AN	J.H. 4-30-7
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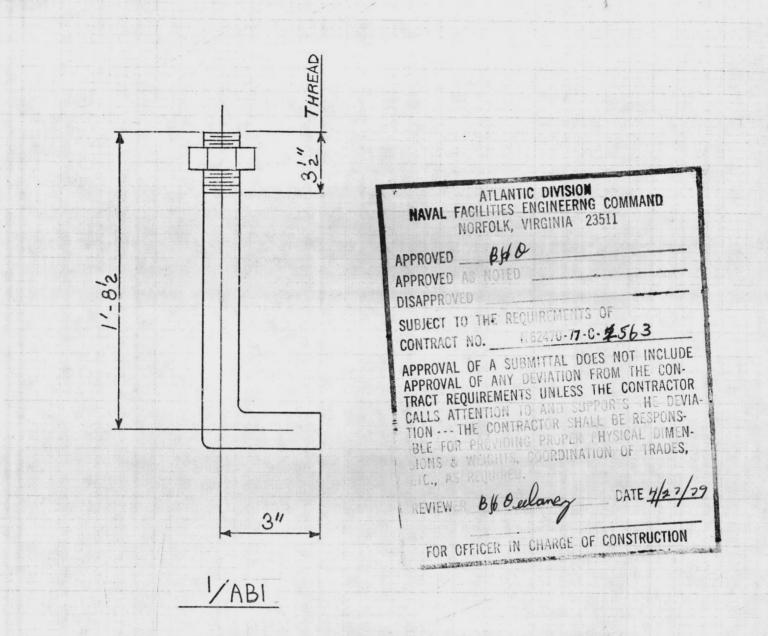
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PER P		ROLL ,	FOR	м	B	2.2 gauge	G	ALV.		3	6" Cor	ER WID	TH		
ł										actual	width/cove	er width			
F					joint,	butted jo	oint, for	rming							
L			tartir	ng po	ints ar	re shown or	n the lag	yout 1	thus		>				
****	2.	Placing S Place to	vo cr	thre	e of fi	rst row an ntinue pla	nd weld :	in pla	ace.	(See weld	ling below	; and typ	pical	Sect	ion
		chaik II	ines a	it re	asonabl	e interval n may elim	ls to ma:	intair	n pro	oper align	ment. Tr	some car	292	the	
- to the second second		Lapped J and form	loint ning	sh	et spec.	eet is lap ial job co tend beyon	onditions	s. A	2" }	caring is	s recuired	, and no	shee	t	
La a de r					144	heets must			nted	over cent	er line o	f support			
	3.					ess noted	on layou	rt.							
S		Lapped & Plug w 12" of	eld a	t ead		ort throug	h the bo	ottom	of t	the rib at	: the side	lap and	for e	ach	
the second description of the		Forming-		laps media of th	at each ate supp ne rib a	6 and abo h support ports. Fo at each co 25 welding	and cent r spans rner and	ter of less l cent	than than	a sheet at 4'6, pl of the she	end laps ug weld the et at inte	and at i hru the b ermediate	nter-		•
2	*	Puddle we	lds si	hall	be at ]	least ½" i	n diamet	er (3	/4 f	or 3" dee	p deck) c	r an elon	gated	weld	4
and an a for the spectrum of the second		shall pan fusion to	egual etrati the i	l per e all suppo	l layers	Fillet	welds, material	when . at e	used nd 1	shall be aps and s	approx.	1" 10ng.	<b>Fley</b>	meita d	al I
WI MANAGER AND THE REAL WAR	4.	shall pan fusion to	egual etrati the i	l per e all suppo	rimeter. L layers prting n tions w	Fillet s of deck members.	welds, material	when at e the	used nd 1 layo	shall be aps and s ut.	approx. i ide joints	l" long. s and hav	<b>Fley</b>	4	1 
ITEM I THE PROPERTY OF A THE P	4.	shall pend fusion to Any specia	equal etrate the s	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	when at e the	used nd 1 layo	shall be aps and s	approx.	l" long. s and hav	Weld e goor	4	1 
Mali 1	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIPTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	ы 10м
MILE ILEW	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	ы 10м
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Wall 1 2 3 4 5	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	ы 10м
1 2 3 4 5 6 7 7	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	ы 10м
1 2 3 4 5 6 7 8 9	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	ы 10м
1 2 3 4 5 6 7 8 9 10 11	4. sh	shall pend fusion to Any specia	equal etrate the ins	l per e all suppo struc	DESC	RIFTION	welds, material vered on Lang	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	1 10M
1 2 3 4 5 6 7 8 9 10 11 11 12 2	4.	shall pend fusion to Any special IIPPING LIST	equal etration al ins	coor	DESCI	RIPTION	welds, material vered on L.2NG 1'5 FEET 36 /6	TH A	used nd 1 layo	shall be aps and s ut.	Approx. i ide joints	MATE P.O. NO.	Weld e good RIAL API	PLICATT	1 10M
1 2 3 4 5 6 7 8 9 10 11 11 12 2	4.	shall pend fusion to Any special IIPPING LIST	equal etration al ins	coor	DESCI	RIPTION	welds, material vered on L.2NG 1'5 FEET 36 /6	when at e	Used nd 1 layo	REMARKS	Approx. 1 ide joints MTRL SPEC. B-GALV	MATE P.O. NO. BR 2119	Weld e goor	A PLICAT	
1 2 3 4 5 6 7 8 9 10 11 12 PRO	4.	shall pend fusion io Any specia IIPPING LIST C. NARK //// /// /// /// /// /// /// // /// /	equal etration al instant	coor <i>RP</i>	DESCI STMBOL DECK	RIFTION	welds, material vered on Leng 15 FEET 36 /6	when at e	Used nd 1 layo BLY MARK PAINT EY	REMARKS	Approx. 1 ide joints MTRL SPEC. B-GALV	MATE P.O. NO. BR 2119 NO. 05	Neld e goor	A PLICATT NO. PCS.	
1 2 3 4 5 6 7 8 9 10 11 12 PRO	4.	shall pend fusion io Any specia IIPPING LIST CB NARK //// /// /// /// /// /// /// /// ///	equal etration al instant		DESCI SYMBOL DECK	Fillet of deck internet for the soft deck intere	welds, material vered on is FEET 36 16	when at e	USEd 1 layo	REMARKS	Approx. ide joints	MATE P.O. NO. BR 2119 Mare No. 05 79-3	Neld e goor	A PLICATT NO. PCS.	
1 2 3 4 5 6 7 8 9 10 11 12 PRO	4.	shall pend fusion io Any specia IIPPING LIST INARK //// /// /// /// /// /// /// /// ///	equal etration al instant		DESCI STMBOL DECK DECK DECK	Fillet s of deck n members. will be con REPTION BECT:ON DIM 22 GAX 22 GAX 5 HEATIN 5, N. C	welds, material vered on Land NB FEET 36 16 16 16 16 16 16 16 16 16 16 16 16 16 1	when at e the inthe sthe shop Holes Guar	USEd Id 1 layo BLY MARK PAINT BLY CED BY	REMARKS	Approx. 1 ide joints MTRL SPEC. B-GALV	MATE P.O. NO. BR 2119 MATE P.O. NO. BR 2119 MO. 05 79-3	Neld e goor	A PLICATT NO. PCS.	
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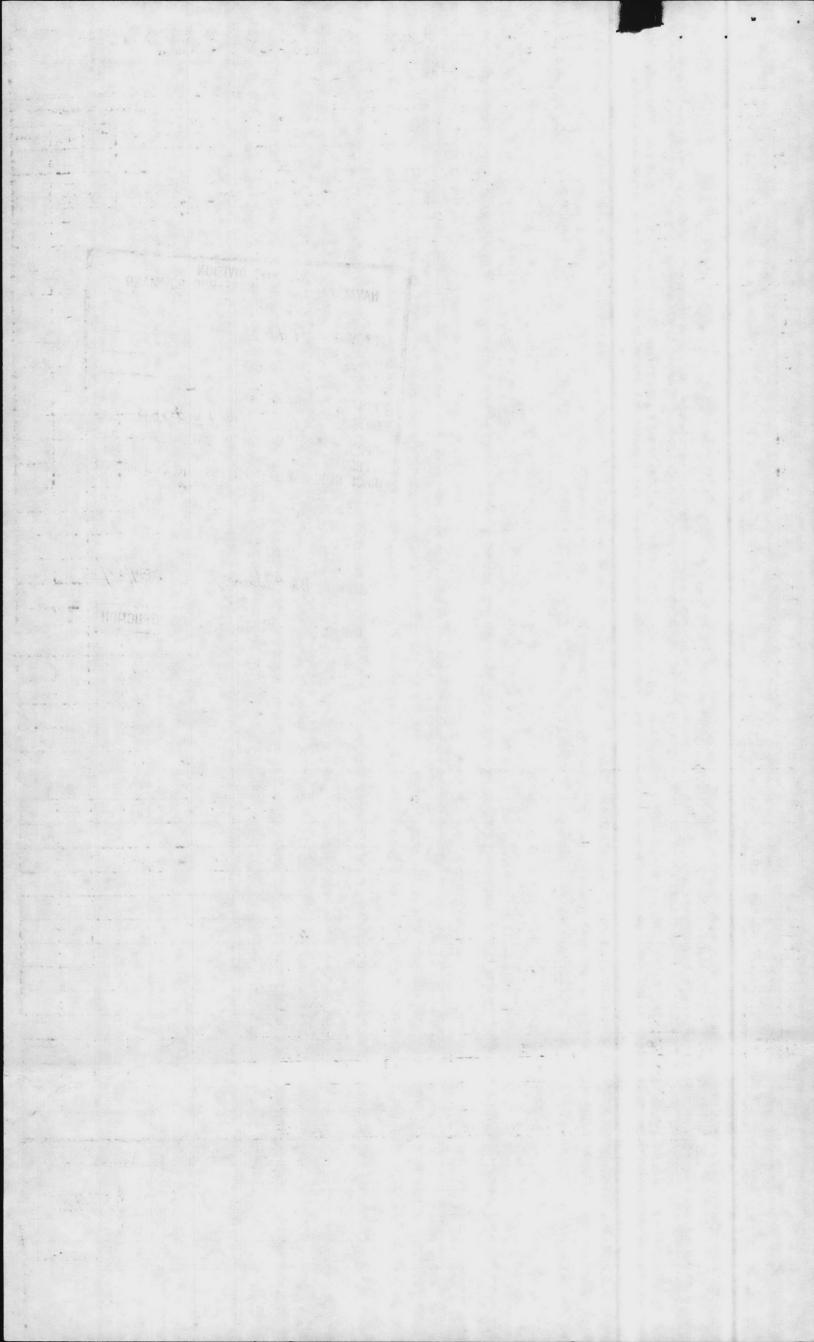
NAVAL FACINO	ATLANTIC DIVIS ILITIES ENGINEE RFOLK, VIRGINIA	RIVE CUMMAND
PPROVED	BHO	
PPROVED AS	Second deligibility	
CONTRACT NO	THE REQUIREMENT D. N62470-7	1
APPROVAL O TRACT REQUI CALLS ATTEN TION THE IBLE FOR P SIONS & WI	REMENTS UNLES VITION TO AND CONTRACTOR S ROVIDING PROPE EIGHTS, COORDIN	SUPPOR S H V HALL BE RESERVE R FHYSICAL UM IN- NATION OF TRADES,
	BXP	DATE 4/2.7/2

P. O. BOX 20888 # (919) 275-9711 GREL SEORO, N. C. 27420



W N	SHIP	ING LIST	PCS.		DESC	RIPTION	LENG	зтн	ASSEM-	REMARKS	MTRL. SPEC.	MATER	HAL AP	PLICAT	пон
LINE	NO PCS.	MARK	REQ'D	CODE	SYMBOL	SECTION DIM'S	FEET	INS	MARK	REMARKS	MIRL. SPEC.	P.O. NO.	LINE	NO. PCS.	LEN
1					ANCH	ORS @ C.OL.									
2	12	1/ABI	12		BAR	34 RD		11/2		THRDABEND		STOCK			
3			12	F	NUT	34 HEX						ł			
4					ANCH	IORS @ COO	LIN	GT	OWE	R					
6	12	1/ABI	12		BAR	34 RD	1	11/2		THRD&BEND	)	STOCK			
7			12	F	NUT	34 HEX						4			
8	-													1.1	
9	.k														
10	() ( the set	A Pages	i. entite			ana dela									
11	The second												The sea		
12											-				
	R	EPLAC	EMI	ENT	OF	HEATING	38	SHO	P PAIN	T					
		BLD						HOL	ES	41 BANNA (* 1998) * 1999 BANA (* 1997)	E STATE	SPEC.	NO.	05-7	17-2
-		CAMI	PL	EJ	EUN	E, NC		MAT	EBYE	C. CLYME	R				Card The Long Street Street of Street
										,CW	ORDER NO	. 79	300	10A	
cu	STOMER	SORRE	LLS	PLL	JMBI	VG & HEATI	NG	SQU	AD LEA	DERK. W. T			OF		
	SEC	T. 05	120	R	EF. DI	WG. S-1		1		12-79	C. C. MARCO	all a star			Contrastor (1 and and

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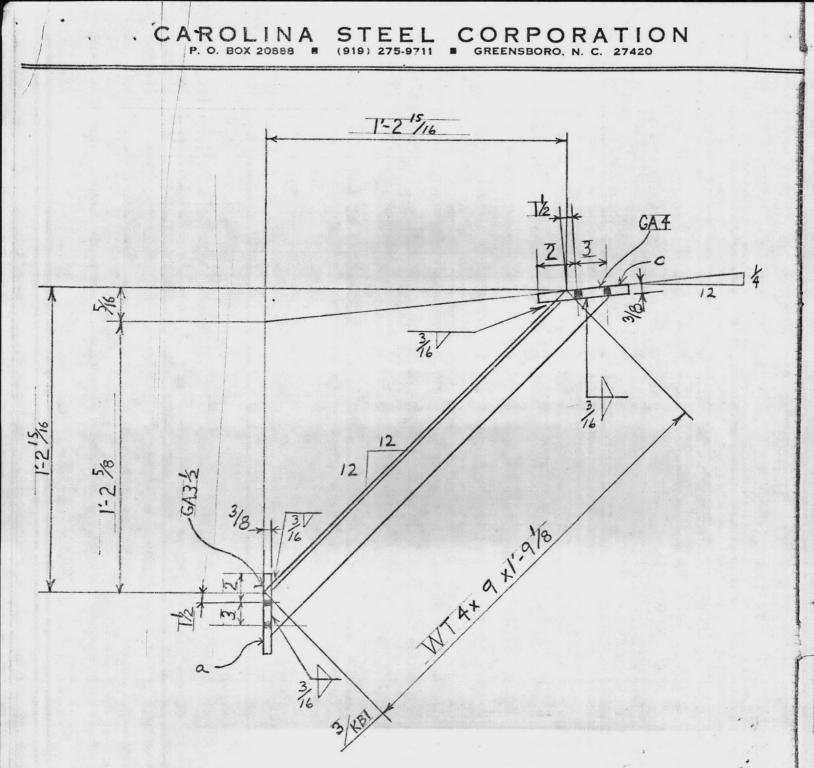
## CAROLINA STEEL CORPORATION P. O. BOX 20888 B (919) 275-9711 B GREENSBORO, N. C. 27420 SHOP BILL

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TEM	SHIP	PING LIST	PCS.		DES	CRIPTIC	ON		LENG	ЗТН	ASSEM- BLY	REMARKS	MTRL. SPEC.	MATE	RIAL A	PPLICA	TION
12	NO PCS.	MARK	REQ'D	CODE	SYMBOL	SEC	TION DIM	's	FEET	INS.	MARK		MINE. SPEC.	P.O. NO.	LINE	NO. PCS.	LE
1													1.1.2				
2		SF	¥IT	K	ING.	5	FOR	1	PE,	WF	FOR	CING.	EXIST. 1	VOOD TA	PUSS	55	
3																	=
4		Re	FER	Te	EI	VG.	DWG.	1	SHA	BI	+5-	2 FOR	DETAIN	54			
5		all all a						-						E.F.S.			
6		SH	EET	F /	4-3	Fo	RA	-00	CA	710	DN	OFL	Exist. h	LOOD TR	wor	55	
'	-							_									
8		21					<u></u>	-									
9	16	2/9	16	X	SPL	IT ,	RING	2	źφ	•	ang sa	5	TECO	BT-2207	1		
0		1	5										<u> </u>		111		
1	-	4	PER	_ /	RUS.	5 /	MT-1	-		4	TRU	USES X	EQ'D)				
2					1.174 - 7.185 1.174 - 7.185		*	_				Televille delle					
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6		1	Den	T	0	1111	7 2	,	/	10			0				
7			PER	-14	2011	14	7-2	-	4	18	1R	USSES,	REQ'D)				
8	16	2/18	16	X	5000	- D.	NG 2	Z	5			F	TEAD				
9	10	110	10	~	SPEIN	<u>×11</u>	NGL	21				5	TECO	BT-2207	/		-
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1			124	10	000		1-5	-	-	2	BUS	065 1	Eq 2)			2.2.2	
2	72	2/22	72	X	SOU	TP.	VG	17	5			4.7	TECO	PT OP AT	2		
3	1-	to tra	10	~			11 67	T				71	1600	01-2201	2		
4		4	PE	R	RUS	- "/	17-2	211	7	18	TA	USES.	REGID		1. (E. 2)		
5			1=1	1	1000		-1_~	-		~	IRU		1592.		P. Com		
6	16	2/26	16	X	SPLI	TR	ING .	49	Þ			11	TECO	BT 1207	2		
7		1		-		- 1.10		1	1		Contraction of		1000	51-6201			
в		2	PEX	> 7	RUS	5"1	MT-3	3"	(	8	TRUS	ses Ro	$\overline{O}(D)$	The second second			~>
9													100			200	
2	8	2/30 4	8	X	SPLA	TR	ING	K	1.1			6	TECO	87-22.07	2		
1		4	PER	TR	155	"M	7-4	"	(2	2.7	FUUS	ES REQ	'D)				
-	Box	TS & W	ASH	For	RE	×157	T. TRU	este						Service States			
4	42		42	F	BOLT	1/2			0	6	TRE	USS MT-1		REQ.			
$\downarrow$	18	2/34		F	BOLT	1/2	and the second second second second		0	71/2	11	MT-3					
1	74	2/35		F	BOLT	1/2		_		71/2	11	MT-2		and the second			
$\downarrow$	18	2/36		=	BOLT	3/4.			0	41/2	11	MT-3					
-		2/37			BOLT	3/4				6	11	MT-4					
	Contraction of the second second				BOLT	314		_	0	7/2	11	MT-2		1			
		-1			WASH	1/2		_									
11	20	2/40	120	FL	WASH	3/4								¥			
io1		EPLACE				47	ING	đ		SHO	P PAINT	NONE					
-	AI	G BL	DG.	26	515					DRA	WING N	0.	A SPEC. N	0. 05-7	7-25	563	
DCA	TION _	CAMP	2 2	EJ	EUI	VE	, N	.C		MAD	EBY	Amt					
_	1					·						· C.W.	ORDER NO.	79-3	309	OA	
ST		ORRELL	S PL	UME	ING	E HA	EATIN	G	Co.	SQU	AD LEAD	DER KWT	SHEET NO.	AB2 .	F		
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NAVAL	FACILITIES EN	DIVISION IGINEERNO RGINIA 2	COMMAND
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APPROVED	AS NOTED _	<u> </u>	
DISAPPROV			
	OF THE REQUI		
	NO. N62		
APPROVAL TRACT REI CALLS AT TION T IBLE FOR SIONS &	OF ANY DEV QUIREMENTS I TENTION TO / HE CONTRACT PROVIDING F	IATION FI JNLESS TI AND SUPP OR SHALL PROPER PH	S NOT INCLUDE ROM THE CON- HE CONTRACTOR ORTS THE DEVIA BE RESPONS- HYSICAL DIMEN- IN OF TRADES,
REVIEWER	BKD	2000 - 2000 2000 - 2000 2000 - 2000	DATE 4/22/29
FOR OF	FICER IN CHA	RGE OF C	ONSTRUCTION



ITEM	SHIP	NG LIST	PCS.		DESC	RIPTION	LEN	этн	ASSEM- BLY	REMARKS	MTRL. SPEC.	MATE	RIAL AP	PLICA	TION
E	NO PCS.	MARK	REQ'D	CODE	SYMBOL	SECTION DIM'S	FEET	INS	MARK	NEM ANTO	MIRE. SPEC.	P.O. NO.	LINE	NO. PCS.	LEN
1	2	3/KB1	2		WT	4 x 9	2	3/6		Bev Z-E		STOCK			
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3			2	Define Sy	PL	3/8× 64	0	6/2	C						
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1															
2															
	BLDG.	2615				NG & A/C		SHO	P PAIN	τ <u>ΤΤ-Ρ-</u> 16 Φ	36 TYPE SPEC No	I REI 6 05-77	- 25	EAD 63	
10	CATION.	CAMP	LEJ	EUNZ	ε, <u>Ν</u> .	<u>C.</u>				VC.W.		. 79- 30	290	A	
		SORRELLS 05120				HEATING (	20			DER KWT	SHEET NO	AB3	OF	1.5	1.30

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	ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511
AP	PROVED BHB
AP	PROVED AS NOTED
	SAPPROVED
C	IBJECT TO THE REQUIREMENTS OF DNTRACT NO. 1.62470-77-6-7.563
ATICTIS	PPROVAL OF A SUBMITTAL DOES NOT INCLUDE PPROVAL OF ANY DEVIATION FROM THE CON- RACT REQUIREMENTS UNLESS THE CONTRACTOR ALLS ATTENTION TO AND SUPPORTS THE DEVIA- ION THE CONTRACTOR SHALL BE RESPONS- BLE FOR PROVIDING PROPER PHYSICAL DIMEN- NONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.
10.00	REVIEWER BYO DATE 4/22/29
	FOR OFFICER IN CHARGE OF CONSTRUCTION

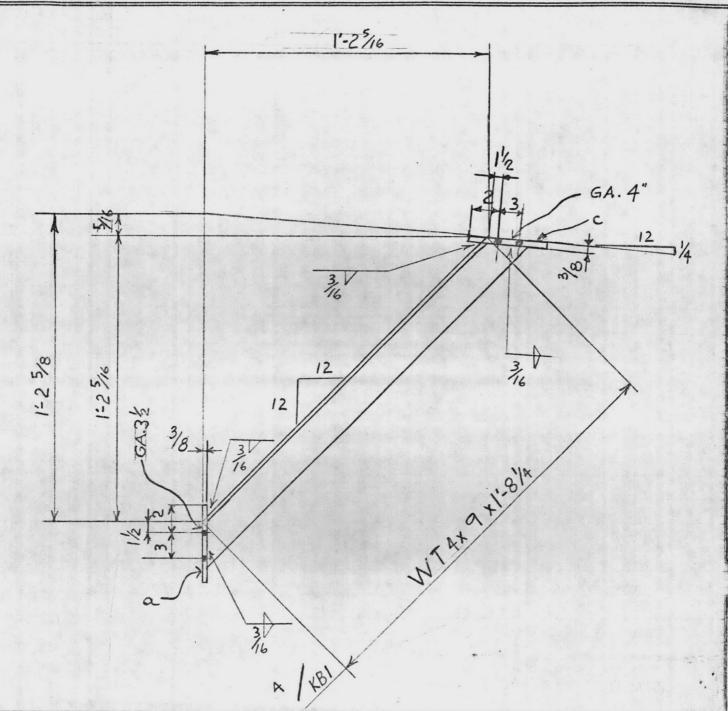
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#### CAROLINA STEEL CORPORATION P. O. BOX 20888 B (919) 275-9711 B GREL ISBORO, N. C. 27420



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1	NO PCS.	MARK	REQ'D	CODE	SYMBOL	SECTION DIM'S	FEET	INS	MARK	REMARKS	MIRL. SPEC.	P.O. NO.	LINE	NO. PCS.	LENG
1	2	4/KBI	2		WT	4 × 9	2	2%		Bev-Z-E		STOCK			
2			2		PL	318 × 6	0	61/4	a			1			
3	1	<u></u>	2		PL	3/8 × 6 1/4	0	6/2	C	(Artistat)	Sec. Sec.	1			1. 
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6		PIDE .	SLEE	VES	5 - RE	FER TO C	TUG.	Du	5-	5-1 \$	M23	FOR			
7		100	ATIC	DN							截	-			
8	2	4/8	2	X	PIPE	10 STD.	0	8	80*	PLAIN	GV	MECK. STOCK			
9			1.1.1												
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11									1 miles						
12						and the second									
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UBJECT TO THE RE ONTRACT NO.	QUIREMENTS OF N 62470-77-C-2563
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RACT REQUIREMEN CALLS ATTENTION T TION THE CONTR BLE FOR PROVIDIN	TS UNLESS THE CONTRACTOR TO AND SUPPORTS THE DEVIA RACTOR SHALL BE RESPONS- IG PROPER PHYSICAL DIMEN- COORDINATION OF TRADES,

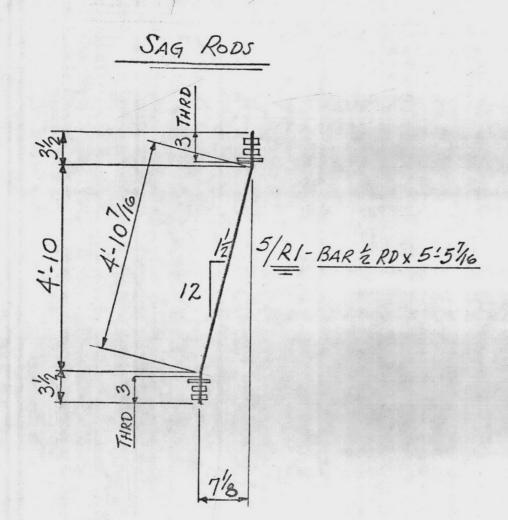
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CAROLINA STEEL CORPORATION P. O. BOX 20888 B (919) 275-9711 GREENSBORO, N. C. 27420



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LINE	SHIP	PING LIST	PCS.		DESC	RIPTION	LENG	этн	ASSEM-	REMARKS	MTRL. SPEC.	MATE	RIAL AP	PLICA	TION
5E	NO PCS.	MARK	REQ'D	CODE	SYMBOL	SECTION DIM'S	FEET	INS	MARK	ALMARNO	MIRE. OFEC.	P.O. NO.	LINE	NO. PCS.	LEN
1	2	5/RI	2		BAR	1/2 RD	5	5%		BEND & THRO		STOCK			
2			8	F	NUT	1/2 HEX	-	N. Y			n an				
3		Sec. 18	4	F	WASH	1/2	-		1						
4	S. Alter								3						
5	12	5/X63	12		BAR	1/2 RD	6	3		G 3"THRP?					
6			24	F	NUT	1/2 HEX					Construction 200				
7			24	F	WASH	1/2									
8															
9		VERTI	CAL	B	RACK	VG									
10	6	5/R2	6		BAR	5/8 RD	18	4							
11	h.	, 	24	F	NUT	5/8 HEX					C. H. Barran	*			
12	12	5/12	12	X	WASH	5/8				10#	PBEV .	JH 8893	1		
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cu	STOMER	SORRE	LLS	PLU	MBING	HEATING	Co.	squ	AD LEA	DER KWT		AB5	a second and		
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	ATLANTIC DIVISION ACILITIES ENGINEERING COMMAND VORFOLK, VIRGINIA 23511
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APPROVED A	
DISAPPROVE	D
	THE REQUIREMENTS OF
CONTRACT N	10. N 62470-77-C-2563
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REVIEWER	B260 DATE 4/20/09

### GAROLINA STEEL CORPORATION GREENSBORO, N. C.

### RIVET AND BOLT LIST

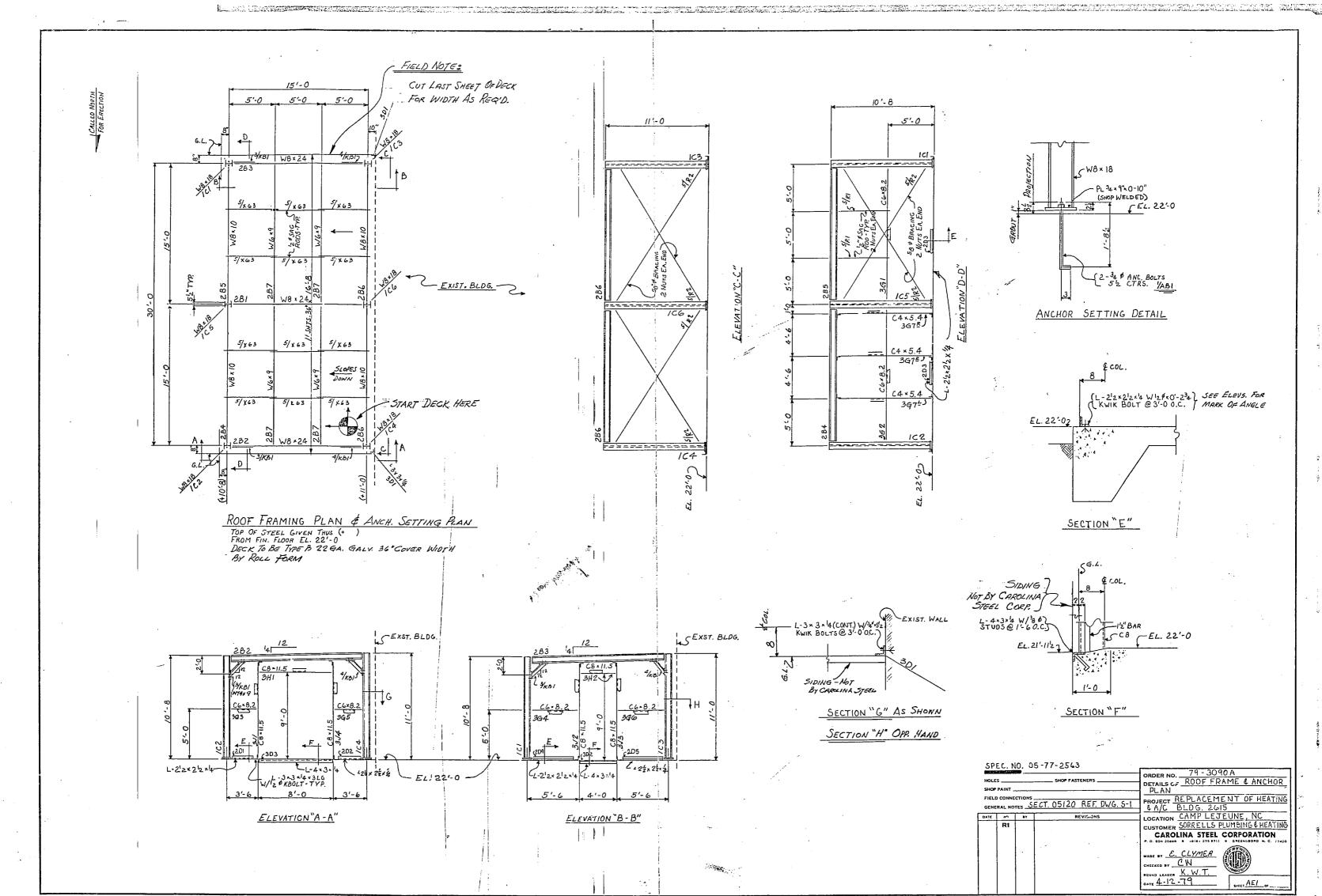
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## CAROLINA STEEL CORPORATION

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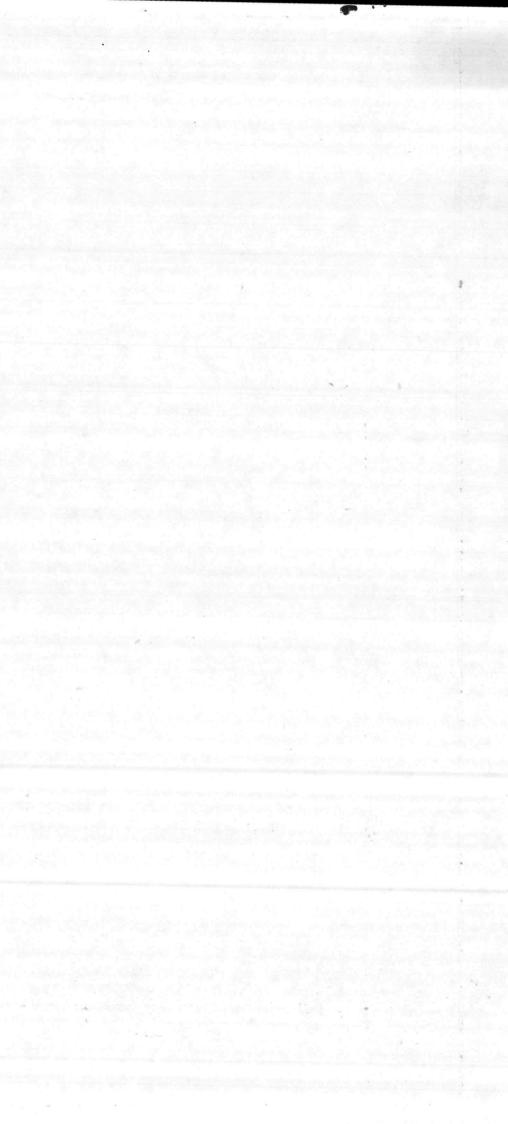


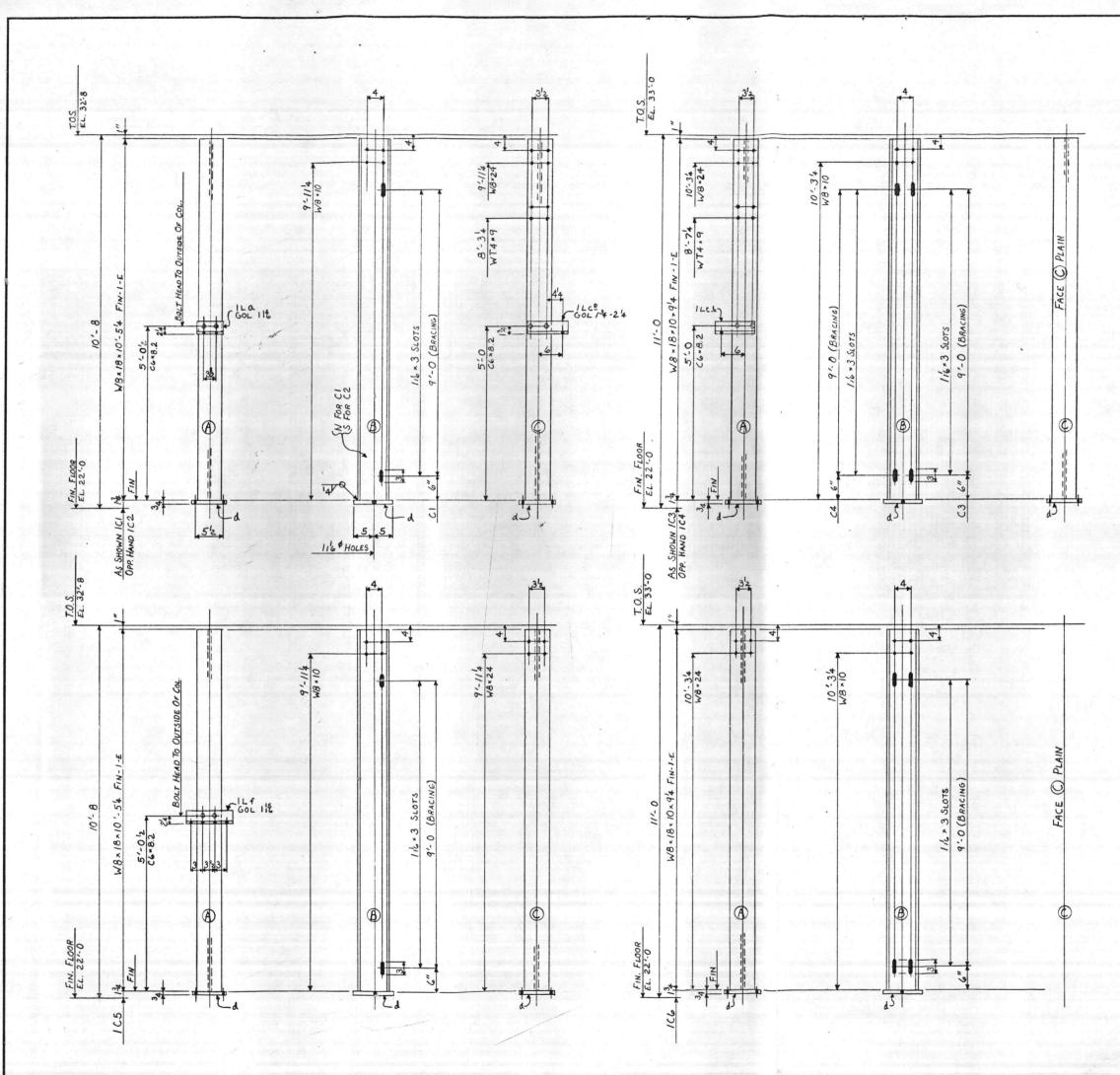
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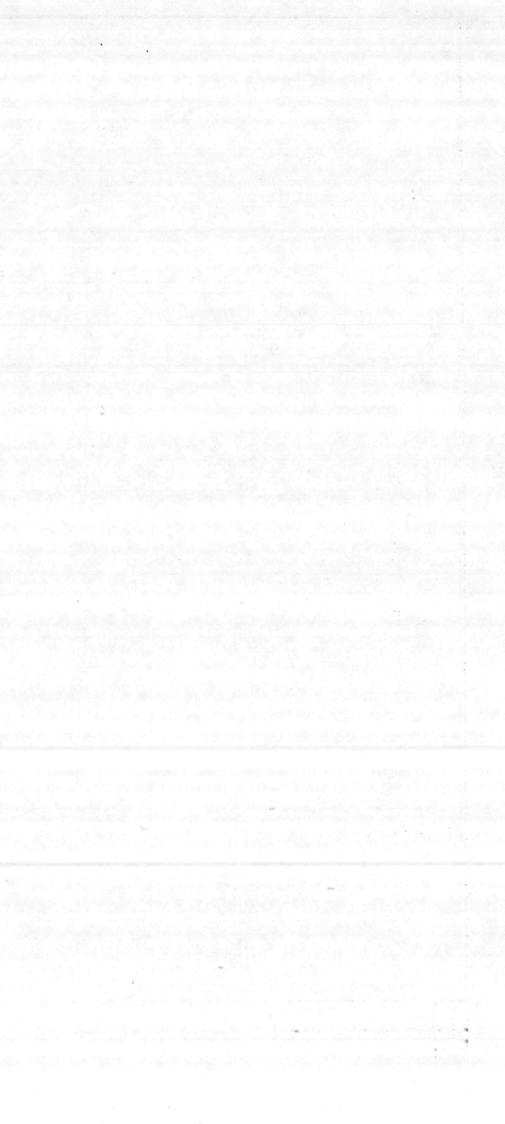
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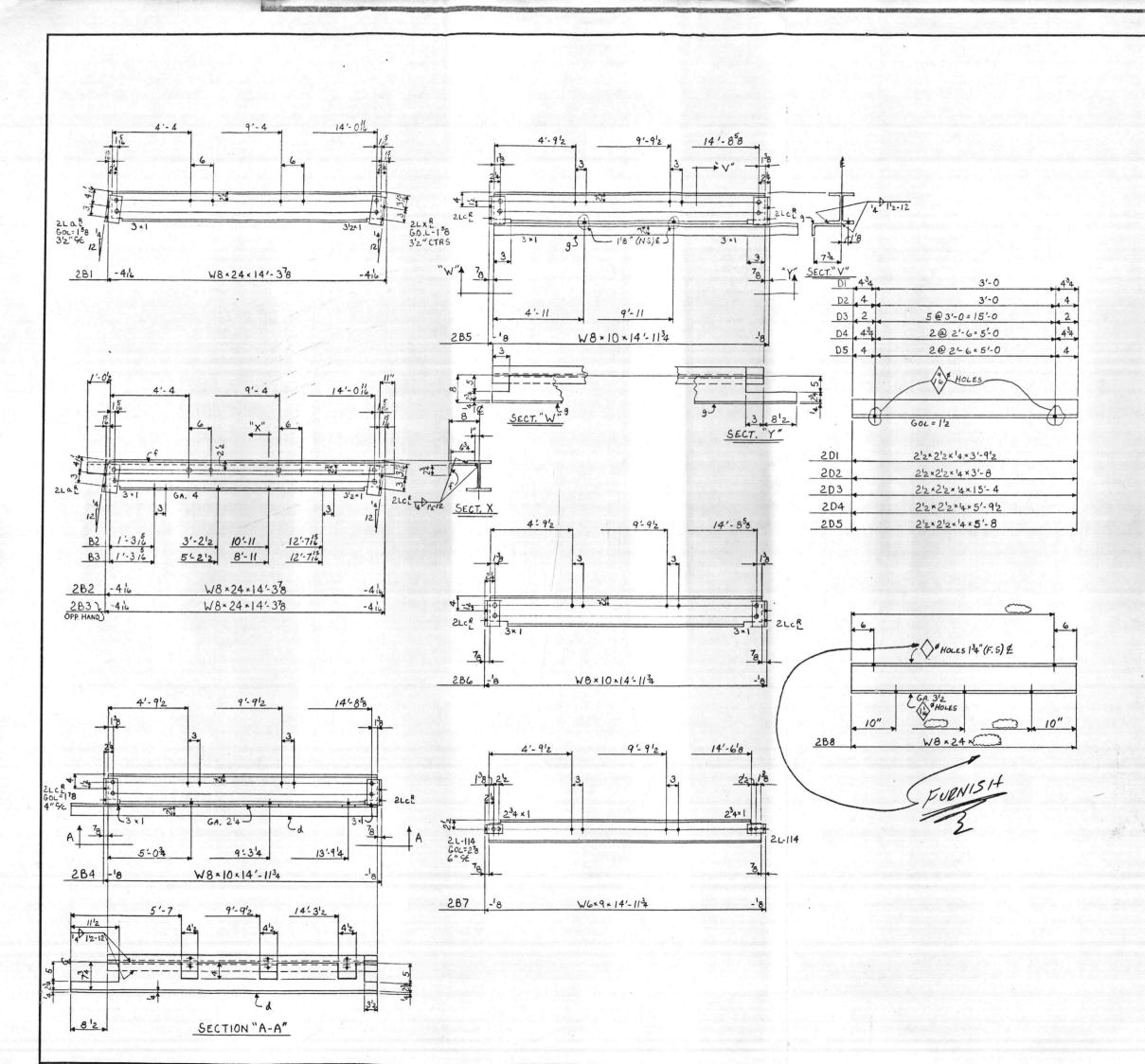




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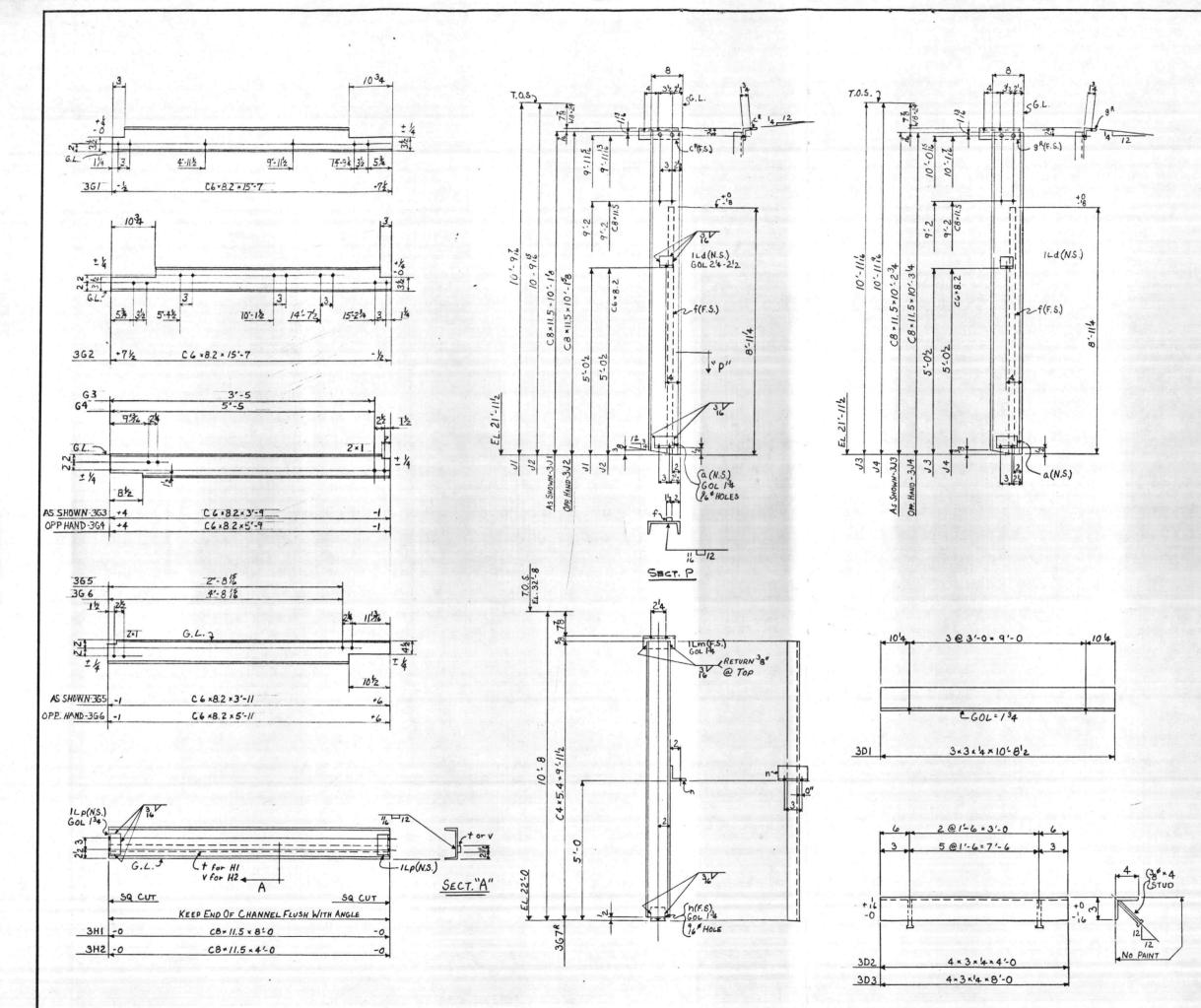




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ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511
APPROVED BLE D APPROVED AS NOTED
SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N62470-77-C-2563
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER FHYSICAL DIMEN- SIONS & WEICHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.
REVIEWER 340 DATE 4/22/29
FOR OFFICER IN CHARGE OF CONSTRUCTION

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	LANTDIV 4-4355/3 (Rev. 6/76	)	1.5.	CONTRACT NO. N62470-77-C-	I Contraction of the second	MITTAL NO. 11	LE/18/79
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то	R. S. Noonan Greensville,	, Inc. South Carolina		Camp Lejeur			
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		1. COLD WATER	PIPING ABOVE	GRADE:		A	BXO
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### N62h70-77-C-2563 11

Corrells Flumbing & Heating Co., Inc. R. S. Noonan, Inc. Greensville, South Carolina

AATTIMEMART BATTING PERSONAL

Replace Heating & Air Conditioning Building 2615, Marine Corps Base Camp Lejeune, North Carolina

10/18/79 - Coast

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449.9 A 7 8 1. COLD WATER FIFING ABOVE GRADE:

a. Type "L" Hard-conforming to ASTM - B-88

II. COLD WATER FIFING BELOW GRADE:

A. Type "K" Hard conforming to ASTM - B-88

III. Copper Fittings to conform to ANSI B-16.

IV. Solder to be 50-50 lead-Tin

Sorrells Flumbing & Hesting Co., Inc. certifies that all above materially to be furnished for this project will be American made and conform to the above specifications.

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Blogs & Baka

Subscribed and sworn to before me this <u>s</u> day of <u>court</u> 1979 Notary Public: <u>Services of Jaccess</u> My commission expires 1/145

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	P.O. Box 1388 / Greenville, South Phone: 803 - 277-79	OUTH CAROLINA		DATE 11 07 1070	DOB NO. C. OLO TO		
	110002. 003 - 2//-/9	50	April 27, 1979 6-048-18				
c	Sorralle Plumbing & Vo	ating Company	u Tao	Mr. Lee Sorrell			
Sorrells Plumbing & Heating Company, Inc.				Contract N62470-77-C-2563 Replace HVAC			
<u> </u>	Post Office Box 9604						
(	Greensboro, North Caro	lina 27408		Building 2615 Camp Lejeune, NC	n a Marina na Brann a shekar data ka sa ƙwaran a ƙwaran a sa s		
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Form No. 96 - 1, 3/12/79

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				Mr. Lee Sorrell
Sorrel	ls Plumbing an	nd Heati	ng Company,	, Inc Contract No. N62470-77-C-2563
Post Office Box 9604				Replace HVAC, O Club
Greens	boro, North Ca	arolina	27408	Marine Corps Base
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co	CONTRACTOR'S SUBMITTAL TRANSMITTAL					
	ANTDIV 4-4355/3 (Rev. 6/76)	CONTR	CONTRACT NO. N62470-77-C-2563			DATE 6/18/79
	CONTRACTOR Prells Plumbi	ng & Heating Co., Inc. Rep.	PROJECT TITLE AND LOCATION Replace Heating & Air Conditioning			
то R.	S. Noonan, ]		lding 2615, Ma p Lejeune, Nor			850
		CONTRACTOR USE ONLY			REVIE	WER USE ONLY
X	Li Contractor Approved	*List only one specification division per form. st only one of the following categories on each transmittal and indicate which is being submitted OICC Approval	form, Deviation/Subst For OICC Ap		A-Appro D-Disap AN-App	proved roved as noted eipt acknowledged. ments
O         PROJ. SPEC. SECT.         ITEM IDENTIFICA           X         & PARA. and/or         (Type, size, model no., Mig           H         PROJ. DWG. NO. *         brochure numb			g. or	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DATI
A-9	07000-10.3Ъ	Asphalt Felt Roof: Celotex Ser:	Les 300		AN	BHD
-10	07000-10.1	Material Certifications: Celote	ex Corp.		A	BHD
-11	07241-4	Roof Insulation: (w/above Celote	ex Series 300)		D	BHD
-12	07241-4	Material Certifications: Celote	ex Corp.		8	

CONTRACTOR'S COMMENTS

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC			SENTATIVE (Signature)
DATE RECEIVED BY	REVIEWER FROM (Reviewer)		TO
	are returned with action indicated. Approval of s attention to and supports the deviation.	an item does not include approval of a	any deviation from the contract requirements unless the con-
Submittals transmittal		ndations indicated in REVIEWER USE	ONLY Section and in comments below on ONE COPY of the
REVIEWER'S COMME	NTS		
A-9:	Asphalt quantities do	not agree with spec.	
A-11:	Insulation does not ha	ave required C-value.	김 씨에는 이번 물건이 들어야 했다.

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LANTDIV (1) A-E (1)	6/25/79	Brian H. Dulanes



### Spec. No. 340-C SHORT FORM SPECIFICATION

Install a built-up roofing membrane according to The Celotex Corporation Spec. No. 340-C, having a U.L. Class A Rating

### APPLICATION

INCLINE: maximum 3 in. per foot.

"General Requirements" and "Roof Deck Requirements," (pages 4-6 of the current Celotex Commercial Roofing Systems Manual), form a part of these specifications.

1. For details covering application of vapor barriers and roof insulation, if any, see Sections V and VI.

2. Prime surface of deck with uniform coating of Asphalt Primer (approx. 1 gal. per 100 sq. ft.) Solid prime poured concrete decks and pre-cast decks.

3. Starting at the low point of the roof, mop the deck or surface of the roof insulation with Steep Asphalt (approx. 23 lbs. per 100 sq. ft.) Solid mop poured concrete, pre-cast decks and insulation. Into the mopping, while hot, embed one ply of Vaporbar® Base Sheet lapping each sheet 4 in. over underlying sheet. Lap ends 6 in. Seal all laps with hot asphalt. Broom each ply to assure complete embedment.

4. Starting at low point of the roof, apply over entire surface a uniform mopping of **Celotex Asphalt**\* (approx. 25 lbs. per 100 sq. ft.) into which, while hot, apple there are a start to be the second three plices of the test of the second three plices of the sec embed three plies of No. 15 Asphalt Felt (Perforated). Use starting strips of felt cut 12 and 24 in. wide, followed by full width sheets. Lap each sheet 242/3 in. over the preceding sheet with Celotex Asphalt\* (approx. 23 bs. per 100 sq. ft.) so that the felt does not touch felt. Broom each ply to assure

### complete embedment.

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Extend all plies up face of cant and cut off evenly at wall line.

5. On slopes 1/2 in. per foot or more, provision shall be made for nailing roofing. This can be ac-complished by nailing directly into **Celo-Therm**® and Fiberboard Roof Insulation, which will accept nails, 2 in. from the top edge of each sheet, on 12 in. centers or by nailing each ply 101/3 in. and 121/3 in. from top edge at wood nailers installed by general contractor.

Over entire surface, pour a uniform top coating\* into which, while hot, embed specified quantity of surfacing material.

#### ASPHALT REQUIREMENTS

The requirement for interply mopping asphalt is 23 pounds per 100 square feet on all asphalt roofs. Since + it is impossible to get a completely uniform membrane because of unevenness in the surface of the substrate and the lack of a practical way to meter the bitumen as it is applied, we accept a variation of plus or minus 15%. This variation also applies to top pourings.

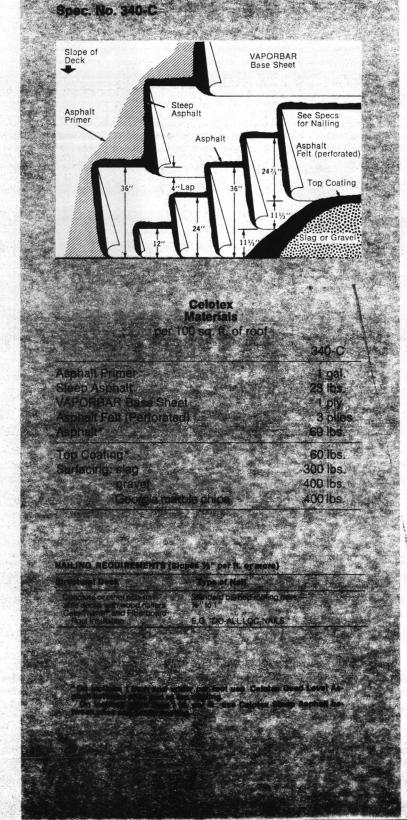
\*On inclines 1 inch and under per foot use Celotex Dead Level Asphalt between plies and as top coating. On inclines above 1 in. per ft., use Celotex Steep Asphalt between plies

and as top coating.

## Asphalt Felt Roof

erles 300 roofing system

NON-NAILABLE DECKS: root insulation (all decks), precast concrete, poured concrete





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Glotex THE CELOTEX CORPORATION, C	GOLDSBORO PLANT ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511
P. O. BOX 2086, GOLDSBORO, N	
	APPROVED AS NOTED
	June 7, 1909SAPPROVED
E. L. Scott Roofing Company Post Office Box 128 Kinston, NC 28501	SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. <u>N62470-77-C-2563</u> APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS DALESS THE CONTRACTOR CALLS ATTENTION TO AND UPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER PHYSICAL DIMEN-
	Re: Building N26 25 WEChiller Room ATION OF TRADES, Camp Lejeunes, RNCUIRED.
Gentlemen:	REVIEWER BX Dulancy DATE 6/2.5/29
Before me, Notary Public, appeared	Robert L. Cherry, to me known to bee constRUCTION

Before me, Notary Public, appeared Robert L. Cherry, to me known to be CONSTRUCTIOn Supervisor of Quality Control of The Celotex Corporation, who having been sworn did depose and say that the following products are manufactured to meet the following specifications:

### PRODUCT

SPECIFICATIONS

D312-71, Type I D312-71, Type III

D2626-73 D226-68 D250-70 D41-73 D2822-69 D2824-69

Celotex	Vaporbar Coated Base Sheet
Celotex	No. 15 Asphalt Felt Perf.
Celotex	No. 15 Asbestos Felt Perf.
Celotex	Asphalt Primer
Elastigu	m Roofers Cement
Celotex	Aluminum Roof Coating (Fibrated)
	Dead Level Asphalt
Celotex	Steep Asphalt #220

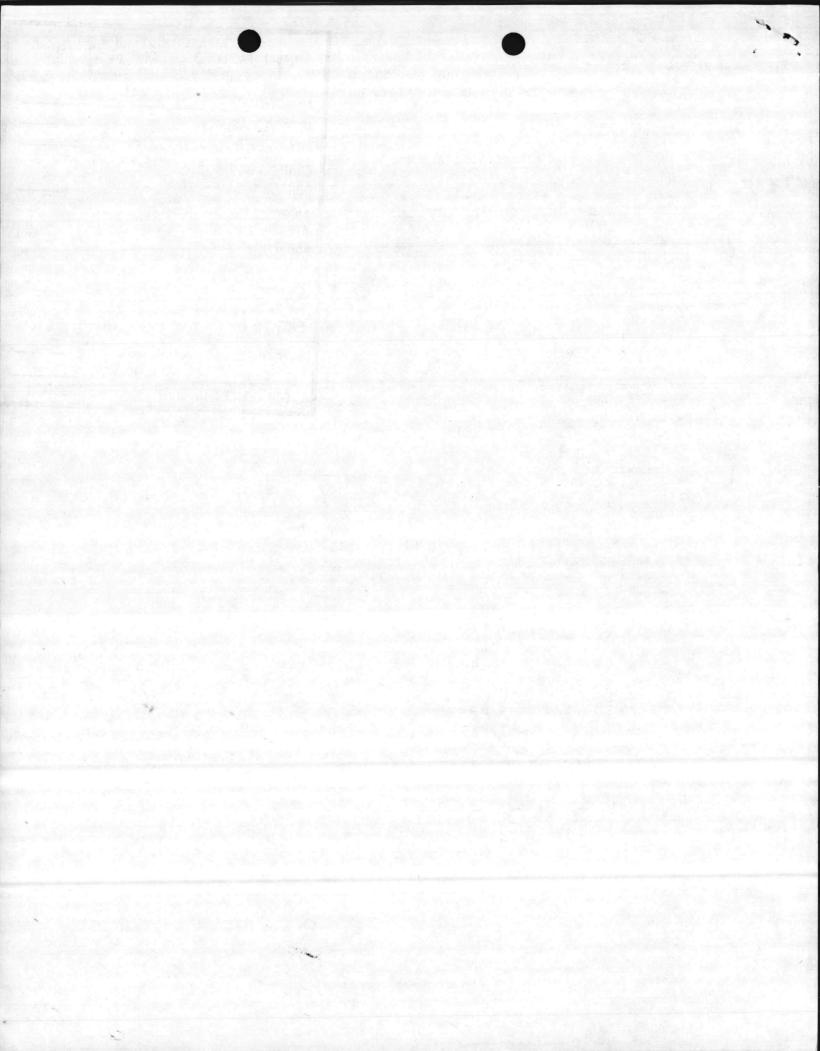
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Marilyn A. Godwin (Wade)
Notary Public

My Commission Expires: 6-1-82

Robert L. Cherry

Quality Control Supervisor THE CELOTEX CORPORATION







HE CELOTEX CORPORATION, P. O. BOX 22602, TAMPA, FLORIDA 33622, (813) 871-4811

June 12, 1979

E. L. Scott Roofing Company, Inc. P.O. Box 128 Kinston, North Carolina 28501

Gentlemen:

BEFORE ME, Notary Public, appeared Stephen A. Hume, to me known and known to be Technical Specialist of the Technical Department of The Celotex Corporation who having been sworn did depose and state that as to be used on the Building 2615, Chiller Room, Camp Lejeune, North Carolina, Celo-Therm Roof Insulation is manufactured to meet Federal Specification HH-I-529 B, and meets A. S. T. M. C-728-72.

IN WITNESS WHEREOF, I have caused him to subscribe his name hereto and hereunto set my hand and seal this 12th day of June, 1979.

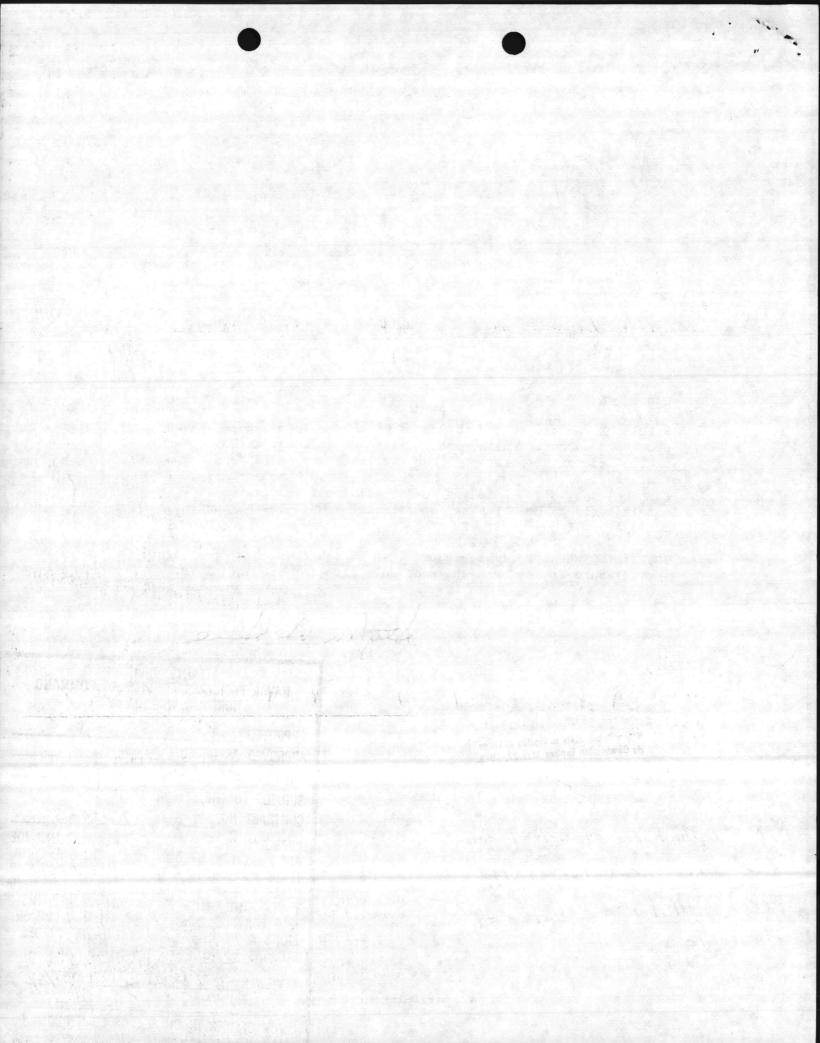
a Jim Walter com

Notary Public Notary Public State of Florida at Large jg My Commission Expires May 27, 1983.

cc: D. R. Hinds Goldsboro Region

Max. std. thickness of celo-therm is 1" with e c value of . 19. specs call for a c value of . 15 of less.

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	REVIEWER B 26 Dulanez. DATE 6/2.5/2



### SECTION VII - 8

### Spec. No. 340-C SHORT FORM SPECIFICATION

Install a built-up roofing membrane according to The Celotex Corporation Spec. No. 340-C, having a U.L. Class A Rating

#### APPLICATION

INCLINE: maximum 3 in. per foot.

"General Requirements" and "Roof Deck Requirements," (pages 4-6 of the current Celotex Commercial Roofing Systems Manual), form a part of these specifications

1. For details covering application of vapor barriers and roof insulation, if any, see Sections V and VI.

2. Prime surface of deck with uniform coating of Asphalt Primer (approx. 1 gal. per 100 sq. ft.) Solid prime poured concrete decks and pre-cast decks.

3. Starting at the low point of the roof, mop the deck or surface of the roof insulation with Steep Asphalt (approx. 23 lbs. per 100 sq. ft.) Solid mop poured con-crete, pre-cast decks and insulation. Into the mopping, while hot, embed one ply of Vaporbar Base Sheet lapping each sheet 4 in. over underlying sheet. Lap ends 6 in. Seal all laps with hot asphalt. Broom each ply to assure complete embedment.

4. Starting at low point of the roof, apply over entire surface a uniform mopping of Celotex Asphalt\* (approx. 25 lbs. per 100 sq. ft.) into which, while hot, embed three plies of No. 15 Asphalt Felt (Perforated). Use starting strips of felt cut 12 and 24 in. wide, followed by full width sheets. Lap each sheet 2423 in. over the preceding sheet with **Celotex As-phalt**\* (approx. 23 lbs. per 100 sq. ft.) so that the felt does not touch felt. **Broom each ply to assure** complete embedment.

Extend all plies up face of cant and cut off evenly at wall line.

5. On slopes 1/2 in. per foot or more, provision shall be made for nailing roofing. This can be accomplished by nailing directly into Celo-Therm<sup>®</sup> and Fiberboard Roof Insulation, which will accept nails, 2 in. from the top edge of each sheet, on 12 in. centers or by nailing each ply 101/3 in. and 121/3 in. from top edge at wood nailers installed by general contractor.

6. Over entire surface, pour a uniform top coating\* into which, while hot, embed specified quantity of surfacing material

#### **ASPHALT REQUIREMENTS**

The requirement for interply mopping asphalt is 23 pounds per 100 square feet on all asphalt roofs. Since . it is impossible to get a completely uniform membrane because of unevenness in the surface of the substrate and the lack of a practical way to meter the bitumen as it is applied, we accept a variation of plus or minus 15%. This variation also applies to top pourings.

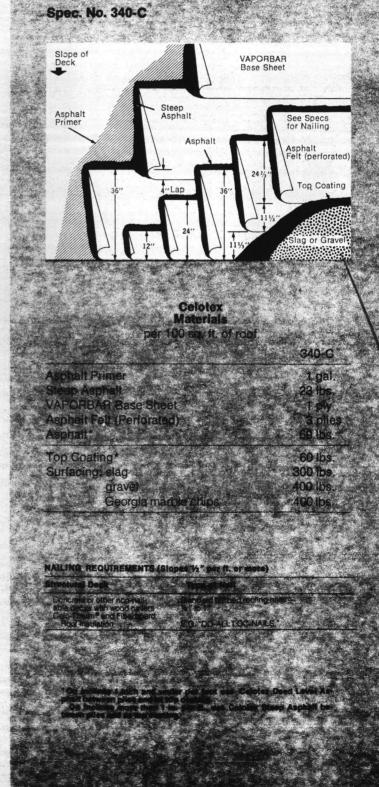
\*On inclines 1 inch and under per foot use Celotex Dead Level Asphalt between plies and as top coating. On inclines above 1 in. per ft., use Celotex Steep Asphalt between plies

and as top coating.

## Asphalt Felt Roof

erles 300 roofing system

NON-NAILABLE DECKS: roof insulation (all decks), precast concrete, poured concrete





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Before me, Supervisor sworn did d	Notary Public, appeared H of Quality Control of The lepose and say that the fo	Robert e Celot	L. Ch tex Co	erry, to me known to be rporation, who having been oducts are manufactured to

meet the following specifications:

#### PRODUCT

### SPECIFICATIONS

Celotex Vaporbar Coated Base Sheet Celotex No. 15 Asphalt Felt Perf. Celotex No. 15 Asbestos Felt Perf. Celotex Asphalt Primer Elastigum Roofers Cement Celotex Aluminum Roof Coating (Fibrated) Celotex Dead Level Asphalt Celotex Steep Asphalt #220

D2626-73 D226-68 D250-70 D41-73 D2822-69 D2824-69 D312-71, Type I D312-71, Type III

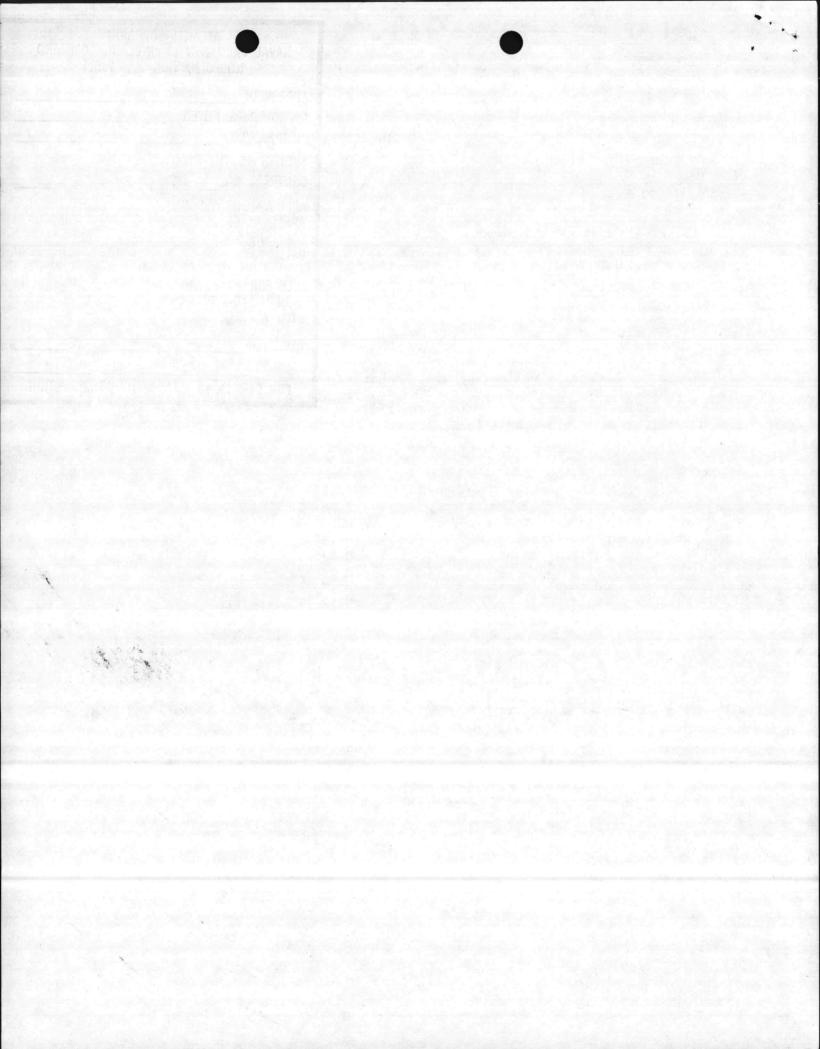
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Notary Public

My Commission Expires: 6-1-82

Robert L. Cherry

Quality Control Supervisor THE CELOTEX CORPORATION







HE CELOTEX CORPORATION, P. O. BOX 22602, TAMPA, FLORIDA 33622, (813) 871-4811

June 12, 1979

E. L. Scott Roofing Company, Inc. P.O. Box 128 Kinston, North Carolina 28501

Gentlemen:

BEFORE ME, Notary Public, appeared Stephen A. Hume, to me known and known to be Technical Specialist of the Technical Department of The Celotex Corporation who having been sworn did depose and state that as to be used on the Building 2615, Chiller Room, Camp Lejeune, North Carolina, Celo-Therm Roof Insulation is manufactured to meet Federal Specification HH-I-529 B, and meets A. S. T. M. C-728-72.

IN WITNESS WHEREOF, I have caused him to subscribe his name hereto and hereunto set my hand and seal this 12th day of June, 1979.

Hume, Technical Specialist Stephen A. ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 Notary Public Notary Public State of Florida at Large APPROVED . My Commission Expires May 27, 1983. APPROVED AS NOTED ig BYD DISAPPROVED cc: D. R. Hinds SUBJECT TO THE REQUIREMENTS OF Goldsboro Region CONTRACT NO. N 62470-77-C-2563 Max. Std. thickness of celo-therm APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CONis 2" with a c value of . 19. TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA-TION --- THE CONTRACTOR SHALL BE RESPONSspecs call for a c value of IBLE FOR PROVIDING PROPER PHYSICAL DIMEN-SIONS & WEIGHTS, COORDINATION OF TRADES, .15 or less ETC., AS REQUIRED. B 26 Dulanez DATE 6/2.5/29 REVIEWER a Jim Walter company FOR OFFICER IN CHARGE OF CONSTRUCTION

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### **FILE FOLDER**

### **DESCRIPTION ON TAB:**

2563 Shop Drawings

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Confidential Records Management, Inc. New Bern, NC 1-888-622-4425 9/08

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) - -	Sorrells Plumbing and Heating Company, Inc.					Replace HVAC, O Club		
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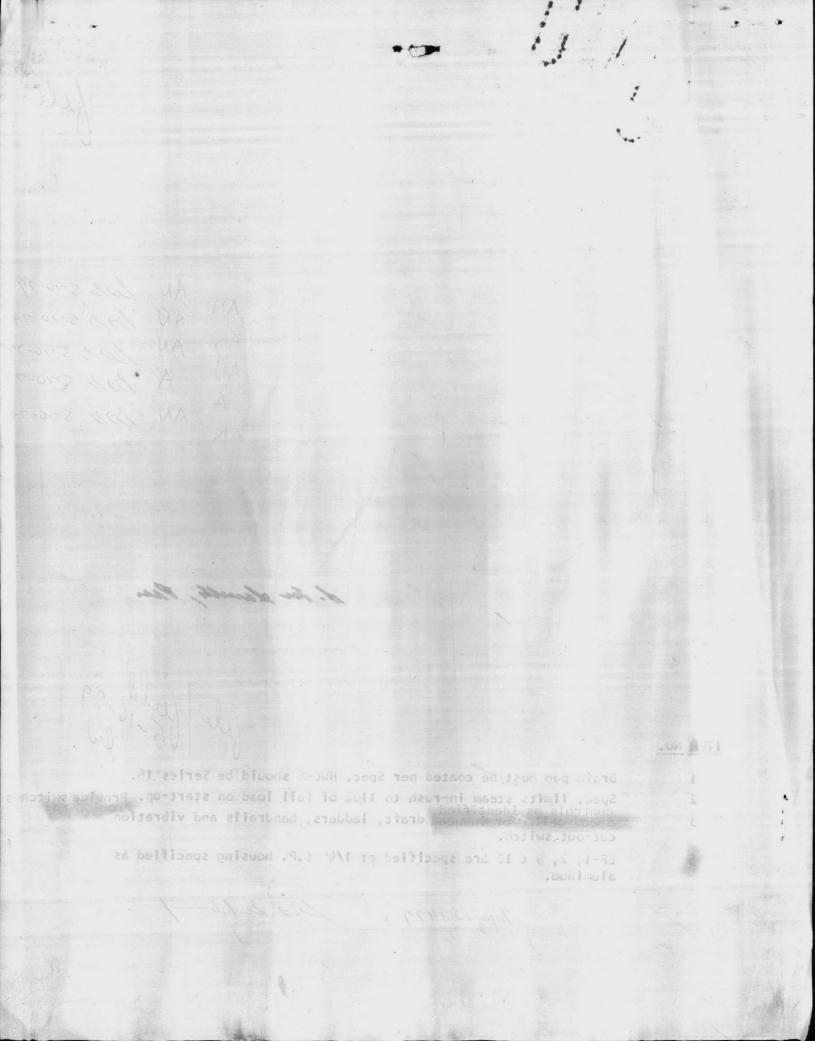
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10 07000-10.1	Material Certifications:	Celotex Corp.			
11 07241-4	Roof Insulation: (w/above	Celotex Series 3	800)		
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Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

REVIEWER'S COMMENTS

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### SECTION VII - 8

### Spec. No. 340-C SHORT FORM SPECIFICATION

Install a built-up roofing membrane according to The Celotex Corporation Spec. No. 340-C, having a U.L. Class A Rating

### APPLICATION

INCLINE: maximum 3 in. per foot.

"General Requirements" and "Roof Deck Requirements," (pages 4-6 of the current Celotex Commercial Roofing Systems Manual), form a part of these specifications.

1. For details covering application of vapor barriers and roof insulation, if any, see Sections V and VI.

2. Prime surface of deck with uniform coating of As-phalt Primer (approx. 1 gal. per 100 sq. ft.) Solid prime poured concrete decks and pre-cast decks.

3. Starting at the low point of the roof, mop the deck or surface of the roof insulation with Steep Asphalt (approx. 23 lbs. per 100 sq. ft.) Solid mop poured concrete, pre-cast decks and insulation. Into the mopping, while hot, embed one ply of Vaporbar® Base Sheet lapping each sheet 4 in. over underlying sheet. Lap ends 6 in. Seal all laps with hot asphalt. Broom each ply to assure complete embedment.

4. Starting at low point of the roof, apply over entire surface a uniform mopping of **Celotex Asphalt**\* (approx. 25 lbs. per 100 sq. ft.) into which, while hot, embed three plies of No. 15 Asphalt Felt (Perforated). Use starting strips of felt cut 12 and 24 in. wide, followed by full width sheets. Lap each sheet 242/3 in. over the preceding sheet with Celotex Asphalt\* (approx. 23 lbs. per 100 sq. ft.) so that the felt does not touch felt. Broom each ply to assure complete embedment.

Extend all plies up face of cant and cut off evenly at wall line

5. On slopes 1/2 in. per foot or more, provision shall be made for nailing roofing. This can be ac-complished by nailing directly into **Celo-Therm**® and Fiberboard Roof Insulation, which will accept nails, 2 in. from the top edge of each sheet, on 12 in. centers or by nailing each ply 101/3 in. and 121/3 in. from top edge at wood nailers installed by general contractor.

6. Over entire surface, pour a uniform top coating\* into which, while hot, embed specified quantity of surfacing material.

#### ASPHALT REQUIREMENTS

The requirement for interply mopping asphalt is 23 pounds per 100 square feet on all asphalt roofs. Since it is impossible to get a completely uniform membrane because of unevenness in the surface of the substrate and the lack of a practical way to meter the bitumen as it is applied, we accept a variation of plus or minus 15%. This variation also applies to top pourings.

\*On inclines 1 inch and under per foot use Celotex Dead Level Asphalt between plies and as top coating. On inclines above 1 in. per ft., use Celotex Steep Asphalt between plies

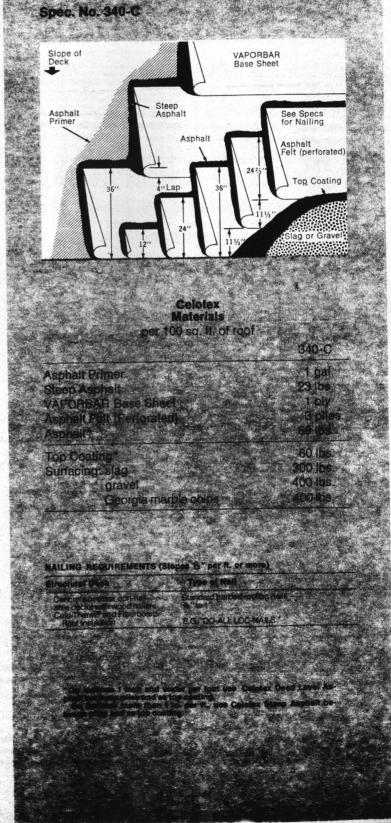
and as top coating.



## Asphalt Felt Roof

eries 300 roofing system

NON-NAILABLE DECKS: roof insulation (all decks), precast concrete, poured concrete



79 JUN 21 All: 03



THE CELOTEX CORPORATION, GOLDSBORO PLANT P. O. BOX 2086, GOLDSBORO, NORTH CAROLINA 27530

June 7, 1979

E. L. Scott Roofing Company Post Office Box 128 Kinston, NC 28501

> Re: Building 2615, Chiller Room Camp Lejeune, NC

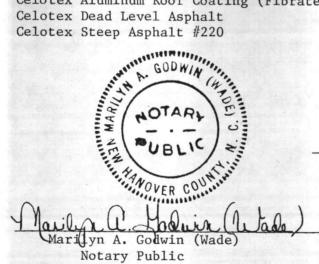
Gentlemen:

Before me, Notary Public, appeared Robert L. Cherry, to me known to be Supervisor of Quality Control of The Celotex Corporation, who having been sworn did depose and say that the following products are manufactured to meet the following specifications:

### PRODUCT

SPECIFICATIONS

Celotex Vaporbar Coated Base Sheet Celotex No. 15 Asphalt Felt Perf. Celotex No. 15 Asbestos Felt Perf. Celotex Asphalt Primer Elastigum Roofers Cement Celotex Aluminum Roof Coating (Fibrated) Celotex Dead Level Asphalt Celotex Steep Asphalt #220 D2626-73 D226-68 D250-70 D41-73 D2822-69 D2824-69 D312-71, Type I D312-71, Type III



My Commission Expires: 6-1-82

Robert L. Cherry

Quality Control Supervisor THE CELOTEX CORPORATION



# 79 JUN 21 All: 03

Celotex.

THE CELOTEX CORPORATION, P. O. BOX 22602, TAMPA, FLORIDA 33622, (813) 871-4811

June 12, 1979

E. L. Scott Roofing Company, Inc. P.O. Box 128 Kinston, North Carolina 28501

Gentlemen:

BEFORE ME, Notary Public, appeared Stephen A. Hume, to me known and known to be Technical Specialist of the Technical Department of The Celotex Corporation who having been sworn did depose and state that as to be used on the Building 2615, Chiller Room, Camp Lejeune, North Carolina, Celo-Therm Roof Insulation is manufactured to meet Federal Specification HH-I-529 B, and meets A. S. T. M. C-728-72.

IN WITNESS WHEREOF, I have caused him to subscribe his name hereto and hereunto set my hand and seal this 12th day of June, 1979.

Stephen & Hume, Technical Specialist

Notary Public Notary Public State of Florida at Large jg My Commission Expires May 27, 1983.

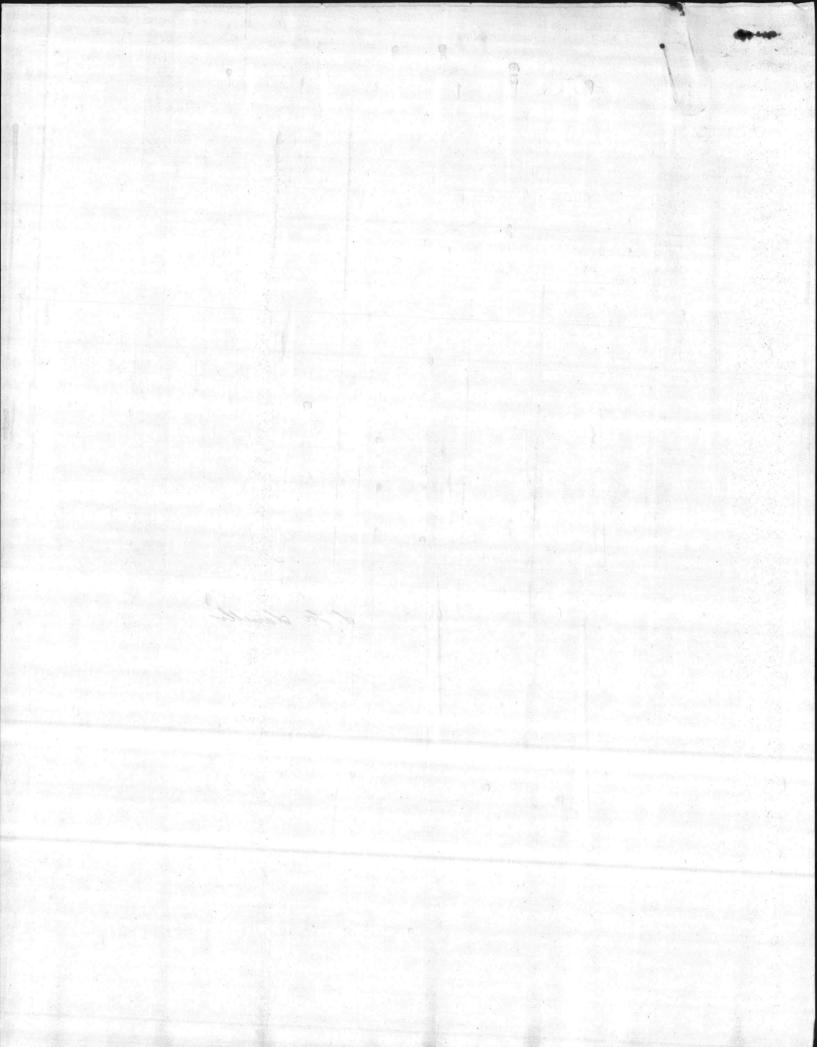
cc: D. R. Hinds Goldsboro Region

a Jim Walter company

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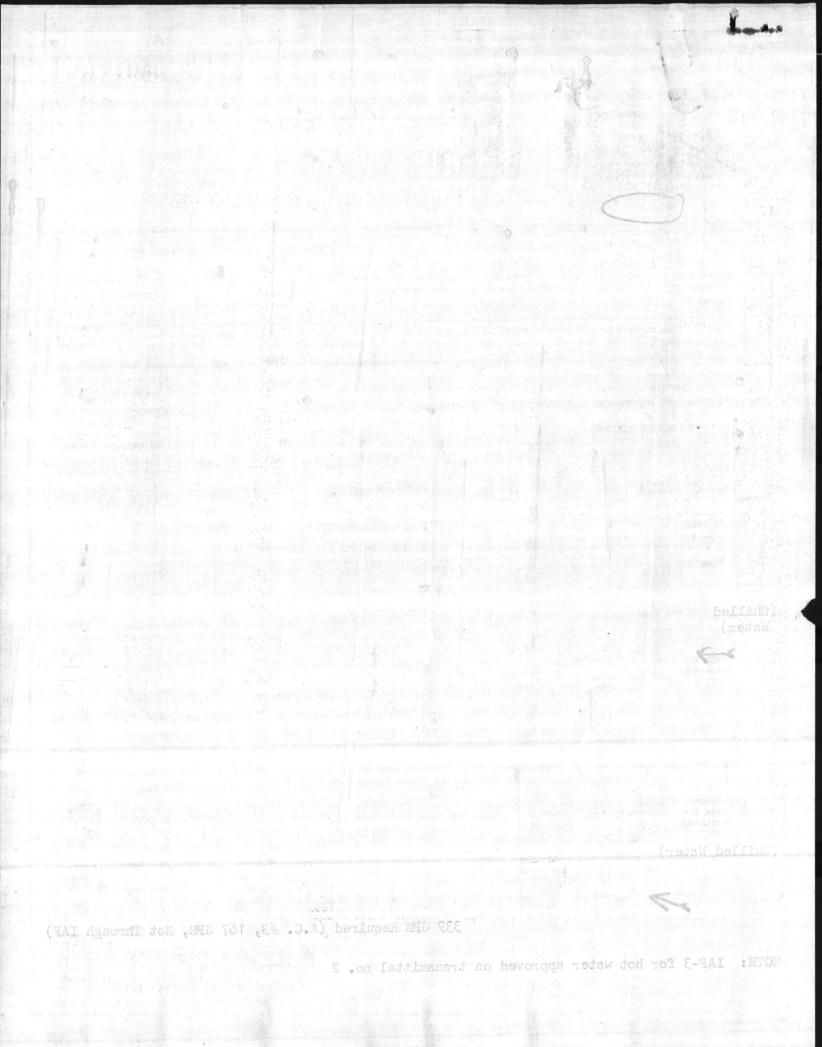
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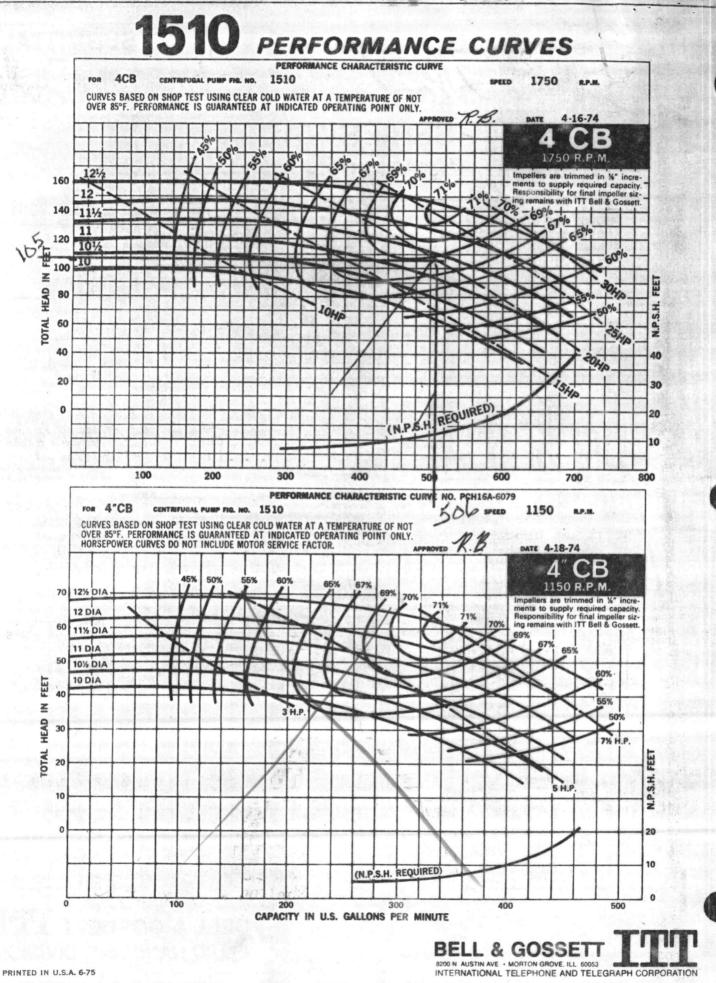


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## BELL & GOSSETT ITT FLUID HANDLING DIVISION



he Zwining Laboratories,

ENGINEERS CHEMISTS

2527 Fresno Street 1507 G Street 816 E Hazelton Avenue 621 W. Willow Street 714 Truxtun Avenue

Fresno, Ca. 93721 Modesto, Ca. 95354 Stockton, Ca. 95203 Visalia, Ca. 93277 Bakersfield, Ca. 93301 (805) 327-8566

(209) 268-7021

(209) 523-0994 (209) 465-3753 (209) 733-2384

Please Address All Mail to P.O. Box 1472, Fresno, California 93716

March 25, 1975

Exam 3307

For:

McDonnell-Miller ITT 3500 North Spaulding Avenue Chicago, Illinois 60618

for attn: Mr. Jack Piper - Chief Engineer

Re:

LAWLER BACKFLOW PREVENTERS REDUCED ZONE

In accordance with your letter of request dated February 10, 1975, The Twining Laboratories, Inc., of Fresno, California, conducted a laboratory test program and compliance examination of series of reduced zone backflow preventers.

The units were designed and are produced by McDonnell-Miller ITT, but for marketing purposes, the Lawler ITT Fluid Handling Division appears on the nameplate. One stock production model of each of the following sizes was tested in accordance with ASSE Standard 1013 - June, 1971 and AWWA C506-69; RZ-3 (3/4"), RZ-4 (1"), RZ-5 (1-1/4"), RZ-6 (1-1/2") and RZ-8 (2").

The attached report presents the results of the test procedure and compliance examination. In our opinion, those devices submitted for approval met or exceeded the requirements and specifications as outlined by the American Society of Sanitary Engineers, and the laboratory testing requirements as outlined by the American Water Works Association.

If there are any questions, please feel free to contact us for details.

THE TWINING LABORATORIES, INC.

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Michael Erwin, P.E. Staff Engineer

ton R. Gray

Shelton R. Gray Engineering Department

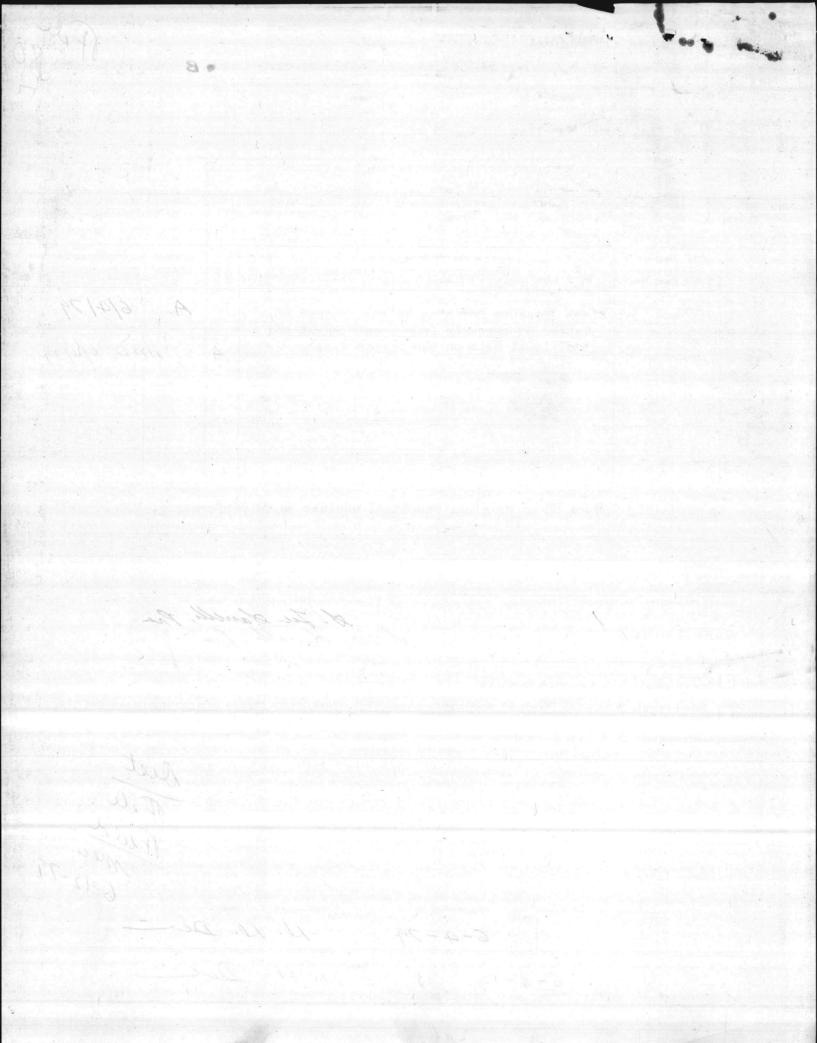
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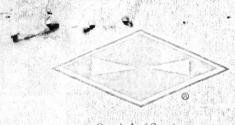
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MEC-TRIC CONTROL COMPANY



P. O. BOX 17242 • CHARLOTTE, N. C. 28211 4110 MONROE ROAD • TELEPHONE 376-8551

Symbol of Service

May 24, 1979

Sorrells Plumbing & Heating P.O. Box 9604 Greensboro, North Carolina 27408

Attn: Mr. Lee Sorrells

Dear Lee:

Mec-Tric Control Company as agents for Spence Engineering would like to confirm the following per you request.

Spence 1<sup>1</sup><sub>2</sub>" model ED will pass 3395#/hr steam with inlet in pressure of 100# reducing down to 14#. The spring range that will be supplied in this valve is 3-20# which is field adjustable to 14#. Maximum capacity of this valve is 3800#/hr as shown in the capacity bulletin I sent to you.

Let me know if you need additional information concerning this valve.

NAVAL	ATLANTIC DIVISION FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511
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Sincerely,

Melanie Phillips

MEC-TRIC CONTROL COMPANY

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### ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511

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FOR OFFICER IN CHARGE OF CONSTRUCTION

The SPENCE Pressure Regulator

Any of the Main Valves described in the Main Valve Section can be combined with any of the Pilots listed below to produce the SPENCE Pressure Regulator. This Regulator will reduce and regulate a steady or varying initial pressure, within the range specified, so as to maintain a constant, adjustable, predetermined delivery pressure. The table below lists the principal Pressure Pilots.

### PRESSURE REGULATOR PILOTS

		(人)()()()		S E I	RVICE	CONDIT	IONS					and getting		
gori est gori est	12月1日	CAST	IRON	CAST B	RONZEa	CAST	STEEL	DELI			DIAI	PHRAGM	LOADING	MAIN
TYPE	Description See Page No.	Maximum Initial Pres- sure, psi	Maximum Tempera- ture, °F	Maximum Initial Pres- sure, psi	Maximum Tempera- ture, °F	Maximum Initial Pres- sure, psi	Maximum Tempera- ture, °F	Minimum psi	Maximum psi	Normal Accuracy Plus or Minus	Diameter Inches	Material	n series al series al series	
	111-3	(250)	450	300	500	600	500	3	150	1 psi	31/2	Stainless Steel	Spring	Elor C Series
D2 //	111-4	250	450	300	500	600	500	100	300	2 psi	31/2	Stainless Steel	Spring	E or C Series
D3-1	111-4	1.6.1	A ALLANT	Serie Start	5 418 4 5 1	600	750	3	150	1 psi	31/2	Stainless Steel	Spring	E or C Series
D4-1	111-4	a stand and	-4.29(.)	a chingher	There it	600	750	100	300	2 psi	31/2	Stainless Steel	Spring	E or C Series
D5	111-4	250	450	300	500	A starting		1	25	1/2 psi	53/4	Stainless Steel	Spring	E or C Series
D120	111-4	250	450	300	500	600	500	5	150	1 psi	41/2	Stainless Steel	Spring	E or C Series
V5	111-4	250	450	300	500	Section V.		30 in. Hg	10	1/2 psi	53/4	Stainless Steel	Spring	E or C Series
W	111-7	250	450	300 ,	500	600	500	0	10	1/4 psi	31/2	Stainless Steel	Weight	E or C Series
W3	111-7	· · · · · ·				600	750	0	10	1/4 psi	31/2	Stainless Steel	Weight	E or C Series
W5	111-7	250	450	300	500		10000 A	0	5	1/8 psi	53/4	Stainless Steel	Weight	E or C Series
W7	111-7	250	450	300	500	600	750	0	48 oz	1/2 OZ	9	Hycar	Weight	E or C Series
W37	111-7	250	450	300	500	600	750	0	30	1 oz	51/2	Hycar	Weight	E or C Series
A73	111-12	250	450	300	500	600	500	1.		1/2 psi	31/2-71/40	Stainless Steel	Air	E or C Series
A53	111-12	250	450	300	500	600	500	the philo	a fight	1/2 psi	31/2-53/4b	Stainless Steel	Air	E or C Series
A	111-12	250	450	300	500	600	500	See resp	onse	1/2 psi	31/2	Stainless Steel	Air	E or C Series
A35	111-13	250	450	300	500			1.1.1.1.1.1	1917-191	1/8 psi	53/4-31/2b	Stainless Steel	Air	E or C Series
A85	111-13	250	450	300	500	600	500	curves	on	1/2 psi	31/2-53/4 ·	Stainless Steel	Air	E or C Series
A84	111-13	250	450	300	500	600	500	-	- States	1/2 psi	31/2-41/2b	Stainless Steel	Air	E or C Series
A83	111-13	250	450	300	500	600	500	page II	1-13	1/2 psi	31/2	Stainless Steel	Air	E or C Series
A82	111-13	250	450	300	500	1				1/8 psi	53/4	Stainless Steel	Air	E or C Series
A80	111-13	250	450	300	500			Charles States	21 2	1/8 psi	53/4	Stainless Steel	Air	E or C Series
Safety Pilot	111-8	·	·	300	500	600	<b>7</b> 50	5	175		31/2	Stainless Steel	Spring	E or C Series

Bronze body pilots are recommended for water service.

<sup>b</sup>These pilots have dual diaphragms, the first size being the control diaphragm and the second the air loading diaphragm.

NOTES ON SELECTION OF PILOTS

D SERIES PILOTS meet the requirements of the majority of all pressure regulator problems. They are spring-loaded. Other Pilots are modifications of the D Series for specific purposes.

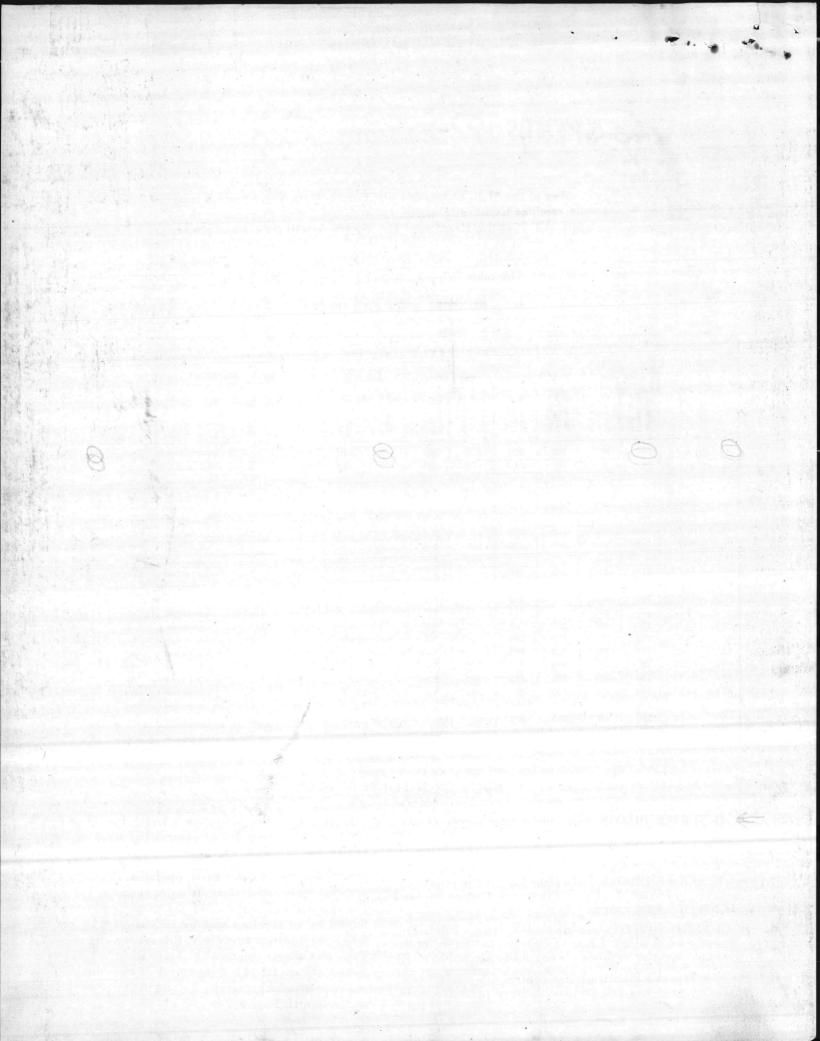
W SERIES PILOTS are weight-loaded for improved accuracy of control. These Pilots are limited to low delivery pressure ranges.

A SERIES PILOTS are air-loaded. These Pilots are  $\tau$  commended where frequent changes in setting must me made and the Regulator is not easily accessible.

The Type V5 Pilot is used to control sub-atmospheric delivery pressures and positive delivery pressures to 10 psi. In any one Series of Pilots a larger Diaphragm will produce closer accuracy of control but with less range in delivery pressure.

WATER SERVICE—Pilot operated Regulators are not uniformly satisfactory as water reducing valves unless the delivery system has the ample cushioning afforded by an elevated tank or air chamber. When the flow is intermittent to an inflexible system, the SPENCE Type D34 Direct Operated Pressure Reducing Valve, as shown on Page III-14 is recommended. For other services or pressure reducing service beyond the scope of the D3<sup>4</sup> see Section II, Page 9.

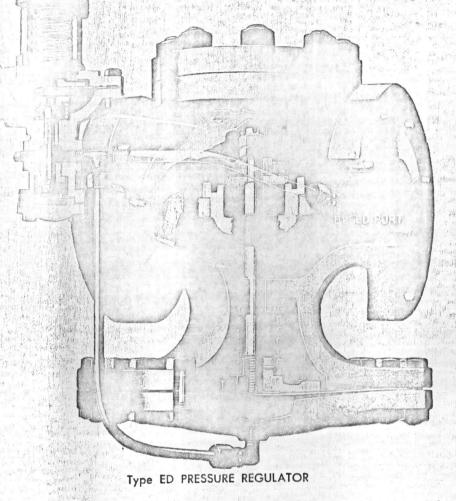
Sec. II Page



## TYPE D PRESSURE PILOT

The principal SPENCE Pressure Filot is the Type **D**. The SPENCE Type **ED** single seated, metal diaphragm, normally closed, packless Pressure Regulator has nearly universal application in the pressure reducing valve field.

The Type E5D Pressure Regulator is used as an alternate for the Type ED when the pressure drop is low. See Page II-3 for further particulars on this Main Valve modification.



The Type D Pilot is designed for delivery pressures between 3 and 150 psi. Under normal conditions (Note 2), it will control the delivery pressure within 1 psi plus or minus variation. It can be furnished with an Adjusting Spring for any of the following delivery pressure ranges: ,

 3
 to
 20
 psi

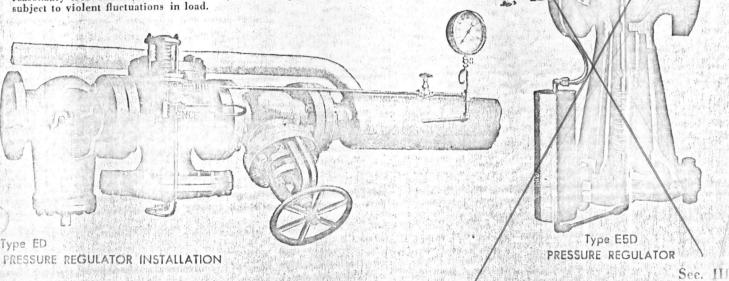
 5
 to
 50
 psi

 10
 to
 100
 psi

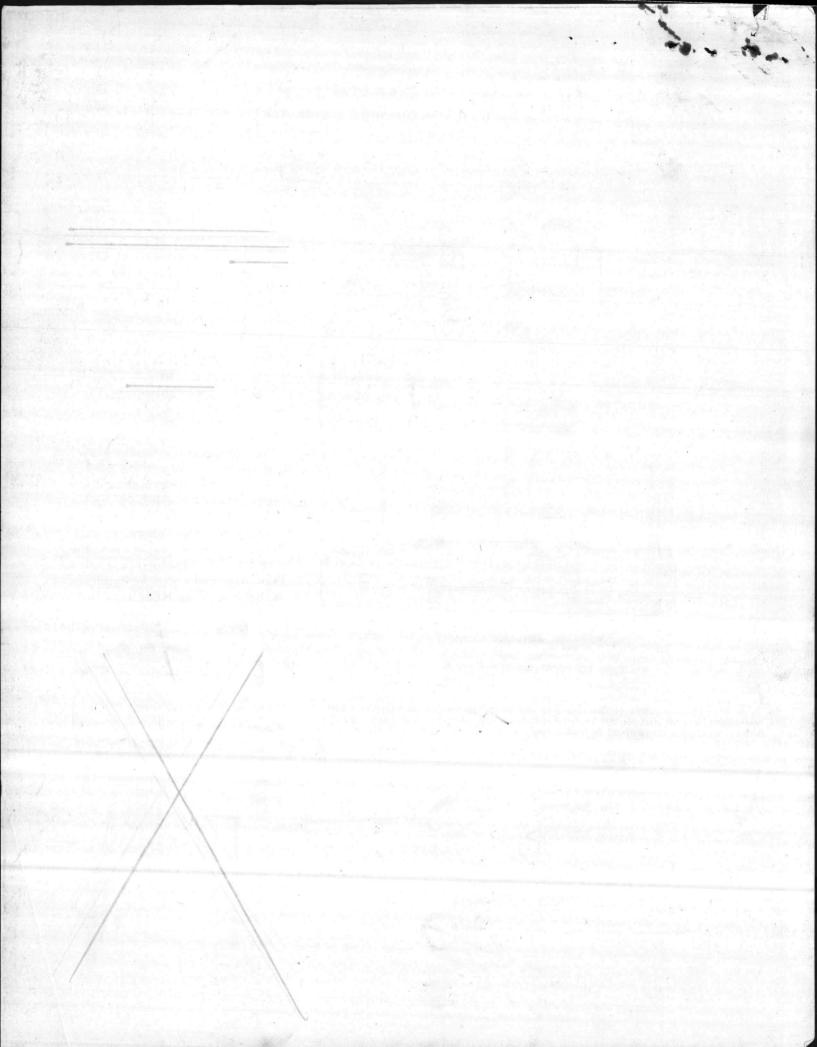
 20
 to
 150
 psi

Outside spring construction makes it possible to change these Springs easily by slacking off on the Adjusting Nuts and removing the Spring Yoke. The outside Spring, being open to the atmosphere, is unaffected by steam temperature. Enclosed Spring Chambers and other Pilot Accessories can be furnished as shown on Page III-6.

Note 2: "Normal Conditions" means that the Regulator is installed as recommended, is used within the range of the pressures and temperatures specified in the tables, is reasonably free of dirt, is not loaded beyond the capacities recommended, and is not subject to violent fluctuations in load.

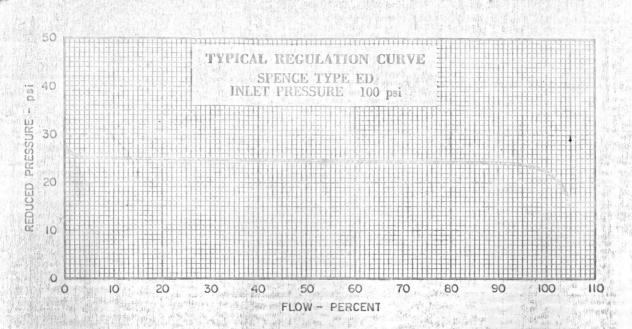


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N62470-77-0-2563 5/11/2 cvg Replace Hesting & A/C ourslis Flandane & Heating Co., Inc. Building 2615 Camp Lejeune, North Carolina . S. Noonser, Anc., Greenville, S.C. 时,在影像的 388 名SW 31V 3月 D - Carlor - C Steam Pressure Reducing Valves: Spence 38.15654 - 13.6 Type ED-Flow Chart 19 Perspected and a To be added to previous submittal The lowest reduced pressure as shown on the chart is only the approximate maximum flow at that pressure or any lower reduced pressure. Reduced pressure can be as low as 3 PSI as .Leftindra Lantaino ditw 81-8 tesde dial red pased on rabed steam capacity cable for three to waive full nore at 100 and all all the



The performance characteristic of a Spence Pressure Regulator is shown above. Using this curve to illustrate several terms of reference, the following facts are evident:

reduced pressure 4% 25.0 psi 22.5 psi 2.5 psi 10%

	Regulated Variable
	Minimum Controlled Flow
	Set Point
	Reduced Pressure at Rated (100%) Flow
e	Accuracy of Regulation, psi
	Accuracy of Regulation, % of set pressure

The slight slope of the curve establishes a definite relationship between flow and regulated pressure. Note that 1 psi accuracy of regulation is obtainable at 95% of rated flow.

For back pressure regulation, or differential where the regulator opens on increasing differential, the characteristic curve would lie opposite to that shown. It would slope upward with flow increase because a positive deviation is required to compel valve opening.

### NOTES ON USE OF TABLES

### "The lowest reduced pressures are approximate critical pressures. No appreciable increase in flow can be obtained at lower pressures.

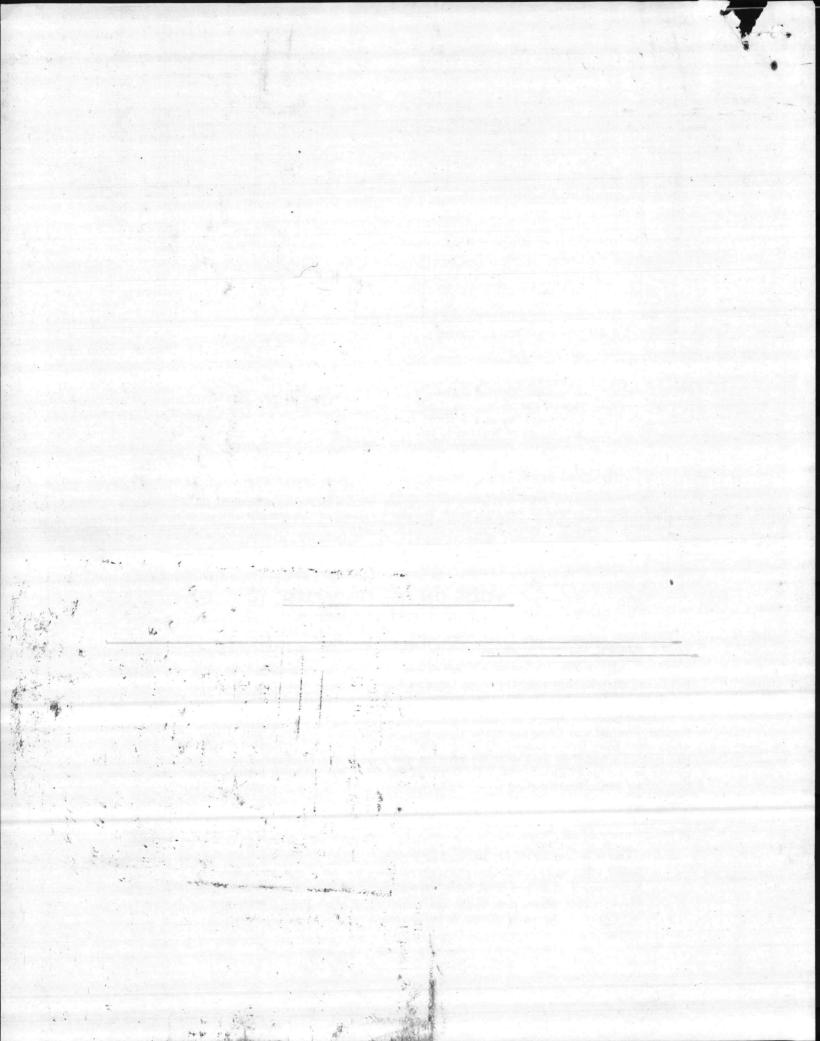
Downstream pipe size should be enlarged at regulator outlet to approximately equalize pipe velocities before and after the reduction. The Steam Capacity Table (Catalog Sec. II Page 6) is useful for determining steam pipe sizes and regulator size at any desired lower velocity level.

Reduced Seats — Spence Regulators are available with a choice of several seat sizes called Full, Regular, Normal and Undersize Ports. There is a capacity table for each port. For a given pressure drop, rated flows with various ports in the same size body may be compared. Thus, valve and port size may be selected to limit velocities entering and leaving the regulator. Lower velocities mean a greater proportion of the pressure drop occurs at the valve seat, where it belongs, rather than in the body outlet and connected piping.

Capacity ratings apply to Spence Regulators with Type D, N and Q Pilots which are spring loaded, 3<sup>1</sup>/<sub>2</sub> inch diaphragm. Other pilots having greater or lesser sensitivity will provide proportionally greater or less accuracy of regulation.

Safety Valves - capacities for sizing

Safety valve set to pop above critical pressure — use rated regulator capacity.
Safety valve set to pop at or below critical pressure — use rated capacity plus 10%.
Type E2 only: above rules apply, but values in table on Page 6 must first be divided by an applicable K factor from Page 13.



# RATED STEAM CAPACITY TABLE TYPE E MAIN VALVE — FULL PORT Pounds of Saturated Steam Per Hour

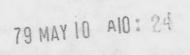
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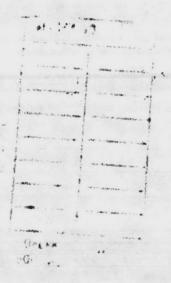
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FOR OFFICER IN CHARGE OF CONSTRUCTION

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	Size to be     Size to be     Size to be     Submittals are refuted     Submittals are refuted     Submittals are refuted     Submittals are forved     Submittals     Submittals     Submittals are forved     Submittals     Submi	CEM 38: RETURN TO 570 FEM 38: RETURN TO 570 RETURN TO 570 RETURN TO 570 RETURN TO 570 Steam capacity table for ty and 50 psi outlet pressure should require to pass 3,400 t. not clarified as per Data Sheet tion on type of port is require a choice of pilot control spring	CONTRACTOR REPRESENTATIVE J.T. Januar TO TO s not include approval of any devia icated in REVIEWER USE ONLY S ype E main valve fu 1-1/2" steam valve 0 lb./hr. steam at t 3-1 B. Value coeff d to determine valve ig is stated in gener	ection and will por will 100 p icient capac al. D fied c	the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract o	90 ps1 ,800 lbs/hr et and les with valve livery pressure

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based on rated steam capacity table for type Limin valve full port at 100 psf inlet pressure and 50 psf outlet pressure 1-1/2" steam valve will pass 60000 lbs/hr steam. Valve should require to pass 3,400 lb./mr. steam at 100 psig inlet and

SEC MITT

Valve port is not clarified as per uata Sheet 3-1 B. Value coefficient CV varies with valve port. Information on type of port is required to determine valve capacity. Delivery pressure ranges based on choice of pilot control spring is stated in general. Delivery pressure ranges for 1-1/2" valve at 100 psis inlet pressure should be specified clearly.

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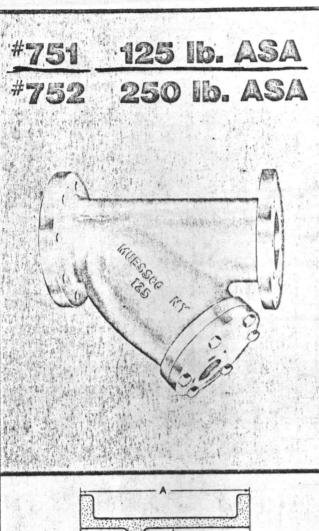
1. 1. Q.

1120

NUD

Notor operated steam valve requires minimum 3 psi differential pressure for proper operation. Valve required to operate at min. differential press. to obtain required flow of 1890%/nr. through water heater. Valve capacity cannot be determined from submitted data sheet.

Joerells Plbg & Htg Job: Camp Le Jeune Bldg 2615 IRON BODY FLANGED "Y" TYPE STRAINERS



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C C C C C C C C C C C C C C C C C C C

WOR	KING PRES	SURES - NO	N SHOCK
		Sat. Steam	Cold Water, Oil, Gas
0	To 12"	125 p.s.i.	175 p.s.i.
#751	14"-24"	100 p.s.i.	150 p.s.i.
	To 12"	250 p.s.i.	400 p.s.i.
#752	14"-24"	200 p.s.i.	300 p.s.i.

SERVICE RECOMMENDATIONS: Self cleaning strainers are used wherever the protection of expensive pumps, meters, valves, regulators or similar equipment is a consideration.

SCREENS: Normally furnished made from heavy gauge perforated brass sheet, reinforced in larger sizes for liquid service. 3/64" perforations usually furnished for steam service in sizes through 10" and 1/16" perforations for larger sizes in steam service. Strainers for liquid service usually furnished with 1/16" perforations in sizes through 4" and 1/8" perforations for larger sizes. In addition, 5/32", 3/16" and 1/4" perforations are available. A large variety of stainless steel and monel screens are also available, see page 4. For services requiring extremely fine straining we suggest 5/32" perforated metal screens lined with an appropriate wire mesh cloth. See page 4.

**CONSTRUCTION:** All sizes feature a bolted cover flange, as illustrated, machined to securely receive the screen. In all sizes the screen is positively secured in both the body and cover flange.

SELF CLEANING is accomplished by opening the valve or plug connected to the blowoff outlet. Advise when strainers are to be mounted in vertical piping, we can rotate the cover bringing the blowoff to the lowest point. BLOWOFF OUTLETS: Tapped FIPT, sizes specified below. Not normally furnished plugged.

CAPACITY: These strainers have screens with open areas many times greater than the corresponding pipe size and thereby reduce pressure loss to a minimum. Dependent upon the selection of perforations, ratios as great as six to one are available.

PRESSURE DROP: See charts, page 13.

GALVANIZED STRAINERS: Available from stock in all sizes.

**TESTING:** <u>#751</u> To 12" – 250 p.s.i.; 14"-24" – 200 p.s.i. #752 To 12" – 500 p.s.i.; 14"-24" – 400 p.s.i.

INDIVIDUAL HYDROSTATIC TEST PER A.S.A. B 16.1 - 1967

HINGED COVER - See page 17.

CLAMP COVER - See page 17.



MUELLER "BREECH-LOK" STRAINERS Furnished as standard in sizes 8" and larger. A one-quarter turn securely locks the screen in its seat and frees the serviceman for bolting the cover flange to the body of the strainer.

#### DIMENSIONS AND WEIGHTS - APPROXIMATE

1	SIZE	7-1/2"	1 21	2-1/2"	3"	3-1/2"	4"	5″	6"	8″	10"	12"	14"	16"	18″	20"	24"
-	#751	7-1/2	9-1/8	10-1/2	12.	13-3/8	14-9/16	16-7/8	18-3/4	24	27-5/8	32-1/4	37-1/4	42-3/8	46-1/8	54-1/2	56
"A"	#752	8-1/16	9-5/16	11-1/16	12-5/8	14-3/8	15-5/8	18-1/4	20-3/16	25-1/8	29-1/8	33-3/4	38-3/4	44-1/8	47-3/4	56	57-3/4
"B"	- Luis - a man	4-1/2	5-3/4	7-1/8	9-1/4	9-1/4	10-7/8	13-3/8	15	16-3/4	19-3/4	22-7/8	26-5/8	29-1/8	36	42	47-1/2
"C"	and the second second	1/2	1/2	1	1-1/4	1-1/4	1-1/2	2	2	2	2	2	2	2	2	2	2
	#751)	17	22	34	46	56	79	119	161	269	414	697	841	1050	2100	3000	4030
WT.	#752	24	26	40	59	76	93	146	194	316	475	750	908	1135	2400	3350	4705
	reen Area Sq. In.	20	36	56	75	91	121	210	278	387	577	795	1093	1409	1810	2280	2859

"A" FOR #752 STRAINERS INCLUDES 1/16" RAISED FACES

MUELLER STEAM SPECIALTY , BROOKLYN. N.Y. 11222

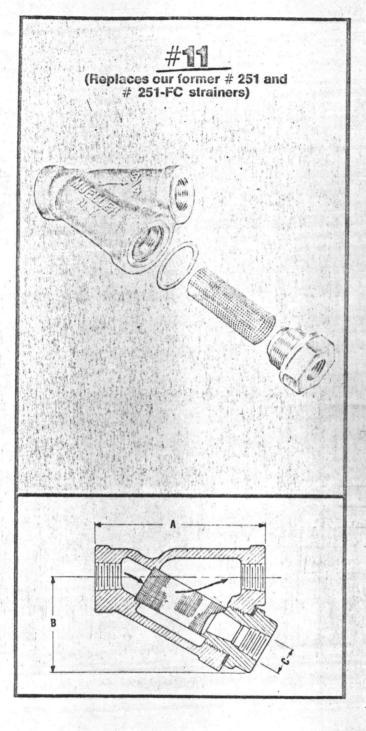
ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511	
APPROVED	_
SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N62470-7>C-1563	
APPROVAL OF A SUBMITTAL DOES NOT INCLUC APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTO CALLS ATTENTION TO AND SUPPORTS THE DEV TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER PHYSICAL DIMEN SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. REVIEWER	)R 'IA-  -
FOR OFFICER IN CHARGE OF CONSTRUCTION	-

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Sorrells Plbg & Hyg



**SELF CLEANING "Y" TYPE SCREWED END STRAINERS** 



# Extra Heavy Iron Body

WORKING	PRESSUR	ES - NON-SHOCK
Steam		250 p.s.i. @ 425°F.
Water - Oil -	- Gas	400 p.s.i. @ 100°F.

SERVICE RECOMMENDATIONS: Used extensively to strain foreign matter from pipe lines and provide inexpensive protection for costly pumps, meters, valves and similar mechanical equipment.

**SCREENS:** 20 Mesh monel or stainless steel screens (1/32" openings) usually furnished in all sizes through 2" for water service and 30 mesh (1/50" openings) for steam service in those sizes. 2-1/2", 3" and 4" strainers furnished with perforated brass screens, 3/64" opening for steam and 1/16" openings for water. A large variety of perforated metals and wire mesh screens other than those usually furnished are available, see page 4.

**CONSTRUCTION:** All sizes feature a machined seat in the body, designed to make the screen self aligning and at the same time the screen is held securely in place by a straight threaded and gasketed cap. The 4" size features a flanged blowoff cap, similar in appearance to those used with our flanged Y strainers.

FEATURES: The advantages of a strainer with machined seats both in the body and cap are obvious — easy assembly and disassembly. The alternative is a strainer which employs a pipe bushing to lock the screen in place and which will more often than not deform the screen, allowing sediment to by-pass the strainer.

SELF CLEANING is accomplished by opening the valve or plug connected to the blowoff outlet.

BLOWOFF OUTLETS: Tapped FIPT, sizes specified below. Not normally furnished plugged.

**CAPACITY:** Generously proportioned bodies with screens that have an open area many times greater than the corresponding pipe size insure low pressure loss.

PRESSURE DROP: See charts, page 13.

GALVANIZED STRAINERS: Available from stock in all sizes.

INDIVIDUAL HYDROSTATIC TEST

DIMENSIONS	AND	WEIGHTS -	APPROXIMATE
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SIZE	1/4"	3/8"	1/2"	3/4"	1″	1-1/4″	1-1/2"	2″	2-1/2"	3″	4"
"A"	3-13/16	3-13/16	3-13/16	4-3/4	5-7/16	6-5/16	7-1/2	8-1/8	10-1/2	12-1/2	15-3/16
"B"	2-3/16	2-3/16	2-3/16	2-3/4	3-1/4	3-3/4	4-1/2	5	6-1/2	7-1/2	11-3/8
"C"	3/8	3/8	3/8	1/2	3/4	3/4	1	1-1/4	1-1/2	1-1/2	1-1/2
Weight	2	2	2	2-1/2	4	6-1/2	10-1/2	15	23	33	70
Screen Area Sq. In.	3	. 3	3	9	15	21	29	33	65	80	125

MUELLER STEAM SPECIALTY . BROOKLYN, N.Y. 11222

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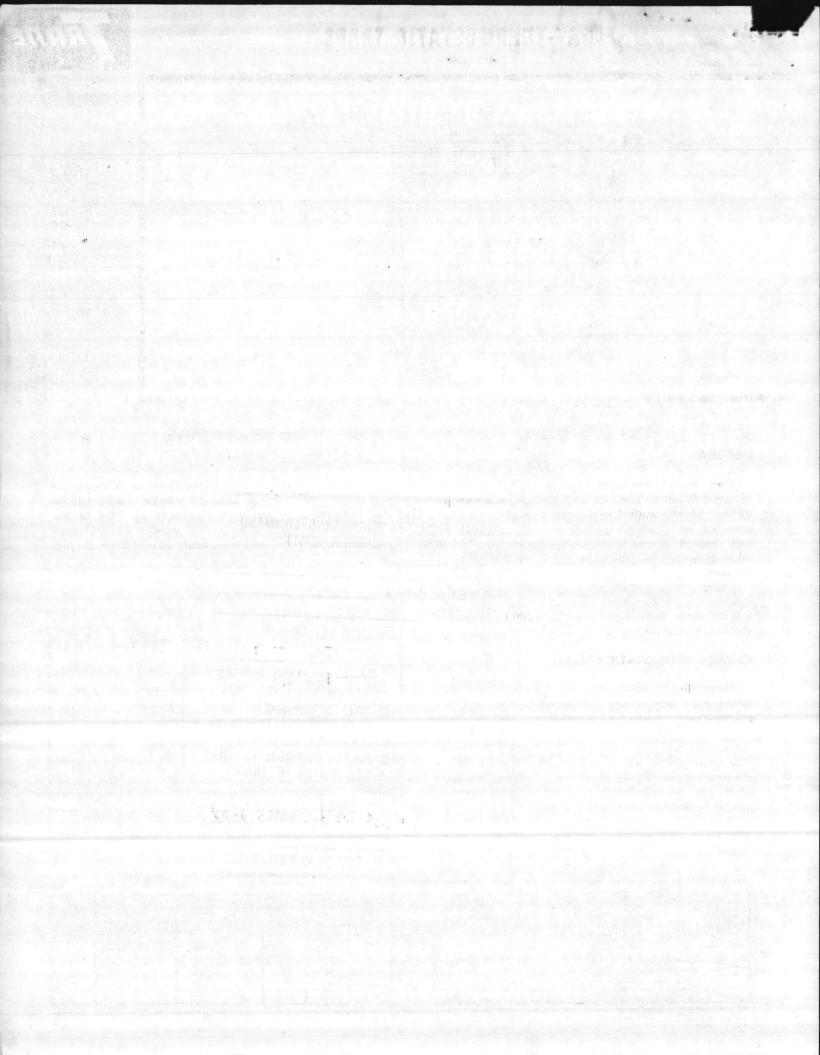
ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511
APPROVED 525
APPROVED AS NOTED
DISAPPROVED
SUBJECT TO THE REQUIREMENTS OF
CONTRACT NO. N62470-77-C-25C-3
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER PHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.
REVIEWER D. J. Buth_/DATE 5-8-29
FOR OFFICER IN CHARGE OF CONSTRUCTION



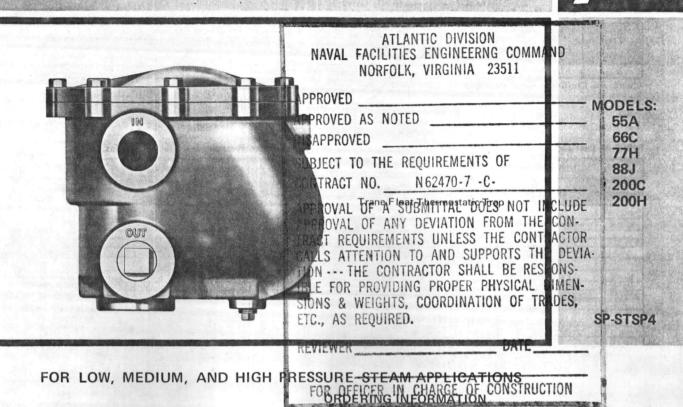
THE TRANE COMPANY -- LA CROSSE, WISCONSIN

# SUBMITTAL DATA

ARCHITE	CT:			DATE 4/17/2	79	SALES ORDER NUMBER SF3-J321
S O L D T O	P.0.	11s P & H Co., Inc Box 9604 sboro, NC 27408			Bldg 2615 Of jeune, NC	ficer's Club
CUSTOMI	ER'S ORDE			ENGINEER		
ITEM	QUAN.	1464 SPECIFICATIONS			R. S. Noona	n, Inc.
A B C	1 1 2	Float-Thermosta	tic Trap - 14	'model 77 HL 3395 ;''model 66 CL 920 ;''model 55 AL 200	#/hr at 5 psi	g
			APPROVED APPROVED A DISAPPROVED SUBJECT TO CONTRACT M APPROVAL O TRACT REQU CALLS ATTE TION THI IBLE FOR F SIONS & W ETC., AS R REVIEWER	THE REQUIREMENTS OF NO. N62470-77-C-2. OF A SUBMITTAL DOES N OF ANY DEVIATION FROM DIREMENTS UNLESS THE INTION TO AND SUPPORT E CONTRACTOR SHALL BI PROVIDING PROPER PHYSI (EIGHTS, COORDINATION OF	OT INCLUDE THE CON- CONTRACTOR S THE DEVIA- E RESPONS- CAL DIMEN- DF TRADES, ATE <u>5-8-25</u>	
SALE			Puel: Vaura	APPROVED BY	DATE	SALES ORDER NUMBE
Cer des proj	tified print cribed abo	eensboro, NC as are attached covering eq we, which we propose to fu rder will be withheld from val of prints. 30.1	rnish for this			SF3-J321



# FLOAT-THERMOSTATIC TRAPS



#### GENERAL

Trane Float-Thermostatic Traps are available in models classified for use on low, medium, and high pressure applications. Those classified for *low pressure* are suitable for operation up to 15 psi; *medium pressure* up to 65 psi; *high pressure* up to 125 psi, except the 88-JH which is rated up to 150 psi; and Class 200, up to 200 psi gauge pressure.

Suffix letters L (Low), M (Medium), and H (High) indicate the pressure classification of No. 55A, 66C, 77H, and 88J traps. Suffix C and H on Class 200 traps indicate the body size of the trap.

#### FLOAT-THERMOSTATIC TRAPS

Trane Float-Thermostatic Traps feature heavy cast iron bodies and covers arranged for easy dismantling without breaking piping connections.

The float valve mechanism has a variable lever ratio to insure quick and wide opening for discharging condensate. The thermostatic bellows member, for venting air, is protected against damage from water hammer by a brass shield cup. All traps have side inlet and outlet tappings, plus an optional bottom outlet tapping.

The 88J Trap is ideally suited to trapping large Absorption Water Chillers and large steam condensers of all types. When ordering all Trane Float-Thermostatic Traps, give quantity desired, pipe size, and ordering number (shown in Tables 2, 3, and 4). For example,  $10 - 1\frac{1}{4}$  in. No. 66CL Traps is an order for 10 standard Float-Thermostatic Traps, low pressure classification, for  $1\frac{1}{4}$  in. pipe size.

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#### TABLE 1-Materials

PART	LOW PRESSURE	MEDIUM PRESSURE	HIGH PRESSURE	CLASS 200
BELLOWS	BRASS	NICKEL PLATED BRASS	NICKEL PLATED BRASS	MONEL METAL
AIR VENT	55AL. 66CL. 77HL BRASS	HEAT STAINLESS TREATED		HEAT TREATED
SEAT AND PLUNGER	88JL STAINLESS STEEL	STEEL	STAINLESS STEEL	STAINLESS
FLOAT VALVE	55AL. 66CL BRASS	STAINLESS	HEAT	HEAT
SEAT AND PLUNGER	77HL. 88JL STAINLESS STEEL	STEEL	TREATED STAINLESS STEEL	TREATED STAINLESS STEEL
BODY	HIGH STRENGT	H CAST IRON. A	.S.T.M. NO. 30	ALL CLASSES
COVER	HIGH STRENGT	H CAST IRON. A	.S.T.M. NO. 30	ALL CLASSES
COVER GASKET	GRAPH	ITE COATED ASE	BESTOS (ALL CL)	ASSES)
COVER BOLTS	CADI	MIUM PLATED ST	TEEL (ALL CLAS	SES)
FLOAT	S	TAINLESS STEEL	L (ALL CLASSES	)

#### TABLE 2-Net Capacity Ratings and Ordering Numbers for Low Pressure Traps

PIPE	ORDER	ING NUMBERS	MAX.	MAX. POUNDS OF CONDENSATION PER HOUR								では、家	NET
SIZE	<ul> <li>Exception of the second se second second s</li></ul>	STAINLESS SEAT	OPER. PRESS.	- Stadigs	PR	ESSURE D	IFFERENC	E - POUM	DS PER S	QUARE IN	сн '	The set of the	WT.
(INCHES)		AND PLUNGER	(PSI)	1/8	1/4	1/2	3/4	12	2	5	10	15	LBS.
8/4	55AL	55ALS	15	50	70	100	120	140	200	210	220	230	6
1	55AL	55ALS	15	125	175	250	300	350	500	525	550	575	6
11/4	66CL	66CLS	15	. 300	425	600	735	850	1200	1260	1320	1380	11
11/2	77HL	77HLS	15	600	850	1200	1470	1700	2400	2520	2640	2760	36
2	77HL	77HLS	15	1250	1775	2500	3060	3550	5000	5250	5500	5750	36

NET CAPACITY RATINGS are in accordance with Standards adopted by the Steam Heating Equipment Manufacturers Association, providing for continuous air elimination when the trap operates at maximum rating.

TABLE 3-Continuous Flow Ratings and Ordering Numbers for Low Pressure 88J Traps

PIPE SIZE (INCHES)	ORDERING NUMBERS	MAX.	and the second	( Labra and	PO	UNDS OF C	ONDENSATIO	ON PER HOI	JR	Part State		NET	
		OPER. PRESS.	1.1245.7	PRESSURE DIFFERENCE - POUNDS PER SQUARE INCH									
		(PSI)	1/8	V/a	. 1/2	3/4	1.1.5	2	5	10	15	LBS.	
21/2	88JL	15	15000	19500	23500	27000	29500	38.000	50000	67000	83000	130	

Above are Continuous Discharge Capacities. Double actual condensate load to size trap.

### TABLE 4-Continuous Flow Ratings and Ordering Numbers for Medium Pressure, High Pressure, and Class 200 Traps.

		MAX. OPER.		Sec. 1			Page Kala		F	OUNDS	OF COM	DENSA	TION PE	R HOU	4	8-1-2	Selence -	And the second	24 1 2 3	
PIPE		PRES-	NET	for the last				Р	RESSUR	E DIFF	ERENCE	- POL	JNDS PE	R SQUA	RE INC	н		Sectores.		in the second
	NUMBERS		LBS.	2	5	10	15	20	25	35	45	50	55	65	75	100	125	150	175	200
					a la facta da la	A	14			M	EDIUM	PRESSU	JRE TRA	PS		And dramatic				
3/4 OR 1	55AM	65	6	200	400	650	820	940	1040	1200	1350	1410	1470	1560	Ι				1	
11/4	66CM	65	11	420	840	1240	1500	1700	1860	2100	2320	2440	2520	2700	1					1
1/2 OR 2		65	36	2000	3400	4600	5700	6600	7400	8800	10100	10600	111100	12000						
21/2	88JM	65	130	13000	20000	28000	32500	37500	41500	47000	51000	53000	54000	56000						
				1.00							HIGH PI	RESSUR	E TRAPS	3						
3/4 OR 1	55AH	125	6		300	425	500	570	620	700	770	840	870	910	960	1100	1220			
11/4	66CH	125	11	1.1.1.1.1.1	390	600	760	920	1040	1240	1400		1540	1650	1760		2180			
1/2 OR 2	77HH	125	36		1800	2800	3600	4400	5000	6200	7000	7400	7800	8400	9000	10400				
21/2	88JH	150	130	4000	6500	9000	11500	13000	14000	16000	17400	18000	19000	20500	22000	26000	29000	33000		
243 mg	一 子 國王 3										CLAS	S 200	TRAPS				100	a sarah		1.1.1
1 OR 11/4	200C ·	200	11		130	230	300	360	400	480	540	580	610	670	725	840	960	1060	1140	1200
11/2 OR 2	200H	200	36	1. 1. 1. 1. 1.	1100	1800	2400	2900	3300	4000	4500		4950		5800			7900	8600	9300

Above are Continuous Discharge Capacities. Double actual condensate load to size trap.

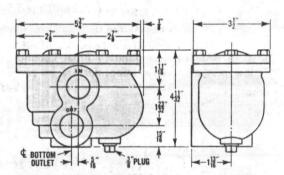


FIGURE 1 — Model 55A Float-Thermostatic Trap Dimensions For All Pressure Classifications.

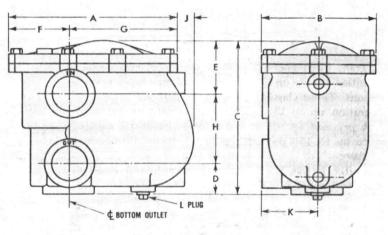


FIGURE 2 – Models 66C, 77H, 88J, 200C, and 200H Float-Thermostatic Trap Dimensions – All Pressure Classes .

SIZE	A	B	С	D	E	F	G	Н	J	к	L.
66C AND 200C	7	4-34	6-5/16	1-9/16**	2.38	2-15 16	4 . 1 / 1 6	2-3 <sup>'</sup> <sup>'</sup> <sup>'</sup> B	0.	2-9/16**	3/8
77H AND 200H	101/2	7 - <sup>3</sup> /8	10	1-15/16	3.38	3.7 <sub>8</sub>	6-58	4-11/16**	1.1/8**	3.5%	1/2 **
88J	16	10-58	14-23/32	2-7/16	3.34	5.3.16"	10-13/16"	81/2	11/4**	5-1/16"	1/2

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#### SP-STSP4-10-270-1171-R.W.S.-P/S

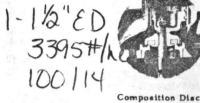
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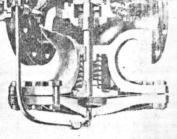
Since The Trane Company has a policy of continuous product improvement, it reserves the right to change specifications and design without notice.



THE TRANE COMPANY-LA CROSSE, WISCONSIN 54601

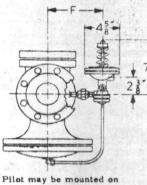
Job: Cample Jevne Bldg. 2615





and Dashpot

Type ED Pressure Regulator



either side of main valve.

E-Face to Face In

250 Lb.

6

10

10 3/4 10

11 1/2

12 1/2

14 1/2

7 1/4

7 3/8

Iron

125

5 1/2

6 3/4

67/8

8 1/2 0

9 3/8

10 3/4

117/8

13 5/8

15 1/8 16

Brz.

Scr. Ends

4 3/8

4 3/4

5 3/8

1/4

Size

3/8

1/2 4 3/8

3/4

1 1/4 6 1/2

2 1/2

3 1/2

4 5

6

70h

Steel

150 Lb.

5 1/2

6 3/4

6 7/8

8 1/2

9 3/8

10 3/4

117/8

13 5/8

15 1/8 16

300 Lb.

6 1/2

77/8

10 1/4

11 1/4

12 1/4

12 3/8

12 1/2

14 1/2

A

2 3/4

2 3/4

2 7/8

3 5/8

4 1/8

4 3/8

5 1/4

5 3/4

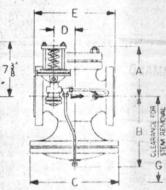
6 5/8

6 7/8 10

7 5/8

8 1/2

10



DIMENSIONS AND WEIGHTS

C

5 7/8

5 7/8

6 1/2 1 3/8

7 7/8 1 7/8

8 3/4

9 7/8

10 7/8

11 3/4

12 3/4

14 3/4

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6.

Walden, New York YPE ED PRESSURE REGULATOR

SPENCE ENGINEERING COMPANY, INC.

pence

The SPENCE Type ED Pressure Regulator is designed to reduce a steady or varying initial pressure to a constant delivery pressure.

Main valve and pilot bodies are suitable for maximum inlet conditions as follows:

Iron	Screwed Ends Flanged ASA 125 lb Flanged ASA 250 lb	12 250 psi 400 F □ 125 psi 350 F □ 250 psi 400 F
Bronze	Screwed Ends	250 psi 400 F
Steel	Screwed Ends Flanged ASA 150 lb Flanged ASA 300 lb	□ 300 psi 600 F □ 150 psi 500 F □ 300 psi 600 F

Other Materials:

\* Approx. Wt. Lbs.

40 37 41

100

2145

73 78

2060

100

2140

Steel

C.I

Brz

Scr. Ends

14 14 18

43

G

7 3/8

7 3/8

7 7/8

8 7/8 23 24 27 26 31

9 1/8 33

9 3/4

11 1/4

12 1/8

14 5/8

15 3/4

18 1/4

20 1/8

22 3/8

27 3/4

36 1/4

41 1/2

125 Lb 250 Lb. 150 Lb. 300

36

45 51 47 55

67 72

82

110 130 125 140

135 155 150 165

200 235 210 230

280 315 295 310

385 455 420 470

657 735 700 710

1260 1430 1240 1300

2070

Seats and discs SECO	Metal
Stems Stainless	Steel
Diaphragms Stainless	Steel
Springs	Steel

#### Main Valve Accessories:

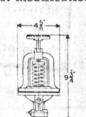
- Composition Disc for liquid, air or gas service
- Dashpot for liquid service
- Bronze Body Pilot for water service

Delivery pressure ranges, determined by choice of Pilot Control Spring, are as follows:

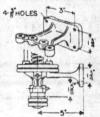
13 to 20 psi 🖾 5 to 50 psi 🗆 10 to 100 psi 20 to 150 psi

Data Sheet No. 3-1B

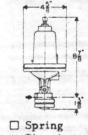
Pilot Modifications:



□ Adjusting



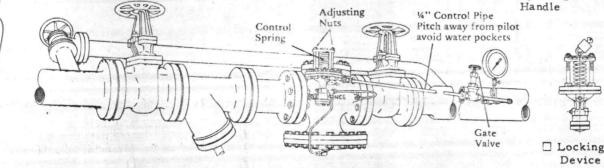
Wall Bracket



Chamber

8 20 20 11 1/2 17 1/4 10 19 23 5/8 23 3/8 23 5/8 25 13 3/4 10 25 26 1/2 28 26 1/2 28 15 7/8 25 1/4 12 \* Add 10 lb for pilot and fittings



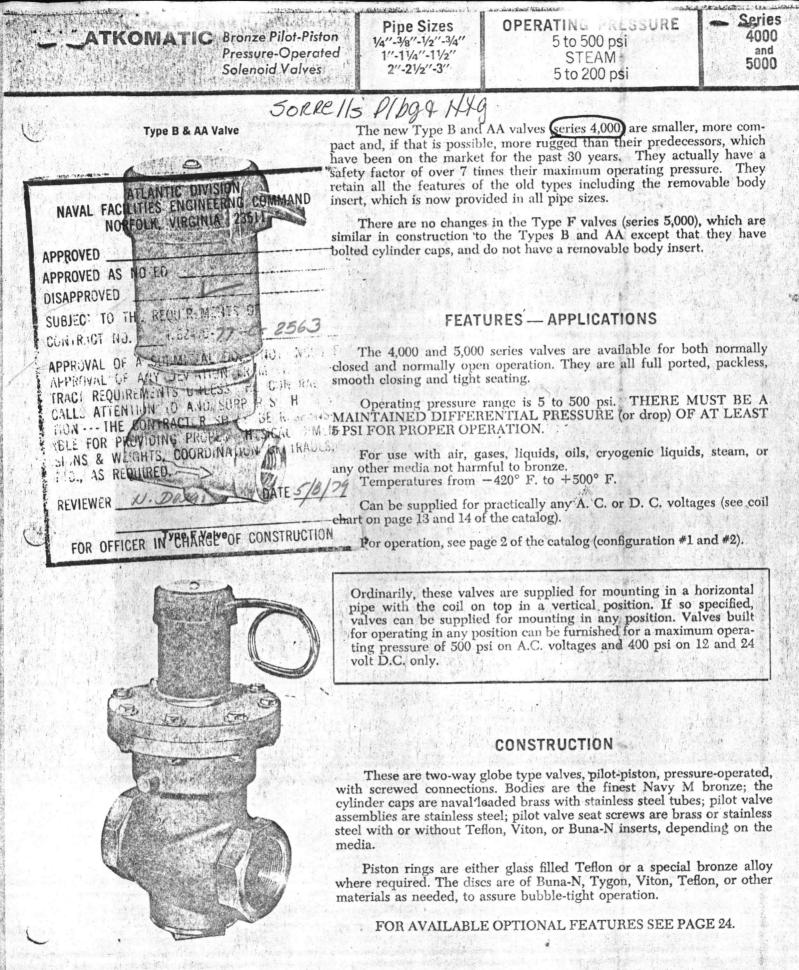


Typical installations of the Type ED Pressure Regulator

Printed in U.S.A.

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## ATKOMATIC VALVE COMPANY, INC.

141 SOUTH SHERMAN DRIVE

23

INDIANAPOLIS, INDIANA 46201

Series 4000 and 5000

V. T. S. ANG YEAL MANY STRATES

### TING PRESSURE 5 to 500 psi STEAM 5 to 200 psi

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MATIC	Bronze Pilot-Piston
er og handelige	Pressure-Operated
WARRAN PARA	Solenoid Valves

	PERF	ORMA	NCE	DATA	Max. Pr		
DESCRIPTION	Турв	Catalog Number	Pipe Size	Port Size	Gases & Liquids	Steam	CV Flow Factor
Normally closed valves for media at temperatures ranging	B	4000	1/4" 3/8"	3/8″ 3/8″	500 500	14 Martin	1.4 2.7 3.5
media at temperatures tanging from zero to 220° F. Supplied with Class A paper insulated coils. Have removable body in- serts.	AA	4200 4300 4400 4500 4600 •	$\frac{1}{2''}$ $\frac{1}{2'4''}$ $\frac{1''}{1!/4''}$ $\frac{1}{1!/2''}$	$\frac{1/2''}{1''}$ $\frac{1''}{1''}$ $\frac{11/2''}{11/2''}$	500 500 500 500 500		8.4 9.5 19.5 21.0 43.0
Type F valves have bolted cyl- inder caps. They do not have removable body inserts.	<b>F</b>	5700 5800 5900	2" 2¼2" 3"	2" 3" 3"	500 500 500	Sec.	43.0 63.0 71.0
Normally closed valves for ex- tremely hot or cold media, in- cluding steam and cryogenic	BGS	4008G 4108G	1/4" 3/8"	3/8" 3/8" 1/2"	500 500 500	200 200 200	1.4 2.7 3.5
vapors at temperatures ranging from minus 420° F. to plus 500° F. Supplied with Class H coils and stainless steel removable body inserts.	AAGS	4208G 4308G 4408G 4508G 4608G	1/2" 3/4" 1" 11/4" 11/2"	$\begin{array}{c} 1'' \\ 1'' \\ 1'' \\ 1^{1/2''} \\ 1^{1/2''} \\ 2'' \end{array}$	500 500 500 500 500	200 200 200 200 200	8.4 9.5 19.5 21.0 43.0
Type FGS valves have bolted cylinder caps. They do not have removable body inserts.	FGS	5708G 5808G 5908G	21/2" 3"	3" 3"	500 500	200 200	63.0 71.0
Normally open valves for media	BN	4001 4101	1/4" 3/8"	3/8" 3/8" 1/2"	500 500 500		1.4 2.7 3.5
at temperatures ranging from zero to 220° F. Supplied with Class H coils. Have removable body inserts.	AAN	4201 4301 4401 4501 4601	$ \begin{array}{c} \frac{1/2''}{3/4''} \\ \frac{1}{1''} \\ \frac{1}{1/4''} \\ \frac{1}{1/2''} \end{array} $	1" 1" 1½" 1½"	500 500 500 500		8.4 9.5 19.5 21.0
Type F valves have bolted cyl- inder caps. They do not have removable body inserts.	FN	5701 5801 5901	2" 21/2" 3"	2" 3" 3"	500 500 500		43.0 63.0 71.0
Normally open valves for ex- tremely hot or cold media, including steam and cryogenic	BGSN	4007G 4107G	1/4" 3/8"	3/8" 3/8" 1/2"	500 500 500	200 200 200	1.4 2.7 3.5
vapors at temperatures ranging from minus 420° F. to plus 500° F. Supplied with Class H coils and stainless steel removable body inserts.	AAGSN	4207G 4307G 4407G 4507G 4607G 5707G	$\begin{bmatrix} \frac{1/2''}{3/4''} \\ \frac{1''}{11/4''} \\ \frac{11/2''}{2''} \\ 2'' \end{bmatrix}$	1/2" 1" 1'' 1'/2" 1'/2" 2"	500 500 500 500 500 500	200 200 200 200 200 200	8.4 9.5 19.5 21.0 43.0
Type FGSN valves have bolted cylinder caps. They do not have removable body inserts.	FGSN	5807G 5907G	21/2" 3"	3″ 3″	500 500	200	63.0 71.0

These valves require a minimum pressure differential or drop of at least 5 psi to open or remain open. They can be built to operate at the extreme range of 5 to 500 psi but to achieve optimum performance, within the actual operating range, the actual maximum and minimum pressure should be specified.

#### **Required Ordering** Information

- 1. Pipe size

- Pipe size
   Type of valve
   Catalog number
   Media (the specific gas or liquid)
   Temperature range
   Maximum inlet pressure
- 7. Minimum inlet
- pressure 8. Back pressure (if
- any) 9. Voltage and cycles
- 10. Optional features

SYMBOL	OPTIONAL FEATURES
G	Class H coll for high or low tempertures
E	Epoxy encapsulated coil for humid conditions Explosion proof coil housing for hazardous locations
WP	Waterproof coil housing (NEMA Type (V)
M	Positive manual opening device
MT	At a stating douice for throttling main port flow
CV	CV feature for flow in either direction (will not close against flow in both direction

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**Pipe Sizes** 

1/4''-3/8''-1/2''-3/4'' 1''-11/4''-11/2'' 2''-21/2''-3''

Tunot	The Ast	Nor	nally C	losed Va	ives	212 vi 1		Nor	mally Q	pen Val	ves	1
PIPE SIZE	1/4" & 3/8"	1/2"	3/4" 8. 1"	11/4" 8, 11/2"	2"	21/2" & 3"	1/4" & 3/8"	1/2"	3/4" & 1"	14" & 142"	2″	24/2" & 3"
Dimension X	71/8"	71/8"	81/4"	9'%"	125/8"	143/8"	81/8"	81⁄8″	9744" 1	11"	133/4"	154/2
Dimension Y	61/4"	61/4"	7"	8"	93/4"	101/2"	71/4"	71/4″	8%"	9%6"	107/8"	115/B'
Dimension Z	21%"	3″	4"	5″	6¼s"	81/2"	211/16"	3″	4"	5″	61/8"	81/2
SHIPPING	6	8	9	15	35	76	6	8	9	15	36	76

ATKOMATIC VALVE COMPANY, INC. 24

141 SOUTH SHERMAN DRIVE

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INDIANAPOLIS, INDIANA 46201

	P.O. Box 1388 / Green Phone: 80	03 - 277-795	0	May 8, 1979 6-048-18
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-	Post Office Box	197 - 198 199		MCB Camp Lejeune North Carolina
(	Greensboro, Nor	th Caro	lina 27408	Transmittal Nos. 8 and 18
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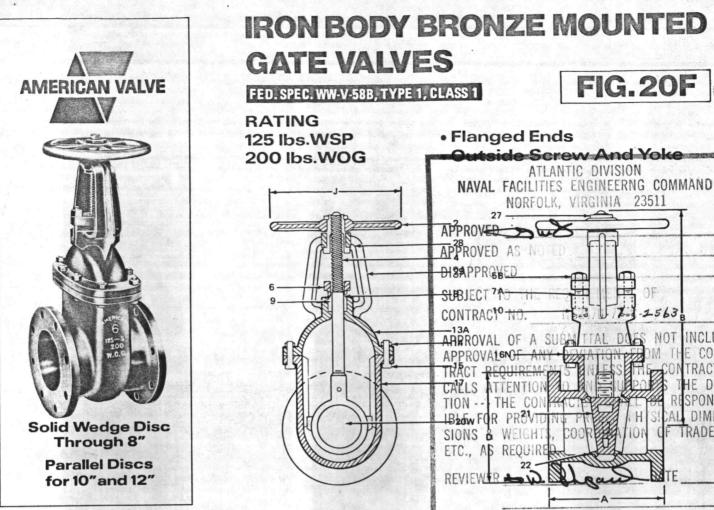
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	NTRAC	55/3 (Rev. 6/76)		CONTRACT NO N62470-77-C-2563 7 4/18/79					
So:	R. S.	Plumbi	ing & Heating Co., Inc. , Inc. South Carolina	PROJECT TITLE AND LOCATION Replace Heating & Building 2615, Ma Camp Lejeune, No:	& Air	Corps B	oning ase fill		
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ITEM NO.	& PAR	PEC. SECT. A. and/or WG. NO. *	ITEM IDENTIFIC (Type, size, model no., Mi brochure num	g. name, dwg. or	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DA		
9	15654-	-13.1	Gate Valves, Flgd:	American #20-F		A	02		
0	"do"	13.1	Gate Valves; Bronzed:	и #3-F		A	لهر		
1	ngou	13.2	Globe Valves: None	e Valves: None Required					
32	"do"	13.3	Check Valves, Flgd:	American #35		A<	Gue		
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13	"do"	13.3	Check Valves, Bronzed:	₩ #31-F	i Wern, y		The Constant of the		
34	"do" TRACTOR'S But	13.4	Check Valves, Bronzed: Butterfly Valves: Keyst valves to be used in lieu	tone #228	ines c	A mly - 2-	-1/2™ and		
34 CONT 1.	"do" TRACTOR'S But lar	13.4 COMMENTS terfly ger.	Butterfly Valves: Keys	tone #228			-1/2™ and		
24	"do" TRACTOR'S But lar	13.4 COMMENTS terfly ger.	Butterfly Valves: Keyst	tone #228 of gates on water li			-1/2™ and		
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Con A GUERA 144 Europa A & WER'NA Reling & Areling Low stands from . Na ist 2917 1704A 0 ITEM NO. 32. SPEC. NO. GIVEN APPLIES 34. HAS . 40 59EC. 40. ligel a. a.



APPROVED APPROVED AS NO SUBJECT 7 AD TH OF CONTRACTO NO. 11 1563 ARROVAL OF A SUBA D NOT INCLUDE APPROVALINGE AN E CON-OM TI CONTRACTOR HE DEVIA-CALLS ATTENTION **RESPONS-**TION --- THE CON 1820W FOR PROVIDIN AL DIMEN-TRADES, SIONS & WEIGHT ETC., AS REQUIRI

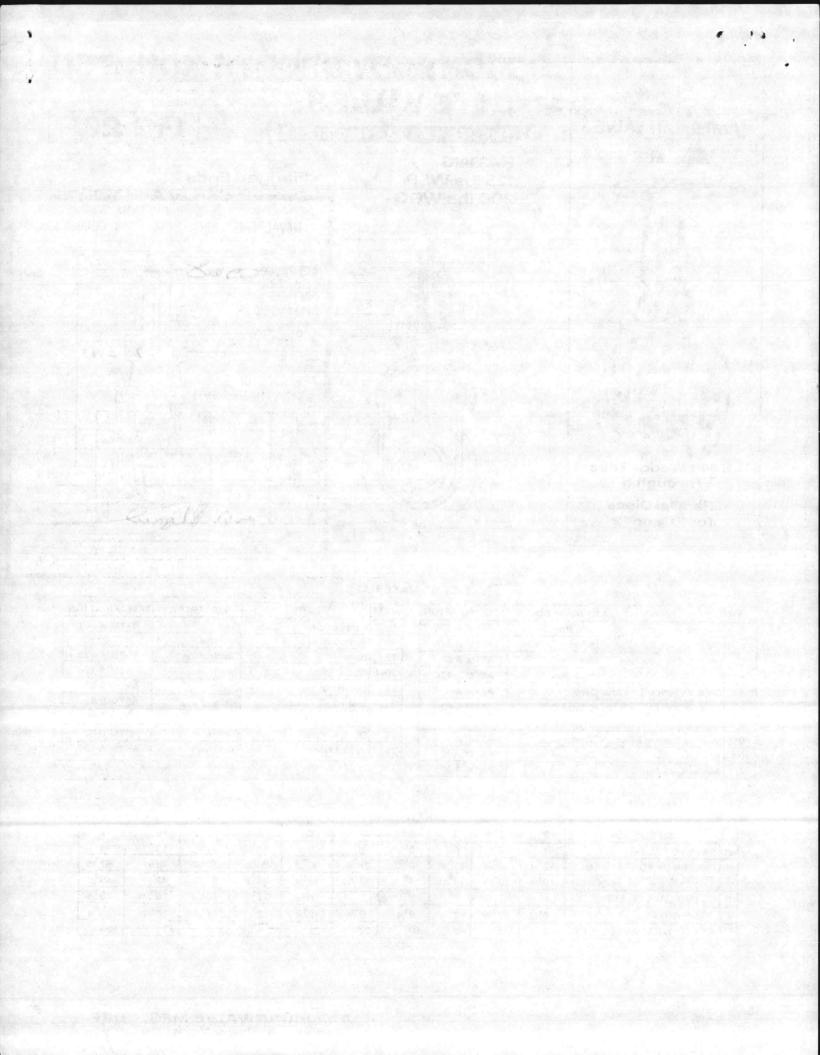
FIG.20F

FOR OFFICER IN CHARGE OF CONSTRUCTION

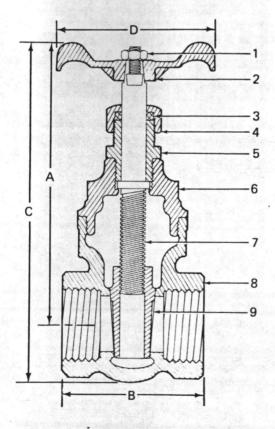
LIST OF MATERIALS

ITEM	PART	MATERIAL	SPECIFICATION	ITEM	PART	MATERIAL	SPECIFICATION
2	Handwheel	Cast Iron	ASTM A-126	15	Bonnet Bolt	Steel	ASTM A-307
4	Stem	Silicone Bronze	ASTM B-371	16N	Body Gasket	Asbestos	R Start Start
- <del>-</del> 5B	Strap Adjustment Nut	Bronze	ASTM B-62	17	Body	Cast Iron	ASTM A-126
6	Strap	Cast Iron	ASTM A-126	20W	Disc	Cast Iron	ASTM A-126
	OS & Y Stuffing Box Stud		ASTM A-307	21	Disc Ring	Bronze	ASTM B-62
8	Packing Gland	Bronze	ASTM B-62	22	Seat Ring	Bronze	ASTM B-62
9	Packing	Graphite Asbestos		27	Yoke Lock Nut	Bronze	ASTM B-62
10	Stuffing Box Lock Nut	Steel	ASTM A-307	28	OS & Y Yoke Nut	Bronze	ASTM B-62
	Bonnet	Cast Iron	ASTM A-126	29	Yoke (Arms)	Cast Iron	ASTM A-126
	Bonnet Lock Nut	Steel	ASTM A-307				

					DI	MENSION	IS			The Cherry Control		Sec. 25. 19
-	SIZE	General States	2	21/2	3	31/2	4	5	6	8	10	12
A	FACE TO FACE	Water and	7	71/2	8	8 <sup>1</sup> /2	9	10	101/2	111/2	13	14
-	CENTER OF PORT	OPEN	121/4	16 <sup>3</sup> /8	171/4	1813/16	217/8	237/8	30 <sup>1</sup> /8	40 <sup>1</sup> /4	48 <sup>1</sup> /2	571/2
-	TO STEM TOP	CLOSED	10 <sup>1</sup> /4	131/2	141/8	149/16	171/2	18 <sup>1</sup> /4	237/8	311/2	37	45 <sup>1</sup> /2
D	OD OF FLANGED E	ND	6	7	75/8	8 <sup>5</sup> /8	9 <sup>1</sup> /8	10	111/8	131/2	16 <sup>3</sup> /16	19 <sup>1</sup> /4
J	OD OF WHEEL	120	6 <sup>1</sup> /2	71/4	71/4	9 <sup>1</sup> /4	9 <sup>1</sup> /4	101/4	12 <sup>3</sup> /8	141/4	16 <sup>1</sup> /4	18 <sup>1</sup> /4
i litz	APPROX WT. W/WH	EEL (LBS)	24	39	52	69	90	122	154	300	472	684







# BRONZE GATE VALVES FED SPEC. WWAV-54D, TYPE 1, CLASS A



RATING 125 lbs. WSP 200 lbs. WOG

- Threaded Ends
- Non-Rising Stem
- Solid Wedge Disc
- Teflon Asbestos Packing

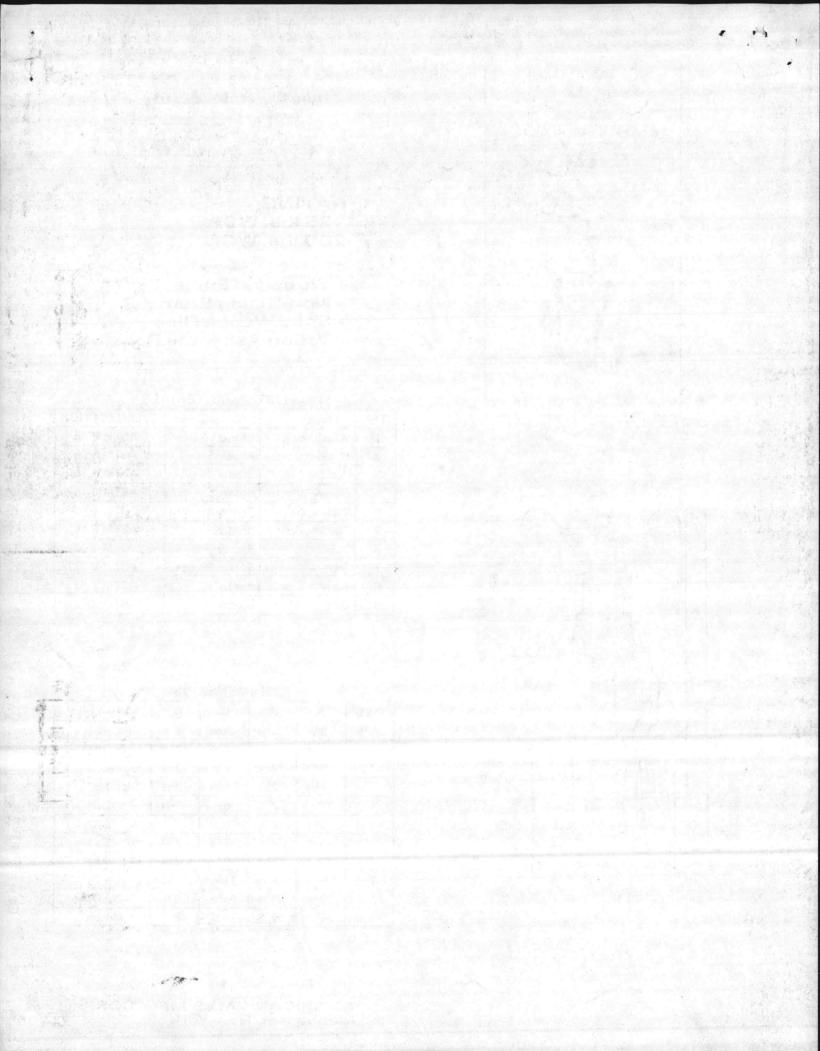
ITEM	PART	MATERIAL	SPECIFICATION			
1	Wheel Nut	Bronze	ASTM B 16			
2	Handwheel	Aluminum	ASTM B 85			
3 Packing		Packing Bronze				
Arrest .	Gland Follower	Bronze	ASTM B 16			
4	Packing Nut	Teflon-Asbestos	Contractor March			
5	Stuffing Box	Bronze	ASTM B 16			
6	Bonnet	Bronze	ASTM B 62			
7	Stem	Silicon-Bronze	ASTM B 371			
8	Body	Bronze	ASTM B 62			
9	Disc	Bronze	ASTM B 62			

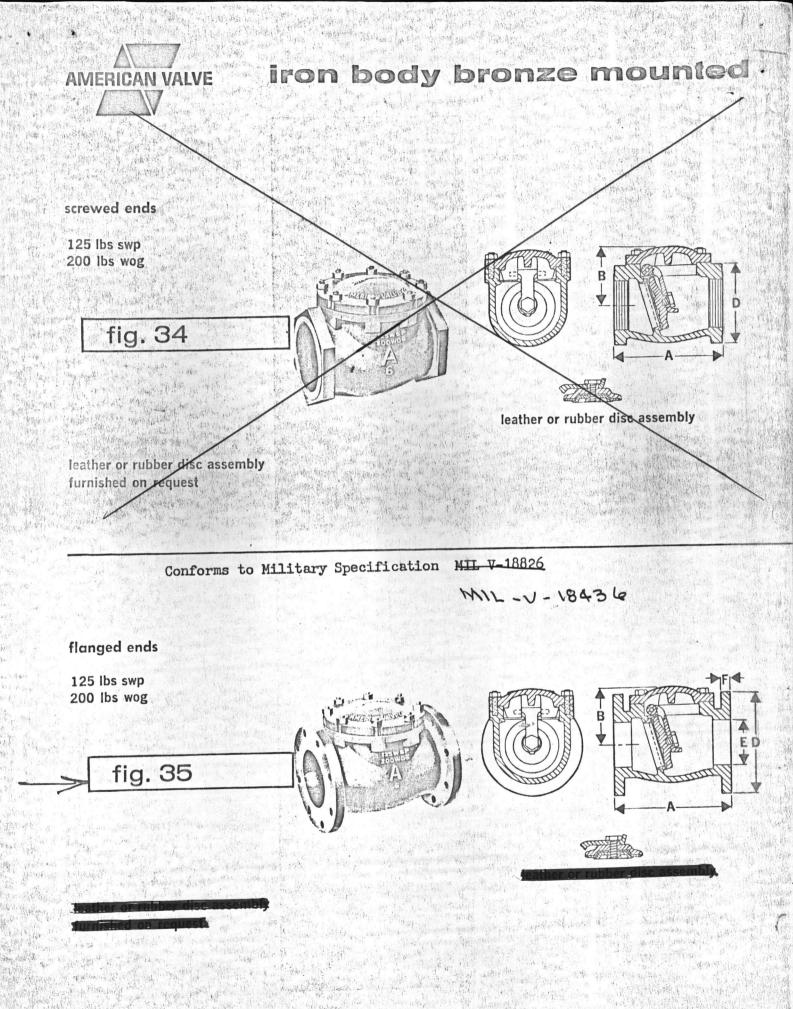
### LIST OF MATERIALS

### DIMENSIONS

SIZE	A	В	С	D	WEIGHT-lbs.
1/4	33/4	17/8	43/8	2 <sup>1</sup> /8	.94
3/8	33/4	17/8	4 <sup>3</sup> /8	2 <sup>1</sup> /8	.94
1/2	33/4	2 <sup>1</sup> /8	4 <sup>3</sup> /8	2 <sup>1</sup> /8	.94
3/4	41/8	2 <sup>1</sup> /4	47/8	2 <sup>3</sup> /8	1.32
1	5	25/8	6	23/4	2.08
11/4	5 <sup>1</sup> /2	27/8	6 <sup>3</sup> /4	3	2.82
11/2	6	31/8	73/8	31/4	3.71
2	71/4	33/8	87/8	33/4	5.44
2 <sup>1</sup> /2	9 <sup>1</sup> /2	4 <sup>1</sup> /8	111/2	4 <sup>1</sup> /2	9.34
3	103/4	43/4	137/8	5	15.84
4	14 <sup>1</sup> /8	5 <sup>3</sup> /8	171/4	8	41.00

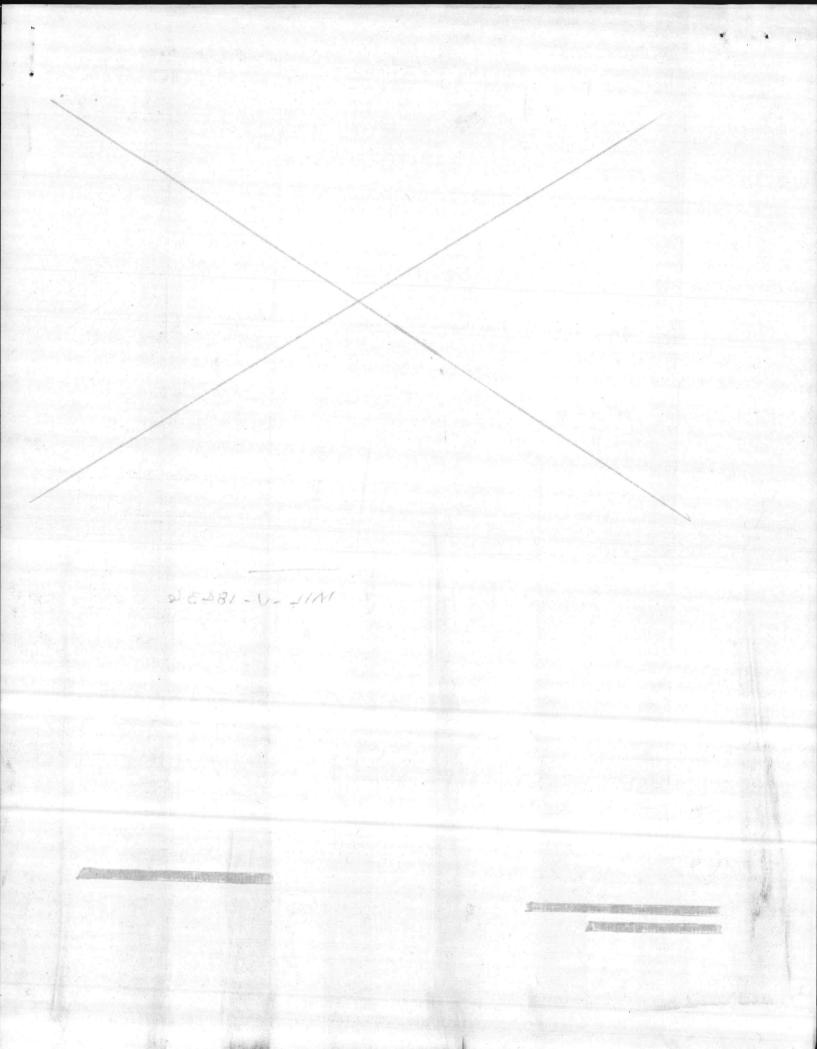
AMERICAN VALVE MFG. CORP. Manhasset, New York

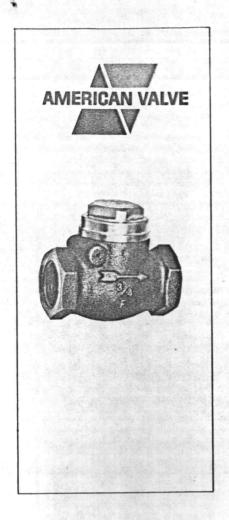




AMERICAN VALVE MANUFACTURING CO., Manhasset, New York

COLUMN TRANSFER





# **BRONZE CHECK VALVES**

FED. SPEC. WW-V-51, TYPE IV, CLASS A

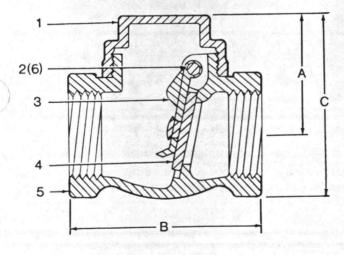
FIG.31F

RATING 125 lbs. WSP 200 lbs. WOG

- Swing Check
- Threaded Ends
- Bronze Disc
- Side Plug

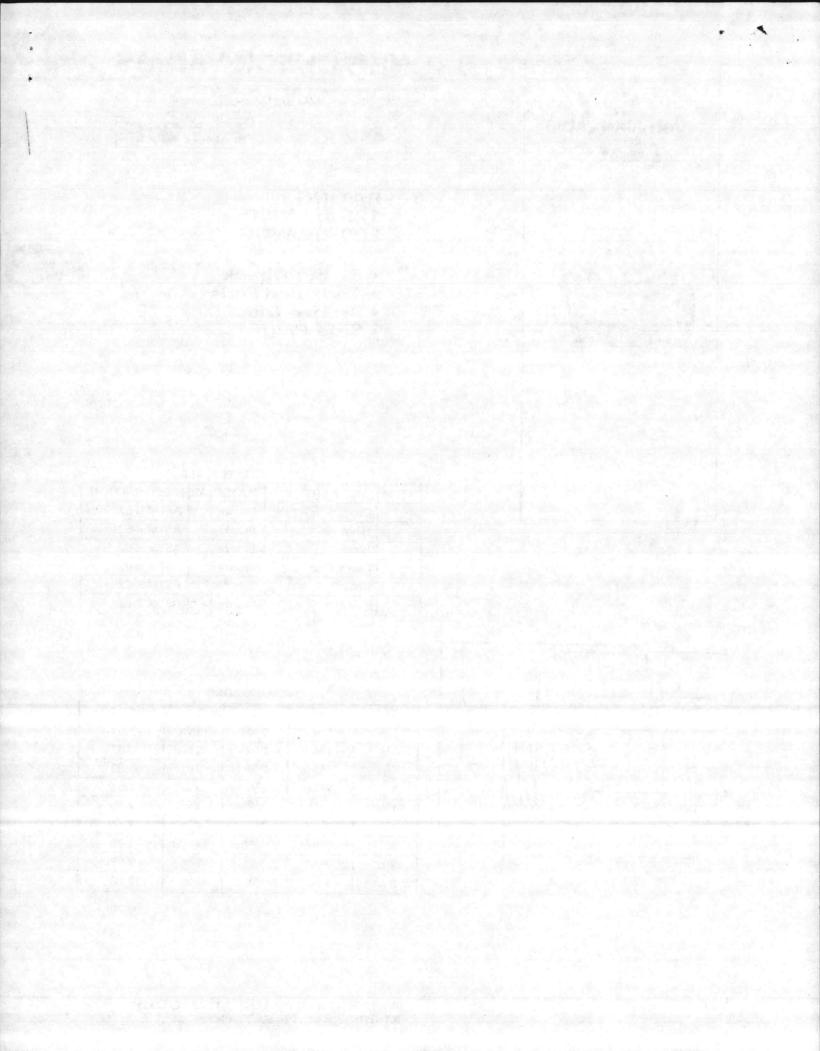
ITEM	PART	MATERIAL	SPECIFICATION
1	Сар	Bronze	ASTM B-62
2	Hinge Pin	Bronze	ASTM B-62
3	Hinge	Bronze	ASTM B-62
4	Check Disc	Bronze	ASTM B-62
5	Body	Bronze	ASTM B-62
6	Side Plug (Outside)	Bronze	ASTM B-62

### LIST OF MATERIALS



ITEM	A	в	С	WEIGHT-Ibs.
3/8	13/4	2 <sup>1</sup> /2	2 <sup>5</sup> /16	.64
1/2	15/8	2 <sup>1</sup> /2	25/16	.67
3/4	111/16	2 <sup>3</sup> /4	2 <sup>1</sup> /2	.89
1	2 <sup>3</sup> /16	3 <sup>1</sup> /2	3 <sup>1</sup> /4	1.54
11/4	211/16	315/16	4	2.25
1 <sup>1</sup> /2	3 <sup>1</sup> /16	4 <sup>1</sup> /2	4 <sup>3</sup> /8	3.44
2	3 <sup>3</sup> /16	415/16	415/16	4.75
2 <sup>1</sup> /2	33/8	6	5 <sup>3</sup> /8	7.98
3	4 <sup>1</sup> /8	7 <sup>1</sup> /8	6 <sup>1</sup> /8	12.00

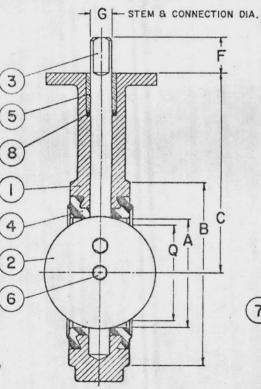
AMERICAN VALVE MFG. CORP. Manhasset, New York

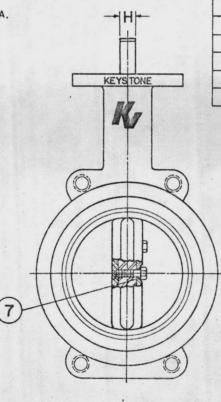


POSOMS -

# NOTES:

- 0  $\overline{\alpha}$ E Ø 0 D-
- I. VALVE RATED AT 175 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION.
- 2. STANDARD VALVE FURNISHED WITH FOUR TAPPED THROUGH LUGS AS SHOWN & USED BETWEEN ASA 125 OR 150 POUND FLANGES.
- 3. "Q" DIMENSION IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISK SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.
- 4. SEE DATA PAGE SMOOOI FOR ADAPT-ABILITY CODE LETTER SYMBOL DIMENSIONS REGULATING INTERCHANGE-ABILITY OF BODY TOP PLATE MOUNTING AS TO KEYSTONE HANDLES, PLATES. GEAR OPERATORS, POWER ACTUATORS, ETC.





	41/8	61/8	7	2	3%	16	4	11/4	5/8	7/16	31/4	4	7/16	71/2	4	5/8-11NC	1 3/4	BAC
	53/6	75%	71/2	21/8	5	19	4	11/4	5/8	7/16	31/4	4	7/16	81/2	4	3/4-10NC	1 3/4	BAC
	61/8		8	21/8	6	22	4	11/4	5/8	7/16	31/4	4	7/16	91/2	4	3/4-10NC	1 3/4	BAC
	81/8		91/2	21/2	8	36	6	11/4	3/4		5	4	9/16		4	3/4-10NC	2	CAD
1	101/8	133/8	10 3/4	21/2	10/16	55	6	11/4	7/8			4	9/16	141/4	4	7/8-9NC	21/4	CAE
	1		10 4	<u> </u>	1. 10						<b></b>		1			11		<b></b>
			ITE		NAME		10. Q'D.	PAF & F	T NO	). I	MATER	IAL			RE	MARKS		
			1		BODY		1	203	3-22	8					1			
									statute designation of the local division of							and the second se	and the second se	A REAL PROPERTY AND A REAL

VALVE DIMENSIONS

G

9/16

9/16

H

3/8

3/8

E

4

4

WEIGHT

10

13

2 3-15-14 1 3-1-70 O. DATE

С

6

D

13/4

13/4

Q

23/6

2%

B

31/8 53/8 61/4

SIZE

21/2

3

4

5

6

8

10

Δ

2% 41/8

F

11/4

14

2	DISK	1	204-100		
3	STEM	1	205-228		
4	SEAT	1	206-100	an Margan	
5	BUSHING	1	207-100	a barra da ser esta	
6	SCREW	2	905-100		
7	"O"RING	2	927-730		
8	PACKING	1	928-100	1.11 C	

TOP PLATE DRILLING

4

4

NO. HOLE

DIA.

7/16

7/16

BOLT

31/4

31/4

CIRCLE HOLES

TAPPED LUG DATA

TAP

5/8-11NC 1 1/2

5/8-11NC 11/2

ADAPT

CODE

BAB

BAB

BOLT

LENGTH

NO.

4

4

BOLT

5 1/2

6

CIRCLEHOLES

NO SPEC NO

	SUB	SUBASSEMBLY PART NUMBER				
	TRIM	PART	SIZE	FIG.NO.	STYLE	
		703		228		
YES 175" PSI RATING WAS 150" CJ BOLT LENGTH COLUMN ADDED SV 121045	BODY: TAPP	60° TOP PL DARD PIECE W/FL	ON G TYPE ATE	NA	-71 STONE LVE HOUSTON	
TOLERANCES UNLESS OTHERWISE SHOWN FRACTIONAL±1/4; DECIMAL±.04; ANGLE±1/2"	DR: FMSCH:		BMN	SMO	204	

# KEYSTONE VALVE CORPORATION HOUSTON, TEXAS INSTALLATION AND MAINTENANCE INSTRUCTIONS

21/2" - 10" FIGURE 228 BUTTERFLY VALVE

Flange and Pipe Compatibility: The Figure 228 valve is made to be used between all types of ASA 125 and 150 pound flat or raised face flanges. Flange gaskets are unnecessary as the Keystone butterfly seat face design eliminates the need for gaskets. Lined pipe, heavy wall pipe, or flanges must have a minimum allowable inside diameter (Dimension "Q") at the centered body face to clear the disk sealing edge when opening the valve.

Installation Information: The Keystone valve is nondirectional and will control flow equally well in either direction. For the best results in slurry service regarding sedimentation, position the valve assembly to have the stem in the horizontal position and the lower disk edge to open in the downstream direction. To install the valve between existing ASA flanges, the flanges must be spread sufficiently before placing the valve in position to prevent distortion and/or damage to the sealing face of the seat. In new construction using ASA welding type flanges, the following method of installation has proven beneficial. With the disk in the nearly closed position, align and center the companion flange bolt holes to the body lug holes. Assemble the body and flanges with the flange bolting, and make-up the bolting. Use the flange-body-flange assembly for fit-up and centering to the pipe. Tack weld the flanges to the pipe. Remove the bolting and valve assembly from between the flanges. Important: Do not finish weld the flanges to the pipe with the valve bolted between the flanges as this will result in serious heat damage to the seat. Finish welding the flanges to the pipe and allow the flanges to cool completely.

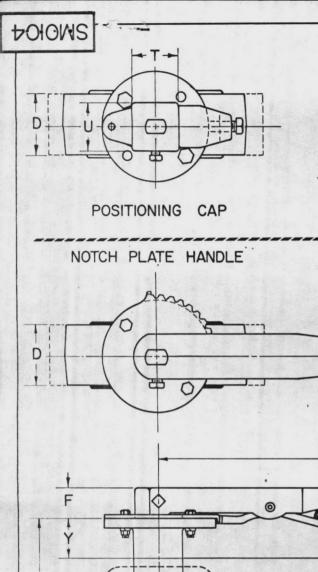
Installation Instructions: Observe that the disk sealing edge is in line with the parallel flats on the stem. (The 10" disk sealing edge is in line with a line scribed across the top of the stem connection.) Rotate the stem clockwise to position the disk within the body at least 3/8" away from the body face. After spreading the flanges, insert the valve between the flanges and assemble the valve body to the flanges with all flange bolts possible. Turn the disk to the fully open position. Next, while gradually removing the flange spreaders, center the valve body to the flanges and tighten the bolting handtight. Slowly close the valve clockwise to check for adequate disk clearance. Return the disk to the fully open position and cross-tighten all bolting to the proper torque specification. Again, check for adequate disk clearance. If the installation is satisfactory, the valve is ready for service after installing the valve operator or actuator.

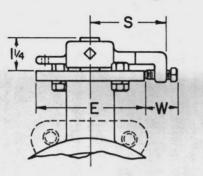
Maintenance: Routine maintenance or lubrication is not required.

**Repairs:** The Keystone butterfly valve is field repairable. If in time it is necessary to replace certain parts, the valve must be removed from the line. Proceed by turning the disk to the nearly closed position, loosen all flange bolting, remove necessary bolting, spread the flanges if necessary, and remove the valve from between the flanges.

Value Disassembly: Turn the disk to the almost open position. Proceed by removing the operator or actuator, disk screws with "O" rings, stem, packing, and bushing. Remove the disk by pulling or "rolling" the disk out of the seat bore. To remove the seat from the body, pry under both seat edges at one point, collapse the seat into the shape of a round bottom heart configuration ( $\mathcal{O}$ ), and pull the seat out of the body bore. Discard the parts to be replaced.

Valve Assembly: Clean all reusable parts. If possible, use Silicone base oil or lubricant to facilitate assembly. Collapse the seat into the shape of a round bottom heart configuration ( O), firmly place the "bottom" part of the seat into position taking care to align the lower stem holes, snap the seat into position within the body, and check all stem holes for proper alignment. Install the disk with the screw holes toward the body top plate and align the stem holes. Install the packing, bushing, and stem. Use a rotary downward pressure on the stem to facilitate assembly while paying particular attention that the seat is not damaged due to any misalignment of the stem holes. Align the counterdrilled portion of the stem screw holes with the disk screw holes. Place "O" rings on the disk screws. Install the disk screws and tighten securely.





### NOTES

- ATORS ARE RECOMMENDED ON 8"AND LARGER SIZE VALVES FOR MOST APPLICATIONS.
- VIDES 10° THROTTLING POSITIONS.
- RATED AT 150 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION.
- 4. BROKEN OUTLINE DENOTES FIG. 122 BODY WITH TAPPED ANS DRILLING, THRU BOLT-ING IS OPTIONAL.
- 5. WHEN 125 OR 150 POUND ANS DRILLED FLANGES ARE USED, THE BOLTS SPAN THE BODY 0.D. OF FIGURE 99 8 100.
- 6. "Q" DIMENSION IS THE MIN-IMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISK SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.

			VAL	/E C	MIC	ENSI	ONS		
0175		D	~	0	-	0		WEIGHT	and the second
SIZE	A	В	С	D	E	Q	FIG 99	FIG 100	FIG 122
2	21/8	41/8	3 15/16	15/8	4	11/16	6	6	71/2
21/2	2%	4%	41/2	1 3/4	4	23/16	8	8	10
3	31/8	5 <sup>3</sup> /8	41/8	1 3/4	4	21/8	9	9	11
4	41/8	6%	6	2	4	3%	11	13	17
5	5 <sup>3</sup> /16	7 5/8	6	21/8	4	5	15	15	21
6	61/8	8 <sup>3</sup> / <sub>4</sub>	61/2	21/8	4	6	17	19	26
8	81/8	11	8 5/16	21/2	6	8	29	31	42
10	101/8	13%	9	21/2	6	10 1/16	44	47	65

HAND	LE	DIMENS	IONS	5		
HANDLE SUB-ASSEMBLY NO.	VALVE	VALVE FIG. NO.	G	Y	F	WEIGHT
812-020-401-026	2-3	99,100,122	101/2	3	11/4	2
812-040-401-026	4-5	99	101/2	3	11/4	2
812-040-401-026	4-6	100,122	101/2	3	11/4	2
812-060-401-026	6	99	101/2	3	11/4	2
812-070-401-026	8	100,122	14	33/4	11/4	4
812-080-401-026	8	99	14	33/4	11/4	4
812-080-401-026	10	100,122	14	33/4	2	4
812-100-401-026	10	99	14	33/4	2	4

POSITIO	NING	CAP DI	MEN	ISIO	NS		
POSITIONING CAP SUB-ASSEMBLY NO.	VALVE	VALVE FIG. NO.	S	Т	U	W	WEIGHT
812-020-407-003	2-3	99,100,122	25/8	13/4	13/4	3/4	1/2
812-040-407-003	4-5	99	25/8	13/4	13/4	3/4	11/2
812-040-407-003	4-6	100,122	25/8	13/4	13/4	34	11/2
812-060-407-003	6	99	2 5/8	13/4	134	3/4	11/2
812-100-407-000	8	100,122	33/4	11/2	3	31/2	21/2

NO SPEC NO.

NO. DATE	TOLERANCE	REVISIONS	DR:EMS CH: BMM_APPD: BMM_	SM0I04
			ELASTOMER SEATED VALVES WITH NOTCH PLATE HANDLE ASS'Y. AND	DATE: 2-20-70

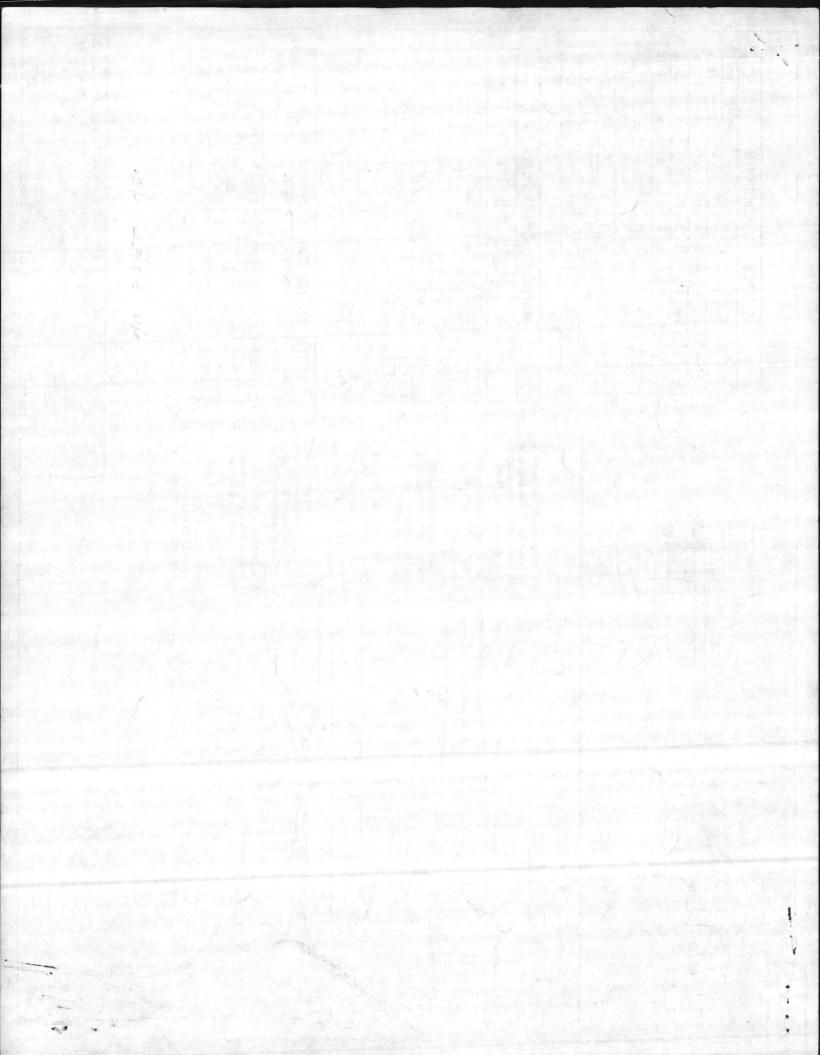
I. GEAR OR HANDI-CRANK OPER-2. NOTCH PLATE HANDLE PRO-

3. FIGURE NO'S. 99,100,8 122

LUGS FOR 125 OR 150 POUND

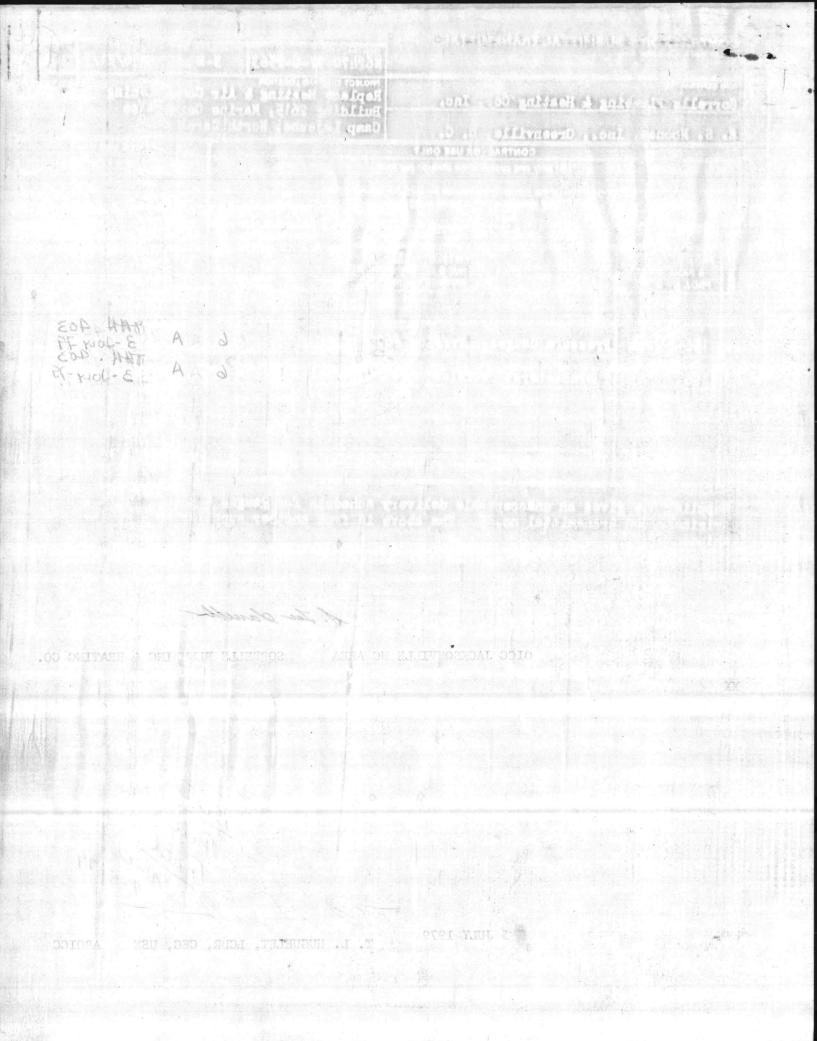
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INSERT 10.0



	ANTDIV 4-4355/3 (Rev. 6/76)		NTRACT NO. 62470-77-C-256	3 TRANSMIT	B	6/21/79
0	CONTRACTOR rrells Plumbi	Re Haulden On the	oject title and Location eplace Heating uilding 2615,	& Air	Conditi Corps B	oning
ż.	S. Noonan. I	nc., Greenville, S. C. Ca	amp Lejeune, N	orth Ca	rolina	}
		CONTRACTOR USE ONLY	and a second		1.0.00000000000000000000000000000000000	EWER USE ONLY
2	L Contractor Approved	*List only one specification division per form. ist only one of the following categories on each transmi and indicate which is being submitted OICC Approval	ittal form,		A-Appr D-Disa AN-Ap	pproved proved as noted ceipt acknowledged. ments
ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, brochure number)	The set of the set	NO. OF	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
				194		st. g
2	15654-14.4	Pressure Gauges: Trerice #600		6	A	8AA 403 3-Jour 79
23	15654-14.5	Thermometers: Weksler		6	A	JAH . 403 3-JOLY-79
St or sh	TRACTOR'S COMMENTS applier now g riginally on hipment.	ives an unacceptable delivery s transmittal no. 5. The above i	Schedule for guilts from anothe: CONTRACTOR REPRESENTAT	r suppi	Tel. MIO	meters submit promises eau
St ol sl	pplier now g riginally on hipment.	UBMITTALS TO ROICC	CONTRACTOR REPRESENTAT	r suppi	LUMBING	- + HEATING - CC
	y of tRANSMITTAL AND S E RECEIVED BY REVIEWER Submittals are return tractor calls attentic	UBMITTALS TO ROICC	CONTRACTOR REPRESENTAT	IVE (Signature)	LUMBING	& HEATING CC
	y of transmittals are forwar submittals are forwar submittals are forwar transmittal form.	UBMITTALS TO ROICC 1 FROM (Reviewer) OICC JACKSONVILLE NC ned with action indicated. Approval of an item does not in- in to and supports the deviation.	CONTRACTOR REPRESENTAT	VE (Signature) Automation RELLS P viation from Section and	LUMBING the contract in lin comments	E HEATING CC equirements unless the

Anna Carta



9 Com & J . 903 04 - RI4K Rocen - Would you please thave Some BOD / LOOK AT THIS AND PROVIDE A RECOMPLENDATION, Turac jos-72 Arguet

MEMORANDUM OF CALL		
то:	19	
VOU WERE CALLED BY-	YOU WERE VISI	TED BY-
OF (Organization)		
□ PLEASE CALL → PHONE NO. CODE/EXT.		
WILL CALL AGAIN	IS WAITING TO	SEE YOU
RETURNED YOUR CALL	WISHES AN APP	OINTMENT
RECEIVED BY	DATE	TIME
63-109 ℃U.S.GPO:1977-0-246-145/6000	Prescribed by G	M 63 (Rev. 8-76) SA 101-11.6

#### OICC-ROICC

### JACKSONVILLE, NORTH CAROLINA AREA MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

NO	124	mec	
DATE	2 July	1979	

FROM Sorrells Plumbing & Heating Co., Inc.

SUBJECT 77- C-2563, Rep1. Htg/AC, Bldg. 2615

-- CODE --

- SUBMITTAL, TL # 5-B Resubmittal, Pressure Gauges & Thermometers
- 6. Investigate
- 7. Retain Copy
- 8. File
- 9. Denote action and return Buck Tag to Contract Branch

10.\_\_

ROUTING	CODE	SEQUENCE	INITIAL	DATE
43-10	and and a set			
43-20	a second	The second second		
43-30		and the state of the	A Company	a second and a second
43-40				
43-50			1	1 m
43-60	and a stranger			
43-70	and the second second			a familie and
43-80	and the second second	1 (ha	s seen, see	note
43-100		(110	o seen, see	note)
43-200		2	RIK	JUL 3 1979
43-510	and the second second	3		JUL . INT
43-520				
43-525	A States		2010 Pales	
10 A		and the second		and the second

REMARKS: Return Buck Tag to Contract Branch with correspondence unless otherwise indicated.

1. Action

- 2. Information
- 3. Prepare reply for \_\_\_\_
- 4. Prepare reply to \_\_\_\_\_
- 5. Prepare estimate

Sorrells Plumbing & Heating Co., Inc.



Blount International, Ltd. Noonan Engineering Division of South Carolina

June 26, 1979

ROUTING

1

2

3

4 5 6

7

100

ORDER

80

INT

RETURN TO O

Officer in Charge of Construction Department of the Navy Marine Corps Base Building 1005 Camp Lejeune, North Carolina 28542

Attention: LCDR T. L. Huguelet

Subject: Replace HVAC, O Club Contract No. N62470-77-C-2563 BLOUNT Job No. 6-048-18

Gentlemen:

Enclosed is the contractor's resubmittal for gauges and thermometers for the subject project. As stated on his transmittal, the reason for the substitution is a long delivery date on the original approved items.

We do not believe review of substitutions for this purpose is within the scope of our shop drawing review contract. Therefore, we are forwarding the package to your office for your review in accordance with paragraph a(3) of your letter, dated February 14, 1979.

Yours very truly,

Brian H Dulane

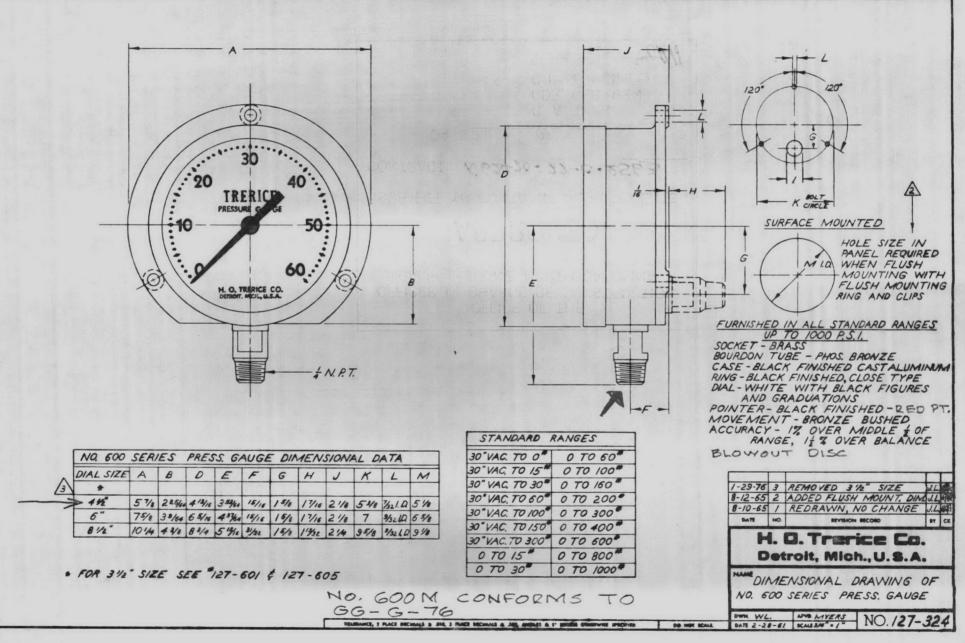
Brian H. Dulaney, P. E. Project Manager

BHD:doj

Enclosure

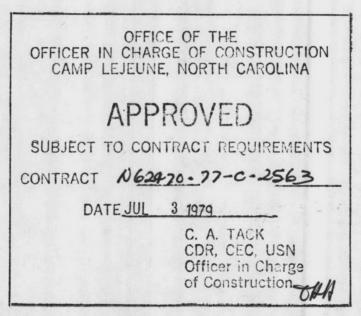
cc: Sorrells Heating & Plumbing (L) CF RF

# 79 JUN 29 AIO: 20



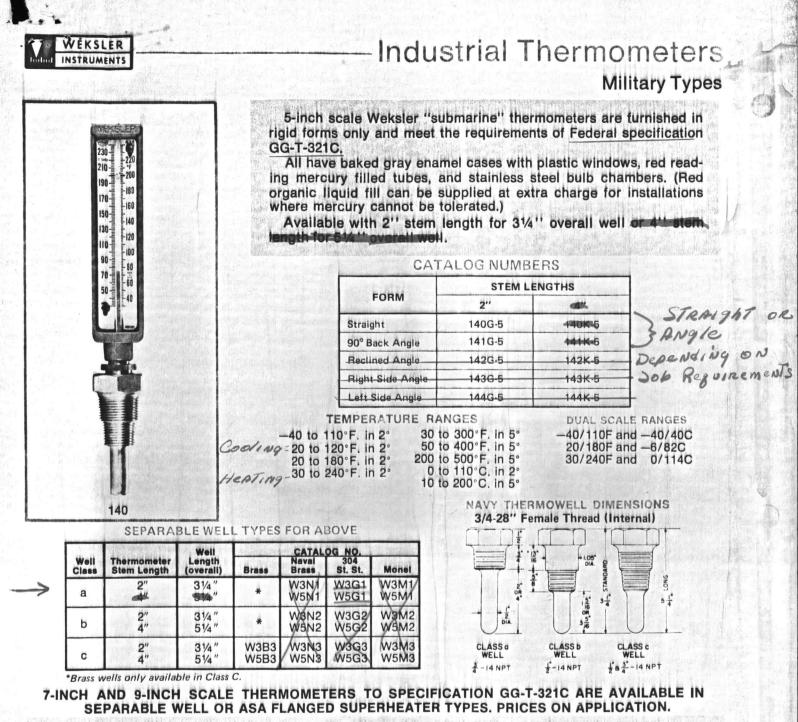
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3,



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ACTION STREET



WHEN ORDERING: Specify (1) Thermometer Catalog No. (2) Range; (3) if required, specify separable well Catalog No. from table above.

GUARANTEE: Weksler Products are warranteed to be of good workmanship and quality and free from defects under normal use and service. This warranty is limited to repairing such defects, provided return is made prepaid to Weksler Instruments Corporation, Freeport, New York, within one (1) year after delivery to the original purchaser. Weksler Instruments Corporation shall not be liable for consequential damages. This warranty is in lieu of all other warranties, guarantees, liabilities or obligations, statutory, expressed or implied to the original purchaser or to any other person. No agent is authorized to assume for Weksler Instruments Corporation any liability, except as set forth above. Orders submitted on customer's own purchase order forms, which forms may contain statements, clauses, or conditions modifying, adding to, repugnant to, or inconsistent with the terms and provisions of the Seller herein contained will be accepted by the Seller only upon condition and with the express understanding that notwithstanding any such statements, clauses, or conditions contained in any order forms of the customer the liabilities of the Seller shall be determined solely by its own terms and conditions of sale, and in accepting and consummating any such order the Seller shall be deemed not to have in any way changed, enlarged or modified its liabilities or obligations as fixed by such terms and condition of sale as stated by the Seller herein.

SUBJECT TO EXPRESS WARRANTY ABOVE AND NO OTHER PLEASE READ CAREFULLY. SALES REPRESENTATIVES IN PRINCIPAL CITIES WEEKSLEER INSTRUMENTS CORPORATION Since 1928 DO MILL ROAD FO. BOX 3040, FREEPORT LUNY 1520 Telephonel 510/523/010 Telephonel 510/523/010

	OFFICE OF THE OFFICER IN CHARGE OF CONSTRUCTION CAMP LEJEUNE, NORTH CAROLINA	
111	APPROVED SUBJECT TO CONTRACT REQUIREMENTS CONTRACT NG2470 - 77-C-2563 DATE_JUL 3 1979 C. A. TACK CDR, CEC, USN Officer in Charge et Construction	

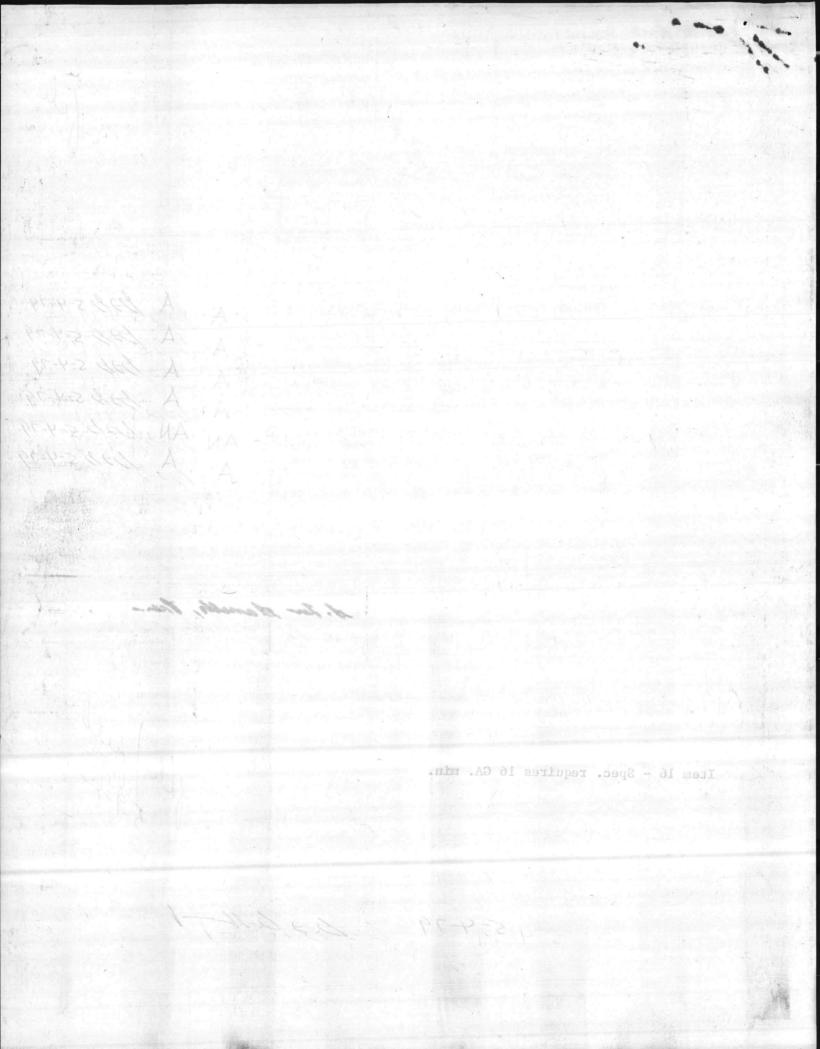
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1 M	CONTRACT		ATTEND IN ALL	The second second second second	N62470-77-	ALC: MENDOWN FOR THE SAME	1 3 C	A STREET STREET	H/ 10/ 13
So	rrells			ing Co., Inc.	Replace H Building	Heating 2615, M	arin	e Corps	Base ()
			South Caro	lina	Camp Leje	eune, No	rth	Carolina	a the for
la e e Rei La e e Rei	Cia COZA	anson RP-1	7 194	CONTRACTOR USE ONLY		C. C		and the second second second	EWER USE ONLY
	- Angel	a support of the second	*List on	ly one specification division	per form.		S MAR	A-Appi	CTION CODES
	r krinden Grand Frankrige		ist only one of th and	e following categories on ea indicate which is being subn	nitted	esti Shirina Galebel		AN-Ap RA-Re	pproved proved as noted ceipt acknowledged
X	Contracto	r Approved	La se de la serie de la ser	OICC Approval		viation/Substi For OICC App		C-Con R-Resi	nments ubmit
ITEM NO.	& PAR	PEC. SECT. A. and/or DWG. NO. *		İTEM IDENTIF (Type, size, model no., f brochure nu	Mfg. name, dwg. or		NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DA
1.1	15654	-10.3	Volume Ex	tractors: Titus	5 E-30-1 & E-	33-1		A,	\$12 kg 5-4-
13	nqon	10.4	Air Diffu	isers: Titus B-	-83.2 & B-128.			A,	(J2/1 5-4
14	"do"	10.5	Supply Re	gisters: Titus	C-70-4	Carling and a second		A.	B3\$ 5-4-
15	"do"	10.6	Return Re	gisters: Titus	C-35-5	a diale in		A	13B 5-4.
16	"do"	10.7	Fresh Air	r Intake Louvers	: Vent Prods.	445-J		AN_	1215 5-4
13. 11		<b>《从底下的书》的时代</b>		A PARTY AND A PART	a half a set of a first of the set of the				
17 CON	"do"	COMMENTS	Roof Vent	tilators: Shipm	an S-RV-1			<u>  A</u>	<u>1928 5-4</u>
CON	TRACTOR'S				an S-RV-1	PRESENTATIVE	Signature	<u>   A</u>	<u>1920 5-9</u>
CON	TRACTOR'S		Roof Vent			PRESENTATIVE			<u>1977 5-1</u>
	TRACTOR'S		SUBMITTALS TO ROI						<u>1977 5-</u>
	TRACTOR'S TRACTOR'S Y OF TRANS TRE RECEIVED Submit tractor Submit	SMITTAL AND S D BY REVIEWER Itals are retur calls attentic	SUBMITTALS TO ROU	CC FROM (Reviewer)	CONTRACTOR REF d. doc does not include approval	of any deviati	on from	the contract	requirements unless
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	TRACTOR'S TRACTOR'S Y OF TRANS TRE RECEIVED Submit tractor Submit transm Trewer'S CC	SMITTAL AND S D BY REVIEWER ttals are return calls attention ttals are forw tital form. DMMENTS 5 - Spec	SUBMITTALS TO ROL	CC FROM (Reviewer) Indicated. Approval of an item of the deviation.	CONTRACTOR REF d. doc does not include approval	of any deviati	on from	the contract	requirements unless
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# SUBMITTAL

PROJECT:

REPLACE HEATING & A/C BUILDING #2615 CAMP LEJEUNE, NORTH CAROLINA

PROJECT:

POST ENGINEER

CONTRACTOR:

SORRELL'S PLUMBING & HEATING COMPANY P. O. BOX 9604 GREENSBORO, NORTH CAROLINA 27408

EQUIPMENT : ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 TITUS PRODUCTS DIVISION ENVIRONMENTAL ELEMENTS CORPORATION AIR DISTRIBUTION

APPROVED APPROVED AS NOTED DISAPPROVED SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. SUBMITTIED BY: APPROVAL OF A SUBMIT AL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS HE DEVIA-

TION --- THE CONTRACTOR SHALL BE RESPONS-IBLE FOR PROVIDING PROPER FHYSICAL DIMEN-SIONS & WEICHTS, COORDINATION OF TRADES, LTC., AS REQUIRED.

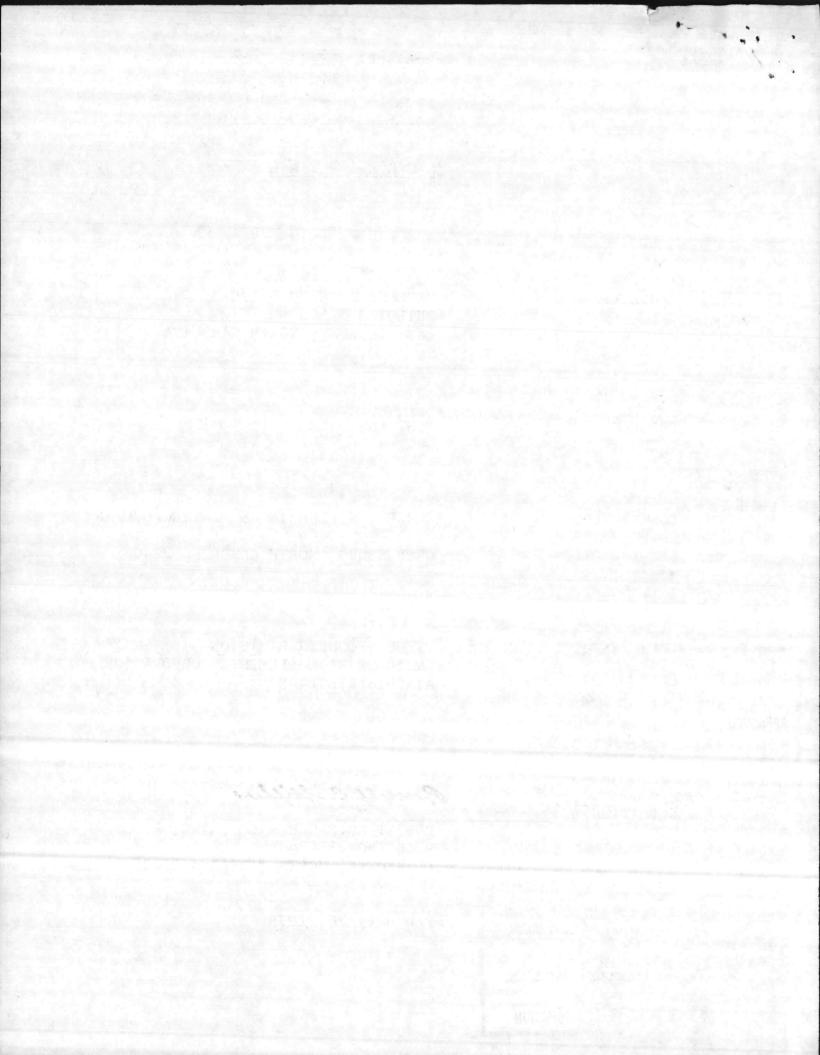
REVIEWER 2. 2. Bit DATE 5-4-79

FOR OFFICER IN CHARGE OF CONSTRUCTION

Russell E. Sliphers

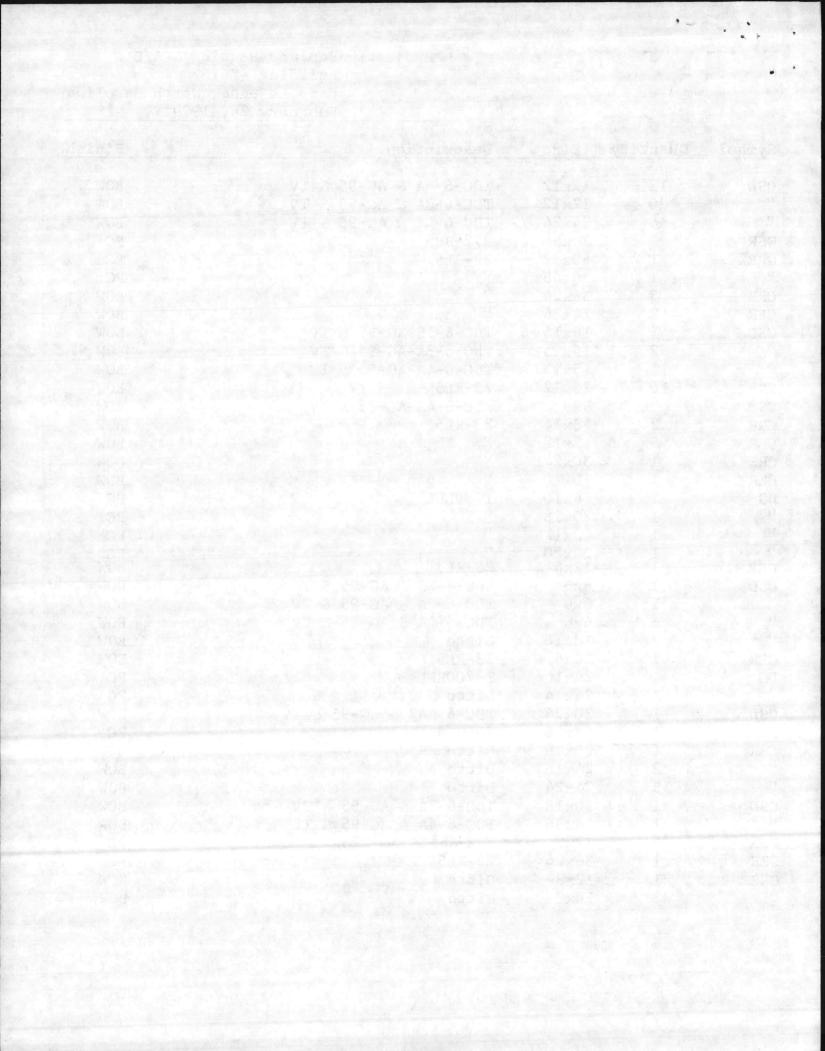
ROBERT E. MASON & CO., INC. P. O. BOX 33424 CHARLOTTE, NORTH CAROLINA 28233

February 26, 1979



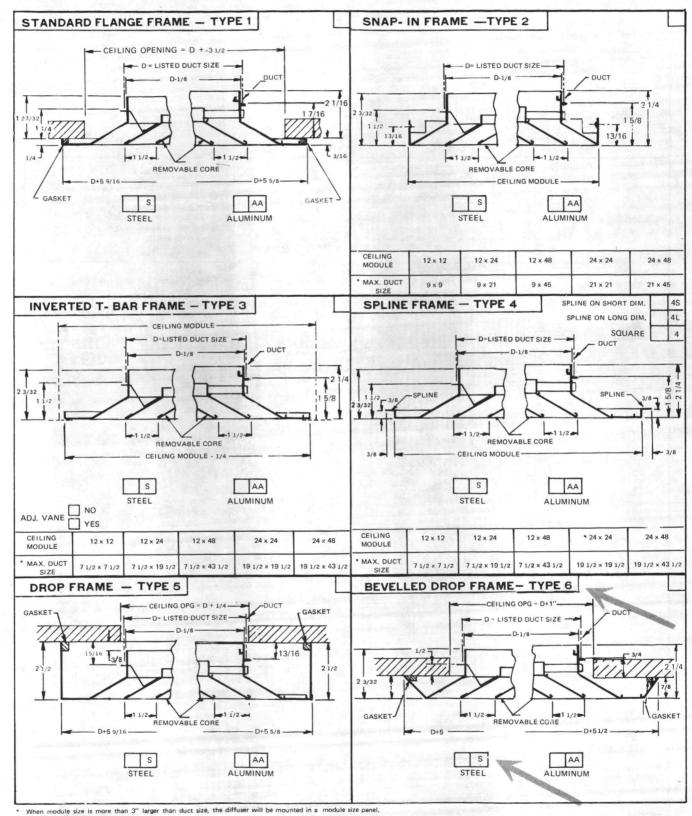
Project: Replace Heating & A/C Building #2615 Camp Lejeune, North Carolina February 26, 1979

Symbol	Quantity	Size	Description	Finish
CSD	12	12x12	TDC-6-4A & AG-95 & TV	BOW
11	20	12x12	TDC-6-3A & AG-95 & TV	BOW
11	6	24x24	TDC-6-4A & AG-95 & TV	BOW
WSR	7	24x6	272-RS5	PC
WRR	1	60x32	23-RL5	PC
11	1	36x48	П	PC
CRR	5	36x24	"	BOW
CER	2	24x16	<b>II</b>	BOW
CSD	1	15x15	TDC-6-1S-AG-95 & TV	BOW
11	2	15x15	TDC-6-3A-AG-95 & TV	BOW
11	11	15x15	TDC-6-4A-AG-95 & TV	BOW
CRR	10	24x12	23-RL5	BOW
CSD	6	9x9	TDC-6-4A-AG-95 & TV	BOW
CRR	2	48x14	23-RL5	BOW
CER	5	12x12	П	BOW
CRR	1	30x24	11	BOW
CER	1	10x10	11	BOW
DG	1	16x10	T700BFL	PC
11	1	20x18		PC
11	1	18x12	"	PC
11	1	24x20	11	PC
CER	1	12x6	23-RL5	BOW
CSD	1	6x6	TDC-6-2S & AG-95 & TV	BOW
11	1	6x6	TDC-6-3A & AG-95 & TV	BOW
11	6	6x6	TDC-6-4A & AG-95 & TV	BOW
п	2	18x18	Ditto	BOW
CER	1	10x6	23-RL5	BOW
DG	1	24x16	T-700BFL	PC
	1	24x14	Ditto	PC
CSD	1	30x24	TDC-6-3A2 & AG-95 & TV	BOW
WRR	1	48x20	23-RL5	PC
CRR	1	20x18	Ditto	BOW
11	2	24x18	Ditto	BOW
11	3	24x24	Ditto	BOW
CSD	1	30x18	TDC-6-2B & AG-95 & TV	BOW
"	1	36x36	TDC-6-4A & AG-95 & TV	BOW
WSR	6	12x8	272-RS5 & AG-225	PC
WRR	1	36x24	23-RL5	PC
CER	1	12x8	Ditto	BOW
11	2	10x8	Ditto	BOW



# SUBMITTAL SHEET

MODEL TDC CEILING DIFFUSER



### WATERLOO, IOWA 50704

### TITUS MANUFACTURING CORPORATION

LITHO IN U.S.A.

Submittal B-83-2 Rev. C

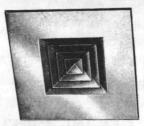
#### FINISH:



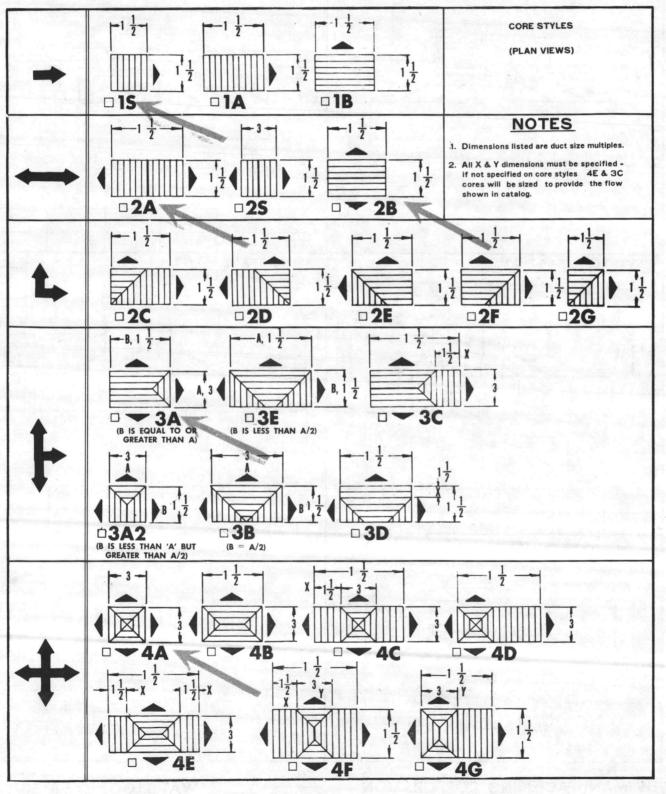
1

(W-1) BAKED OFF-WHITE ENAMEL (STD. FOR STEEL)

BAKED ALUMITINT ENAMEL (ALTERNATE STD. FOR STEEL) (STD. FOR ALUMINUM)



(FRAME TYPES 2, 3, & 4 ONLY) NOTE: WHEN MODULE SIZE IS MORE THAN 3" LARGER THAN DUCT SIZE, THE DIFFUSER WILL BE MOUNTED IN A MODULE SIZE PANEL AS SHOWN IN ABOVE PICTURE.



TITUS MANUFACTURING CORPORATION

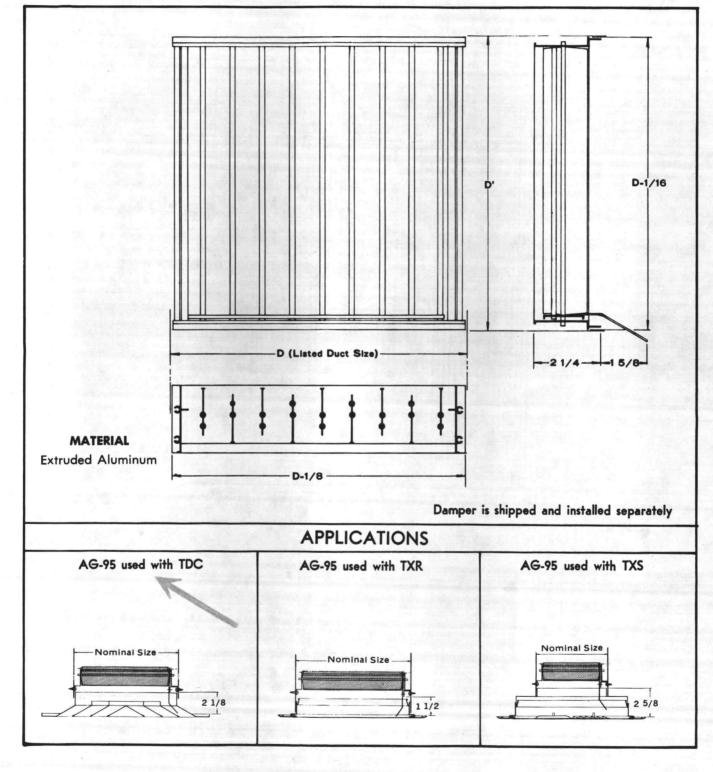
WATERLOO, IOWA 50704 Submittal B-83-2

Rev B

# • TITUS

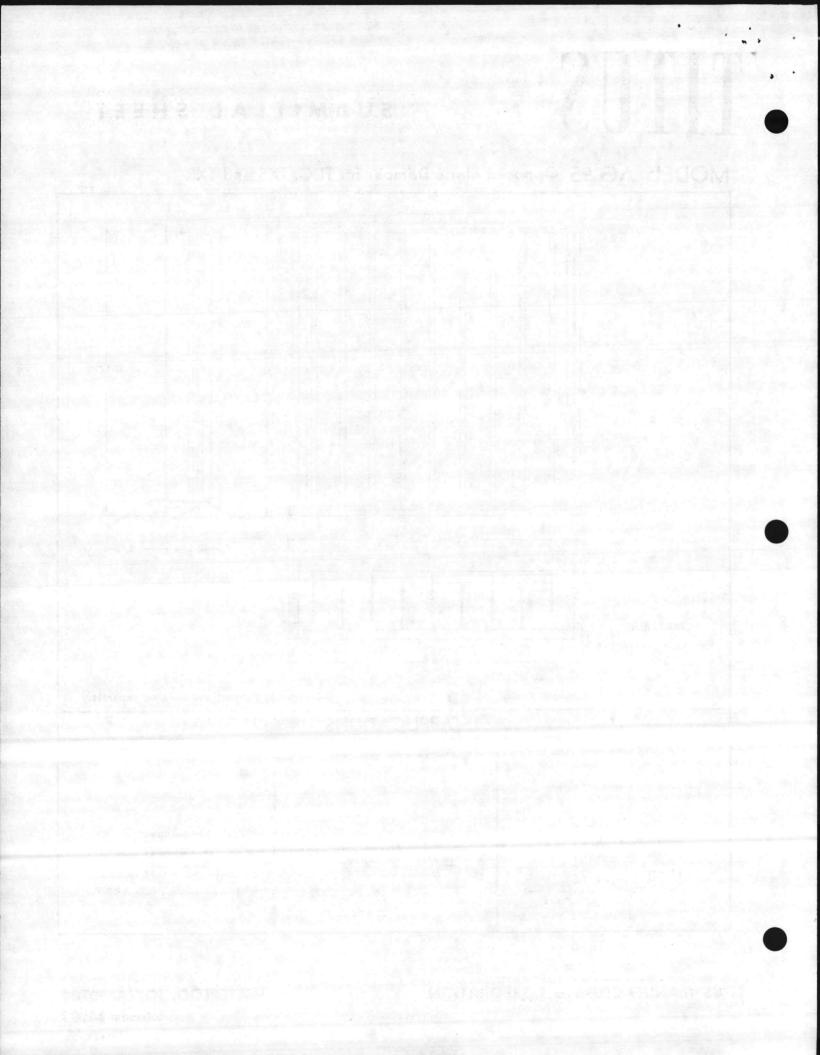
# SUBMITTAL SHEET





### TITUS MANUFACTURING CORPORATION

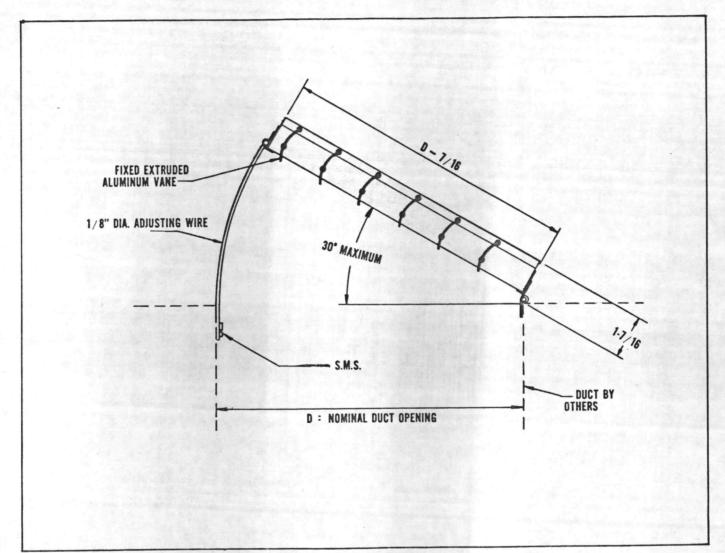
# WATERLOO, IOWA 50704

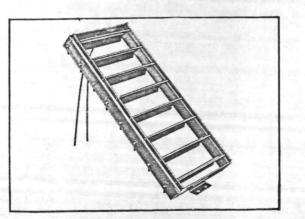


# TITUS

SUBMITTAL SHEET

# MODEL TV VOLUME EXTRACTOR





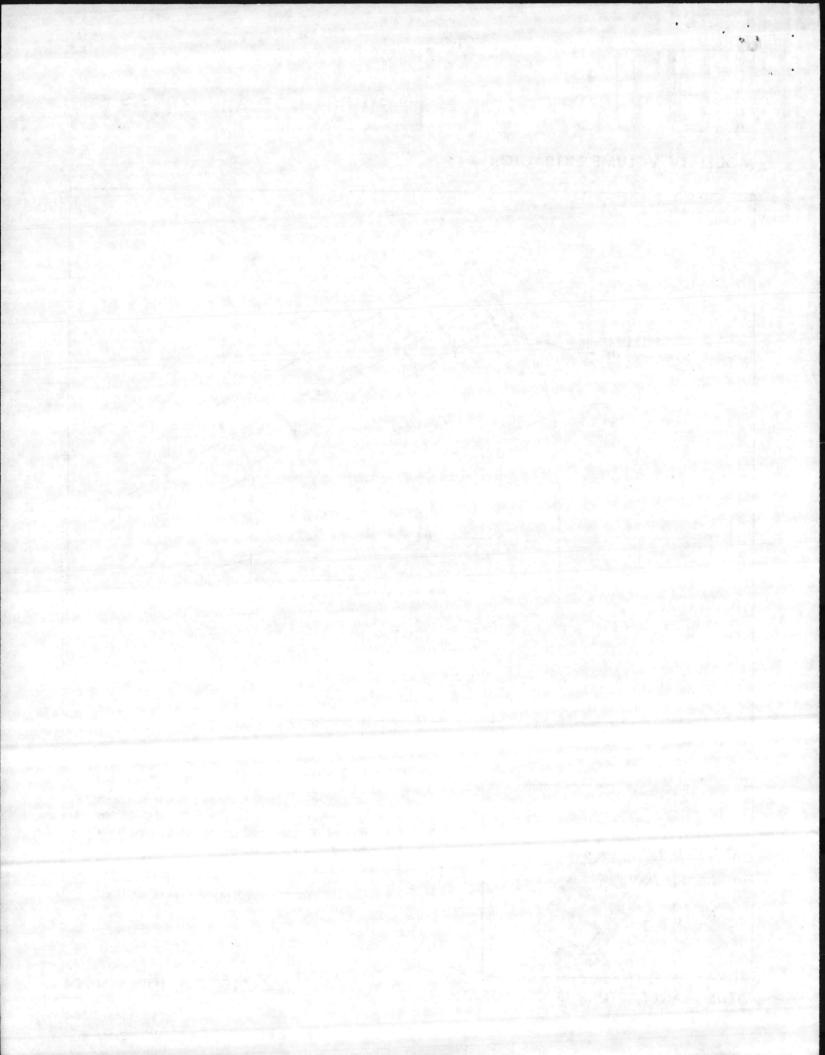
TITUS MANUFACTURING CORPORATION

Fixed blades deflect air to position required to fit application. Provides even air distribution to neck of diffuser . . . or into stub duct. Unit can be set at any angle desired.

Blades of extruded aluminum. Furnished in sizes to fit any standard diffuser neck or duct. Specify size desired.

WATERLOO, IOWA 50704

Sumbittal E-30-1 Rev. A



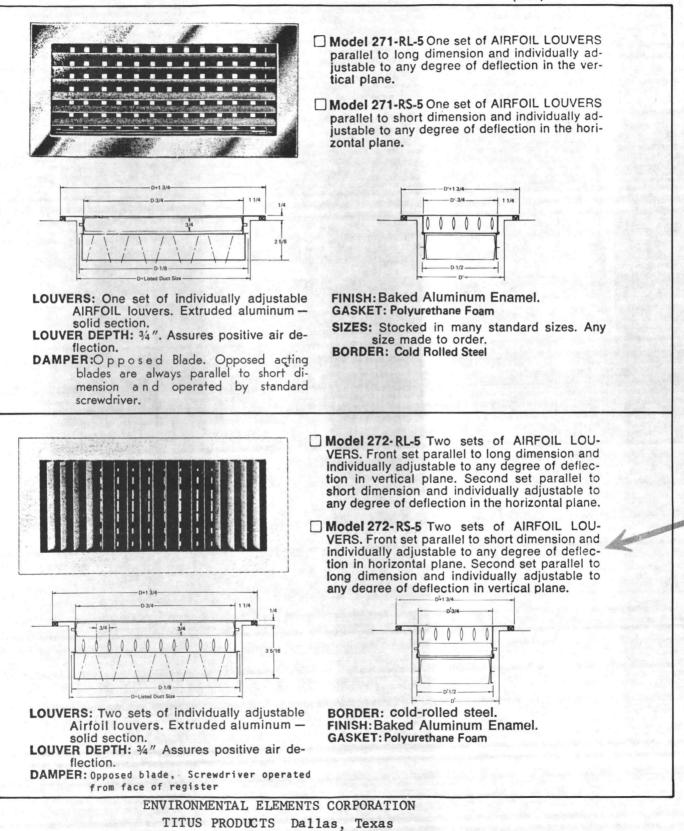


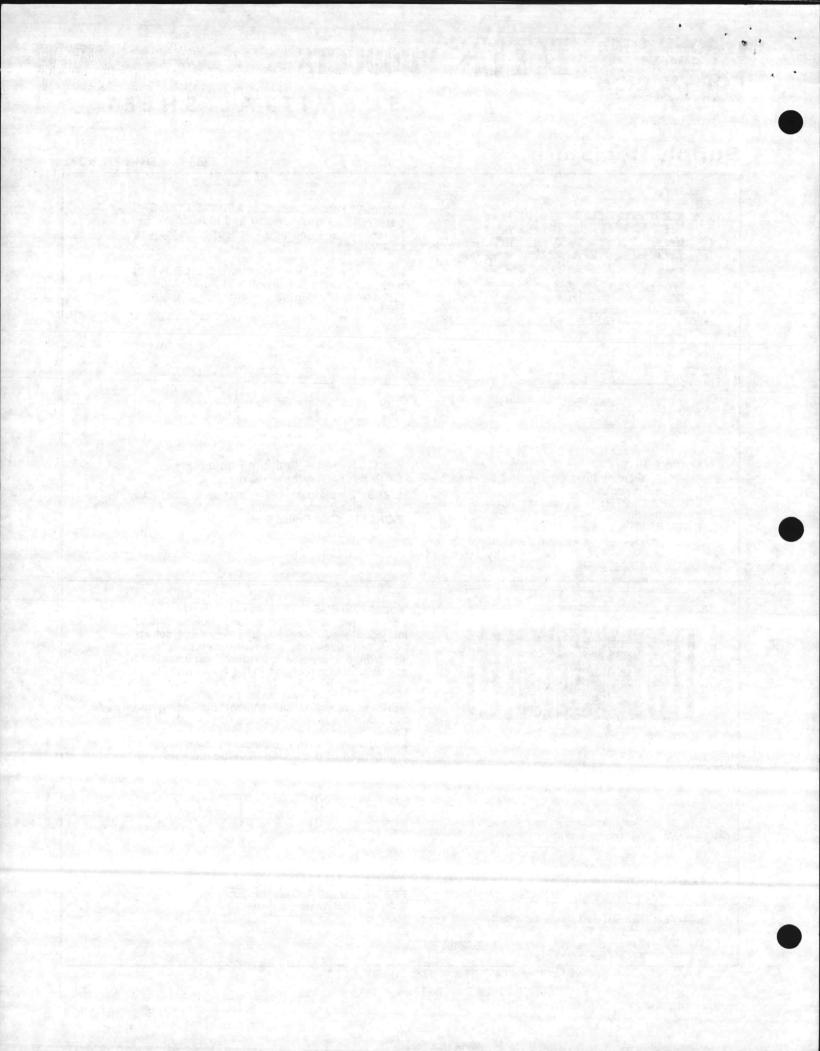
# TITUS<sup>®</sup> products

# SUBMITTAL SHEET

# **Supply Registers**

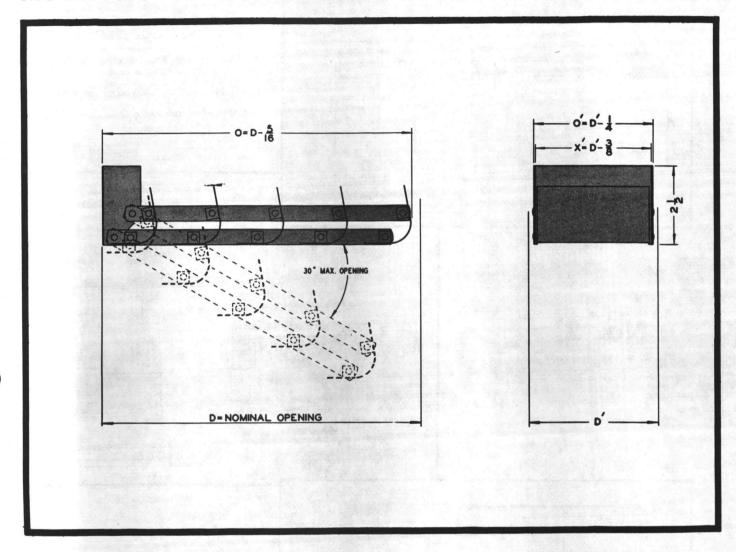
#### (STEL) Core Styles 271 & 272

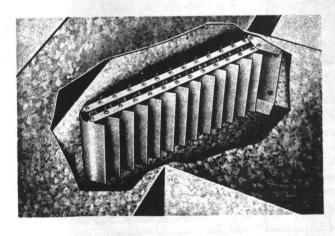




SUBMITTAL SHEET

Model AG-45 & AG-225 AIR VOLUME EXTRACTOR AND CONTROLLER





TITUS

## AG-45 — TURNING VANES ON 1" CENTERS AG-225 — TURNING VANES ON 2" CENTERS

Gang-operated blades are fully adjustable from wide open to completely closed positions to control air direction and volume. Provides even air distribution to diffuser face.

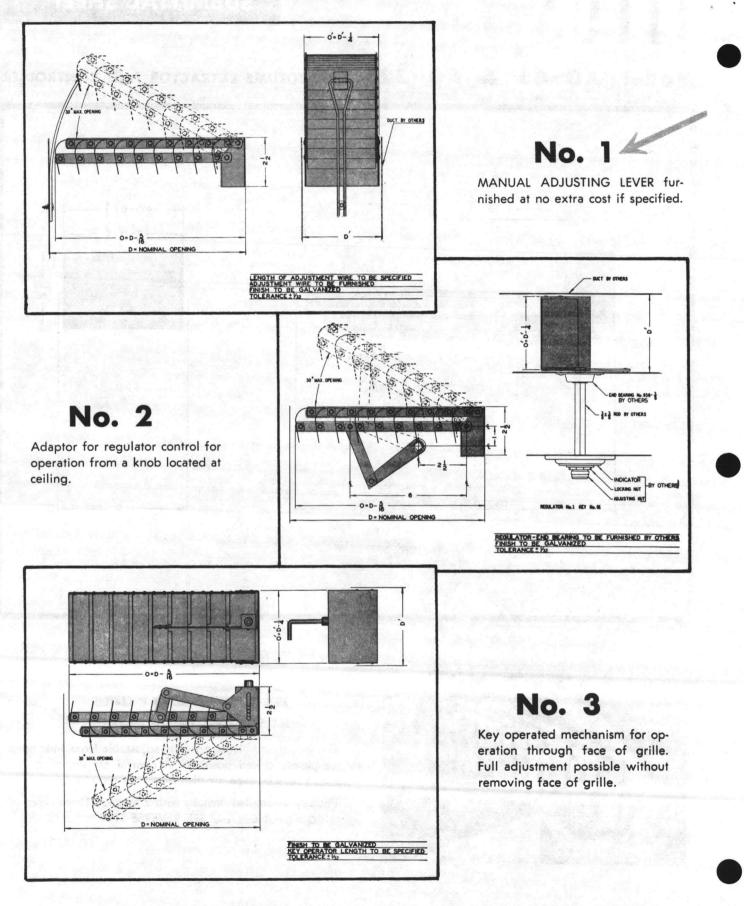
Factory assembled, installs with 2 screws. Three types of operators available. . . . SEE REVERSE SIDE.

#### TITUS MANUFACTURING CORPORATION

# WATERLOO, IOWA 50704

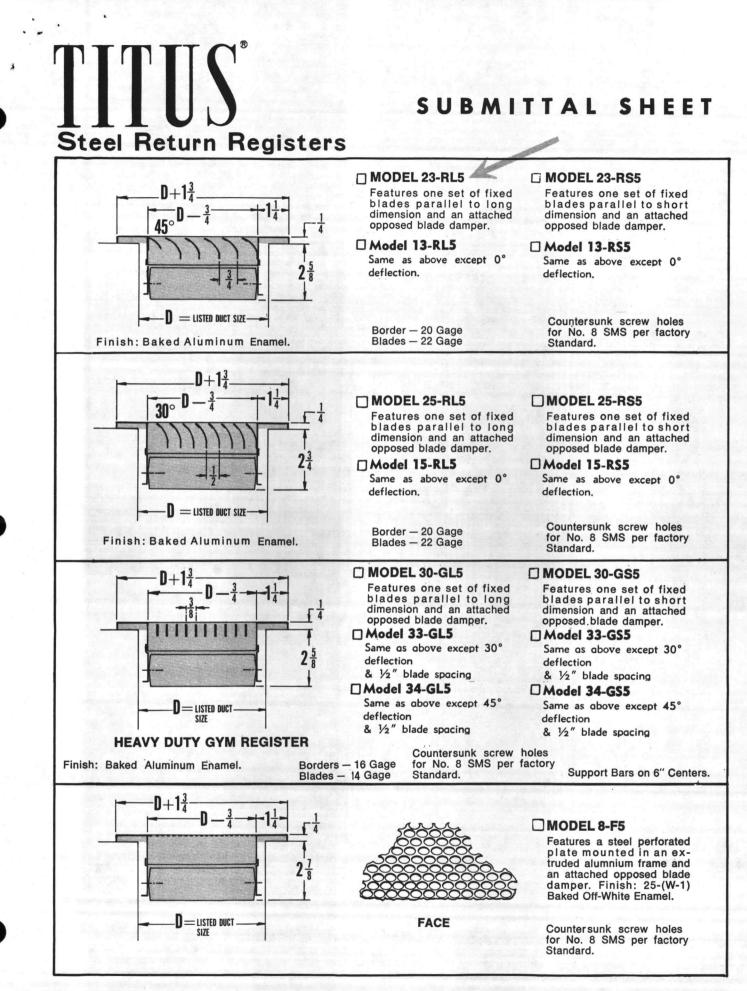
Submittal E-33-1 Rev. B

# **OPERATORS**



TITUS MANUFACTURING CORPORATION

WATERLOO, IOWA 50704 Submittal E-33-1 Rev. B

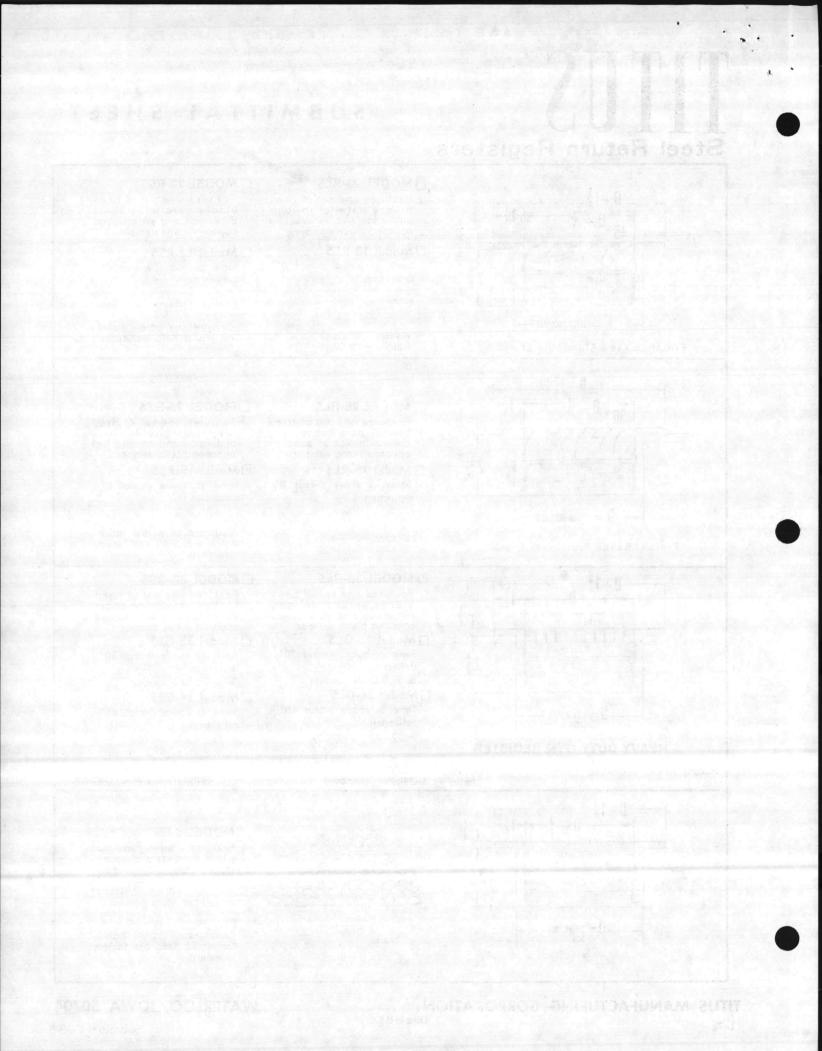


# TITUS MANUFACTURING CORPORATION

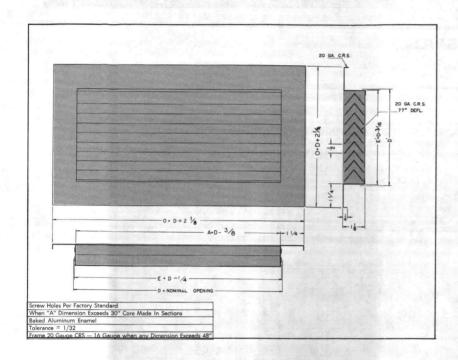
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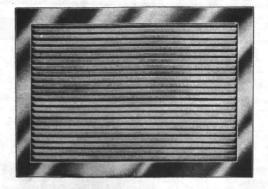
## WATERLOO, IOWA 50704

Submittal C-35-5



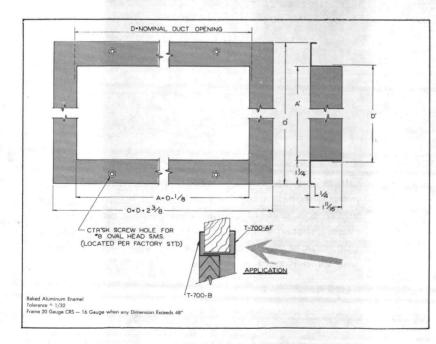
# Model T-700-B Door Grille





Offers maximum free area. Completely sight proof. Widely used for exhaust and return air grilles where concealment of duct desirable. Ruggedly constructed of closely spaced v-shaped louvers parallel to long dimension, rigidly mounted in a flange type frame. Rattle-free, even if door is slammed.

Model T-700-AF Auxiliary Frame



The T-700 B Auxiliary Frame is available for use with the T-700 B Door Grille. Frame telescopes over door grille. Adjusts grille to fit any door thickness from 1%" to  $2\frac{1}{2}$ " and gives a finished appearance to installation.

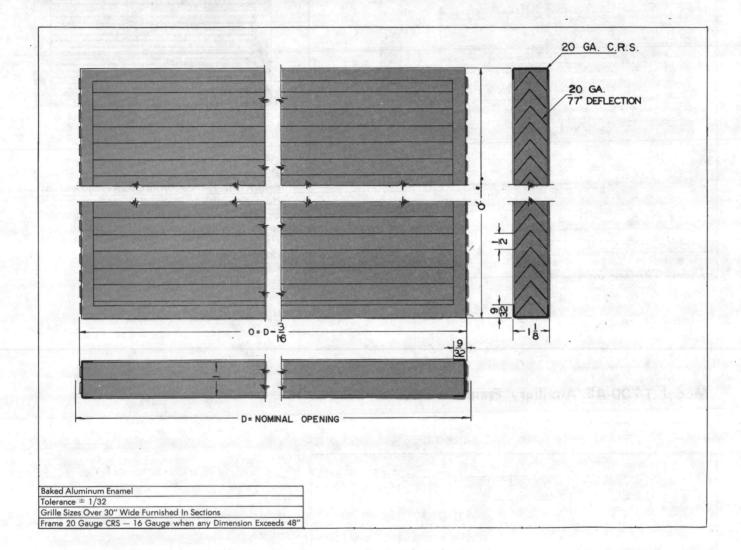
TITUS MANUFACTURING CORPORATION

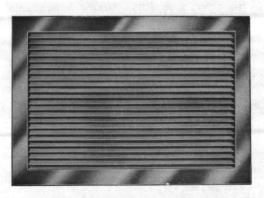
WATERLOO, IOWA Submittal C-10-1 Rev. B

# TITUS

# SUBMITTAL SHEET

# **MODEL T-700-A** DOOR GRILLE





Offers maximum free area. Are completely sightproof. Widely used for exhaust and return air grilles where concealment of duct desirable. Constructed of closely spaced v-shaped louvers parallel to long dimension, rigidly mounted in a channel type frame. Rattlefree even if door is slammed.

Submitted By

Job

# TITUS MANUFACTURING CORPORATION

LITHO IN U.S.A.

WATERLOO, IOWA Submittal C-10-1 Rev. B

Chet Adams Company

Sales Engineers AIR CONDITIONING EQUIPMENT

VENTILATING

AIR POLLUTION SYSTEMS

ENERGY CONSERVATION

March 7, 1979

#### SUBMITTAL DATA

Project:	Replace Heating & Air Conditioning COM (0) Building 2615 Camp LeJeune, North Carolina
Engineer:	R. S. Noonan
Contractor:	Sorrells Plumbing & Heating Company Greensboro, North Carolina
Order No.:	1467
Sales Rep.:	Chet Adams Company Greensboro, North Carolina
Manufacturer:	Vent Products Company

#### LOUVERS

HEATING

- 1 Size 16" x 12" Model VSL-445J Galvanzied Fixed Bladed Louver, with Bird Screen.
- 1 Size 12" x 6" Ditto Above.
- 1 Size 14" x 14" Ditto Above.
- 1 Size 12" x 8" Ditto Above.
- 1 Size 24" x 12" Ditto Above.

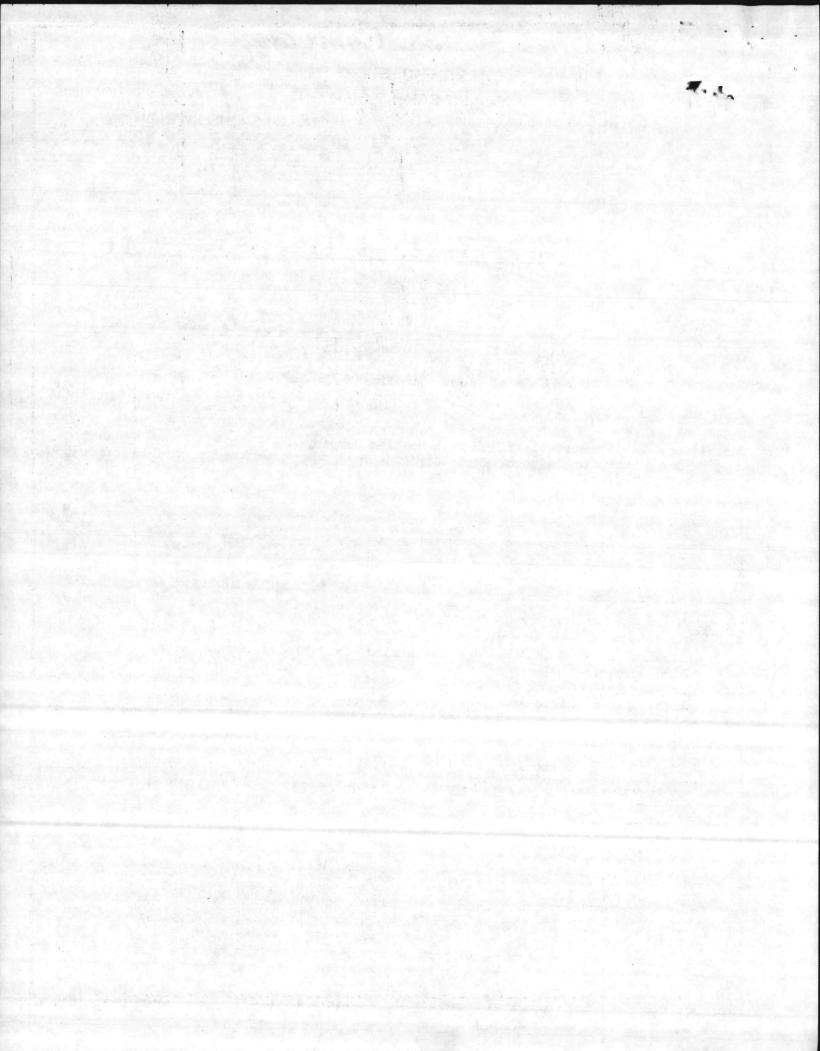
RALEIGH, N. C. 27605 Box 10401 919/828-3366

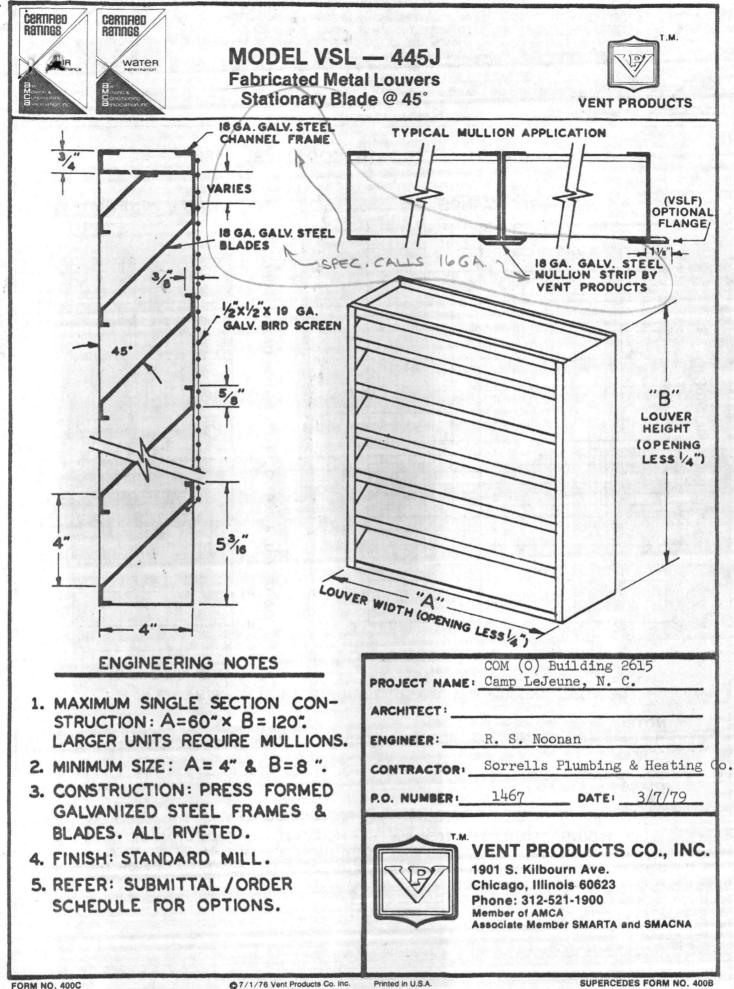
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GREENSBORO, N. C. 27402 Box 3073 919/273-0566

CHARLOTTE, N. C. 28212 Suite 114B 6000 Monroe Road 704/568-3178

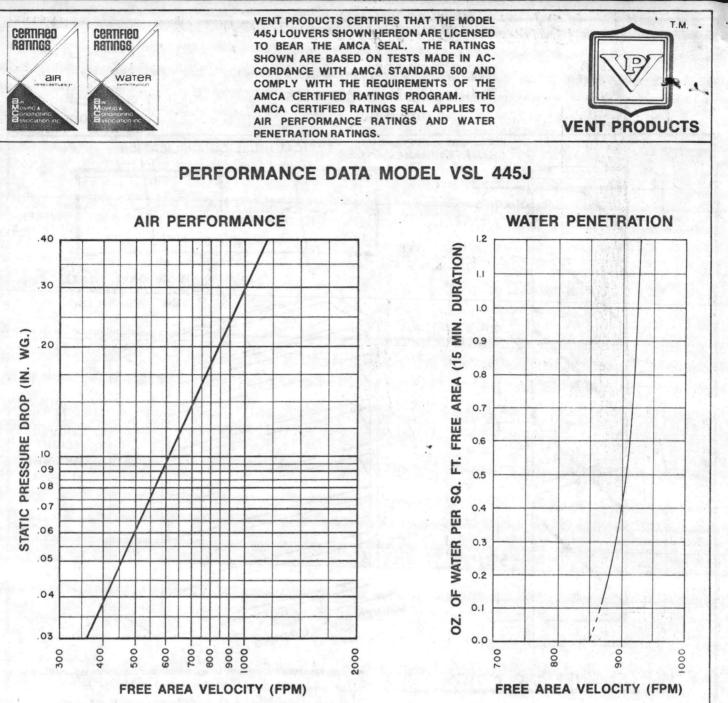
GREENVILLE, 5. C. 29602 P. O. Box 2592 803/268-3550





(Yellow Color)

©7/1/76 Vent Products Co. Inc.





#### NOTE:

THE DATA SHOWN IN THE CHART ABOVE INCLUDES THE EFFECT OF A ½" x ½" x 19" GA. GALV. BIRD-SCREEN.

RECOMMENDED INTAKE DESIGN FREE AREA VELOCITY 850 F.P.M. WHEN MINIMUM WATER PENE-TRATION IS DESIRED.

#### TO DETERMINE PRESSURE DROP

- 1. USING LOUVER DIMENSIONS, DETERMINE FREE AREA OF LOUVER FROM CHART FORM NO. 402.
- 2. FREE AREA VELOCITY IN FPM IS DETERMINED BY DIVIDING DESIGN CFM BY FREE AREA.
- PRESSURE DROP CAN NOW BE DETERMINED BY LOCATING THE POINT AT WHICH THE SLANT LINE INTERSECTS THE DESIGNED FREE AREA VELOCITY. THE PRESSURE DROP IS THEN READ FROM THE VERTICAL SCALE ON THE LEFT.

Chet Adams Company

Sales EngineersHEATINGAIR CONDITIONING EQUIPMENTVENTILATINGAIR POLLUTION SYSTEMSENERGY CONSERVATION

March 7, 1979

#### SUBMITTAL DATA

Project:	Replace Heating & Air Conditioning COM (0) Building 2615 Camp LeJeune, North Carolina
Engineer:	R. S. Noonan
Contractor:	Sorrells Plumbing & Heating Company Greensboro, North Carolina
Order No.:	1467
Sales Rep.:	Chet Adams Company Greensboro, North Carolina

#### Manufacturer: Shipman Industries

#### Intake Relief Vents

- 1 Size 36" x 16" Throat Model S-RV-1 Relief Ventilator, Intake, with bird screen and Model IRC-1 Roof Curb.
- 1 Size 20" x 12" Ditto Above.
- 1 Size 24" x 12" Ditto Above.

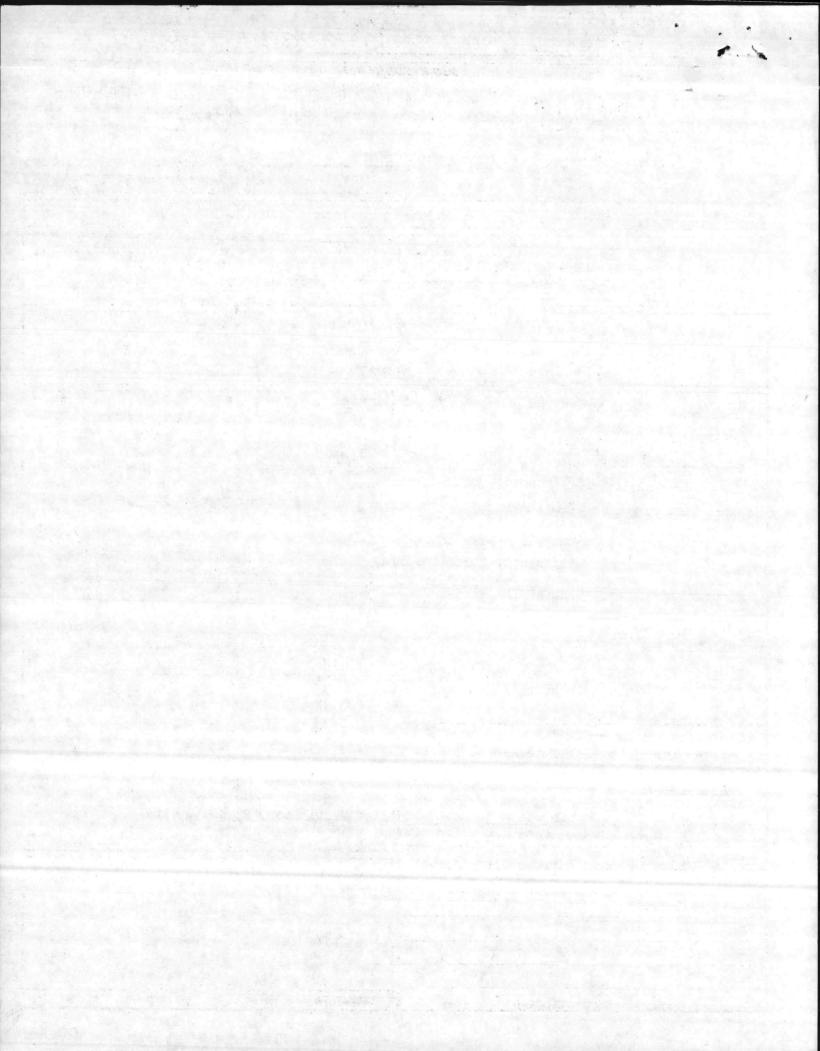
#### Exhaust Relief Vents

- 1 Size 20" x 20" Throat Model E-RV-1 Relief Ventilator, Exhaust, with bird screen and Model IRC-1 Roof Curb.
- 5 Size 14" x 14" Throat Ditto Above.
- 3 Size 10" x 10" Ditto Above.

RALEIGH, N. C. 27605 Box 10401 919/828-3366 GREENSBORO, N. C. 27402 Box 3073 919/273-0566 CHARLOTTE, N. C. 28212 Suite 1148 6090 Monroe Road 704/568-3178

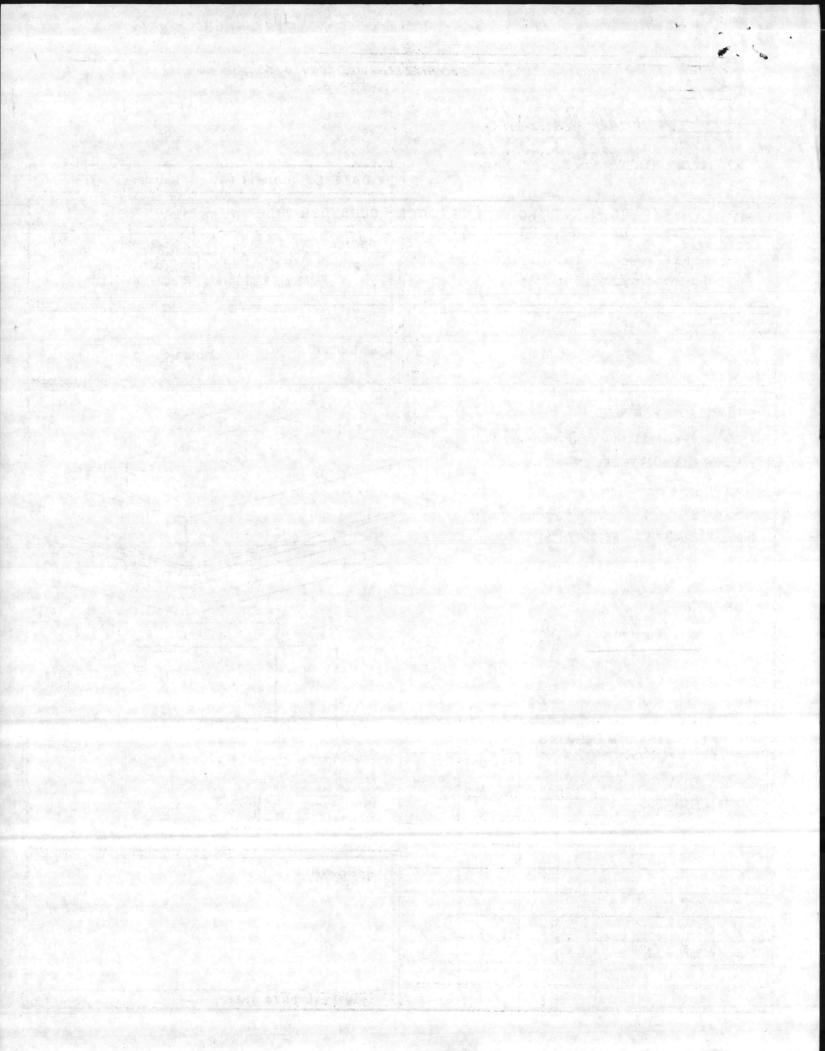
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GREENVILLE, S. C. 29602 P. O. Box 2592 903/268-3550



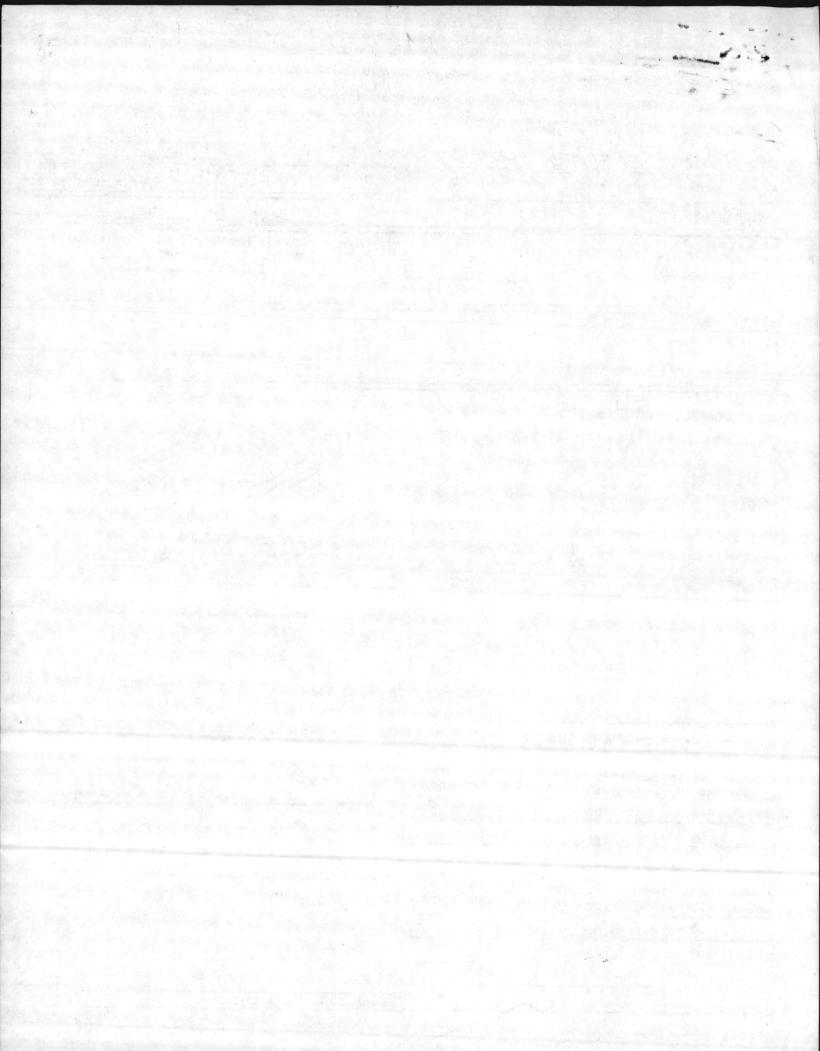
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CUSTO	MER!	ells H	Plumb:	ing &		ing Comp.na	any	PROJECT: Replace Heating & Air COM (0) Building 2615 Camp LeJeune, North Ca	
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						ENGINEER: R. S Noonan
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M CONTRACTOR	PROJECT TITLE AND LOCATION	5		14/10/10 00
prrells Plumbing & Heating Co., Inc.	Replace Heating &			
R. S. Noonan, Inc. Greenville, South Carolina	Building 2615, Ma Camp Lejeune, Nor			
CONTRACTOR USE ONLY				EWER USE ONLY
*List only one specification division pe List only one of the following categories on each and indicate which is being submi Contractor Approved OICC Approval	h transmittal form,		A-Appr D-Disaj AN-Apj	oproved proved as noted ceipt acknowledged ments
PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. * ITEM IDENTIFIC (Type, size, model no., Mi brochure num	lg. name, dwg. or	NO. OF COPIES	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
	oil Piping, including		AN	123 6/6/29 sec submitte
(See Note D Below) Comb. Flow-Meter & Bal. F	Taco 740 or Titting: 780		an Bas Rép <u>rés</u> é	SEE SUBMITTE
1 15654-13.13 Bal. Valves (By-Pass only	): Apollo 70 Series		A	123 6/1/79
2 15654-14.4 Pressure Gauges: U. S. G	and the second second second second	1.1.8	AN	NND 6-4
3 15654-14.5 Thermometers: Palmer Mo	del 5-A	an all a	AN	NND 6-4-
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COPY OF TRANSMITTAL AND SUBMITTALS T	O ROICC		PRESENTATIVE (Signal		And the second s
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Changed thermometer ranges. ITEM 23:  $\frac{1}{2} \sum_{\substack{i=1,\dots,n\\ i\neq i}}^{n-1} \frac{1}{2} \sum_{\substack{i=1,\dots,n}}^{n-1} \frac{1}{2} \sum_{\substack{i=1,\dots,n}}^{n-1} \frac{1}{2} \sum_{\substack{i=1,\dots,n}}^{n-$ 

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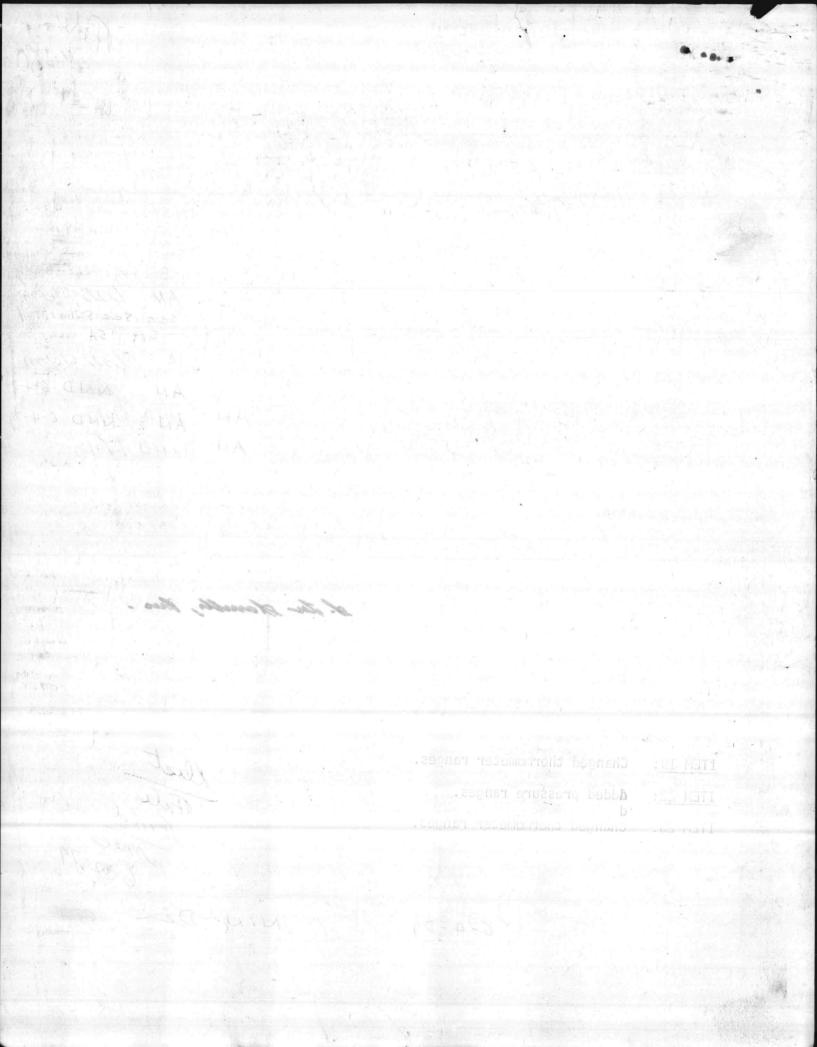
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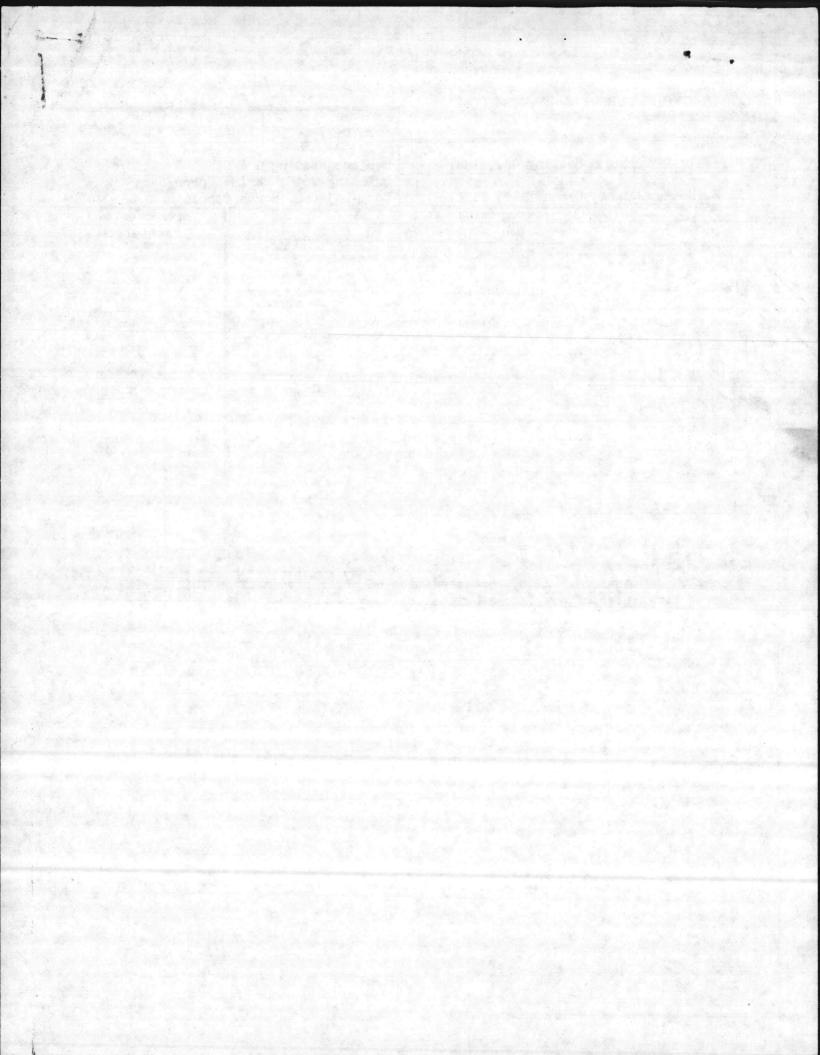


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				N62470-77-0		A	5/4/79
S	and the second second second		ating Co., Inc.	PROJECT TITLE AND LO Replace Hes Building 26	ting & A	ne Corps	
11	· D. Noonan,	Inc., Gre	contractor use only	Camp Lejeur	e, North	-	L IEWER USE ONLY
X	Contractor Approved	List only one of	only one specification division pe the following categories on each nd indicate which is being submit OICC Approval	transmittal form, tted	ion/Substitution OICC Approval	A-App D-Dise AN-Ap RA-Re	ACTION CODES roved approved pproved as noted ceipt acknowledged. nments
ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *		ITEM IDENTIFIC (Type, size, model no., Mfg brochure num	g. name, dwg. or	NO. OF	ACTION CODES	REVIEWER'S INITIALS CODE AND DATE
20	15654 - 13.1	3 Comb. I	Flow Meter & Balanc	eing Fitting		A	NND 6/4/:
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OPY	OF TRANSMITTAL AND SU	UBMITTALS TO RO	ICC	CONTRACTOR REPRESE	NTATIVE (Signature	))	
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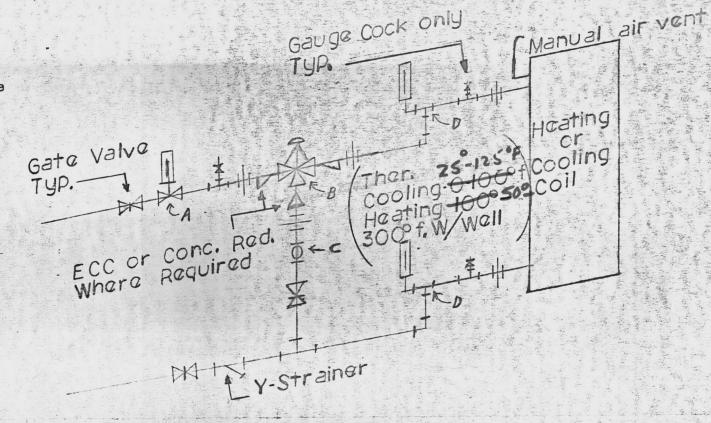
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Contract No. N62470-77-C-2563 Replace Heating and A/C Building 2615, Marine Corps Base Camp Lejeune, North Carolina

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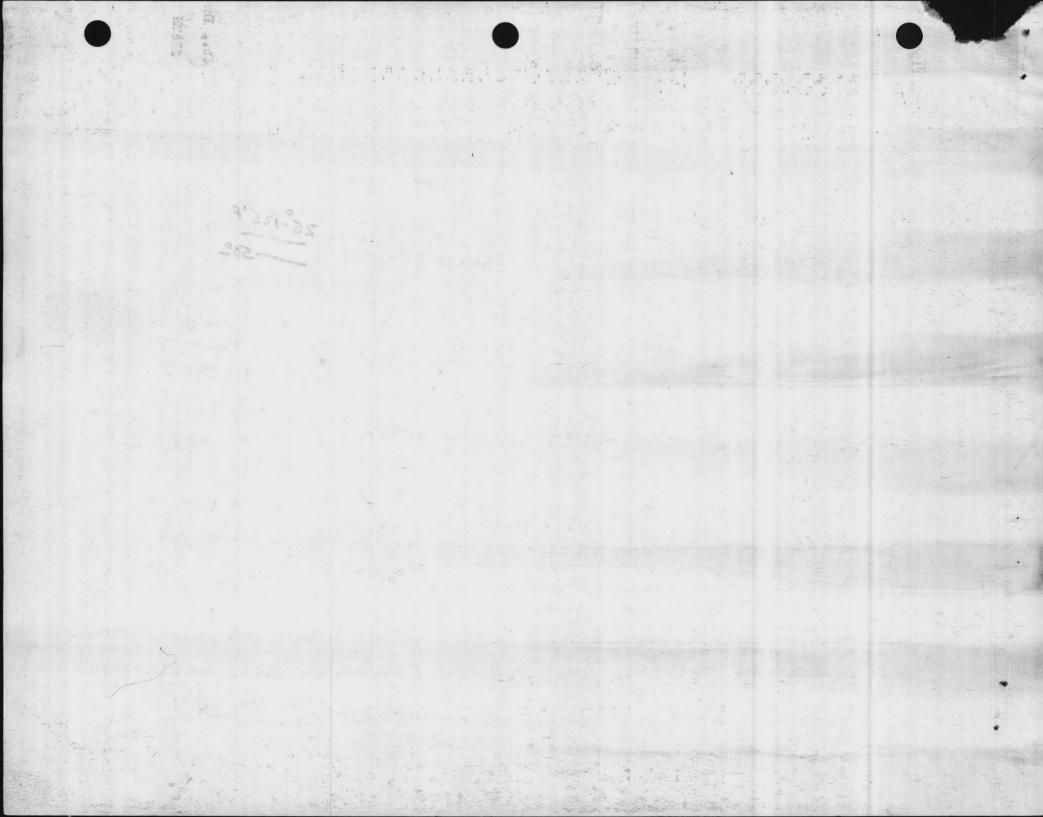


#### TYPICAL COIL PIPING DETAIL

Item A: Flow meter or circuit setter (Taco 740 or 780 series) with combination balancing feature to adjust G.P.M. through coil as per plans.

- Item B: 3-Way valve by Control Sub-Contractor.
- Item C: Balancing valve ("Apollo" ball valve) to be adjusted so that G.P.M. on full by-pass will equal G.P.M. flow through coil determined by above flow meter.
- Item D: Tees for thermometers shall be increased 2 pipe sizes and bushed to receive thermometer well, (ex. 1-1/4" x 3/4" x 3/4" tee).

See attached schedule for A - B - C - D and coil piping size.



#### MISCELLANEOUS VALVE & PIFE SIZES



Heating & Cooling Coils

Cooling Pipe Sizes Coil No. to Unit	"A" Flow Meter Size	"B" 3-Way Valve Size	"C" Balancing Valve Size	"D". Reducing Tee Size	Coil Piping Size
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3" 2" 3" 2" 1 <sup>1</sup> 3" 2" 1 " 1 <sup>1</sup> 3"	212" 2" 3" 2" 112" 2" 11" 1" 1"	3" 2" 3" 2" 1 <sup>1</sup> / <sub>4</sub> " 2" 1" 1 <sup>1</sup> / <sub>4</sub> "	N/A 2 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 2" N/A 2 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 1 <sup>1</sup> / <sub>2</sub> " 2 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 2" 1 <sup>1</sup> / <sub>2</sub> x 1 x 1" 2 x 1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub> "	2 <sup>1</sup> 2 <sup>11</sup> 2 <sup>1</sup> 2 <sup>11</sup>

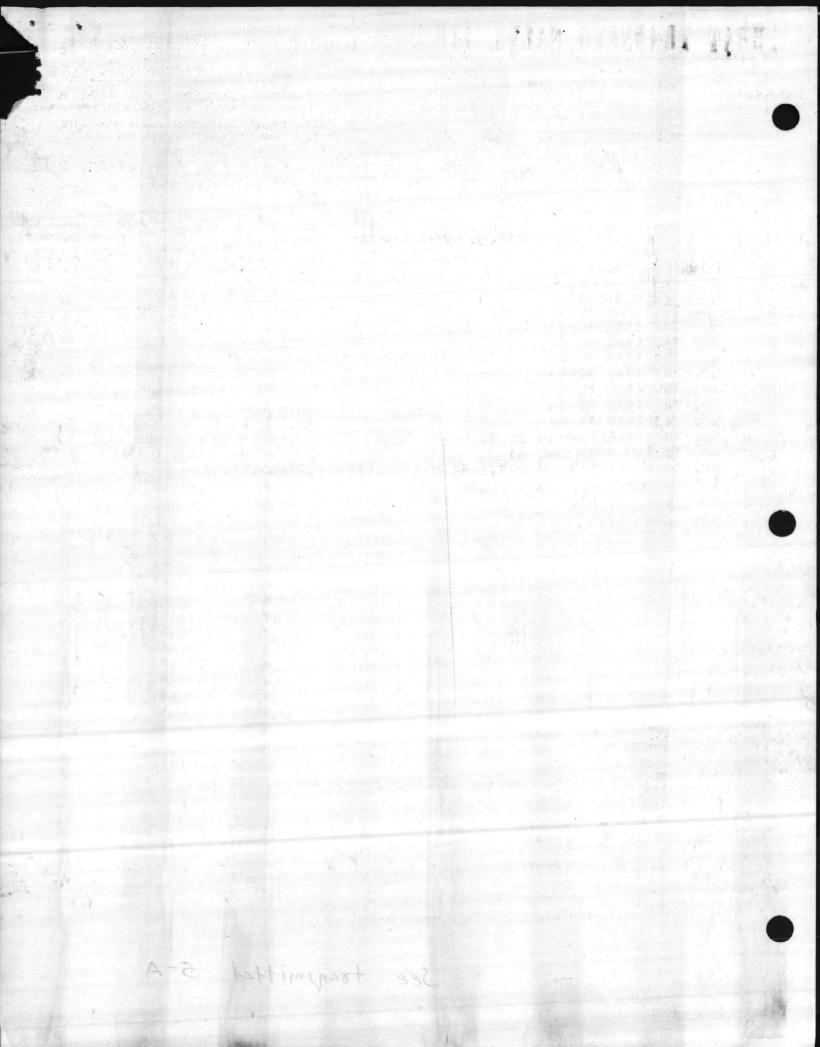
Heating Coil No.	Pipe Sizes to Unit	nAn Flow Meter Size	"B" 3-Way Valve Size	"C" Balancing Valve Size	Reducing	Coil Piping Size
1 2 3 4 5 (2) 6 7 8 9 10 11 12 13 14 15 16 17 18 19	3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4"	3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4"	1/2"         1/2" <t< th=""><th>3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4"</th><th><math>1\frac{1}{4} \ge 3/4 \ge 3/4</math> <math>1\frac{1}{4} \ge 3/4 \ge 3/4</math> <math>1\frac{1}{4} \ge 3/4 \ge 3/4</math> <math>1\frac{1}{2} \ge 1^{11} \ge 1^{11}</math> <math>1\frac{1}{2} \ge 1^{11} \ge 1^{11}</math> <math>1\frac{1}{4} \ge 3/4 \ge 3/4</math> <math>1\frac{1}{4} \ge 3/4 = 3/4</math> <math>1\frac{1}{4} = 3/4 =</math></th><th>"do" 1" 1" 1" 2<sup>1</sup>2"</th></t<>	3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4"	$1\frac{1}{4} \ge 3/4 \ge 3/4$ $1\frac{1}{4} \ge 3/4 \ge 3/4$ $1\frac{1}{4} \ge 3/4 \ge 3/4$ $1\frac{1}{2} \ge 1^{11} \ge 1^{11}$ $1\frac{1}{2} \ge 1^{11} \ge 1^{11}$ $1\frac{1}{4} \ge 3/4 \ge 3/4$ $1\frac{1}{4} \ge 3/4 = 3/4$ $1\frac{1}{4} = 3/4 =$	"do" 1" 1" 1" 2 <sup>1</sup> 2"

Run pipe sizes shown on plans (if larger) up to the near vicinity of coil before NOTE : reducing size.

Contract No. N62470-77-C-2563 Replace Heating & A/C, Building 2615, Marine Corps Base Camp Lejeune, North Carolina

Sorrells Plumbing & Heating Co., Inc P. O. Box 9604 Greensboro, North Carolina Telephone (919) 294-5874 27408

See transmitted 5-A



## HEAT TRANSFER SALES, INC.

9905=7086 SUBMITTAL NO. \_

DATE

FEBUARY 28, 1979

THIS ORDER IS BEING HELD FOR APPROVAL

ORDER HAS BEEN RELEASED PER PRINTS.

JOB: REPLACE HTG. & A/C-BLDG. 2615

THESE PRINTS ARE FOR YOUR RECORDS.

CAMP LEJEUNE, N.C.

AND WILL NOT BE RELEASED UNTIL APPROVED.

P. O. BOX 11103 **GREENSBORO, NORTH CAROLINA 27409** 05-03-03

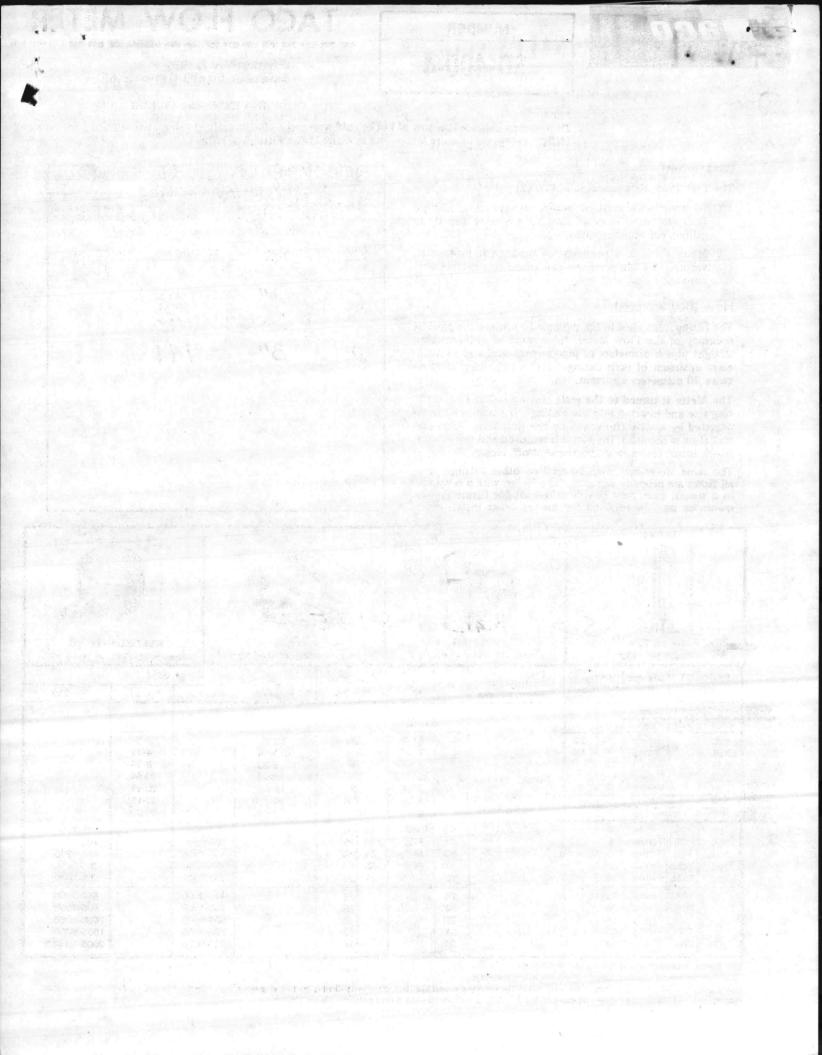
CONTRACTOR: SORRELLS PLBG. & HTG. CO. 121 MONTLIEU AVE. GREENSBORD, N.C. 27409

#### ENGINEER:

EQUIPMENT LIST AND DESCRIPTION ACTION TAKEN UAN. TACO FLOW METER 1 NO. 741 (TAG AC-1) 1 NO. 739 (TAG AC-2) 1 NO. 741 (TAG AC-3) 1 NO. 740 (TAG AC-4) ND. 783 (TAG AC-5) 1 1 NO. 739 (TAG AC-6) 1 NO. 782 (TAG AC-7) 1 NO. 783 (TAG AC-8) 5 NO. 781 (TAG HWC-1, 2, 3, 4, 5) 3/4" NO. 782-1" (TAG HWC-6) 1 ,4 NO. 781-3/4" (TAG HWC-7,8,9,10,11,12,13,14,15,16,17,18, 19, & 20) NO. 729 READOUT METER. 1

See toansmittal 5-A

8 SETS OF SUBMITTAL DATA FOR YOUR APPROVAL.



Laco

NUMBER

SD-400-4

# TACO FLOW METER

Effective: May 7, 1970 Supersedes: SD 400-4, dated 1/26/68

#### Purpose

**REVISED: July 15, 1972** 

Designed to indicate the flow of hot or cold water in a pipe directly in gallons per minute (GPM), using one or more Meters and as many Meter Fittings as required.

#### Description

The Taco Flow Meter consists of two (2) parts:

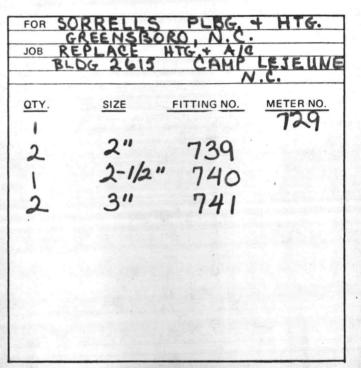
- 1 A meter with multiple scales corresponding to pipe sizes (34" thru 3" or 4" thru 20") reading directly in gallons per minute, (GPM).
- 2 Meter Fittings, which may be installed in horizontal, vertical or angle positions and which incorporate an automatic shut-off.

#### How they are used

The fitting is installed in the piping. To achieve the greatest accuracy of the Flow Meter, there must be uninterrupted straight pipe 5 diameters of pipe downstream and 15 diameters upstream of each fitting.  $1\frac{1}{4}$ " and smaller sizes require 20 diameters upstream.

The Meter is turned to the scale corresponding to the Fitting size and inserted into the Fitting. The required flow is adjusted by a valve (furnished by the installer). After correct flow is obtained, the Meter is removed and the Fitting, which incorporates an automatic shut-off, closes.

The same Meter may then be used on other Fittings until all flows are properly adjusted. The Meter, which is packed in a special case, may be left at the job for future adjustments or may be retained for use on other installations.



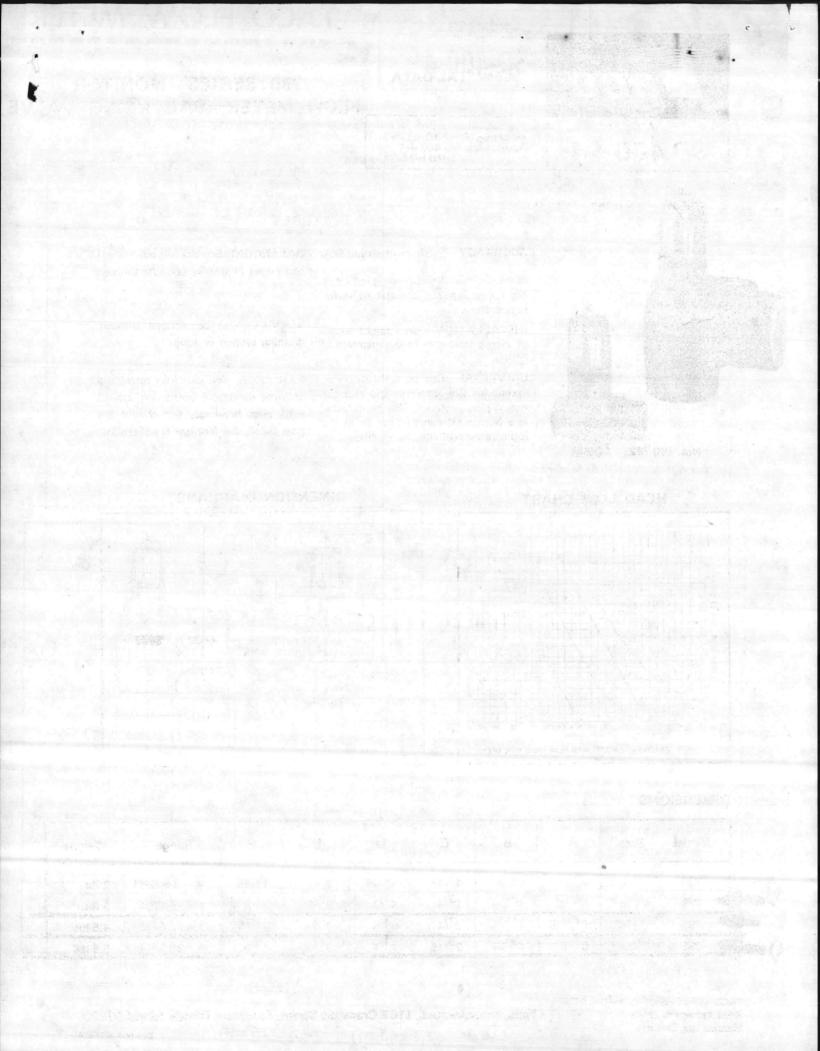
+	7½ FLOW	B-1 METER 729 - 733	(4)		FITTI Nos. 735-741		ru 3")	1		EITTING 746 (4" thru 10	1'') No	WELDED 5. 742L-751	FITTING L (4" thru 20
PROD		Descript	Pipe	Press. Drop	Press Temp. Ratings for	A	в		. Ship		Range		,
NC		ion	Size (3)	Equiv Ft. Pipe	Meters, Fittings			Wh	t. Ibs.	No. 729	No. 730	No. 731	No. 732
729 <sup>(1)</sup> 730 <sup>(1)</sup>			-				3 1/2		2%				
735 736 737 738 739 740 740		Fitting Fitting Fitting Fitting Fitting Fitting	3/4 1 1¼ 1½ 2 2½ 3	22 18 8	Temp. Press. 30 <sup>0</sup> - 200 <sup>0</sup> F 175psi 220 <sup>0</sup> F 152 "		1 5/8 1 7/8 2 3/8 2 11/16 3 1/4 3 7/8 4 5/8		2½ 3½ 3 3½ 5 7½ 0½	1.3-5 3.5-14 5-30 8-46 15-80 20-130 30-190		1.5-6 4-17 8-34 10-54 20-95 30-150 40-220	
742 743 744 745 746	742L 743L 744L 745L 746L	Fitting Fitting Fitting Fitting Fitting	4 5 6 8 10	1	240°F 140 " 275°F 132 " (2) 300°F 125 "	10 11 12 14 16	10½ 11½ 12½ 14¾ 17 1/8	19 22 24 30 37	10 11 13 17 20		40-400 100-600 100-1000 200-1700 300-2500		80-480 100-740 180-1200 350-2000 500-3000
8.	747L 748L 749L 750L 751L	Fitting Fitting Fitting Fitting Fitting	12 14 16 18 20	1		18 20 22 24 26		ing in Pol	24 26 28 30 34		350-3000 400-4000 500-5000 750-7000 1000-9000		650-3800 800-4500 1000-6000 1500-8000 2000-10,00

(1) Meter is packed in a special case for storing.

(2) For intermittent service, such as while taking readings.

(3) Sizes 735-741 are NPT. Nos. 742-746 slip between flanges and are furnished with bolts, nuts and gaskets but not the flanges - L Series are welded.
 (4) 729 & 730 Meters are direct reading at 60°F. 731 & 732 Meters are direct reading above 160°F

See transmitted 5-A





#### SUBMITTAL DATA

Effective: April 10, 1975 Supersedes: SD 400-4-1 dated 9/15/71

# No. 783

Nos. 780-782

## dated 9/15//1

#### FEATURES

ACCURACY + 3% of observed flow

SCALE Linear direct reading in G.P.M. No correction for changes in water temperature.

**INSTALLATION** No straight length of piping upstream or downstream of fitting.

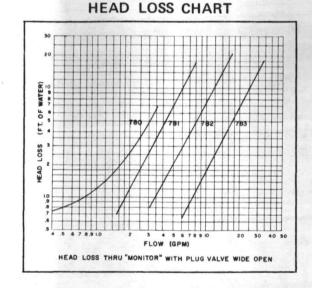
UNIVERSAL Can be fully insulated except for slot in turret top and balancing plug operator. May be installed in a horizontal run of pipe or at the top of a vertical riser as an elbow. BALANCING Screwdriver adjustment of integral plug valve sets rate through loop.

780 SERIES -- MONITOR FLOW METER - BALANCING VALVE

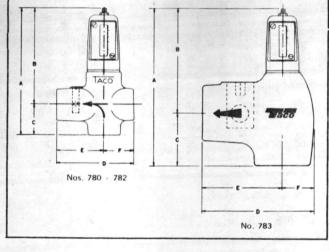
SERVICE Can be serviced without draining system or loop.

FAIL-SAFE The cast iron turret top provides maximum protection against sight glass breakage, but should the glass break, the Monitor is self-sealing.

#### DIMENSION DIAGRAMS



#### DIMENSIONS



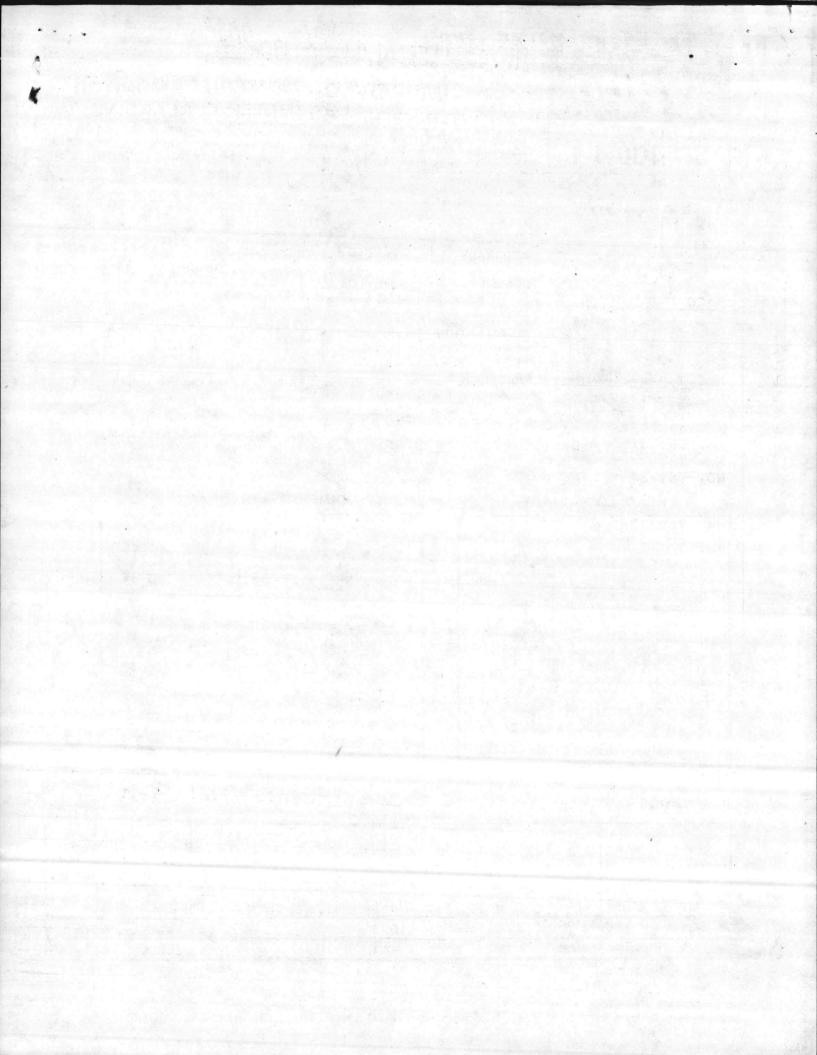
## See transmitted 5-A

	Model	Size	Α	в.	С	D	E	F	Range	Weight
	780	½″ NPT	5 <sup>5/</sup> 8	4 <sup>5/</sup> 16	1 <sup>5/</sup> 16	3 <sup>5/</sup> 16	2	1 <sup>5/</sup> 16	.4 – 3.5 GPM	2 lbs.
	781	34" NPT	6 <sup>5/</sup> 16	4 <sup>9/</sup> 16	13/4	47/8	23/4	21/8	1.5 -8 GPM	3 lbs.
-	782	1" NPT	6 <sup>15/</sup> 16	4 <sup>11/</sup> 16	21/4	53/8	3 <sup>1</sup> /8	21/4	3 - 17 GPM	4.5 lbs
15	783	1%NPT	67/8	4 <sup>9/</sup> 16	2 <sup>5/</sup> 16	43/4	37/16	1 <sup>5/16</sup>	6 – 34 GPM	5.5 lbs

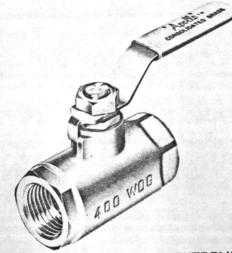
Working Pressure - 125 lbs.

TACO HEATERS OF CANADA, LTD. 3090 Lenworth Drive Mississauga, Ontario

Taco, Incorporated, 1160 Cranston Street, Cranston, Rhode Island 02920



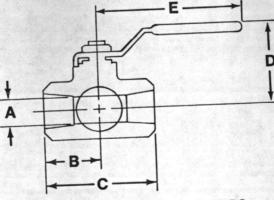
# THE ORIGINAL Apollo" - IMPROVED -BLOW-OUT-PROOF STEM DESIGN



- CHROMIUM PLATED BALL—EXTREMELY HARD WEAR SURFACE REDUCES FRIC-TION, SEAT WEAR AND THE EROSIVE EFFECTS OF STEAM AND OTHER MEDIA
- HIGH PERFORMANCE REINFORCED TEFLON\* SEATS AND STUFFING BOX RING ARE STANDARD ON 1/4" THRU 2" VALVES. 2-1/2" AND 3" VALVES HAVE TEFLON\* SEATS.

- OPTIONS -

- OR STEM
- CHAIN OPERATED LEVER KIT AVAILA ABLE FOR VERTICAL OR HORIZONTAL OVERHEAD OR REMOTE SERVICE
- · BALANCING STOPS
  - STEEL TEE HANDLE FOR VALVES
     THRU 2"
  - LOCKED RETAINER
    - STATIC GROUNDING DEVICES
    - -AUTOMATIC DRAIN
    - ROUGH CHROME PLATING



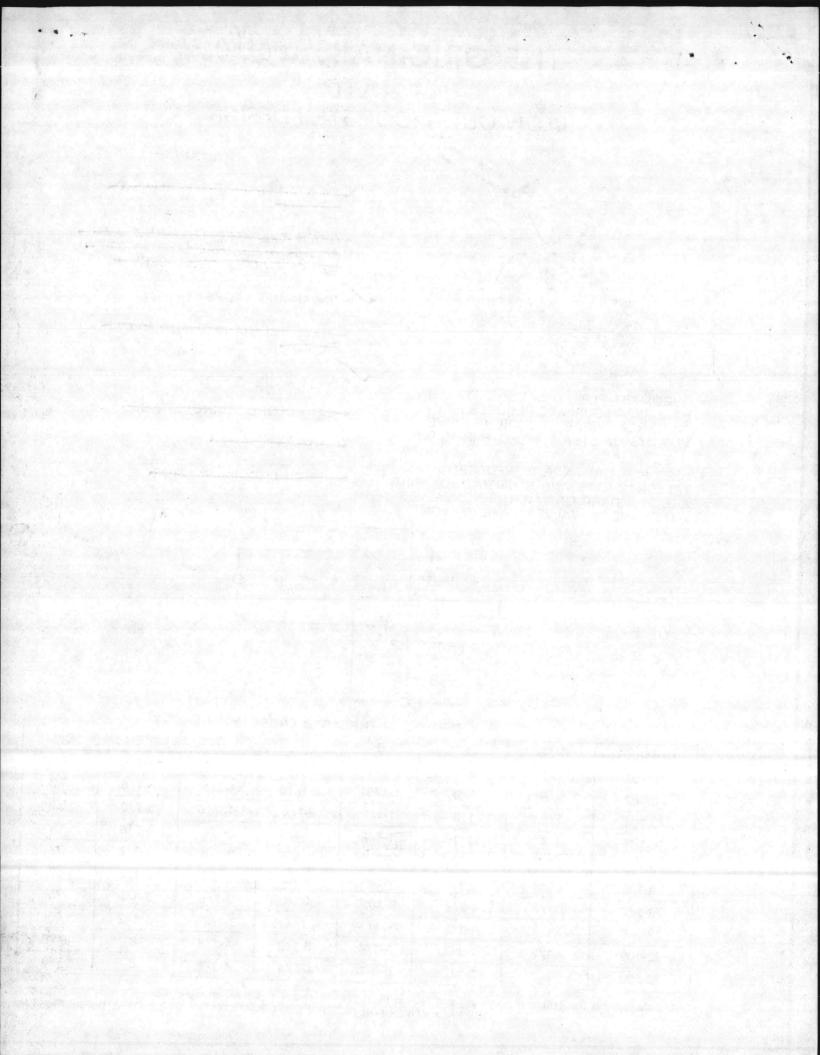
#### BRONZE - THREADED ENDS

174 J. 6 18			В	С	D	E	Cv**
NUMBER	SIZE	A			1-3/4	3-7/8	6.3
70-101	1/4	3/8	1-1/32	2-1/16			5.3
70-102	3/8	3/8	1-1/32	2-1/16	1-3/4	3-7/8	
And		1/2	1-1/8	2-1/4	1-13/16	3-7/8	9.8
70-103	1/2		1-1/2	3	2-1/8	3-7/8	18
70-104	3/4	11/16			2-1/4	3-7/8	32
70-105	1	7/8	1-11/16	3-3/8	Contraction of the second	100 M	40
70-106	1-1/4	1	2	4	2-5/8	5-1/2	
	1-1/2	1-1/4	2-3/16	4-3/8	2-7/8	5-1/2	75
70-107	The second second		2-11/32	4-11/16	3-1/16	5-1/2	98
70-108	2	1-1/2		6-1/2	4-1/8	8	440
70-109	2-1/2	2-1/2	3-1/4			The second second second	390
70-100	3	2-1/2	3-3/8	6-3/4	4-1/8	8	000

\* \*The Cv factor is the gallons of water per minute that the valve will pass with 1 p.s.i. pressure drop. SEE BACK COVER FOR ORDERING INFORMATION

\*DuPont Reg. T.M.

4

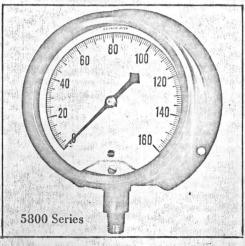




# **Carolina Controls Company**

SPECIALTY EQUIPMENT FOR POWER PLANTS AND INDUSTRY

## AMETEK / U.S. Gauge



## **Industrial Gauges**

#### **General Purpose Gauges**

5800 Series used with air, oil, water, steam, gas or any medium not corrosive to brass or bronze. Recommended for such applications as pumping, heating, air conditioning, refrigeration, water supply, air pressure systems and other general purpose. applications requiring rugged dependable construction.

#### **Hydraulic Gauges**

5840 Series gauges are designed to withstand the frequent shocks, pulsations, and mechanical vibrations such as found in the operations of hydraulic presses, Diesel and oil field equipment. Pressure ranges up to 10,000 psi are available.

GENERAL SPECIFICATIONS

DIAL SIZES: 31/2", (41/2") and 6".

DIAL: Steel, with black markings on white litho background.

POINTER: Adjustable, black.

Ranse

BOURDON TUBE: Phosphor Bronze, 403 Stainless Steel or 316 ST. ST.

SOCKET: Brass, Alloy Steel or 316 Stainless Steel (1/2 or 1/4" NPT).

MOVEMENT: Exclusive Arc-Loc on all 41/2" and 6" gauges. Precision geared providing perfect rolling action on 312" sizes.

CASE and RING: Aluminum back flange caes, Polypropylene snap-on ring; Aluminum front flange case, Steel hinged ring; Stainlees Steel Case, stainless steel bayonet ring; Phenolic turret case, Polypropylene snap-on ring.

ACCURACY: 1% of scale range on  $4\frac{1}{2}$ " and 6" sizes.  $1\frac{1}{2}-1-1\frac{1}{2}$ % on  $3\frac{1}{2}$ " size. 0-15 psi (1 Regd)

0-100 psi (2Rogid)

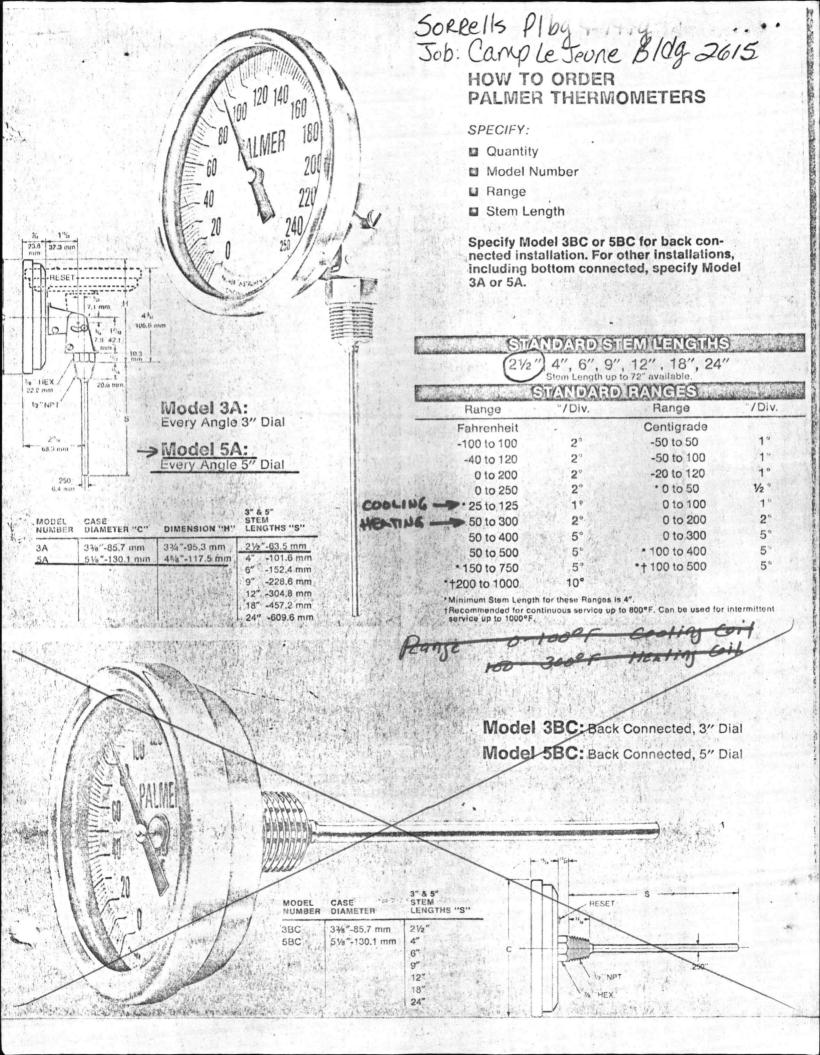
			f and
FIGURE	DIAL	CONN.	RANGES:
5801	31/2"	LM	0-15# 0-60# 0-160# 0-300# 0-600#
$= - i k_1 k_2 k_1^{-1} k_2^{-1}$			0-30# 0-100# 0-200# 0-400# 0-30" VAC.
5801	41/2"	LM	0-15# 0-60# 0-160# 0-300# 0-600#
			0-30# 0-100# 0-200# 0-400# 0-30" VAC.
5801	41/2"	1/4 LM	30"-30# 30"-100# 30"-200#
			30"-60# 30"-150# 30"-300#
5801	6"	LM	0-15# 0-60# 0-160# 0-300# 0-30" VAC.
and the grade	And And And		0-30# 0-100# 0-200# 0-400# 30"-60#
5809	4 <sup>1</sup> / <sub>2</sub> "	<sup>1</sup> <sub>4</sub> LM	0-15# 0-100# 0-300# 0-1000# 30"-30# 30"-150#
	and the second s	$\operatorname{sp}_{i}(0) = \operatorname{sp}_{i}(0)$	0-30# 0-160# 0-400# 0-30" VAC30"-60#
and the second second			0-60# 0-200# 0-600# 30"-15# 30"-100#
5841	31/2"	<sup>1</sup> <sub>4</sub> LM	0-1000# 0-2000# 0-5000#
м. 1864 Дания — 1964	and a start of the		0-1500# 0-3000# 0-10000#
5841	41/2"	LM 4LM	0-1000# 0-2000# 0-5000#
Charles and Street	$\mathbb{E}_{q}[\hat{\mathcal{A}}_{q}^{\dagger}] = [\hat{\mathcal{A}}_{q}^{\dagger}] = [\hat{\mathcal{A}}_{q}^{\dagger}] = [\hat{\mathcal{A}}_{q}^{\dagger}] = [\hat{\mathcal{A}}_{q}^{\dagger}]$	ray all in the second	0-1500# 0-3000# 0-10000#

PHONE 376-8551

GE 94

ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511	
APPROVED	
APPROVED AS NOTED	ac descented and
DISAPPROVED	
SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. P162470-77-0- 2563	
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- IRLOI REQUIREMENTS UNLESS THE CONTRACTOR WILLS ATTENTION TO AND SUPPORTS THE DEVIA- INCH THE CONTRACTOR SHALL BE RESPONS- INCE FOR PROVIDING PROPER THYSICAL DIMEN- SEL FOR PROVIDING PROPER THYSICAL DIMEN- SEL & WHIGHTS, COORDINATION OF TRADES, LTO., AS REQUIRED.	Raye
NEVIEW R LI. Desai DATE 6-4-24	
FOR OFFICER IN CHARGE OF CONSTRUCTION	

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PPROVED	AS NOILD
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SUBJACE TH	) THE REQUIREMENTS OF
	NO. 1(624/0-17-0- 2563
PPROVAL TRACI REQUALLS AND TRACI REQUALLS AND TRACING AND BLO FOR TRACE ROR	OF A SUBMITTAL DOES NOT INCLUDE OF ANY DEVIATION FROM THE CON- ULREMENTS UNLESS THE CONTRACTOR ENTLOW TO AND SUPPOR S H DEVIA HE CONTRACTOR SHALL DE RESPONS- PROVIDING PROPER THIS CAL DIMEN- WIGHTS, COURDINATION OF TRADES, REGULARD.
Eru., 48	N. Desai DATE 6-9-2



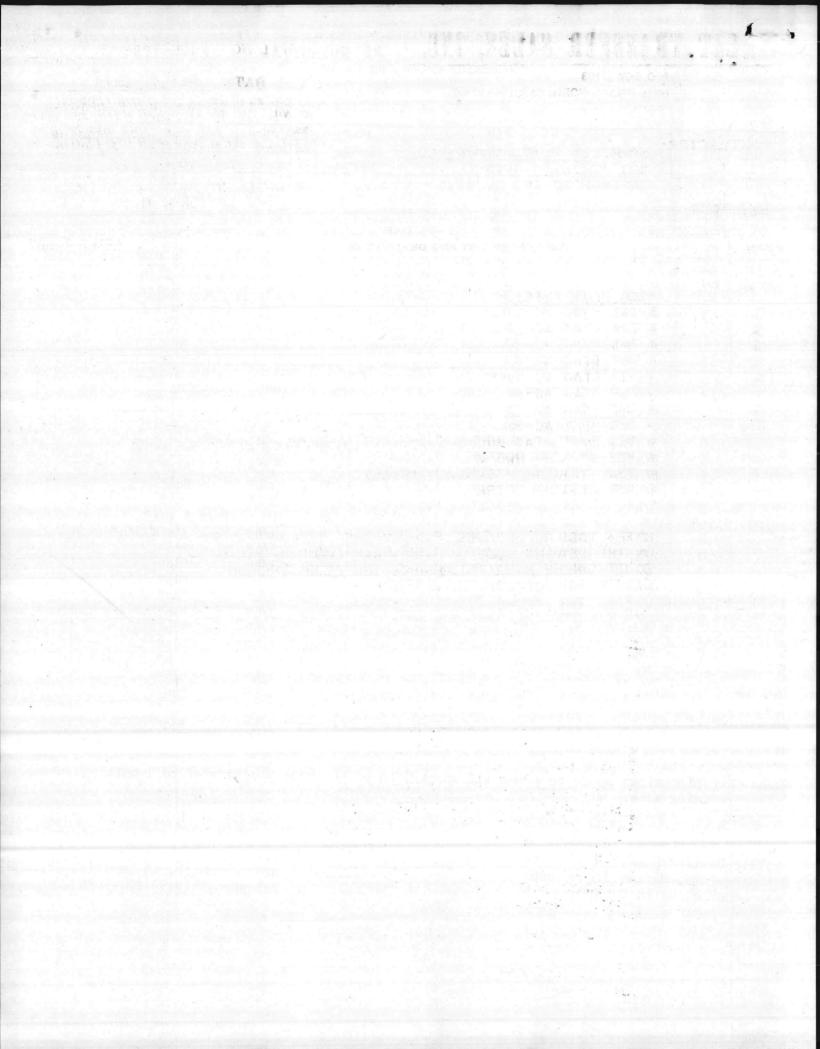
#### Heating & Cooling Coils

Cooling Coil No.	Spec. GPM	Pipe Size to Unit	Туре	"A" Flow Meter Size	Range	"B" 3-Way Valve	"C" Balance Valve	"D" Reducing Tee Sizes	Coil Piping Size
1 2 3 4 5 6 7 8	108 52 167 75 26 46 14 18	3" 2" 3" 2" 1 <sup>1</sup> 4" 2" 1" 1 <sup>1</sup> 4"	741 739 741 739 783 739 782 782 783	3" 2" 3" 2" 1 <sup>1</sup> 4" 2" 1" 1" 1 <sup>2</sup> 4"	30-190 15-80 30-190 15-80 6-34 15-80 3-17 6-34	2 <sup>1</sup> 2" 2" 3" 2" 1 <sup>1</sup> 4" 2" 1" 1"	3" 2" 3" 2" 1 <sup>1</sup> 4" 2" 1" 1" 1 <sup>1</sup> 4"	N/A $2^{1}_{5} \times 2^{1}_{5} \times 2^{"}$ N/A $2^{1}_{5} \times 2^{1}_{5} \times 2^{"}$ $2 \times 1^{1}_{5} \times 1^{1}_{5}$ " $2^{1}_{5} \times 2^{1}_{5} \times 2^{"}$ $1^{1}_{5} \times 1 \times 1^{"}$ $2 \times 1^{1}_{4} \times 1^{1}_{4}$ "	2 <sup>1</sup> ວິ 2 <sup>1</sup> ວິ 1

Heating Coil No.	Spec. GFM	Pipe Size to Unit	Туре	"A" Flow Meter Size	Range	- 0	"C" Balance Valve	"D" Reducing Tee Size	Coil Size	Piping
1 2 3 4 5 6 (2) 7 8 9 10 11 12 13 14 15 16 17 18 19 20	4.0 3.5 5.5 6.1 3.2 11.0 3.8 5.0 1.3 2.0 1.4 5.9 1.7 9 2.1 4.1 4.4 1.2 2.2	3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4" 3/4"	781 781 781 781 781 782 781 782 781 780 781 780 781 781 781 781 780 781	3/4" 3/4" 3/4" 3/4" 3/4" 1" 3/4" 1/2" 3/4" 1/2" 3/4" 1/2" 3/4" 1/2" 3/4" 3/4" 1/2" 3/4" 1/2" 3/4" 3/4" 1/2" 3/4"	1.5-8.0 $1.5-8.0$ $1.5-$	1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"01 5/8"01 1/2"01 1/2"01 1/2"01 1/2"01 1/2"01 1/2"01 5/8"02 1/2"01 5/8"02 1/2" 1.2" 1.2" 1.2" 0.5/8"0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1 <sup>1</sup> / <sub>4</sub> x 3/4 x 3 "do" "do" "do" "do" 1 <sup>1</sup> / <sub>2</sub> x 1 x 1" 1 <sup>1</sup> / <sub>4</sub> x 3/4 x 3 "do"	3/J†u	2 <sup>1</sup> 2 x 1 <sup>1</sup> 2 <sup>11</sup> "do" 1 <sup>11</sup> 1 <sup>11</sup> 1 <sup>11</sup> 1 <sup>12</sup> 1 <sup>11</sup> 1 <sup>11</sup>

NOTE: Run pipe sizes shown on plans (if larger) up to the near vicinity of coil before reducing size.

Contract No. N62470-77-C-2563 Replace Heating & A/C Building 2615, Marine Corps Base Camp Lejeune, North Carolina Sorrells Plumbing & Heating Co., In P. O. Box 9604 Greensboro, North Carolina 27408 Telephone (919) 294-5874



# ÀEAT. TRANSFER SALES, INC.

**GREENSBORO, NORTH CAROLINA 27409** 

P. O. BOX 11103

RE-SUBMITTAL NO. 9905-7086

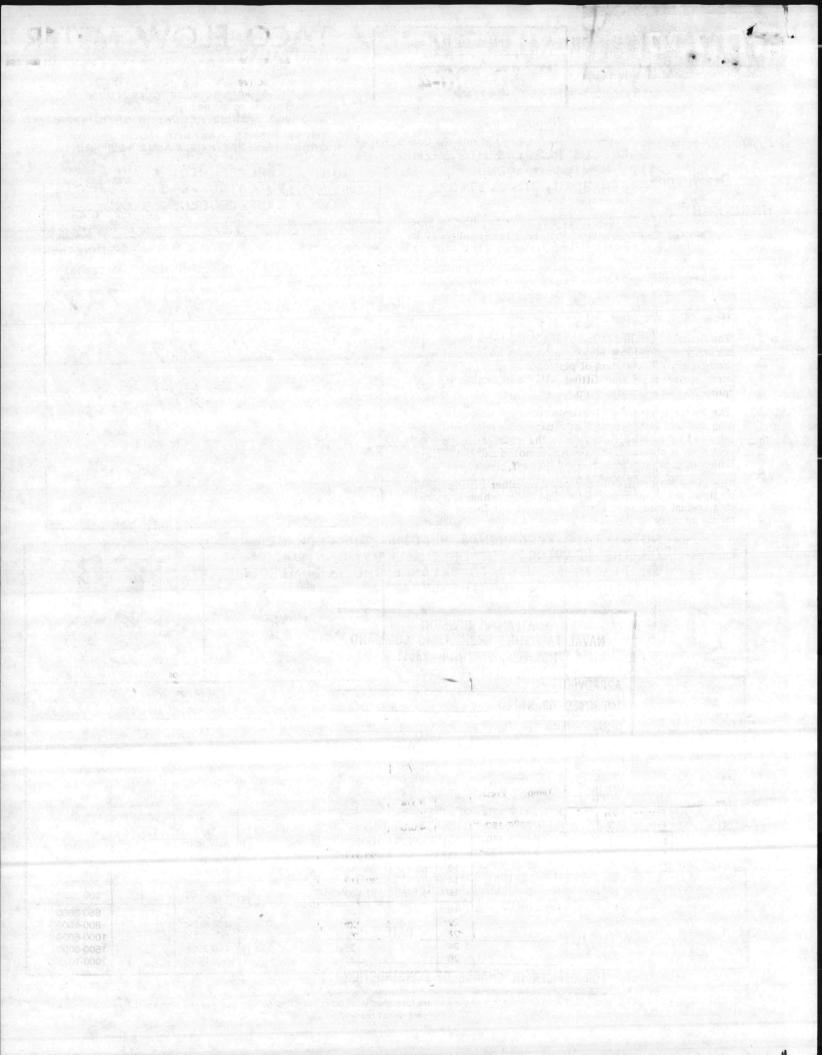
## DATE MAY 4, 1979

- THIS ORDER IS BEING HELD FOR APPROVAL AND WILL NOT BE RELEASED UNTIL APPROVED.
- THESE PRINTS ARE FOR YOUR RECORDS. ORDER HAS BEEN RELEASED PER PRINTS.
- JOB: REPLACE HTG. & A/C BUILDING 2615 CAMP LEJEUNE, N.C.

QUAN.	EQUIPMENT LIST AND DESCRIPTION	ACTION TAKEN
1 1 1 1 1 1 1 1 1 2 5 1	TACO FLOW METERS # 741 (TAG AC-1) # 739 (TAG AC-2) # 741 (TAG AC-3) # 739 (TAG AC-4) # 783 (TAG AC-5) # 739 (TAG AC-6) # 782 (TAG AC-7) # 783 (TAG AC-8) # 781 3/4" (TAG HWC-1,2,3,4,5,7,8,10,13,14,16,17,18 # 782 1" (TAG HWC-6) # 780 (TAG HWC- 9,11,12,15,19) # 729 READOUT METER NOTE: TACO RECOMMENDS PLACING THE FLOW METER ON THE LEAVING SIDE OF THE 3 WAY CONTROL VALVE	,20)
	SO IT CAN BE USED TO BALANCE THE FLOW THROUGH EITHER THE COIL OR THE BYPASS.	
	ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511 APPROVED	
	SUBJECT TO THE REQUIR MENT OF	
	CURANCIA NO. 1624 0- 7- 1- 2563	
ų	APPRIVAL OF A SUBMIT AL OUES NOT INCLUDE ARE ALL OF ANT OLVIATION THEM ME CON- RAG REQUIREMENTS UNLESS THE CONTRACTOR VALL ATTENTION TO ANY SUPPOR S. HE DEVIA- ATTENTION TO ATTENTION	
	N.W. N. Devai DATE 6-4-79	
	FOR OFFICER IN CHARGE OF CONSTRUCTION	

CONTRACTOR: SORRELLS PLBG. & HTG. CO. 121 MONTLIEU AVENUE GREENSBORD, N. C.27409

#### ENGINEER:



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N	11	M	R	F	R
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# SD-400-4

#### Purpose

## TACO FLOW METER

Effective: May 7, 1970 Supersedes: SD 400-4, dated 1/26/68

#### REVISED: July 15, 1972

Designed to indicate the flow of hot or cold water in a pipe directly in gallons per minute (GPM), using one or more Meters and as many Meter Fittings as required.

#### Description

The Taco Flow Meter consists of two (2) parts:

- 1 A meter with multiple scales corresponding to pipe sizes (3/4" thru 3" or 4" thru 20") reading directly in gallons per minute, (GPM).
- 2 Meter Fittings, which may be installed in horizontal, vertical or angle positions and which incorporate an automatic shut-off.

#### How they are used

The fitting is installed in the piping. To achieve the greatest accuracy of the Flow Meter, there must be uninterrupted straight pipe 5 diameters of pipe downstream and 15 diameters upstream of each fitting.  $1\frac{1}{4}$ " and smaller sizes require 20 diameters upstream.

The Meter is turned to the scale corresponding to the Fitting size and inserted into the Fitting. The required flow is adjusted by a valve (furnished by the installer). After correct flow is obtained, the Meter is removed and the Fitting, which incorporates an automatic shut-off, closes.

The same Meter may then be used on other Fittings until all flows are properly adjusted. The Meter, which is packed in a special case, may be left at the job for future adjustments or may be retained for use on other installations.

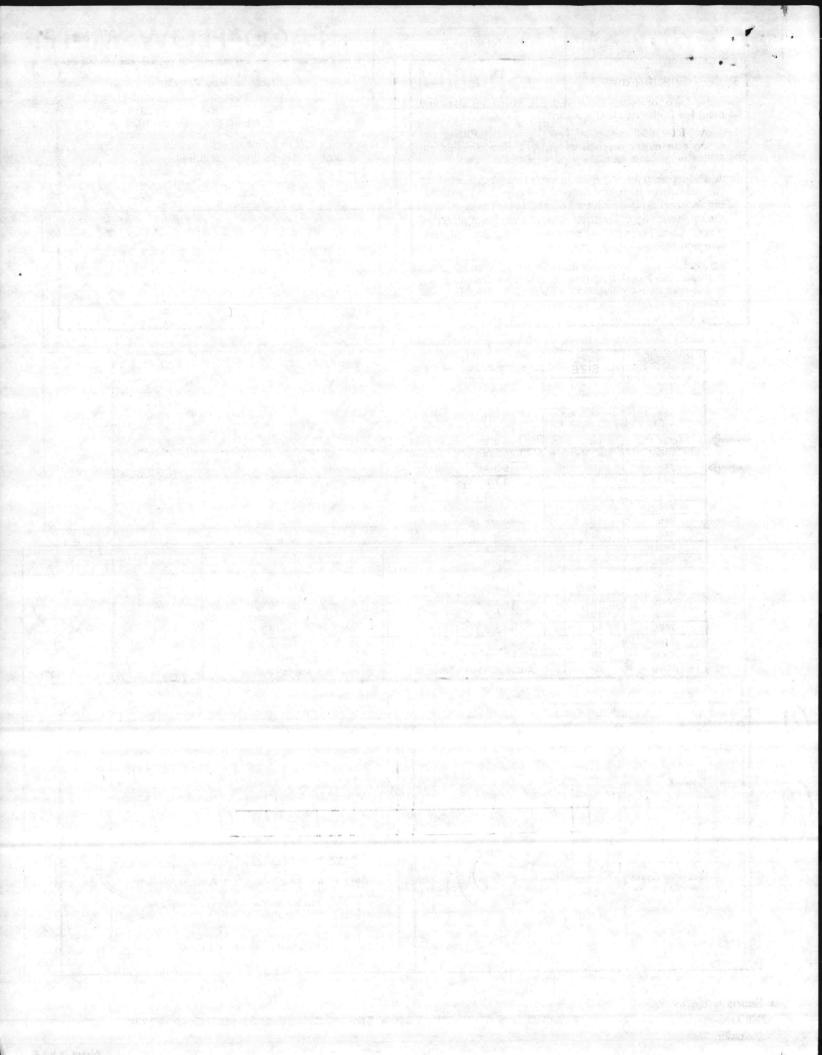
1			729
3	2"	739	
2	3″	741	

	FLOW METER <sup>(4)</sup> Nos. 729 - 732			FITTING Nos. 735-741 (¾" thru 3") Press, - Temp.			FITTING Nos. 742-746 (4" thru 10")			WELDED FITTING Nos. 742L-751 L (4" thru 20")				
	PROD		Descript	Pipe Size	LUTOD.	Press Temp. Ratings for	A	в		p. Ship		Range	GPM	
1				(3)	Equiv. Ft. Pipe	Meters, Fittings			WH	nt. Ibs.	No. 729	No. 730	No. 731	No. 732
7	729 <sup>(1)</sup> 730 <sup>(1)</sup>		Meter Meter	-				3 1/2	1	2¾				
	735 736 737 738 739		Fitting Fitting Fitting Fitting Fitting	3/4 1 1¼ 1½ 2	22 18 8	Temp. Press.		1 5/8 1 7/8 2 3/8 2 11/16 3 1/4		2½ 3½ 3 3½ 5	1.3-5 3.5-14 5-30 8-46 15-80		1.5-6 4-17 8-34 10-54 20-95	
ļ	740 741		Fitting Fitting	2½ 3		30 <sup>o</sup> - 200 <sup>o</sup> F 175psi 220 <sup>o</sup> F 152 "	10	3 7/8 4 5/8		7½ 0½	20-130 30-190	8.4	30-150 40-220	
	742 743 744 745 746	742L 743L 744L 745L 746L	Fitting Fitting Fitting Fitting Fitting	4 5 6 8 10	1	240 <sup>o</sup> F 140 " 275 <sup>o</sup> F 132 " 300 <sup>o</sup> F 125 "	10 11 12 14 16	10½ 11½ 12½ 14¾ 17 1/8	19 22 24 30 37	10 11 13 17 20		40-400 100-600 100-1000 200-1700 300-2500		80-480 100-740 180-1200 350-2000 500-3000
Statement of the statem		747L 748L 749L 750L 751L	Fitting Fitting Fitting Fitting Fitting	12 14 16 18 20	1		18 20 22 24 26			24 26 28 30 34		350-3000 400-4000 500-5000 750-7000 1000-9000		650-3800 800-4500 1000-6000 1500-8000 2000-10,000

(1) Meter is packed in a special case for storing.

(2) For intermittent service, such as while taking readings.

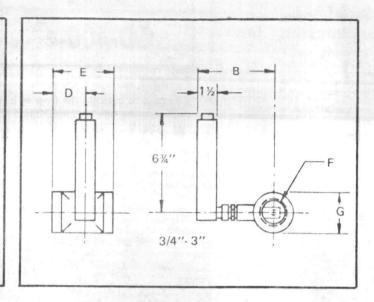
(3) Sizes 735-741 are NPT. Nos. 742-746 slip between flanges and are furnished with bolts, nuts and gaskets but not the flanges - L Series are welded.
 (4) 729 & 730 Meters are direct reading at 60°F. 731 & 732 Meters are direct reading above 160°F.



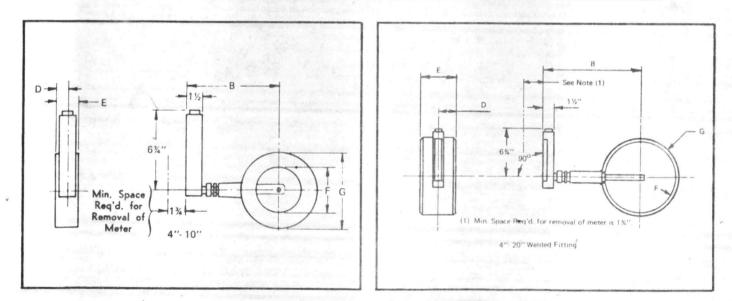
#### **Typical Specification**

Install a Taco, or equal, Flow Meter as shown on plans and to meet the following specifications:

- 1-Flow Meter shall consist of two (2) parts...a Fitting and a separate meter capable of reading flow directly in GPM for at least five (5) pipe sizes.
- 2—A Fitting shall be installed in each line as indicated on the plans, size to be the same as the pipe size. Each Fiting to be so designed that when the Meter Gauge is withdrawn from the Fitting, an almost tight shut-off takes place. Each Fitting to be provided with a cap for positive shut-off.
- 3-Provide......Meter Gauge(s), each equipped with multiple scales so that when positioned for flow required it will read directly in GPM. Meters to be provided with calibration at 60°F; 200°F. (select one)

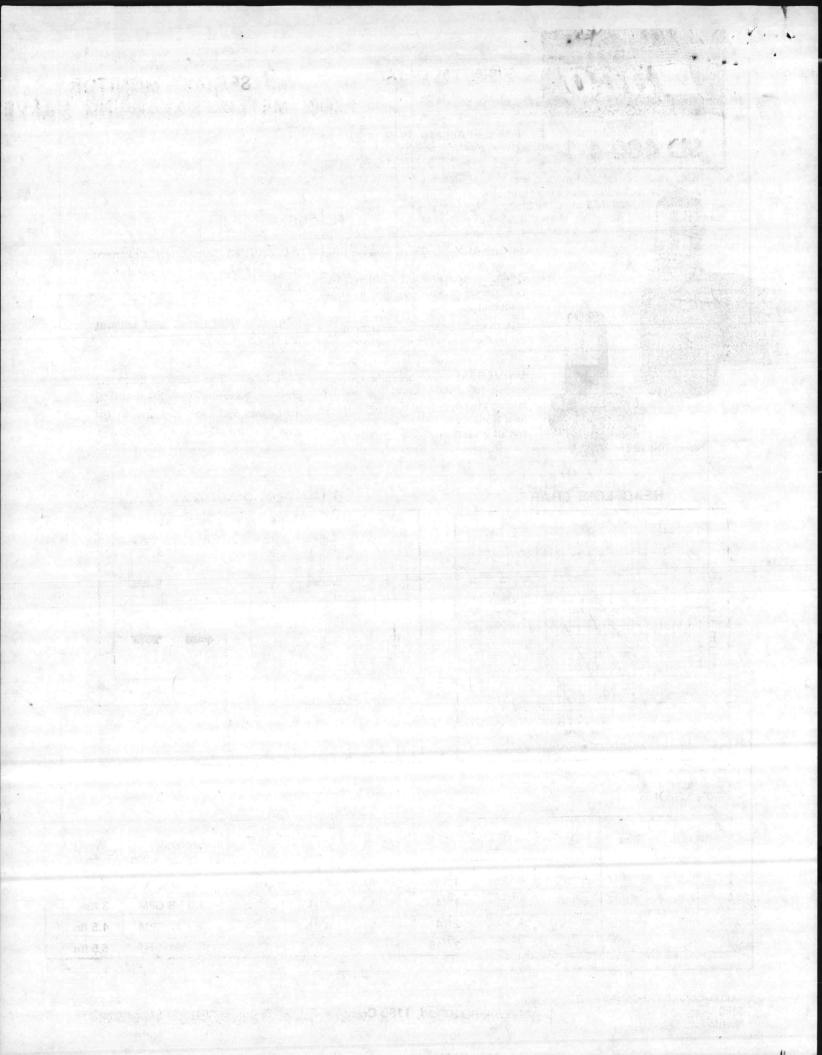


PRODUCT NO.	PIPE SIZE	. В	D	E	F	G
735	3/4	5 3/4	2 1/4	3.1/2	3/4 NPT	1 5/8
736	1	5 3/4	2 1/2	4	1 NPT	1 7/8
737	1 1/4	5 3/4	2 1/8	3 3/4	1 1/4 NPT	2 3/8
738	1 1/2	5 3/4	2 1/4	3 7/8	1 1/2 NPT	2 11/16
739	2	5 3/4	2 5/8	4 1/2	2 NPT	3 1/4
740	2 1/2	5 3/4	3	5 7/16	2 1/2 NPT	3 7/8
741	3	5 3/4	3 3/8	6 3/16	3 NPT	4 5/8
742	4	8 7/8	7/8	1 3/4	4	6 3/4
743	5	9 3/8	7/8	1 3/4	5	7 5/8
744	6	9 7/8	7/8	1 3/4	6	8 5/8
745	8	10 7/8	7/8	1 3/4	8	10 7/8
746	10	11 7/8	7/8	1 3/4	10	13 1/4
742L	4	8 7/8	2	4	4.026	4.500
743L	5	9 3/8	2	4	5.047	5.563
744L	6	97/8	2	4	6.056	6.616
745L	8	10 7/8	2	4	7.981	8.625
446L	10	11 7/8	2	4	10.020	10.750
747L	12	13 7/8	2	4	12.000	12.750
748L	14	15 7/8	2	4	13.250	14
749L	16	17 7/8	2	4	15.250	16
750L	18	19 7/8	2	4	17.250	18
751L	20	21 7/8	2	4	19.250	20



co Heaters of Canada, Ltd. 3090 Lenworth Drive Cooksville, Ontario

TACO, INC. 1160 Cranston Street, Cranston, Rhode Island 02920



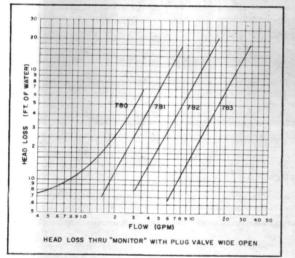




Nos. 780-782

102

HEAD LOSS CHART



#### DIMENSIONS

	Model	Size	А	в.	С	D	E	F	Range	Weight
5	780	½" NPT	5 <sup>5</sup> /8	4 <sup>5/</sup> 16	1 <sup>5/</sup> 16	3 <sup>5</sup> /16	2	1 <sup>5/</sup> 16	.4 – 3.5 GPM	2 lbs.
+>	781	34" NPT	6 <sup>5/</sup> 16	4 <sup>9/</sup> 16	13/4	47/8	23/4	24/8	1.5 -8 GPM	3 lbs.
	≥ 782	1" NPT	6 <sup>15</sup> /16	4 <sup>11/</sup> 16	21/4	53/8	31/8	21/4	3 – 17 GPM	4.5 lbs
1>	783	1%NPT	6 <sup>7</sup> /8	4 <sup>9/</sup> 16	2 <sup>5/</sup> 16	43/4	3 <sup>7/</sup> 16	15/16	6 - 34 GPM	5.5 lbs

Working Pressure - 125 lbs.

TACO HEATERS OF CANADA, LTD. 3090 Lenworth Drive Mississauga, Ontario

Taco, Incorporated, 1160 Cranston Street, Cranston, Rhode Island 02920

printed in U.S.A.

### 780 SERIES -- MONITOR FLOW METER - BALANCING VALVE

#### FEATURES

ACCURACY ± 3% of observed flow

dated 9/15/71

SUBMITTAL DATA

Effective: April 10, 1975 Supersedes: SD 400-4-1

SCALE Linear direct reading in G.P.M. No correction for changes in water temperature.

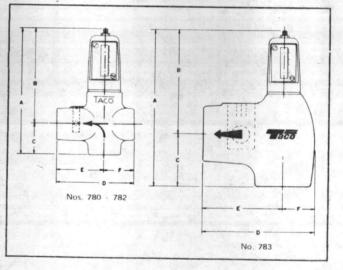
**INSTALLATION** No straight length of piping upstream or downstream of fitting.

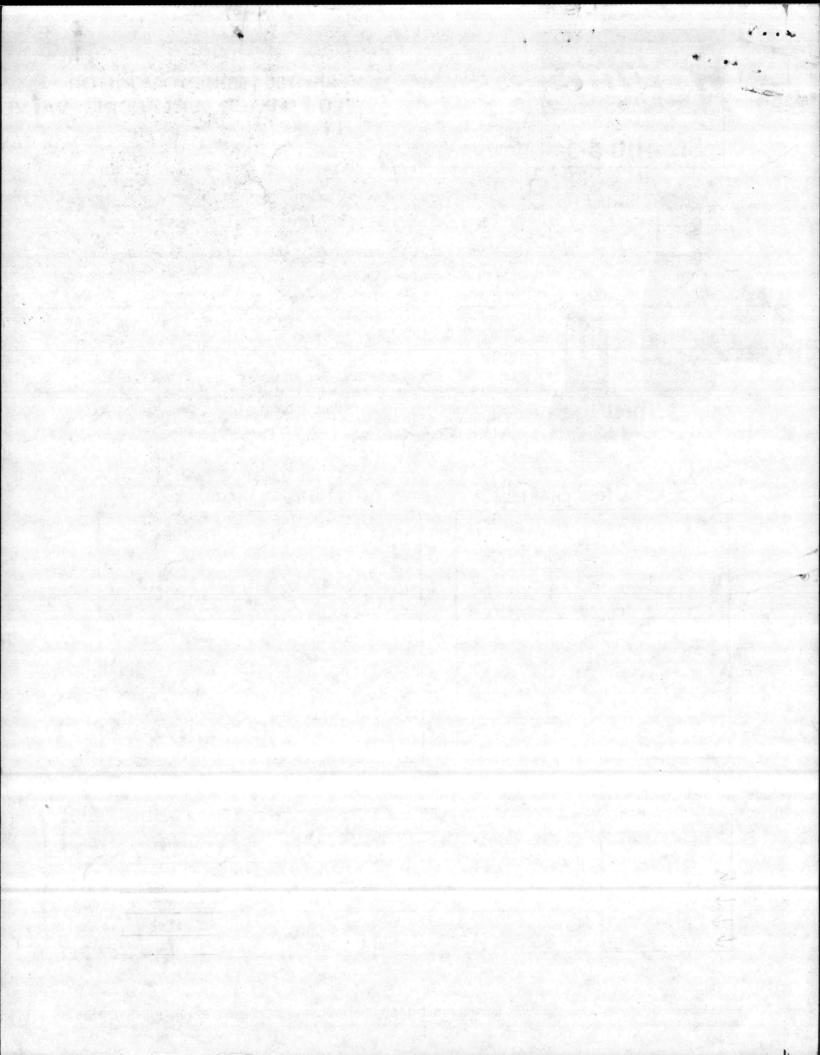
UNIVERSAL Can be fully insulated except for slot in turret top and balancing plug operator. May be installed in a horizontal run of pipe or at the top of a vertical riser as an elbow. BALANCING Screwdriver adjustment of integral plug valve sets rate through loop.

SERVICE Can be serviced without draining system or loop.

FAIL-SAFE The cast iron turret top provides maximum protection against sight glass breakage, but should the glass break, the Monitor is self-sealing.

#### DIMENSION DIAGRAMS





ND L	ANTDIV 4-4355/3 (Rev. 6/76)	DUDIWITTAL TRANSMITTAL	Continuorino	RANSMI 12		DATE 4/18/79		
	CONTRACTOR rrells Plumbi	ng & Heating Co., Inc.	PROJECT TITLE AND LOCATION Replace Heating	k Ai	c Condit:	ioning/		
	. S. Noonan, reenville, Sc	Inc. outh Carolina	Building 2615, Marine Corps Base Camp Lejeune, North Carolina					
1.3.87	and the particular free	CONTRACTOR USE ONLY		REVIEWER USE ONLY				
x	L Contractor Approved	*List only one specification division per fo. ist only one of the following categories on each tra. and indicate which is being submitted OICC Approval			A-Appro D-Disap AN-App	proved roved as noted pipt acknowledged. nents		
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5	15654-14.1	PIPE HANGERS & SUPFORTS:			A	Cue		
		a. Steam & Condensate: Gri (type 44) with type 40-A	Saddles		A	Sac		
		b. All Other Piping: Grinne with fig. 167 ins-protec	ll fig 260 (type 1 tion(type 41) on	)	A	Gae		
		insulated pipe						
		NOTE: All hangers, rod, & zinc or cadium plate	supports to be d(except saddles		A	Auce		

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	Submittals are forwarded to L transmittal form.	ANTDIV with A-E recommendations i	indicated in REVIEWER USE	E ONLY Section and in comments below on ONE COPY of the				

<b>REVIEWER'S</b>	COMMENTS

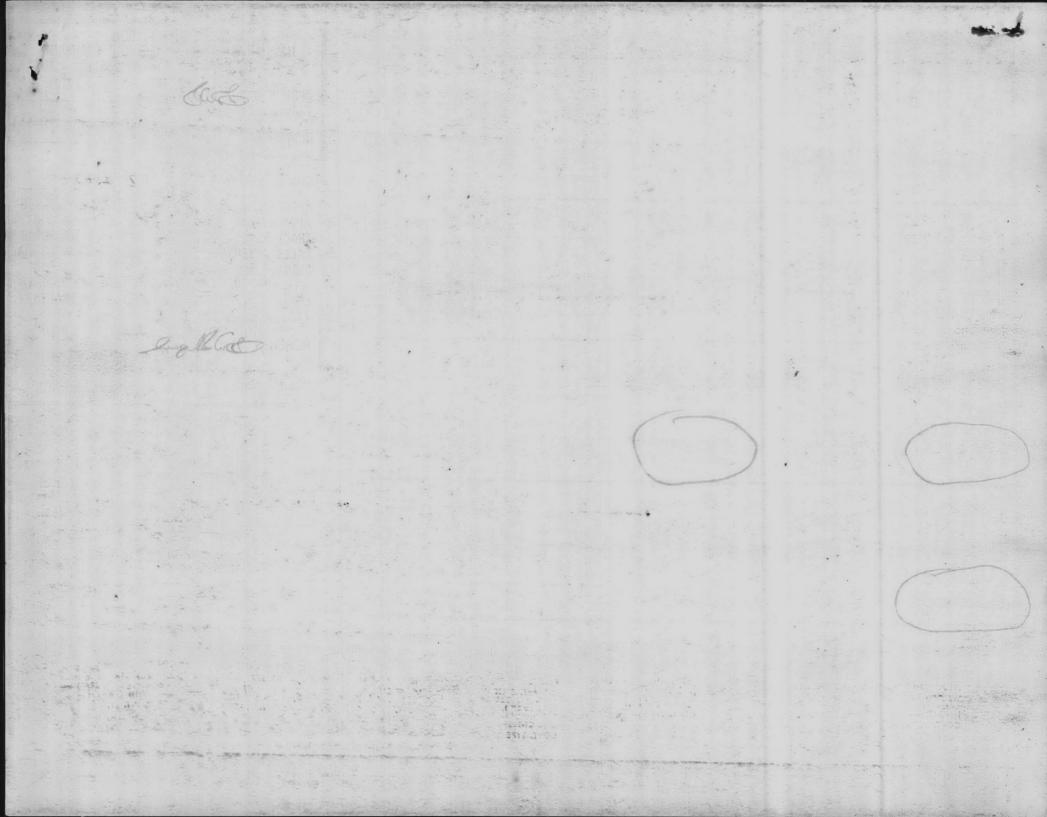
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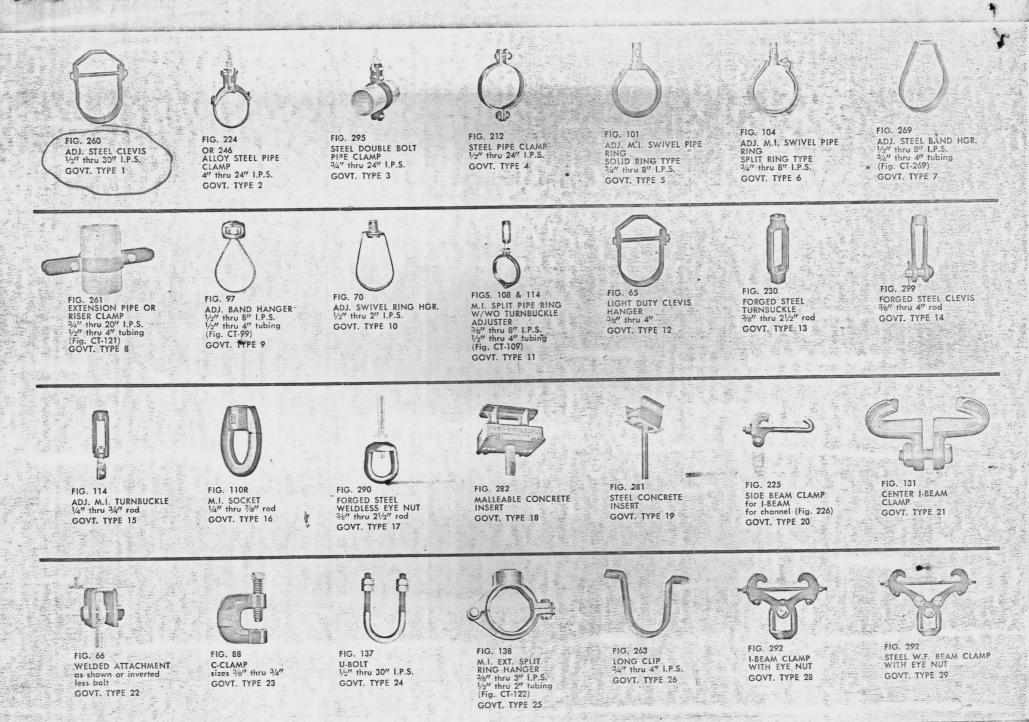
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ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 APPROVED APPROVED AS NOTED DISAPPROVED SUBJECT TO THE RECORDERED OF 162410-17-0-2563 CONTRACT NO. APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA-TION --- THE CONTRACTOR SHALL BE RESPONS-IBLE FOR PROVIDING PROJECT HYSICAL DIMEN-SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. 0 REVIEWE CONSTRUCTION FOR OFFICER FEDERAL SPECIFICATION WW-H-171D Dated October 19, 1970



shown herein are manufactured to heat which Standard Protifica



Anneh Exaligities Offices - Providence-RAAdenia



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	b. Fittings: Cla	ss 250 C.J	L. M.J., confor	ms	an an Angel	-
	to ANSI 21.10	見い読みためたいがない	化自己运行 的现在分词 网络哈哈诺	1211	A	Sul
	c. Thrust Blocks:	Conc. at	all changes of	air	•	and a
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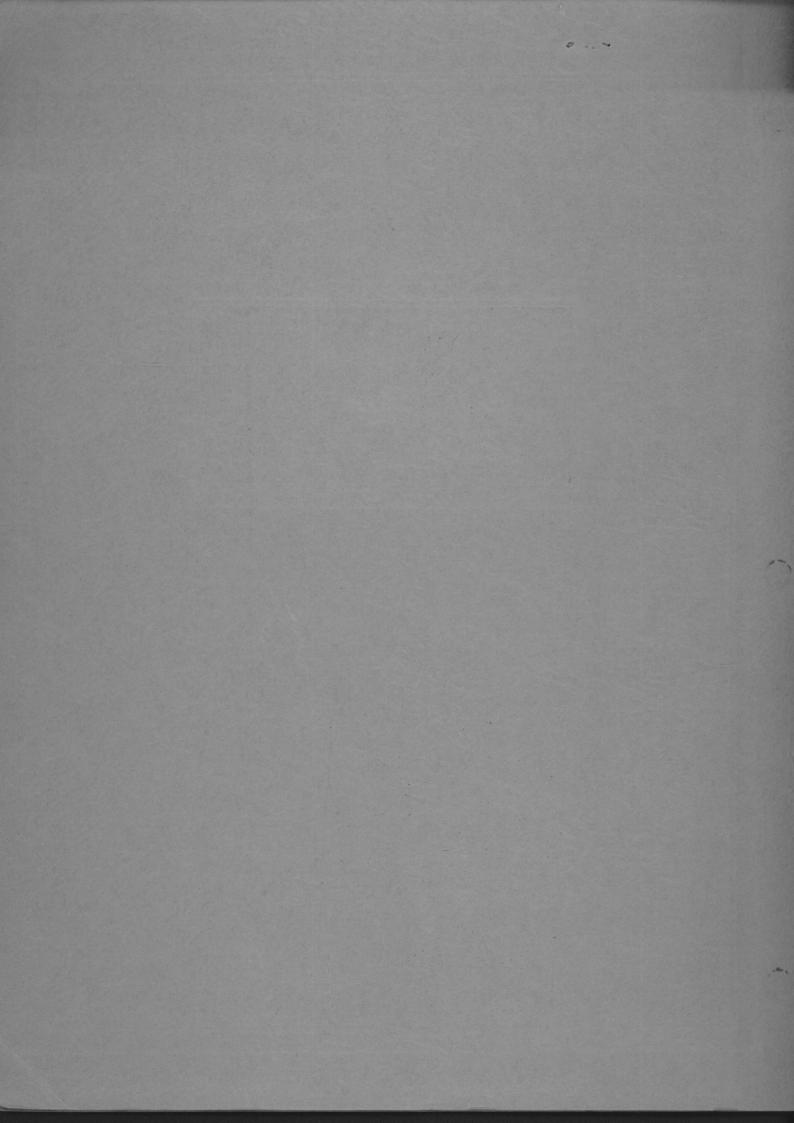
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		*List only one specification division per fo	orm.		**Au A-Appro	CTION CODES
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AL SS 44 430-TA A SEP142-19 Mar 11 1 of , for somether, Her Item E-7 Minimum metal thickness to be 20 gage. Ballast to have "8" sound rating. (S. Marina 424

SOUTHERLAND ELECTRIC JOB: Bldg. #2615, Camp Lejune

20%



March 15, 1979

	SOUTHERLAND ELECTRIC	
	JOB: Replace Heating and Conditioning for B Camp Lejune	
Circuit Breaker	ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMI NORFOLK, VIRGINIA 23511	MAND FPE NEU 631175
Circuit Breaker	APPROVED AS NOTED	FPE 1200F
Safety Switches	DISAPPROVED	FPE_7132
Safety Switches	SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. 62470-7 -C-	FPE 1_36R
Transformers	APPROVAL OF A SUBMITTAL DOES NOT APPROVAL OF ANY DEVIATION FROM TH	E CON-07 ILOY 200
A State of the second	TRACT REQUIREMENTS UNLESS THE CON "CALLS ATTENTION TO AND SUPPORTS T TION THE CONTRACTOR SHALL BE RE	HE DEVIGENCIA-CALGOI SIZE I
Combination Stat	TIBLE FOR PROVIDING PROPER PHYSICAL SIONS & WEIGHTS, COORDINATION OF T	DIMEN-#1214-CA2362 Size 2
Fuses	ETC., AS REQUIRED.	FPE #113N 30
Fuses	REVIEWER <u>BH</u> D DATE	4/30/79 FFE #ECN 60
Type MDP1	FOR OFFICER IN CHARGE OF CONSTRU	
Type MDP2	APPROVED AS NOTED	FPE 120/208 304W 60/3MCB 6-20-1 6-1PSO All Brks. 10,000IC
Type A	NOT A P.O. D	Keene L#24ORS-120V
Type C	"It is hereby car to at to to up month ima-	Keene L#24ORS-120V
	terial) shown and markel in this submittal is that prolosed to le noor orale in o lot race Num- ber	Prescolite #9300 W/ non breakable globe
	EV. 3/116/29 Date Of the Company	

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# **Molded Case Circuit Breakers**

A COLOR

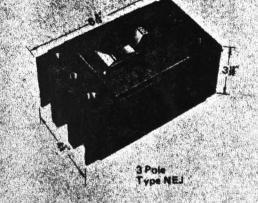
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#### THERMAL MAGNETIC

### DE NEJ - 125 through 225 Amperes - 240 Volts, A.C.

 Thermal Magnetic 
 Non-interchangeable Trip 
 Ouick Make, Ouick Break • 40°C • U.L. Listed • Common Trip • Trip Free • Meets Class 12b, Federal Spec. W-C-3768. Lugs included on load terminals only. Line lugs will be supplied at no cost when ordered with breaker.2

4400	2 POLE, 240 Ve	N. A.C.	STOLE 20 V	IR. A.C.	A Mre
	Cat. No.	List Price	Cat. No.	Lie Rise	Contraction of the second
125	NEJ272128 NEJ272169 NEJ222169	576.00 76.00 76.00	NE3231126 NE3231160 NE3231176	\$204.06 204.06 204.09	SCONCE SCONTIN SCONTIN
	NE.0222200 NE.0222225	74.00	NE-1231200 NE-1231225	201.00	abow cin Sozia cin
Case Switch	NELTOTZZSKA		NEJZ31225NA	180.00	JOOM CH.
Shipping Regist	in.		1		1



## Type NFJ - 70 through 225 Amperes - 600 Volts, A.C.

Thermal Magnetic 
 Non-Interchangeable Trip 
 Outch Make, Quick Break 
 # 40\*C

U.L. Listed . Common Trip . Trip Free

Neets Classes 14b, 19a and 20a, Federal Spec. W-C-3758.

Lugs included on load terminals only. Line lugs will be supplied at no post when ordered with breaker.

a sector	MAGNETIC ADJUSTABLE BANGE	V FPOLE 100 Vella A.S. 250 Volts, D.G.	a POLE, 600 Ville, A	L
Amp	Low He	Canada Martin Print	Canalog No.	tice Size
70 90 100	100 700 000 1000 000 1000 100 1250			
125				
225	Moldin Case Switch	M. BARRIS	NE JESSE SNA	State State
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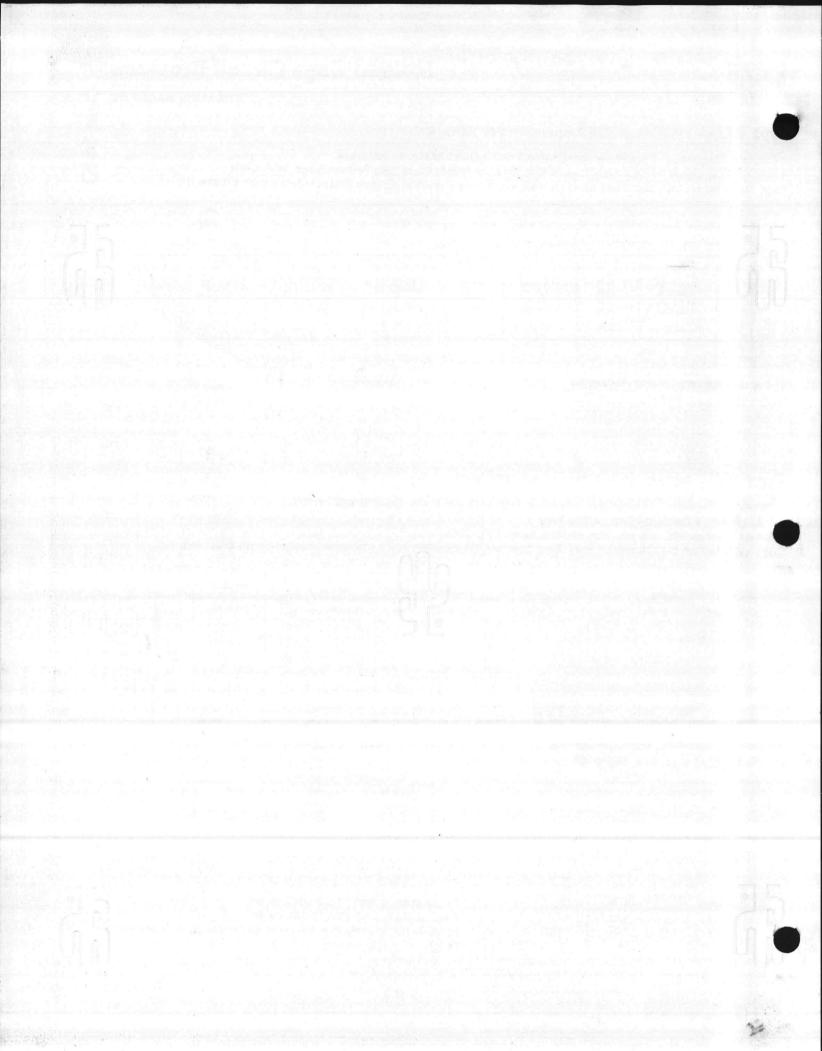
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Bresker	Cat No.	時に
NEJ	EJSZ FJSZ	
NF.J	F.132	
A CONTRACT OF	1 June 1 Store and Alter	

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ACCESSORIES: REFER TO PAGES 53. 54. ENCLOSURES: REFER TO PAGES 60, 61. For types HEJ and HFJ High Interrupting Capacity Breakers, see pages 60. 67

FRE



SINGLE THROW-PLUG AND CARTRIDGE FUSES

NEMA 1

General Purpose

Catalog

List

250 V. D.C.

Single throw, plug and cartridge fusible Federal Pacific General Duty Safety Switches are designed for requirements of commercial and residential installation. They are suitable for light duty motor circuits and approved for service entrance. FPE General Duty Safety Switches meet U.L., NEMA, and federal government standards for general duty switches.

#### Plug Fuse Type-30 Amp

These 30 amp plug fuse switches are designed for residential and commercial applications.

Type

	Alexandre and a	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		HORSEPOWER RATINGS				General Pu		Rainproof		
	escription	Volts	120 V	., A.C.	240 V	., A.C.	125 V., D.C.	250 V., D.C.	Catalog	List	Catalog	List
Sel and Se	et all a fine for the state		Std.	Max.	Std. 19	Max. 1.0	0.0.	0.0.	Number	Price	Number	Fille
11	1 Pole plus S/N	120 V., A.C.	42	2	-	-	2		0311SN	\$11.50	RH0311SN	\$26.00
., [1	(1 Blade, 1 Fuse)	125 V., D.C.	-	14.14	Prese		16.00		0322	13.20	RH0322	30.00
11	2 Pole	120/240 V., A.C. 125/250 V., D.C.	42	2	142	3	2	5	+00322	16.50		-
11	(19-2 Wire)	the second s	-		-	1 .	The second second		0322SN	14.90	RH0322SN	30.00
III	2 Pole plus S/N (19-3 Wire)	120/240 V., A.C. 125/250 V., D.C.	42	2	14/2	3	2	, 5	+D03225N	18.00	ئىتى <u>.</u> مەربىيە مەربىيە مەربىي	+
-	3 Pole (3) Wire)	120/240V., A.C.	-	-	1 2 <del></del> 1 -				0332	26.00		1_

HORSEPOWER RATINGS

Max.

16 39

240 V., A.C.

30

Std

10

Cartridge Fuse Type-Fusible

2 Pole, 120/240 V., A.C.--- 125/250 V., D.C.

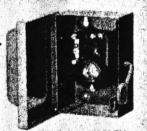
Amos

t Dead front.

50

226

1



Cat. No. 0311SN

#### CH/AL Lug Canacities

Switch Rating		Wire Size
30A 60A 100A 200A 400A 600A	Single Cable Double Cable Two	14-8* 14-2 8-1/0 #6-250MCM #4-600MCM #1/0-250MCM #2-600MCM

\*Copper only

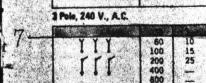
#### Hubs for Rainproof Switches

The rainproof General Duty Switches rated 30 amp through 200 amp (Catalog Prefix RH) are designed to use the same quick-eligning, interchangeable hubs as furnished for Heavy Duty Switches. Refer to table on Page 35.

400 amp General Duty Switches are shipped with undrilled and plates. Hub openings may be punched or drilled in the field as required.

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	120/240 V., A.C	30 60 100 200 400 600	142 3 742 15 -		3 10 15 	11111	3 10 20 20 	3322 3622 3122 3222 3422 3722	\$ 17.40 34.50 70.50 148.00 379.00 807.00	RH3322 RH3622 RH3122 RH3222 R3422	\$ 30.00 \$3.50 82.50 203.00 \$26.00
30 $14_2$ 3         3 $74_2$ 3 $33228N$ $19.60$ $RH3622$ 4         100 $74_2$ 15         10         15         10 $3622$ $34.50$ $RH3622$ 200         15         15         50         20 $3122$ $70.50$ $RH3622$ 200         15         15         60         20 $3122$ $70.50$ $RH3222$ $2$ 400         -         50         -         100         - $34225N$ $420.00$ $RH3222$ $2$ $400$ - $50$ - $100$ - $34225N$ $420.00$ $R34225N$ $50$ - $100$ - $33325N$ $32.50$ $RH33325N$ $50$ - $100$ - $33322$ $32.50$ $RH3632$ $74_2$ 15 $30$ - $3132$ $95.00$ $RH3632$ $74_2$ 15 $30$ - $3132$ $95.00$ $RH33325N$	SN (2 Blades-2	Fuses) 1	20/240 V	., A.C	125/250	V., D.C.					
30 $1\frac{14_2}{3}$ 3 $7\frac{1}{2}$	¥¥I	30 60 100 200 400	142 3 71/2 15	3 74/2 15 25 50	3 10 15 	74/2 15 30 60 100	10 20 20	3622 3122 3222 3422SN	34.50 70.50 148.00 420.00	RH3622 RH3122 RH3222	32.00 53.50 82.50 203.00 571.00
30 $1\frac{14_2}{3}$ 3 $7\frac{1}{2}$	240 V. A.C.								Star Contains		
Wire SN (3 Blader-3 Fuers) 240 V., A.C.           Y         30 $1\frac{1}{2}$ 3 $7\frac{1}{2}$ -         3332SN         32.50         RH3332SN           Y         Y         10         15         -         3632         95.00         RH3332SN           Y         Y         100         7 $\frac{1}{2}$ 15         15         30         -         3132         95.00         RH3332SN           Y         100         7 $\frac{1}{2}$ 15         15         30         -         3132         95.00         RH3232           200         -         25         -         60         -         3232SN         407.00         RH3232           400         -         75         -         100         -         3732SN         962.00         RH3232           wo-phase, 4-wire or 5-wire switches available. Consult nearest field office for prices.         RH3232         RH3232         RH3232           Mor-Fusible         2 Pole, 120/240 V., A.C.         -         125/250 V., D.C.         -	Į į į	60 100 200 400	3	74/2 15 25 50	10 15 	15 30 60 100		3632 3132 3232 3432	53.50 95.00 205.00 453.00	RH3632 RH3132 RH3232	49.5 74.5 137.0 247.0 506.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CN /2 Blades 2	6-1-1-	MAN V A	C	A constraints						
wo-phase, 4-wire or 5-wire switches available. Consult nearest field office for prices.	1. A.	30 60 100 200 400	14/2	3 74/2 15 25 50	10 15 	15 30 60 100	1	3632 3132 3232 3432SN	53.50 95.00 205.00 487.00	RH3632 RH3132 RH3232	49.5 74.5 137.0 247.0 638.0
	A State of the second se		1. 1.						fice for pr	ices.	
Y Y 50 3 3 7322 17.40 847322 1	n-Fusible-	30	e, 120/	240 V	., A.C	- 125 	3		17.40	RH7322	30.0





Cat. No. 3122

DISCOUNT C SCHEDULE

RH7332 RH7632

RH7132

RH7232

26.00 34.50 81.50

149.00

7632 7132

7232

10

20 20

15

30 60

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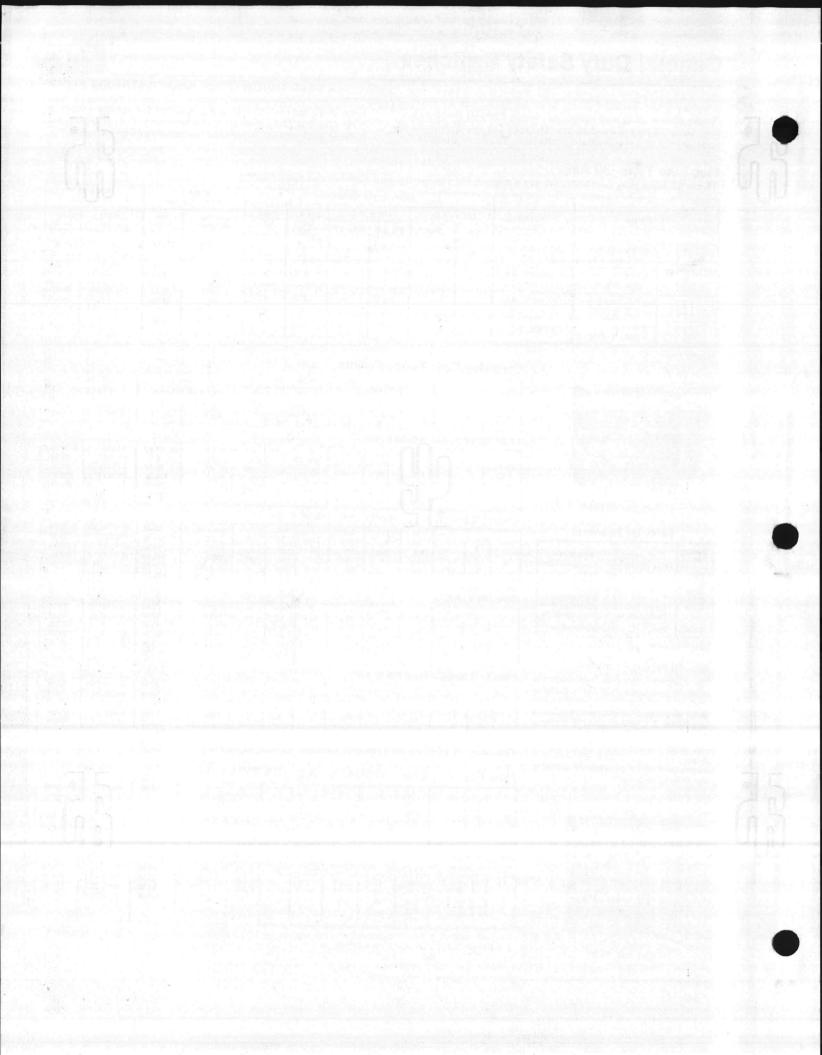
46.50 73.50 137.00 247.00

NEMA 3R

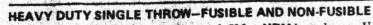
Rainproof

List

Catalog



# **Heavy Duty Safety Switches**



Heavy duty switches meet or exceed U.L., NEMA and federal government (WS865C) heavy duty standards for performance and safety. All switches approved for service entrance.

U.L. listed for use on systems up to 200,000 amperes, RMS symmetrical when used with Class J or Class R fuses installed.

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#### 10EMED VA

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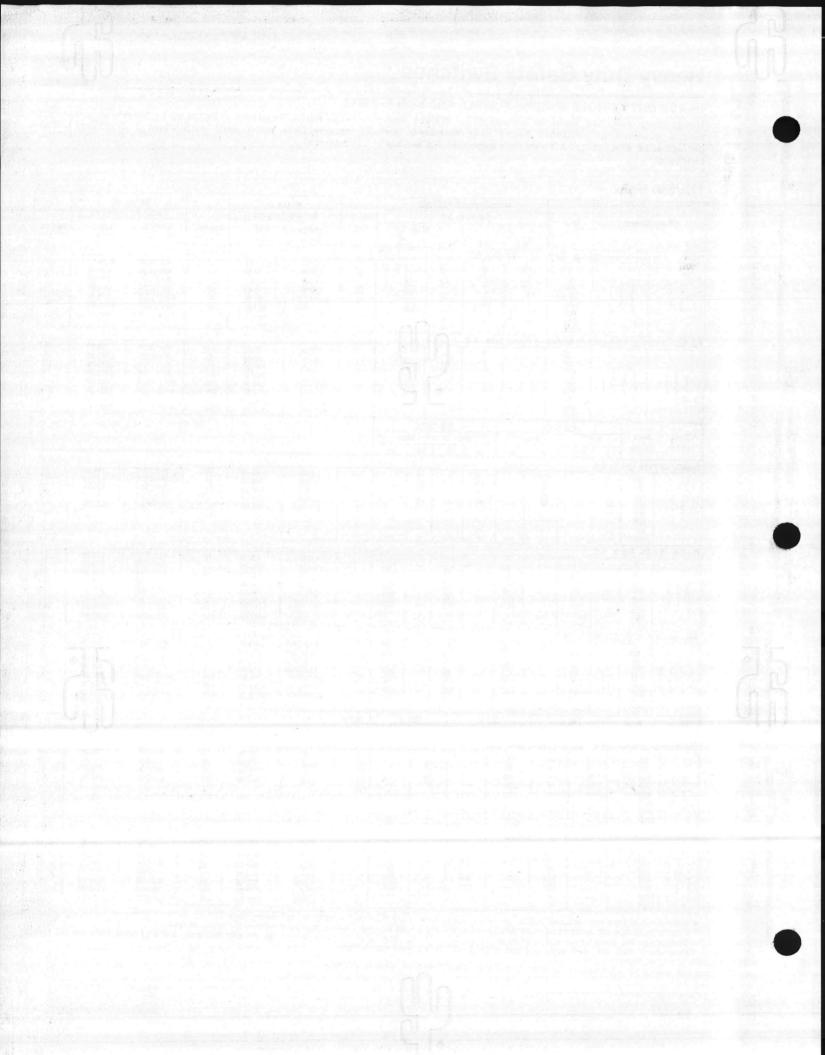
25/250	n digin oʻri Social			1É	HOI	SEPOWI 240 Vol		NOS	250 V.		AA 1 Purpose		NEMA Rainproof E		
Wining	g System		Amp Rating	and the second second	- Std.	240 Vα 3φ	16	Max. 3d	D.C.	Cetalog Number	List Price	Approx. Wt. Lbs.	Catalog Number	List Price	Approx Wt. Lbi
	Ĭ	II	30 60 100 200 400 600 800 1200	IV. AC	<b>125/25</b>	<b>8</b> 715 25 50 75	795	71/2 15 30 60 125 200 	5 10 20 40 50 	1322R 1622R 122R 1222R •01422R •01422R •01722R	\$ 41.00 78.50 123.00 218.00 450.00 893.00 	10 19 22 60 129 130 -	RH 1322R RH 1628R RH 1122R RH 1222R +RQ 1422R +RQ 1422R 	\$ 74.50 141.00 180.00 260.00 579.00 1136.00	14 22 27 72 113 196 -
**************************************		5 T	IN (3 Ble 30 60 100 200 400 600 800 1200			<b>BV, A.C.</b> 3 7% 15 25 50 75 	THEFT	7½ 15 30 60 125 200	111111	1332R 1632R 1132R 1232R •01432R •01732R •01836L* •01936L*	50.00 88.59 141.00 243.09 564.00 1012.00 2172.00 2854.00	11 20 25 64 105 135 215 234	RH1332R RH1632R RH1132R RH1232R RH1232R •RQ1432R •RQ1432R •RQ1732R •RQ1836L •RQ1936L	93.50 148.00 215.00 651.00 1359.00 2691.00 3497.00	15 25 29 79 141 202 263 310
Viring .	Amp Reting	S	<b>480</b> Id.	Volta Ma	Contraction of the	St	the second second second	Max.							Propati Sur Spanner Spanner
Sure and		10 V., A.C	30	10	3.6	10	3:6		0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1336R	88.50	18	RH1336R	149.00	21
11	30 100 200 400 600 800	3520     + ]	111111	222221111	1111111	3 10 15 30 	1111111	50		1636R 1136R 1236R 01426R	106.00 198.00 288.00 746.00 	21 32 70 102 	RH1336R RH1636R RH1136R RH1236R RQ1426R   	178.00 278.00 379.00 823.00	21 32 36 151 
sible_3	Pole, 606 100 200 400 600 1200	Y. AC	15 25 100 159	111111	11 SBGCe	I I I I I I I I I I I I I I I I I I I	1 1 201386-	111111	20         -           50         -           50         -           50         -           50         -           50         -           50         -           50         -           50         -           50         -           50         -           50         -           1         -	1836R 1135R 1135R 1136R 01436R 01736R 01838L 01838L 01936L	88.50 106.00 198.00 288.00 746.00 1258.00 2172.00 2854.00	18 21 32 70 106 136 215 234	RH1336R RH1636R RH1136R R01436R R01436R R01436R R01836L R01936L	148.00 178.00 278.00 379.00 891.00 1755.00 2001.00 3497.00	2 33 38 15 21 26 31
	and the second se	227/4	<b>B V., A.</b> 5 15 25 50 100 150.	1111	15 30 80 125 250 14	111111	7% 1530 1250 1200	111111	20	1336SNR 1636SNR 1136SNR 1136SNR 1236SNR •01436R •01736R •01736R •01836L*	120.00 215.00	18 21 32 70 106 136 215 234	RH 1336SNR RH 1636SNR RH 1136SNR RH 1236SNR •RQ 1436R •RQ 1436R •RQ 1436L •RQ 1836L	198.00	2 33 38 18 21 26 31
Wiring System	Amp Rating		240 V	the second s	10	160 V 3¢		600 V	250 V 0 D.C.					14年	
	30 60 108 209 400 600 800 1200		AC 0	1111111	2838   1   1	111111	1000		- 5 - 10 - 20 - 40 - 50 	5336 5636 5136 5236 	46.09 85.50 132.00 203.00	19 22 21 55 	RH5336 RH5636 RH5136 RH5236 	<b>95.50</b> 147.00 205.00 247.00 	1325
111 111		a d	- AC .	141990120 -		).C.	· •		20	5336 5636 5136 5236 05436 05736 05836 05836	46.00 85.50 132.00 203.00 453.00 802.00 1628.00 2189.00	10 22 21 55 122 126 194 196	RH5336 RH5636 RH5136 RH5236 R05436 R05736 R05936	85.50 147.00 205.00 247.00 619.00 1236.00 2128.00 2914.00	10

Solid Neutral Bars not included in "Q" switches. Order from Solid Neutral Bar table on following page. L suffix switches are equipped for instellation of one Class L fuse per leg. Class L fuses are rated 600V., A.C. or less. 30 through 500 amp heavy duty switches are svallable for "J" fusing at no extra charge. 30, 60 and 600 amp, 240 and 600V switches are factory essembled; 100, 200, 400 amp, 240 and 500V switches are field convertible.

For additional information request FPE Bulletin, class 1240 from local sales office

\*

FPZE



FRE

# Type FH General Purpose Insulating Transformers

a an				SI	IGLE AND	THREE P	to 500 KVA HASE, 60Hz	- CLAS	SH-1	50° RISE
le Ph	ase Type F	H		e Paris de la composición Composición de						
	Catalog	List	Din	nensions — In	ches	Weight	elenere applea	D8 Sound	Insulation System	Insulation Temp.Rise
<b>WA</b>	Number	Price	Height	Width	Depth	Lbs.	Mounting	Level	°C	°C

10	50050	\$ 5/0.	27%	16 1/2	12%	1 145	Well-Floor	42 1	220	150	1
25	50051	813.	301/2	19%	121/4	215	Wall-Floor	42			1
37.5	50052	1000.	341/2	191/2	14 . 14 . Walt			42		ALC: NO CONTRACTOR OF A	
50	50053	1215.	34%		14 - 200			42		a transmission of the second	1
75	50054	1545.	The second second second second second	and the state of the state of the state	16%			45		Contraction of the Contraction of the	1
100	50055							45	Construction of the second sec	and the second se	
167	50056	3420.	50	32				47		Contract and the State of the State	
	50 75 100	25         50051           37.5         50052           50         50053           75         50054           100         50055	25         50051         813.           37.5         50052         1000.           50         50053         1215.           75         50054         1545.           100         50055         1975.	25         50051         813.         30½           37.5         50052         1000.         34½           50         50053         1215.         34½           75         50054         1565.         40½           100         50055         1375.         46	25         50051         813.         30 ½         19 ½           37.5         50052         1000.         34 ½         19 ½           50         50053         1215.         34 ½         19 ½           75         50054         1545.         40 ½         21 ½           100         50055         1975.         46         22 ½	25         50051         813.         30½         19½         12¼           37.5         50052         1000.         34½         19½         14           50         50053         1215.         34½         19½         14           75         50054         1545.         40½         19½         16¼           100         50055         1975.         46         22½         16¼	25         50051         813.         30½         19½         12¼         215           37.5         50052         1000.         34½         19½         14         310           50         50053         1215.         34½         19½         14         380           75         50054         1545.         40½         21½         16¼         485           100         50055         1975.         46         22½         16¼         600	25         50051         813.         30½         19½         12¼         215         Wall-Roor           37.5         50052         1000.         34½         19½         14         310         Wall-Roor           50         50053         1215.         34½         19½         14         380.         Wall-Roor           50         50053         1215.         34½         19½         14         380.         Wall-Roor           75         50054         1545.         40½         21½         16¼         485         Floor           100         50055         1975.         46         22½         16¼         600         Floor	25         50051         813.         30½         19½         12½         215         Wall-Floor         42           37.5         50052         1000.         34½         19½         14         310         Wall-Floor         42           50         50053         1215.         34½         19½         14         380         Wall-Floor         42           75         50054         1545.         40½         21½         16¼         485         Floor         45           100         50055         1975.         46         22½         16¼         600         Floor         45	25         50051         813.         30½         19½         12½         215.         Wail-Roor         42         220           37.5         50052         1000.         34½         19½         14         310         Wail-Roor         42         220           50         50053         1215.         34½         19½         14         380         Wail-Roor         42         220           75         50054         1545.         40½         21½         16¼         485         Floor         45         220           100         50055         1975.         46         22½         16¼         600         Floor         45         220	25         50051         813.         30½         19½         12½         215.         Wail-Roor         42         220         150           37.5         50052         1000.         34½         19½         14         310         Wail-Roor         42         220         150           50         50053         1215.         34½         19½         14         380         Wail-Roor         42         220         150           50         50053         1215.         34½         19½         14         380         Wail-Roor         42         220         150           75         50054         1545.         40½         21½         16¼         485         Floor         45         220         150           100         50055         1975.         46         22½         16¼         600         Floor         45         220         150

15	50060	\$ 638.	271/2	161/2	121/4	145	Wall-Floor	42	220	150
25	50061	950.	301/2	191/2	12%	215	Wall-Floor	42	220	150
37.5	50062	1055.	341/2	19%	14	310	Wall-Floor	. 42	220	150
50	50063	1270.	341/2	19%	14	380	Wall-Floor	42	220	150
75	50064	1615.	401/2	211/2	16%	485	Floor	45	220	150
100	50065	2060.	46	22	16%	600	Floor	45	220	150
167	50066	3695.	50	32	\$ 19%	940	Floor	47	220	150

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CONTRACTORS

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**Three Phase Type FH** 

480A Volts Primary, 208Y/120 Volts Seconda

	100 M	<b>4 708</b>	1 Hall 22%	214	124	ALL AND A				State of the second second
25	50341	963.	27 %	231/2	12%	245	Wall-Floor	42	220	150
30	50342	1038.	271/2	231/2	12%	270	Wall-Floor	42	220	150
37.5	50343	1160.	301/2	241/2	12%	310	Wall-Floor	42	220	150
45	50344	1265.	301/2	241/2	121/4	355	Wall-Floor	42	220	150
50	50345	1360.	301/2	241/2	121/4	370	Wall-Floor	42	220	150
75 .	50347	1925.	341/2	28	14	565	Floor	45	220	150
100	50348	2180.	401/2	31	15%	845	Floor	45	220	150
112.5	50349	2535.	401/2	31	151⁄4	.710	Floor	45	220	150
150	50350	3255.	46	341/2	161/4	920	Floor	45	220	15
225	50352	4380.	50	40	191/2	1210	Floor	47	220	150
300	50353	5360.	55	44	27	1725	Floor	47	220	150
500	50355	8460.	60	50	34	2425	Floor	50	220	150

	400	T AOL	s Print	ary, Z	MUT AO	HILE DECC	SUCCEU			
and 4-2	21/2%	FCBN	Taps.	2-21/19	6 FCAN	and 2-	21/2%	FCBN	Taps on 1	15

15	50360	\$ 760.	221/2	21%	12%	175	Wall-Floor	42	220	150
30	50361	1638.	27%	231/2	12%	270	Wall-Floor	42	220	150
45	50362	1265.	301/2	24%	12%	355	Wall-Floor	42	220	150
75	50363	• 1925.	34%	28	14	565	Roor	45	220	150
112.5	50364	2535.	401/2	31	15%	710	Floor	45	220	150
150	50365	3255.	46	34%	16%	920	Roor	45	220	150
225	50366	4380.	50	40	19%	1210	Floor	47	220	150

600 Volts Primary	, 208Y/120 Volts	Secondary 4	1-21/4%	FCBN T	ape

15	50370	\$ 713.	221/2	21%	12%	175	Wall-Floor	42	220	150
30	50371	1090.	27%	23%	12%	270	Wall-Floor	42	220	150
45	50372	1450.	301/2	241/2	12%	355	Wall-Floor	42	220	150
75	50373	2245.	341/2	28	14	565	Roor	45	220	150
112.5	50374	2810.	401/2	31	15%	710	Floor	45	220	150

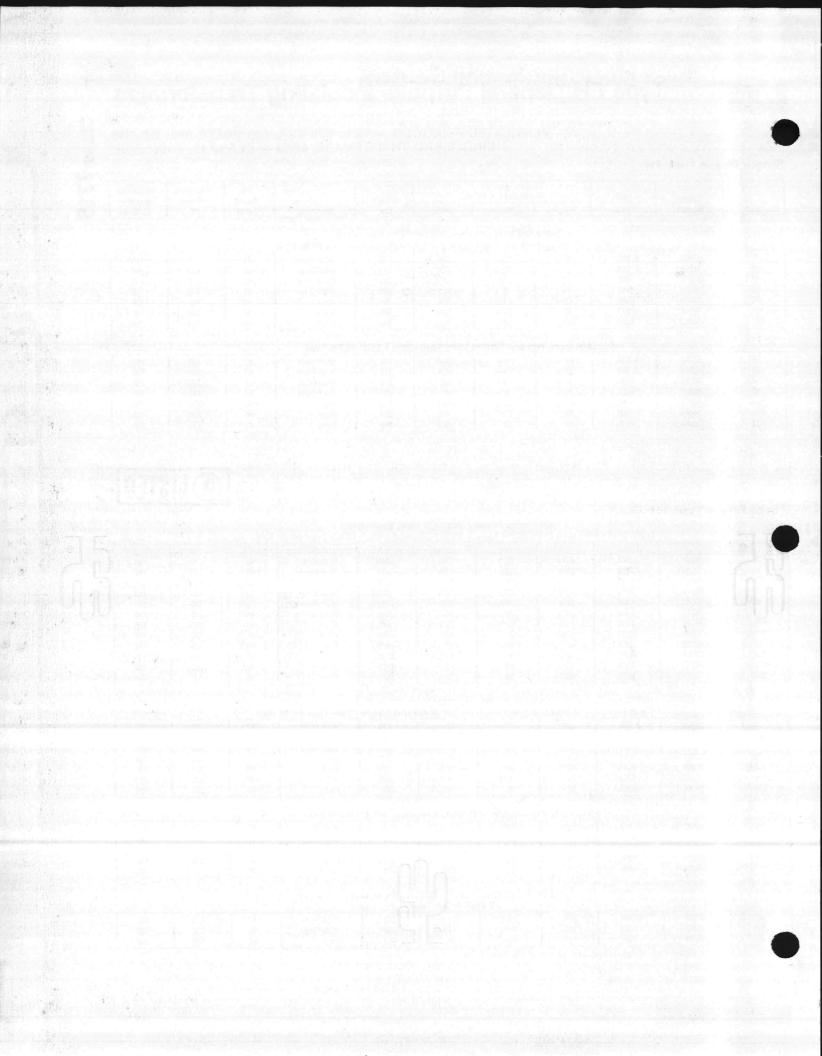
240 Volts Primary, 208Y/120 Volts Seconds

45	50382	\$1265.	30%	0.414	1 101/	Arr.	Manager Print a state to the second		and the second s	
		+1200.	30 11	24%	12%	355	Wall-Floor	42	220	150
50	50383	1360.	301/2	241/2	12%	370	Wall-Floor	0	220	150
75	50384	1525.	341/2	78	1	565	Floor	AE I	220	150

voltages not shown, consult with your local FPE Sales Office



Y



# Class 4213 Non-Reversing 3 Phase Starters with Non-Fusible Disconnect Switch

All 3 Phase Starters have 3 overload relays.

	MAX. HP		NEMA	WEMA Gen Purp Enclose	orel Oso	NEMA Water Steinles Enclo	tight is Steel	NEMA 1 Oil-Tight/ Indus Enclo	Dusttight trial
200 Volts	230 Volts	460 Volts	Size	Stylet	Price	Stylet	Price	Stylet	Price
3 7½ 10 25 40	3 7½ 15 30 50	5 10 25 50 100	01234	CA0390 CA1308 CA2300 CA3300 CA3300	\$190. 200. 316. 526. 1018.	CD0300 CD1300 CD2300 CD3300 CD3300 CD4300	\$390. 400. 624. 1072. 1702.	CK0300 CK1300 CK2300 CK3300 CK3300 CK4300	\$240. 250. 388. 626. 1270.

## **Class 4227 Reversing Combination Starters with Non-Fusible Disconnect Switch**

To order Reversing Non-fusible disconnect switch starters, change class number to 4227, use above style numbers and add reversing additions price from Table A, page 167, to above prices.

For Combination Size 5 and 6 Starters, see page 176, Table II.

## **Class 4214 Line Voltage Type with Fusible Disconnect Switch** All 3 Phase Starters have 3 overload relays.

SOO VOLTS	MAXIMUM	25-60 CYC	LES					*PRICES	DO NOT IN	ICLUDE HEA	
60 Cycle	MAX Dual Element	N.E.C.	NEMA	C	JSE LIP INGS	NEN General Enclo	Purpose .	NEM Wate Stainles	rtight	NEM Dust Enclose	tight uret $ight$
Voltage	Fuses	Fuses	Size	Volts	Amps	Stylet	Price	Stylet	Price	Stylet	Price
200/208 Volts	7½ 10 25 40	3 3 7% 10= 10 15= 25 30 40	0	250 250 250 250 250 250 250 250 250 250	30 30 60 60 100 200 100 200 200 400	CA0321 CA1321 CA1322 CA2322 CA2323 CA2324 CA2324 CA3323 CA3324 CA3324 CA4324 CA4325	\$ 196. 206. 219. 324. 350. 374. 546. 594. 1018. 1152.	CD0321 CD1321 CD1322 CD2322 CD2323 CD2324 CD3323 CD3324 CD4324 CD4325	\$ 396. 406. 410. 632. 658. 682. 1082. 1130. 1764. 1838.	CK0321 CK1321 CK1322 CK2322 CK2323 CK2324 CK3323 CK3224 CK3224 CK4324 CK4325	\$ 246 256 260 396 420 446 636 584 1272 1400
-238/240 Volts	71% 15 30 50	3 3 7½ 15 15 30 30 50	0	P 835 535 535 55	30 30 60 80 100 200 100 200 200 200 200 400	CA4325 CA0321 CA1321 CA1322 CA2322 CA2322 CA2323 CA2324 CA3324 CA3324 CA3324 CA4325	196. 206. 218. 324. 350. 374. 546. 594. 1018. 1152.	CD0322 CD0321 CD1321 CD1322 CD2322 CD2323 CD2324 CD3223 CD3324 CD3224 CD4324	396. 406. 410. 632. 658. 682. 1082. 1130. 1704. 1838.	CK0321 CK0321 CK1322 CK1322 CK2322 CK2323 CK2324 CK3324 CK3324 CK4324 CK4325	246 256 260 396 420 446 636 684 1272 1406
Volts	16 25 1	5 10 15 25 30*		800 600 800 800 800 800	30 85 60 100 100	CA0361 ICA1361 CA1362 CA2362 CA2363 CA3363	214. 530 554. 556.	CD0361 CD1361 CD1362 CD2362 CD2363 CD2363 CD3363	400. 410. 414. 638. 662. 1094.	CK0361 CK1361 CK1362 CK2362 CK2363 CK3363	250 260 264 402 424 650
	100	50 60 100	34	600 600 600	200 200 400	CA3364 CA4364 CA4365	602. 1058. 1170.	CD3364 CD4364 CD4365	1138. 1746. 1856.	CK3364 CK4364 CK4365	65 131 142

## **Class 4228 Reversing Combination Starters** with Fusible Disconnect Switch

Change class number to 4228. Use above style numbers and add Reversing additions price from Table A, Page 167, to above prices.

## Class 4237, 4238 Multispeed Combination Starters

Refer to bottom page 171.

- \* Prices including Heater Units: Add \$0.00 to 3 Pole Starter Prices. (3 Heaters required at \$3.00 each.)
- \* Prices do not include control circuit transformers. If required to meet JIC specifications, add prices from modification table on page 171
- ONEMA 12 normally supplied without external reset push button, specify if required. No extra charge.
- · Suitable for this horsepower on light starting duty. For heavy starting duty, starter with next size larger fuse clips is recommended.
- t When using Type J fusse, order by description.

#### **Coil Voltages** Coll Volts Catalog No. Size 00 4 Suffix Standard A.C. Voltage 24/60 -36 110/60 -02 120/60. 110/50 -01 -43 208/220/60 240/60, 220/50 -06 277/60 - 77 440/60, 380/50 -11 480/60, 440/50 -12 550/60 600/60, 550/50 -70 600/50 -71 Dual-Voltage A.C. 120/240/60 -26 208/220/440/60 -55 240/480/60 -51

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#### ORDERING INSTRUCTIONS

- 1. Order by class and style number
- 2. If modifications and spe cial features are required refer to table on page 17! Add the appropriate suffix letter(s) in alphabetical order to the style number
- 3. Specify coil voltage and frequency from coil chart above and add coil suffit number to end of catalog number
- 4. Order heaters separately select from chart on page 186

Dimensions: Page 170. Field Mod. Kits: Pages 172. Factory Modifications: Page 171

Technical Data: Page 174 Overload Relays: Page 174 Motor Full Load Currents (NEC): Page 191.

> REVER Add to Changing to CI 30, 6

Price

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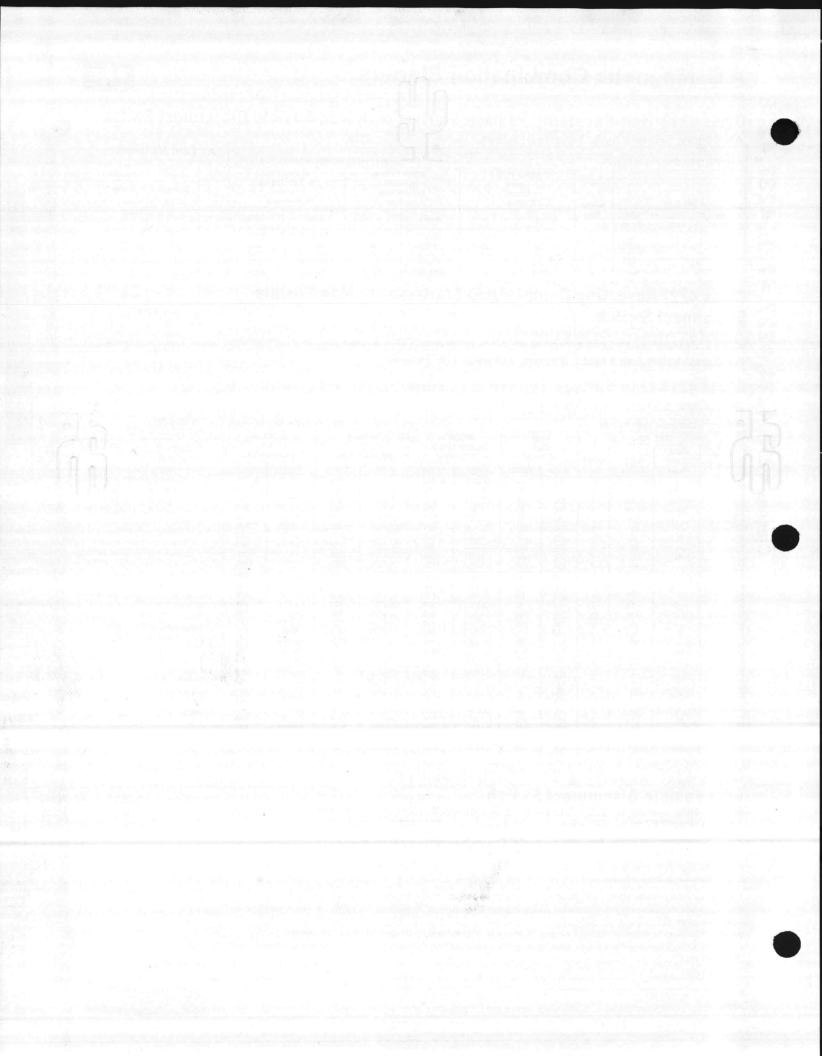




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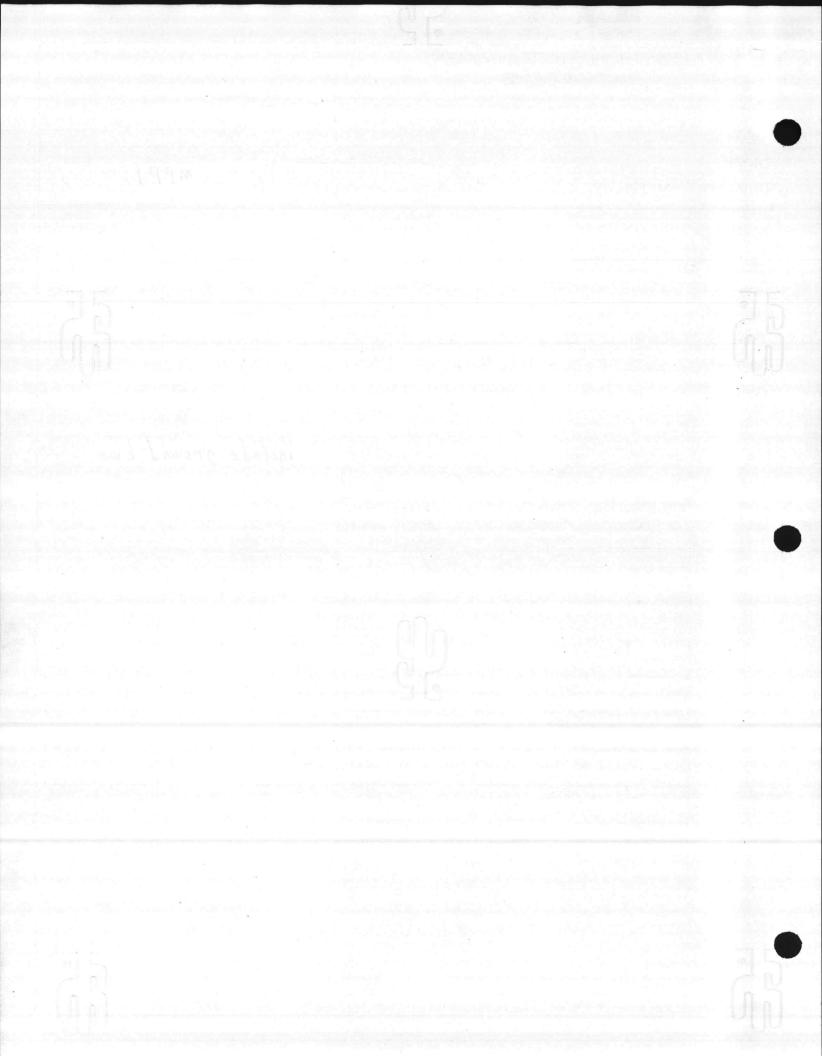
166



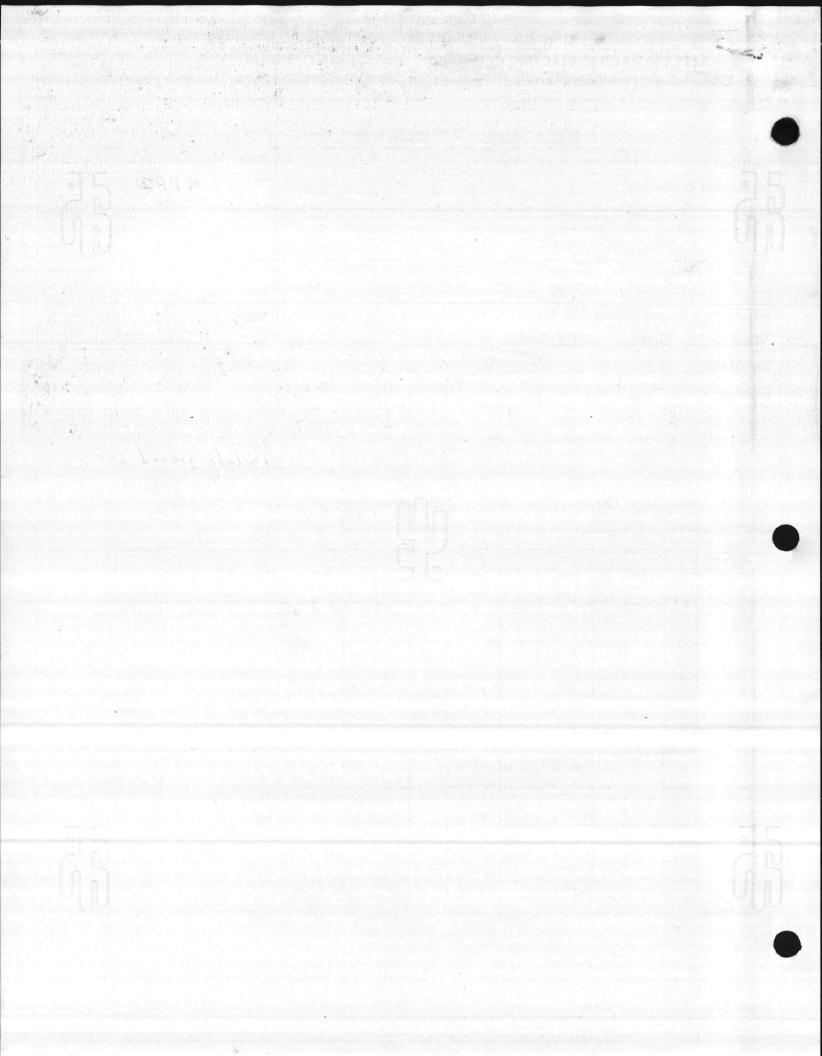
FEDERAL PACIFIC ELECTRIC COMPANY Panelboard Drawing	FPE No.
JOB Name REPLACE HTG. & AC BLDG. 2615	Page Item
ADDIED FIEDT SUPPLY	Panel MDP
Distributor Order No.	MPPI
Panel TypeNBLF	
120 208 Volts _ 3 Phase _ 4 Wire	Chassis AC EVILT
60 Amps NB BRKR Main	Lug
Lug Size 1# 6-20 \$ \$ 1	Trim
Trim: 🔲 Flush 🕅 Surface	Box
Box Size: 30" H 20" W 6" D	
Gutters: Top Bot L.S R.S.	
Type Amp Ckt.     Ckt. Amp Type $1/E$ $2.5$ $1/E$ $1/E$ <th></th>	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	

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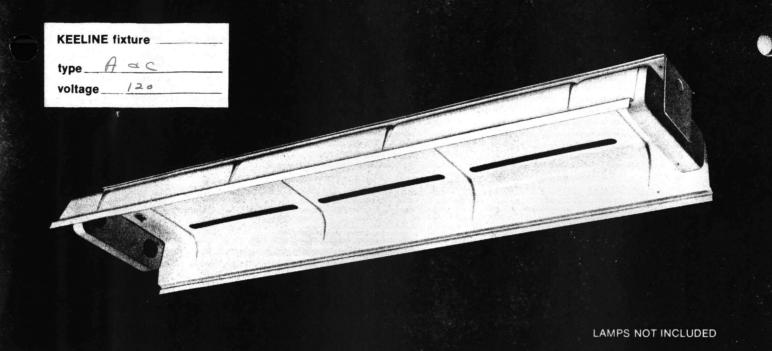
Date:



Panelboard Drawing	FPE No		
Job Name REPLACE HTG & A C BLDG # 2615 Distributor <u>CRAVEN ELECT. SUPPLY</u> Distributor Order No.	Page Item PanelMPP-2 MPP2	_ Item	
Panel TypeNBLP $120/200Volts$ 3 Phase $4 Wire$ $60$ AmpsNB $BRKR$ $60$ AmpsNB $BRKR$ Lug Size $1 \pm 6 - 20$ $\phi \notin A^{\pm}$ Trim: $\Box$ Flush $\blacksquare$ SurfaceBox Size: $36^{''}$ H $20^{''}$ $W$ $6^{''}$ $D$ $Gutters:$ $5^{''}$ Top $5^{''}$ Top $5^{''}$ Bot. $6^{''}$ $L.S.$	Chassis <u>AS</u> <u>BUILT</u> Lug Trim Box		
Type Amp Ckt.         Ckt. Amp Type           NE         Ckt. Ckt. Amp Type           NE         Ckt. Ckt. Ckt. Ckt. Ckt. Ckt. Ckt. Ckt.	BRKR 10,000 AIC SY include ground bus		



# premium industrial 6" lamp spacing/turret sockets/surface, stem or chain mount



KEELINE ordering guide Specify voltage: 120V or 277V-i.e. L240RS-120V.

	1111日1日	fixture size		Constant Section	lamp des	signation				
cat. no.	width	length	depth	type	qty.	watts	nominal length	connected wattage	ship. wt.	
L240RS L240RS-T tandem	14" 14"	49¹¾₅" 99₩"	6" 6"	rapid start rapid start	2 4	40 40	48" 48"	92 184	16 32	104
L296SL	14"	96"	6″	slimline	2	75	96″	192	36	en en en
L248HO L296HO	14" 14"	48″ 96″	6 ¾" 6 ¾"	800 M.A. 800 M.A.	2	60 110	48" 96"	154 243	23 45	
L248VHO L296VHO	14" 14"	48' 96'	6 ¾" 6 ¾"	1500 M.A. 1500 M.A.	2	110 215	48' 96'	250 455	24 43	

**stock accessories** Order through local KeeLine Distributor for fastest delivery.

Wide-Line Hanger: for hard surface and concealed spline ceilings	
Shallow 2" channel Cat. No. AH2	
Deep 23/4" channel	
TwisTee Hanger: for exposed "T" grid ceiling	
Shallow 2" channel	
Deep 23/4" channel Cat. No. AH3D	
Heavy-duty Slide-Grip Hanger Cat. No. AH4	
Chain Hanger Set Cat. No. AH5	

Single Stem Canopy Set specify stem length.....See Accessories Heavy-duty Row Connector ......Cat. No. ARC3 Universal Wire Guard (not illustrated) ......Cat. No. WA See Accessories (page 33) for complete listing and illustrations.

installed options Consult local KeeLine Distributor for price and availability.

• In-line fusing • Low Heat and Very Low Heat Rise Ballasts 0°F and -20°F Cold Weather Ballasts • Other voltage B sound

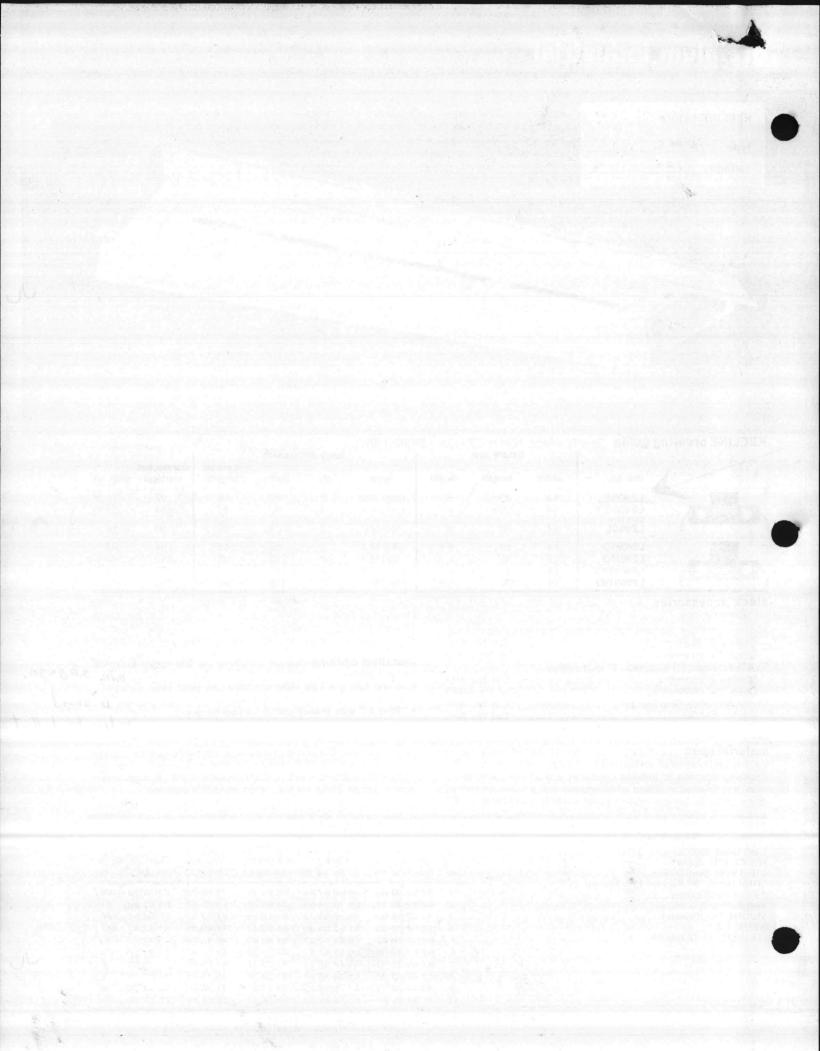
rating for ballast

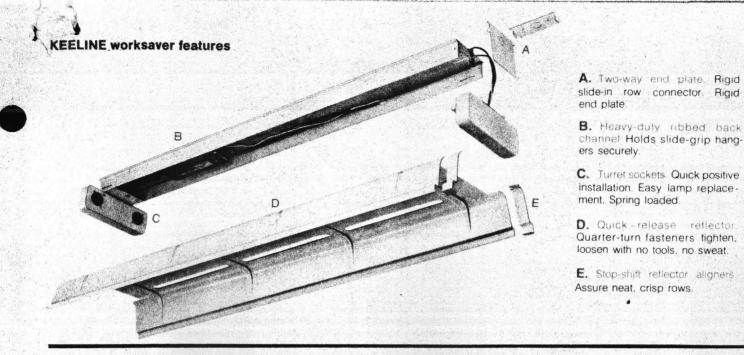
• "Plug-In" with branch circuit (consult factory).

**material spec** Heavy duty body is roll-formed of heavy gauge cold rolled sheet steel, embossed for rigidity and heavy-duty use. Phosphate-primed to prevent corrosion and assure paint adhesion, and finished in baked white enamel with a minimum reflectance of 85%. Spring-loaded turret sockets positioned for 6"

lamp spacing. Die-formed reflector is rib-reinforced for rigidity, provides either 10-15% uplight or total down light as desired. Fixture is furnished with ETL-CBM certified Class "P" high power factor ballast. Fixture is U.L. listed and IBEW labelled.

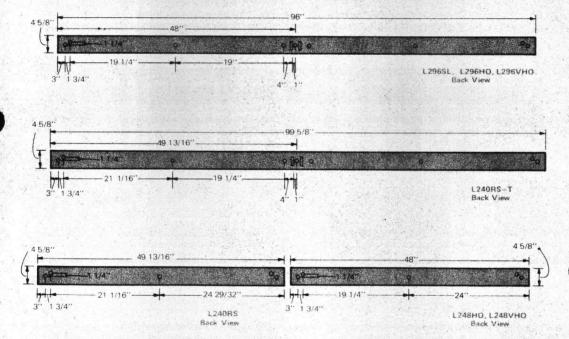
TEST DATA: MODEL NO. L296HO		cu-z	onal cavity	method	New Section	and there is		
LAMPS: Two F96T12/CW/HO		pcc	80%	70%	50%	30%	10%	0%
Each rated 8500 lumens, 3130 fl.	-120*		Percent	Percent	Percent	Percent	Percent	Percent
CIE TYPE: Semi-Direct.	-90	pw	70 50 30 10	70 50 30 10	50 30 10	50 30 10	50 30 10	0
SHIELDING: 0 <sup>o</sup> Parallel,11 <sup>o</sup> Normal. Test of candlepower	a service and a service of	1	97 93 90 86	94 90 87 84	84 81 79	78 76 74	73 72 70	68
distribution in 3 planes.	1	2	89 82 76 71	85 79 74 69	74 69 66	69 65 62	65 62 59	57
MOUNTING: Pendant.	60.	23	81 72 65 59	78 70 63 58	65 60 55	61 57 53	57 54 51	48
S/MH: 1.3		2 4	74 64 56 50	71 62 55 49	58 52 47	54 49 45	51 47 43	41
ITL REPORT NO. 8068		A 5	68 56 48 42	65 54 47 41	51 45 40	48 43 38	45 41 37	35
		0 6	62 50 42 36	60 49 41 36	46 39 34	43 37 33	41 36 32	30
	X	E 7	57 45 37 31	55 44 36 31	41 35 30	39 33 29	37 32 28	26
	30'	8 8	53 40 32 27	51 39 32 27	37 30 26	35 29 25	33 28 24	22
		9	48 36 28 23	47 35 28 23	33 27 22	31 26 22	30 24 21	19
A CONTRACT OF		10	45 33 25 21	43 32 25 20	30 24 20	28 23 19	27 22 18	17

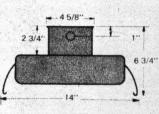




#### Installation guide Knockout locations and other pertinent information.

NOTE: HO and VHO fixtures must be mounted a minimum of K O. DIAMETER %" UNLESS OTHERWISE NOTED 11/2" away from the ceiling K.O. PATTERN SAME ON BOTH ENDS



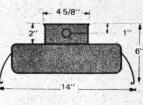


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Rigid

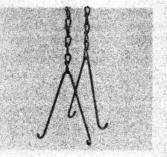
Rigid

L248HO, L296HO, L248VHO, L296VHO End View



124085, L24085-T L296SL End View

Chain Hangers (AH5). Hook securely into fixture back. Optional.

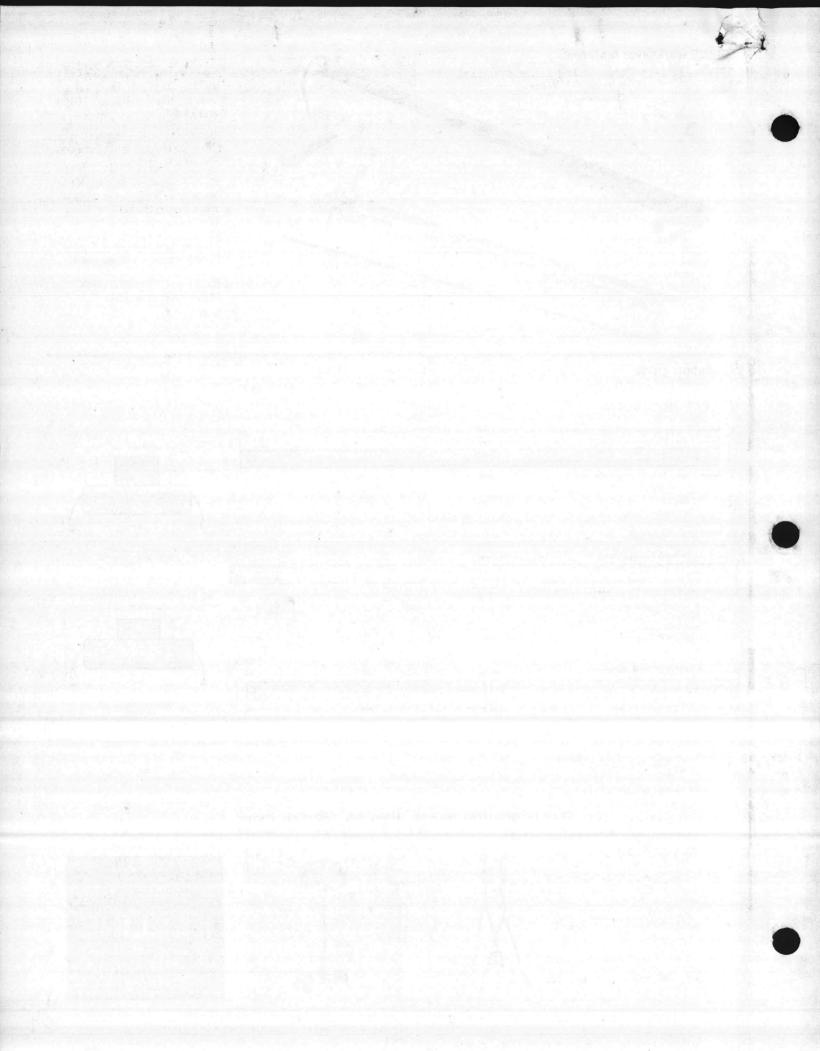


Heavy-duty Slide-Grip Hanger (AH4) on Single Stem Canopy Set (ASC12). Optional.





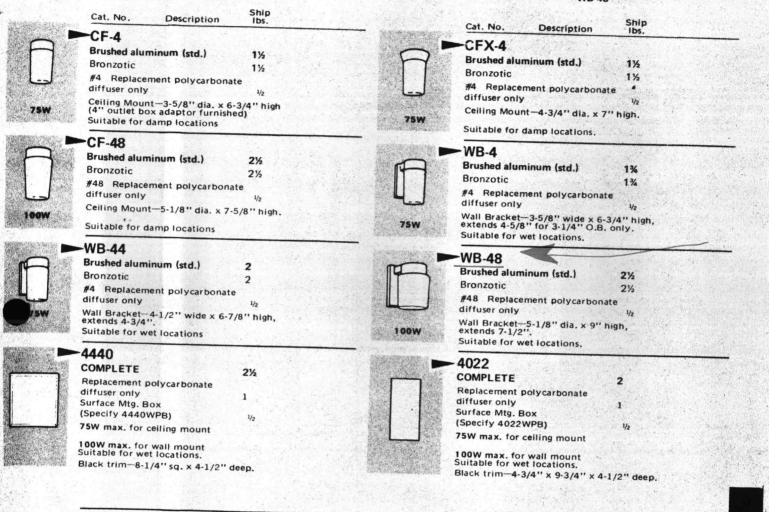
KEENELIGHTING/KEELINE CINDUSTRIAL WAY, WILMINGTON, MA 01887



# Tough Service vandal-proof lighting

All fixtures utilize injection molded polycarbonate diffusers – discast aluminum construction – tamperproof stainless steel ws (except CFX-4). Lamps not furnished.

Cast surface mounting box available for all surface units. No concealed outlet box required. Four side holes for surface conduit (tapped  $\frac{1}{2}$ " NPS). Back hole for through wall wiring. Four plugs included. Suitable for wet locations.



# Mercury Vapor Wall Brackets

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### 93048

 100W, A-23 medium base. DieLux diecast aluminum wall bracket. Integral transformer housing. 8" diameter white polished Thermopal glass. Brushed aluminum finish standard. Matte white available.

 8" wide x 9%" high, extends 11½" from wall.

 120V, H.P.F., C.W.A. ballast std. 208V, 240V or 277V available at no extra cost - specify voltage.

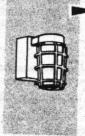
 Complete

 Brushed alum.std. or matte white

 12

 Glass only
 2

Photo cell available for 93048 and 93049 units

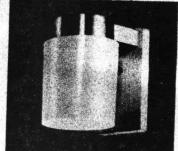


Suitable for wet locations.

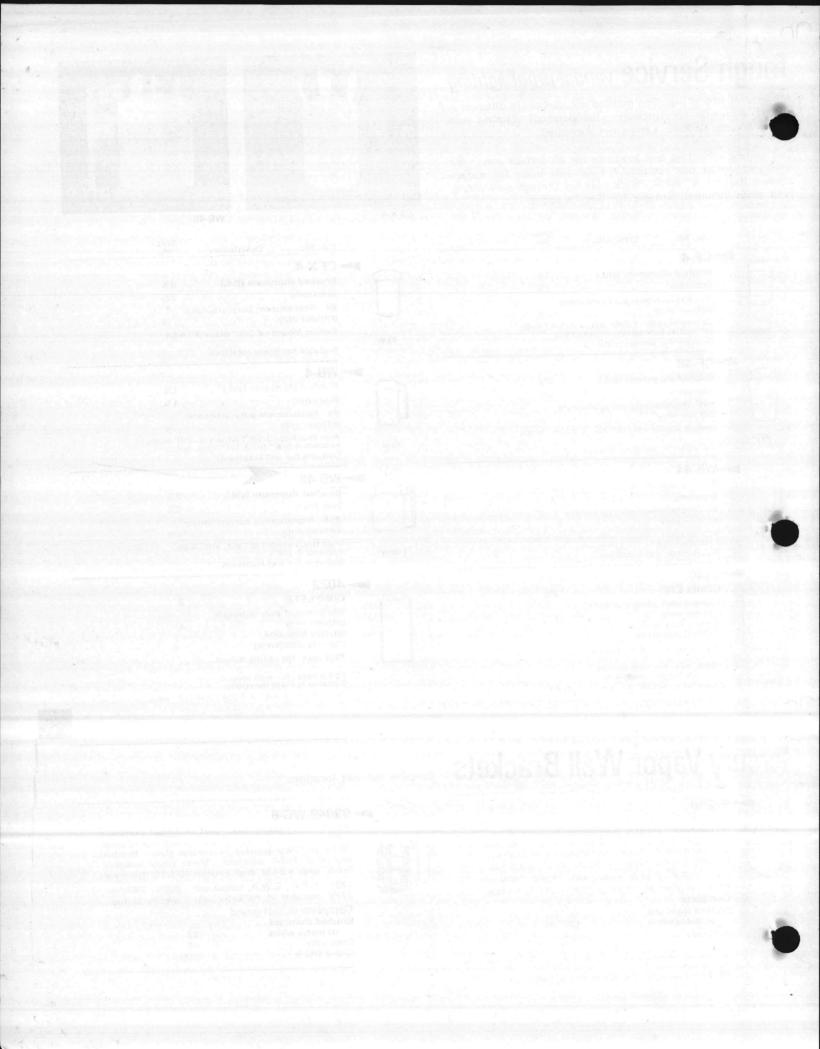
### -93049-WG-8

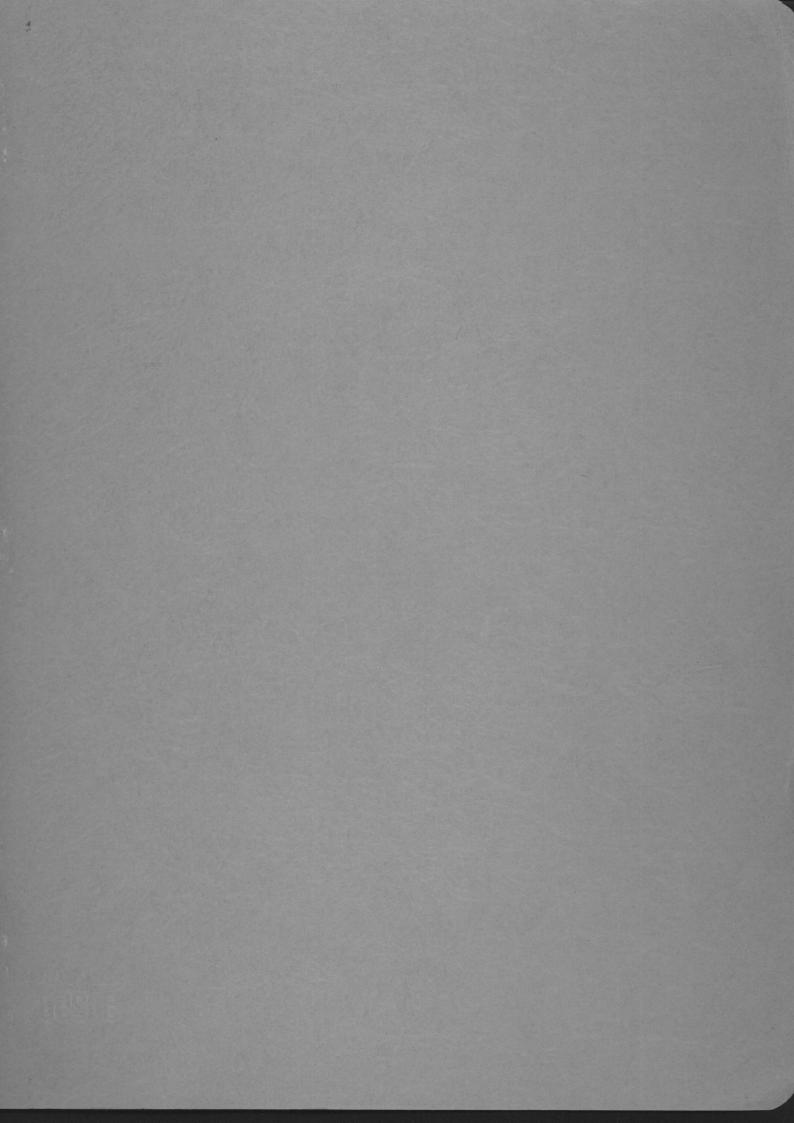
0.040.000
100W, A-23 medium base. Die Lux diecast aluminum wall bracket and guard. Integral transformer housing. White polished guarded Thermopal glass. Brushed aluminum finish standard. Matte white available. 5-7/8" wide x 9-1/2" high, extends 10-7/16" from wall.
120V, H.P.F., C.W.A. ballast std. 208V, 240V or 277V available at no extra cost - specify coltage.
Complete w/cast guard
Brushed alum. std.
or matte white 13
Glass only 2
Guard WG-8

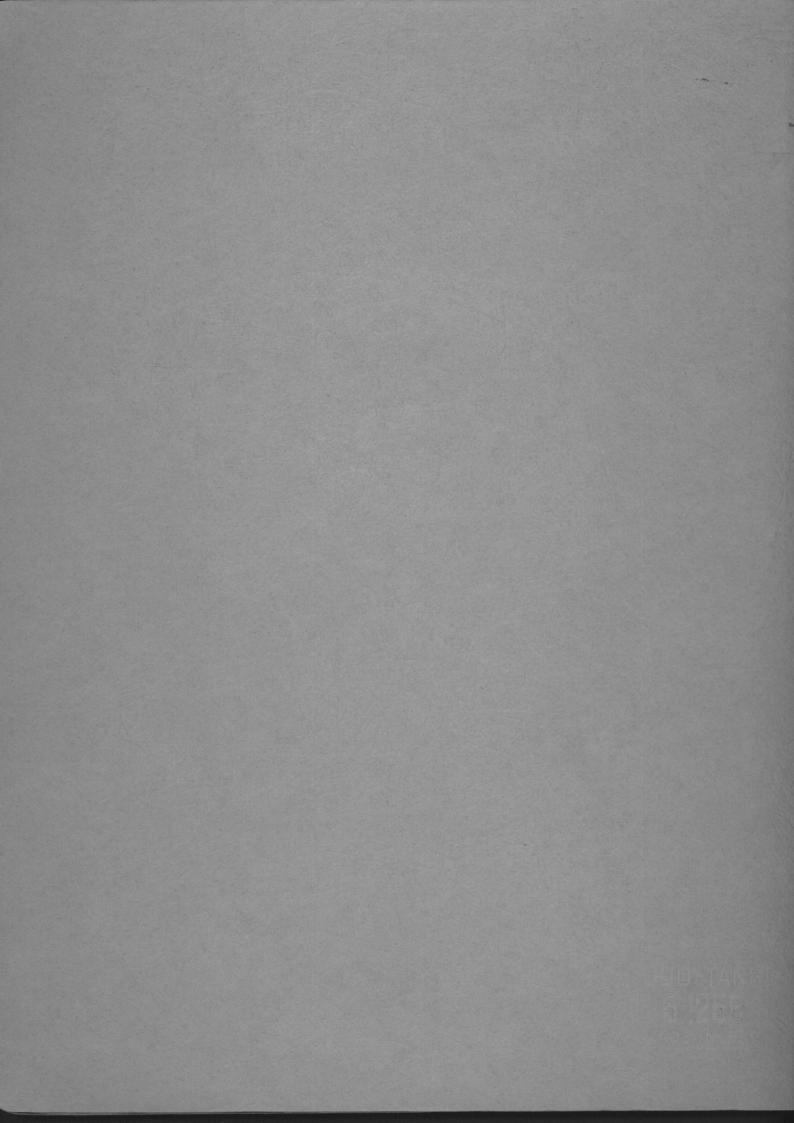




WB-48

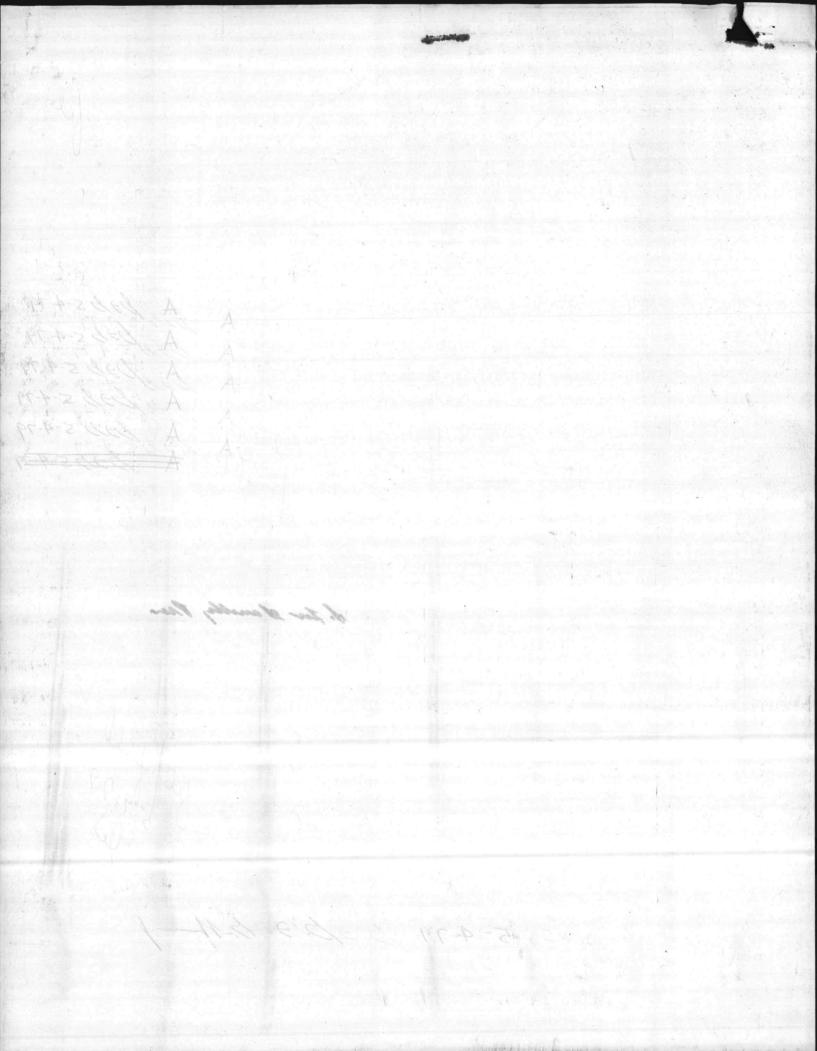






ND L	NTRACTOR'S S ANTDIV 4-4355/3 (Rev. 6/76)	States and the second		CONTRACT NO N62470-77-C-2563	TRANSMIT	TAL NO.	дате 4/18/79
IOM					<u>1   184 - 2 - 1</u>	Conditi	Ioning
and the second	rrells Flumbin	CONTRACTOR OF THE REPORT OF THE AND STREET	ng Co., Inc.	Replace Heating Building 2615,	Marine	Corps I	Base []
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25	"do" 18.1.2	"do"	Exposed A	A-3 reas: Owens-Corning	it.	A	6235-4-79
26	"do" 18.5	Piping In	sulation: Owen:	s-Corning ASJ	2 Agen (Marin)	A	826 5-4-7
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SOUTHEASTERN INSULATION CORPORATION

Post Office Box 30727 Raleigh, North Carolina 27612 919/78/79/7980 832-2750

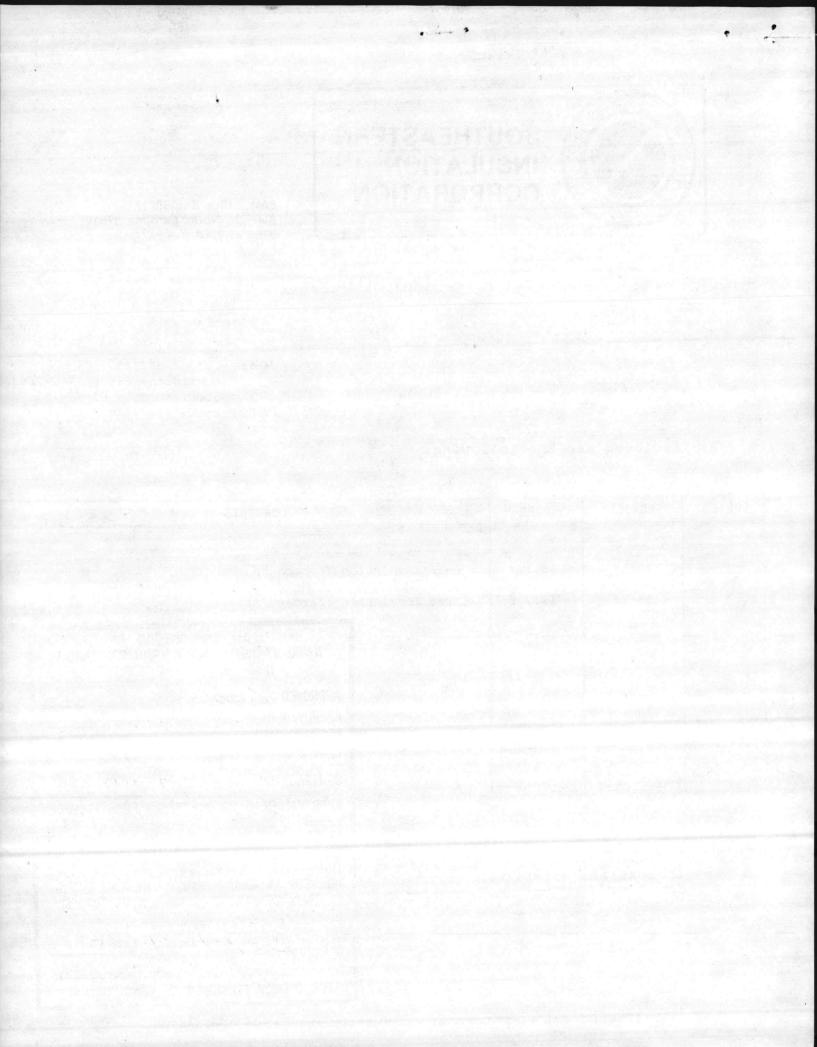
## TRANSMITTAL

JOB: Building 2615 Contract #N62470-77-C-2563 Specification 05-77-2563 DATE: April 17, 1979

## Enclosed are the following:

COPIES	SECTION	PARAGRAGH	CONTENTS
8 8	15654 15654	18.1.1	Duct Insulation (concealed spaces) Duct Insulation (Exposed Areas)
			ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511 APPROVED SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. E.62470-77-C-1563
	Enclosures		APPROVAL OF A SUBMITIAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER FHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. REVIEWER $2.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5.5$

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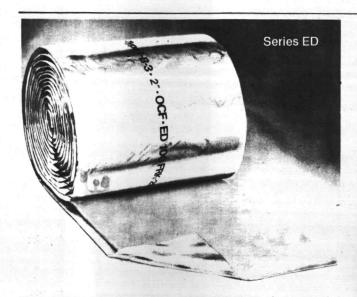




# Faced Duct Wrap Insulation—FRK 25

Series ED-75, ED-100, ED-150

Faced duct wrap insulation for concealed and exposed hot, cold, or dual-temperature air handling systems



OWENS/CORNING

BERGLAS

18.1.1

Supply & Return duct in concealed spaces

### uses

Fiberglas\*\* Faced Duct Wrap is used to insulate residential and commercial air conditioning or dual-temperature ducts operating at temperatures from 40F to 250F.<sup>†</sup>

†Meets test requirements of HH-I-5538B for service temperature of 350F.

# benefits

Low operating costs—low k factor at 75F mean temperature and full-thick resilience means less heat loss or gain. Systems operate efficiently. Air is delivered at design temperature. No water-stained ceilings—vapor barrier facings have low perm ratings to stop moisture vapor from condensing on the cold duct surface. An insulation to fit every job—hot, cold, dual temperature exposed or concealed, tailored to economic and performance requirements. Damage resistant—Fiberglas Duct Wrap Insulations are tough and resilient. They resist damage in shipment and after they are installed.

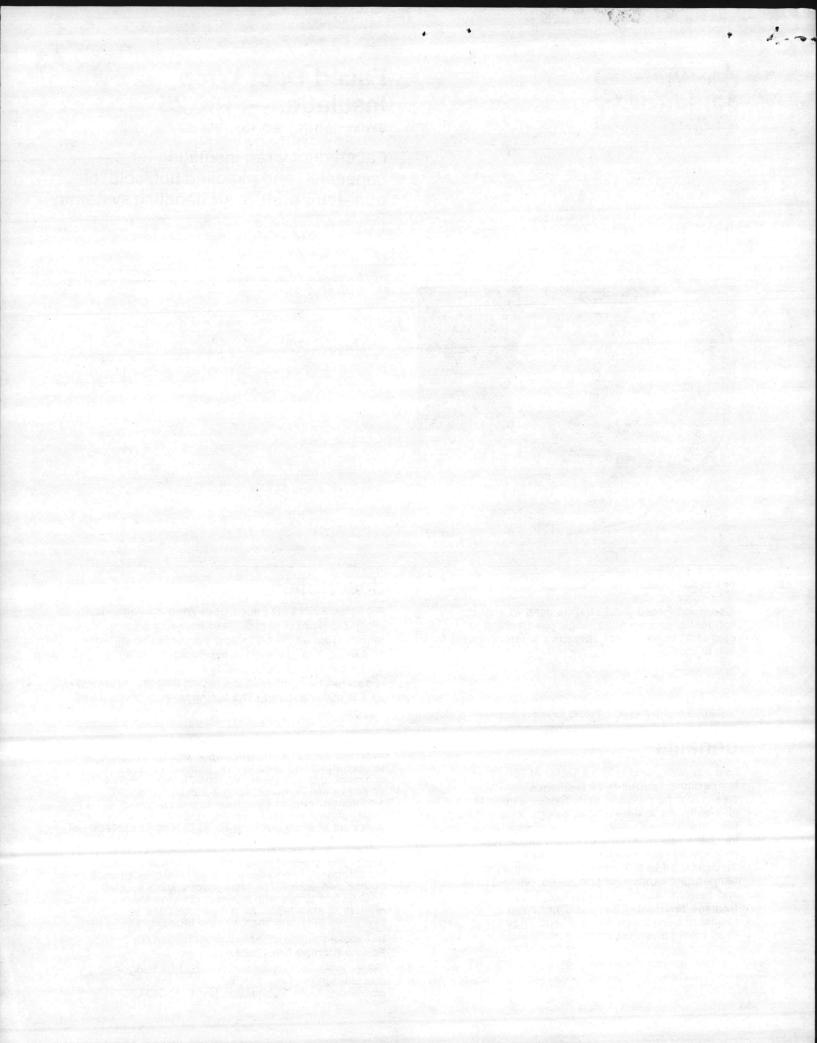
# description

Fiberglas Series ED Faced Duct Wrap Insulation is an inorganic blanket of pink glass fiber with a factory-applied FRK-25 vapor barrier facing with one 2" flange. It is designed to meet performance specifications. Uniform quality of the finished product is assured by combining the facing with the insulation as it is manufactured. The facing is firmly bonded and inspected continuously during manufacture.

Application specification: Insulation shall be wrapped tightly on the duct work with all circumferential joints butted and longitudinal joints overlapped a minimum of 2". Adhere insulation to metal with 4" stripes of insulation bonding adhesive\* at 8" O.C. Additionally secure insulation to the bottom of rectangular duct work over 24" wide with mechanical fasteners at not more than 18" O.C. On circumferential joints, the 2" flange of the facing shall be secured using 9/16" flare-door staples applied 6" O.C. and taped with minimum of 3" wide foil reinforced kraft tape. On longitudinal joints, the overlap shall be secured using 9/16" flare-door staples applied 6" O.C. and taped with minimum 3" wide foil reinforced kraft tape. All pin penetrations or punctures in facing shall also be taped.

In exposed applications cover all joints with 3" wide Foil Reinforced Kraft tape.

\*Refer to Accessory Materials — List for suggested manufacturers of mastics, adhesives and other accessory items. Publication No. 4-IN-3430.



# **Performance characteristics**

Property	Test Method	Specification	Tolerance
Fire Hazard Classification: (Carries a U.L. Label)	ASTM E84-70	Flame Spread, Maximum 25 Smoke Developed, Maximum 50 Fuel Contribution, Maximum 50	
Thermal Conductivity: @ 75F mean temp. Btu in./hr. ft <sup>2</sup> Deg. F	ASTM C518-70	ED-75 0.30 ED-100 0.26 ED-150 0.24	±0.01
Odor:	M-05Ca (1)	Commercially odorless	- 1
Corrosion:		Will not accelerate corrosion in aluminum or galvanize	ed steel
Vapor Permeability: Perms	ASTM E96-66 (1972) Procedure A	0.02	i
Moisture Absorption:		Less than 0.2% by volume, when exposed to conditions of 120F, 90% R.H. for 96 hrs.	
<b>Bacteria and Fungus Resistance</b>		Does not breed nor sustain bacteria or fungus	
Physical characteristics:			
Thickness:	ASTM C167-64 (1970)	11/2", 2"	+5/16" -1/16
Width:	D-03A (1)	Std. 48"	± 1/8 "

11/2" std. 100'; 2" std. 75'

One 2" flange

(1) Owens-Corning Test Method

Length:

Flanges:

#### **Condensation control**

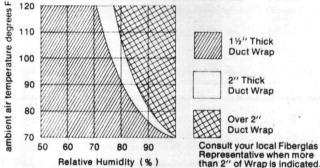
To determine thickness to prevent condensation at various ambient temperature and humidity: (Based on compressed thickness of installed material, air at 60 F in duct moving at 1200 FPM).

> 1. Select maximum expected Relative Humidity (RH) on lower scale, and;

D-03A(1)

Steel rule

- 2. Move up vertically until that line intersects the expected maximum ambient air temperature;
- Select the thickness when the intersection point falls 3. within the shaded areas.



11/2" Thick Duct Wrap 2" Thick Duct Wrap Over 2" Duct Wrap

Consult your local Fiberglas

#### **Specification compliance:**

Fiberglas Series ED Duct Wrap Insulations meet the requirements of the following Federal Specifications: HH-I-558B, Form B, Type 1 Class 6-Designation B-2 (ED-75)

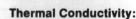
-3 (ED-100)

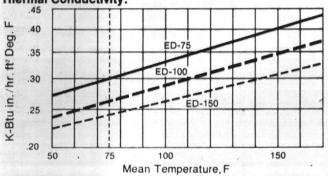
-4 (ED-150)

This FRK-25 faced Duct Wrap complies with HH-B-100b Type II

#### Suggested specification:

All heating, cooling, dual temperature or ventilating supply and return air ducts shall be insulated with inches thick of Faced Duct Wrap Series ED\_ \_FRK-25 as manufactured by Owens-Corning Fiberglas.





+ 1',-0

± 1/4 "

#### **Recommended thickness**

Owens-Corning Fiberglas recommends a full 2" thickness for protection against excessive heat loss or gain. This is because flexible blanket insulations may be compressed during installation. This effects the thermal performance.

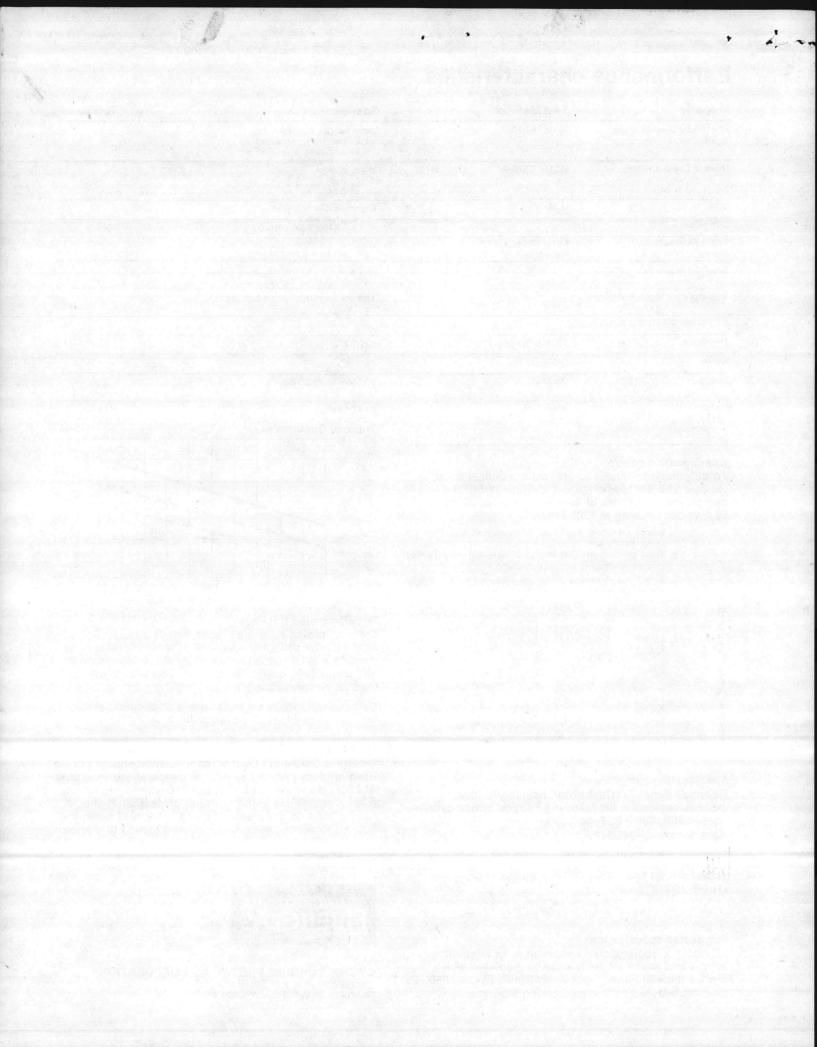
Selection of insulation thickness & application are the responsibility of the contractor and engineer.

#### Limitations

Fiberglas Series ED Duct Wrap Insulation should not be used on duct systems subject to temperatures in excess of 250F. It should not be exposed to weathering or mechanical abuse without proper protection. It should not be used on the inside of ducts. All values given are subject to normal manufacturing and testing tolerance.

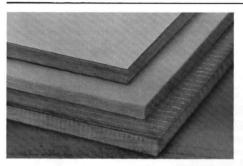


**OWENS-CORNING FIBERGLAS CORPORATION** Mechanical Products Division Fiberglas Tower, Toledo, Ohio 43659





### Industrial Insulation 700 Series Plain and Faced



### Uses

E 1

Owens-Corning 700 Series Fiberglas\* plain and faced industrial insulations are a highly versatile group designed to insulate ductwork, equipment, vessels, and tanks, both thermally and acoustically, where operating temperatures do not exceed 450F.

**Type 701** is a lightweight, resilient insulation, in board form, used on vessels having irregular surfaces and where the exterior finish is supported by welded studs, pins, or other mechanical attachments.

**Type 703** is a semi-rigid board recommended for use on equipment, vessels, and air-conditioning ductwork.

**Type 705** is a rigid board with very high strength characteristics for use on chillers, hot and cold equipment, heating and air-conditioning ductwork, and where greater abuse resistance and good appearance is required.

### Description

Owens-Corning Fiberglas 700 series Industrial Insulations are made of inorganic glass fibers preformed into semi-rigid to rigid rectangular boards of varying densities. Each type has specific thermal, acoustical, and physical characteristics which make it suitable for the uses described. Types 703 and 705 are available with factory-applied FRK-25 foil-reinforced kraft facing. Type 705 is available with ASJ-25 All-Service Jacket facing. Both facings are vapor barriers, and provide a neat and finished appearance.

705 w/FRK Finish

l" Thick

\*Trademark Registered Owens-Corning Fiberglas Corporation

Features and Related Bei	nefits
Exceptional thermal efficiency	Fiberglas 700 series insulation boards save energy and reduce heat loss, lowering operating costs, in $-60F$ to $+450F$ service.
Available in three densities	A selection of products is offered to meet specific performance and eco- nomic requirements.
Structural integrity	700 series insulations resist damage, maintain structural integrity and efficiency. Thickness stays uniform.
Excellent acoustic properties	This versatile group of Fiberglas boards efficiently reduces sound transmission.
Factory-applied facings	Attractive finished appearance can be attained. Heavier density boards cut neatly, with neat, square corners.
UL-listed	Fiberglas 700 series insulation (faced and unfaced) has a UL flame spread rating of less than 25;* this usually permits immediate building code approval.
	*This UL rating is used solely to measure and describe the properties of the products in response to heat and flame under controlled laboratory conditions. This numerical flame spread rating is not intended to reflect hazards pre-

sented by this or any other material under actual fire conditions.

### Performance & Physical Characteristics

Flat Surface Time Rate of Heat Loss per Unit Area 80F Ambient Temperature 0.0 Wind Velocity, MPH 0.90 Surface Emittance ASTM recommended practice for determination of heat loss or gain, and surface temperatures of insulated pipe and equipment systems by the use of a computer program ASTM designation C-680.

### **TYPE 701 FIBERGLAS INSULATION**

		2-14			Oper	ating 1	Tempe	erature	, degi	rees F				
Insulation	1	50	2	00	250		3	00	350		400		450	
Thickness (Inches)		Surf. Temp.		Surf. Temp.								Surf. Temp.		Surf. Temp
1.5	11	88 87	20	95 92	31 24	102 97	42	110 103	55 43	118 110	70 54	126 117	86 66	135 124
2.5	7	85	13	90	19	94	27	99	35	105	44	110	54	117
3.0 4.0	6 5	84 83	11 8	88 86	16 12	92 89	22 17	96 93	29 22	101 96	37 28	106 100	45 34	111 105
5.0 6.0	43	83 82	7 6	85 84	10 8	88 86	14 12	90 89	18 15	93 91	23 19	97 94	28 23	100 97
7.0	3	82	5	84	7	85	10	87	13	90	16	92	20	95

### **TYPE 703 FIBERGLAS INSULATION**

	1.27	Operating Temperature, degrees F														
Insulation Thickness (Inches)	150		2	00	00 250		300		350		400		450			
		Surf. Temp.		Surf. Temp.		Surf. Temp.				Surf. Temp.		Surf. Temp.	1	Surf. Temp		
1.0	15	91	26	99	40	108	54	117	71	127	89	137	109	148		
1.5	10	88	18	94	28	100	38	107	49	114	62	122	76	130		
2.0	8	86	14	91	21	96	29	101	38	107	48	113	58	119		
2.5	6	85	12	89	17	93	24	97	31	102	39	107	47	113		
3.0	5	84	10	87	15	91	20	95	26	99	32	103	40	108		
3.5	5	83	8	86	13	89	17	93	22	96	28	100	34	104		
4.0	4	83	7	86	11	88	15	91	20	95	25	98	30	102		

### **TYPE 705 FIBERGLAS INSULATION**

		Operating Temperature, degrees F														
Insulation	1	50	200		250		300		350		400		450			
Thickness (Inches)		Surf. Temp.				Surf. Temp.										
1.0 1.5	15 10	91 88	27 19	99 94	40 28	108 100	54 38	117 107	70 49	126 114	88 61	136 121	108 75	147 129		
2.0 2.5 3.0	8 6 5	86 85 84	14 12 10	91 89 87	21 17 15	96 93 91	29 24 20	101 97 95	38 31 26	107 102 99	47 38 32	113 107 103	57 47 39	119 112 108		



Flat Surface Time Rate of Heat Loss per Unit Area 80F Ambient Temperature 0.0 Wind Velocity, MPH 0.20 Surface Emittance ASTM recommended practice for determination of heat loss or gain, and surface temperatures of insulated pipe and equipment systems by the use of a computer program ASTM designation C-680.

### TYPE 701 FIBERGLAS INSULATION WITH BRIGHT METAL JACKET

		Operating Temperature, degrees F														
Insulation	1	50	2	00	250		3	00	350		400		450			
Thickness (Inches)		Surf. Temp.						Surf. Temp.				Surf. Temp.		Surf. Temp.		
1.5	10	97	18	110	27	122	38	136	49	150	62	165	77	180		
2.0	8	94	14	104	21	115	30	126	39	137	49	150	61	163		
2.5	6	92	12	101	18	110	24	119	32	129	40	139	50	151		
3.0	5	90	10	98	15	106	21	114	27	123	34	132	42	142		
4.0	4	88	8	94	12	101	16	107	21	114	27	122	33	130		
5.0	3	87	6	92	9	97	13	103	17	109	22	115	27	122		
6.0	3	86	5	90	8	95	11	100	14	105	18	110	22	116		
7.0	3	85	5	89	7	93	10	97	12	102	16	107	19	112		

### TYPE 703 FIBERGLAS INSULATION WITH BRIGHT METAL JACKET

			-		Oper	ating 1	Tempe	erature	, degi	rees F				
Insulation	1	50	2	00	2	50	3	00	3	50	4	00	4	50
Thickness (Inches)		Surf. Temp.		Surf. Temp.										Surf. Temp
1.0 1.5	12 9	101 96	22 16	116 107	34 25	131 119	47 34	147 131	61 44	163 144	77 56	181 157	95 69	199 172
2.0 2.5	7 6	93 91	13 11	102 99	19 16	112 107	27 22	122 115	35 29	132 124	44 36	143 134	54 44	155 144
3.0 3.5 4.0	5 4 4	90 88 88	9 8	96 95 93	14 12 10	103 101 99	19 16 14	111 107 105	24 21 19	119 114 111	31 27 23	127 122 118	37 33 29	136 130 125

### **TYPE 705 FIBERGLAS INSULATION WITH BRIGHT METAL JACKET**

			-	The second	Oper	ating 1	Tempe	erature	, degr	ees F				
Insulation	1	50	2	00	2	50	3	00	3	50	4	00	4	50
Thickness (Inches)				Surf. Temp.										
1.0	12	101	22	116	34	131	47	147	61	163	77	180	94	197
1.5	9	96	16	108	25	119	34	131	44	144	55	157	68	170
2.0	7	93	13	102	19	112	27	122	34	132	43	143	53	154
2.5	6	91	11	99	16	107	22	115	28	124	36	133	44	143
3.0	5	90	9	96	14	104	19	111	24	118	30	127	37	135

### Specification Compliance

### Application Recommendations

These products conform to the property requirements of government specifications:

### 701 703 705

HH-I-558B			
Amendment 3			
Form A, Class 1	•	•	•
HH-I-558B			
Amendment 3			
Form A, Class 2		•	
HH-I-558B			
Amendment 3			
Form B, Class 7	•		

Products 703 and 705 comply with the requirements of NFPA 90A.

**Type 701**—lightweight unfaced flexible insulation in board form for use on vessels having irregular surfaces, where the compressive strength is not a performance criterion.

**Types 703 and 705**—board insulations normally impaled on welded pins on flat surfaces. They are cut in segments and banded in place on irregular surfaces. Unfaced boards are normally finished with reinforced insulating cement or weatherproof mastic. For outdoor application: Types 703 and 705, faced.

ASJ-25 or FRK-25 Faced insulation boards shall be applied using mechanical fasteners such as weld pins or stick clips. Fasteners shall be located not less than 3" from each edge or corner of the board. Pin spacing along the duct should be no greater than 12" on centers. Additional pins or clips may be required to hold the insulation tightly against the surface where cross breaking is used for stiffening. Weld pin lengths must be selected to insure tight fit but avoid "oil canning" effect.

Apply vapor seal ASJ or FRK pressure-sensitive patches. Rub hard with the nylon sealing tool to insure a tight bond and a vapor seal.

All insulation edges and butt joints are to be sealed with pressure-sensitive joint sealing tape to match the jacket. Rub hard with nylon sealing tool. Use 3" wide tapes on flat surfaces, or where edges are shiplapped and stapled. 5" wide tape can be used in lieu of shiplapping.

#### Precautions:

- Keep all contact adhesive surfaces clean.
- Use nylon sealing tool to prevent wrinkles and fishmouths.
- Duct-work or radius may require pre-scoring to allow the board to conform to the surface.
- When painting the facings for indoor applications, use only water base / latex products.

### Limitations:

- Pressure-sensitive sealing tapes or patches should only be applied when the ambient temperature is between + 35F and + 110F.
- Maximum insulation surface temperatures in use are limited to 10F to +150F.
- Outdoor applications require additional weather protection.

### Mounting:

No. 7 (Modified): Insulation placed against 24-gauge sheet metal over a 16-inch air space. This mounting configuration is typical of a sheet metal enclosure with insulation on one side.

#### Sound Absorption Coefficients:

		Unfaced	d Insulation	Туре			Faced Insulation Type									
	7	01	70	03	70	05	70	01	703	FRK	705 FRI	( or ASJ				
Frequency	One-Inch	Two-Inch	One-Inch	Two-Inch	One-Inch	Two-Inch	One-Inch	Two-Inch	One-Inch	Two-Inch	One-Inch	Two-Inch				
Hz	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness	Thickness				
125	.38	.44	.33	.38	.32	.39			.31	.38	.25	.38				
250	.34	.66	.28	.63	.30	.59			.45	.51	.48	.36				
500	.68	.99	.62	.99	.66	.99			.62	.83	.28	.39				
1000	.82	.99	.88	.99	.90	.99	Not Av	ailable	.65	.73	.57	.37				
2000	.87	.99	.96	.99	.95	.99	Fac	ced	.51	.53	.39	.56				
4000	.96	.99	.99	.99	.99	.99			.28	.37	.30	.38				
NRC	.68	.90	.69	.90	.70	.89			.56	.65	.43	.42				

For further Noise Control information, contact your local Owens-Corning Fiberglas representative.

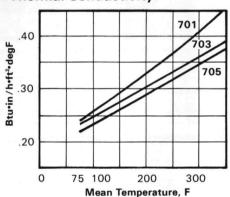


Size and Density	1.		
	701	703	705
Density (pcf)	1.58	3.00	6.00
Thickness (1/2" (increments)	11⁄2′′-4′′	1''-2''	1''-2''
Compressive strength (psf at 10% deform.)		100	350
Standard size (inches)	2	4′′x48′′	

J D

Thermal conductivity at 75F mean temp. 0.242 0.230 0.220





Vapor transmission rates: ASJ-25-.02 perms FRK-25-.02 perms Beach puncture resistance: ASJ-25-50 units FRK-25-25 units

### Surface Burning Characteristics:

(unfaced or faced:)	
flame spread	25
fuel contributed	50
smoke developed	50
(compared to untreated Red	Oak as
100)	

### Facings:

Types 703 and 705 are available with the following factory-applied vapor barrier facings, with UL labels if specified: FRK—Foil reinforced kraft: 703, 705 ASJ—Embossed white kraft foil laminate:

705 only

### **Offices of Owens-Corning Fiberglas Corporation**

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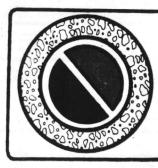
617—2 617—9	35-75 26-38	40 80
313—9 313—7 616—4 517—3	67-13 87-65 52-87 72-49	00 73 88 30
612—8	54-49	94
601—9	82-08	10
816—7 314—4	53-77 34-65	25 10
406—2	52-84	96
402—3	97-20	72
609—7 609—4 201—4	28-85	90
505—2	94-55	11
518—8 716—8 212—7 716—3 914—4 315—4	32-14 59-38 81-03 72-34	10 10 40
704—3 919—2 919—8	72-70 73-05 72-08	65 28 23
216—8 513—5 216—8 614—4 419—2	84-94	40
405—8 918—6	48-67 27-12	61 20
503—6	20-10	14
215—6 215—8 717—6 215—6 412—7	47-27 65-04 52-85 47-34 65-37	00 27 03 05 50
401—3 401—4	33-60 34-74	71 37
803—2 803—5 803—2	54-99 46-27 88-84	29 51 50

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Mid East Regional Hdqrs.:	7700010
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OWENS-CORNING FIBERGLAS CORP. Mechanical Division Fiberglas Tower, Toledo, Ohio 43659

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# SOUTHEASTERN INSULATION CORPORATION

## TRANSMITTAL

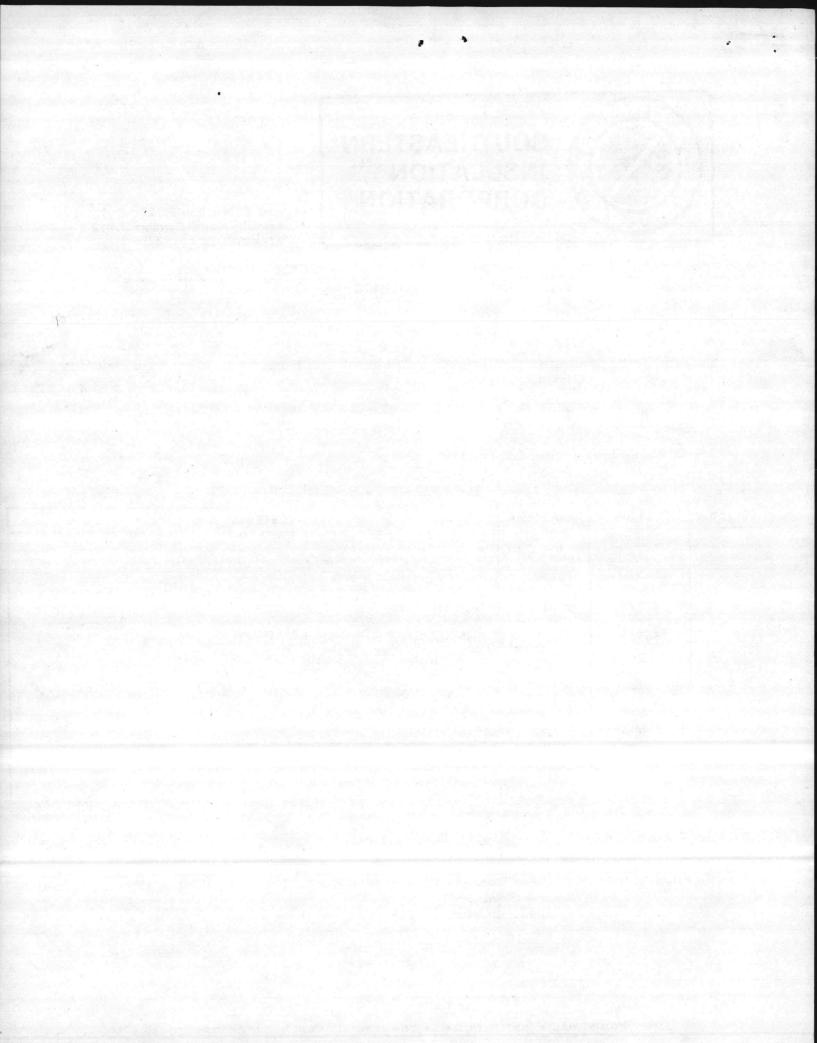
JOB: Building 2615 Contract # N62470-77-C-2563 Specification 05-77-2563 DATE: April 17, 1979

Enclosed are the following:

COPIES	SECTION	PARAGRAGH	CONTENTS	
The state of the		Free Contraction		1
8	15654	18.5	Piping Insulation	11
8	15654	18.5	Lap Adhesive	
8	15654	18.5	Premolded Polyvinyl-Chloride Fitting Covers	
		and the second		

Enclosures: (8) Owens/Corning Fiberglas ASJ

- (8) SpeedLine
  - (8) Insul-Coustic IC-225





One piece pipe insulation

# Fiberglas 25ASJ/SSL

### (ALL SERVICE JACKET)

A UL-rated noncombustible pipe insulation for hot or cold concealed and exposed piping operating at temperatures from -60F to +450F



Chilled Water	1" Thick
Hot Water (Size 1/2 thru 21/2")	1" Thick
Hot Water (Size 3" and larger)	13" Thick
Cold Drain Piping, Cold Water Pi	ping-2" Thick
Steam, Condensate, Hot Water	
(Below 338)	l" Thick
Steam, Condensate, Hot Water	
(Above 338 <sup>°</sup> )	1岁" Thick

### uses

Recommended for use on all hot, cold, concealed and exposed commercial piping operating from -60F to 450F such as commercial and institutional buildings, schools, hospitals, and places of public assembly. Also recommended for processing lines where fire safety is a paramount criterion.

# description

Fiberglas 25\* ASJ/SSL pipe insulation is composed of Fiberglas one-piece pipe insulation jacketed with an embossed vapor barrier laminate. The jacket has a pressure sealing lap adhesive to eliminate the use of staples, adhesives, or bands.

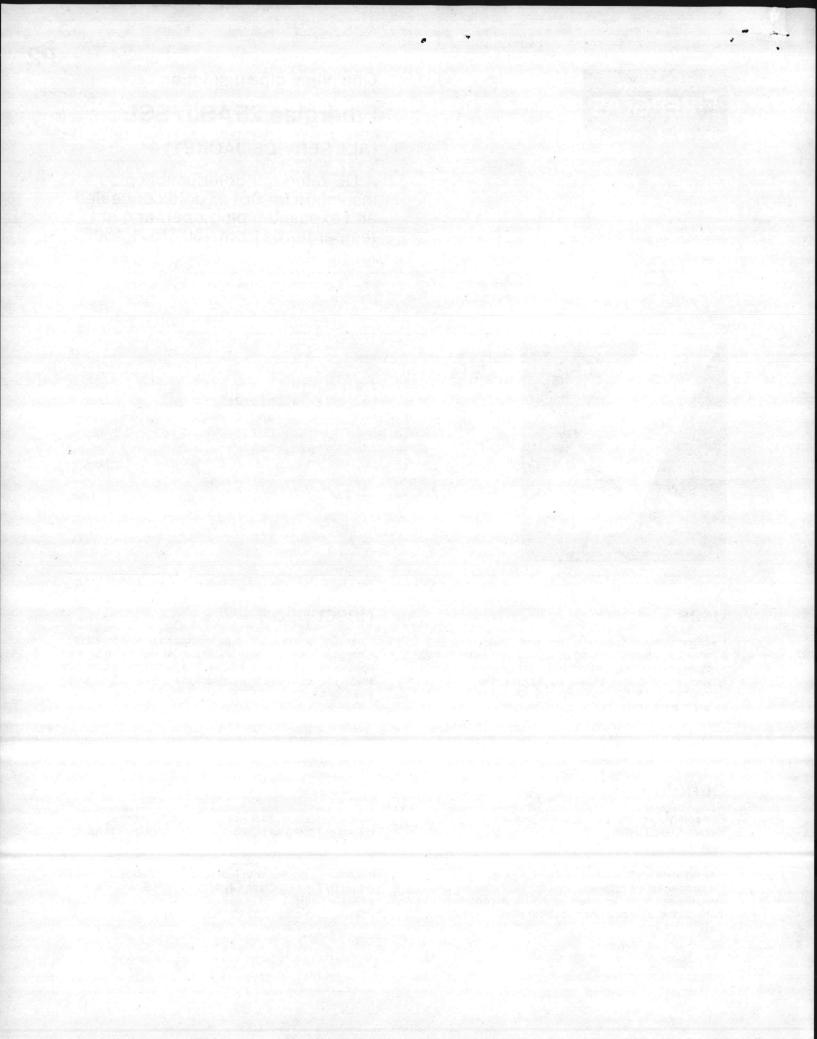
# benefits

**Fire safety**—a complete insulation product with a UL Fire Hazard Classification.

**Savings**—Fiberglas 25 ASJ/SSL pipe insulation meets all existing standards for fire safety and its uses may result in lower insurance costs.

No condensation drippage—the foil vapor barrier and pressure sensitive lap, when applied in accordance with instructions, assure a positive vapor seal. Lower operating costs—the exceptional thermal efficiency of Fiberglas pipe insulation contributes to lower operating cost of heating and cooling equipment.

Meets federal specifications—Fiberglas ASJ/SSL pipe insulation complies with federal specifications HH-I-558B (Form D, Type III, Class 12), MIL-I-22344B, and MIL-I-24244A (Ships).



# performance characteristics

#### Insulation

Moisture absorption: 0.2% by volume 96 hours at 120F and 95% RH

Specific heat: 0.20 Btu/lb.F

Shrinkage: none

Alkalinity: ph9

Capillarity: negligible after 24 hours

Dimensional stability: will not warp, shrink, rot, or decompose.

Vermin and rodent resistant-provides no sustenance. Temperature limitation-recommended for chilled or hot water piping from -60F to +450F.

#### Jacket

Water vapor permeance-.02 perms. Beach puncture-minimum 50 units.

# fire hazard classification

Fiberglas 25 ASJ/SSL is classified by Underwriters' Laboratories for Pipe Covering:

Flame Spread	25
Fuel Contributed	50
Smoke Developed	50
The classification cove	rs Fiberala

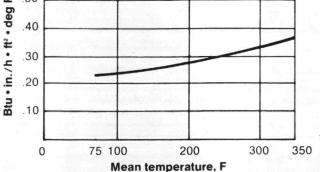
las 25 ASJ including selfsealing lap and factory furnished butt strips. This is your assurance that you can specify and use Fiberglas 25 ASJ/SSL without the danger of contributing to the spread of fire or that combustion will liberate excessive smoke. The system has been designed to meet the stringent fire safety requirements of the GSA and Corps of Engineers.

# application recommendation

The self-sealing lap feature of Fiberglas 25 ASJ pipe insulation sections makes installation on straight runs of pipe a simple procedure. The only precaution needed is to keep all contact adhesive surfaces clean and to rub

.50 LL.

Thermal conductivity



hard all longitudinal and circumferential seams with a nylon sealing tool. The end joints are similarly sealed with a factory furnished (butt) strip with pressure sealing adhesive.

Self sealing lap or butt strips should only be applied when the ambient temperature is between 35F and 110F. There can be no condensation or other contaminants on the surface. Maximum insulation temperature is limited to minus 10F and plus 150F. Outdoor applications must be protected from the weather.

If painting is required for indoor applications, use only water base/latex paint.

# caution

The recommended Economic Thicknesses shown are chosen with respect to cost, thermal performance, and energy conservation. It is possible that heat may be generated from the resinous binder of insulations if ignited by external sources such as welding slag, cutting torches, etc. Care should be taken to avoid direct contact with the insulation by fire or ignition sources.

#### **Dual-temperature lines**

If dual temperature line, compare with economic thickness for hot side service and choose greatest to

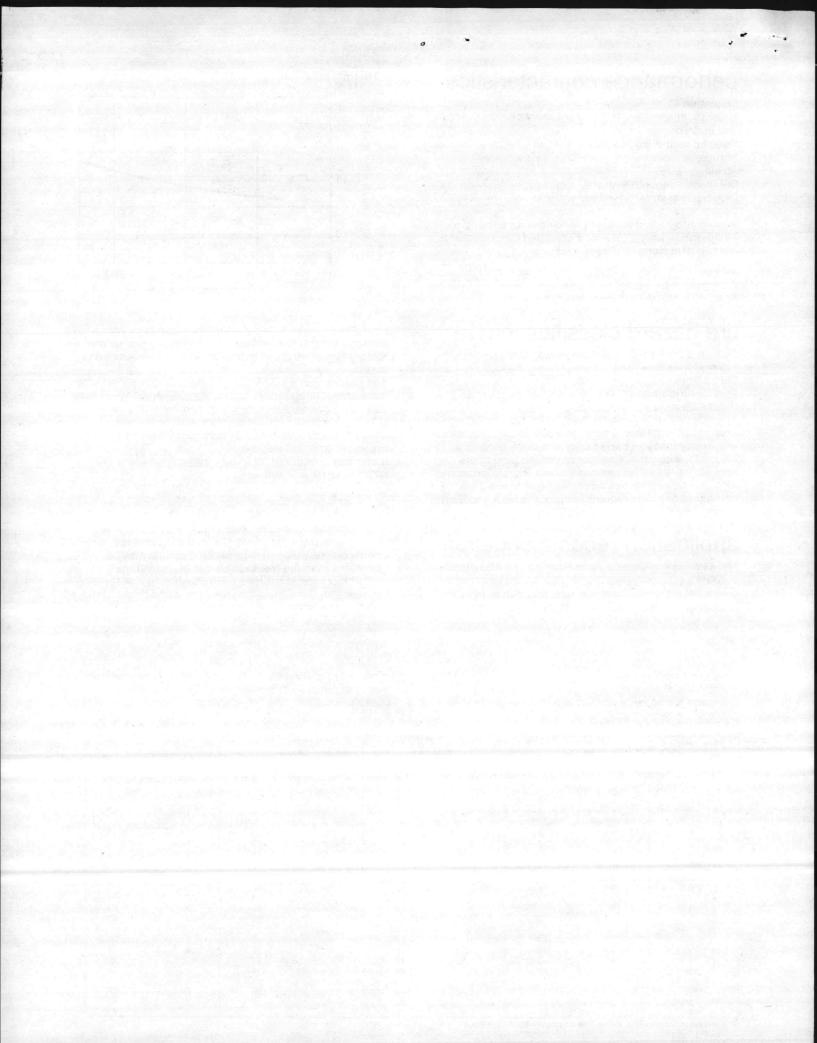
#### Cold and dual-temperature lines

minimize operating costs. Never choose thickness less than that required to prevent condensation in cold operation.

#### (90F at 80% RH)

pipe surface temperature, F	50	& up	491	to 35	34	to 0	0 to	-30
pipe size	RT	HG	RT	HG	RT	HG	RT	HG
1/2	1	4	1	5	1	8	1 1/2	8
3/4	1	5	1	6	1	9	11/2	10
1	1	6	1	7	1 1/2	8	1 1/2	11
1 1/4	1	7	1	8	1 1/2	9	1 1/2	12
11/2	1	8	1	. 9	1½	10	1 1/2	13
2	1	10	1	11	1 1/2	12	1 1/2	15
21/2	1	12	1	13	1 1/2	15	2	15
2 2½ 3	1	11	1	15	1 1/2	16	2	17
31/2	1	12	1	12	1 1/2	18	2	19
4	1	13	1	14	1 1/2	18	2	20
41/4	1	14	1	15	11/2	22	2	23
5	1	15	1	19	1 1/2	23	2	23 23
6	1	17	1	22	1 1/2	25	2	26
7	1	18	1	25	1 1/2	28	2	29
. 8	1	20	1	25 27	112	31	2	29 32 35
9 .	1	22	1	29	1 1/2	34	2	35
10	1	25	1	32	1 1/2	36	2	38
11	1	25	1	34	1 1/2	39	2	41
12	1	26	1	35	1 1/2	43	2	44

RT = recommended thickness, inches HG = heat gain, Btu/hr/lineal foot



# economic thickness

Selection of an insulation for any specific application should take into consideration the following important criteria: **1.** Cost of insulation applied. **2.** Cost of heat energy at midlife. **3.** Cost of capital. **4.** Capital investment in heat production equipment. **5.** Temperature differential. **6.** Size of the pipe surface. **7.** Conductivity of insulation. **8.** Depreciation period—insulation and facility.

Economic thickness for heated piping to 450F (80F ambient, still air, commercial full time)

The thicknesses shown in the tables below are based on the following typical conditions:

### Commercial (full time):

Annual fuel price increase: 4% Initial heat cost: \$2.75/1000 lb. steam Heat cost at midlife: \$4.07/1000 lb. steam Cost of money: 7½%/year Capital investment: \$20/lb. steam/hour Pipe insulation cost (1½" x 1"): \$2.40/lf Depreciation time: 20 years Hours of operation: 8760/year

ipe temp emp. diff		150 70	2	87	200 120		-	300 220			400 320			450 370	
IPS	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	ST	ET	HL	S
1/2	1/2	8	88	1	12	89	11/2	20	91	21/2	27	89	21/2	34	9
3/4	1	8	86	1	14	91	2	21	89	21/2	30	90	3	35	9
. 1	1	8	85	1 1/2	12	86	2	22	89	3	32	89	3	40	9
: 11/4	1	10	87	1 1/2	14	86	21/2	23	88	3	36	91	31/2	42	9
1 1/2	1	11	86	1 1/2	15	87	21/2	23	87	31/2	34	88	31/2	43	9
2	11/2	10	84	2	15	85	21/2	28	88	31/2	40	89	4	46	8
21/2	11/2	10	83	2	16	84	3	27	86	4	40	87	-		
3	1 1/2	13	84	2	20	86	3	32	87	4	46	89	Suchas in		
31/2	1 1/2	13	83	21/2	17	84	31/2	30	86	1000			1		
4	11/2	15	84	21/2	20	84	- 31/2	34	86						
4 1/2	2	13	83	21/2	20	84	31/2	35	86	1.1.51.5					
5	2	15	83	21/2	23	85	4	36	85	1.5.500					
6	2	17	83	21/2	27	85	4	40	86	Sec.					
7	2	19	83	3	26	84	4	44	86						
8	2	21	83	3	28	84	4	49	86						
10	2	25	83	3	34	84									
12	2	29	83	2	-		1		For req	uireme	nts in	this ar	ea, use	2-	
14	2	33	84	3 3	39 44	84		a de a	piece h	eavy d	ensity	Fiberal	as pipe	in-	
16	2	38	84	3	44	85	- 15		sulation						
18	2	42	84 84	3		85 85		1.1.	alation						
10	2	42	84	3	54	85									
20	2	46	84	3	59	85								•	
24	2	54	84	3	70	85	1								
30	2	75	85	21/2	90 `	86									

Commercial (part time):

Annual fuel price increase: 4%

Initial heat cost: \$3.00/1000 lb. steam Heat cost at midlife: \$4.44/1000 lb. steam Cost of money: 7½%/year

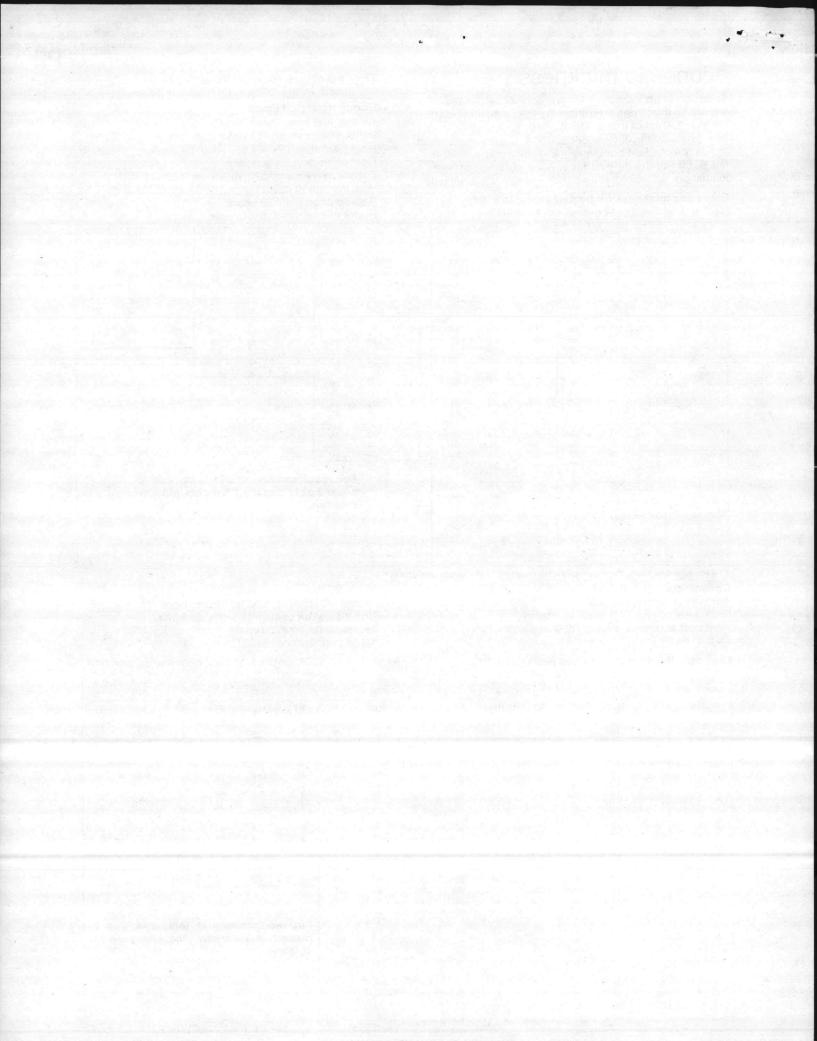
#### Economic thickness for heated piping to 450F

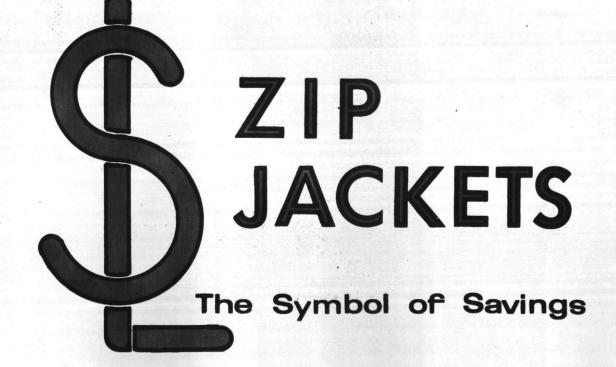
Capital investment: 20/1b. steam/hour Pipe insulation cost ( $1\frac{1}{2}$ " x 1"): 2.40/1fDepreciation time: 20 years Hours of operation: 5400/year

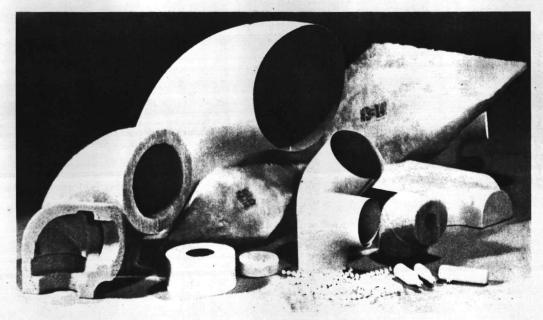
(80F ambient, still air, commercial part time)

pipe temp temp, diff.		150 70			200 120			300 220			400 320			450 370		
IPS	ET	HL	ST	EŤ	HL	ST	· ET	HL	ST	ET	HL	ST	ET	HL	ST	
1/2	1/2	8	100	1	12	89	1 1/2	20	91	2	31	94	2	39	97	1
3/4	1/2	10	97	1	14	91	1 1/2	24	93	2	35	96	2	44	100	
1	1/2	12	98	1	15	90	11/2	26	93	2	38	95	21/2	43	94	
1 1⁄4	1	10	87	1	19	92	2	27	91	21/2	40	93	21/2	50	97	
1 1/2	1	11	86	1 1/2	15	87	2	26	89	21/2	40	92	3	46	92	
2	1	12	86	1 1/2	18	87	2	31	91	3	43	91	3	54	94	
21/2	1	14	86	1 1/2	18	86	21/2	30	87	3	46	91	31/2	53	91	
3	1	17	87	1 1/2	23	88	21/2	36	89	31/2	50	90	31/2	62	93	ļ
31/2	1 1/2	13	83	2	20	85	21/2	37	88	31/2	52	90	4	60	90	
4	11/2	15	84	2	23	86	3	. 37	88	31/2	58	91	4	67	92	
41/2	11/2	15	84	2	23	85	3	38	87	4	54	88	4	68	91	
5	1 1/2	19	85	2	28	86	3	44	88	4	60	89	-			١
6	1 1/2	22	85	2	31	86	3	50	89	4	68	90	Salar.			
7	11/2	24	85	21/2	30	85	31/2	48	87			00	-			l
8	1 1/2	27	85	21/2	32	85	31/2	53	87	-						l
10	2	25	83	21/2	39	85	31/2	64	88	and set in a						l
12	2	29	83	21/2	45	85	31/2	73	88	For re	equiren	nents i	n this	area, u	se 2-	
14	2	33	84	21/2	50	86	31/2	81	88	piece	heavy	density	Fiber	glas pi	pe in-	I
16	2	38	84	21/2	57	86	31/2	90	89	sulati						I
18	2	42	84	21/2	63	86	31/2	100	89							l
20	2	46	84	21/2	69	86	31/2	109	89	0.9408					1,120,000	ĺ
24	11/2	70	85	21/2	82	86	3'2	128	89	1					- 1 C L 3	ĺ
30	11/2	100	86	2	115	88	3	176	92	1					1.1.2	ĺ

**P2** 







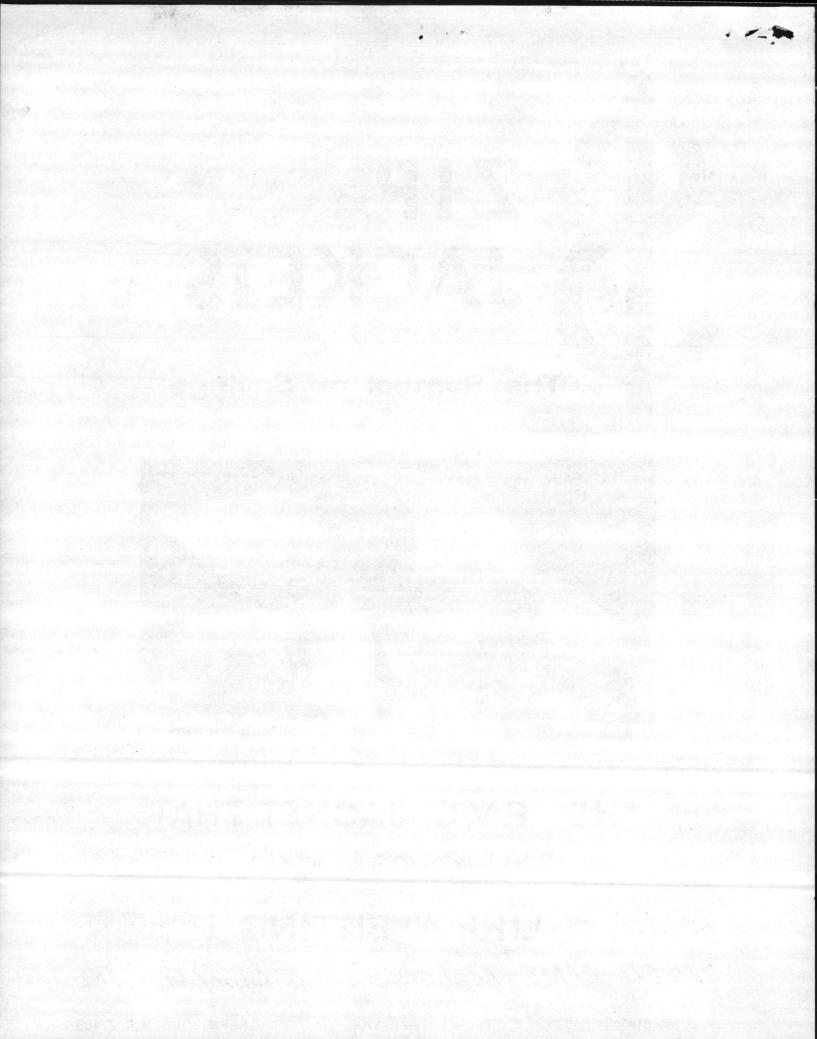
# THE P.V.C. JACKET THAT <sup>\$1</sup>LOOKS<sup>"</sup> LIKE A FITTING

SPEED-LINE Manufacturing Company Inc.

P. O. Box 6143

Phone 1 919-275-1700

GREENSBORO, N. C. 27405



COVERS

CAST IRON AND COPPER TUBE CONVERSION CHART

# **Standard Conversion**

PIPE		INSUL	ATION	THICK	NESS:	
SIZE	1/2	3/4	1	1 1/2	2	21/2
1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 3 1/2 4 5 6 8 10 12	5 5 7 7 9 10 11 12 13 15 17 19 21	5 7 9 9 10 11 12 13 14 16 18 20	7 9 9 10 11 12 13 15 15 15 17 18 20	10 10 11 12 13 13 15 17 17 17 18 19 21	12 13 13 15 15 17 17 18 19 20	13 13 15 15 15 17 17 18 19 19 20 21
5/8 7/8 1 1/8 1 3/8 1 5/8 2 1/8 2 5/8 3 1/8 3 5/8 4 1/8 5 1/8 6 1/8	2 5 5 7 9 10 11 12 13 15 17	4 5 7 9 10 11 12 13 14 16 17	7 7 9 9 11 11 13 15 15 15 17 18	10 10 11 12 13 13 13 15 15 15 15 17 18 19	12 12 12 13 13 15 15 15 17 17 17 18 19 20	13 13 13 15 15 15 17 17

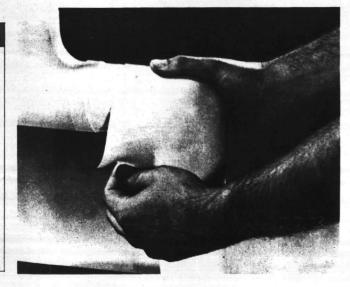
# NonStandard Conversion

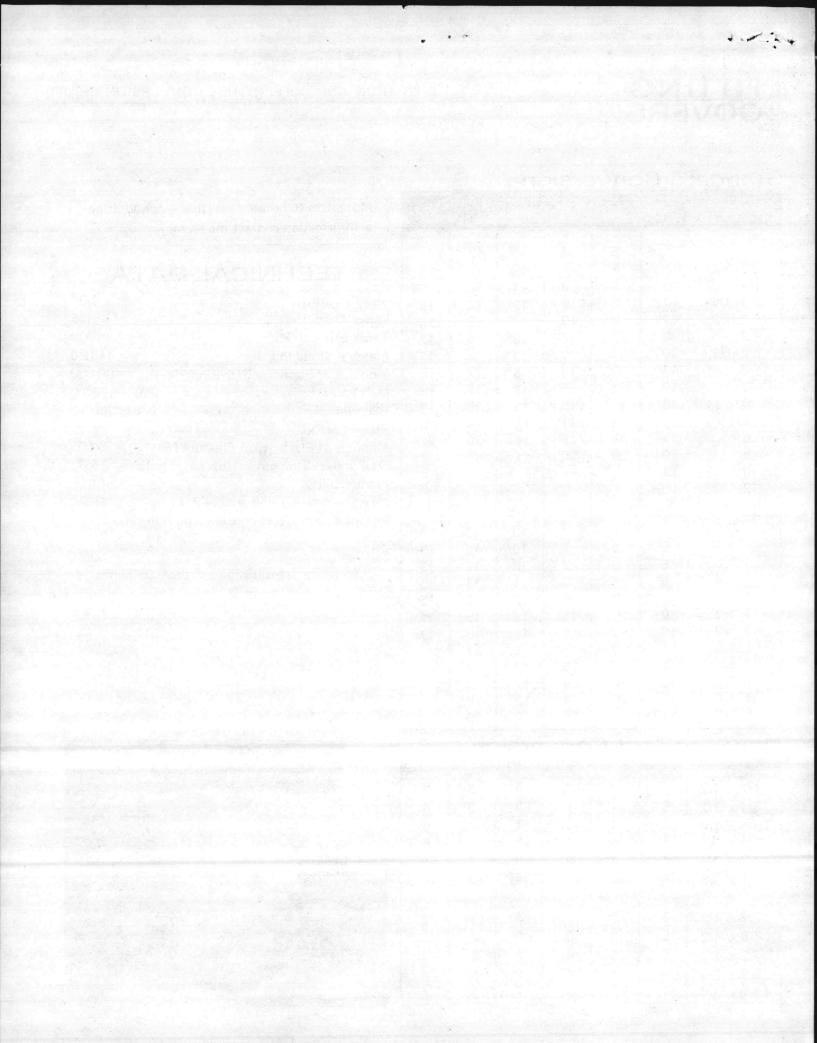
Fit. Size						
1/2 x 1/2	5	3	3	5	3	3
3/4 x 1/2	5	4	4	5	5	4
1 1/4 x 1/2	7	6	6	7	7	6
3/4 x 3/4	5	6	6	5	7	6
1 1/4 x 3/4	9	9	8	9	9	8
4 x 3/4	15	14	14	14	14	14
5/8 x 1/2	3	2	2	3	3	2
7/8 x 1/2	5	3	3	5	3	3
11/8 x 1/2	5	5	4	5	5	4
5/8 x 3/4	4	4	4	5	5	4
11/8 x 3/4	7	6	6	7	7	6

More sizes to become available – for additional information contact the factory.

# **TECHNICAL DATA**

Specific Gravity	1.31
Water Absortion	.05
Tensil Strength PSI	7000
Flexural Strength PDI	11,000
Modulus of Elasticity in tension PSI	400,000
Melt Point 250°	-175° C
Flash Point	260° C
Flame Spread	23
Modulus of Elasticity in Flexture PSI	425,000
Izod impact Strength Ft. Ibs./in. of notch	15.00
Flammability	Self-Ext.
Heat Distortion Temp. at 264 PSI	69° C
Moisture Vapor Transmission, Gm/Mil/10	0 in.
2/24 Hrs.	4.4
Self Ignition	526°C
Moisture Transmission less than .05 p	erms







# I-C 225 Sure-Stik N-F Adhesive

### DESCRIPTION

Sure-Stik<sup>™</sup> is a nonflammable, fire-resistive, high-strength adhesive designed to adhere fibrous glass or mineral wool insulations to galvanized or aluminum air conditioning ductwork. Fire hazard during application is eliminated because nonflammable solvents are used in the formulation. Sure-Stik™ is the recommended adhesive for sealing the laps of vapor barriers on pipe insulation. It forms a positive seal, eliminating "fish mouthing."

### COLOR

Off-white

### SERVICE TEMPERATURE

-40 to 250°F (I-C STM-105)\*

### WATER VAPOR TRANSMISSION

Vapor barrier.

### COVERAGE

Depends upon type and condition of application surface and method of application. One gallon will cover 150 to 250 sq ft.

### WEIGHT PER GALLON

11 lb (I-C STM-110)

### AVERAGE NONVOLATILE

26% by weight (I-C STM-102)

### **BONDING TIME**

(I-C STM-101) Insulation: 0 to 10 min Lap sealing: 5 to 20 min

### SAFETY

Flammability: Wet: Nonflammable. Drv: UL Classified and Labeled. (UL Standard 723, ASTM E-84) Fire rating<sup>†</sup>

Threshold limit value of solvent vapor (TLV): 350 PPM.

### Caution:

Vapor harmful. Use with adequate ventilation. Avoid prolonged or repeated breathing of vapor. Avoid prolonged or repeated contact with skin. Do not take internally. In an emergency, call a physician

\*Insul-Coustic Corporation Standard Test Method. \*See UL Classification Marking, 2nd column.

R-5896 **UNDERWRITERS LABORATORIES, INC.®** CLASSIFIED ADHESIVE 295U FIRE-HAZARD CLASSIFICATION Applied to Asbestos-Cement Board (Based on 100 for Untreated Red Oak) Flame Spread 10 **Fuel Contributed** 0 **Smoke Developed** 0 Tested as applied at a coverage of 200 sq. ft. per gal. SEE UL CLASSIFIED BUILDING MATERIALS DIRECTORY

### LIMITATIONS

- Do not apply below 40°F, or above 100°F.
- · Test for solvent attack before use with foam insulations

### **COMPLIES WITH**

Mil-A-3316B Class II NFPA 90A ASC-A-7001C 1972 TI

### MATERIAL PREPARATION

Do not thin Sure-Stik™ N-F adhesive prior to application. Stir well before using.

### METHOD OF APPLICATION

Brush, spray, roller.

### APPLICATION

For industrial use only by trained and qualified craftsmen.

Apply over clean, dry surfaces with clean tools.

### For adhering insulation to itself or to metal:

Sure-Stik<sup>™</sup> N-F adhesive is best applied in a thin film. Brush coat the entire surface at a rate of approximately 200 sq ft per gal. To ensure uniform and complete bonding, apply firm pressure. Sure-Stik<sup>™</sup> N-F adhesive permits an open time of approximately 10 min.

#### For laps of vapor barrier jackets:

Coat both surfaces with Sure-Stik<sup>™</sup> N-F adhesive when sealing vapor barrier facings and foils. "Strike" the surfaces together and open the lap for a few minutes to allow the solvent to flash off. Apply firm pressure when resealing the lap.

### CLEANUP

1,1,1-trichloroethane or toluol.

Insul-Coustic Corporation Jernee Mill Road

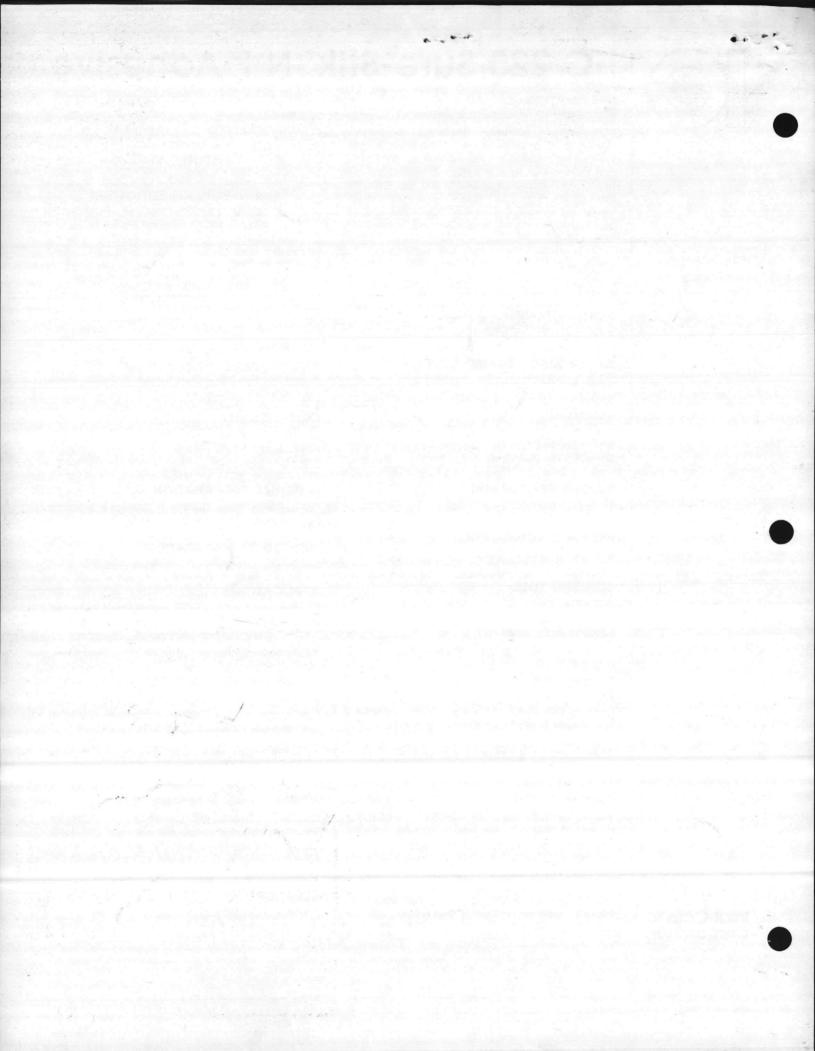
Sayreville, New Jersey 08872 (201) 257-6674

Plants: Sayreville, New Jersey Greenfield, Indiana

The physical and chemical properties of Sure-Stick™ N-F adhesive represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. To assure current information, call I-C Sales Service.

Our Technical Staff is available to assist purchasers in obtaining the best results from our products. Recommendations are based upon tests and information believed to be reliable. However, since we have no control over the methods and conditions of application, transportation, storage, or handling of our products, recommendations and sales are made on condition that we assume no responsibility beyond the purchase price of our material. No representative of our company has authority to change or extend this condition of sale





SND	NTRACTOR'S S ANTDIV 4-4355/3 (Rev. 6/76)	UBMITTAL TRANSMITTA	L	CONTRACT NO.	-	TRANSMIT	TAL NO.	DATE	
	ANTDIV, + 4333/3 (Net. 6/76)			N62470-7	States of the second second	a set and a second	2	4/18/	79
for		ng & Heating Co., Inc	•	PROJECT TITLE	Heating	& Air			
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		CONTRACTOR US	E ONLY		1 San San			EWER USE O	
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x	Contractor Approved		oroval		Deviation/Su For OICC	Approval	R-Resu		
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13	15654 - 12.4	DRAIN PIPING FOR A.C	. UNITS:						
+2		a. Pipe & fittings:			Lvent		A	BHO	4/25/7
		cement socket ty	pe confo	orming to	ASTM		and and a second se	10	
		D1785, Sch. 40,	& D-2466	6 or D-266	65				
	and the second se					AND AND AND	half a third		
								A States	
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B)19-4/2-5/79

Corrells Plumbing & Heating Co., Inc. R. S. Noonan, Inc. Greenville, South Carolina

Replace Heating & Air Conditioning Building 2615, Marine Corps Base Camp Lejeune, North Carolina

12

10000

Brien H. Pular

43 15654 - 12.4 DRAIN PIPING FOR A.C. UNITS:

C 2 c .3

 a. Pipe & fittings: PVC plastic solvent cement socket type conforming to ASTM D1785, Sch. 40, & D-2466 or D-2665

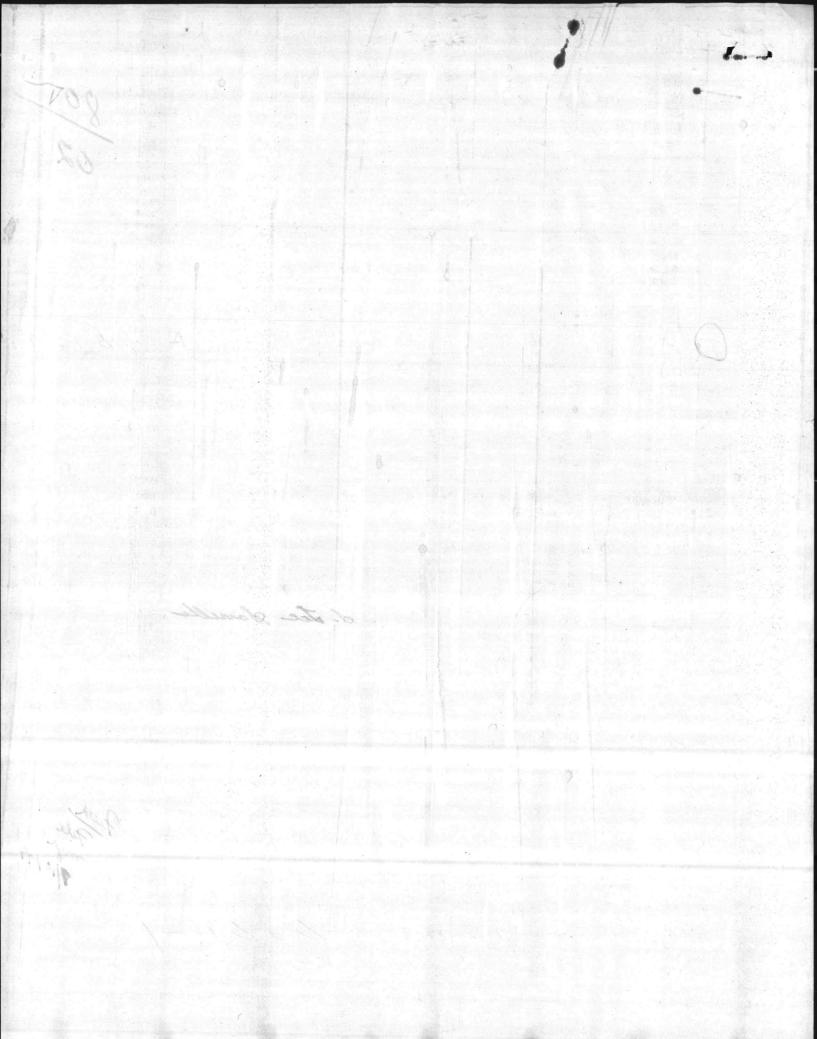
Correlis Flumbing & Heating Co., certifies that all above materials to be furnished for this project will be where and conform to the above specifications.

"ubseribed and avoirs to before me this <u>18</u> day of <u>Conce</u> 1979 Notary Fublic: <u>Security Manuelly</u> My commission expires 1/4/83

N L	ANTDIV 4-4355/3 (Rev. 6/76	SUBMITTAL TRANSMITTAL	CONTRACT NO. N62470-77-C-256	3 TRANSMI		DATE 6/18/79
5 <b>01</b>	and the second second	ing & Heating Co., Inc. Inc., Greenville, S. C.	PROJECT TITLE AND LOCATION Replace Heatin Building 2615, Camp Lejeune,	g & Air Marine	Corps	Base
-		CONTRACTOR USE ONLY	ing a first count referris constructions in		REVI	EWER USE ONLY
]	Contractor Approved	*List only one specification division j List only one of the following categories on eac and indicate which is being subm	ch transmittal form, nitted	ibstitution	**A A-Appr D-Disaj AN-App	CTION COLLES oved pproved proved as noted ceipt acknowledged. ments
ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFI (Type, size, model no., N brochure nu	CATION lfg. name, dwg. or	NO. OF COPIES	ACTION	REVIEWER'S INITIALS CODE AND DAT
1	15654-11	Exhaust Fans: I.L.G. Ind	ustries		Ą	676 7.5.
FF	RACTOR'S COMMENTS	ing FCB-925 exhaust fan in	lieu of the BF-18	due to	incapal	pility of th
EF BF	7 - Submitt	ing FCB-925 exhaust fan in ing as engineered. (This	lieu of the BF-18 is per their commen	due to at on a	incapat pproved	pility of th transmittal
EF BF no	-7 - Submitt -18 with wir	ing as engineered. (This	contractor representat	NT ON A	pprovea	oility of th transmittal
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Chet Adams Company

HEATING

Sales Engineers AIR CONDITIONING EQUIPMENT

VENTILATING

AIR POLLUTION SYSTEMS

ENERGY CONSERVATION

June 19, 1979

	<u>RE-SUBMITTAL</u>	ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND A T A NORFOLK, VIRGINIA 23511 APPROVED
		APPROVED AS NOTED
Project:	Replace Heating & Air Condition: COM (0) Building 2615 Camp LeJeune, North Carolina	DESUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N62470-77-C- 2563
Engineer:	R. S.Noonan	APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR
Contractor:	Sorrells Plumbing & Heating Comp Greensboro, North Carolina	ADALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS-
Order No.:	1467	IBLE FOR PROVIDING PROPER PHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.
Sales Rep.:	Chet Adams Company Greensboro, North Carolina Order No. GE3-4808-6	REVIEWER <u>Sz. Sthat</u> DATE 7-5-79
Manufacturer:	ILG Industries	FOR OFFICER IN CHARGE OF CONSTRUCTION

### Fan EF-7

Dwg. No.

1 - Model FCB-925 Util-A-Set, 925 CFM @ <sup>1</sup>/<sub>4</sub>" S.P., 929 RPM @ .17 BHP, AN-12108-5 with <sup>1</sup>/<sub>4</sub> HP Motor, 115/230 volts, 60 cycles, single phase, with Page 6 belt guard, counterclockwise-upblast (CCW-UB).

GREENSBORO, N. C. 27402 Box 3073 919/273-0566

CHARLOTTE, N. C. 28212 Suite 1148 6000 Monroe Road 704/568-3178 GREENVILLE, S. C. 29602 P. O. Box 2592 803/268-3550

	APPROVED
	APPROVED AS NOTED
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	SUBJECT TO THE REQUIREM
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where the second of a second of the second 
# Util-A-Sets

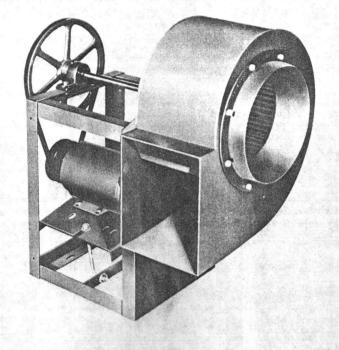
Type FCB 925 and 1075

For ventilating and exhaust applications where speed adjustments are required, IIg offers two FCB Util-A-Sets with adjustable V-belt drives for low volume performance requirements.

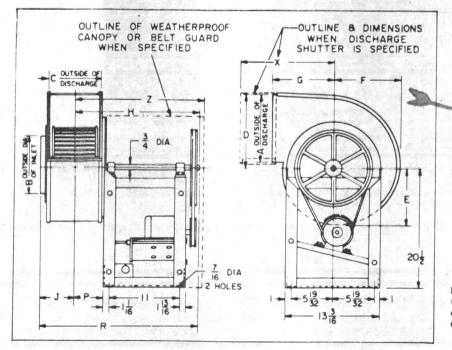
Self-contained, the 925 and 1075 FCB belted centrifugal fans incorporate the same features provided for BF direct drive units. The rotatable housing is of sturdy, weather resistant construction. Steel wheels have forward curved blades for high efficiency. Ball bearing pillow blocks are self-aligning.

Capacities range from 358 CFM to 1719 CFM and from ½" SP to 2" SP. Standard IIg enamel finish is weather resistant.

A complete line of accessories and options is available to customize the fan for specific operations.



# Vibration isolators Motor canopy <u>Belt guard</u> Inlet screen Drain plug Access doors Spark resistant construction



6

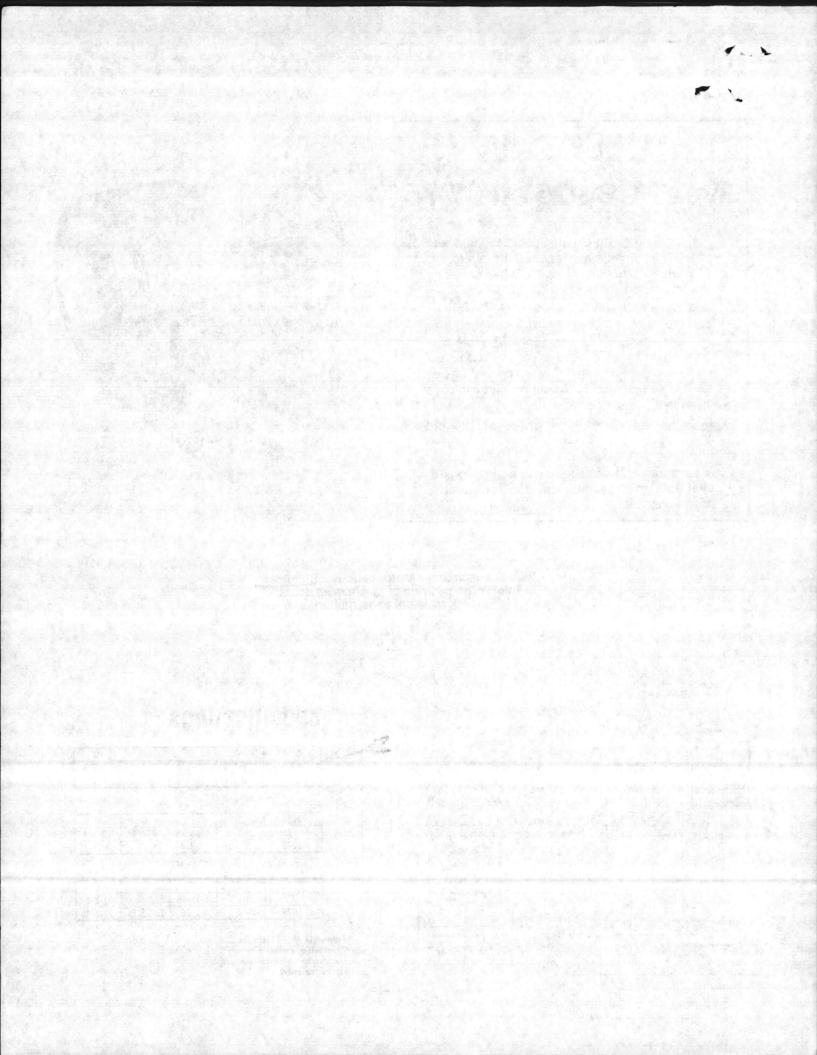
# specifications

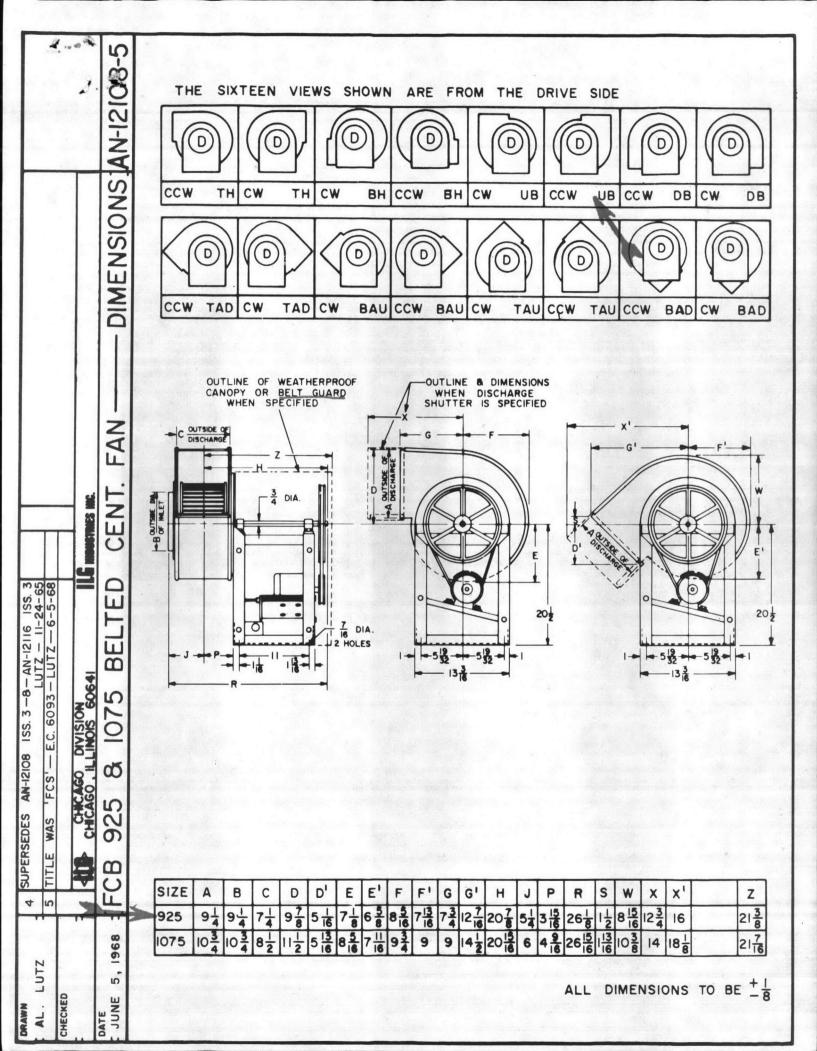
Size	A	В	C	D
925	9-1/4	9-1/4	7-1/4	9-7/8
1075	10-3/4	10-3/4	8-1/2	11-1/2

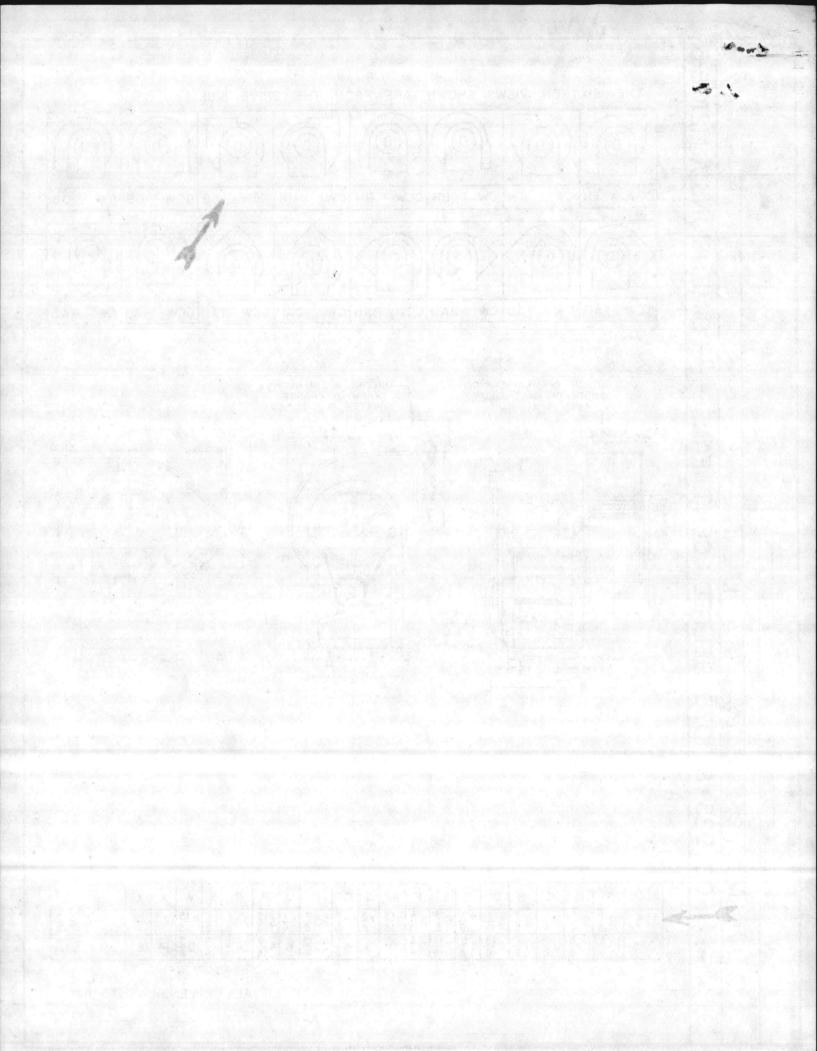
SIZE	E	F	G	Н
925	7-1/8	8-5/16	7-3/4	20-7/8
1075	8-5/16	9-3/4	9	20-15/1

SIZE	J	P	R	Z
925	5-1/4	3-15/16	26-1/8	21-3/8
1075	6	4-9/16	26-15/16	21-7/16

Rotatable in 45° stages (clockwise-to-clockwise or counterclockwise-to-counter clockwise only)

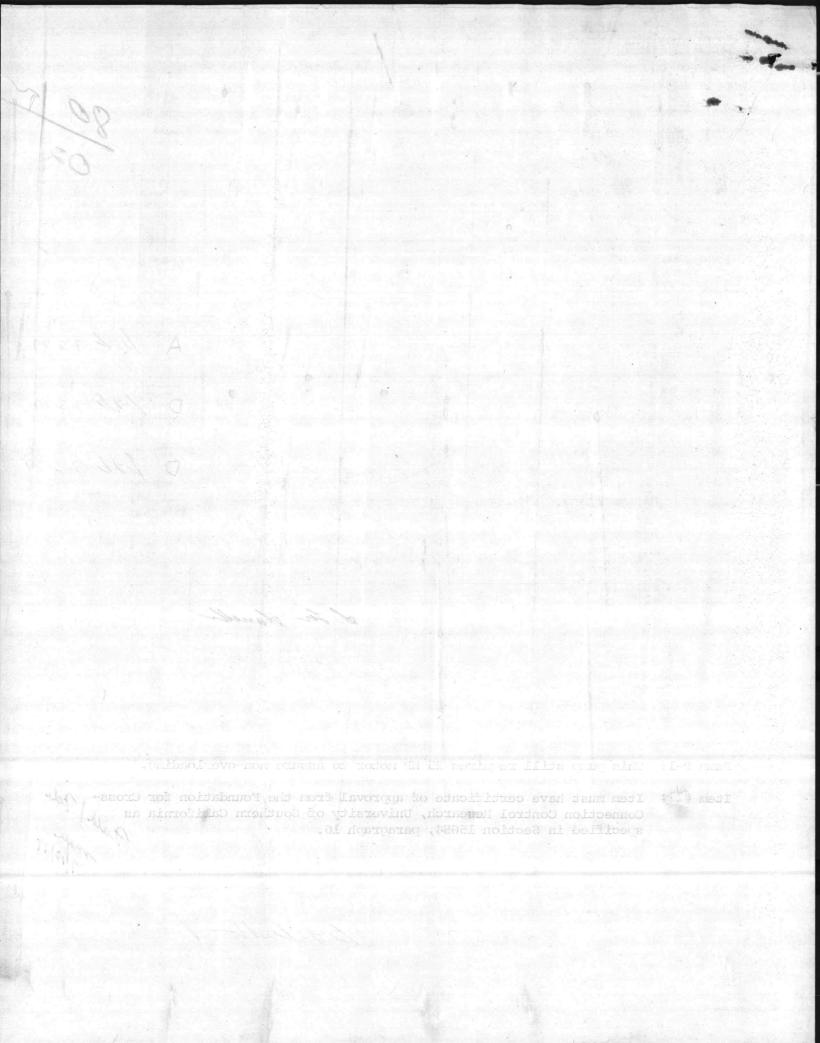






10.00	ANTDIV 4-4355/3 (Rev. 6/76	SUBMITTAL TRANSMITTAL	CONTRACT NO. N62470-77-C-25	563 TRANSMI		DATE 6/18	/79
So	Sale of the second second	ing & Heating Co., Inc. Inc., Greenville, S.C.	PROJECT TITLE AND LOCATION Replace Heating Building 2615, Camp Lejeune, 1	g & Air Marine	Corps E	ioning Base 80	2
		CONTRACTOR USE O			REVI	EWER USE OF	VLY 2
x]	Contractor Approved	*List only one specification divis List only one of the following categories o and indicate which is being OICC Approve	sion per form. In each transmittal form, submitted	ubstitution C Approval	A-Appi D-Disa AN-Ap RA-Re	ACTION CODE roved approved proved as note ceipt acknowle nments	s
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7	15654-14.9	Air Separator: B&GA	A-324		A	þz\$	7-5-79
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William State Street	TOR			and the second second				DATE
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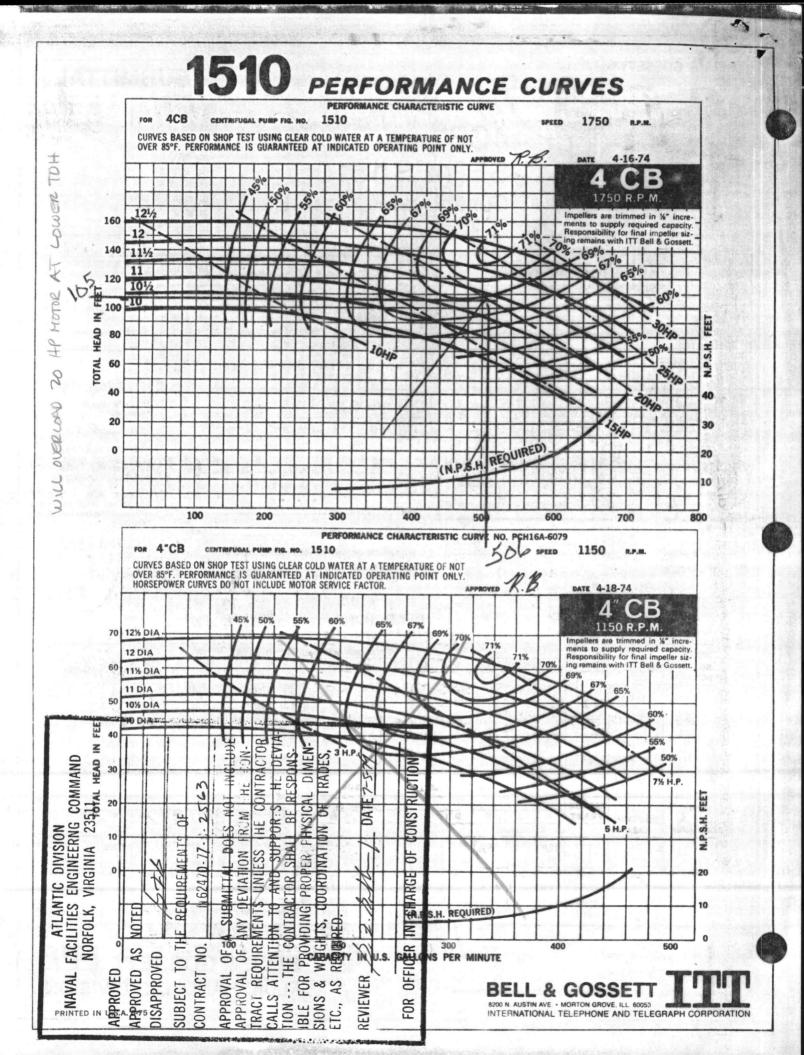
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FLUID HANDLING DIVISION

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CHEMISTS ENGINEERS

2527 Fresno Street 1507 G Street 816 E. Hazelton Avenue 621 W. Willow Street 714 Truxtun Avenue

Fresno, Ca. 93721 Modesto, Ca. 95354 Stockton, Ca. 95203 Visalia, Ca. 93277 Bakersfield, Ca. 93301 (805) 327-8566

(209) 268-7021 (209) 523-0994 (209) 465-3753 (209) 733-2384

Please Address All Mail to P.O. Box 1472, Fresno, California 93716

March 25, 1975

Exam 3307

For:

McDonnell-Miller ITT 3500 North Spaulding Avenue Chicago, Illinois 60618

for attn: Mr. Jack Piper - Chief Engineer

Re:

LAWLER BACKFLOW PREVENTERS REDUCED ZONE

In accordance with your letter of request dated February 10, 1975, The Twining Laboratories, Inc., of Fresno, California, conducted a laboratory test program and compliance examination of series of reduced zone backflow preventers.

The units were designed and are produced by McDonnell-Miller ITT, but for marketing purposes, the Lawler ITT Fluid Handling Division appears on the nameplate. One stock production model of each of the following sizes was tested in accordance with ASSE Standard 1013 - June, 1971 and AWWA C506-69; RZ-3 (3/4"), RZ-4 (1"), RZ-5 (1-1/4"), RZ-6 (1-1/2") and RZ-8 (2").

The attached report presents the results of the test procedure and compliance examination. In our opinion, those devices submitted for approval met or exceeded the requirements and specifications as outlined by the American Society of Sanitary Engineers, and the laboratory testing requirements as outlined by the American Water Works Association.

If there are any questions, please feel free to contact us for details.

THE TWINING LABORATORIES, INC.

mallap

ME: SRG: ek

Michael Erwin, P.E. Staff Engineer

ton R. Gray

MUST BE GERTIFIED BY FOUNDATION Shelton R. Gray Engineering Department FOR CROSS-CONNECTION CONTROL RESEARCH

> ENGINEERING AND ANALYTICAL SERVICES FOR CONSTRUCTION. TESTING, CONTROL. AND RESEARCH

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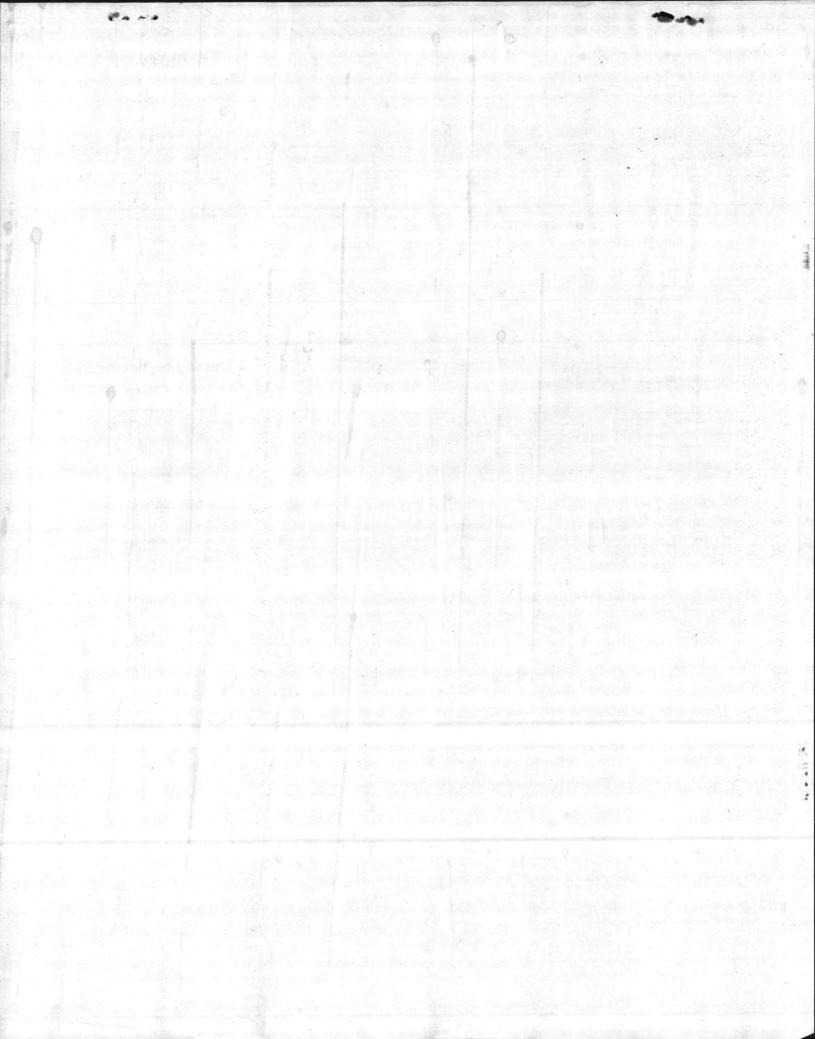
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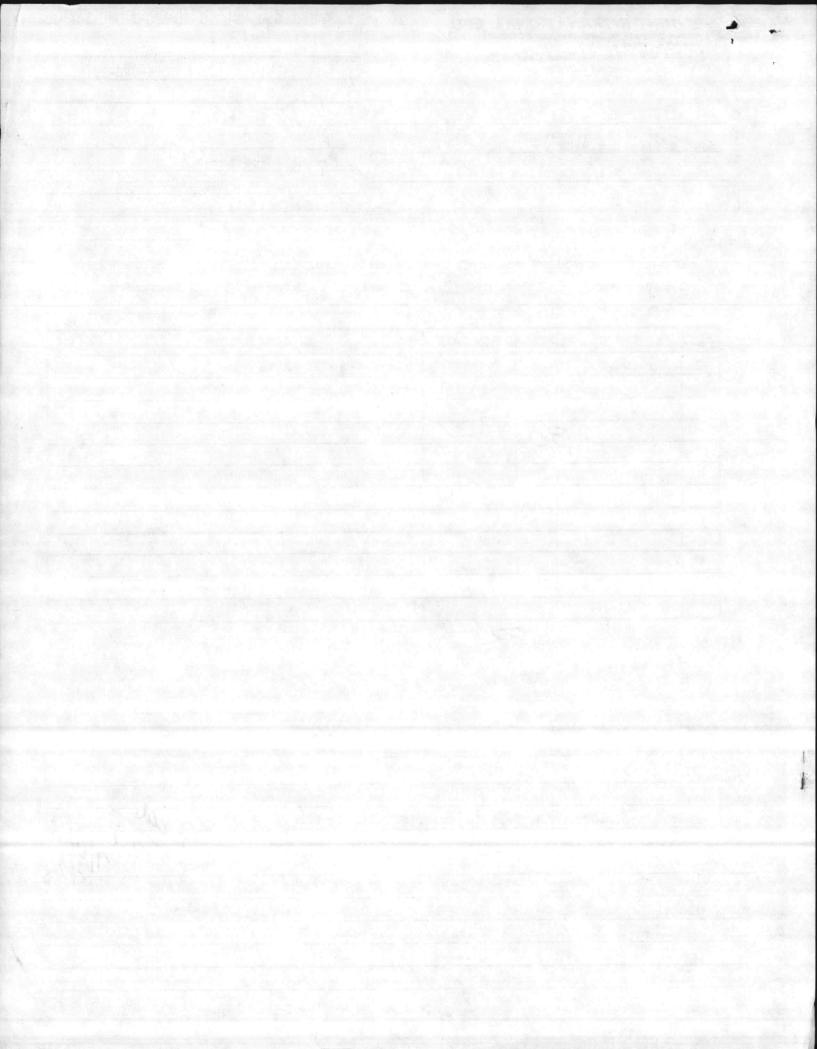


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# Honeywell

## **Temperature Controls**

## **GENERAL SPECIFICATIONS** FOR PNEUMATIC **TEMPERATURE CONTROLS**

## Specification Data



AIR VELOCITY SENSOR/ CONTROLLER PACKAGE



Combines an ultrasensitive air velocity sensor with any of three pneumatic controllers to accurately detect and effectively control air flow in high velocity duct systems, regardless of system static pressure. Although designed primarily for use in high velocity air systems, the sensor can accurately sense low velocities when used together with the RP980.



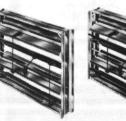
## Models:

	Maximum velocity limit.
CP980B	Adjustable maxi- mum and minimum velocity limits.
	Adjustable maxi- mum and minimum velocity limits with reheat sequencing.

Air Consumption: 0.04 SCFM (1133 SCCM). Ambient Operating Temperature Limits: 40 to 130 F (4 to 54 C). Maximum Safe Air Pressure: 30 psi (207 kPa). Velocities from 75 to 5000 ft/min. (0.4 to 25.4 m/s).



D640-D645 MODUFLOW\* DAMPERS



\*Trademark Rev. 8-78 J.P.S.

Parallel and opposed action, horizontal or vertical, standard sized dampers for controlling air flow in ventilating, heating, and air conditioning systems.

## Models:

D640A	Parallel action blades, all ro- tate in same direction.
D641A	Opposed action blades, adja- cent blades rotate in opposite direction.
D642A	Same as D640A except has inflatable seal rated to seal off w/leakage not to exceed 10 CFM per sq ft of damper area at 4 in. H <sub>2</sub> O pressure.
D643A	Same as D642 except opposed blades.
D644A	Same as D642 except has higher temperature rating.
D645A	Same as D643 except higher temperature rating.

Sizes: Start at 8 in. (203 mm) (nominal) vertical and horizontal and go up in 2 in. (51 mm) increments to 48 in. (1220 mm) (nominal) vertical and horizontal. Standard sizes bolt together for larger than 48 in. (1220 mm). Uses internally mounted or external pneumatic or electric operator. Ambient temperatures: -40 to 400 F (-40 to 204 C) max. Approach Velocity: 1500 FPM (20.3 m/s) max. (D642, D645).

## HP970 & TP970 SERIES DUCT SAMPLING CHAMBER (14002362-001)



May be used with the HP970 Series Humidistats or TP970 Series Thermostats, providing an easy means for sampling air within a duct to provide humidity or temperature control by circulating air through the chamber around the controller. Insertion Depth: 12 inches (305 mm).

## **HP970 SERIES PNEUMATIC HUMIDISTATS & SENSOR**



Two-pipe proportioning humidistats used to control valves in humidifying and dehumidifying equipment in air conditioning systems.

## Models:

HP970A	Direct-acting (BLP increases with an rh increase). 15 to 75% rh.
HP970B	Reverse-acting (BLP decreases with an rh increase). 15 to 75% rh or 65 to 95% rh.
HP971A Sensor	Direct-acting (BLP increases with an increase in percent rh). 15 to 75% rh or 65 to 95% rh.
HP972B	Reverse-acting (BLP decreases with an rh increase). 15 to 75% rh.

Setpoint Increments: 5%. Temperature Limits: 45 to 125 F (7 to 52 C). Maximum Safe Air Pressure: 25 psi (172 kPa). Supply Air Pressure: 18 psi (124 kPa) nominal. A variety of covers and finishes available.

## **HP973A PNEUMATIC** ENTHALPY CONTROLLER



Helps optimize energy conservation and minimize operating costs in central air conditioning systems. With LP914 and HP971A sensors, it measures the total heat content (enthalpy) by combining the temperature

> Form Number 77-9815 MLF TAB: II. C. 1.

and relative humidity of outdoor and return air. Then, it initiates damper operation to utilize the air source which puts the least strain on the cooling system. Enthalpy Range: Return Air - 19 to 40 Btu/lb. Temperature: 65 to 85 F (18 to 29 C) dry bulb limits. Relative Humidity: 20 to 75%. Outdoor Air -8 to 50 Btu/lb. Temperature: 32 to 110 F (0 to 43 C) dry bulb limits. Relative Humidity: 15 to 85%. Air Consumption: 0.02 SCFM (566 SCCM) nominal. Supply Air Pressure: 18 psi (124 kPa) maximum. Safe Air Pressure: 25 psi (172 kPa). Required accessories: Temperature Sensors (2) LP914A: -40 to 160 F (-40 to 70 C); Humidity Sensors (2) HP971A: -15 to 85% RH; Honeywell No. 14002914-002 .007 in. (.2 mm) restrictions (4).



## L91B PROPORTIONAL PRES-SURETROL\* CONTROLLER



A modulating pressure operated controller used as a high limit controller or, in steam heating systems, as a direct controller for a proportional Modutrol\* motor operating an automatic burner. May also provide pressure regulation of liquid or air and other noncorrosive gases. It should not be used with combustible mediums, or any medium which is chemically injurious to the brass bellows. Adjustable throttling range allows selection of exact pressure control range desired.

Range	Maximum Safe Pressure PSI
22 in. vac to 35 psi	110
(74 kPa vac to 241 kPa)	(758)
0 to 1 psi	6
(0 to 7 kPa)	(41)
0 to 4 psi	6
(0 to 28 kPa)	(41)
0 to 15 psi	20
0 to 103 kPa)	(138)
2 to 50 psi	85
(14 to 345 kPa)	(586)
5 to 150 psi	225
(34 to 1034 kPa)	(1551)
10 to 300 psi	325
(69 to 2068 kPa)	(2240)

Electrical Rating: 24V ac. Scale Markings: All ranges marked for both psi and kg/cm<sup>2</sup>; kPa  $(0.0102) = kg/cm^2$ . L480B, G TEMPERATURE CONTROLLERS



Operate electric dampers, valves, and compressor or fan motors to provide temperature or limit control of air conditioning systems and refrigeration units. Models with 20 ft (6 m) capillary operates from the coldest one foot long section making it ideal for coil freeze-up protection. L480B also used as frost alarm. UL Listed.

## Models:

L480B	SPDT snap switch. Automati- cally recycles. Makes R-B and breaks R-W.
L480G	SPST snap switch. Manual reset model. Breaks on temperature fall.

Temperature Ranges: -20 to 30 F (-30 to 0 C) or 20 to 60 F (-5 to 15 C). Dual Fahrenheit/ Celsius Scaleplate. 5 ft (1.5 m) capillary with 3 in. (76 mm) Sensing bulb, or 20 ft (6 m) element with no sensing bulb. Electrical Rating (full load): 10.2A at 120V ac, 6.5A at 240V ac, 0.2A at 120V dc, 0.1A at 240V dc.

L4029E MANUAL RESET

## LA419D AIRSTAT\* FAN SAFETY CUTOFF CONTROL



Manual reset fan safety cutoff switch for use in all types of heating, ventilating, and air conditioning systems where fire protection is needed. Manual reset following safety shutdown. Adjustable Setpoint Ranges: 45 to 125 F (7 to 52 C) or 25 to 75 C (77 to 167 F). 10-1/2 in. (267 mm) Helical bimetal element. Electrical Rating (full load): 8.0A at 120V ac, 5.1A at 240V ac, 2.4A at 120V dc, 1.2A at 240V dc, UL Listed.

## LP906A INSERTION SAFETY GRAD-U-STAT\* CON-TROLLER



This controller senses temperature below the critical point and may be used to close pneumatically operated outdoor air dampers or to open pneumatically operated valves. It is a two-pipe, nonbleed controller with single or multiple element. Guards against freezing of heating or cooling coils. Direct or reverse acting, field adjustable. Setpoint Range: 35 to 65 F (2 to 18 C), factory set at 50 F (10 C). Maximum Safe Air Pressure: 20 psi (138 kPa). Maximum Safe Temperature: 200 F (93 C).



Safety device which breaks line-voltage contacts as air temperature reaches predetermined cut-out level where fire protection is needed.

Temperature Cutout Setting (Fixed)

F	125	135	145	165	200	225	240
			62.5			107	

LP907A PNEUMATIC AIR-STREAM INSERTION THERMOSTAT



Direct-acting, one-pipe, bleed-type controller commonly used as discharge controller in unit ventilator applications. Provides for "submaster action" control of valves and damper operators. Gage tee and tank valve



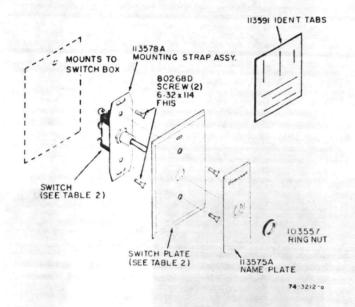


TABLE 2 - SINGLE SWITCH KITS

Kit Assy. No.	Includes Switch No.	Description	Includes Switch Plate
801736A	113703	DPDT, Two-Position	113586
801736B	113700	SPDT, Center-Off	113586
801736C	113701	SPDT, Two-Position	113586
801736D	113702	DPDT, Center-Off	113586
801736E	101720A	4PDT, Two-Position	113586
801736F	- 101721A	4PDT, Center-Off	113586
801736G	113700	SPDT, Center-Off	113583
801736H	113701	SPDT, Two-Position	113583
801736J	113702	DPDT, Center-Off	113583
801736K	113703-	DPDT, Two-Position	113583
801736L	101720A	4PDT, Two-Position	113583
801736M	101721A	4PDT, Center-Off	113583

SWITCH PLATES (Includes mounting screws and nuts, see Fig. 8 )

IMPORTANT: In applications where all the openings in the switch plate are not utilized, snap-in plugs are available to fill the vacant hole(s). Part #105612C (1/2-inch dia.) is used to plug unused switch openings. Part #105612L (9/16-inch dia.) should be ordered to plug unused light openings.

## SWITCH BOX MOUNTING

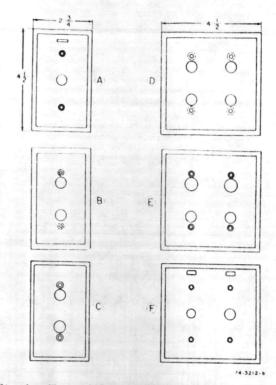


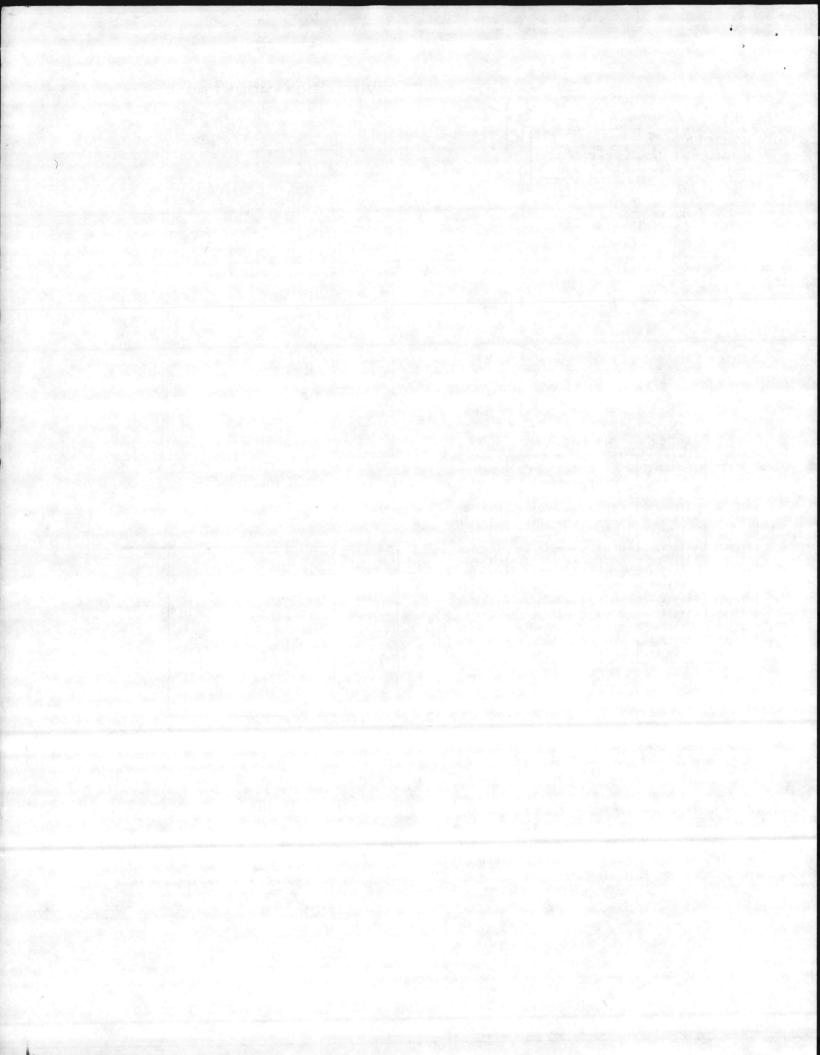
Fig. 1 - Typical Switch Plates (Switch Box Mtg.)

TABLE 3

Ref.	Part No.	Description	Notes
(A)	113583A	Single Switch Plate	a, d
<b>B</b>	113581A	Two-Switch Plate	b, d
C	113582A	One-Light, One-Switch Plate	b, d
0	113584A	Four-Switch Plate	
E	113585A	Two-Light, Two-Switch Plate	
F	113393A	Plate for 112894G Remote	
	1	Temperature Selector and	
		Switch. 112894G Mounts in	
		Left Hand Hole.	

a - Where the number of conductors in a single-switch box exceed electrical code limits, particularly in installations requiring multi-pole switches, it will be necessary to employ a 4 x 4 or 4-11/16 x 4-11/16-inch box with a single gang mud ring as shown in Fig. 11.

b-If the application of this type of arrangement is such that a multi-pole switch is required, and resultant conductors exceed electrical code limits for single-switch boxes, this plate is adaptable to a square box by employing a mud ring as shown in Fig. 11.



facilitate checking line pressure. Invar rod and seamless brass tube insertion-type sensing element. Temperature Limits: 20 to 250 F (-7 to 121 C). Range: 40 to 90 F (4 to 32 C) and 90 to 140 F (32 to 60 C). Maximum Safe Air Pressure: 20 psi (138 kPa).

LP910A AIRSTREAM AVERAGING THERMOSTAT

Direct-acting, one-pipe, bleed-type controller

used as a discharge controller in unit ventilator application. Setpoint Range (Nominal): 40 to 250 F (4 to 121 C). Adjustable Throttling Range: 10 to 70 F (-12 to 21 C). Liquid-filled 7.5 ft (2.3 m) averaging sensor with 3 ft (1 m) armored capillary. Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Safe Temperature: 265 F (130 C).



## LP911A LIQUID-FILLED INSERTION THERMOSTAT



Direct-acting, one-pipe, remote bulb type used in air or water systems. Averaging element type also available. Used as discharge controller in central fan systems. Remote Bulb Range: 40 to 140 F (4 to 60 C), 130 to 230 F (54 to 110 C), 0 to 60 C (32 to 140 F). Adjustable Throttling Range: 10 to 70 F (-12 to 21 C). Liquid-filled, flex averaging sensor with armored capillary. Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Safe Temperature: 250 F (121 C).



## **LP914A PNEUMATIC TEMPERATURE SENSOR**



Direct-acting, proportional type sensor used with RP908 Controller for controlling pneumatic valves, damper operators in fan room applications. Duct, wall, or through-the-wall mounting. Element: Rod and tube, 6 in. (152 mm) and 15 in. (381 mm) lengths for water and air. Separate immersion wells w/heat conductive compound. Sensing Range (non-adjust.): -40 to 160 F (-40 to 71 C), 40 to 240 F (4 to 116 C), -20 to 80 F (-29 to 27 C). 25 to 125 F (-4 to 52 C). Maximum Safe Temperature at Element: 265 F (130 C). Supply Air Pressure: 18 psi (124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Pressure Output: 3 to 15 psi (21 to 103 kPa).

## **LP915A PNEUMATIC TEMPERATURE SENSORS**



Direct-acting, proportional type sensor used with RP908 Controller for controlling pneumatic valves and damper operators in fan room applications. For duct mounting. Sensing Range (non-adjust.): 0 to 200 F (-18 to 93 C). 8.75 ft (27 m) or 20 ft (6 m) liquid-filled averaging element. Maximum Safe Temperature at Element: 225 F (107 C). Supply Air Pressure: 18 psi (124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Pressure Output: 3 to 15 psi (21 to 103 kPa).

## LP916A-C UNIT MOUNTED **RETURN AIR** THERMOSTAT

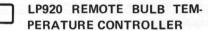


Unit mounted, two-pipe temperature controller for proportional control of induction units, fan coil units and unit ventilators. Sensing Range: 40 to 80 F (4 to 27 C), 55 to 95 F (13 to 35 C), 60 to 80 F (16 to 27 C), 65 to 85 F (18 to 30 C) marked "WARMER-COOLER". Element: Liquid bulb with Capillary.

#### Models:

LP916A	Direct-acting, single temp. May be changed to reverse- acting in field.
LP916B	Built-in switch-over reverse- acting (summer) 13 psi (90 kPa), direct-acting (winter) 18 psi (124 kPa) (special model summer 9 psi [62 kPa]; winter 18 psi [124 kPa]).
LP916C	Reverse-acting, single temp. May be changed to direct- acting in field.

Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Safe Temperature: Duct mounted 190 F (88 C), others 135 F (57 C).



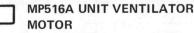


Direct or reverse acting, single temperature, pneumatic controller. With a high capacity valve unit, it proportionally controls pneumatic dampers and valves which regulate air and water temperatures. Features hand moveable setpoint and throttling range adjustments with Fahrenheit and Celsius scales for both. Bold type raised numeric scales are highly visible in even poorly lit equipment rooms. Contains easily replaceable filter cartridge. Setpoint Range: 35 to 150 F (2 to 66 C). Throttling Range: 5 to 25 F (3 to 15 C). Factory set at 10 F (6 C). Liquid Filled Elements with 5 ft (1.5 m) element and 8 ft (2.4 m) Averaging Capillary also available.

## Models:

LP920A	Direct Acting.	
LP920B	Reverse Acting.	

Maximum Safe Air Pressure: 30 psi (210 kPa). Maximum Safe Temperature: 230 F (110 C). Supply Air Pressure (Nominal): 18 psi (124 kPa). Branch Line Pressure Output: 3 to 13 psi (21 to 90 kPa).





Sturdy, compact pneumatic damper operator used primarily on unit ventilator control systems. Hesitation feature available for use with cycles requiring minimum percentage outdoor air.

## **Operating Range:**

Hesitation Motor: Min. OA Range, factory set for 33% min. stroke at 3 psi (21 kPa). Field Adjustable 0 to 100%; Hesitation Range, 3 to 8 psi (21 to 55 kPa); Maximum OA Range: 8 to 12 psi (55 to 83 kPa). Single Range Motor: Full stroke 4 to 8 psi (28 to 55 kPa) or 5 to 12 psi (34 to 83 kPa). Damper Load Rating: 2.7 ft<sup>2</sup> (0.25 m<sup>2</sup>). Maximum Safe Air Pressure: 25 psi (172 kPa). Ambient Temperature: 160 F (71 C) maximum, -20 F (-29 C) minimum.



MP516B & C PNEUMATIC OPERATOR



Sturdy, compact pneumatic damper operators used primarily on unit ventilator control systems, and may be adapted to various individual unit ventilator systems. Available with and without hesitation feature with integral air motion relay requiring minimum percent outdoor air. C model has auxiliary day/night switch for use with two-pressure systems. Operating Range: Min OA Range, adjustable 0 to 100%, factory set for 33% min. stroke at 3 psi (21 kPa). Hesitation Range: 3 to 8 psi (21 to 55 kPa); Max. OA Range, 8 to 12 psi (55 to 83 kPa). Stroke: 2-1/2 in. (63.5 mm) maximum at outer limit of slot. Maximum Safe Air Pressure: 25 psi (172 kPa). Ambient Temperature: 140 F (60 C) maximum, 0 F (-18 C) minimum.



For positioning damper blades in controlling the volume of air flowing through a particular portion of an HVAC or ventilation system, and for sequence operation. Operates on air pressure from control device and provides proportional control.

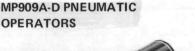
#### Models:

M904A	Operator with positioner. Start point adjustment 3 to 10 psi (21 to 69 kPa). Operating range adjustment for 3, 5, or 10 psi (21, 34 or 69 kPa). Max- imum load 18 psi (124 kPa) control air, 45 ft <sup>2</sup> (4.2 m <sup>2</sup> ) damper.
MP904B	Same as MP904A except with- out positioner. Operating ranges to suit application. Maximum load 18 psi (124 kPa) control air, 30 ft <sup>2</sup> (2.8 m <sup>2</sup> ) damper.

Maximum Safe Air Pressure: 25 psi (172 kPa). Ambient Temperature Range: -20 to 160 F (-29 to 71 C).

Used for proportional control of standard dampers, and valves and shutters in variable volume and high velocity mixing boxes. Rolling-diaphragm operated piston-type operator with a rugged aluminum body. Universal mounting bracket furnished with MP909A, B, & C permits external installation on all makes of dampers with shaft extension to outside of duct. For the MP909D, versatile mounting and connecting hardware is optional.

Maximum Safe Air Presure: MP909A, B, C - 25 psi (172 kPa); MP909D - 30 psi (207 kPa). Ambient Temperature Range: MP909A, B, C: -20 to 160 F (-29 to 71 C), MP909D: 50 to 140 F (-46 to 60 C).





## Models:

Description of the Pro-	and the second
MP909A	2-3/4 in. <sup>2</sup> (1775 mm <sup>2</sup> ) effec- tive area. Damper Load Rating: 4 ft <sup>2</sup> (0.37 m <sup>2</sup> ) (D640/D641), 3 ft <sup>2</sup> (0.28 m <sup>2</sup> ) (D642/D643). Range: 3 to 13 psi (21 to 90 kPa). Stroke: 1 to 3-1/2 in. (25 to 89 mm).
MP909B	6-1/2 in. <sup>2</sup> (4200 mm <sup>2</sup> ) effec- tive area. Damper Load Rating: 7 ft <sup>2</sup> (0.65 m <sup>2</sup> ) (D642/D643), 8 ft <sup>2</sup> (0.74 m <sup>2</sup> ) (D640/D641). Range: 7 to 13, 2 to 7, or 3 to 13 psi (48 to 90, 14 to 48 or 21 to 90 kPa). Stroke: 2-1/2 to 4 in. (64 to 102 mm).
MP909C	10 in. <sup>2</sup> (6450 max.) effective area. Damper Load Rating: 12 ft <sup>2</sup> (1.11 m <sup>2</sup> ) (D640/ D641), 10 ft <sup>2</sup> (0.93 m <sup>2</sup> ) (D642/D643). Range: 2 to 7, 7 to 13, or 3 to 13 psi (14 to 48, 48 to 90 or 21 to 90 kPa). Stroke: $2 \cdot 1/2$ to 4 in. (64 to 102 max.).
MP909D	3 in. <sup>2</sup> (1935 mm <sup>2</sup> ) effective area. Damper Load Rating: 2-1/2 ft <sup>2</sup> (0.23 m <sup>2</sup> ) (D640/ D641), 2 ft <sup>2</sup> 0.19 m <sup>2</sup> ) (D642/D643). Range: 3 to 8, 5 to 10, 8 to 13 psi (21 to 55, 34 to 69 or 55 to 90 kPa). Stroke: 2.3 in. (58 mm).

MP913A PNEUMATIC DAMPER OPERATOR

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Piston type pneumatic operator for proportional control of air valves and dampers in air terminal units and fan coil units. 2.2 in<sup>2</sup> (1420 mm<sup>2</sup>) effective area. Range: 3 to 8, 3 to 13, 5 to 10, and 10 to 15 psi (21 to 55, 21 to 90, 34 to 69 and 69 to 103 kPa). Stroke: 1 in. (25 mm). Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Temperature Range: 50 to 140 F (10 to 60 C).



MP953A-D PNEUMATIC VALVE OPERATORS



For direct- or reverse-acting proportional control of V5011 or V5013 Valve Bodies. May or may not be supplied with positive positioner. Diaphragm Sizes: 5, 8, or 13 in. (127, 203 or 330 mm).

Temperature Limits: -20 to 160 F (-29 to 71 C) (neoprene diaphragm), -20 to 250 F (-29 to 121 C) (Silicone or Ethylene Propylene diaphragm).

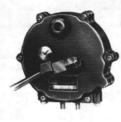


Models:

MP953A	Direct acting. Adjustable 3, 5, or 10 psi (21, 34 or 69 kPa) span with adjustable start 3 to 10 psi (21 to 69 kPa) with positioner.
MP953B	Same as MP953A except reverse acting.
MP953C	Direct acting. 2 to 7, 4 to 11 or 8 to 12 psi (14 to 48, 28 to 76, or 55 to 83 kPa) with- out positioner.
MP953D	Reverse acting. 3 to 7, 4 to 11 or 8 to 13 psi (21 to 38, 28 to 76 or 55 to 90 kPa) without positioner.

250, or 277V ac. P658C, 5 volts at 5 mA/dc. Switching Action: spdt. Pressure Range: 2 to 24 psi (14 to 165 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Differential: P658A and B, fixed at 2 psi (14 kPa); P658C, fixed at 1.5 psi (10 kPa). Adjustable Setpoint: P658A and B factory set at 4, 10 or 14 psi (28, 69 or 97 kPa); P658C, 10 psi (69 kPa). UL Listed.

## PP92B & C DIFFERENTIAL PRESSURE REGULATOR



Direct-acting, diaphragm-operated, bleedtype, proportional controllers for positioning pneumatic operators in controlling air flow in commercial heating and ventilating systems and industrial process systems. Available with integral selector relay for overriding thermostat control on mixing box applications.

## Models:

PP92B	Two-pipe (hi-range model available). Neoprene dia- phragm.
PP92C	Two-pipe w/attached four- pipe higher-of-two pressure selector relay (no hi-range models). Silicon diaphragm.

Setpoint Range: Mounted in vertical plane, or horizontal plane with adjustable knob down; .05 to .80 in.  $H_2O$  (.01 to .20 kPa) for standard model; .15 to 3.0 in.  $H_2O$  (.04 to .75 kPa) for high range model. Mounted in horizontal plane with knob up; .10 to .80 in.  $H_2O$  (.02 to .20 kPa) for standard model; .25 to 3.0 in.  $H_2O$  (.06 to .75 kPa) for high range model. Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Operating Temperature: 160 F (71 C). One-pipe, bleed type pressure controller for providing proportional control of pneumatic motors and valves, or may be used to control the pressure of steam, air, or noncorrosive liquids and gases. Direct or reverse acting. Special shockproof, corrosionresistant model available. Bellows element. Setpoint Ranges available from 22 in. Hg vac to 300 psi (74 kPa vac to 2068 kPa).

> PP901A & B PRV AND PP902A & B PRV STATION WITH SUB-MICRON FILTER

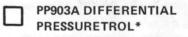


Provide control of high-pressure air and adjustable air pressure reduction suitable for main air supply for pneumatic control systems.

#### Models:

PP901A	Used in single-pressure system. PRV only.
PP901B	Used in two-pressure system. (Higher pressure maintained when main pressure applied to switch-over port.) PRV only.
PP902A	Same as PP901A except with sub-micron filter element and pressure gages.
PP902B	Same as PP901B except with sub-micron filter element and pressure gages.

Inlet Pressure Range: 45 to 150 psi (310 to 1034 kPa). Regulated Outlet Pressure: Adjustable, 0 to 25 psi (0 to 172 kPa); PP901B and PP902B secondary pressure adjustable 0 to 5 psi (0 to 34 kPa) above base setting. Safety Pressure Relief: Factory set at 23.5 psi (162 kPa).





A pressure-operated, bleed-type, one-pipe controller for providing proportional control of pneumatic motors and valves. It varies

## P638A DUAL PNEUMATIC



Provides dual pressure-activated electrical switching. Used with TP971A, C in day-nite unit ventilator installations or other general applications. Factory Settings (Limited Field Adjustment): Low Range-Right Switch (H) (spst) makes at 2.5 psi (17 kPa). High Range-Left Switch (K) (dpdt) makes at not less than 13.5 psi (93 kPa) and not more than 16.5 psi (114 kPa). Electrical Rating (full load): 5.0A at 120V ac, 4.0A at 208, 240 and 277V ac. Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Ambient Temperature: 125 F (52 C). UL Listed.





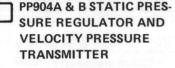
Converts a pneumatic signal from a controller or other pneumatic device to a two-position electric switch action, providing on/off control of fans, pumps and electric heaters, interlock functions and alarm initiations. Electric Rating: P658A and B, 25A at 125, 250 or 480V ac, 1 hp at 125V ac, 2 hp at 250V ac. Pilot Duty: 750 volt/A at 125,

## PP97A PRESSURE CONTROLLERS



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the air pressure piped to it in relation to the difference in pressure existing between water pressures. Direct- or reverse-acting (factory set direct acting, may be set reverse acting in field). Range: 0 to 22, 3 to 50, 5 to 65 psi (0 to 152, 21 to 345 and 34 to 448 kPa). Maximum Safe Air Pressure: 18 psi (124 kPa). Bellows Type Element.



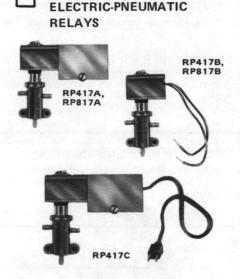


"B" Model available for adjustable span velocity pressure transmitter.

## Models:

PP904A	Two-pipe, valve unit type.
PP904B	One-pipe, bleed type trans- mitter.

Range: Adjustable 0.01 to 8 in. water column (0.0025 to 2.0 kPa). Throttling Range: Adjustable, 0.02 to 0.5 in. water column (.005 to 0.012 kPa). Normal Air Supply: 18 psi (124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Safe Static Pressure: 28 in. water column (6.96 kPa). Ambient Temperature Limits: 40 to 120 F (4 to 49 C).



RP417A, B, C; RP817A, B

Electrically operated pneumatic switches used for interlock between an electrical system and a pneumatic control system. May be used as stop and bleed relays or as diverting or selector relays. Wall or panel mounted in any position.

Model	Electrical Rating
RP417A	100, 110, 120, 200, 208, 220, 240, 277, 440, 480v AC, 50 or 60 Hz
RP417B	110, 120, 208, 220, 240, 440, 480v AC, 50 or 60 Hz
RP417C	110 or 120, 50 or 60 Hz
RP817A	24v AC, 50 or 60 Hz
RP817B	24v AC, 50 or 60 Hz

Air Capacity: At 20 psi (138 kPa) supply; 1 psi (7 kPa) pressure drop -0.30 SCFM (8495 SCCM). Power Consumption: 10 watts maximum.



## PP905B STATIC OR VELOC-ITY PRESSURE SENSOR



One-pipe proportional pressure sensor with fixed 2 in. (51 mm) span used with RP908 Controller to control static or differential pressure in central fan installations. May be used with calibrated gage for continuous pressure indication. Direct or reverse acting. Control Range: 0 to 7 in. water column (0 to 1.74 kPa) (positive, negative or differential). Maximum Safe Air Pressure: 25 psi (172 kPa). Safe Static Pressure: 25 in. water column (6.96 kPa). Air Consumption: 0.019 SCFM (538 SCCM). Ambient Temperature Limit: 40 to 125 F (4 to 52 C).

## RP470A & B PNEUMATIC RELAYS



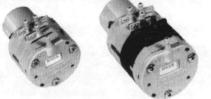
Designed for use in HVAC systems to either transmit the higher of two input signals or shut off one pressure signal when a second signal is higher. In-line mounted or panel mounted with clip. B model is lockout relay used on summer-winter applications keeping air-stream thermostat inoperative during cooling operation. Range: 0 to 18 psi (0 to 124 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Operating Limits: 32 to 125 F (0 to 52 C), 5 to 95 percent rh. Air Handling Capacity: 0.039 SCFM (1104 SCCM) at 1 psi (7 kPa) differential.

**RP471A PNEUMATIC SNAP** ACTING RELAY



Four-port, snap-acting diverting pneumatic relay (spdt plus pilot) designed for use in HVAC systems to transform a gradual air pressure change from a controller to a positive (two-position) pressure change at a pneumatic valve or damper. Pilot pressure is modulated. Designed for surface or panel mounting with clip, or may be in-line mounted. Setpoint adjustable, 3 to 15 psi (21 to 103 kPa). Differential: 1 psi (7 kPa), factory set, nonadjustable. Maximum Safe Air Pressure: 30 psi (207 kPa). Range: 3 to 15 psi (21 to 103 kPa) on scale. Ambient Operating Limits: 0 to 140 F (1 to 60 C), 5 to 95 percent rh.

## RP670A & B PNEUMATIC SWITCHING RELAYS





Two-position pneumatic relays with either spdt or dpdt switching action for use in pneumatic heating and cooling control systems where a valve or damper operator must be switched from one circuit to another. Switchover pilot pressure must be twoposition, not modulated. Designed for in-line mounting but may be wall or panel mounted with clip. Pilot Range: 3 to 7, 13 to 18, or 19 to 21 psi (21 to 48, 90 to 124 or 131 to 145 kPa). Operating Air Pressures: 0 to 21 psi (0 to 145 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Ambient Operating Limits: 20 to 140 F (-7 to 60 C), 5 to 95 percent rh. Second switch on dpdt B models molded in black for identification. A models are spdt.



RP908A & B PNEUMATIC CONTROLLERS







Used with remote sensors to provide proportional control of air conditioning systems. CPA models use an additional compensating signal to change setpoint of controller. Depending on sensor, controllersensor combination may be used for controlling temperature, humidity, pressure or dewpoint. Corrosion resistant construction for high humidity or salt air atmosphere installation.

#### Models:

Single-input with remote CPA.	or	without
Dual-input with remote CPA.	or	without

Supply Air Pressure: 18 psi (124 kPa) nominal. Maximum Safe Pressure 25 psi (172 kPa). Ambient Temperature Limits: 40 to 120 F (4 to 49 C).



A diaphragm logic pressure selector used in pneumatic control applications to select the highest and/or lowest branch pressure input from zone thermostats. It will select the highest pressure demand (cooling) and/or lowest pressure demand (heating) to operate final control elements. Two analyzers can be connected together to increase inputs to twelve. Operating Temperature Range: 40 to 140 F (4 to 60 C). Air Consumption: .04 SCFM (1133 SCCM). Supply Air Pressure: 18 psi (124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa).

# RP914C PNEUMATIC



Works in conjunction with remote sensors to provide proportional-integral (PI) control of air conditioning systems. The RP914C is a force balance controller with non-bleed amplifier, modular diaphragm capsules used for sensor input and remote control point adjustment. Model with or without CPA. Output: 3 to 13 psi (21 to 90 kPa) over fieldadjustable proportional band, for direct or reverse action. Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Temperature Limits: 40 to 120 F (4 to 49 C). Reset Time: Field adjustable from 0.1 to 20 minutes.

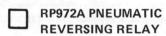
## B RP970A CAPACITY AND LOWER OF TWO PRESSURES RELAY



Direct acting, proportional relay suitable for use in HVAC systems to increase the capacity of the branch line signal to a pneumatic valve or damper operator. It can also be used as a lower of two pressures relay, selecting and transmitting (without increasing capacity) the lower of two input signals. Operating Range: 0 to 18 psi (0 to 124 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Operating Limits: 0 to 140 F (-18 to 60 C), 5 to 95 percent rh. Operating Air Pressures: Pilot - 0 to 15 psi (0 to 103 kPa); Main - 18 psi (124 kPa). Air Handling Capacity: 0.039 SCFM (1104 SCCM) at 1 psi (7 kPa) differential.

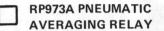
RP971A PNEUMATIC RATIO

Four-port nonbleed direct acting pneumatic relay which produces a modulating pressure output proportional to pilot pressure changes. It is used for controlling pneumatic valve or damper motors in sequence from a single thermostat. Pilot Pressure Ranges: 3 to 5 psi (21 or 34 kPa), nonadjustable. Start Point Adjustment: 0 to 10 psi (0 to 69 kPa). Maximum Safe Air Pressures: 30 psi (207 kPa). Normal Operating Pressures: Main -18 psi (124 kPa); Pilot - 3 to 15 psi (21 to 107 kPa). Air Handling Capacity: 0.039 SCFM (1104 SCCM) at 1 psi (7 kPa) differential. Ambient Operating Limits: 0 to 140 F (-18 to 60 C), 5 to 95 percent rh.





Modulating relay suitable for all types of heating and air conditioning control systems. It is used as a reversing relay to reverse and increase the capacity of the branch line pressure to the final control element. Factory set at 16 psi (110 kPa) but can be field set for 13 to 18 psi (90 to 124 kPa). Operating Range: 0 to 13 psi (0 to 124 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Operating Pressures: Pilot - 3 to 15 psi (21 to 103 kPa); Main - 18 psi (124 kPa). Ambient Temperature Limits: 0 to 140 (-18 to 60 C). Air Handling Capacity: 0.039 SCFM (1104 SCCM) at 1 psi (7 kPa) differential. Air Consumption: 0.0017 SCFM (48 SCCM).





Direct-acting, three-port pneumatic relay suitable for use in control systems where the average of two input pressures is required to operate a valve or damper motor, or as a controller input. Operating Air Pressure: 3 to 15 psi (21 to 103 kPa) input and output. Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Operating Limits: 32 to 125 F (0 to 52 C), 5 to 95 percent rh. Air Consumption: .005 SCFM (142 SCCM) maximum.





Special three-port pneumatic hesitation relay designed to control an MP904 or MP909 damper operator on outside air dampers in large volume unit ventilator applications. Manually adjustable minimum position. Output: Factory calibrated for 7 to 12 psi (48 to 83 kPa), manually adjustable: may be recalibrated for any 5 psi (34 kPa) span in the 0 to 18 psi (0 to 124 kPa) range. Normal Operating Pressures: Main - 18 psi (124 kPa); Branch Output - 0 to 18 psi (0 to 124 kPa); Pilot Input - 0 to 18 psi (0 to 124 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Air Consumption: 0.022 SCFM (51 SCCM) maximum. Ambient Operating Limits: 32 to 125 F (0 to 52 C), 5 to 95 percent rh.



RP7509A & B ELECTRONIC-PNEUMATIC TEMPERATURE CONTROLLERS



Combine electronic temperature sensing and pneumatic actuation of valves and dampers in temperature control systems. Designed for use with Balco type sensors with nominal resistance of 500 ohms at 74 F (23 C). Pneumatic output varies with temperature changes at sensor. Available with Celsius or Fahrenheit scales. Direct or reverse acting. Integral insertion sensor supplied with RP7509B models. Supply Voltage: Fahrenheit scale, 120V ac, 60 Hz, 0.05A; Celsius scale, 24V ac, 50 Hz, 0.25A. Output: 3 to 13 psi (21 to 90 kPa). Ambient Operating Limits: 32 to 140 F (0 to 60 C), 5 to 95 percent rh. Proportional Band: 2 to 36 F (1 to 22 C). Compensation Ratio: 0.25 to 20.

S659A-E TIMERS



Provides automatic electrical switch programming of occupancy operation in control systems. Models with 7-day or 24-hour programming are available. Models available with spring carry-over. Available with or without cover. Electrical rating (per pole): full load, 16 amp @ 120v AC, 8 amp @ 208/ 240v. Locked rotor, 96 amp @ 120v and 48 amp @ 208/240v. Resistor, 40 amp; Pilot duty, 690VA.

Models:

S659A	7-day program. Switch action: Four pole; two pole-NO, two- pole-NC
S659B	Same as A model except with spring carry-over.
S659C	24-hour program. Switch ac- tion: SPDT
S659D	Same as C model except with skip-a-day feature.
S659E	Same as D model except with spring carry-over.

SP470A & B PNEUMATIC SWITCH



Two- or three-position, four-pipe switches used in pneumatic control systems for manually diverting air between system components such as valves, thermostats or damper motors.

#### Models:

SP470A	Switch only.
SP470B	Switch on panel.

Normal Operating Pressure Range: 0 to 18 psi (0 to 124 kPa). Maximum Operating Pressure: 30 psi (207 kPa). Operating Ambient Limits: 0 to 140 F (-18 to 60 C), 5 to 95 percent rh. Air Capacity: .005 SCFM (142 SCCM) at 1 psi (7 kPa) differential.

## SP955A ELECTRIC-HEAT STEP CONTROLLER



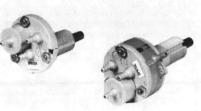
Used in pneumatic control systems to control electric-heating elements, the fan motor, and mixed air dampers in unit ventilators on ASHRAE Cycle 1, 2, or 3 operational sequences. Fail-safe feature provides opening of all heating element switches and the fan switch in event of air pressure failure. Power Consumption (E-P Relay): 10 watts each (20 watts total per controller). Air Pressure Range: 0 to 18 psi (0 to 124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Ambient Temperature: 125 F (52 C). UL Listed.

Switch	Rating
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Load Type	120V	208/240 or 277V	480V
Resistive	21A	21A	21A
Inductive	8A	5.1A	
Locked Rotor	48A	30.6A	

SP970A-D MANUAL & MINIMUM POSITION

## PRESSURE REGULATOR



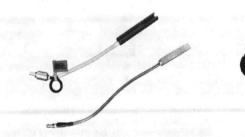
Designed for use in HVAC control systems where it is desirable to manually regulate pressure to an output device such as a pneumatic damper operator. Port 4 may be piped to an input device to provide external override of the manual setting.

## Models:

SP970A	Three-port manual or mini- mum for panel mounting, with pilot bleed and 5 or 10 psi (34 or 69 kPa) spans avail- able (convertible to 8 or 16 psi (55 or 110 kPa) spans).
SP970B	Same as SP970A but with wall mounting bracket.
SP970C	Four-port with isolated pilot chamber for use with bleed type pilot devices. 5 or 10 psi (34 or 69 kPa) span.
SP970D	Same as SP970C but with wall mounting bracket.

Operating Pressures: Main - 18 psi (124 kPa); Branch Output - 3 to 15 psi (21 to 103 kPa); Pilot Input - 3 to 15 psi (21 to 103 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Air Consumption: .022 SCFM (623 SCCM).





Direct-acting, proportional type sensors used with RP908 Controller to control pneumatic valves and damper operators. May be used with calibrated gage for continuous temperature indication. Sensing Range: Nonadjustable, 50 to 100 F (10 to 38 C). When used with the SSP129A DewProbe, senses 103 to 153 F (40 to 68 C) cavity temperature range. Dewpoint temperature range is 40 to 75 F (4 to 24 C).



## TP938A, B SUBMASTER ROOM THERMOSTAT



For proportional control of pneumatic valves and damper operators in heating and air conditioning systems, particularly applicable to control systems designed to conserve heating and cooling energy. Integral setpoint adjustment,

## Models:

Direct acting (BLP increases on temperature rise).
Reverse acting (BLP decreases on temperature rise).

Setpoint Range: 60 to 85 F (16 to 30 C). Throttling Range: 2 to 10 F (1 to 6 C). Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Safe Temperature: 150 F (66 C). Submaster Set Up Range: Fixed at 9 F (5 C), when line pressure increases from 3 to 13 psi (21 to 90 kPa).



## TP940A, B PNEUMATIC SUBMASTER UNIT THERMOSTAT



Provide proportional control of pneumatic valve and damper actuators in heating and air conditioning systems, primarily induction units, fan coil units, and unit ventilators, for individual room temperature control. Control point can be automatically changed at the command of a master controller. Liquid-filled bulb thermal element.



Models:	
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TP940A	Direct acting (BLP increases on temperature rise).
TP940B	Reverse acting (BLP decreases on temperature rise).

Setpoint Range: 60 to 80 F (16 to 27 C). Normal Mainline Pressure: 20 psi (138 kPa). Throttling Range: 5.5 F (3 C) fixed. Submaster Set Up Range: Fixed at 9 F (5 C), when Submaster line pressure increases from 3 to 13 psi (21 to 90 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Maximum Safe Temperature: 150 F (66 C).

## TP970 SERIES ASPIRATING WALL BOX



Used for pneumatic thermostat mounting where complete thermostat protection is needed or where a smooth wall appearance is desired. Supply Air Pressure: 18 psi (124 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa). Air Consumption: 0.024 SCFM at 18 psi (680 SCCM at 124 kPa). Larger cover (Part No. AK3970) available (3-1/2 x 5-1/2 in. [89 x 140 mm]).

## TP970 SERIES



These thermostats include single temperature, dual temperature, heating-cooling, and room temperature sensors to meet every need in wall mounted thermostats and all have integral thermometers. A variety of covers and finishes is available. Maximum Safe Air Pressure: 25 psi (172 kPa). Branch Line Indication: Self-sealing gauge tap accessible from front under stat's cover (except TP973). Maximum Safe Temperature: 150 F (66 C). See HP970 listing for Duct Sampling Chamber.

Model	Sensor Action	Sensing Range	Throttling Range
TP970A	D.A.	40-70 F 60-75 F 60-90 F 15-30 C	
TP970B	R.A.	60-90 F 75-90 F 15-30 C	
TP971A	D.A.	Day: 60-90 F 15-30 C Nite: 50-75 F 10-24 C	2-10 F (1-6 C)
TP971B	R.A.	10-24 0	
TP972A (Including Energy Conserva- tion Models -1036; -1051)	R.A. @ 9 or 13 psi (62 or 90 kPa) D.A. @ 18 psi (124 kPa)	60-90 F 15-30 C	
TP973A	D.A.		al generation
TP973B	R.A.		

## TP974A ROOM TEMPERA-TURE SENSOR



Proportioning type temperature sensor used with RP908 and HP973 Controllers for control of pneumatic valves and damper operators on one or two pipe installations. It features a bimetal element, plug-in air connections and a built in filter. With direct action, it has a fixed sensing range of 50 to 100 F (10 to 38 C). Maximum Safe Air Pressure: 25 psi (172 kPa). Supply Air Pressure (nominal): 18 psi (124 kPa). Pressure Output: 3 to 15 psi (21 to 103 kPa). Maximum Safe Temperature: 150 F (66 C).

## TP975A & B DIFFUSER THERMOSTAT



Used for proportional control of pneumatic valves and mixing boxes in heating or air conditioning systems. Use this stat for onepipe installation. Mounting is in one end of a slot or light troffer diffuser, or in return air grilles. A model is direct acting, B model reverse acting. Setpoint Range: 67 to 83 F (20 to 28 C). Normal Main Line Pressure: 18 psi (124 kPa). Throttling Range: Adjustable 2 to 10 F (1 to 6 C) marks on sliding indicator. Maximum Safe Air Pressure: 150 F (66 C). Air Consumption: .011 SCFM (311 SCCM).

V5011A-E SINGLE SEATED VALVES



Used for proportional control of steam, liquids, air, or other noncombustible gases in HVAC systems requiring tight shut-off. Body is single-seated, two-way, straight through globe type. Models:

V5011A	D.A. Single seated, equal percentage plug, 1/2 to 3 in. (13 to 76 mm). Screwed 150 psi (1034 kPa) body, 2-1/2 to 6 in. (64 to 152 mm). Flanged 125 psi (862 kPa) body.
V5011B	R.A. Single seated, equal per- centage plug, 4 to 6 in. (102 to 152 mm). Flanged 125 psi (862 kPa) body.
V5011C	D.A. Single seated, linear flow plug, 1/2 to 3 in. (13 to 76 mm). Screwed 150 psi (1034 kPa) body.
V5011D	D.A. Single seated, equal per- centage plug, 2-1/2 to 6 in. (64 to 152 mm). Flanged 250 psi (1724 kPa) body.
V5011E	R.A. Single seated, equal per- centage plug, 4 to 6 in. (102 to 152 mm). Flanged 250 psi (1724 kPa) body.

Available in bronze bodies with screwed NPT end connections or cast iron bodies with flanged end connections. Operators are MP953 series. Operating Temperature: -20 to 250 F (-29 to 121 C).

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## V5013A-E THREE-WAY MIXING & DIVERTING VALVES

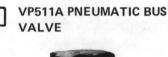
#### Models:

V5013A	Three-way valve for mixing service, D.A. to bottom inlet, 1/2 to 2 in. (13 to 51 mm) screwed 150 psi (1034 kPa) body.
V5013B	Three-way valve for mixing service, D.A. to bottom inlet, 2-1/2 to 8 in. (64 to 204 mm) flanged 125 psi (862 kPa) body.
V5013C	Three-way valve for diverting service, R.A. to bottom outlet, 2-1/2 to 8 in. (64 to 204 mm) flanged 125 psi (862 kPa) body.
V5013D	Three-way valve for mixing service, D.A. to bottom inlet, 2-1/2 to 8 in. (64 to 204 mm) flanged 250 psi (1724 kPa) body.
V5013E	Three-way valve for diverting service, R.A. to bottom outlet, 2-1/2 to 8 in. (64 to 204 mm) flanged 250 psi (1724 kPa) body.

Bronze body with screwed end connections or cast iron body with flanged end connections. Operators are MP953 Series. Operating Temperature: -20 to 250 F (-29 to 121 C).



Provides proportional or two-position control of hot or cold water in heating or cooling systems. Can be used for mixing service (V5013A, B & D) to direct flow from one of two inlets to a common outlet or for diverting service (V5013C & E) to direct flow from a common inlet to one of two outlets. Direct or reverse acting.





Single seated, normally-open, straightthrough pneumatic valve provides modulating control of flow from a bus engine cooling circulation system to the heating coil of the air handling system. Alternate model available with spdt MICRO SWITCH to simultaneously activate the coolant circulation pump and space heater blower when valve opens. Cast brass body with oval flanged end connections, 1-1/4 NPT. Rolling type neoprene diaphragm actuator. Body Pressure Rating: 150 psi (1034 kPa). Close-Off Rating: 12.5 psi (86 kPa) with 3 to 8 psi (21 to 55 kPa) spring range or 16.5 psi (114 kPa) with 3 to 12 psi (21 to 83 kPa) spring range. Maximum Control Air Pressure: 25 psi (172 kPa). Maximum Safe Diaphragm Temperature: 160 F (71 C).



Normally-open, single seated, straightthrough or angle globe valve for proportional control of either steam or hot water in unit ventilators. Bronze body in 1/2 to 1-1/4 NPT sizes. Nominal Body Rating: 150 psi (1034 kPa). Molded neoprene diaphragm operator. Control Air Pressure: 25 psi (172 kPa). Operating Range: 3 to 8 or 6 to 11 psi (21 to 55 or 41 to 76 kPa), factory set, with Cv Ratings from .63 to 16. Ambient Temperature Limit: 160 F (71 C).

## VP513A SINGLE-SEATED WATER VALVE



Pneumatically-operated, high-pressure, single seated, normally open valve for proportional control of unit air conditioners using hot and/or cold water as the control agent. Small physical size with flare tube connections. Available in straight-through patterns for 5/8 or 7/8 in. (16 or 22 mm) OD copper tubing. Operator can be rotated 360 degrees on bonnet to align with air piping connections. Nominal Body Rating: 250 psi (1724 kPa), 250 F (121 C) maximum temperature. Maximum Pressure of Control Agent: 250 psi (1724 kPa). Operting Range: 3 to 7 or 3 to 10 psi (21 to 41 or 21 to 69 kPa). Maximum Pressure Differential for Close-Off with 13 psi (90 kPa) in Operator: Cv of 2.5 and 4.0, 79 psi (545 kPa). Maximum Safe Air Pressure: 25 psi (172 kPa).







A pneumatically operated, high-pressure, single seated, normally-closed, reverse-acting valve used for proportional control of unit air conditioners using hot and/or cold water as the control agent. Small physical size. Offset straight-through body pattern for 5/8 in. (16 mm) OD copper tubing. 45 degree angle SAE flare connections. Operator can be rotated 360 degrees on bonnet to align with air-piping connections. Capacity Index (Cv): 1.0, 1.6, or 2.5. Maximum Pressure of Control Agent: 250 psi (1724 kPa). Maximum Temperature of Control Agent: 250 F (121 C). Operating Range: 9 to 13 psi (62 to 90 kPa), nonadjustable, molded neoprene, rolling type diaphragm with 11 in.<sup>2</sup> (71 cm<sup>2</sup>) affective area. Maximum Safe Air Pressure: 25 psi (124 kPa). Maximum Safe Diaphragm Temperature: 160 F (71 C).



## VP517A THREE-WAY MIXING VALVE



A pneumatically operated, three-way, highpressure water valve for proportional control of unit air conditioners and fan coil units, using hot and/or cold water. Forged brass body in small physical size with 7/8 in. (22 mm) OD copper tubing. Flare connections. Operator can be rotated 360 degrees on valve bonnet to align with air piping. Nominal Body Rating: 250 psi (1724 kPa). Capacity Index (Cv): 4.0, 6.3, and 3.0. Control Medium Temperature: 35 to 250 F (1 to 121 C). Molded neoprene, rolling type diaphragm. Operating Range: 3 to 10 or 8 to 12 psi (21 to 69 or 55 to 83 kPa). Close-Off Rating: 50 psi (345 kPa) between maximum inlet and minimum downstream pressure with 2.0 psi (14 kPa) or more air pressure in operator. Maximum Safe Air Pressure: 25 psi (124 kPa). Maximum Safe Diaphragm Temperature: 160 F (71 C).



## VP519C TWO-POSITION, THREE-WAY AIR VALVE



Two-position, three-way, normally open to bottom inlet air valve operates as an air switch in large Day-Nite or Summer-Winter switchover systems. Operator may be rotated on bonnet to permit alignment of air connection with air piping or relay piping. Rightangle mounting bracket permits mounting on wall or panel. Bronze body in 1/2 or 3/4 NPT. Nominal Body Rating: 150 psi (1034 kPa). Molded neoprene diaphragm operator. Maximum Safe Air Pressure: 25 psi (124 kPa). Maximum Ambient Temperature: 160 F (71 C). Operating Range: 6 to 9 psi (41 to 62 kPa), nonadjustable. Close-Off Ratings: 0 to 120 psi (0 to 827 kPa) at various air pressures.



## VP522A & B SEQUENCING WATER VALVE

Three-pipe, sequencing, pneumatically operated water valve. The VP522A is proportioning-sequencing, used to control the flow of both hot and cold water to fancoil induction units. The VP522B is divertingsequencing, return-water, used in conjunction



with the VP522A on four-pipe systems. Nominal Valve Size: 1/2, 5/8, and 7/8 in. (13, 16, and 22 mm) OD copper tubing. Brass flared connection. Nominal Body Rating: 250 psi (1724 kPa). Close-Off Rating: 45 or 50 psi (310 or 345 kPa). "B" models maintain closure against 15 psi (103 kPa) difference in return line pressure when used with the VP522A. Control Medium Temperature: 35 to 250 F (1 to 121 C). Maximum Safe Air Pressure: 25 psi (124 kPa).

# VP525A PNEUMATICRADIATOR VALVE



Normally-open, single seated, straightthrough and angle pneumatic valve provides two-position or proportional control of twopipe hot water or steam systems. Small size permits installation where space is limited. 1/2 and 3/4 in. (13 and 19 mm) cast bronze bodies with screwed and union ends. Body Pressure Rating: 150 psi (1034 kPa) maximum, Controlled Medium Limits: Temperature 240 F (116 C), Pressure: 150 psi (1034 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Maximum Diaphragm Temperature: 230 F (110 C). Spring Ranges: 2 to 5, 3 to 10 and 8 to 11 psi (14 to 34, 21 to 69 and 55 to 76 kPa). CV available: 1.6, 3.0 and 2.5 or 5.

VP526A PNEUMATIC THREE-WAY HIGH PRESSURE WATER VALVE



Used for high-pressure proportional control of unit air conditioning and fan coil units using hot and/or cold water. Small size permits installation where space is limited.

Pipe connections are for 45 degree SAE flared fittings. Action: Three-way with lower port B normally-open to port AB. Nonadjustable Range: Full Range, 3 to 10 psi (21 to 69 kPa); Sequencing Range, 2 to 5 or 8 to 11 psi (14 to 34 or 55 to 76 kPa). Valve Sizes: 3/8 in. (10 mm) (1/2 in. [13 mm] OD tube) and 1/2 in. (13 mm) (5/8 in. [16 mm] OD tube). Nominal Body Pressure Rating: 250 psi (1724 kPa). Controlled Medium Temperature: 35 to 250 F (1 to 121 C). Maximum Safe Air Pressure: 30 psi (207 kPa). Maximum Diaphragm Temperature: 239 F (110 C). Capacity Index: 3/8 in. (10 mm) valve, 1.0 or 1.6 Cv; 1/2 in (13 mm) valve, 1.6 or 2.5 Cv.

## VP527A PNEUMATIC WATER VALVE



This normally open, single seated, high pressure valve provides proportional control of hot and/or cold water in unit air conditioners and fan coil units. Small size permits installation where space is limited. Forged brass body with end connections threaded for 45 degree SAE flare fitting nuts. Body Size: 3/8 in. (10 mm) nominal on 1/2 in. (13 mm) OD tubing. Body Pressure Rating: 250 psi (1724 kPa). Controlled Medium Temperature: 35 to 250 F (1 to 121 C). Operating Range: 2 to 5 or 3 to 10 psi (14 to 34 or 21 to 69 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Capacity Index: .4, .63, 1.0 or 1.6 Cv.



This single seated, normally-open, straightthrough pneumatic valve provides direct acting proportional control of hot or cold water in terminal units. It is available with screwed NPT or soldered end connections. Rolling diaphragm actuator with integral air connection for 1/4 in. (6 mm) OD plastic tubing. Bronze body, 1/2 or 3/4 in. NPT, 5/8 or 7/8 in. (16 or 22 mm) OD copper tubing. Body and Packing Pressure Limits: 150 psi (1034 kPa). Maximum Safe Air Pressure: 30 psi (207 kPa). Ambient Temperature Limits: 43 to 150 F (6 to 66 C). Diaphragm Temperature Limits: 230 F (110 C). Spring Range: 2 to 5 or 3 to 10 psi (14 to 34 or 21 to 69 kPa). Flow Capacity (Cv): 1/2 in. NPT, 1.6 or 2.3; 3/4 in. NPT or solder, 2.6 or 3.3; 1/2 in. solder, 1.6 only.



W655A-F DIAL THERMOMETERS



3-1/2 in. (89 mm) dial thermometers used for direct readings of temperatures in air ducts (A, C and E models) and liquids in storage tanks or pipes (B, D and F models). W655A through D have liquid filled bulb and Bourdon tube sensing elements. The case may be swiveled or tilted on its mount. E and F models have rigid, bimetal sensing elements. Accuracy: W655A-D,  $\pm 1$  percent at center 2/3 of scale; W655E and F,  $\pm 1$ -1/2 percent at center 2/3 of scale.

## Models:

W655A	Element: 10 ft (3 m) cap, 10 in. (254 mm) element. Range: 20 to 180 F (-7 to 82 C); -40 to 120 F (-40 to 49 C); -5 to 85 C (23 to 185 F); -40 to 50 C (-40 to 122 F).
W655B	2-1/4 x 1/2 in. (57 x 13 mm) bulb. Range: 30 to 250 F (-1 to 121 C); 0 to 120 C (32 to 248 F).
W655C	7-1/2 x 7/16 in. (191 x 11 mm) element. Range: 20 to 180 F (-70 to 82 C); -40 to 120 F (-40 to 49 C); -5 to 85 C (23 to 185 F); -40 to 50 C (-40 to 122 F).
W655D	10 ft (3 m) cap, 2-1/4 x 1/2 in. (57 x 13 mm) bulb. Range: Same as Model B.
W655E	9 in. (229 mm) bimetal. Range: -40 to 140 F (-40 to 60 C); 30 to 240 C (86 to 464 F).
W655F	4 in. (102 mm) bimetal. Range: -40 to 140 F (-40 to 60 C); 30 to 240 C (86 to 464 F).

WP51A & B OPTIMUM START PROGRAMMER



In central HVAC fan systems varies the heating plant start to achieve building warm up as a function of actual and design outdoor temperature and building construction. It is capable of weekend warm up cycle omission and late occupancy manual override and uses a standard pneumatic outdoor temperature sensor input. It features a choice of three delay cams which follow the mathematical time/temperature warm up relationship for different types of construction, an adjustable selection of minimum outdoor design temperatures from -20 to 30 F (-29 to -1 C) and an adjustable daily timing with weekend skip options. Heating plant ON-OFF status is indicated by lights at a glance. Power Requirements: 125V ac, 50 or 60 Hz. Time Clock: 3VA. Switch Ratings: 490VA per pole (two spst contacts). Storage Temperature: -20 to 150 F (-29 to 66 C). Operating Temperature: 50 to 120 F (10 to 49 C).



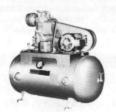
WP241 DUAL AIR

COMPRESSORS

Provides and maintains an air pressure source for pneumatic temperature control systems. Automatic alternation that equalizes wear for long life. Second pump acts as automatic standby to maintain system pressure should primary unit be shut down. The storage tank, which meets ASME standards, is available in various capacities. Maximum Ambient Temperature: 104 F (40 C). Pressure Range: Cut-In Pressure, 70 psi (483 kPa). Cut-Out Pressure, 90 psi (621 kPa).

Compressor Model	Motor HP (kW)	Output SCFM @ 80* PSI (1/s @ 552* kPa)	Voltage/Frequency/ Phase
WP241Y	1/3 (0.25)	1.1 (0.52)	115/230V, 60 Hz, 1
WP241B	1/2 (0.37)	1.9 (0.90)	208V. 60 Hz, 3;
WP241C	3/4 (0.56)	3.3 (1.56)	230V, 60 Hz, 3 or
WP241D	1 (0.75)	3.8 (1.79)	460V, 60 Hz, 3
WP241E	1-1/2 (1.12)	5.9 (2.78)	208, 60 Hz, 3;
WP241F	2 (1.49)	8.6 (4.06)	230V, 60 Hz, 3 or
WP241G	3 (2.24)	12.6 (5.95)	460V, 60 Hz, 3
WP241H	5 (3.73)	19.3 (9.11)	
WP241J	7-1/2 (5.60)	30.0 (14.16)	

## WP231 AIR COMPRESSORS



Used to provide and maintain an air pressure source for pneumatic temperature control systems. The storage tank meets ASME standards. If a remote tank is required, the compressor is attached to a mounting base. Maximum Operating Ambient: 104 F (40 C). Pressure Range: Cut-In Pressure, 1/3 to 5 hp (0.25 to 3.73 kW), 70 psi (483 kPa); 7-1/2 to 20 hp (5.6 to 14.92 kW), 60 psi (414 kPa). Cut-Out Pressure, 1/3 to 5 hp (0.25 to 3.73 kW), 90 psi (621 kPa); 7-1/2 to 20 hp (5.6 to 14.92 kW), 100 psi (689 kPa).

Compressor Model		fotor P (kW)	Output SCFM @ 80* PSI (1/s @ 552* kPa)	Voltage/Frequency/ Phase
WP231Y	1	/3 (0.25)	1.1 (0.52)	115/230V, 60 Hz, 1;
WP231B	1	/2 (0.37)	1.7 (0.80)	208V, 60 Hz, 3;
WP231C	3	/4 (0.56)	3.3 (1.56)	230V, 60 Hz, 3 or
WP231D	1	(0.75)	3.8 (1.79)	460V, 60 Hz, 3
WP231E	1-1	/2 (1.12)	5.9 (2.78)	208V, 60 Hz, 3;
WP231F	2	(1.49)	8.6 (4.06)	230V, 60 Hz, 3 or
WP231G	3	(2.24)	12.6 (5.95)	460V, 60 Hz, 3
WP231H	5	(3.73)	19.3 (9.11)	
WP231J	7-1	/2 (5.60)	36.6 (17.27)	CONTRACTOR OF THE
WP231 K	10	(7.46)	47.0 (22.18)	
WP231L	15	(11.19)	72.5 (34.21)	and a second second
WP231M	20	(14.92)	89.0 (42.00)	

\*100 percent operation of each pump.



WP260 OIL-LESS AIR COMPRESSORS



Used to provide and maintain an air pressure source for pneumatically operated temperature control equipment. Provided with 12 to 60 gallons (45 to 227 1) ASME rated storage tanks. Maximum Operating Ambient: 100 F (38 C). Compressor RPM: 1725. Pressure Range: Cut-In Pressure, 70 psi (483 kPa); Cut-Out Pressure, 90 psi (621 kPa).

Compressor Model	Motor HP (kW)	Output SCFM @ 90* PSI (l/s @ 621* kPa)	Voltage/Frequency/ Phase
WP260T	1/6 (0.12)	.55 (0.26)	120V, 60 Hz, 1
WP260A	1/4 (0.19)	.80 (0.38)	1. 19 B. (1. 19 B. (1. 19
WP260B	1/2 (0.37)	1.8 (0.85)	120V, 60 Hz, 1:
WP260C	3/4 (0.56)	2.6 (1.23)	208V, 60 Hz, 3;
WP260D	1 (0.75)	3.4 (1.97)	460V, 60 Hz, 3
WP260E	1-1/2 (1.12)	5.3 (2.50)	

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HKN COMPRESSED AIR REFRIGERATION DRYERS



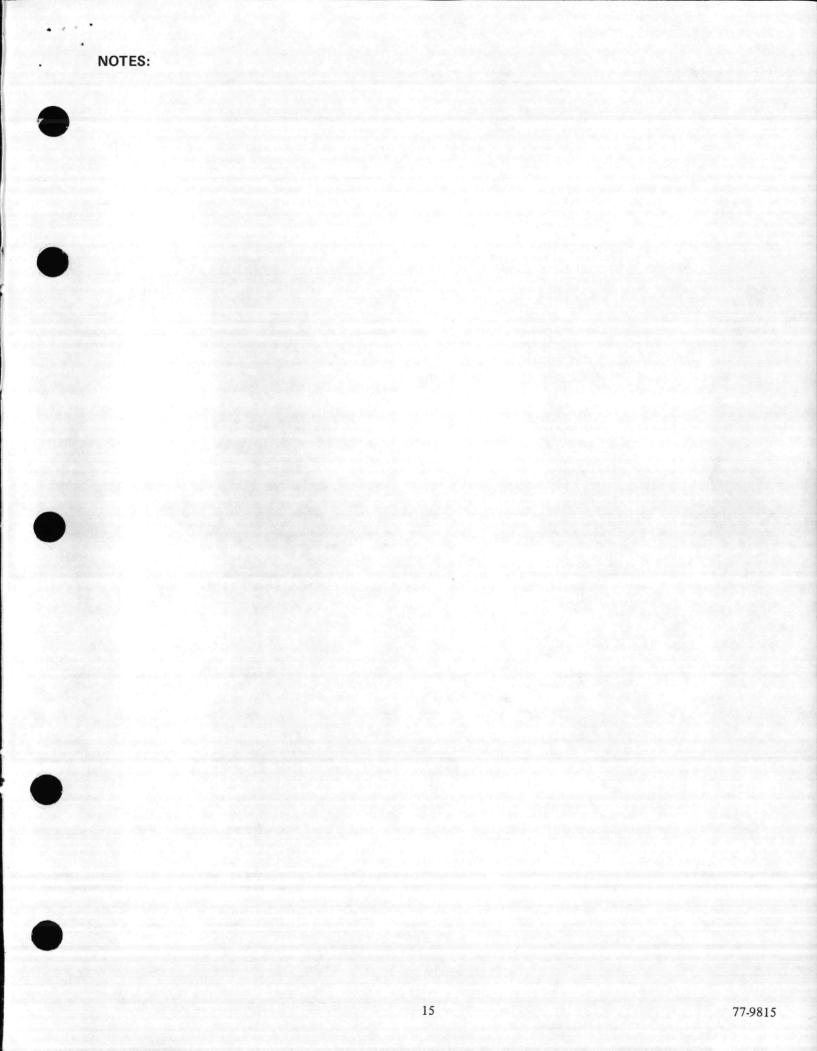
Condition air supply systems for pneumatic controls by cooling control air and condensing and removing oil, water vapor and other contaminants from the system. Designed to dehydrate to a 35 to 39 F (2 to 4 C) dew point at normal operating tank pressures.

M	od	els:	

HKN8010	A - 10 SCFM (4.72 1/s)	HKN802
	Standard Model. B - 10 SCFM with PP902A and prepiped bypass valve (PP902A Capacity- 3 SCFM [1.42 1/s]).	
	C - 10 SCFM with PP902B and prepiped bypass valve (PP902B Capacity- 3 SCFM [1.42 1/s]).	HKN8035
	D - 10 SCFM - High Altitude Model.	
	E - 10 SCFM - High Altitude Model - Same as "B".	HKN8055
	F - 10 SCFM - High Altitude Model - Same as "C".	Sec. Sec.
	<ul> <li>H - Same as "A" - with End Screen (for Los Angeles Code).</li> </ul>	
	<ul> <li>K - Same as "B" - with End Screen (for Los Angeles Code).</li> </ul>	HKN8070
	L - Same as "C" - with End Screen (for Los Angeles Code).	
HKN8015	A - 15 SCFM (7.08 l/s) Standard Model.	HKN 80100
	<ul> <li>D - High Altitude Model.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>	80100

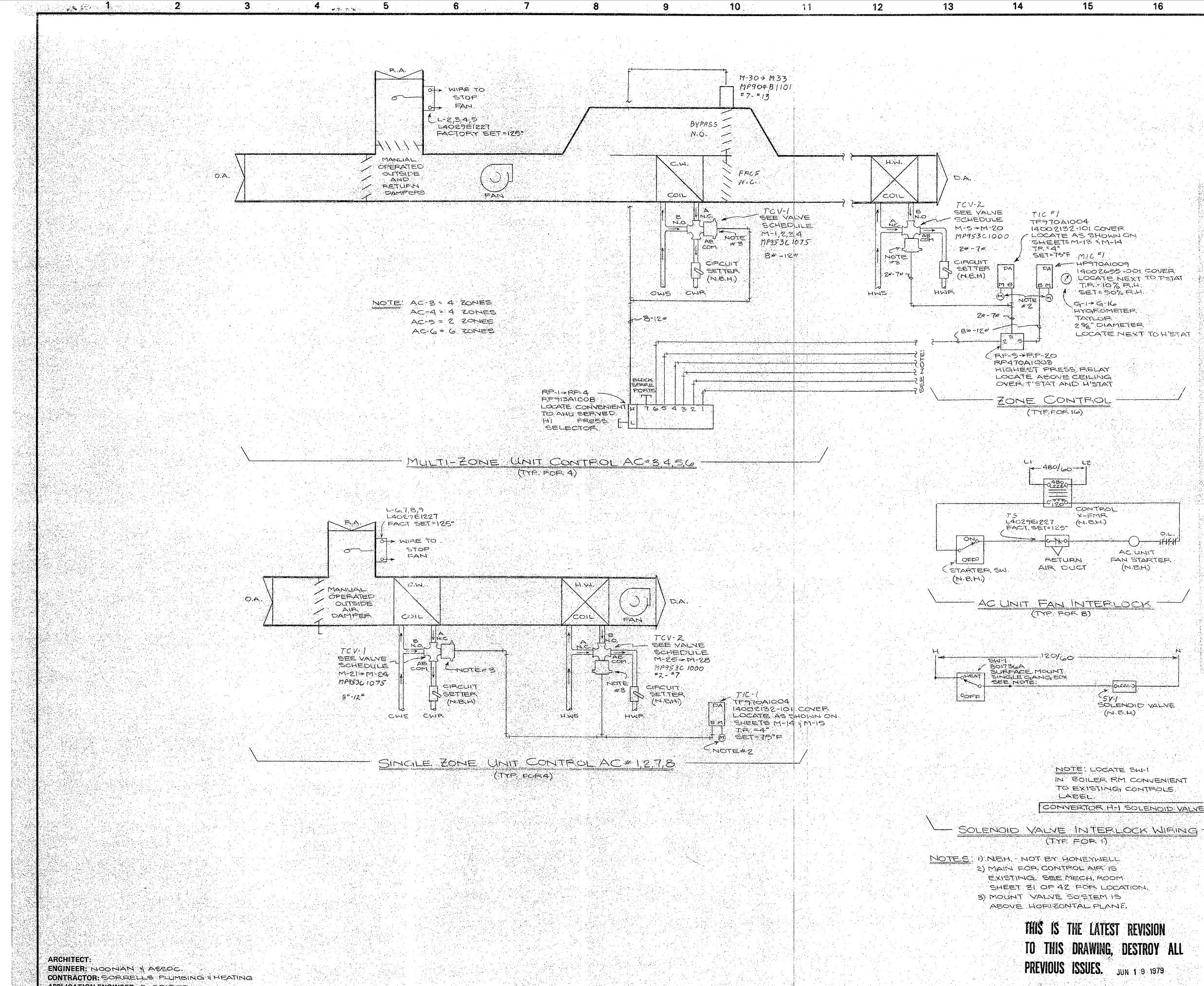
HKN8025	<ul> <li>A - 25 SCFM (11.80 l/s) Standard Model.</li> <li>D - High Altitude.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>
HKN8035	<ul> <li>A - 35 SCFM (16.52 l/s) Standard Model.</li> <li>D - High Altitude Model.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>
HKN8055	<ul> <li>A - 55 SCFM (25.95 l/s) Standard Model.</li> <li>D - High Altitude Model.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>
HKN8070	<ul> <li>A - 70 SCFM (33.03 1/s) Standard Model.</li> <li>D - High Altitude Model.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>
HKN 80100	<ul> <li>A - 100 SCFM (47.29 l/s) Standard Model.</li> <li>D - High Altitude Model.</li> <li>H - With End Screen (for Los Angeles Code).</li> </ul>





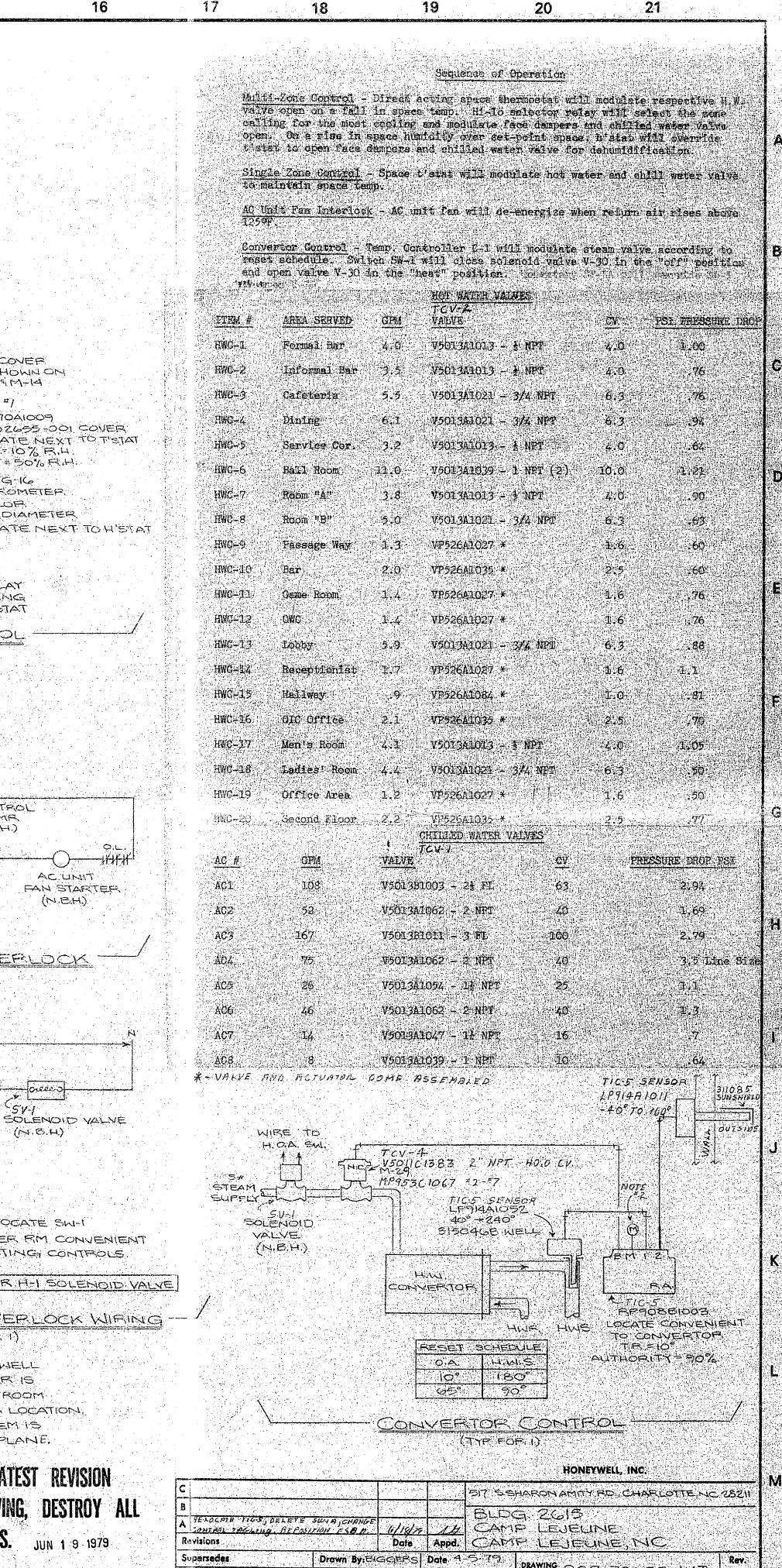
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ATLANTIC DIVISION



APPLICATION ENGINEER: S GEIGER

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Superseded By

Approved By:

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(N.E.H.)

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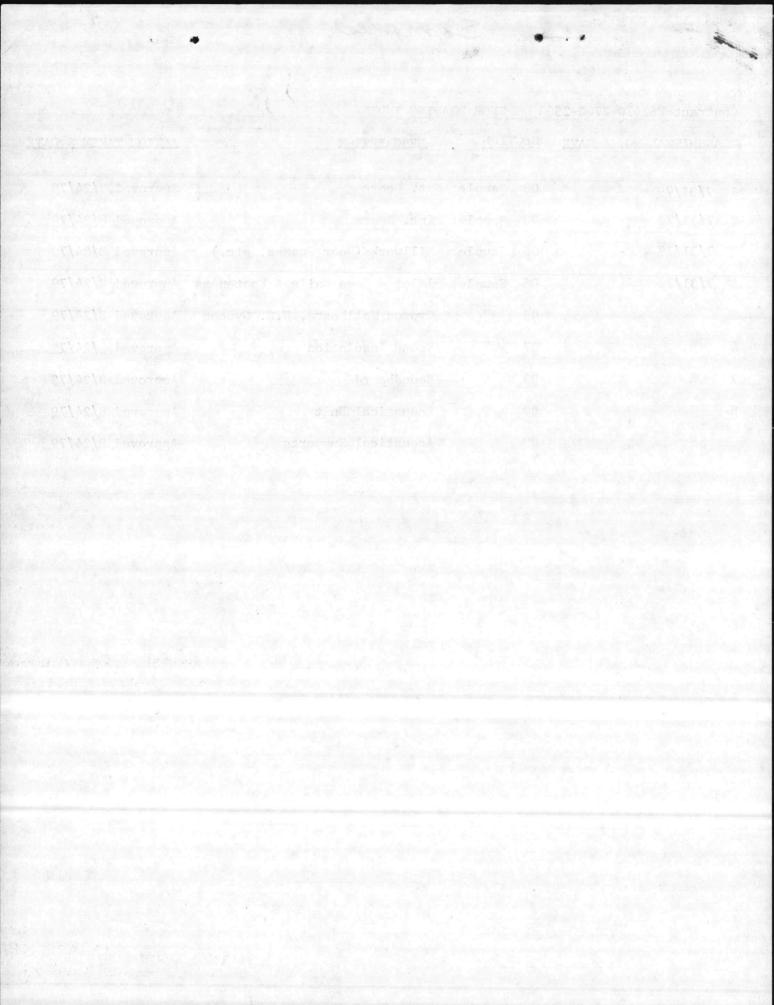
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2	7/31/79	08	Sample:	Int. Doors	Approved	8/24/79
3	7/31/79	06	Sample:	Millwork (Door Frames, etc.)	Approved	8/24/79
4	7/31/79	06	Sample:	1 lot - 5 ea Nails & Fasteners	Approved	8/24/79
5	П	09		Gypson Wallboard, U.S. Gypson	Approved	8/24/79
6	Π	07	"	Sound Insulation	Approved	8/24/79
7		09		Soundboard	Approved	8/24/79
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# Algoma Hardwoods, Inc.

# architectural doors

# 1001 Perry Street Algoma, Wisconsin 54201 (414) 487-5221

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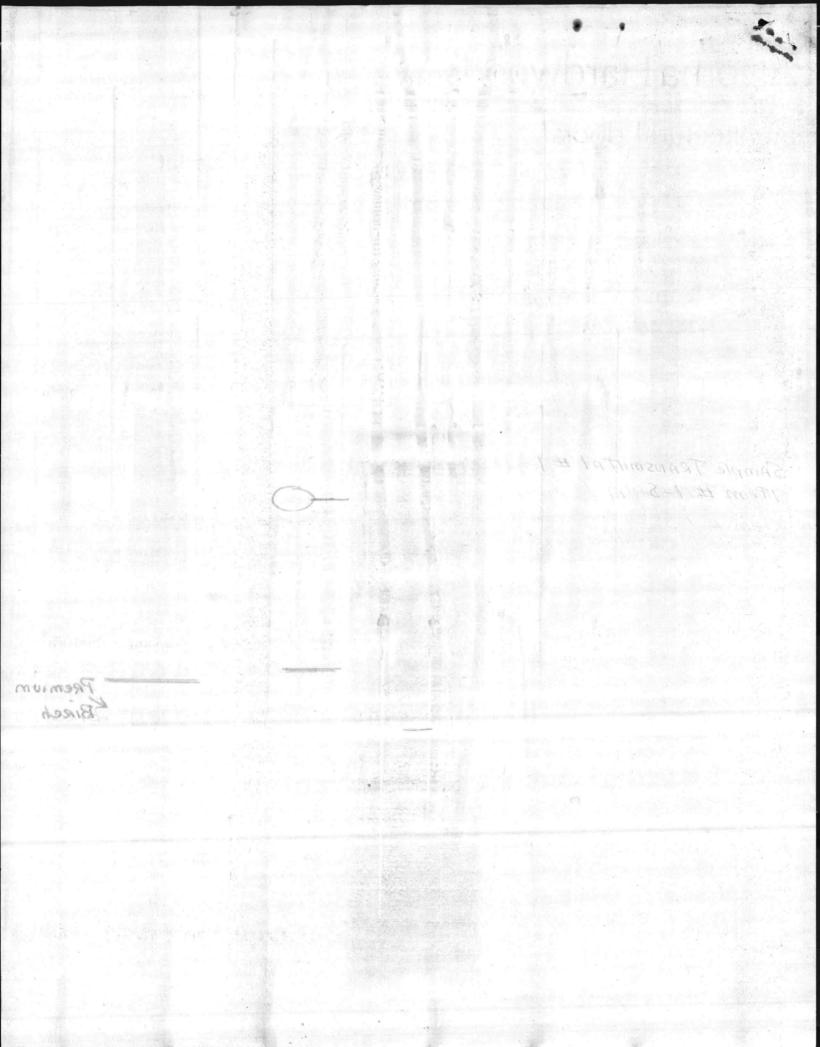
# Novodor

op/overall product, in place

The Novodor<sup>®</sup> is a decorative architectural door using a particleboard core with stiles and rails bonded to the core to insure strength and rigidity. Evenly sanded cores provide freedom from telegraphing and furnish as ideal base for both fine hardwood veneers and overlays for solid color finishes.

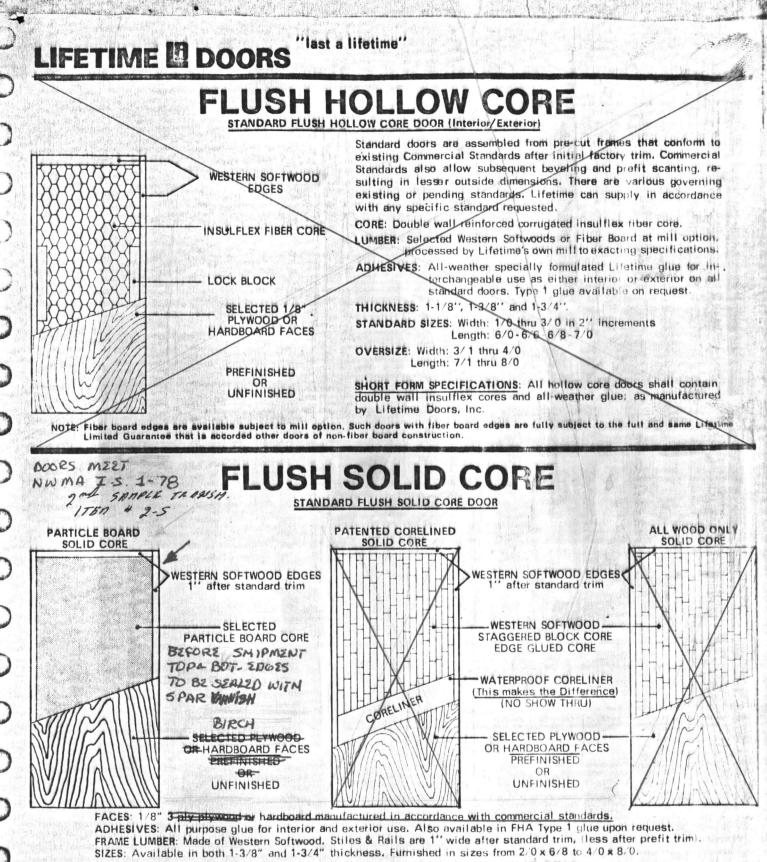
The Algoma<sup>™</sup> Grade Novodor<sup>®</sup> is most suitable for interior application in schools, hospitals, motels, office buildings & other structures. It can be used for sheltered exterior openings in any climate. See warranty.

#### specifications echnical support 13%" or 134" thickness Available prefit or stock size up to 4/0 x 10/0, in 20 size Min. or 30 Min. 4/0 x 9/0 is Max. 1¼" minimum 2 ply edge strips glued to core, outer ply (%") of species compatible to face veneer; inner ply mill option. No Fingerjoints. stiles (edge bands & strips) lock blocks 11/4" minimum 2 ply end strips glued to core-mill top & bottom option hardwood species. rails Conforms to commercial std. CS236-66 covering mat-formed particleboard and N.W.M.A. I.S. 1-78 core PREMIUM crossbands 1/16" thick minimum-hardwood. Birch All foreign & domestic species; rotary or sliced as faces available. Also plastic, medium & hi-density overlays. Veneer plys are hot press glued to core with exterior Type I melamine fortified Urea. glue Available in pairs or sets; also with matching veneer matching transoms Standard lites & louvers available not to exceed details 40% of door area or 50% of height. Specify flashings on exterior doors, 324 sq. in. Glass Lite is Max. on 30 Min. Doors. U.L. labeled 20 Min. Max. on 30 Min. Doors. U.L. Jabeled 20 Min. allows 100 sq. in vision panel. Warnock Hersey 20 Min. Jabeled allows 1200 sq. in. glass lite (30 x 40 Max.) and 24" x 24" fusible link lvr. U/L When requested, available with butt & lock machining as well as other specials, such as rabbets, machining holders, drop seals, pivots, etc. Contact mill. finishing Available with 4 coat clear or toned Univar® in standard shades. Architectural Woodwork Institute—Core, c; faces 1, 3, 4; LLL-D581D Type I; Industry Standard. I.S. 1-78. standards eet or exc



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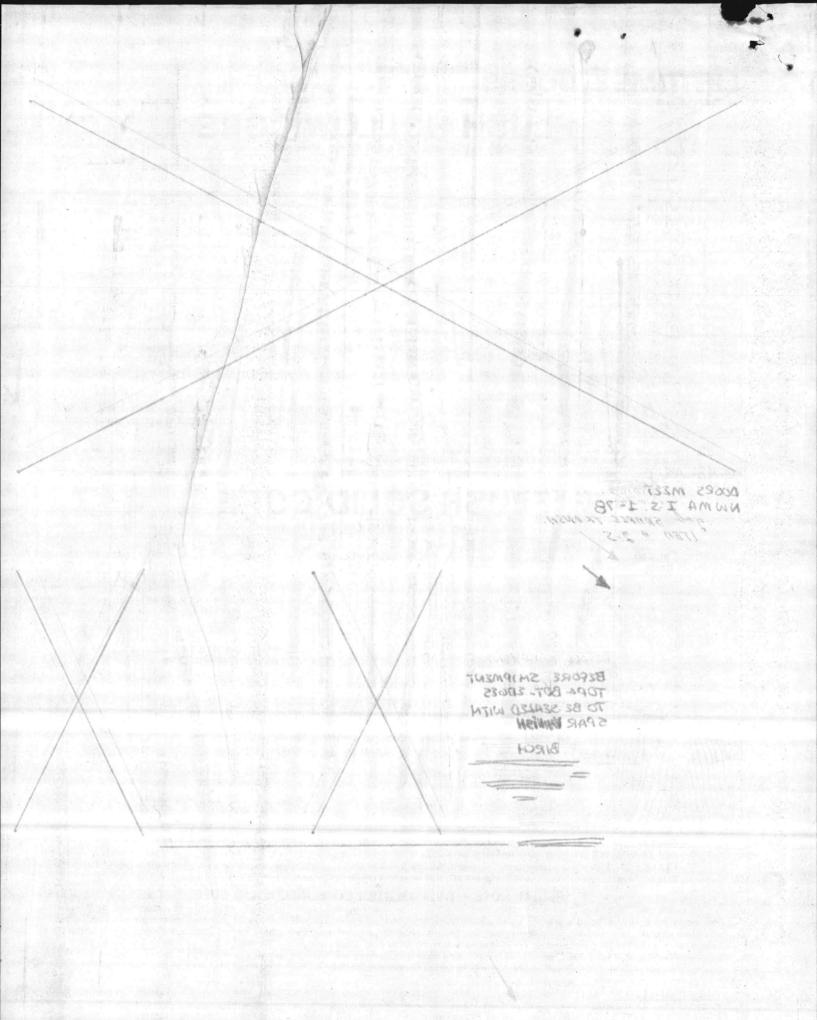
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## SPECIAL NOTE - THE PATENTED CORELINED SOLID CORE

A "no-show-thru" wood-block lumber-core door that is fully guaranteed & in conformance with Industry Commercial Standards. The wood core is surfaced on both sides under the faces with a patented water resistant composition lining which is highly sound-absorbent and prevents core-telegraphy. Exclusively developed and manufactured by Lifetime Doors, Inc. under U.S. Patent No. 31687663. Particularly recommended for institutional door use. The Core-lined door may <u>safely</u> be used on an <u>exterior</u> opening and will not "swell" from moisture absorption as does Particle board. GUARANTEED to be superior to particle board in every respect. Also has superior heat resistance and sound deadening specifications, in addition to meeting Class C Fire Door specifications as explained below.

FIRE PROOF TESTED: Tests conducted on a 1-3/4" thick door sample section of this patented "CORELINED" solid core door exceeded the 45 minute burn requirement for 1-3/4" C label fire proof doors. Substantiating details available on request. HEAT PROOF TESTED - U Factor .26: Thermal Proof Tested April 29, 1977 No. 439333. Certification available upon request. SOUND PROOF TESTED - 28 db: Sound Proof Tested at an independent Jaboratory. Certification available upon request.



LIFETIME DOORS

"last a lifetime"

Section IV Page 2

THE BEST MANUFACTURED DOOR STILL REQUIRES SKILLED INSTALLATION WORKMANSHIP AND PROPER CARE

# Guarantee imited

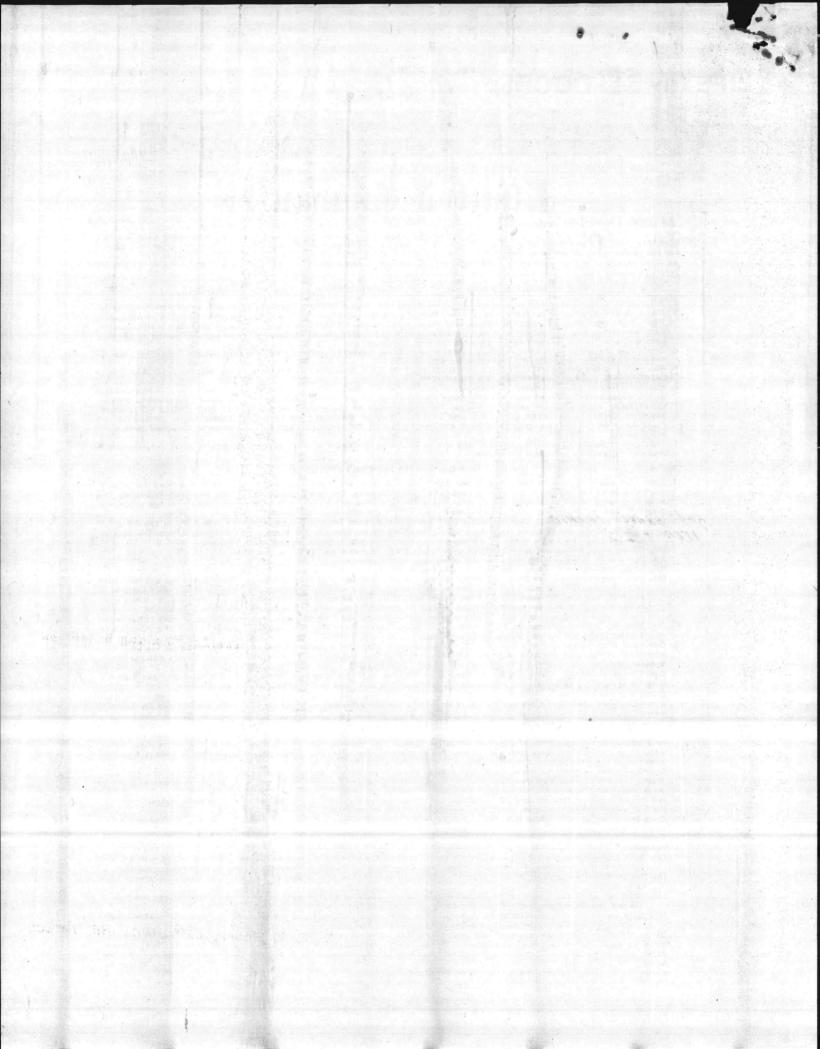
All standard doors, manufactured by Lifetime Doors, Inc. with components, of either finger-joint or non-finger-joint wood or fiber board or particle board, (excluding specific exceptions stated herein or otherwise expressly excluded) are guaranteed for one year from date of manufacture to be free of any defects which will make the door not fit or serviceable for the normal use for which a door is normally intended. Defectively manufactured doors will be replaced "in the like" as originally supplied or repaired or credited at the option of Lifetime Doors, Inc. This warranty is extended to the original retail purchaser only and not further transferable.

#### IS GUARANTEE IS SUBJECT TO THE FOLLOWING STIPULATIONS AND CONDITIONS:

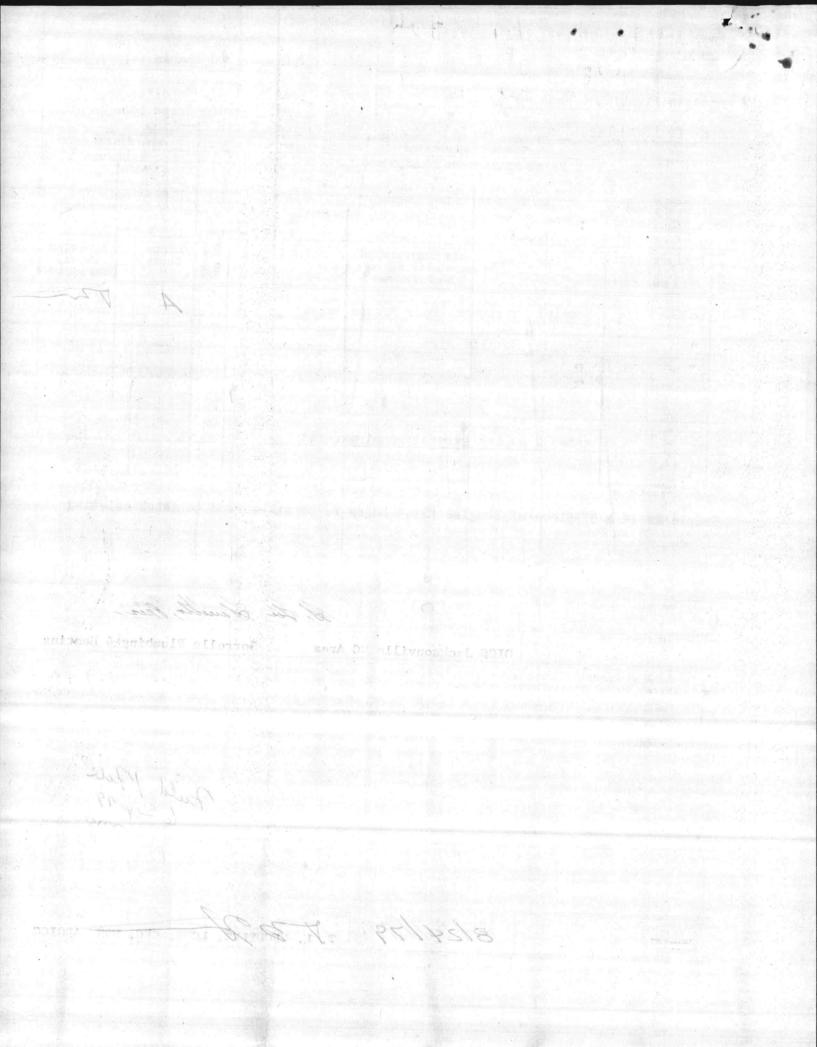
- All claims must be reported in writing within 30 days after first detecting any defects or this guarantee is not valid. b. Doors seldom need to be replaced due to warp. Temporary distortions will usually disappear when humidity is equalized. When doors have become warped after job-site installation in amount of unusual percentage at any one job-site location, detrimental job-site conditions may be suspected and doors shall remain installed for a seasoning period of one year before eligibility for replacement or credit is to be considered.
- c. Doors that are repaired or removed from job site without the express consent in writing, of Lifetime Doors, Inc. are not
- Subject to claims, replacements, refunds or credit. d. ALL DOORS ARE GUARANTEED ONLY AS OUTLINED IN THIS GUARANTEE AND ARE NOT SUBJECT TO ANY OTHER GUARANTEES OR WARRANTIES IMPLIED OR OTHERWISE.
- Boandateries on Wahran files Intritted on Officients.
   Notwithstanding anything herein contained, or any law of any State pertaining thereto, it is expressly understood that in the event of a breach of contract or warranty on the part of the seller, seller's liability shall be limited to the pur-chase price for the goods and/or the repair or replacement of the goods. IN NO EVENT AND UNDER NO CIRCUM-STANCES SHALL THE SELLER BE LIABLE FOR CONSEQUENTIAL DAMAGES OR FOR ANY DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE GOODS WHICH ARE THE SUBJECT OF THE CONTRACT, such price to be based upon a unit price basis
- This guarantee void, non-transferable, and not in effect in the event of any outstanding payments of unfulfilled contractual obligations by initial purchaser.

#### THIS GUARANTEE EXPRESSLY EXCLUDES:

- 1. Warp less than 1/4 inch in the plane of the door itself. Warp is any distortion in the door itself, and does not refer to the relation of the door to the frame or jamb in which it is hung. The term warp shall include bow, cup and twist. The amount of warp shall be determined by applying a straight edge or taut string from edge extremes over the suspected concave area. This guarantee further excludes any warp in the following instances.
  - (a). 1-3/4" or thicker doors that are wider than 3/8 or higher than 7/0 with warpage of less than 1/4" in any 3/6 x 7/0 section of the door. If one dimension of the door is smaller than the 3/6 width or the 7/0 height, then the section measured will be 3/6 in width by the height of the door is smaller than the 3/6 width or the 7/0 he (b), 1-3/8" thick and under doors that are wider than 3/0 or birther than the 3/6 width of door.
- (b). 1-3/8" thick and under doors that are wider than 3/0 or higher than 7/0. (c). Doors with faces of different species, other than bifold panels.
- Doors that are improperly hung or do not swing freely. (d).
- (e). Warp tolerances will not apply in the following instances: When solid and hollow core flush doors are cut for lights and louvers, that portion, between the cut-out area and the edge of the door shall not be less than 5 inches. In addition, the area between cut-outs for lights or louvers and adjacent cut-out shall not be less than 5 inches wide at any point. The cut-out areas shall not exceed 40 percent of the area of the face of the door. In addition, cut-outs shall not exceed half the height of the door. All cut-outs shall be suitably prepared. On solid core composition boards, fastenings used to fix mouldings in openings in doors with composition core shall be of a number and size to provide adequate mechanical strength.
- 2. Openings that are structurally unsound. Flush doors may be cut for light openings as ordered, however the utility or structural strength of the door must not be impaired in cutting the door for the lights, louvers, panels and any other special details.
- 3. Doors hung with less than 3 hinges in sizes over 6/8 and up to 7/0 long or with less than 4 hinges in sizes over 7/0 long. Doors should be hung with a clearance of 1/8" on the lock side and 1/16" on the hinge side.
- 4. Doors not properly stored flat and level and not properly storaged in covered, clean, dry, air circulated areas. This guarantee void when doors are not carefully handled physically (treated as finished quality millwork) and are scuffed, marred, scratched, dirtied or otherwise subjected to abusive, damaging handling.
- 5. Doors not adequately sealed on top and bottom fails and edges within 3 days after fitting or within 5 days of first job site exposure. An adequate seal is 2 full coats (or equivalent) of a good grade of oil based paint, varnish, or lacquer or 2 equivalent moisture-proof clear or tinted coatings. The sealant must be adequate and sufficient to repel water. Allow adequate drying time between coats. Water thinned paints are not acceptable. Guarantee is void if doors are exposed to green cement or plaster unless all 6 surfaces are first fully finished.
- Doors exposed to abnormal heat, lack of humidity, excessive humidity or rapid change cycles.
- Doors installed where positive heat and relative humidity control is not maintained on a continuous basis in accord with approved standard practice.
- Hardboard discoloration or sanding markings, providing such marks can be concealed after two paint coats. 8.
- 9. Natural variations in the color, texture or woodgrain of the veneer faces, real or simulated.
   10. Core show-thru, providing the flatness of the surface of the door does not vary in excess of ten one-thousandths within any three inch circumference.
- 11. Exterior doors where directly exposed to the elements, that do not have a properly hung storm door concurrently installed.
  - (a). Such exterior doors must also be completely coated on the exterior surface exposure and all 4 edges with a 2 coat full exterior finish before exposure to weather. Such coatings must be repeated as needed to insure quarantee (b). Such exterior doors must also be properly flashed in accordance with proper practice and as needed wherever lites
  - or other openings exist. (c). All lites and openings must be properly imbedded in putty or weatherseal in accordance with proper practice to
  - prevent moisture from leaking into the core. (d). Such exterior doors must NOT be flush surface (shed type) mounted and may not swing "out": A recessed frame installation with elevated sill and drip-cap header is mandatory.
- 12. Doors finished with materials that are not compatable with the hardboard, veneer or glue lines. Some species of wood contain a chemical loak, particularly) which reacts untavorably with certain finishes. Door surfaces should FIRST be tested for such possible unfavorable reactions. Application of a sealant before finishing will usually prevent this difficulty. Open grain veneers must be filled and sealed before stain or finish is applied. Whenever a dark finish is to be used, the surface must FIRST be sealed.
- 13. Fire doors not installed with pre-drilled holes per instructions prior to insertion of specified hinge screws.



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GRADE - Wood mouldings are available in two grades. "N-Grade" is intended for natural or clear-finishes and the exposed face must be of one single piece. "P Grade" is intended for opaque paint finishes or overlays and can be finger jointed and or edge glued.

These grades may have a few minor characteristics such as light checks, small pitch pockets, light tom grain, pin-size or small knots, occasional medium stain or a small amount of medium pitch. A serious combination of these is not admissible in any one piece. The number and extent of characteristics permitted varies as the area of the piece increases or diminishes.

N-GRADE (suitable for natural, stain, paint or enamel finish). On the basis of net 2" face - 12' long this grade will admit the following characteristics or their equivalent.

A small spot of torn grain, one foot of medium pitch, light skip in dressing on back, or

- a. One small and one very small pitch pocket, or b.
- Two pin knots or a small knot together with one other minor characteristic, or
- One short tight season check and a light snipe at one end, or C. d.
- Medium stain in occasional (10%) pieces for one third the area in an otherwise perfect piece. P.

Characteristics that will not show when piece is laid shall not be given the same consideration as characteristics elsewhere.

The same quality as N-Grade except stain is no defect. Glue joints (laminated or finger joints) must be precision machined and assembled with tight joints. Patching, filling or plugging is permitted providing a paintable surface results.

Random lengths shall be 3 to 20 feet in multiples of one foot. Not over 15% of any one item shall be un-der 8 feet. When computing the percentage of shorts in casing and stops, pieces 7' in length will be considered long lengths.

Specified lengths of cut to length window and door trim shall be graded as completely useable.

Finger and/or laminated jointed mouldings may be ordered in specified lengths with not over 15% trim backs permitted in any one item.

#### ADHESIVES

Adhesives used in finger joints or laminations shall meet the dry use adhesive performance re-quirements of ASTM D-3110-72 (or latest revision) "Standard Specification for Adhesives Used in Non-Structural Glued Lumber Products."

In situations where a Wet-Use adhesive is required, it shall be so specified, acknowledged and invoiced.

BUNDLING shall be in accordance with the Standard Western Wood Moulding and Millwork Producers Schedule.

# MANUFACTURING TOLERANCES

Thickness and width + or - 1/32"

DEFINITIONS

16

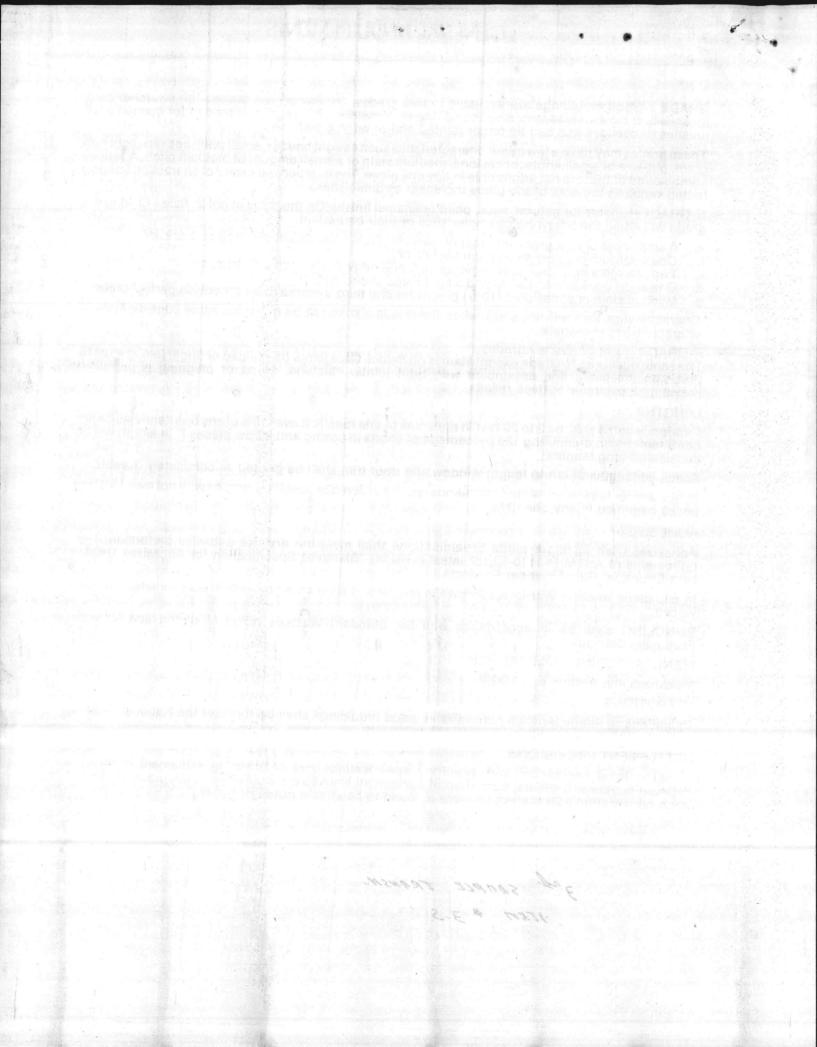
Definitions of characteristics permitted in wood mouldings shall be those of the National Grading Rules for softwood lumber.

## SETTLEMENT PROVISIONS

In determining compliance with purchase specifications and of effecting settlement of invoices between buyers and sellers, each item of a shipment shall be considered as of the grade invoiced if upon reinspection 95% thereof or more is found to be of said grade or better.

MID SOUTH DOOR AND MILLWORK COMPANY, GREENSBORO, N. C.

3 ad SAMPLE TRANSH. ITEM # 3-5



GRADE - Wood mouldings are available in two grades. "N-Grade" is intended for natural or clear finishes and the exposed face must be of one single piece. "P Grade" is intended for opaque paint finishes or overlays and can be finger jointed and or edge glued.

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- C. One short tight season check and a light snipe at one end, or d.
- Medium stain in occasional (10%) pieces for one third the area in an otherwise perfect piece. e.

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#### LENGTHS

Random lengths shall be 3 to 20 feet in multiples of one foot. Not over 15% of any one item shall be under 8 feet. When computing the percentage of shorts in casing and stops, pieces 7' in length will be considered long lengths.

Specified lengths of cut to length window and door trim shall be graded as completely useable.

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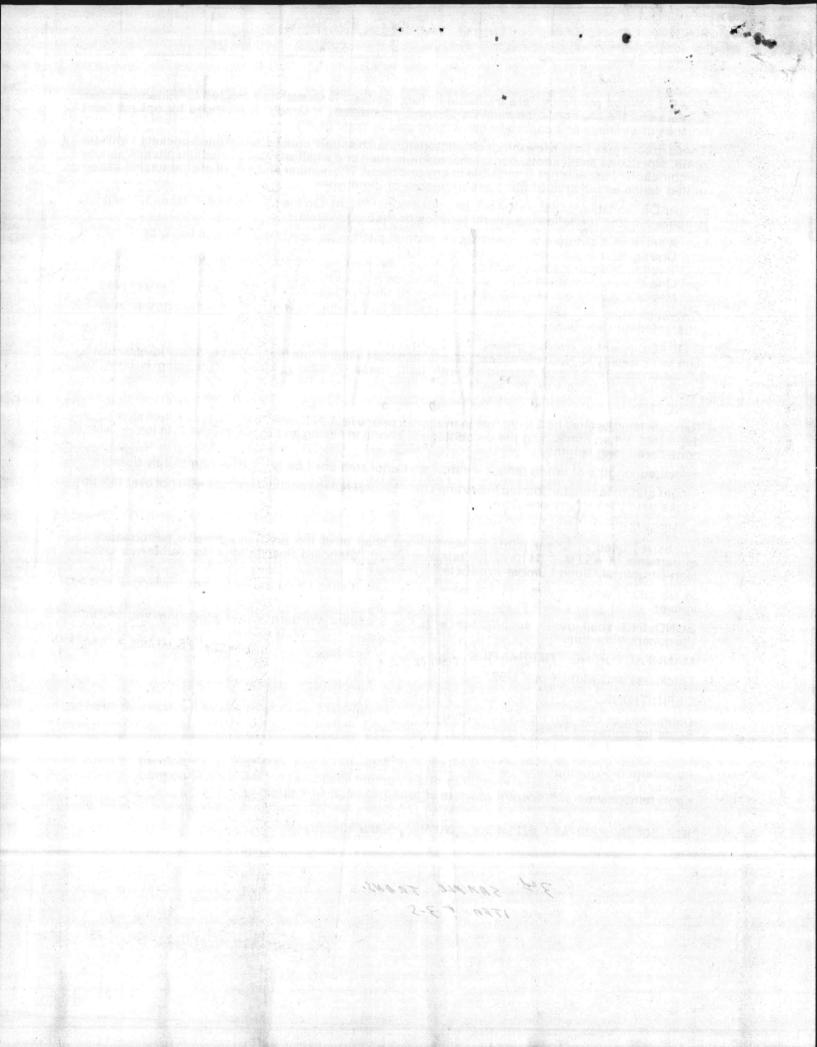
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MID SOUTH DOOR AND MILLWORK COMPANY, GREENSBORO, N. C.

3°d. SAMPLE TRANS. ITEN # 3-S



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# **SHEETROCK Gypsum Panels & Accessories**

# description and utility

There is only one SHEETROCK—the Interior wall and celling surface developed and improved by United States Gypsum. This product, in the last quarter-century, has revolutionized construction—to the point that today more than 90% of all new residential buildings are finished with gypsum panels. Systems using SHEETROCK Gypsum Panels now have gained the same acceptance in commercial building.

SHEETROCK is a mill-fabricated gypsum panel composed of a fireresistant gypsum core encased in a heavy natural-finish paper on the face side and a strong liner paper on the back side. The face paper is folded around the long edges to reinforce and protect the core, and the ends are square-cut and finished smooth. In SHEETROCK SW Gypsum Panels, an exclusive rounded edge design strengthens the joint and reduces imperfections in finishing.

Gypsum panels are produced in specialized forms for various applications. Complementing these is the industry's broadest line of accessories, adhesives and joint treatment materials to provide complete partition, ceiling and floor assemblies. This catalog covers these products in five groups: (1) Gypsum Panel Products; (2) Trim Accessories; (3) Structural Accessories; (4) Screws and Adhesives; (5) Joint Treatment and Texture Products. A general specification appears on pages 10 to 12; performance and specification of assemblies using these components are covered in pertinent U.S.G. System Folders.

Interior walls and cellings built with SHEETROCK Panels gain a durable surface suitable for any type of decorative treatment and for repeated decoration during the life of the building. Joints between adjacent panels may be reinforced and concealed with a U.S.G. joint treatment system, or may be featured by leaving exposed or covering with decorative mouldings.

Dry Construction—factory-fabricated gypsum panels eliminate excessive moisture in construction.

Speed-Panels are easily cut and quickly applied.

Quick Decoration—essentially a "dry" material, SHEETROCK Panels permit painting or other decoration, and the installation of metal or wood trim, almost immediately.

Fire Protection—the gypsum core will not support combustion or transmit temperatures greatly in excess of 212°F. until completely calcined—a slow process. See U.S.G. Construction Selector SA-100 for fire-resistance ratings.

Crack Resistance—with joints reinforced by one of the U.S.G. joint systems, SHEETROCK SW Gypsum Panels form walls and ceilings exceptionally resistant to cracks caused by frame movement vibration or minor settlement.

Non-Warping — expansion or contraction under normal atmospheric changes is negligible and does not cause harmful warping or buckling. Availability — over 20 strategically located U.S.G. operating plants produce and/or stock the gypsum panel materials described here. Special distribution centers, in addition to these plants, increase total service efficiency to major markets and rural areas from coast to coast. All standard or specialty gypsum panel products may be considered readily available and easily procured upon short notice.

SAmple TRANSMITTAL H.S iTem # 5-S



#### technical data

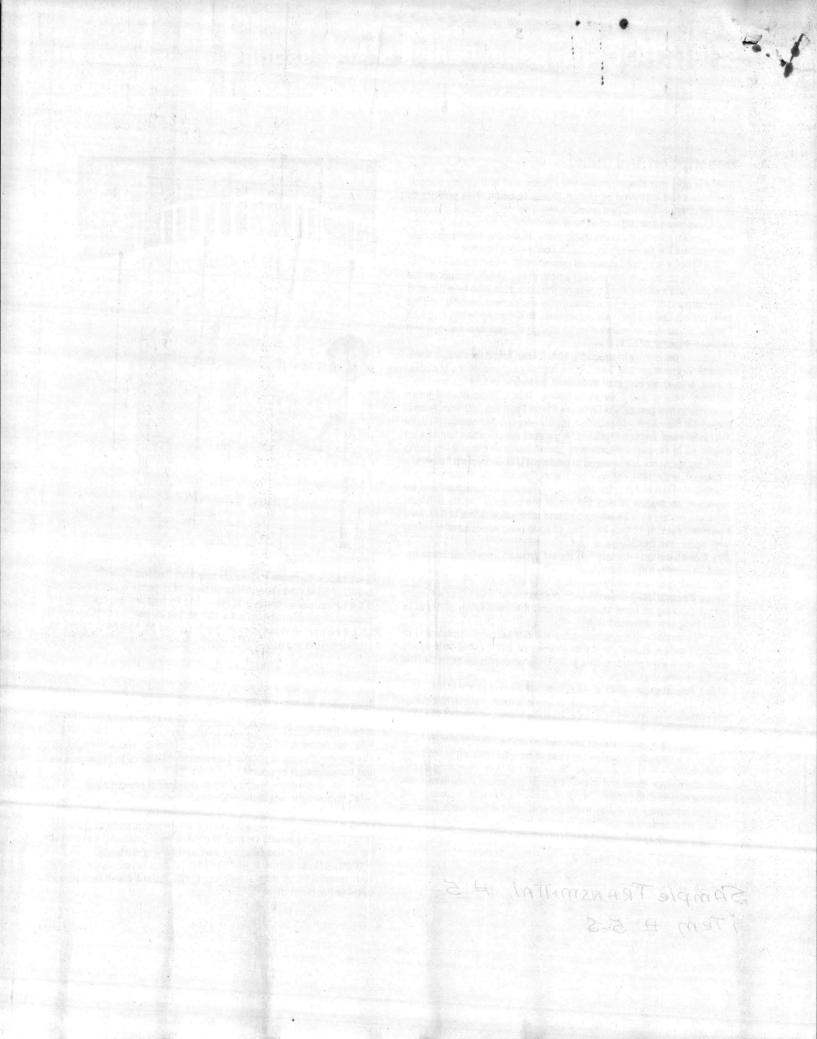
SHEETROCK Gypsum Panels comply with Federal Specification SS-L-30D; ASTM C36. Thermal coefficient of expansion (unrestrained):  $9.0 \times 10^{-6}$  in. per in. per deg. F. ( $40^{\circ}$ — $100^{\circ}$ F); hygrometric coefficient of expansion (unrestrained):  $5.4 \times 10^{-6}$  in. per in. per % r.h. (5%—90%t.h.). Fire hazard classification: flame spread 15, fuel contributed 15, attock developed 0.

SHEETROCK Regular Gypsum Panels have long edges tapered on the face side to form a shallow channel for joint reinforcement. Made In four thicknesses for specific purposes:

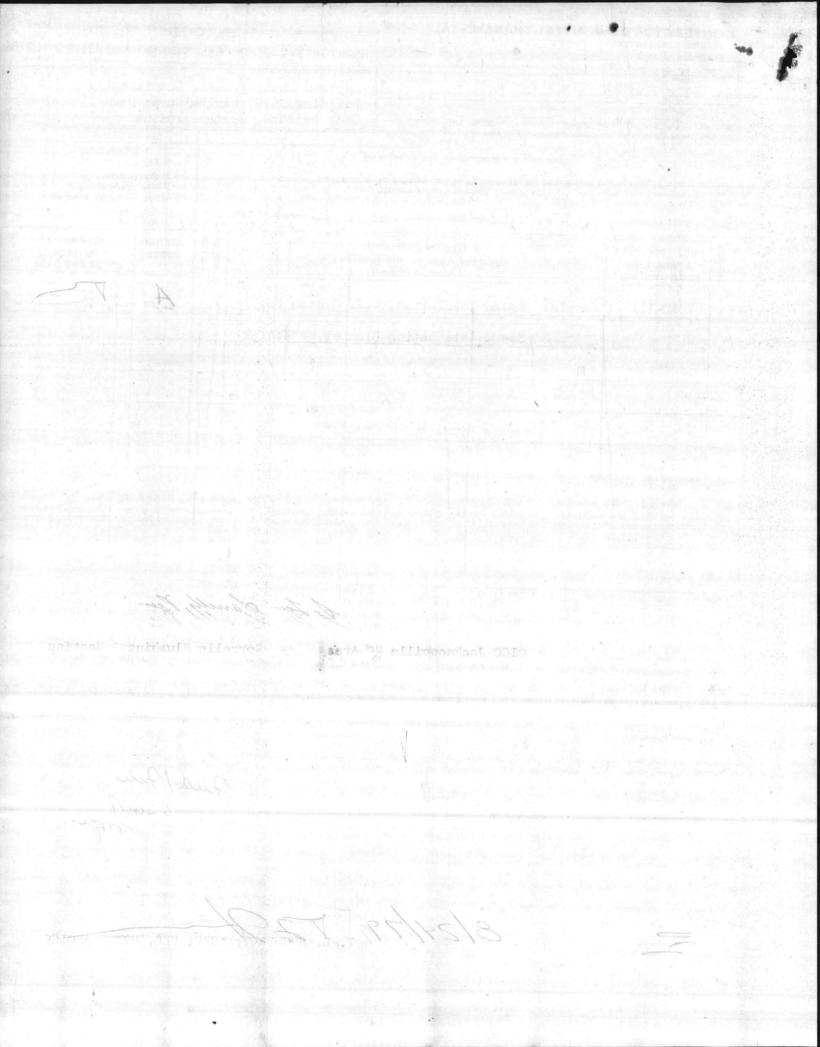
—%", recommended for the finest single-layer drywall construction. The greater thickness provides increased resistance to fire exposure and transmission of sound.

-1/2", for single-layer application in residential construction.

-%", lightweight, applied principally in the double wall system over wood framing and in repair and remodel work. Width: 4 ft.; length: 8, 9, 10, 12 or 14 ft. (except 1/4", available in 8 and 10-ft. lengths only); edges: tapered; finish: natural-finish face paper, suitable for paint or other decoration.



CC BND	ANTOIN 4-4555/5 (Rev. 6/76)	UBMITTAL TRANSMITTAL	CONTRACT NO. N62470-77-0-2563	thansmit 6th		7/31/79
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	DR T. L. Hug	uelet, OICC, Camp Lejeune	Camp Lejeune, N	orth	HEVIE	WER USE ONLY
	anni sharara Tana anni sharara	*List only one specification division per let only one of the following categories on each and indicate which is being submit	transmittal form,	titution	A-Appro D-Disap AN-App	proved roved as noted eipt acknowledge nents
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# Sound Control and Insulation Products

Adequate sound control and energy conservation are among the most important requirements in today's buildings. The public has become sufficiently aware of these factors to demand effective measures to control unwanted sound and heat transfer in both commercial and residential construction. With its advanced research, U.S.G. has been a leader in developing new systems and products for efficient, low-cost sound control and thermal insulation for new construction and remodeling.

THERMAFIBER Sound Attenuation Blankets-A semi-rigid mineral-fiber mat of uniform dimension and controlled density and without paper covering especially developed for U.S.G. partition assemblies. When installed in the partition cavity or in ceiling plenum, these blankets help provide excellent fire resis-tance. When installed in resilient or decoupled partitions they substantially improve STC ratings. Easily handled and cut; simple to install. Meet Federal Specification HH-1-521E. Type I, except identification marking paragraph 3.7.1.

THERMAFIBER Sound Attenuation Blankets are noncombustible when tested in accordance with ASTM E136-73 procedures.

Sound Attenuation Blankets fit snugly between steel studs (right). Proper stapling of Regular Blankets is to sides of wood studs (below).

Sample Jiansmittal # 6 Item 6-5





Specifications—THERMAFIBER Blankets(1)

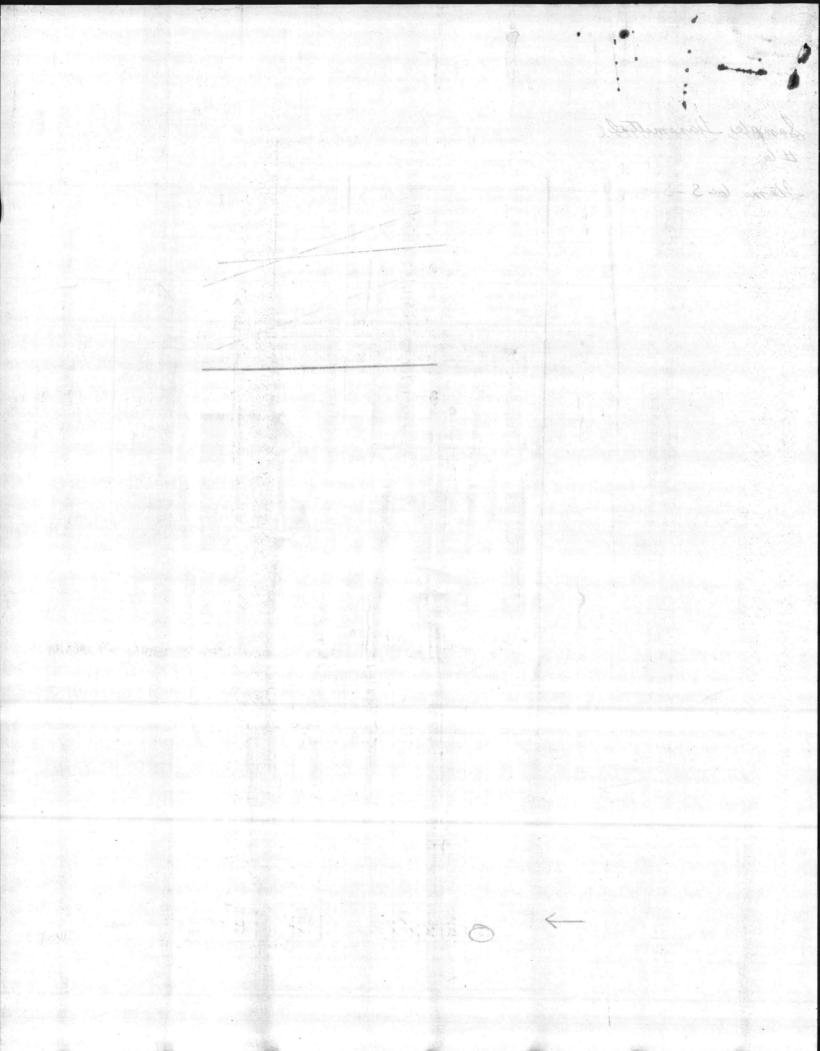
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Regular	3 3 <sup>1</sup> /2 4 5 <sup>1</sup> /4 6	76 89 102 133 152	16 and 24	406 and 610		1.22	2.0	0.12	11 13 15 19 22	1.9 2.3 2.6 3.3 3.9
Aluminum Foil-Faced	25/8 3 51/4 6	67 76 133 152	15 and 23	381 and 584	4 and 8	1.22 and 2.44	2.0	0.12	10 11 19 22	1.8 1.9 3.3 3.9
Fast-Fit	3 31/2	76 89	15	381	4	1.22	2.0	0.12	11	1.9 2.3
M-S	3 3 <sup>5</sup> /8	76 92	16 and 24	406 and 610	4 and 8	1.22 and 2.44	2.0	0.12	11 13	1.9 2.3
Sound Attenuation		25 38 51	16 and 24	406 and 610	4	1.22	4.0 3.0 2.5	0.25 0.19 0.16	4 6 7	07 1.1 1.2
2-Furring	11/2	25 38 51 76	24	610	4	1.22	6.0 4.5 4.0 4.0	0.37 0.28 0.25 0.25	4 6 8 12	0.7 1.1 1.4 2.1

B/Inickness

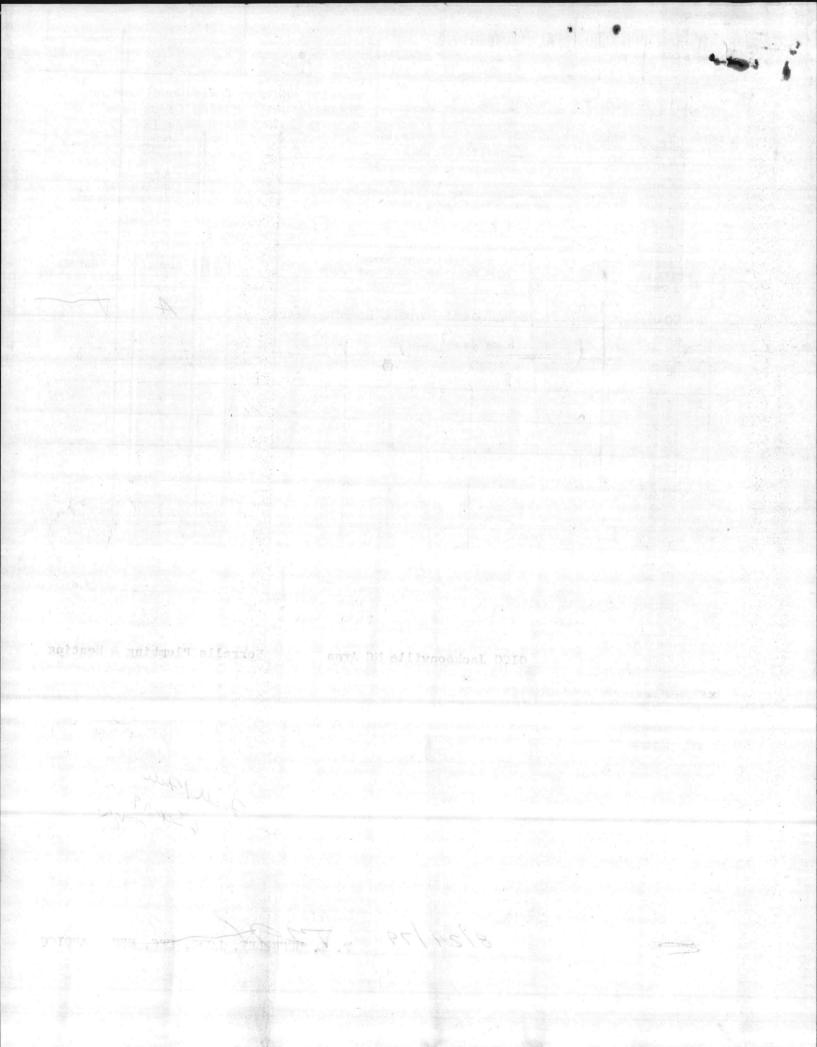
A value at 75 F (24 C) without facing

Symbols F degrees Fahrenheit: h ... hour: Blu armat units

K degrees Kelvin: W = watts.



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	CDR T. L. Hu	Sale in any Algori	ICC, Camp Le; contractor Usi nly one specification d	EONLY		and and a	HEVIE	TION CODES
	Contractor Approved	· · · · · · · · · · · · · · · · · · ·	the following categoria d indicate which is bei	es on each transi ing submitted	mittel form,	bstitution	D-Disap AN-App RA-Rec C-Com	p <b>roved</b> roved as noted eipt acknowledg nents
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UNITED STATES GYPSUM COMPANY

Post Office Box 50073 / Atlanta, Georgia 30302

July 6, 1979

Acoustics, Inc. P. O. Box 3204 Charlotte, North Carolina 28203

Attention: Mr. Floyd L. Montgomery, Jr.

CERTIFICATION OF MATERIALS FOR:

Officers Club Building 2615 Camp LeJune, North Carolina Job # 2470-77-C-2563

We, the undersigned, certify that the following materials supplied by us for use on the above named job comply with requirements and tests of the federal specifications for each product as indicated below and are so guaranteed by us:

PRODUCT

5/8" x 2' x 4' Auratone Firecode

Ceiling Panels, Fissured, Filigree NRC Grade 60, STC = 40-44

or Pin Perf

FEDERAL SPECIFICATION

SS-S-118A, Class 25, Type III

LR Grade LR1

Sincerely,

UNITED STATES GYPSUM COMPANY

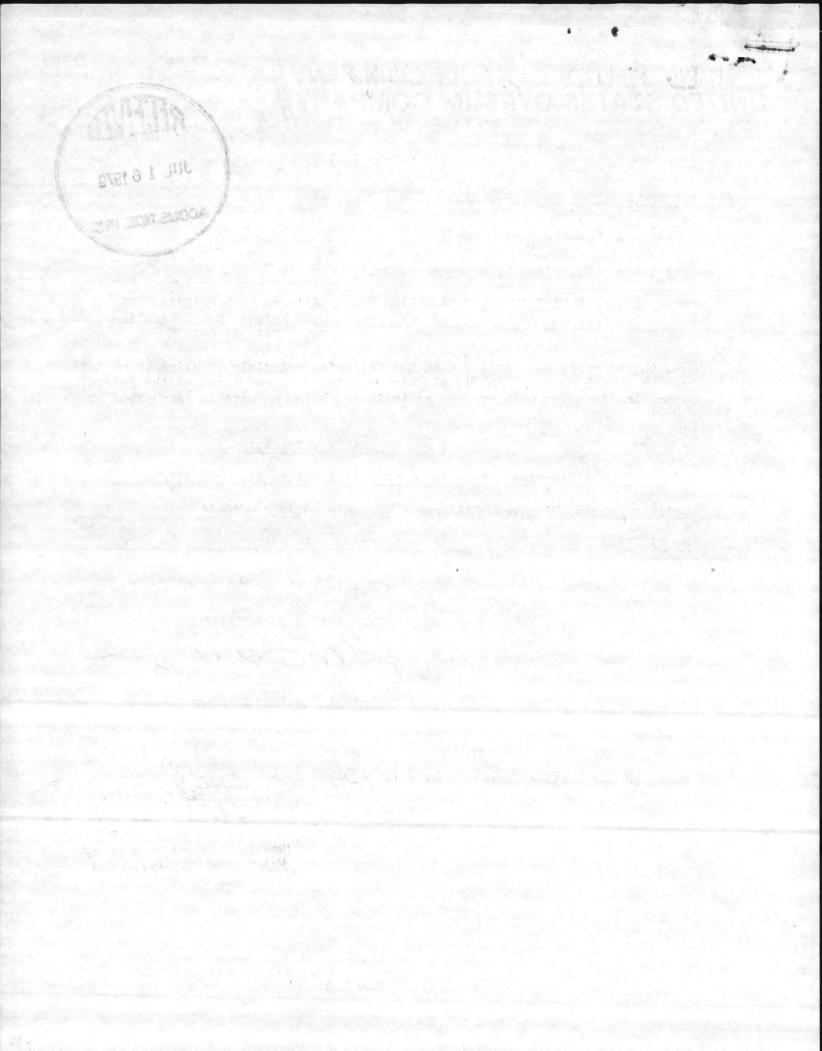
sully

J. G. Biesenberger Technical Services Manager

JGB/ph

July Sworn to and subscribed before me this 13th day of \_, 1979. Notary Publig

Notary Public, Gwinnett County, Georgia My Commission Expires May 30, 1982



CONTRACTOR'S S IND LANIDIV 4-4398/3 (Nev 8/76)	UBMIITAL		CONTRACT ND N62470-77-C-2563	8th	Car Strate State	DATE 7/31/79	
FROM CONTRACTOR Sorrells Plumbi	ng & Heat	ing Co Inc.	Replace Heating Building 2615, Camp Lejeune, N	oning Base			
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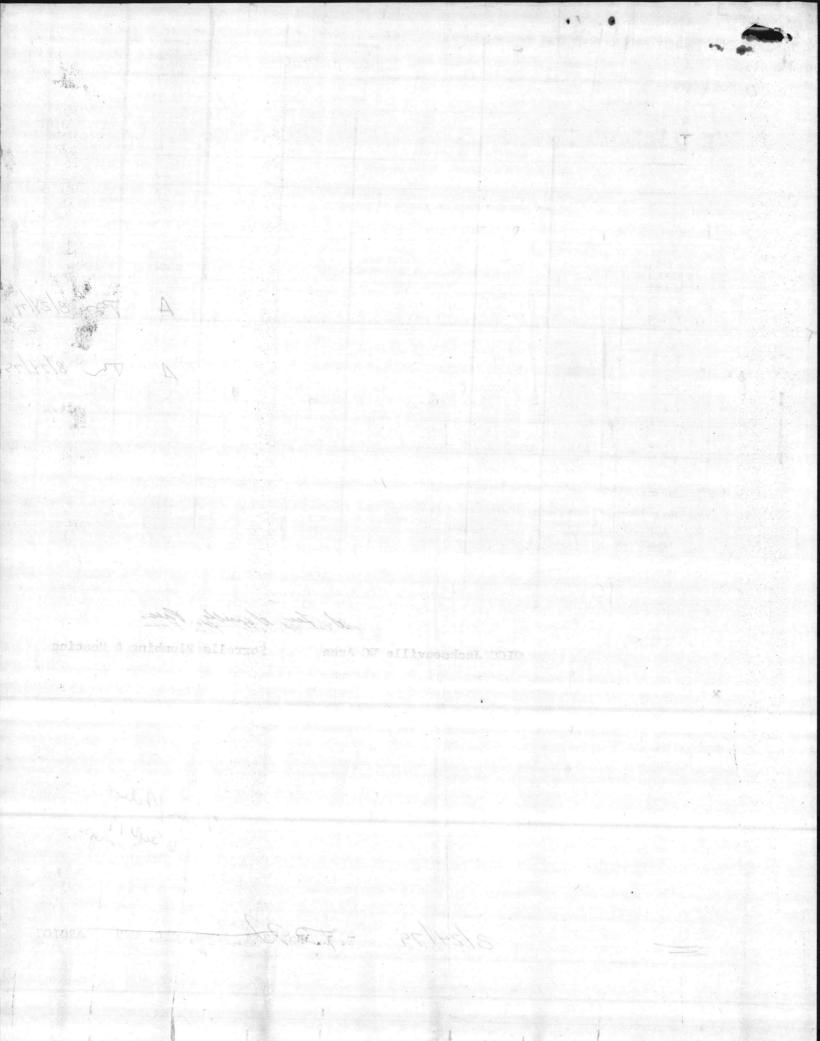
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# Altatone acoustical ceiling panels and tile

Sound Control Products by United States Gypsum 101 S. Wacker Dr., Chicago, III. 60606

### description

<u>AURATONE FIRECODE®</u> <u>Acoustical Ceiling Panels</u> and Tile. . . are composed of mineral-wool fibers and heat-resisting ceramic materials water-felted to form units yielding optimum balance between sound absorption and sound attenuation, while providing versatility of size and thickness.

AURATONE FIRECODE Panels and Tile provide finished acoustical ceilings qualifying for fire ratings up to 3-hr. The tile ceiling is suspended by metal concealed or concealed accessible grid system. Panel ceiling is suspended by exposed grid system. Both ceilings conceal mechanical and electrical equipment and services in the plenum.

*Limitations*—Installation should not be made: (a) where panels or tile will be continuously exposed to high humidity (over 80% RH); (b) below wainscot height or where exposed to impact, abrasion or tampering. Overlaid material such as insulation nullifies the fire rating of UL Designs, and in any case should be limited to a uniform load of 0.75 psf maximum to prevent objectionable sag of panels or tile.

Patterns—Four standard patterns are available, illustrated below.

- Color-Standard color is white.

Finishes—Standard finish is washable vinyl coating, factoryapplied and heat-cured. AURATONE FIRECODE Panels and Tile are available with special factory-applied plastic coating which reduces ceiling maintenance where high soiling is anticipated.

#### technical data

Physical Dimensions

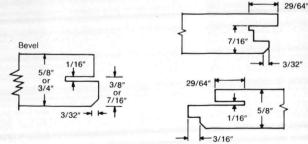
- Thickness (nominal): 5/8" or 3/4"
- Standard Sizes:

tile—12"x12", 12"x24"; <u>panels</u>—24"x24", <u>24"x48</u>", 30"x60" (except Fissured and Filigree patterns in 5%" thickness). Non-Standard Sizes: Consult U.S.G. sales representative for other size requirements and availability of UL label service on non-standard sizes.

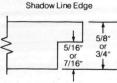
Edge Configuration (tile): Bevel, with standard kerf; tongue & groove, with kerf and bevel edge

Kerf and Edge Dimensions:



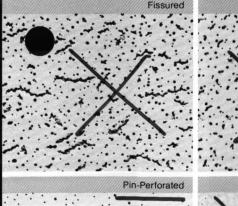


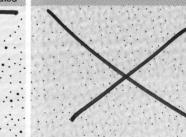
Edge Configuration (panels): Square Cut or Shadow Line for lay-in application Edge Dimensions:



Patterns Filigree

Nordic





#### Weight-1.15 psf (5%"); 1 27 psf (34")

Light Reflectance—Grade LR 1 (ASTM C523 test procedure)

Thermal H	Resistance	(R)-1.8	5 (5/8"); 2	.14 (3/4")
-----------	------------	---------	-------------	------------

Installed Resistance (1):	heat fl	heat flow down		
	panels	tile	panels	tile
metal suspension (5%")	3.05	3.50	4.60	4.20
metal suspension (34")	4.18	3.80	4.88	4.50

(1) R-factors shown include "R" for inside air film and air space above installed ceiling unit.

#### Sound Absorption (ASTM C423 test procedure)

			S	ound a	bsorpt	ion coe	efficien	ts	
	thick-	mount-	t	NRC					
product	ness	ing	125	250	500	1000	2000	4000	range
AURATONE FIRE	CODE Pan	els:							
Fissured	5/8"	7	.33	.29	.60	.87	.67	.61	.5565
Filigree	5/8"	7	.30	.28	.58	.86	.67	.u3	.5565
Pin-Perforated	5⁄8″	7	.32	.31	.60	.80	.62	.46	.5565
AURATONE FIRE	CODE Tile	:	0.241					1.0	
Fissured	5/8"	7	.41	.33	.53	.82	.67	.62	.5565
	3/4"	7	.38	.34	.60	.84	.65	.56	.5565
Filigree	5/8"	7	.43	.35	.56	.81	.67	.64	.5565

Note: Surfaces tested were painted white. Mounting No. 7-metal suspension system.

#### Sound Attenuation (AMA 1-II test procedure)

sound attenuation factors-db band center frequency—Hz 125 160 200 250 315 400 500 630 800 1000 1250 1600 2000 2500 3150 4000 STC %" AURATONE FIRECODE Panels, Fissured pattern; mounting CE 31 39 38 32 31 34 35 37 40 44 48 52 55 5 54 56 40-44 55 %" AURATONE FIRECODE Panels, Filigree pattern; mounting CE 54 54 58 40-44 29 37 37 31 31 32 35 37 40 45 48 52 54 %" AURATONE FIRECODE Panels, Pin-Perforated pattern; mounting CE 33 37 38 32 30 34 37 39 41 47 53 56 40-44 49 %" AURATONE FIRECODE Tile, Fissured pattern; mounting CCF 29 34 38 32 32 34 35 37 38 41 46 54 55 60 40-44 51 56 34" AURATONE FIRECODE Tile, Fissured pattern; mounting CCF 30 38 40 35 36 40 41 42 46 49 52 55 57 55 55 58 45-49 5%" AURATONE FIRECODE Tile, Filigree pattern; mounting CCF 30 35 36 30 30 32 34 36 40 41 46 52 55 54 55 60 40-44

Note: Surfaces tested were painted white. Mounting CE—exposed suspension system, continuous at partitions. Mounting CCF—concealed suspension system, continuous at partitions, flat splines.

- Fire Resistance—Type III Class 25 (Federal Spec. SS-S-118A); fire hazard classification (ASTM E84 test procedure):
- UL Fire Hazard Classification-based on 100 for untreated Red Oak: flame spread—25, fuel contributed—25, smoke developed —5. See UL classified building materials directory.

Underwriters Laboratories Inc. Fire Tests (panels)

rating	beam	design no.	panel size (ft.) (1)	construction
3 hr.	4 hr.	A207	2x4	conc./metal form/beam
2 hr.	_	P207	2x4	gyp. conc. & formbd./bar joist
1 hr.	-	P207	2x4	foam insul./gyp. conc. & formbd./bar joist
2 hr.	-	P213	2x4	roof insul./gyp.plank/bar joist
2 & 3 hr.	-	G211	2x2, 2x4	conc./lath/bar joist
2 hr.	4 hr.	G227	2x2, 2x4	conc./lath/bar joist/beam
2 hr.	3 hr.	G231	2x2, 21/2x5 (2)	conc./lath/bar joist/beam
2 hr.	2 hr.	G251	2x4	conc./lath/bar joist/beam
2 hr.	_	J202	2x2, 2x4	prestressed conc. T-beam/deck
11/2 hr.		P233	2x4	roof insul./steel deck/bar joist
11/2 hr.	_	P229	2x4	gyp. conc. & formbd./bar joist
11/2 hr.	_	P228	2×4	roof insul./gyp.plank/bar joist
1 hr.	_	L206	2x2, 2x4	wood floor & joists
1 hr.	1 hr.	P214	2x4	roof insul./steel deck/bar joist/beam

(1) Panel thickness: 5%" or 34", except G251 and P228 which are 5%" only (all tested as 5%" AURATONE FIRECODE). Panels suspended on fire-rated exposed grid. Complete details may be found in current U.S.G. Architectural Technical Folder SA-905 on Sound Control Ceilings. (2) Also 12%5 non-standard size.

#### Underwriters Laboratories Inc. Fire Tests (tile)

rating	beam	design no.	tile size (in.)†	suspension	construction	
3 hr.	4 hr.	A009	12x12	concealed	conc./metal form/beam	
2 hr.		G019	12x12	concealed	conc./lath/bar joist	
2 hr.		P002	12x12	concealed	gyp. conc./formbd./bar joist	
2 hr.	2 hr.	G008	12x12	concealed	conc./lath/bar joist/beam	

†Tile thickness: 5%", except A009 is 34". Complete details may be found in current U.S.G. Architectural Technical Folder SA-905 on Sound Control Ceilings.

#### installation

AURATONE FIRECODE Panels and Tile are sold installed, on a contract basis by qualified acoustical contractors. The contractor furnishes all labor and materials necessary to complete the job according to specifications in this data sheet.

### availability

Available nationally—qualified contractors are located throughout the United States.

#### maintenance

*Cleaning*—wash with a damp sponge or clean with a vacuum cleaner or chemical rubber sponge (used dry).

Repainting—spray thinned non-bridging latex paint or other waterreducible, breathable coating. Repaint plastic-coated panels with latex semi-gloss enamel or other breathable paint to retain natural semi-gloss appearance.

#### architectural specifications

notes to architect

AURATONE FIRECODE Panels and Tile are designed for installation and use under standard occupancy conditions at no more than 80% RH.

Related information may be found in current U.S.G. Architectural Technical Folder SA-905 on Sound Control Ceilings.

#### Part 1: general

1.1 scope—Specify areas to receive this acoustical treatment.

1.2 qualifications—Construction conditions shall comply with ASTM C636.

Acoustical materials and suspension systems, including necessary hangers, grillage, splines, and other supporting hardware, shall be furnished and installed by a qualified contractor.

1.3 delivery and storage of materials—All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.4 environmental conditions—Installation of acoustical panels and tile shall not begin until building is enclosed, permanent heating and cooling equipment in operation, and residual moisture from plaster, concrete or terrazzo work dissipated.

1.5 design conditions—System shall be rated NRC .55-.65 in accordance with ASTM C423 and STC ( ) in accordance with AMA 1-II as tested by an independent agency.

Part 2: products

2.1 materials

2.1.1 AURATONE FIRECODE Acoustical Panels by United States Gypsum, approved for UL design No. ( ), (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, white color, nom. (%") (34") thick, (length x width), (square cut) (Shadow Line) edge, mineral-fiber ceiling panels, (factory-applied plastic surface coating).

2.1.2 AURATONE FIRECODE Acoustical Tile by United States Gypsum, approved for UL Design No. ( ), (Fissured) (Filigree) (Pin-Perforated) (Nordic) pattern, white color, nom. (%") (34") thick, (length x width), bevel edge and kerf (with tongue & groove), mineral-fiber ceiling tile, (factory-applied plastic surface coating).

2.1.3 concealed suspension (tile)—34'' Z-runner spaced 12" o.c., attached to 112'' channel grillage. Flat metal splines engage adjacent tile.

2.1.4 fire-rated suspension—Per UL Design No. ( ) and ASTM C635.

#### Part 3: execution

3.1 suspended—Install acoustical material and suspension system, including necessary hangers, grillage, splines and other supporting hardware, in accordance with UL Design No. ( ) and ASTM C636.











July 3, 1979

Acoustics Incorporated P.O. Box 3204 Charlotte, N.C. 28203

Attention: Mr. Floyd L. Montgomery; Jr.

RE: Officers Club - Building 2615 Camp Lejeune, North Carolina Contract No. 2470-77-C-2563

Dear Sir:

This is to certify the following components are manufactured by Donn Corporation, 1000 Crocker Road, Westlake, Ohio 44145.

The DX-24 main tee is manufactured from 27 gage commercial quality cold rolled steel, roll formed into an inverted tee shape of double web design 1-1/2" high with a 15/16" face and a 1/4" x 1/2" rectangular bulb at the top. A cold rolled steel cap is applied to the face during the roll forming operation.

The DX-24 main tee is classified Intermediate Duty in accordance with ASTM C-635 when supported on a 48" simple span.

Respectfully submitted,

DONN INCORPORATED

then Juli

Jonathan Teli Test & Evaluation Supervisor

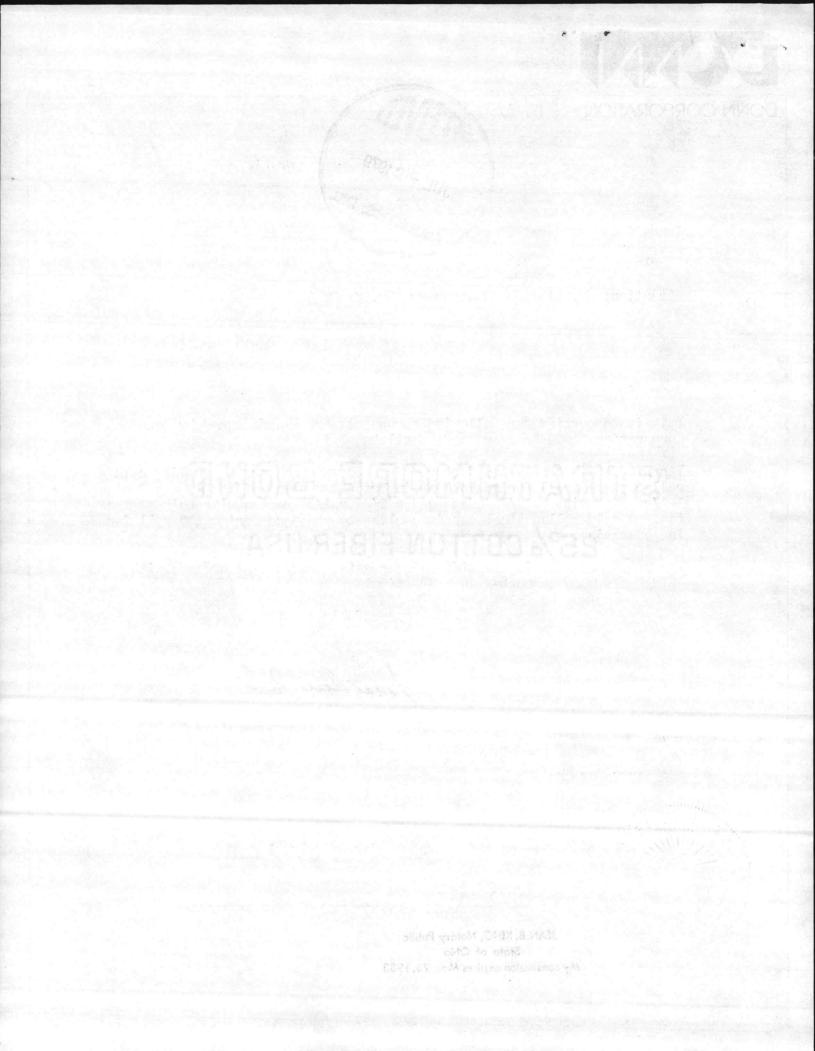
JT/du

cc: Barry Farmer

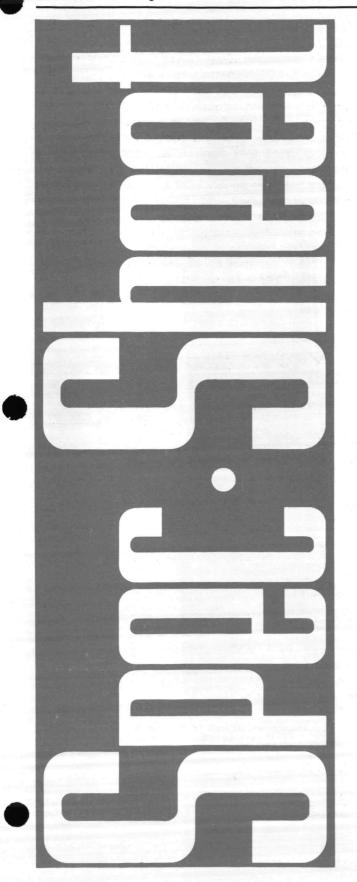
Sworn to before me this 3rd day of July, 19 79.

Public

JEAN B: KING, Notary Public State of Ohio My commission expires Mar. 23, 1983



**Exposed Tee Grid** 



# **DXO Double Web Offset**

#### SPECIFICATIONS:

**DXO System** 

SUSPENDED CEILING SYSTEM shall be DONN DXO Exposed Grid System as manufactured by DONN Products, Inc., Westlake, Ohio. Components shall be formed from commercial quality cold-rolled steel, electro-galvanized coated and prepainted. Exposed finish shall be low sheen satin white.

The suspension system shall support the ceiling assembly as shown on the drawings, or specified herein, with a maximum deflection of 1/360 of the span.

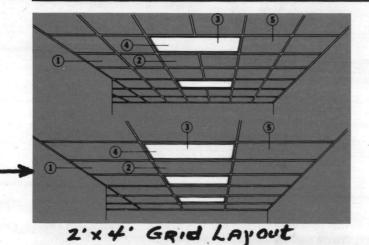
The ceiling pattern shall be as shown on the drawings using the following components: (1) MAIN TEE with a double web design and with a rectangular bulb; with 15/16" exposed flange with a rolled cap; with cross tee holes at 6" o.c.; with hanger wire holes at 2" o.c.; with integral reversible splice. (2) DXO CROSS TEE with double web design and with a rectangular bulb; with a high tensile steel end clenched to the cross tee web that shall interlock with opposing cross tee through main tee web holes. Lower flange extended and offset to provide a flush level intersection. (3) WALL MOLDING with a channel or angle shape and with a 1" exposed face.

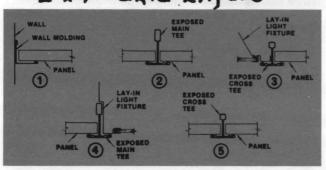
# DONN PRODUCTS INC.

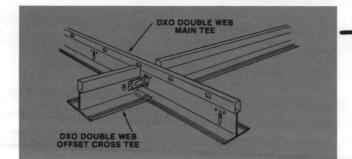
1000 Crocker Rd./Westlake, Ohio 44145 Phone (216) 871-1000



# **Exposed Tee Grid**







CONNECTI	ON VALUES	
TYPE INTERSECTION	TENSION	COMPRESSION
Main Tee Splice (DX-24)	175 LBS.	478 LBS.
Main Tee Splice (DX-26)	234 LBS.	888 LBS.
Main Tee Splice (DX-28)	314 LBS.	1070 LBS.
Cross Tee Connections (DXO)	351 LBS.	326 LBS

### **Limitation Statement**

Allowable load data valid only when material is installed in accordance with "the specifications for acoustical tile and lay-in ceiling suspension systems" distributed by the Acoustical Materials Association, 335 East 45th St., New York, New York 10017.

Also approved under L.A. Permit No. 22179.

# **DXO Double Web Offset**

THE DONN DXO DOUBLE WEB STEEL EXPOSED GRID SYSTEM is the highest quality exposed grid system available. This direct suspended system features 1-1/2" high main tees and 1", 1-1/4" and 1-1/2" high cross tees with 15/16" wide tee face to provide a supporting surface and appropriate load, carrying capacities for lay-in panels and light fixtures. Interlocking of grid components, both main tee and cross tees may be accomplished with a "plug-in" bayonet style insertion\*\* in a conventional grid pattern. The double interlock mechanism of the high tensile strength ends clenched to the cross tee section affords a fast, reliable but exceptionally rugged main tee/cross tee connection.

Complete catalog of Acoustical Ceiling Systems available upon request or see Acoustical Ceiling Systems, 1978 Sweets Architectual File, section 9.2/Do.

### DX RATED LOAD CAPACITY\*, LBS. PER LINEAR FOOT ON SIMPLE SPAN

	Company of the			SPAN	
	PART NUMBER	DIM. LG.	4 FT.	5FT.	6 FT.
_			LBS./LF	LBS./LF	LBS./LF
	DX-28	12 FT.	16.3	7.3	4.9
	DX-26	12 FT.	16.3	7.3	4.9
-	DX-24	12 FT.	12.4	6.1	3.6

Note: To establish the maximum lbs./ft<sup>2</sup> of ceiling, divide the load given in table by Main Tee spacing in ft.

 Limited by deflection of 1/360 of indicated span when tested per ASTM-C-635.

> DXO CROSS TEE RATED LOAD CAPACITY\*, LBS. PER LINEAR FOOT ON SIMPLE SPAN

· A POPPART	Dime	nsions		SP	AN	
	LG.	HT.	2 FT.	3 FT.	4 FT.	5 FT.
	-		LBS./LF	LBS./LF	LBS./LF	LBS./LF
DXO-216	2 FT.	1"	33.5		121 S. C. C. C. C. C. C. C. C. C. C. C. C. C.	digender of
DXO-316	3 FT.	1″		10.1		Sec.
DXO-416	4 FT.	1"	Section 1	Case of the	5.0	1.1.1.1.1
DXO-420	4 FT.	1-1/4"		desept is	7.1	
DXO-520	5 FT.	1-1/4"	all all a	State -		3.9
DXO-424	4 FT.	1-1/2"			13.7	
DXO-524	5 FT.	1-1/2"	and the second second second second second second second second second second second second second second second	and the second second second		6.4

NOTE: To establish the maximum lbs./ft<sup>2</sup> of ceiling, divide the load given in table by Cross Tee spacing in ft.

 Limited by deflection of 1/360 of indicated span when tested per ASTM-C-635.

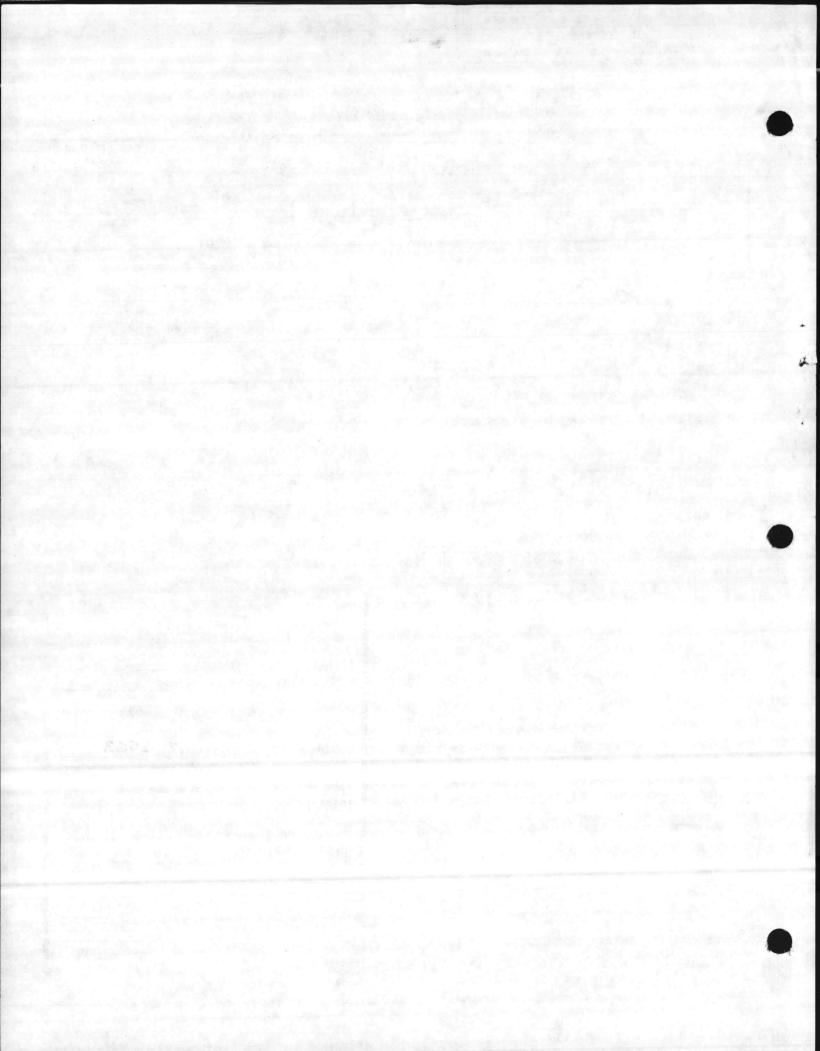
\*\* DX-28 is identical in cross-section to DX-26; a splice plate is utilized on DX-28 in lieu of integral bayonet splice for conditions where tension and compression values of connections in access of 300 pounds are specified.



THE TRANE COMPANY -- LEXINGTON, KENTUCKY

# SUBMITTAL DATA

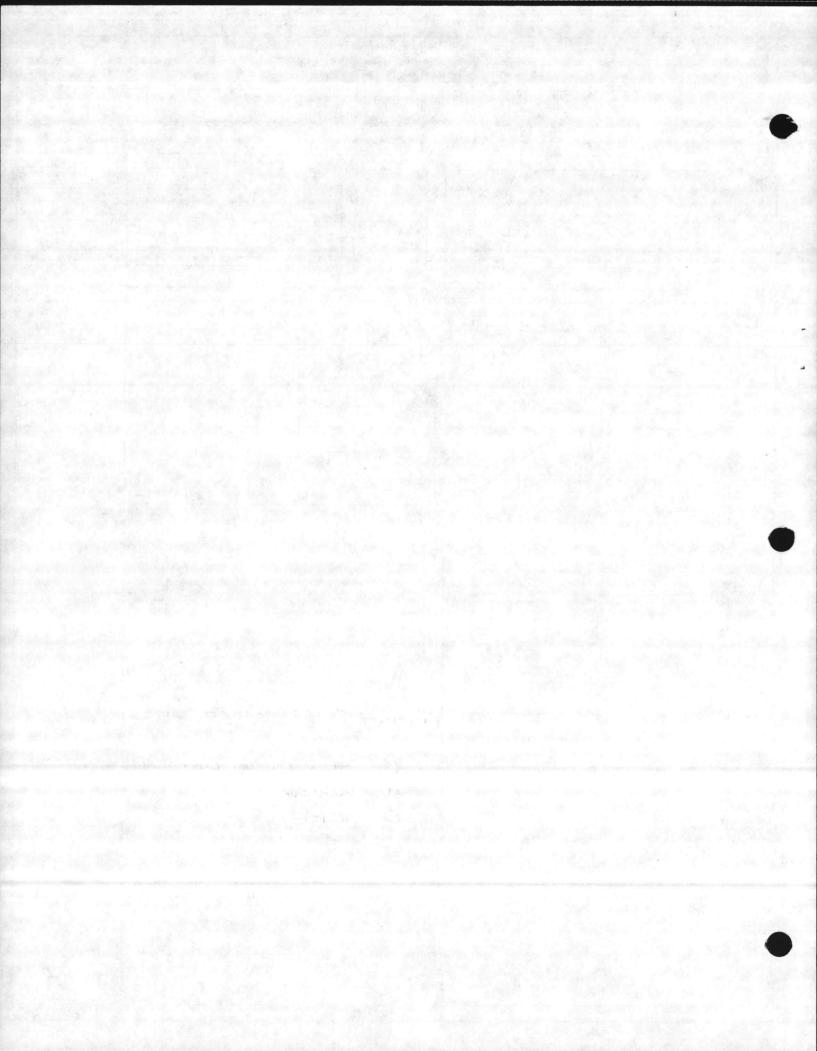
CUSTOMER C	DRDER NUMBER	DATE 3-22-79	TRANE ORDER NUMBER
S O L D T O	Sorrells P & H Co., Inc. PO Box 27408 Greensboro, NC 27408	P o Com(0), Bldg. 2615 E c T	Officer's Club
ARCHITECT		ENGINEER R.S. Noonan,	Inc .
TOTAL QTY. PER ORDER	MODEL SPECIFICATIONS AND TAGGING	Kiel Noonany	
. 8	#17 Central station air handler draw 12 central station air handler d 50 central station air handler b 21 central station air handler b 8 central station air handler b 12 central station air handler b 6 Central station air handler dr	raw thru TAG: AC-2 low thru TAG: AC-3 low thru TAG: AC-4 low thru TAG: AC-5 low thru TAG: AC-6	CION RNG COMMAND
Drawin	FICE/SALES ENGINEER:	APPROVED APPROVED AS NO ED DISAPPROVED SUBJECT TO THE REQUIREMENT CONTRACT NO. N62470-7 APPROVAL OF A SUBMITTAL IN APPROVAL OF ANY DEVIATION TRACT REQUIREMENTS UNLESS CALLS ATTENTION TO AND SU TION THE CAPPERSYSE BY IBLE FOR PROVIDING PROPER SIONS & WEIGHTS, COORDINA ETC., AS REQUIRED. REVIEWER D. M. CHARGE O	TTS OF 7-C-2663 DOES NOT INCLUDE FROM THE CON- THE CONTRACTOR DPORTS THE DEVIA- ALL BE RESPONS- PHYSICAL DIMEN- TION OF TRADES, DATE <u>5-10-29</u>
equipm	ent we propose to furnish for this project submitted for approval to manufacture.		



# SUBMITTAL DATA DRAW-THRU CLIMATE CHANGER®



QUANTITY			мс	DEL	17 M Back	ediur Vert	n pres	disc	e Vert charge	ical	TRANE SALES ORDER NO.	KF3-J094
	C-1							ar caro a caro				
	F	AN		den este Statistica	3				Call I wanted in the second state of the second	IOTOR		SUBMITTAL APPROVAL DRW
SCFM ESP TSP BHP		9763 1.0 2.73 3.0 1331					HP RPM FRAME ELECT TYPE		10 180 219 460 0pe	5T 0/60/3		Clch S/MS Clch S31 Clch S40
RPM DRIVE SERVICE F	1	Varia	able	<u>e 1.</u>	5		моинт		Le			
C A P C C C C C C C C C C C C C C C C C	ECTION SING 5	кw 04	DВ 76.9		DB	ат °F wв 646.	COIL APD 41.56 .16		W	врм, м PRESS. . темр. IN 08 40 4 180	арания и поределание и поределани И поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поределание и поредел	1
C Y SECONDIN O D COIL BAY I E L C PREHEAT	CASING I		64 . FIN SER.		and the second s	O TOT.CIR. PER COIL		RCUITS PER DIST.	TURBS.	TUBE MATERIA	COIL SUPPL	·····································
S R SECTION I FIRST IN T CASING O SECOND IN N CASING		D 6	18	30 30	81					copper copper	right right	Clch S140 Clch S144 Clch S150
	ACCES	SORIE	E C							G OPTIONS	<u>. 1 1911</u>	
FACE DAMPERS INT, FACE & BYF EXT, FACE & BY FILTER BOX COMB, FILTER M FILTERS MIXING BOX PREHEAT SECTION ACCESS SECTION HUMIDIFIER ACCESS DOOR BELT GUARD ISOLATORS	PASS XING BOX	thr non non non ves			shea		INLET INSUL GALV. EXTR MAX. S SPECIA SPECIA	YPE ARALL VANES ATION DRAIN A LENG SPACE I L FEAT	PAN LINI TH CASIN BETWEEN TURES: T BE		ne 3/4 1b 5 D ne ne 7 IN PEC. SEC1	Clch S49
	APPROV -	AL STA	MP				A	PPT		DBYC		4



TAG: acl, ac2, ac3, ac4 ac5 ac6 ac7 CLCH-S/MS-1



MECHANICAL SPECIFICATIONS CENTRAL STATION AIR HANDLERS LOW AND MEDIUM PRESSURE DRAW THRU (HORIZONTAL AND VERTICAL), AND BLOW-THRU CLIMATE CHANGERS SIZES 3 THRU 86

DATE: APRIL, 1978

SUBMITTAL

### UNIT CONSTRUCTION†

**Unit Casing** — High grade steel reinforced, braced with steel angle framework. Sectionalized construction; fan section, coil section, drain pan. Removable panels in fan and coil sections provide access to all internal parts. Mounting holes prepunched at factory.

**Unit Insulation** — Panels insulated with 1" mat-faced glass fiber. Drain pan has seamless, 1/2" cellular, spray foamedin-place insulation. (OPTIONAL) Drain pan with galvanized steel inner liner, spray foam-in-place insulation between liner and drain pan.

**Centrifugal Fans** — Sizes 3 thru 31 double width, double inlet, forward curved multi-blade. Sizes 35-86, double width, double inlet, nonoverloading, backward inclined blades. Fan shaft operates below first critical speed. Fan bearings, grease lubricated ball bearings for 200,000 hour average life. Fan housing die-formed, air tight. Fans dynamically balanced, tested after being installed in factory assembled fan section.

**Coils** — Sigma-Flo<sup>®</sup> II design, continuous aluminum fin, copper tube. Copper fins optional. Fin collars drawn, belled, bonded to tubes by mechanical tube expansion. No soldering or tinning used. Coils removable through access panels.

Unit and Accessory Finish — Casing and all accessories, except coil, chemically cleaned, phosphatized, coated with enamel paint.

### ACCESSORIES

Face and Bypass Dampers — Opposed blade, locked to slotted damper rods, rotate in nylon bushing.

Filter Boxes — Flat, medium capacity, high capacity and combination filter mixing boxes. Hold two inch permanent or throwaway filters. Flat filter boxes have access doors both sides. Other filter boxes sizes 3 thru 31 have a single large access door one side. All units, Size 35 and larger, individual access doors each side provided for each row of filters.

**Mixing Box and Combination Filter Mixing Box** — Parallel damper blades, merge airstream inside box. Blades locked to slotted rods, rotate in nylon bushings.

† Variations from above construction will be indicated on the submittal data sheet.

### **ELECTRIC HEAT**

**Electric Heat** — Coil, control combination, attaches directly to base unit or accessories. NEMA 1 control panels mount integral to electric section or remote either on floor or wall. All Trane Company wiring copper, wiring by others should be copper.

Open resistance construction, heating elements 80% nickel, 20% chromium. Coil terminations crimped and tightened to specified torque. Coil circuits uniformly distributed across coil face whenever possible. Coil frames fabricated of aluminized or galvanized steel.

Safety controls include two independent systems, automatic and manual reset, required by UL. Manual reset devices based on number of coil circuits.

Coil/panel electrical connections factory complete with integral panels. Remote panels available with factory wired conduits.

Circuit fusing in accordance with UL and NEC requirements.

Factory tests include continuity and dielectric strength tests of primary thermal protection systems and recycle feature on 6, 10 and 18 step control systems.

### UNIT INSTALLATION

**Shipping** — Sizes 3-31 and horizontal draw-thru sizes 35-50 ship assembled. Remaining unit sizes 35 and larger ship in sections on separate skids.

Accessories ship on separate skids designed for direct attachment to base unit or other accessories. Mounting hardware ships with each skid.

**Handling** — Handling and location recommendations in Installation and Maintenance Bulletin shipped with unit. Mounting hole locations shown on the "Mounting Hole Location" diagram.

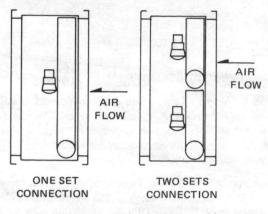
Weights - See Tables 1 and 2

**Connections** — Hydronic and refrigerant coils. See Tables 4 and 5. Connections for Electric Heat shown on Submittal Diagrams, wiring diagrams supplied with unit (mounted inside control panel door).

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FINNED	NO. OF REFRIG.		CONNSO.D. L ROWS		CONNSO.D L ROWS
WIDTH	CIRCUITS	LIQUID	SUCTION	LIQUID	SUCTION
12	1	5/8	5/8	NA	NA
	2	7/8	1-3/8	5/8	1-5/8
	4	7/8	1-5/8	7/8	1-3/8
	8	1-1/8	2-1/8	7/8	1-3/8
18	1	5/8	5/8	NA	NA
	2	7/8	1-3/8	5/8	5/8
	3	7/8	1-5/8	NA	NA
los de la	6	1-1/8	2-1/8	7/8	1-5/8
	12	1-3/8	2-1/8	1-1/8	2-1/8
24	2	7/8	1-5/8	5/8	5/8
	4	7/8	1-5/8	7/8	1-3/8
	8	1-1/8	2-1/8	7/8	1-3/8
	16	NA	NA	1-1/8	2-1/8
30	2	7/8	1-3/8	5/8	5/8
	4	7/8	1-5/	7/8	1-5/8
Contraction of the	5	7/8	2-1/8	NA	NA
Fries State	10	1-3/8	2-1/8	7/8	2-1/8
1.10	20	NA	NA	1-3/8	2-1/8
33	3	7/8	1-5/8	NA	NA
1. 200	7	1-1/8	2-1/8	7/8	1-5/8
Bellen Ch	11	1-3/8	2-1/8	**	2-1/8
Colline State	22	NA	NA	1-3/8	2-1/8

REFER TO BASIC UNIT SUBMITTAL DRAWING FOR SIZE AND NUMBER OF COILS IN UNIT.



EXAMPLE, 4, 6, AND 8 ROWS

NA - Not Available As Standard

\* - 1-3/8" For 2 Circuit Split Coil With 2 Sets of Connections

\*\* - 6 Circuit Connection 1-1/8". 5 Circuit 7/8".

UNIT	FLAT FILTER	COMBINATION & MEDIUM	HIGH CAPACITY
SIZE	BOX	FILTER BOX	BOX
3	1 - 20 x 25	2 - 16 x 25	2 - 20 x 25
6	2 - 20 x 25	4 - 16 x 25	4 - 20 x 25
8	4 - 16 x 20	4 - 20 x 25	6 - 20 x 20
10	4 - 16 x 25	6 - 16 x 25	6 - 20 x 25
12	2 - 20 x 20	4 - 20 x 25	6 - 16 x 20
	2 - 16 x 25	2 - 16 x 25	3 - 20 x 25
99 . S	1 - 16 x 20		
14	4 - 16 x 20	8 - 16 x 25	6 - 20 x 20
	2 - 20 x 25		3 - 20 x 25
17	6 - 16 x 20	8 - 20 x 25	3 - 20 x 25
	2 - 16 x 25	Section 24 Vice and	9 - 20 x 20
21	8 - 16 x 20	10 - 20 x 25	3 - 20 x 25
	2 - 16 x 25	Derykkowski	12 - 20 x 20
25	12 - 16 x 20	6 - 20 x 25	6 - 20 x 25
	and the second second	6 - 16 x 25	9 - 20 x 20
31	7 - 16 x 20	8 - 16 x 25	8 - 20 x 25
	7 - 16 x 25	12 - 16 x 20	12 - 20 x 20
35	14 - 16 x 25	16 - 20 x 25	28 - 16 x 25
41	6 - 16 x 20	20 - 20 x 25	
	12 - 20 x 20	States and States	32 - 16 x 25
50	7 - 16 x 20	28 - 16 x 25	
	14 - 16 x 25	and on the party states in the second states in the	35 - 16 x 25
63	10 - 16 x 25	30 - 20 x 25	49 - 16 x 25
1.15.13	12 - 20 x 25		a distance in the
73	6 - 20 x 20	36 - 20 x 25	42 - 20 x 25
1.1.14	18 - 20 x 25		and the second second
86	_21 - 20 x 25	42 - 20 x 25	49 - 20 x 25
	7 - 20 x 20		

3

TABLE 6 - 2" Filter Sizes & Quantities Per Set

PRINTED BY PRODUCTION SERVICES - LA CROSSE

### TABLE 1 - Approximate Operating Weights (Lbs.)



the second second second second second second second second second second second second second second second s				1.1.1	10 L.	Sec. 1	UNI	T MOL	DEL NI	JMBEF	3					
	3	6	8	10	12	14	17	21	25	31	35	41	50	63	73	86
	1		-	-	-		TE CH			1000	101					-
CASING ONLY	205	275	400	460	700	750		_	1255		2100			4270	4710	5030
2 ROW	291	424	570	677		1060	1229		1725	2082	2832			5529		6390
4 ROW	328	487	657	785		1213	1418			2418				6218		7420
6 ROW	368	552	742	891	1243	1369	1607				3616		4794	6929	7560	8440
8 ROW	406	618	828	988	1373	1520	1781	2216	2518	3108	3984	4699	5330	7611	8320	9330
			BI	_OW-T	HRU C	LIMA	TE CHA	ANGER	RS						1.00	
CASING ONLY		605	765	810		1095	1260	1425	1600	1810	3250	3650	4025	4580	5030	5530
2 ROW	1.1.1	754	935	1027	1158	1405	1614	1839	2070	2472	3982	4463	4983	5839	6436	7142
4 ROW	1.1	817	1022	1135	1288	1558	1803	2070	2339	2808	4348	4907	5535	6528	7240	8114
6 ROW		882	1107	1241	1423	1714	1992	2298	2609	3168	4766	5367	6069	7239	8018	9046
8 ROW .		948	1193	1338	1553	1865	2166	2521	2863	3498	5134	5809	6605	7921	8824	9998
				the start	ACC	ESSOF	RIES		0.50 20	all sold	Stark.					dani.
FLAT FILTER BOX		A Sector	-	Sales and	de se	5 °		Long St.	a design	C. States	100			Add to		1.4. 51
THROWAWAY	28	38	45	68	73	76	92	113	120	135	170	180	210	335	S. And	
LOW VELOCITY PERMANENT	33	47	56	84	91	97	117	145	155	183	222	234	284	426		
HIGH VELOCITY PERMANENT	51	63	75	108	120	131	156	193	207	257	306	338	365	582		1.00
MEDIUM FILTER BOX	1.1		12.5			5. 11	1.0	11.14.55	1623.58	States?	Kennen	in the second		Sec.	142.20	
THROWAWAY	76	101	144	171	178	228	247	303	324	355	370	456	520	565	655	775
LOW VELOCITY PERMANENT	84	117	162	195	204	260	284	348	373	413	429	546	631	695	805	950
HIGH VELOCITY PERMANENT	96	141	190	231	248	312	347	428	456	513	557	706	799	935	1085	
HIGH CAPACITY BOX								114								
THROWAWAY	111	148	170	192	229	260	278	330	398	425	470	535	590	680	789	930
LOW VELOCITY PERMANENT	120	166	194	223	261	305	324	393	568	512	574	660	735	865	1000	1180
HIGH VELOCITY PERMANENT	136	198	230	271	317	360	296	489	576	648	742	852	950	1160	1345	1585
ROLL FILTER	80	114	142	158	187	204	219	250	290	363	430	475	500	750	870	1025
COMB. FILT-MIX BOX	1.000		-			Carlos .									0.0	11020
THROWAWAY	115	168	248	286	300	315	358	400	490	620	710	790	885	1133	1310	1550
LOW VELOCITY PERMANENT	122	184	266	310	324	345	393	441	540	686	780	874	997	1265		1730
HIGH VELOCITY PERMANENT	134	208	298	346	368	397	456	521	625	786	906	1035	1165	1505		2060
MIXING BOX	82	118	160	182	256	270	319	340	380	437	519	623	750	869	1010	1185
EXTERNAL FACE AND BYPASS	40	58	96	112	154	161	170	216	292	417	457	470	618	925		1265
INTERNAL FACE AND BYPASS	30	53	77	100	109	113	124	184	223	327	334	363	441	535	10/0	1205
FACE DAMPERS	39	55	91	106	111	115	142	225	232	297	312	370	446	543		-

### TABLE 2 – Approximate Motor Weights – Open, Drip Proof, 1800 RPM

MOTOR HORSEPOWER	1/4	1/3	1/2	1	1-1/2	2	3	5	7-1/2	10	15	20	25	30	40	50	60	75
MOTOR WT. (LBS.)	20	20	25	33	44	44	71	82	127	144	187	214	263	300	409	460	560	640

### TABLE 3 – Fan Data

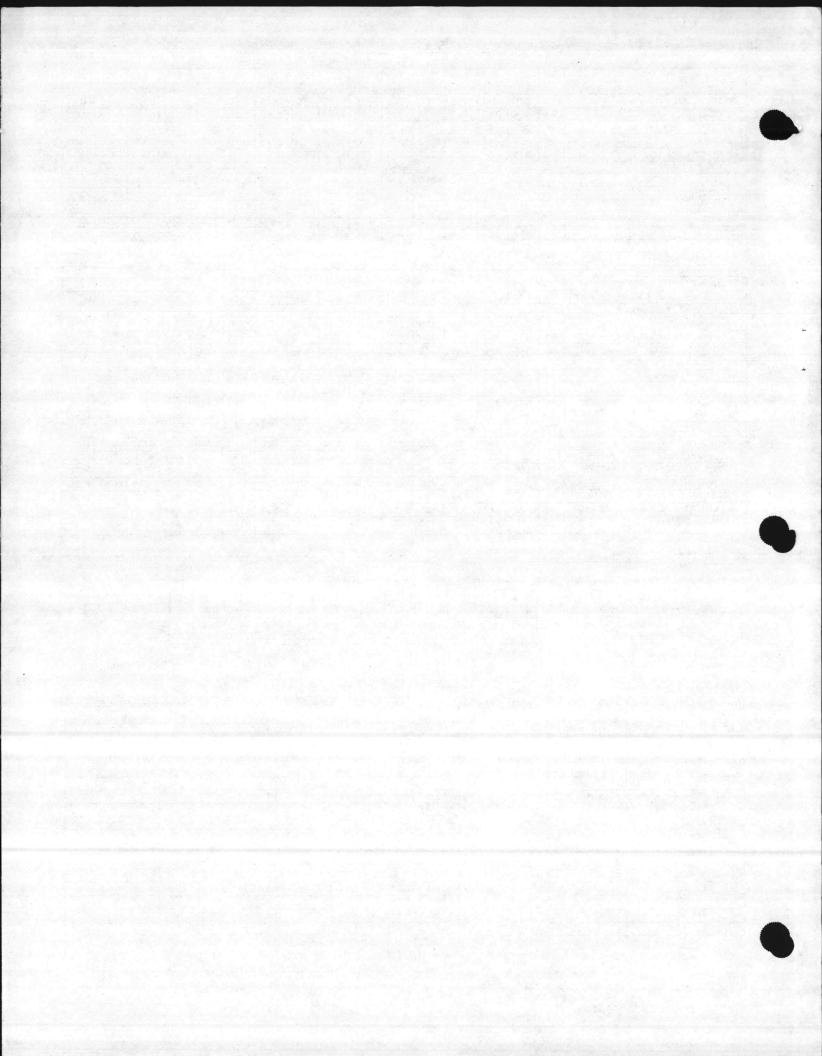
	FAN SIZE	AND TYPE
UNIT	. LOW	MED.
SIZE	PRESS.	PRESS
3	1 - 9" FC	1 - 7-1/2" FC
6	1 - 12-1/4" FC	1 - 10-1/2" FC
8	1 -15" FC	1 - 13-1/2" FC
10	1 - 16-1/2" FC	1 - 15" FC
12	1 - 18-1/4" FC	1 - 16-1/2" FC
14	1 - 20" FC	1 - 18-1/4" FC
17	2 - 15" FC	2 - 13-1/2" FC
21	2 - 16-1/2" FC	2 - 15" FC
25	2 - 18-1/4" FC	2 - 16-1/2" FC
31	2 - 20" FC	2 - 18-1/4" FC
35	1 - 30'' BI	1 - 27" AF
41	1 - 33" BI	1 - 30'' AF
50	1 - 36-1/2" BI	1 - 33" AF
63	1 - 40-1/4" BI	1 - 36-1/2" AF
73		1 - 36-1/2" AF
86		1 - 40-1/4" AF

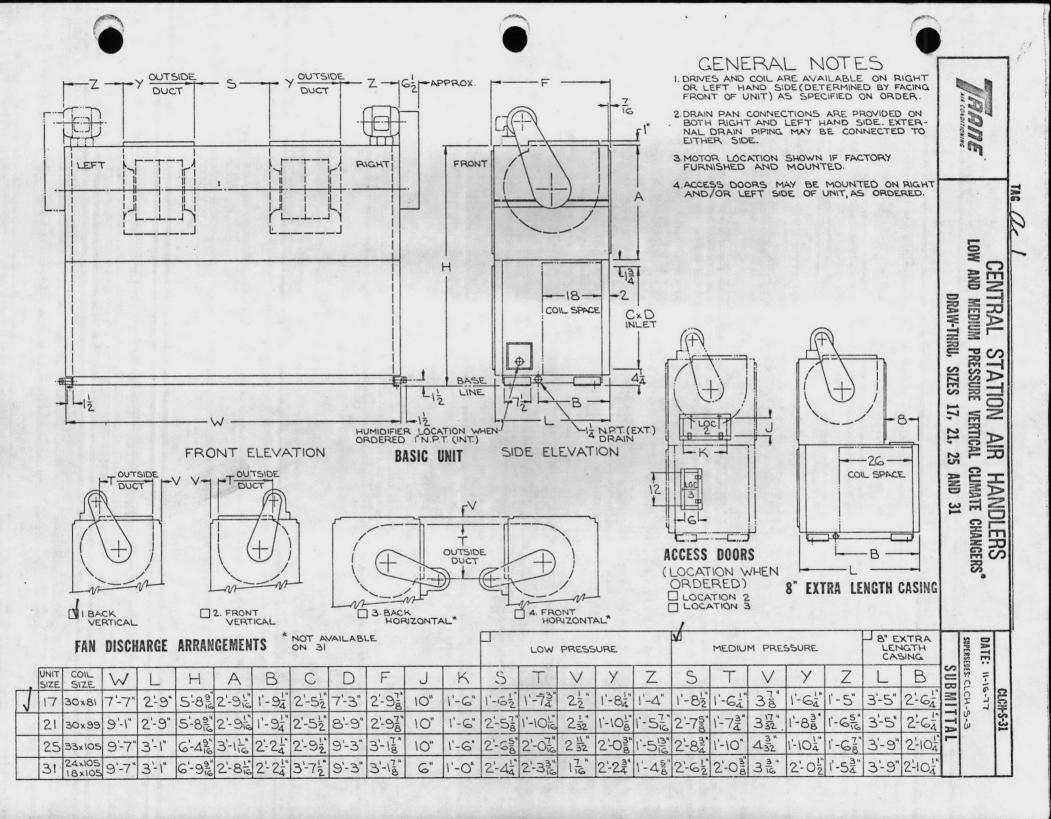
### TABLE 4 - Water and Steam Coil Connections

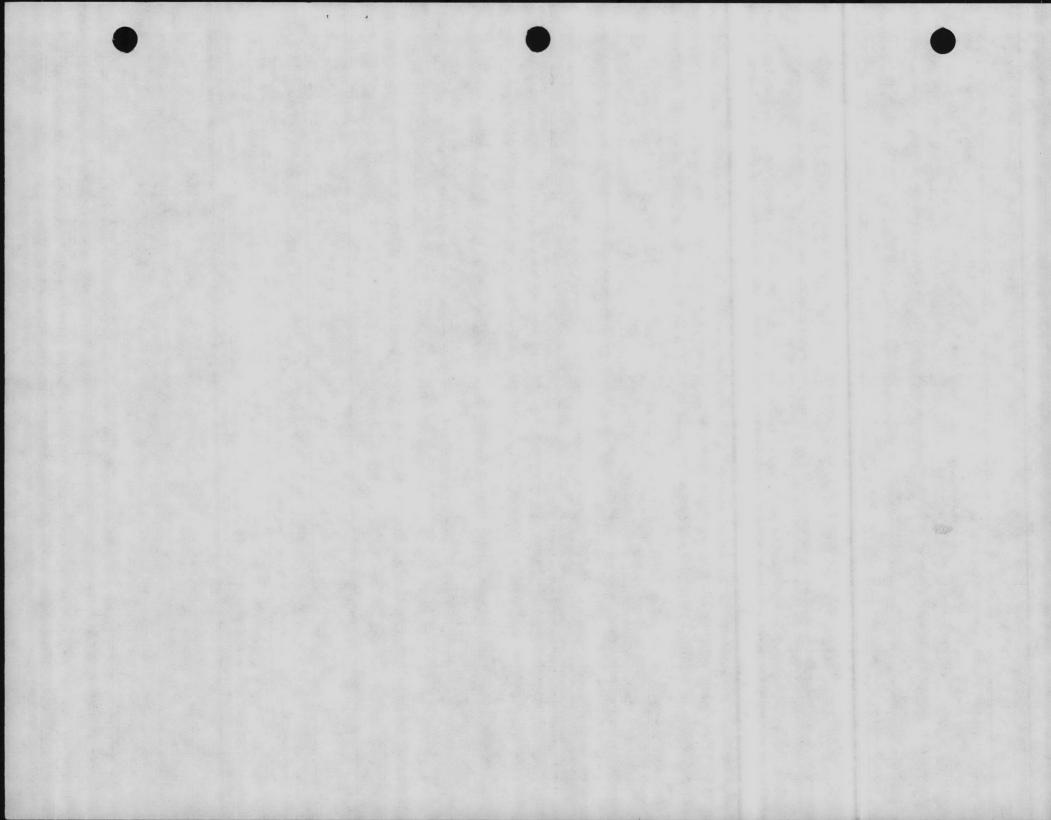
Television of the second	HEADER	C	ONNECTION	SIZE (N.P.T.)
COIL TYPE	HEIGHT	SUPPLY	RETURN	DRAIN & VENT
W-WATER	18, 24, 30, 33	2-1/2	2-1/2	1. The shares
D - WATER	18, 24, 30, 33	2-1/2	2-1/2	1/2 (EXT.)
DD - WATER	18, 24, 30, 33	2-1/2	2-1/2	1/2 (EXT.)
K - WATER	18, 24, 30, 33	2-1/2	2-1/2	
P2 - WATER	12, 18, 24, 30	3/4	3/4	Country Charles
P4 - WATER	12, 18, 24, 30	1	1	
P8 - WATER	18, 24, 30	1-1/4	1-1/4	a farma and a far
A - STEAM	18, 24, 30, 33	2-1/2	1	
AW - HOT WATER	18, 24, 30, 33	2-1/2	2-1/2	24)
WC - HOT WATER	12, 18	1	1	11
WC - HOT WATER	24	1-1/4	1-1/4	
WC - HOT WATER	30, 33	2-1/2	2-1/2	
N, NS STEAM	12	1-1/2	1	the other many speciel and
N, NS STEAM	18	2	1	poles (1996) Tark (19
N, NS STEAM	24	2-1/2	1-1/4	
N, NS STEAM	30, 33	3	1-1/4	

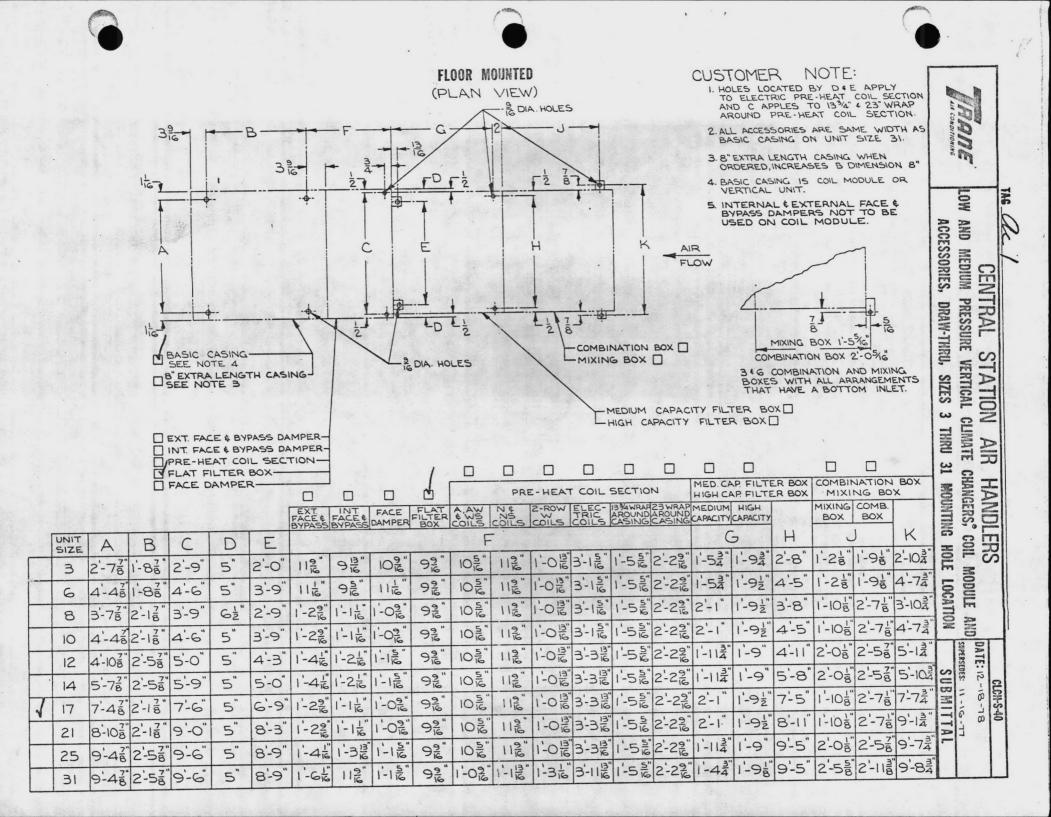
All 12" header height coils, Types A, AW, D, K and W, supply 1-1/4 N.P.T., return 1-1/4 N.P.T.

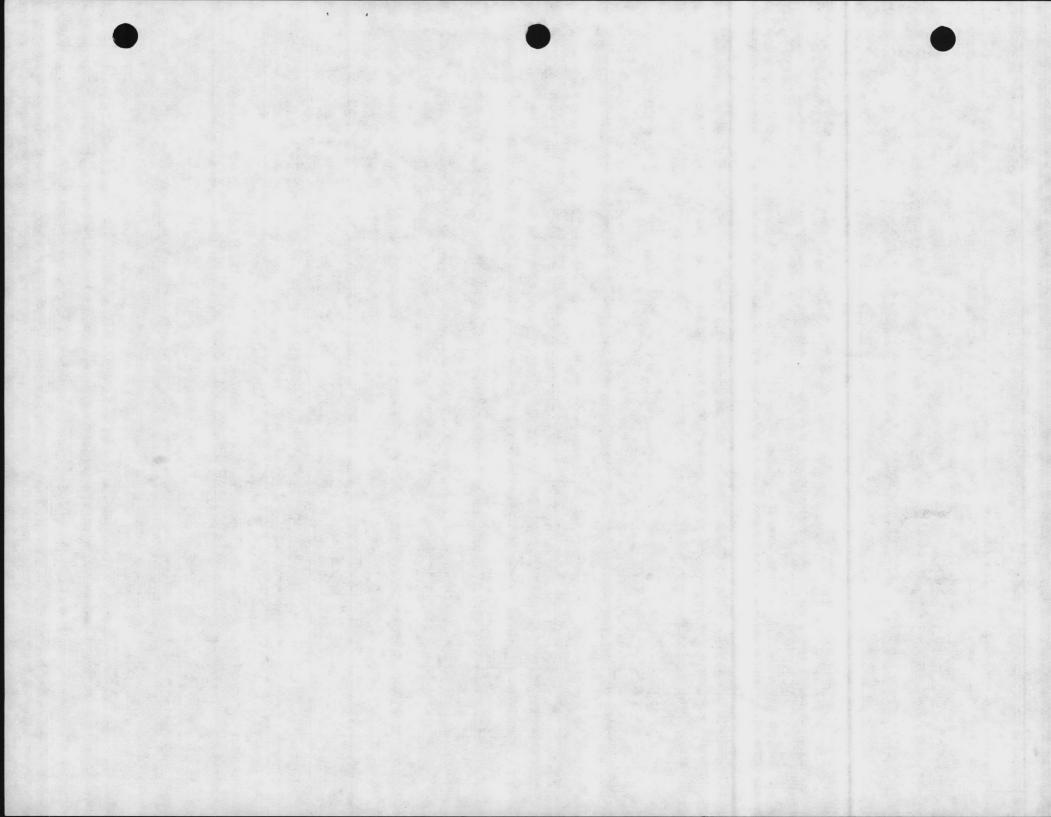
Above connections internal except drain and vent.

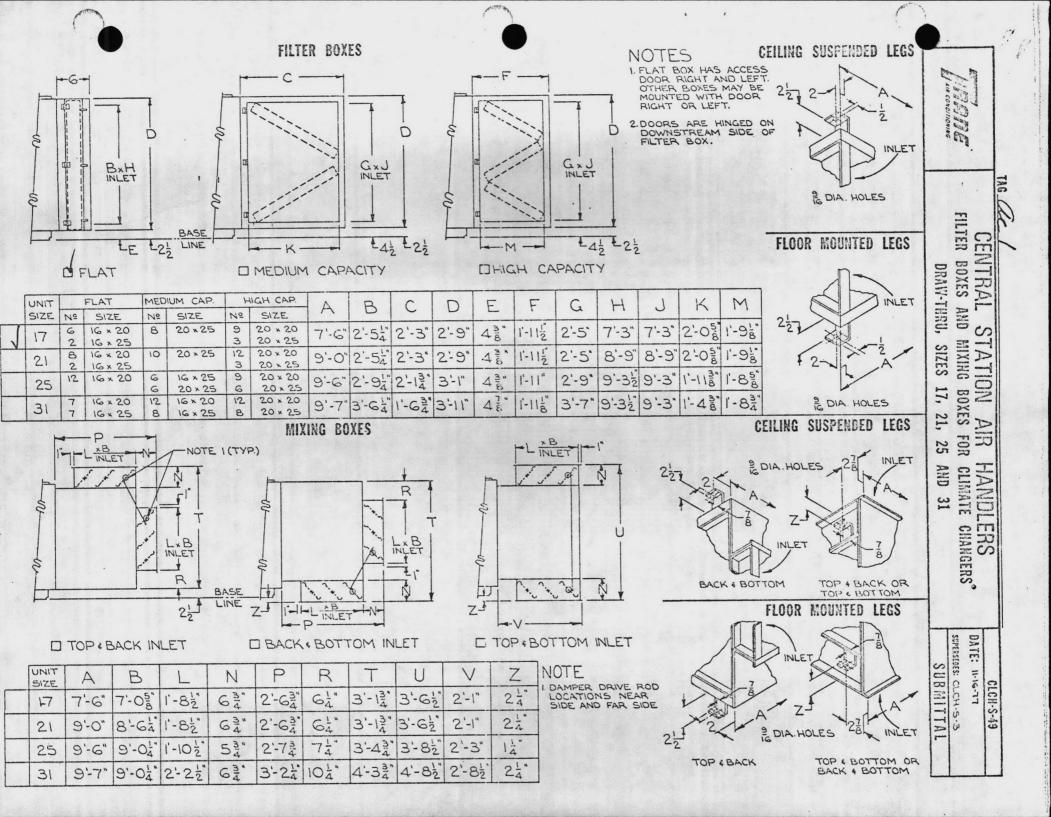


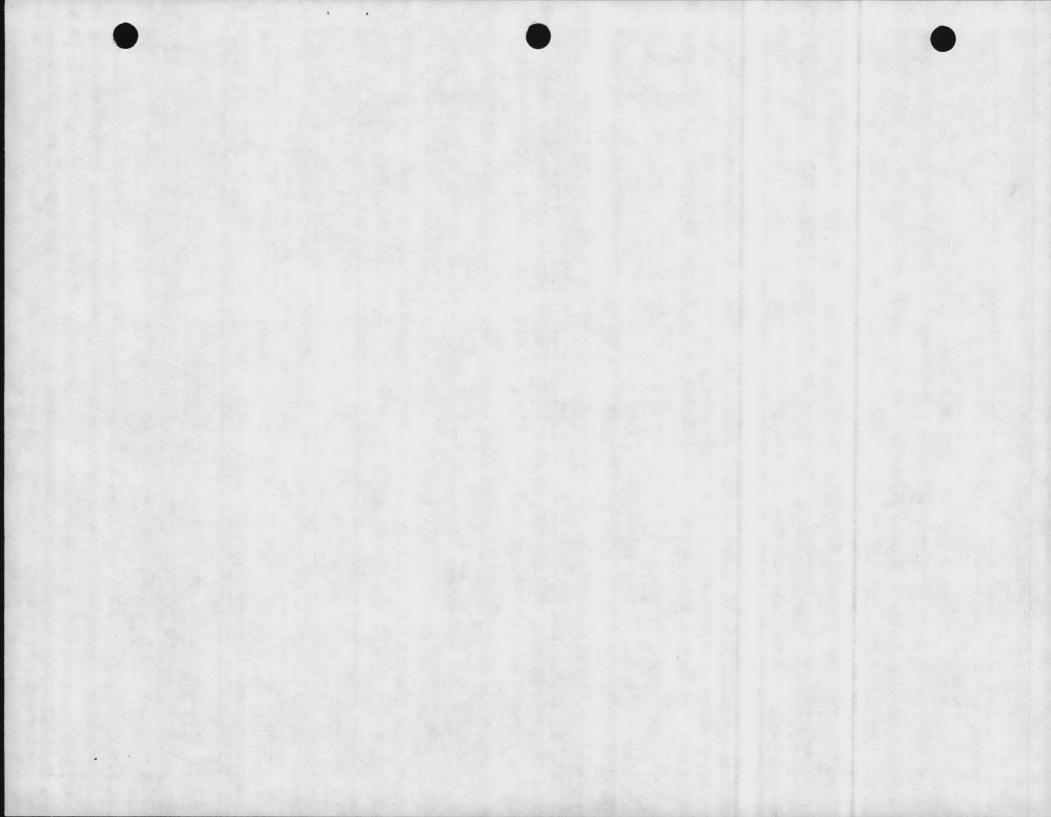


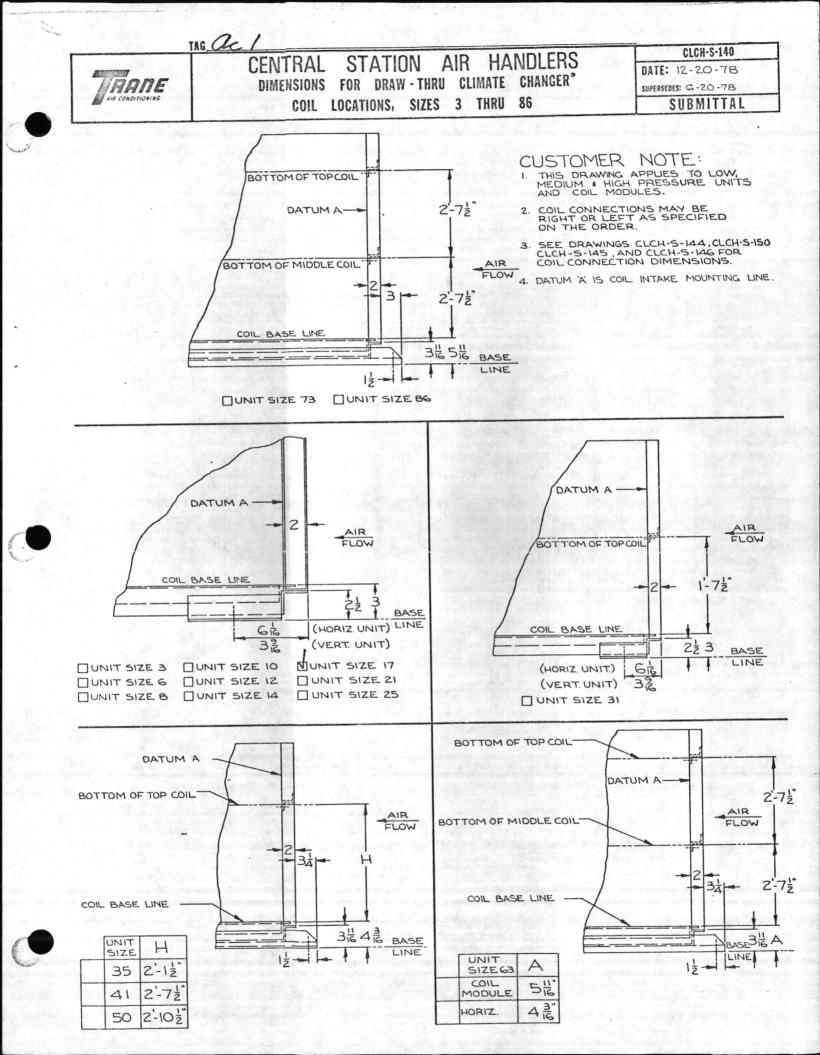


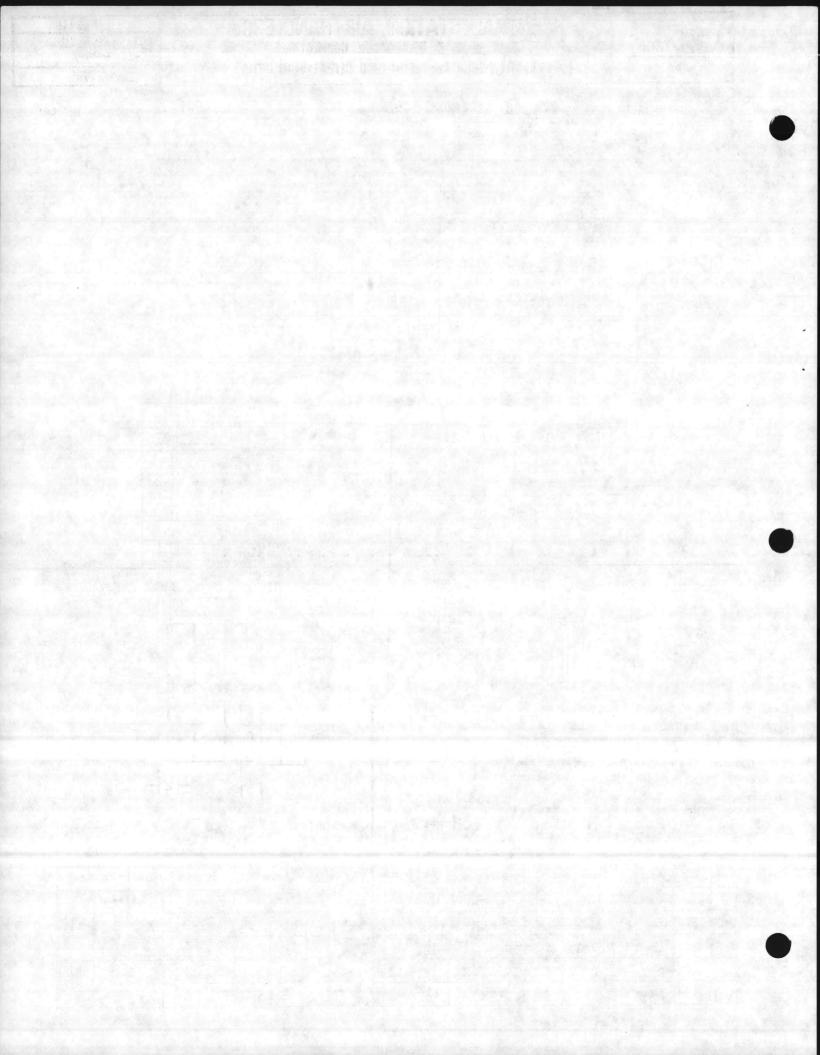














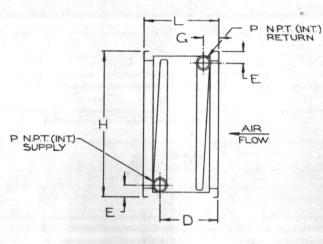
## CENTRAL STATION AIR HANDLERS TYPE W, D, K, NS, DD COIL CONNECTIONS FOR DRAW-THRU AND BLOW-THRU CLIMATE CHANGERS<sup>®</sup>

CLCH-S-144 DATE: G - 1G - 78 SUPERSEDES: SUBMITTAL

GENERAL NOTE

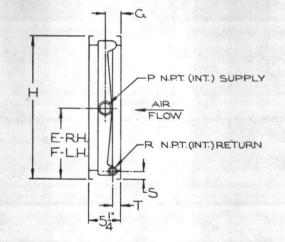
IAU\_

I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.



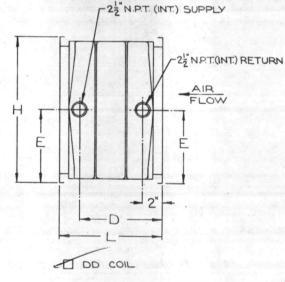


					2	ROW	4	ROW	6	-Row	W B-ROW		
COIL	H	E	G	P	L	D	L	D	L	D	L	D	
12	131	19"	21	14"	61"	48	91:	73"	121"	103"	15 2	13 3	
18	192	24"	1519	$2\frac{1}{2}$ "	61"	4%	912"	7%	121"	10%	151	13%	
24	251	$2\frac{1}{4}$ "	1510	21:	61	4 16	912"	7%	$12\frac{1}{2}$	10%	151	13%	
30	312"	$2\frac{1}{4}$ "	1510	$2\frac{1}{2}$ "	61	4%	912"	7 2"	121	102:	152	13%	
33	341	$2\frac{1}{4}$	510	212"	612	4 16	91"	7 26	and the second se		151	13%	



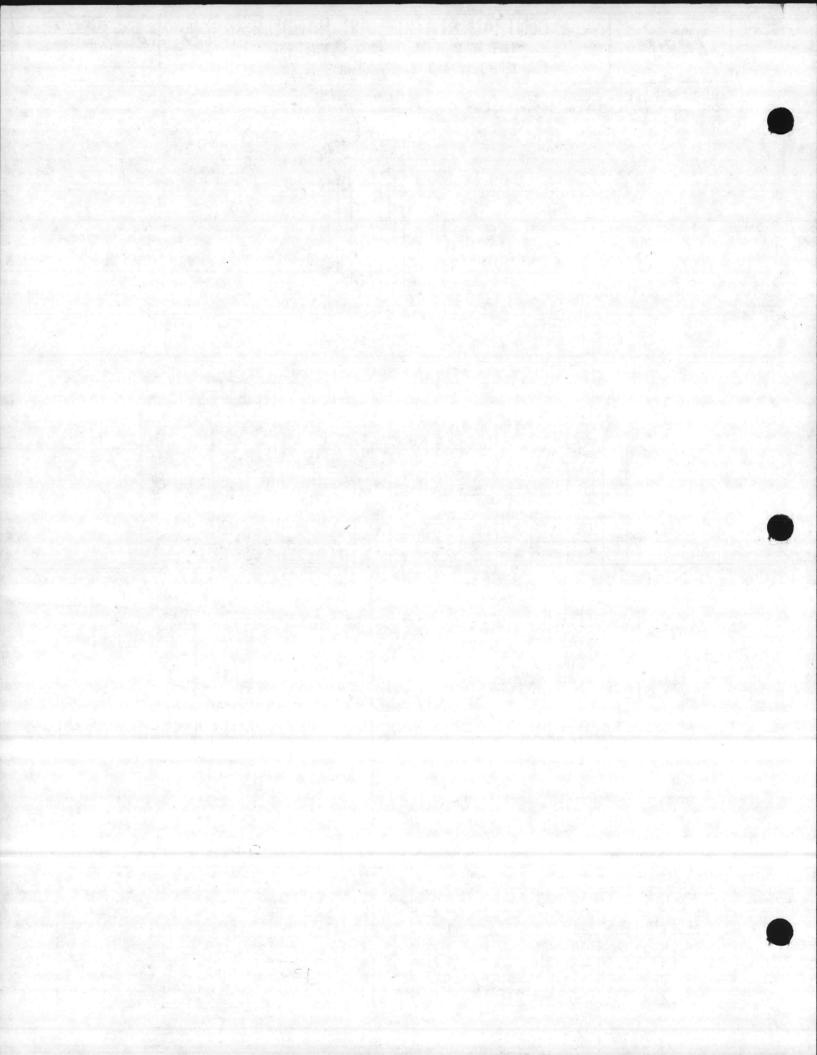
### I-ROW NS COIL

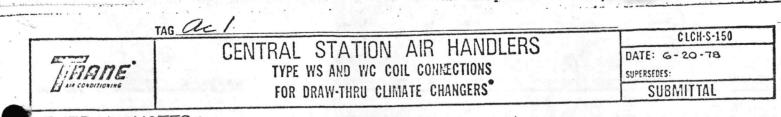
 COIL	Н	E	F	G	Ρ	R	S	Т
12	132	54"	81	23	12"	۱"	113"	15
18	192"	84	114"	212"	2"	۱"	13"	15"
24	252	$11\frac{1}{4}$ "	144"	21	212"	14"	12"	14"
30	312"	144"	174	21"	3°	14"	12"	14"
33	341	174"	174"	$2\frac{1}{2}$	З"	14"	112"	14"
		Charles and the	Contraine Press					



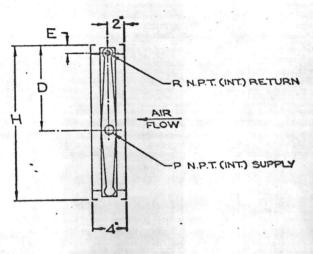
				4-	ROW	8-	ROW
in the second second second second second second second second second second second second second second second	COIL	H	E	L	D	L	D
i a	18	191"	94"	912"	712"	151	132"
	24	251	123	91"	712"	151"	1312"
/	30	312"	154	912"	712"	152"	131
	33	341	174"	91"	71="	151	131



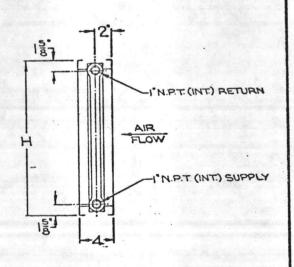




GENERAL NOTES: 1. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.

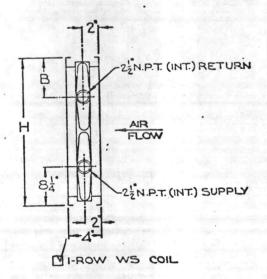


	SIZE	H	D	E	P	R
	24	251	132	13	14	14
1	30	312	171	150	21	12
1	33	342	184	15:	212*	12"

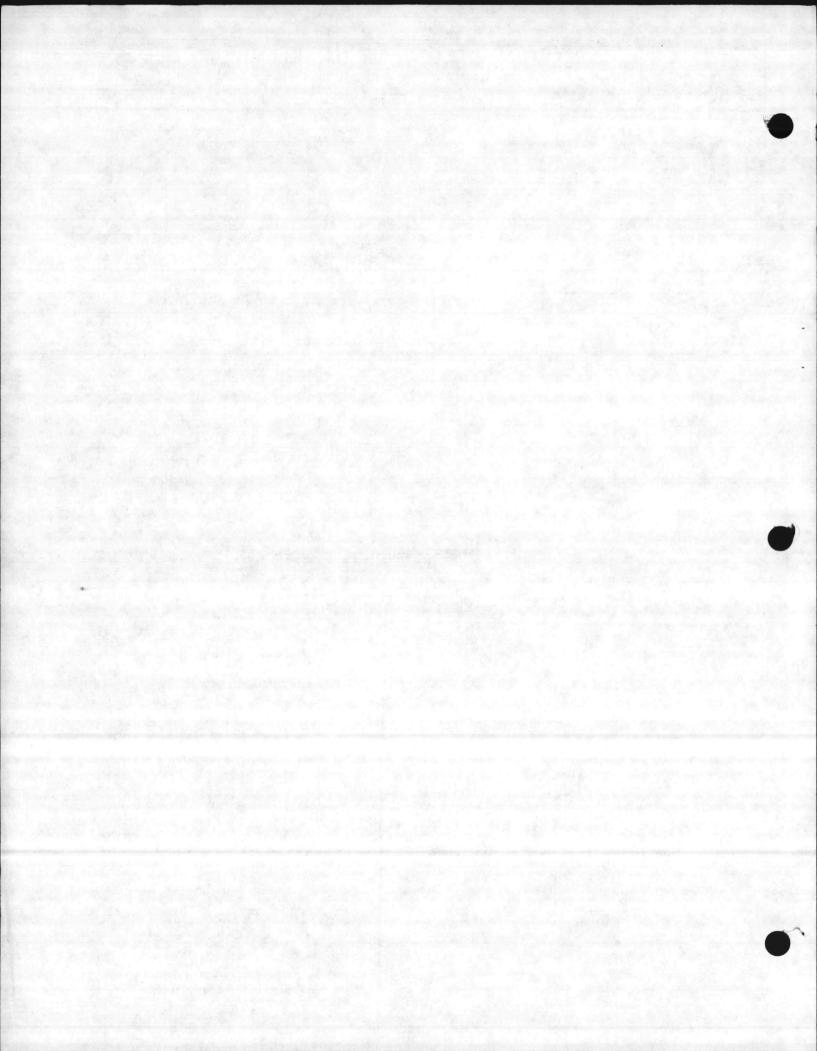


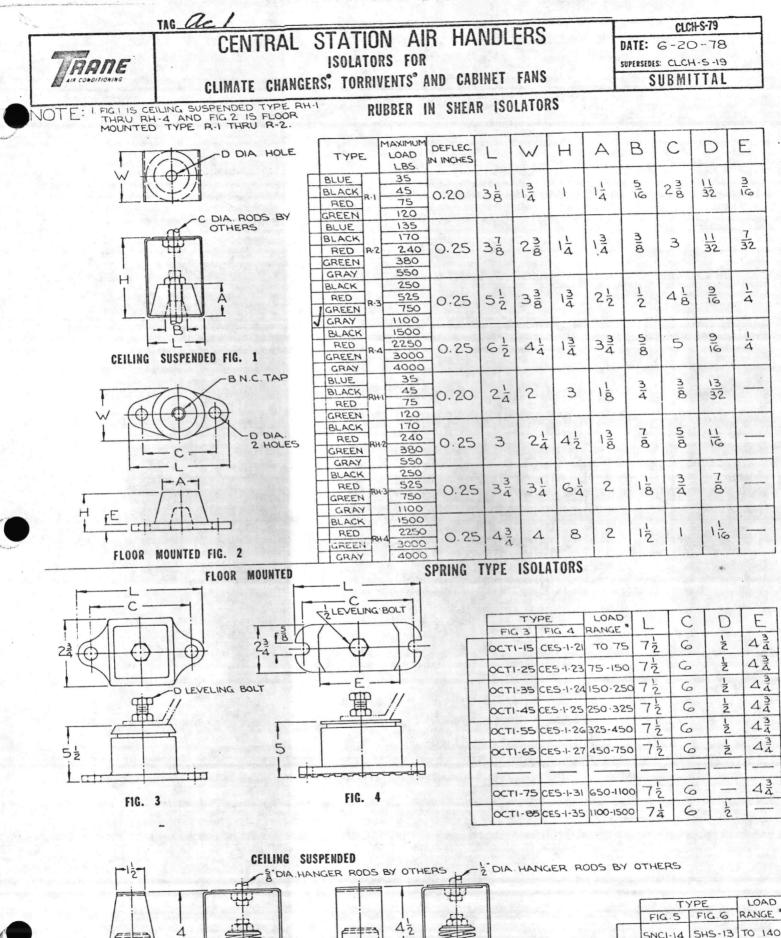
DWC COIL

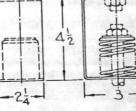
SIZE	H	
12	132	i,
18	192	ĺ



	SIZE	н	B
T	30	312	84
	33	342	94



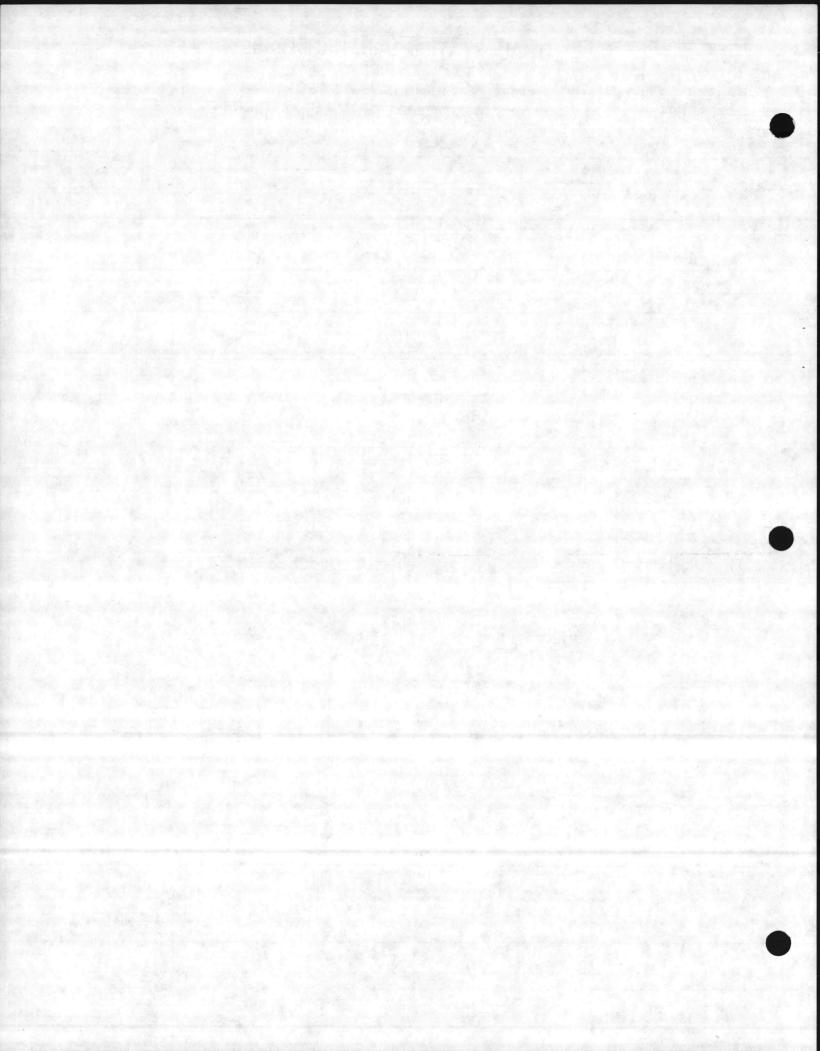




	TY	PE	LOAD
	FIG.5	FIG.6	RANGE *
	SNCI-14	SHS-13	TO 140
	SNCI-26	SHS-14	50 - 260
	SNCI-45	SHS-17	100-450
10.2	SNCI-70	SHS-18	200-700

FIG. 5

23

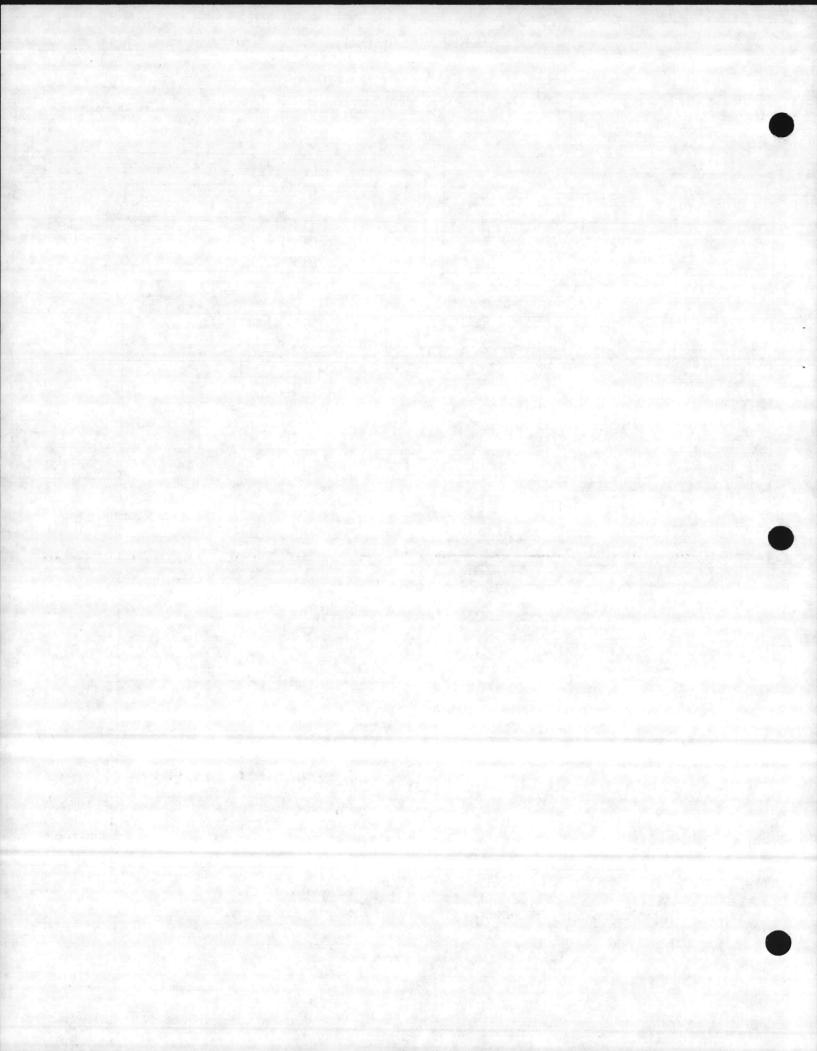


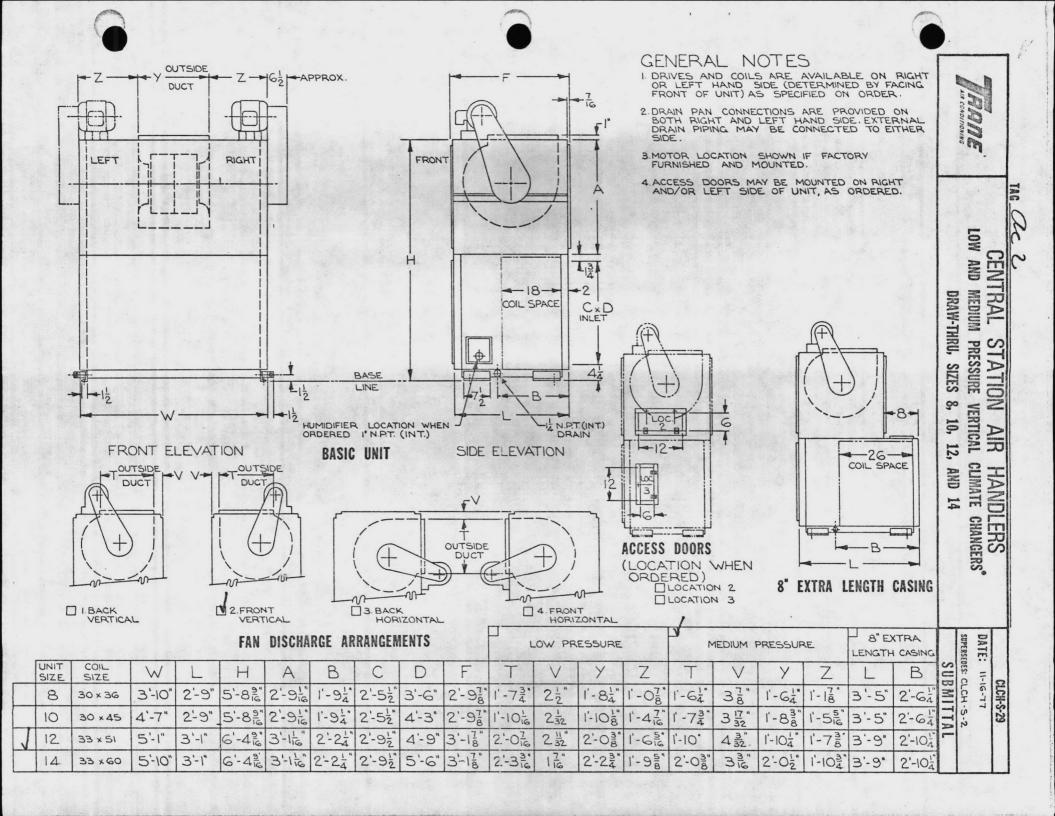
# SUBMITTAL DATA DRAW-THRU CLIMATE CHANGER®

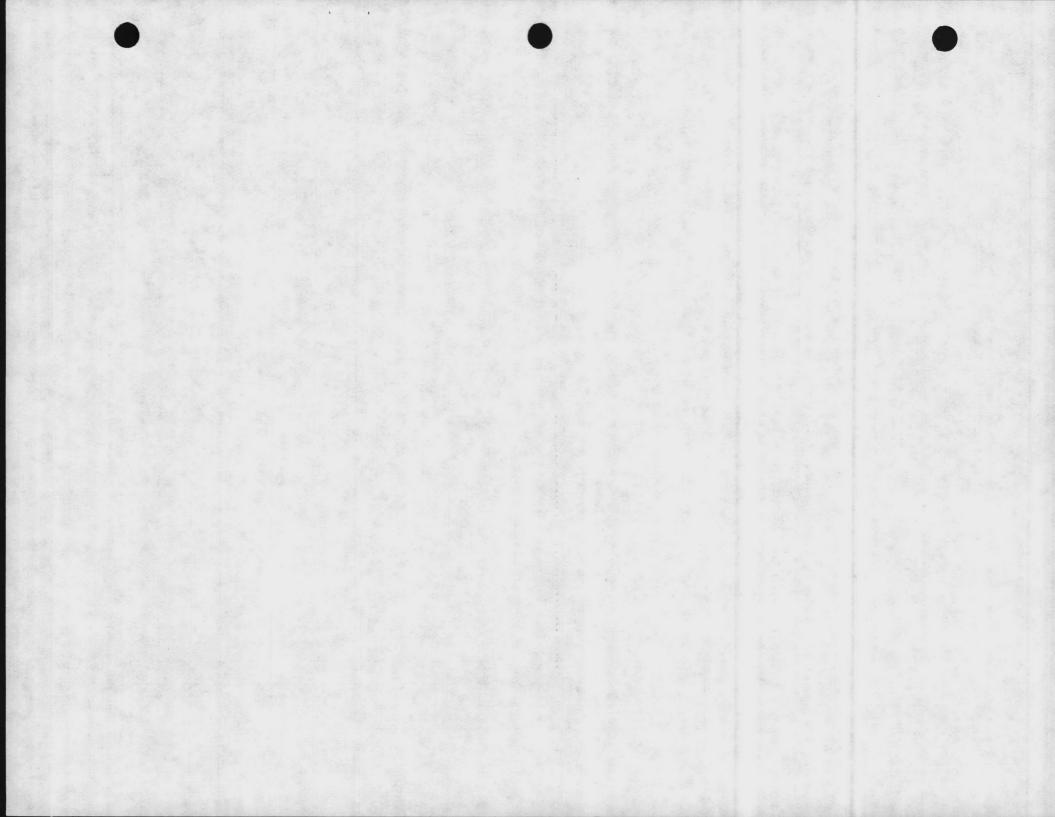


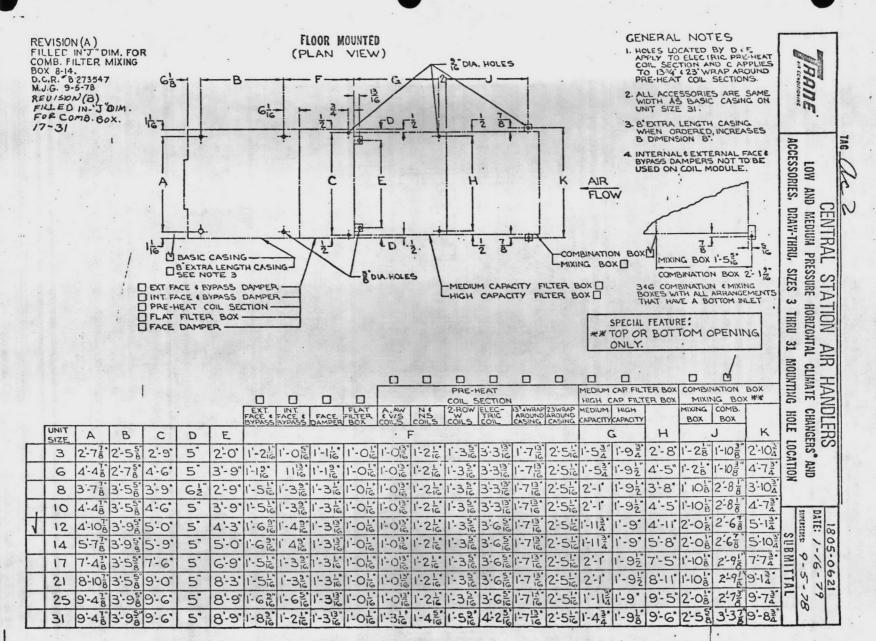
ANTITY ]		MODEL	12 Me Front	dium ver	pressur tical di	scharg	ge		RANE S	o. KF	3-J094
AGGING AC-2					A	-					
10 C 10 C	FAN						OTOR				SUBMITTAL
FM	5700		9•C	_	НР	- 5	10				Clch S/MS1
SP	1.0			-	RPM	181				1	Clch S29
5P	2.29			-	FRAME	1.61	0/60/	3			1805-0621
	966		14 A.		TYPE	Ope		y march	laster d		
RIVE SERVICE FACTOR	Varia	ble l.	2		MOUNT	Le					Sharp Str.
С	вн	EAT °F	LA	T °F	COIL	I CTTA	PM, MPRESS.	WATER	TEMP.	WPD	
A COIL BANK	/ -	DB WB	DB	WB	APD F		. TEMP.	IN	OUT	(FT)	
A PREHEAT SECTION	-17	6.664.	6/18	61.8 1	1.18	W 52		404	9.82	.9	and the state of the
Τ	and a second second second second second second second second second second second second second second second	5.3	78.			-IW 3.	5	180 1	34	.1	
Y SECONDINCASING				OT.CIR.					COIL SI	UPPLY	
D COIL BANK QTYTY	DEDOWE	ER. WIDE	LONG	PER	COIL DIST.	TURBS.	TUBE M	ATERIAL	CONNE	CTION	
S PREHEAT				$\checkmark$	$\times$	1 1			1.15		And And State
R SECTION		22						· · ·			Clch S14
P FIRST IN	N 6	18	51			no	cor	per	rig	ht	Clch S14
I SECOND IN 1		33				110		<u></u>			Clch S150
	WS 1	15	51			lyes	cor	per	rig	ht	I
						CASIN	G OPTI	ONS			1
	ssories				UL LISTED	CASIN	GOFTI	none	)	1997	
ACE DAMPERS	none		a a a a a a a a a a a a a a a a a a a	-	FAN TYPE			FC	14		
XT. FACE & BYPASS	none		and the		FAN PARAL	LEL CONTI	ROL	none			A State of the
ILTER BOX	none	,		_	INLET VANE	S		none	3/4 1	h	1805-0700
OMB. FILTER MIXING BOX					INSULATION			yes	(D)	<u> </u>	
ILTERS	none	waway		_	GALV. DRAI			none	3		No. 12 Lan
IXING BOX	none	supplier and an in the second			MAX. SPACE			none			1.1.1.1
CCESS SECTION	none										a state of the
UMIDIFIER	none		ha na angali	_	SPECIAL FEA	TURES:					
CCESS DOOR	none	2		-	Combina	tion f	ilter	Mixi	ng b	ox	
BELT GUARD	yes rubb	per in	shea	r	opening	top &	bott	om ro	ds r	ight	Clch S79
SOLATORS								And Andrews	1. 1. 1. 1. 1.		
APPRO	VAL STAM	P	i i i i i		DSAM	E CO	MME	NTS	AS	FOR	
					AC-						BLANK OF
					AC	1					BOTTOM
- 10											OPENING
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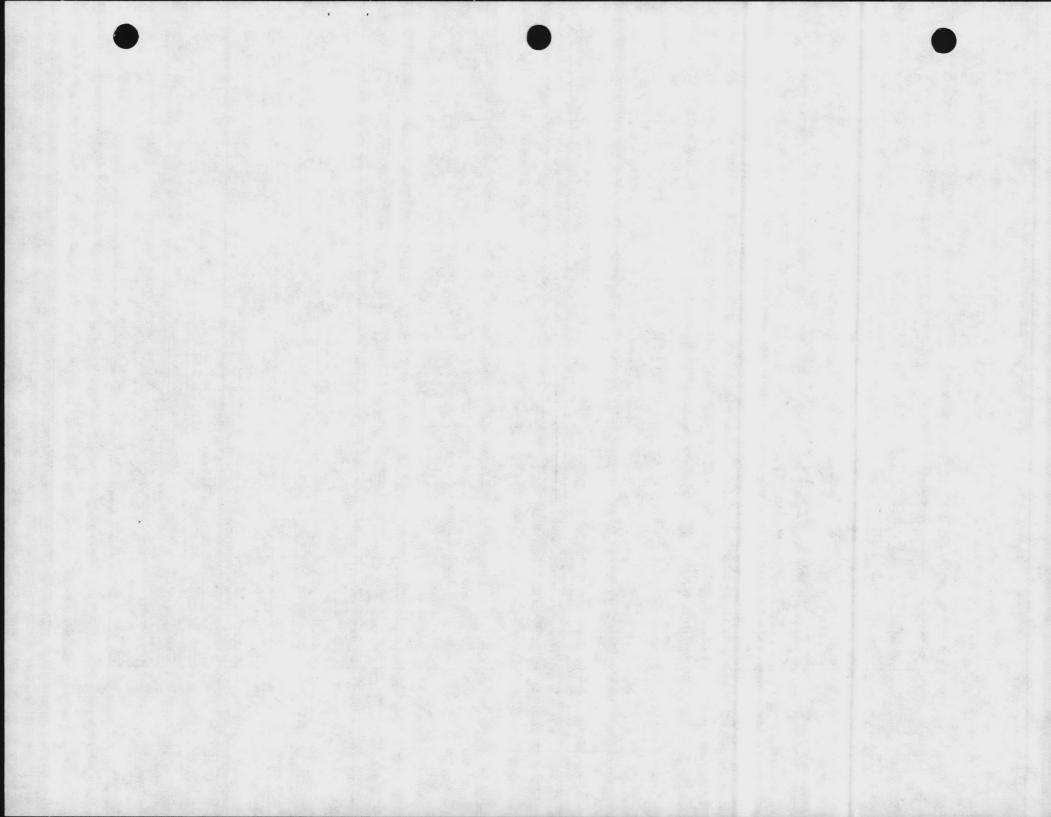
PAGE 2 OF 8

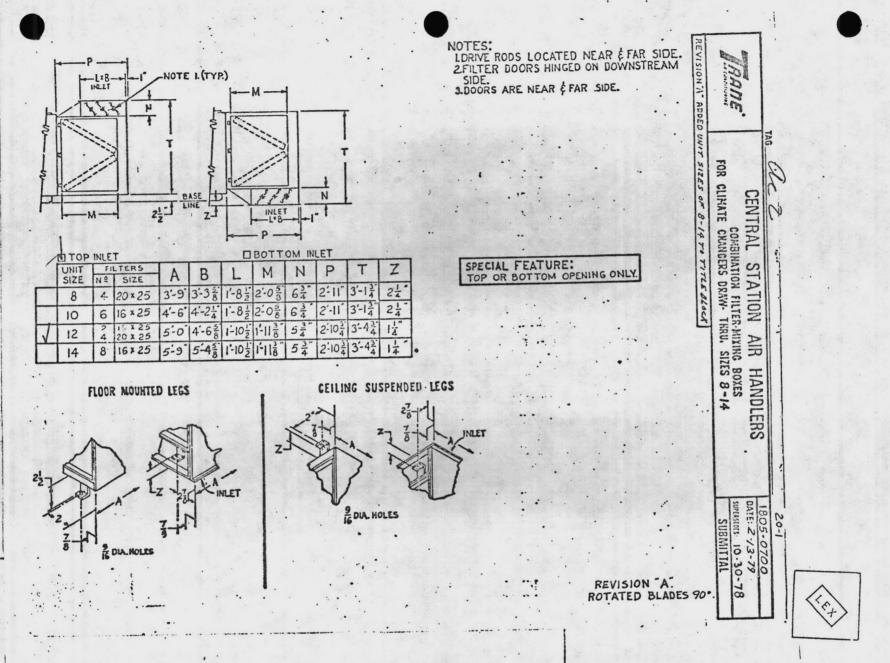


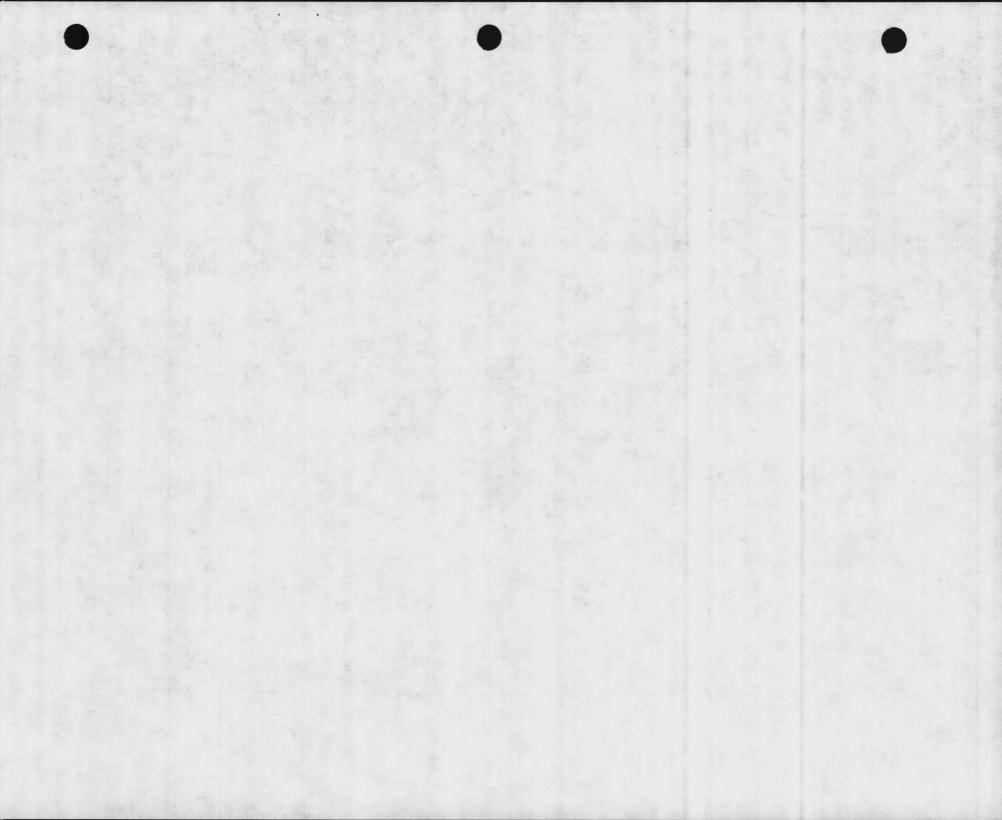


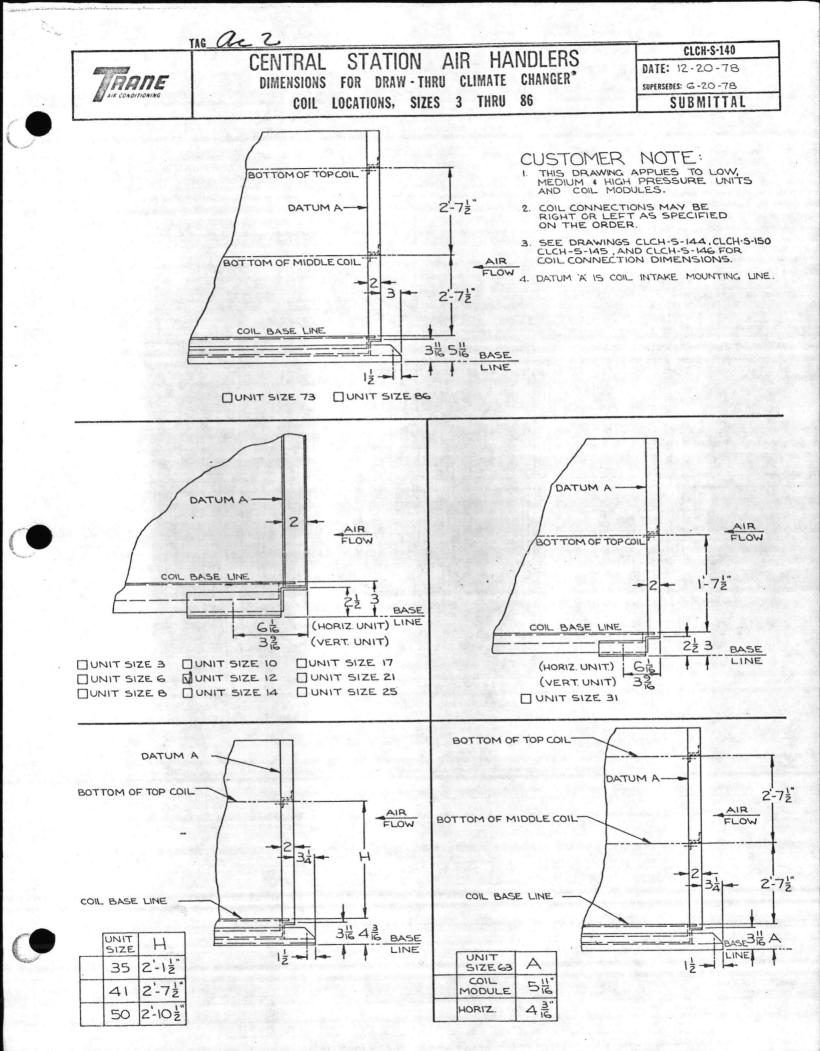


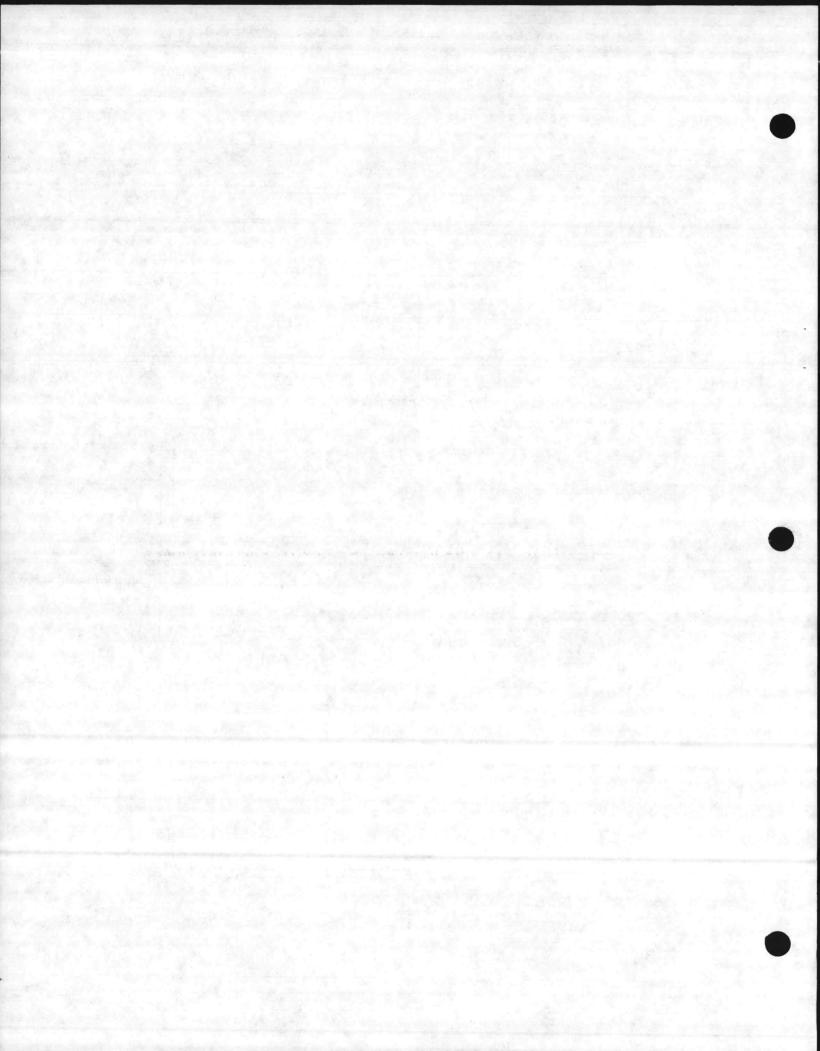


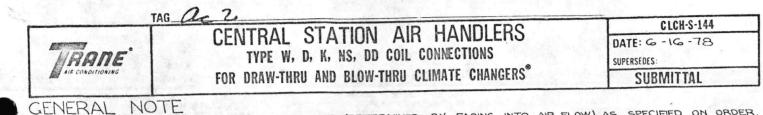




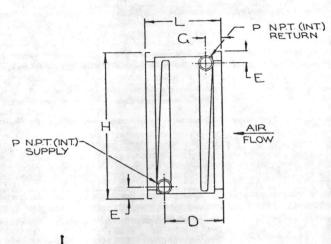






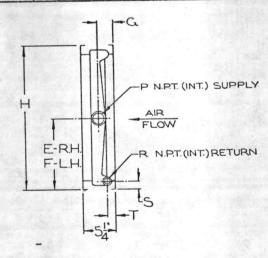


I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.



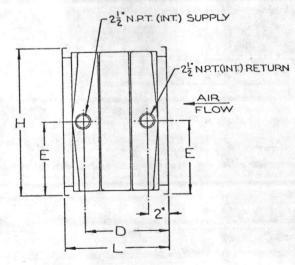
W COILS DO COILS DK COILS

											1			
							2-	ROW	4-	ROW	Y 6.	ROW	8-	ROW
		COIL	H	E	G	P	L	D	L	D	L	D	L	D
[		12	131	19"	21	14"	61"	43"	912	718	121	103"	152	133
		18	192	24	15	212"	61"	4 2"	91:	7%	121	10%	152"	13%
		24	25 2	24"	15	21	61"	4 9"	91	7%	$12\frac{1}{2}$	10%	152	132
		30	312	24"	115"	21"	61"	416	912"	79"	122	109:	152	13 2"
	J	33	342	24	115.	21	61.	416	91	72"	122	10 3	152	13%



### I I-ROW NS COIL

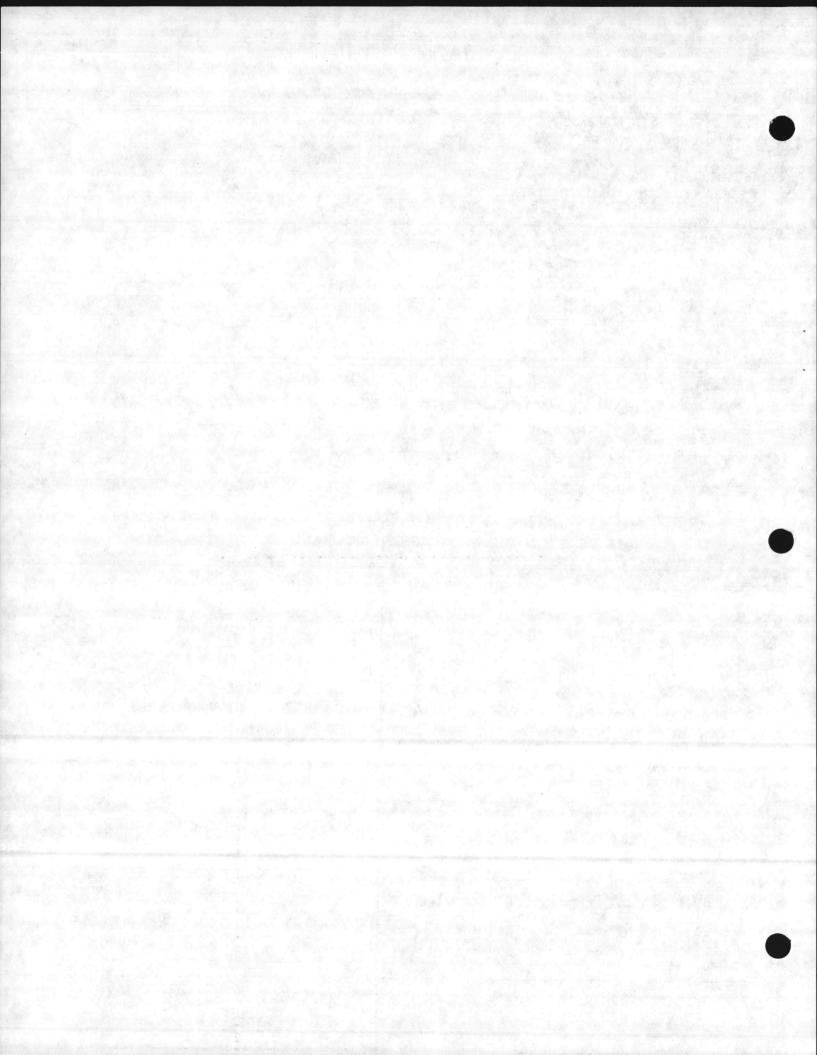
COIL	H	E	F	G	P	R	S	Т
12	132	54"	84	$2\frac{3}{4}$	12"	١"	13"	15
18	192"	84	114"	212"	2"	1"	13"	15
24	252"	114"	144"	21	212"	14"	12"	14
30	312"	144"	174	22	3"	14"	12"	14
 33	341	174"	174"	21"	3"	14"	112"	14



DD COIL

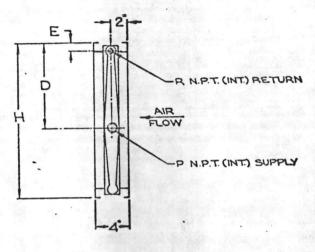
		in spinister 	- ALLIANS	4-	ROW	- 8-1	ROW
	SIZE	H	E	L	D	L	D
	18	1912	93"	91."	712"	152	132
	24	252	123	91"	72"	151"	132
34	30	312"	154	91"	712"	152	132
	33	342	174	91"	71:	152	132





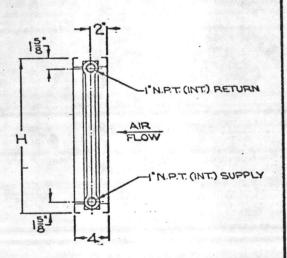
IAU.	ac.2.	CLCH-S-150
TAAne	CENTRAL STATION AIR HANDLERS TYPE WS AND WC COIL CONNECTIONS	DATE: G-20-78 SUPERSEDES:
LI AIR CONDITIONING	FOR DRAW-THRU CLIMATE CHANGERS	SUBMITTAL

GENERAL NOTES: I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.

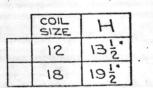


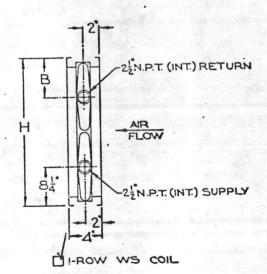
WC COIL

SIZE	H	D	E	P	R
24	251	132	13	14	14
30	312	174"	1510	21	12
 33	341	184	15	212*	12"

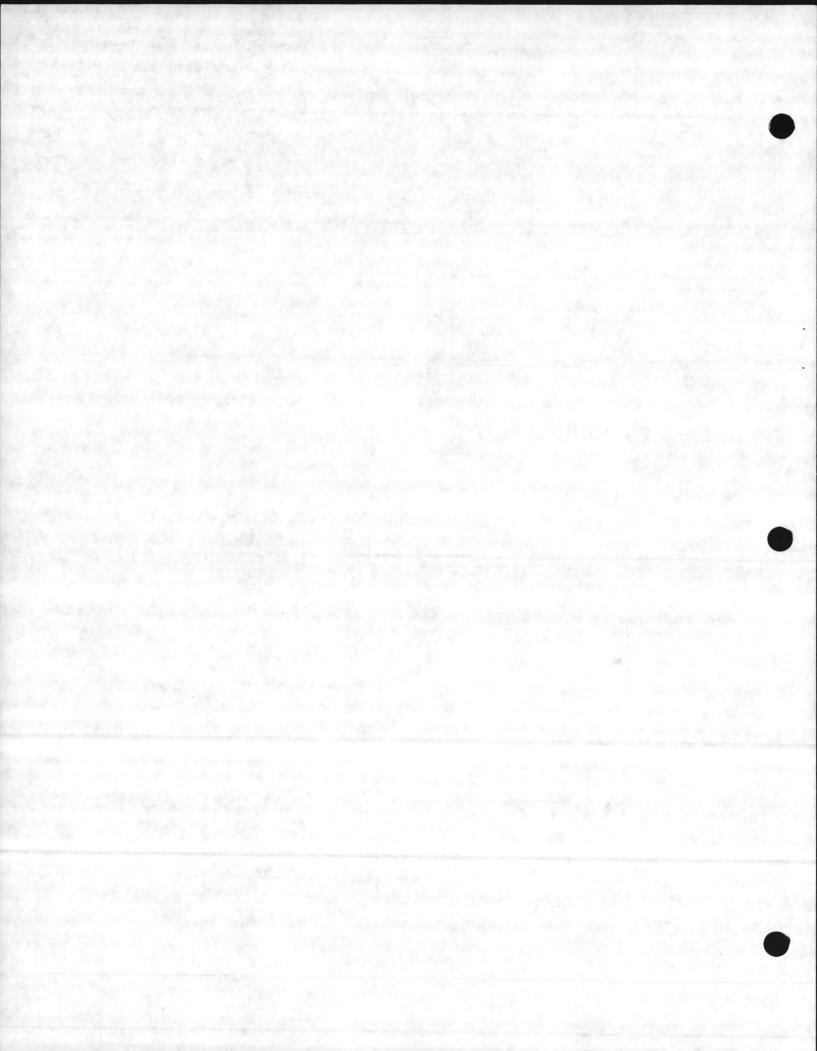








	COIL	Н	B
	30	312	84
1	.33	342	94



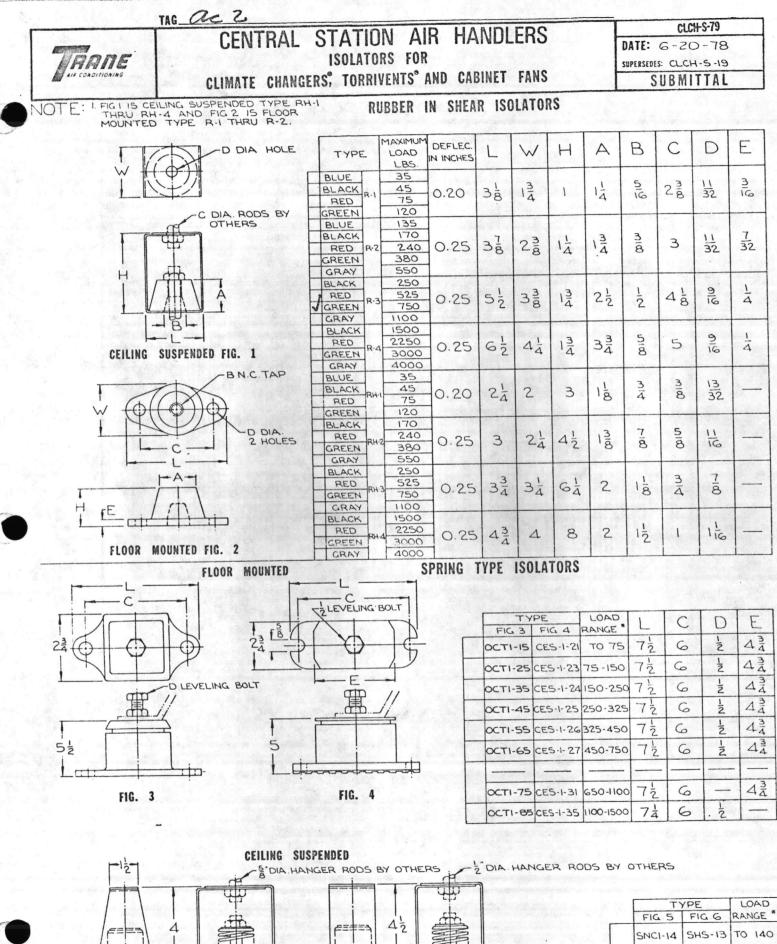
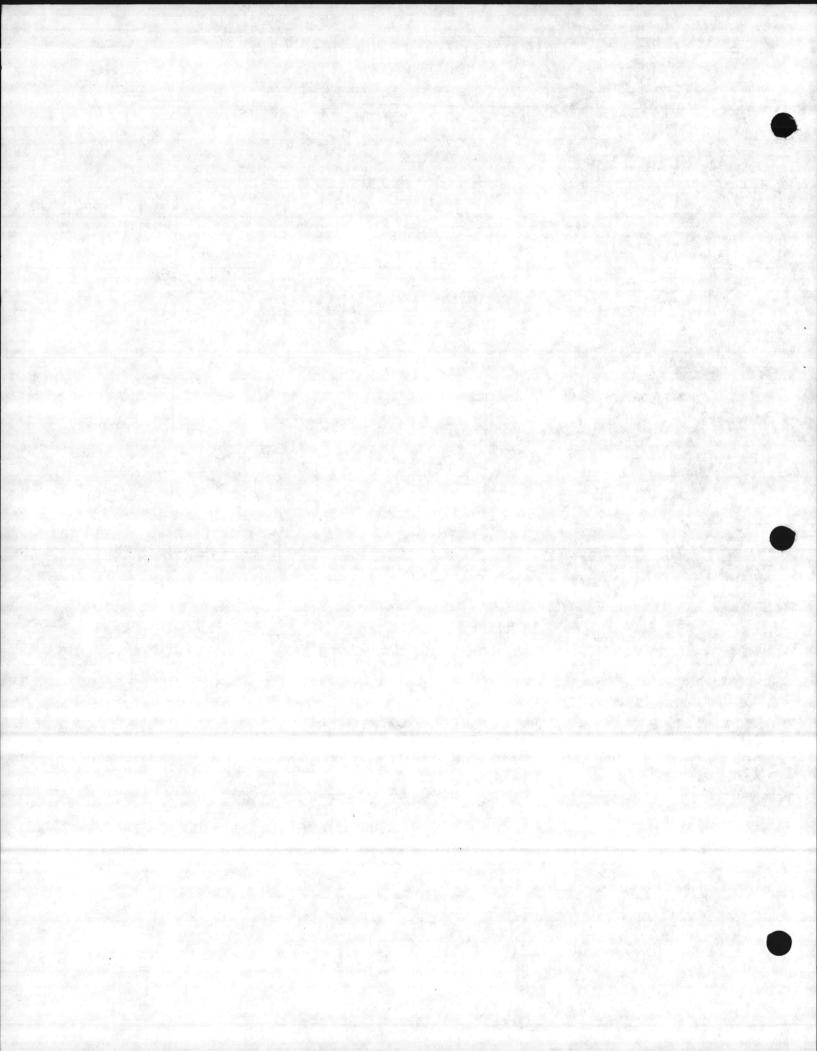






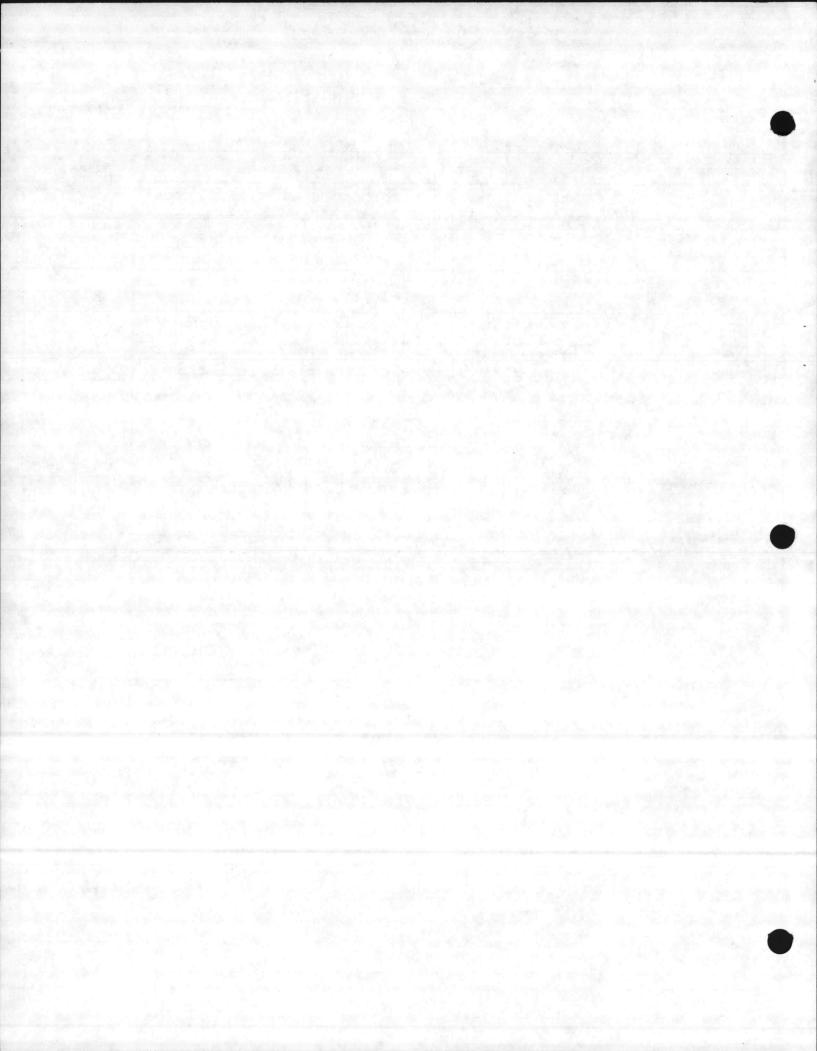
FIG 5	FIG.G	RANGE *
SNCI-14		
SNC1-26	SHS-14	50 - 260
SNCI-45	SHS-17	100-450
SNCI-70	SHS-18	200-700

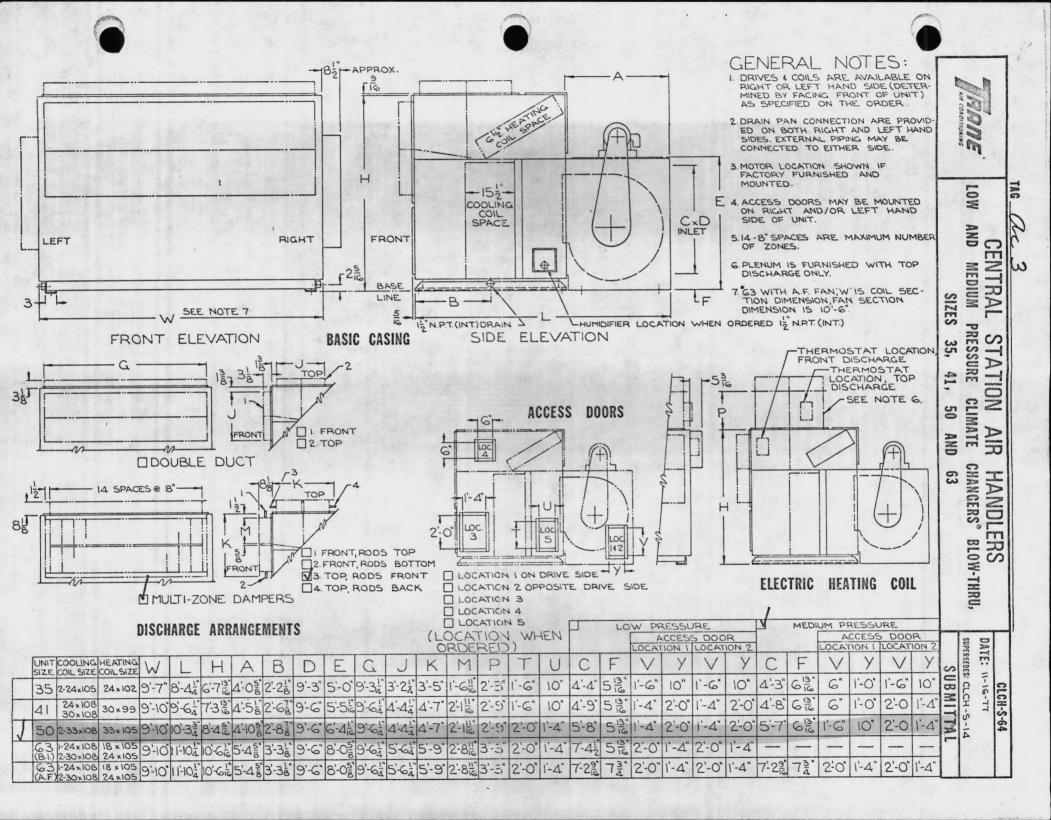


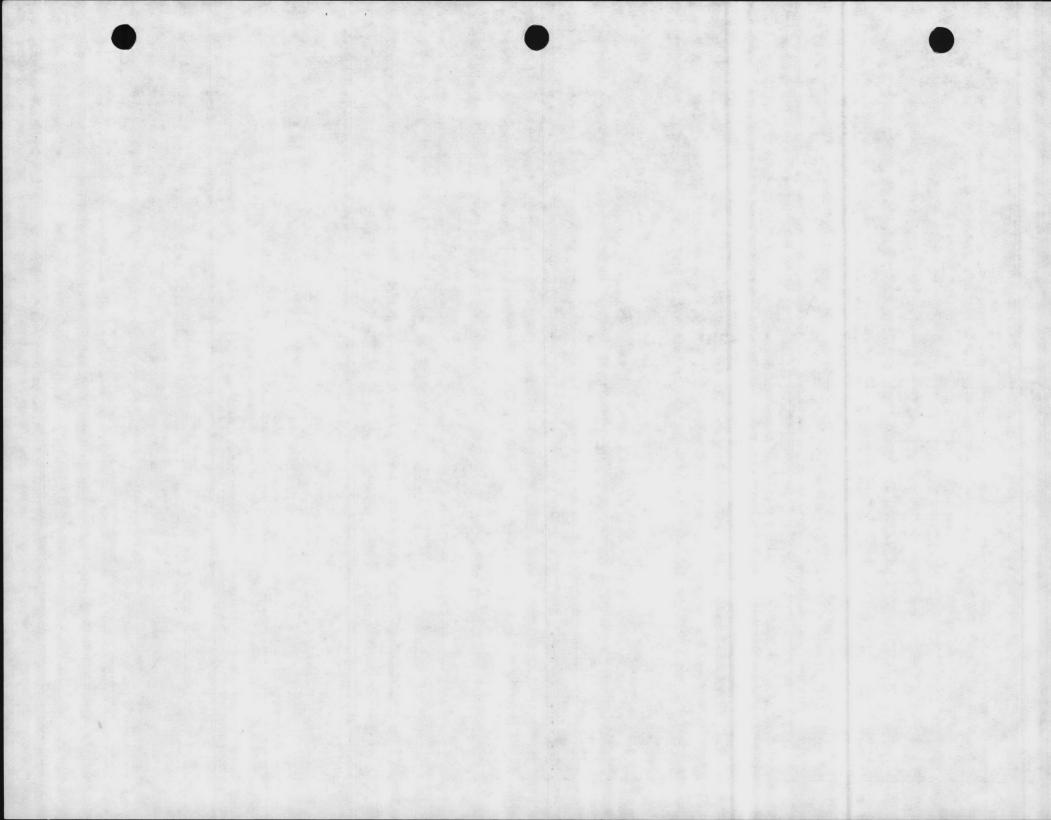
## SUBMITTAL DATA BLOW-THRU CLIMATE CHANGER®

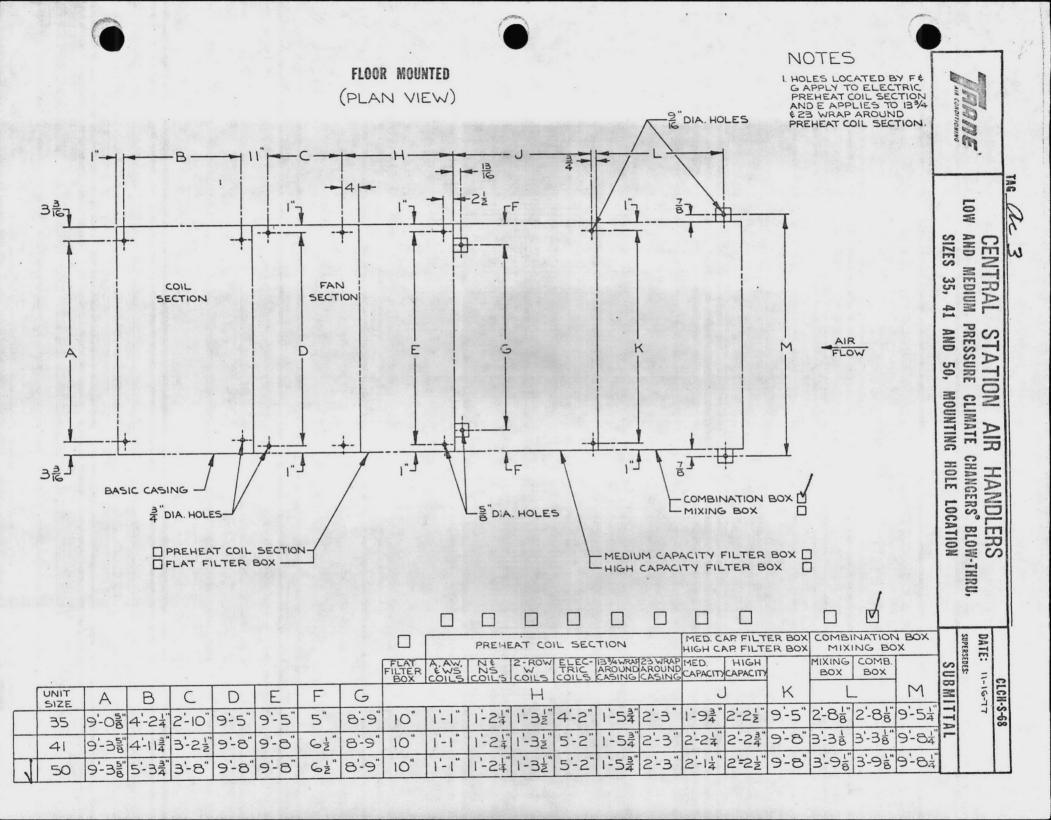


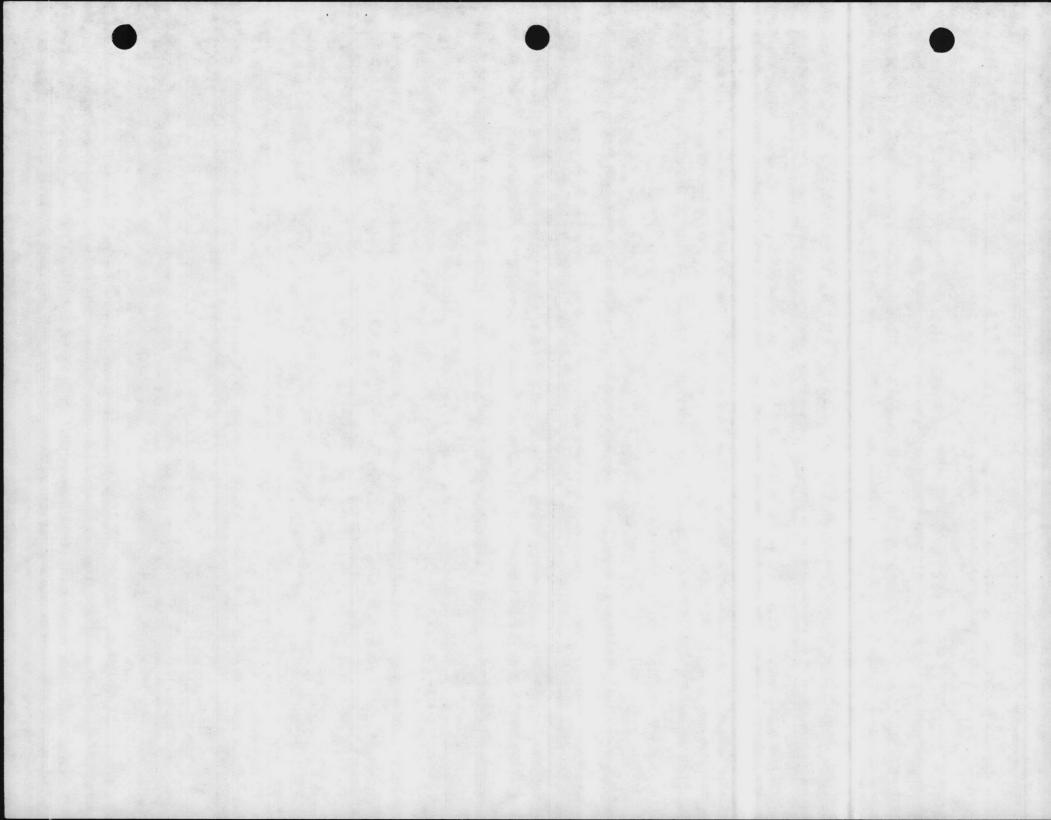
MOTOR     SUBMITTAL APPROVAL DWA SCFM       SCFM     24730       MOTOR       Colspan="2">Substructure       MOTOR       Colspan="2">Substructure       MOTOR       MOTOR       Colspan="2">Substructure       MOTOR       Substructure	TAG	GIN	AC-3						1136	harg										<u> </u>
SCFM       24730         esp       1.0         esp       2.25         BAP       13.4         PRM       930         ONKE SERVICE FACTOR       Variable 1.5         ONK		_													IOTOR					
ACCESSORIES       None       None       None       Clch S142         Filters       ACCESSORIES       Cold Bark       Ves       Cold Bark	ESP TSP BHP RPM		SERVICE FAC	CTOR	1 2 1 9	.0 .25 3.4 30		e l.	5		RPM FRA ELE TYP	CTRIC	CAL	1800 254 460 0per	T /60/3 n				Clch S/ Clch Se	MS
Image: Construct of the construction of the constructio	A		COIL BANK	;	/	<w></w>		1				F	TYF	STEA	MPRESS.					
Coll Bank OTTTYPEROWS       FIN       SIZE       TOTCIR.DIST       CIRCUITS       TURBS.       TUBE MATERIAL       COIL SUPPLY CONNECTION         PREHEAT       PREMEAT       ONO       OUL       OUL       OUL       CIL BANK OTTTYPEROWS       FIN       SIZE       TOTCIR.DIST       CIRCUITS       TUBE MATERIAL       COIL SUPPLY CONNECTION         PREMEAT       ONO       OUL       OUL       OUL       OUL       CIL BANK OTTTYPEROWS       FIN       SIZE       COIL DANK OTTTYPEROWS       CIL SIZE       COIL SIZE       CIL SIZE<			HOT DECK	NOI	HW	<u>co</u>	ils	in	duc t	work	0.80	U 1	Ch	1 16	7	40	52.0	21.5		
L       C       PREHEAT       Clch S142         S       F       F       F       Clch S142         OBCK       OBCK       OBCK       Clch S144       Clch S144         COLD       DECK       OBCK       Clch S142       Clch S144         FILTER 50X       None       None       ODE       CASING OPTIONS       Clch S144         FILTER 50X       None       None       None       ODUBLE DUCT       None         FILTER 50X       None       None       MULTIZONE (NO. ZONES)       None       ODUBLE DUCT       None         FILTER 50X       None       None       None       AF       Nultizone (NO. ZONES)       Nultizone       Clch S73         MIXING 80X       None       None       None       None       AF       Nultizone       Clch S73         MIXING 80X       None       None       None       None       None       Clch S73         MIXING 80X       None       None       None       None       None       Clch S73         MIXING 80X       None       None       None       None       None       Clch S73         STEAM 6RID HUMID.       None       None       None       SPECIAL FEATURES:       SPECIAL FE				QTY			FIN	SI	ZE	TOT.CIR. PER	DIST	CIRCI					COIL	SUPPLY		
Image: Cold Deck       Image: Cold Deck <th< td=""><td>S F</td><td></td><td>SECTION</td><td></td><td>No</td><td>ne</td><td>-HW</td><td>Coi</td><td>ls</td><td>in du</td><td>ctwo</td><td>XX</td><td><math>\mathbb{R}</math></td><td></td><td></td><td></td><td></td><td></td><td>Clch Sl</td><td>42</td></th<>	S F		SECTION		No	ne	-HW	Coi	ls	in du	ctwo	XX	$\mathbb{R}$						Clch Sl	42
FILTER BOX       none         COMB. FILTER MIX BOX       yes         FILTERS       throwaway         MIXING BOX       none         MIXING BOX       none         PREHEAT SECTION       none         Access Section       none         STEAM GRID HUMID.       none         Access DOORS       none         BAFFLES       #60&70 hot deck         BeLT GUARDS       yes         ISOLATORS       rubber in shear         APPROVAL STAMP       OBAME COMMENT AS FOR			COLD	2	W	4	18	33	108					yes	cc	pper	le	ft		
COMB. FILTER BOX       YES         FILTERS       throwaway         MIXING BOX       none         MIXING BOX       none         ACCESS SECTION       none         ACCESS DOORS       none         BAFFLES       #60&70 hot deck         BELT GUARDS       yes         ISOLATORS       rubber in shear         APPROVAL STAMP       O GAME COMMENT AS FOR				AC	CESS	ORIE	S							CASIN	G OPTI					
BELT GUARDS ISOLATORS  Yes rubber in shear Clch S79 Combination filter Mixing box opening top & back rods left  O SAME COMMENT AS FOR	CON FIL MIX PRE ACC STE ACC	IB. TE INC EB AM	FILTER MIX RS 3 BOX EAT SECTION IS SECTION I GRID HUMID IS DOORS			es hro one one one one	waw		dec		MUL FAN FAN INL	LISTI LISTI I TYP I PAR ET VA	NE (N NG E ALLE ANES	IO. ZONE	ROL	4 AF none none 1" 3,	/4 1	b .	Clch S7	3
	BEL	.т	GUARDS	APP	ŗ	es ubb	ber		-		Combo	o ina n ing	atio g to	on fi op &	back	rods	lef	t		9
AC-1						•				1	0	SA	m	E Ce	mm	ENT	AS	FOR		
					-						,	90	2-1							





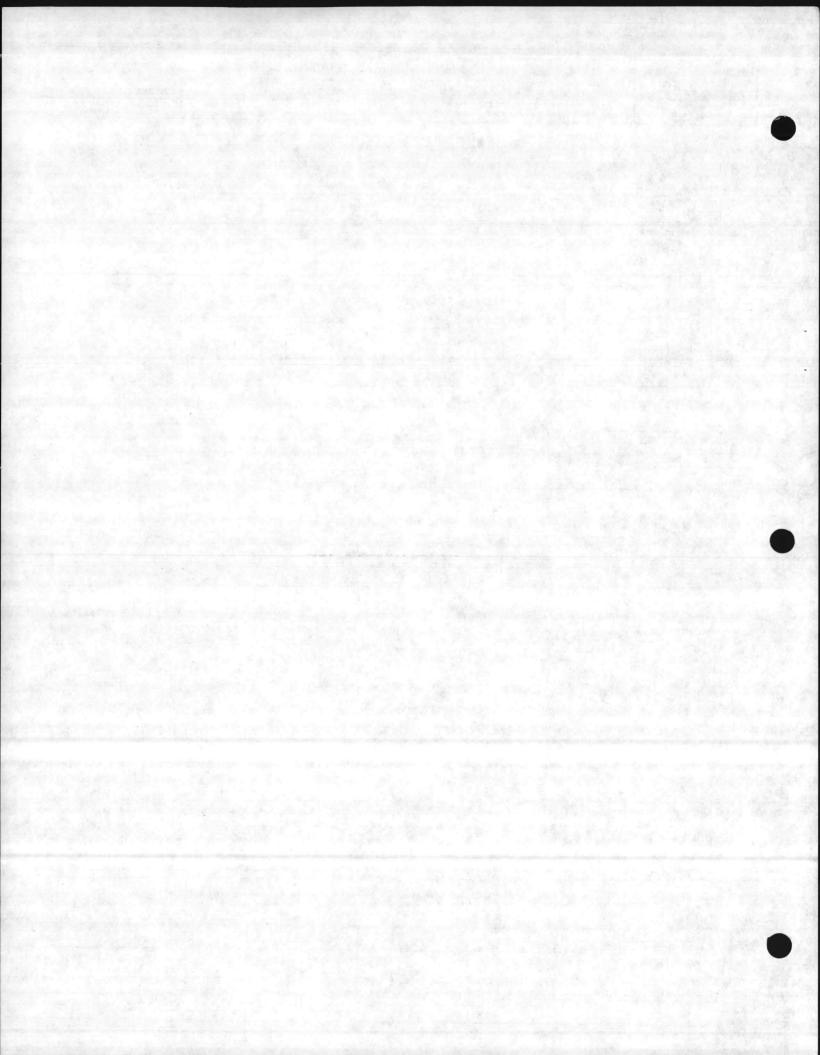


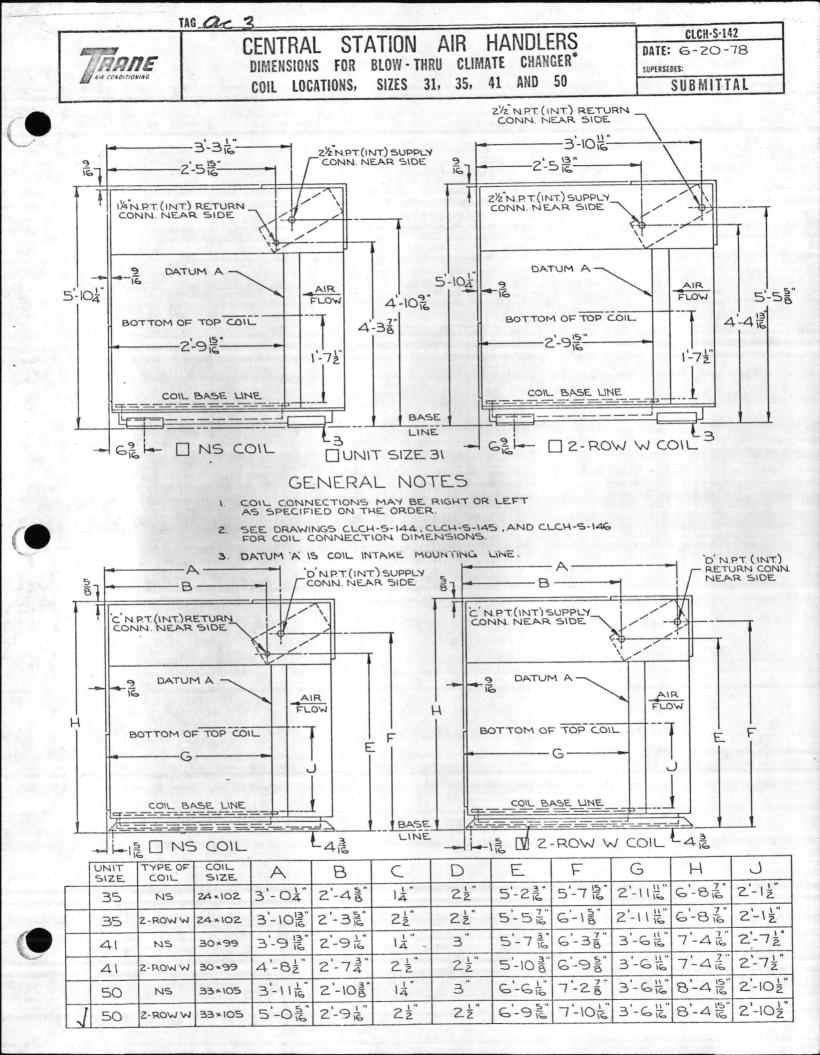


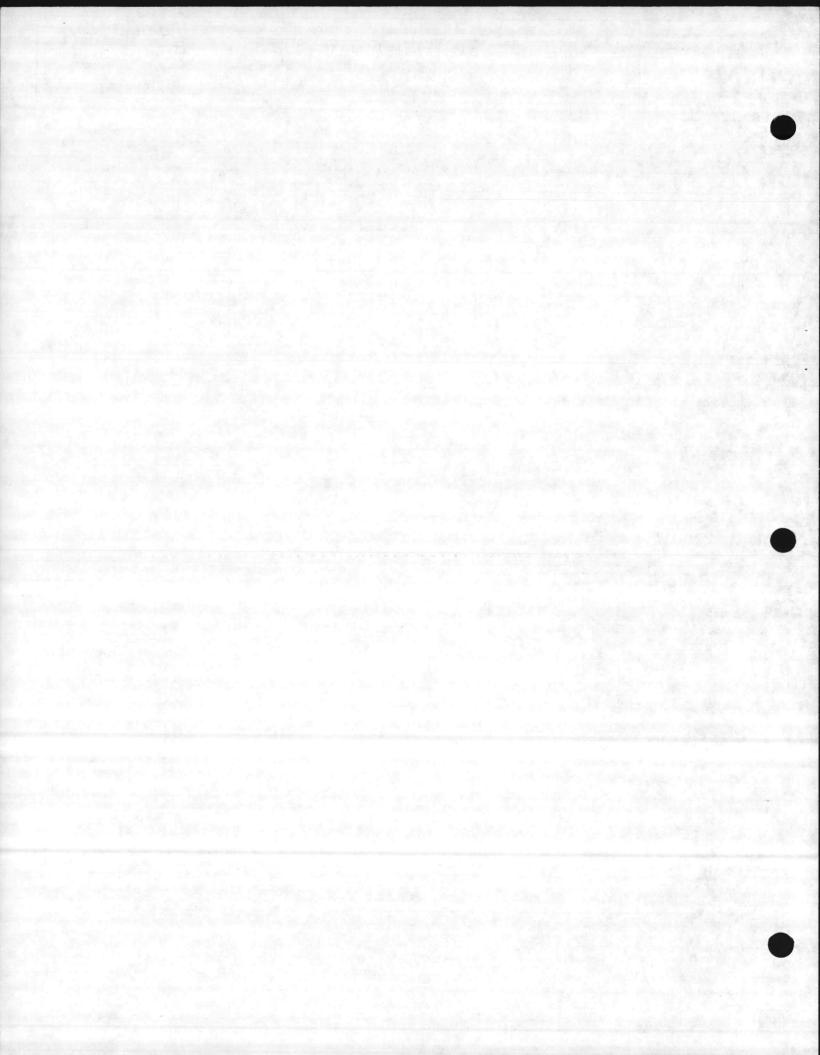


TA	ac 3		
TRANE AIR CONDITIONING	CENTRAL STATION AIR COMBINATION FILTER-MIXING BOXES AN CLIMATE CHANGERS® BLOW-THRU, SIZES	ID FILTER BOXES FOR	CLCH-S-73 DATE: 11-16-77 SUPERSEDES: CLCH-S-14 SUBMITTAL
	FILTER BOXES	I. DAM NE	NERAL NOTES
		-F-	TERS IN ALL FILTER BOXE MOVABLE FROM EITHER E.
		G×H INLET 518,38	OR MOUNTING LEGS
UNIT J FLAT SIZE Nº SIZE 35 14 16×25 41 6 16×20 50 7 16×2 50 14 16×25 16×20 16×20 16×20 16×20 16×20 16×25 12 20×2	16 $20 \times 25$ $28$ $16 \times 25$ $9' \cdot 7"$ $9' \cdot 3"$ $1$ 20 $20 \times 25$ $32$ $16 \times 25$ $9' \cdot 10"$ $9' \cdot 6"$ $2$ 20 $20 \times 25$ $32$ $16 \times 25$ $9' \cdot 10"$ $9' \cdot 6"$ $2$ 20 $20 \times 25$ $35$ $16 \times 25$ $9' - 10"$ $9' - 6"$ $2$ 20 $28$ $16 \times 25$ $35$ $16 \times 25$ $9' - 10"$ $9' - 6"$ $2$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	G       H       J $3\frac{1}{4}$ $4^{-}$ $9^{+}$ $3\frac{1}{2}$ $3^{-}$ $11\frac{1}{2}$ $3\frac{1}{2}$ $4^{-}$ $9^{+}$ $3\frac{1}{2}$ $3^{-}$
	COMBINATION FILTER MIXIN	NG BOXES	FLOOR MOUNTING LE
BASS	Z TI TI TI TI TI TI TI TI TI TI TI TI TI	R NLET NLET NLET NLET NLET NLET NLET NLET	
TOP & BACK INL	ETS BACK & BOTTOM INL	ETS TOP & BOTT	TOP & BAC
UNIT FILT	ERS A L N P	R S T	U V Z
	×25 9'-7" 2'-6±" 7 <sup>‡</sup> " 3'-5 <sup>‡</sup> "	1-07 9'-04" 5'-14	5-7 2-11 15
35 16 20	* 25 9'-10" 2'-102" 834" 4'-134"	1-14" 9-34" 5-73	"6'-21" 3'-6" 25

1.1	UNIT	1	FILIERS			N		K			U		4
Single 1	SIZE	Nº	SIZE	A		14	200						15 11
	35	16	20 × 25	9'-7"	2'-6±"	7ª"	3'-54	1-07	9-04	5-17	5-7	2-11	126
1	41	20	20 × 25		2'-10'="		4'-13"	1-14	9-34	5-73	6-25"	3'-6"	215
T	50	28	16×25	9'-10"	3'-6±"	83"	4'-77	1'-23"	9'-34"	6'-63"	7-12"	4'-0"	215"
V	63	30	20×25		4'-21'		5-34	1'-9"	9'-34"	8'-34	8-10	4'-8"	215"
	05	1	L			ALC: SALA	March Street	1	a subscription			313 L 3 3	1. (P. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

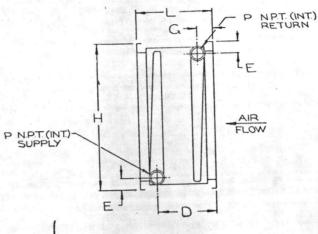






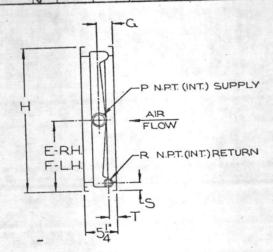
TAG	ac3	CLCH-S-144
TRANE	CENTRAL STATION AIR HANDLERS TYPE W, D, K, NS, DD COIL CONNECTIONS	DATE: G - 1G - 78 SUPERSEDES:
AIR CONDITIONING	FOR DRAW-THRU AND BLOW-THRU CLIMATE CHANGERS"	SUBMITTAL

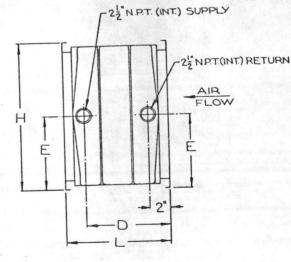
GENERAL NOTE 1. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.



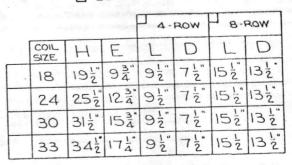
W COILS D COILS DK COILS

				•		2-	ROW	4-	ROW	6-	ROW	8-	ROW
	COIL	HI	F	G	P	L	D	L	D	L	D	L	D
	SIZE	132	1916	21	14"	61	43"	91:	73"	121	103"	152	133
+	18	192	24	15	212"	61"	42"	91:	7%	121	10%	152	13%
+	24	252	24	15	21	62"	4 2"	91.	7%	$12\frac{1}{2}$	10%	152	13%
-	1	- 1 -	24	1510	212"	61	416	912	7%	122	10%	152	13%
+	30	312	1.	15:	21		416	91	7%	121		152	13%

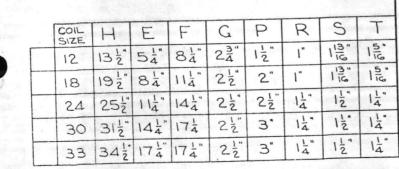




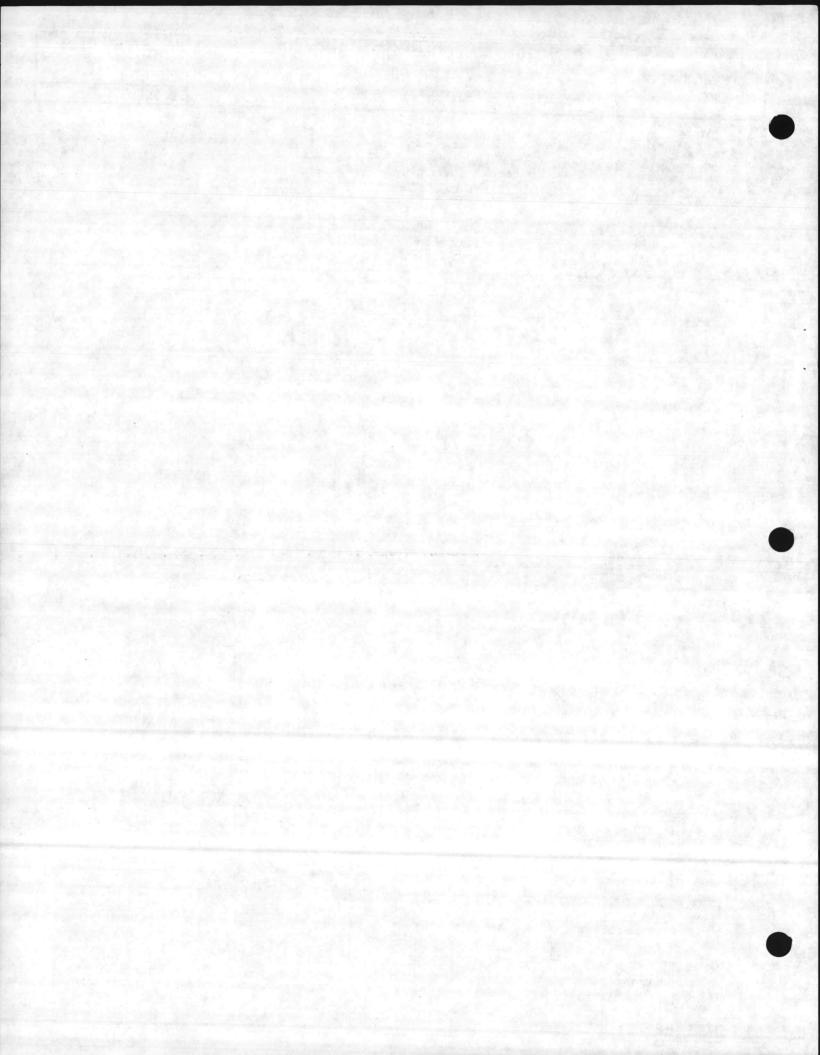
DD COIL



I I-ROW NS COIL







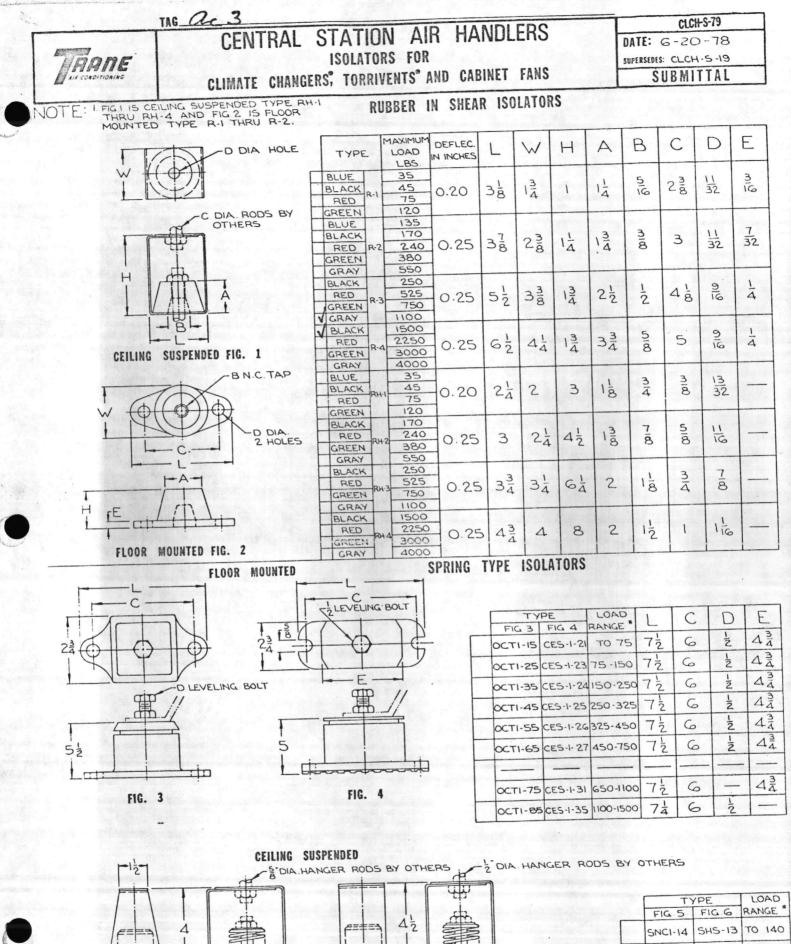
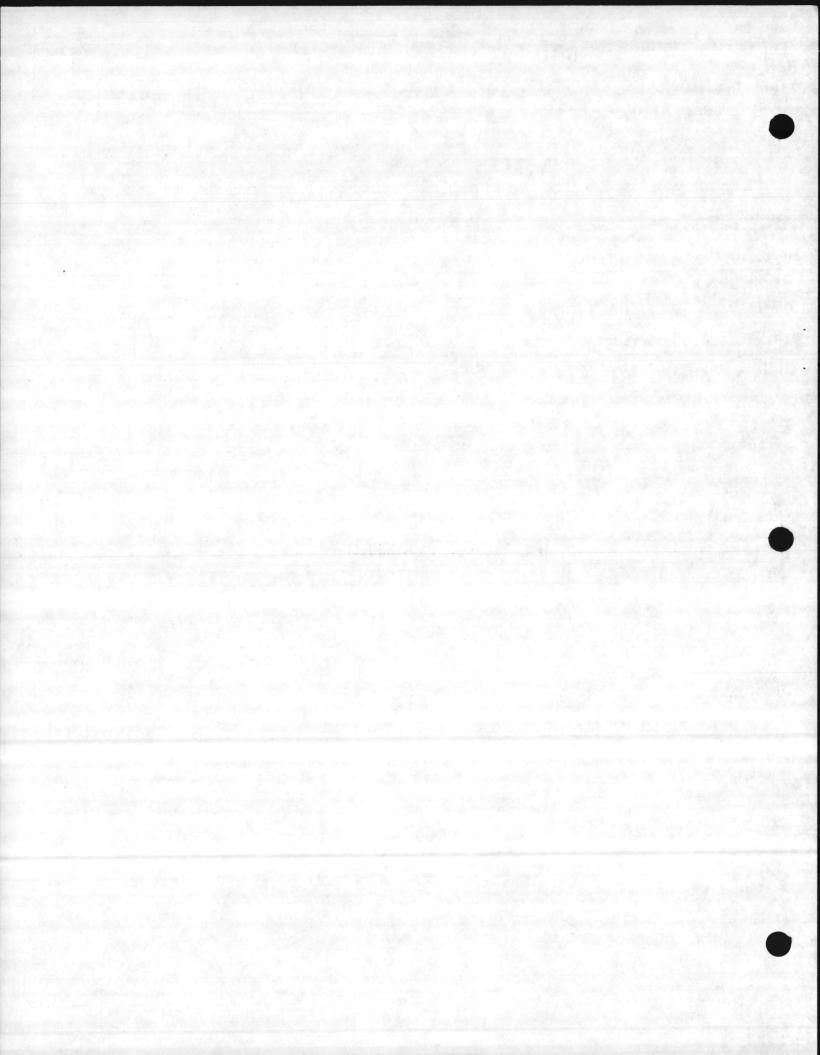


FIG. 6

FIG. 5

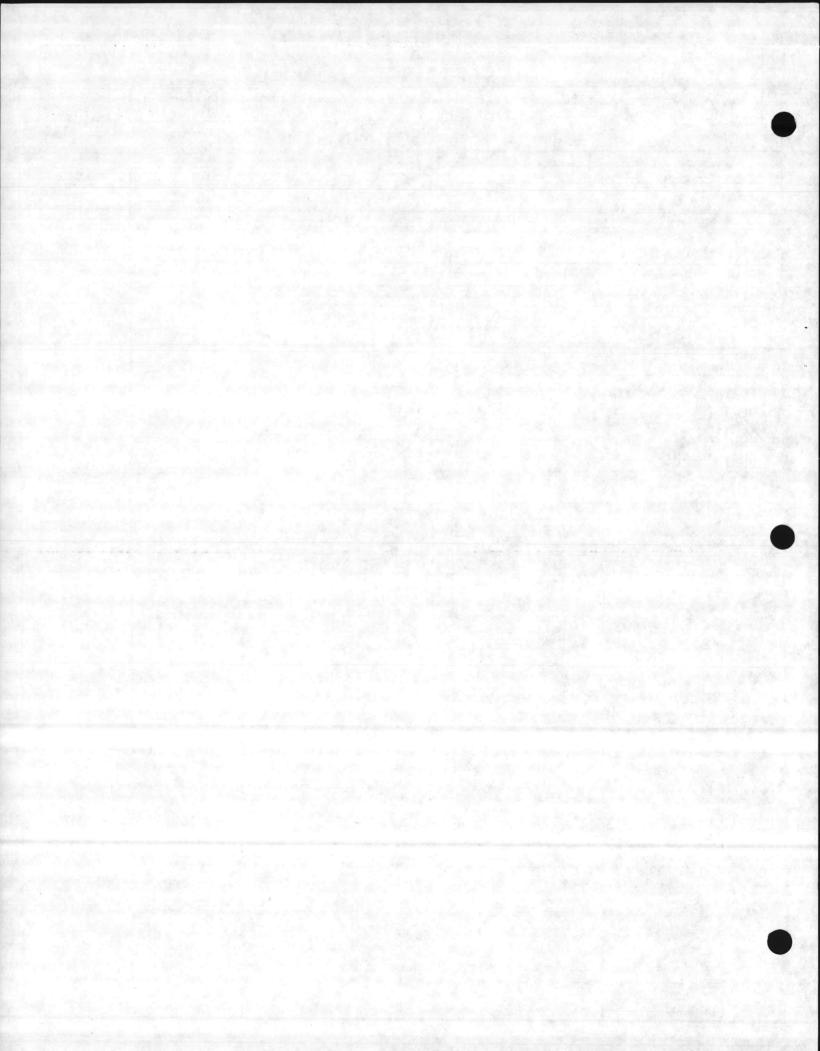
		FL	20110
	FIG 5	FIG.6	RANGE *
	SNCI-14	SHS-13	TO 140
	SNC1-26	SHS-14	50 - 260
	SNCI-45	SHS-17	100-450
1	SNCI-70	SH5-18	200-700
	1	Annonities	

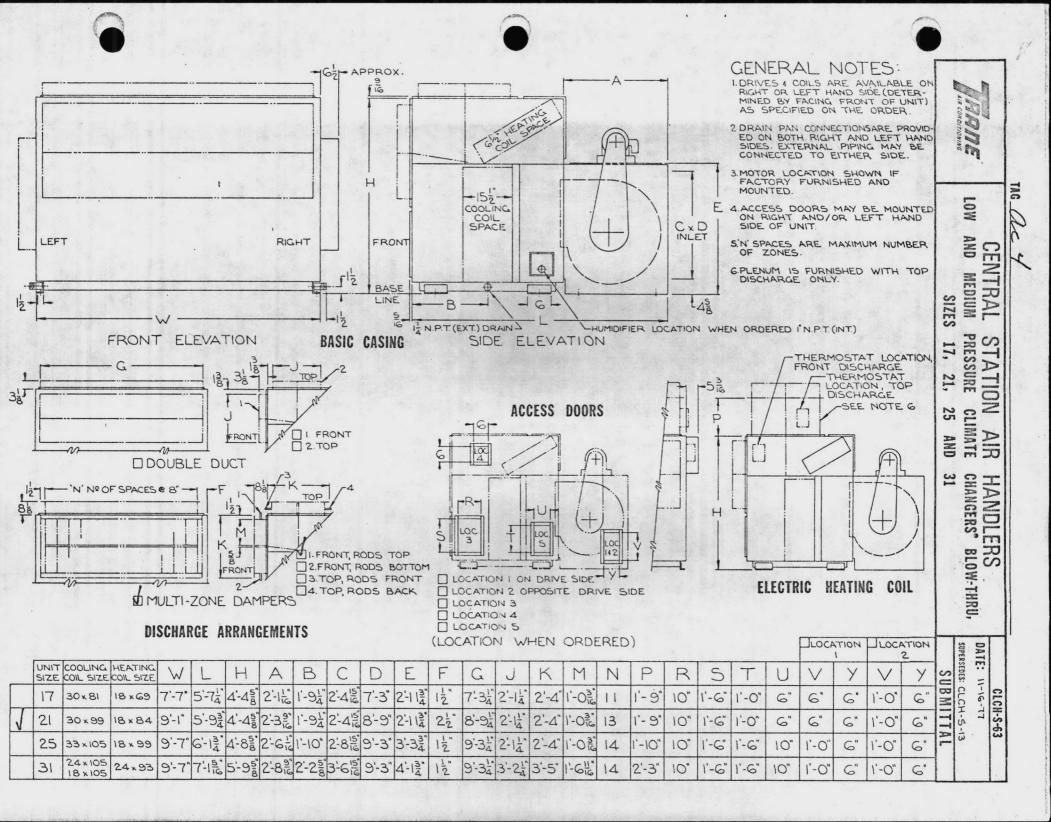


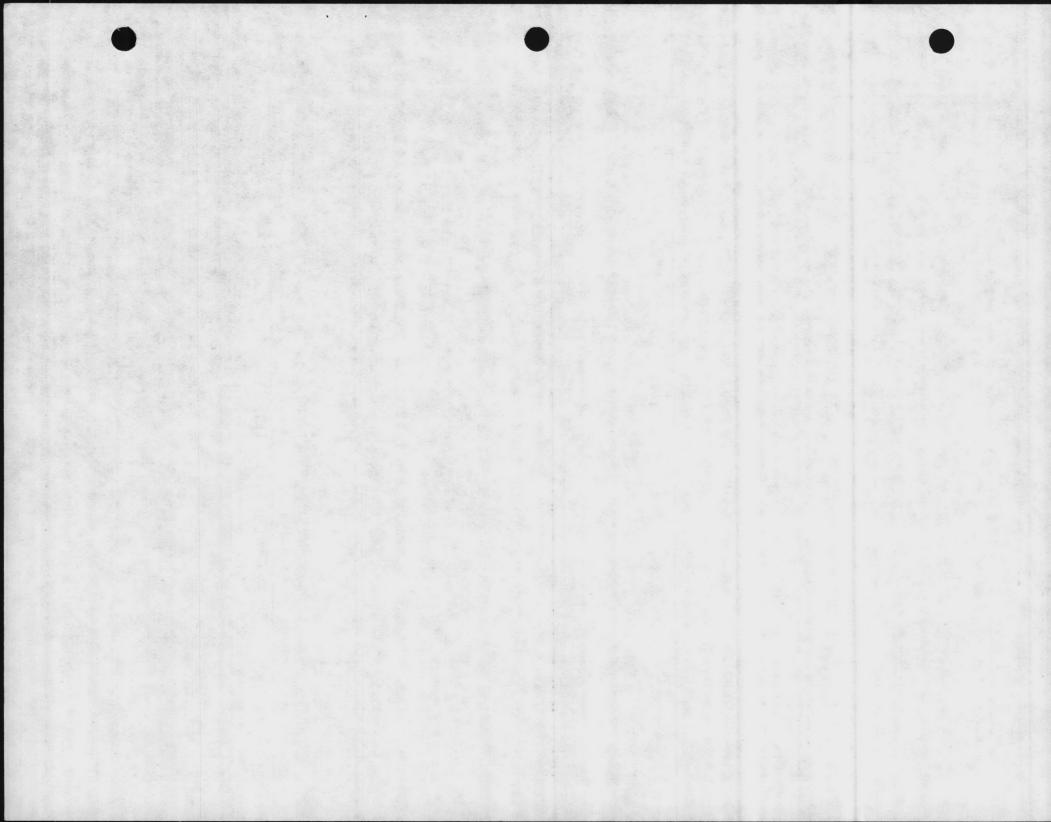
# SUBMITTAL DATA BLOW-THRU CLIMATE CHANGER®

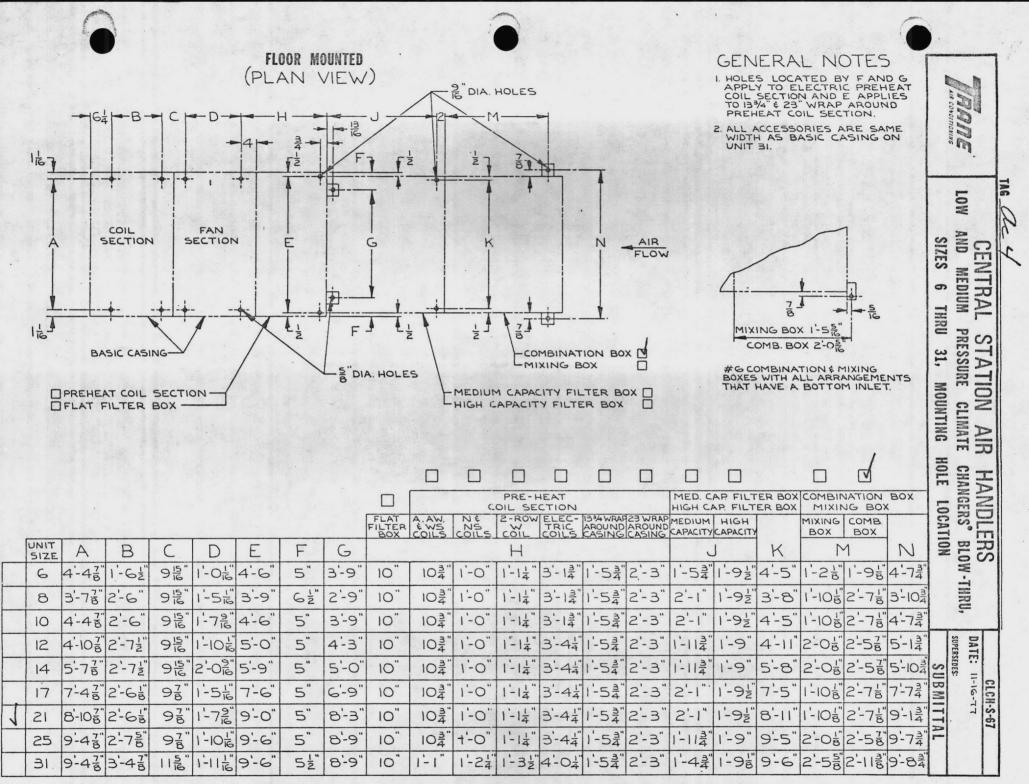


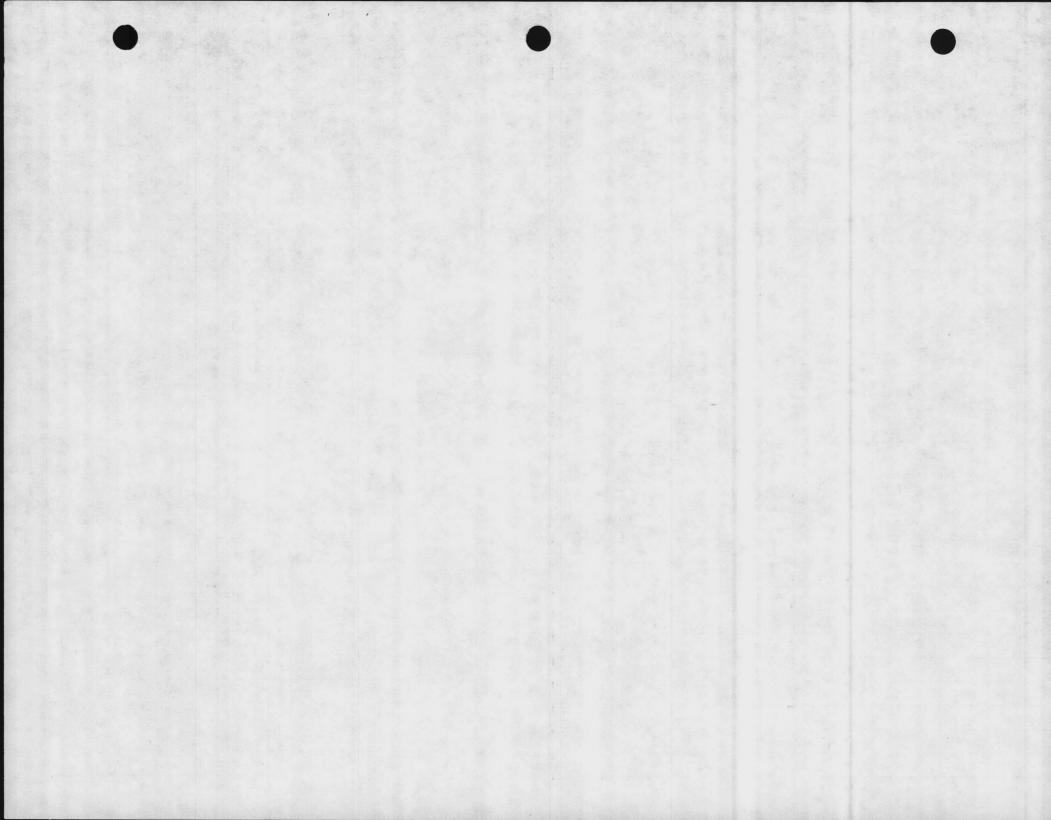
	Open Right	RTEMP, WPD	submittal Approval drwgs Clch S/MS1 Clch S63 Clch S67				
SCFM     11080       ESP     1.0       TSP     2.25       BHP     8.4       RPM     1130       DRIVE SERVICE FACTOR     Variable 1.5       C     COIL BANK       MBH     EAT °F       LAT °F     COIL F	10 1800 215T 460/60/3 Open Right YPE STEAMPRESS. WATE		Clch S/MS1 Clch S63				
ESP TSP BHP RPM DRIVE SERVICE FACTOR COIL BANK COIL COIL COIL BANK COIL COIL COIL COIL COIL COIL COIL COIL	1800 215T 460/60/3 Open Right YPE STEAMPRESS. WATE		Clch S/MS1 Clch S63				
BHP RPM DRIVE SERVICE FACTOR COIL BANK COIL BANK BHP COIL BANK BHP A BHP B 4 1130 Variable 1.5 COIL F COIL F COIL F COIL BANK COIL COIL COIL COIL COIL COIL COIL COIL	460/60/3 Open Right YPE STEAMPRESS. WATE						
COIL BANK MBH EAT OF LAT OF COIL F	Right GPM, WATE STEAMPRESS.						
C A COIL BANK MBH EAT °F LAT °F COIL F T	GPM, WATE						
A COIL BANK KW DB WB OB WB APD F	YPE STEAM PRESS.		The state of the state of the				
A PREMEATSECTION							
C PREHEAT SECTION U HOT DECK None HW Coils in duct work			A second and the second				
C Y COLD DECK 389 76.063.151.551.2 .87 0 (	W 75 40	50.37.8					
0 D COIL BANK QTYTYPEROWS FIN SIZE TOT.CIR. DIST CIRCUITS	TURBS. TUBE MATERIA	COIL SUPPLY					
L S PREHEAT		. I softendes ter	- A detry				
S H SECTION P HOT None - HW Coils in duct Work							
СоLD 1 W 4 18 99	no copper	left	Clch S141 Clch S144				
ACCESSORIES	CASING OPTIONS						
FILTER BOX DOUBLE DU	ст пог	пе					
FILTERS throwaway	(NO. ZONES)	16	Clch S72				
MIXING BOX UL LISTING FAN TYPE	FC						
	EL CONTROL						
pope	INLET VANES none						
ACCESS DOORS NONE GAL V. DRAIN	GALV. DRAIN PAN LINER YES						
BAFFLES _#60&70 hot deck			Same and				
BELT GUARDS <u>YES</u> SPECIAL FEAT	TURES:		Clch S79				
	tion filter Mix	king box	cicii sij				
	top & bottom						
			Π				
🛈 SAM	E COMMENT	AS FOR	BLANK OFF				
AC-			BOTTEM				
	and a starting of the		OPEUIUG				
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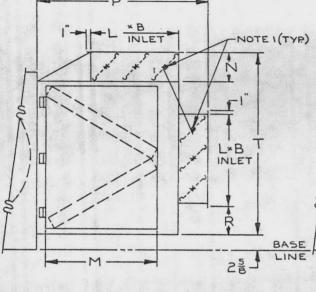


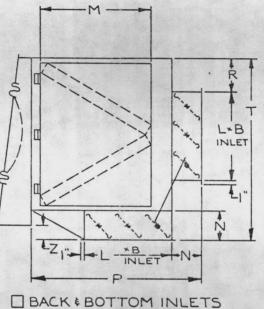






#### **COMBINATION FILTER - MIXING** BOXES



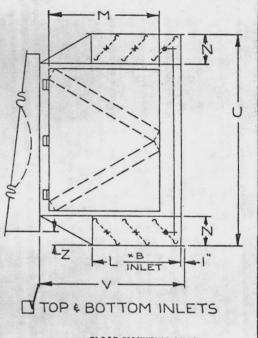


## TOP & BACK INLETS

## GENERAL NOTES

I. DRIVE ROD LOCATED NEAR AND FAR SIDE. 2. FILTER DOORS HINGED ON DOWNSTREAM SIDE. 3 BOX WITH TOP AND BOTTOM INLET, DOOR MAY BE NEAR OR FAR SIDE. OTHER BOXES, DOORS ARE NEAR AND FAR SIDE.

UNIT		FILTERS		D	1	NA.	N 1		0				
SIZE	Nº Nº	SIZE	A				N	P	R		0		2
6	4	16 × 25	4'-6"	4-24	1-01	1-5	54"	2'-43"	54"	2'-23	2'-6'2"	2'-0"	18"
8	4	20 × 25	3'-9"	3-35	1-82	2'-05"	64"	3-34	64"	3-13"	3-61	2-10"	2늘"
10	6	16 ×25	4'-6"	4-24	1-81	2'-05"	64"	3-34	64"	3-13"	3-62	2'-10"	5루
12	24	16 × 25 20 × 25	5-0"	4-65	1-102	1-113	54"	3-12"	74"	3'-43"	3'-8'="	2'-83"	15
14	в	16 × 25	5-9"	5-45	1-101	1-113"	54	3-12"	74"	3-44	3'-8'2	2'-83	15"
17	8	20 × 25	7'-6"	7'-0툴"	1-81	2'-05"	64"	3-34	64"	3-14"	3'-61	2'-10"	218"
21	10	20 × 25	Contraction of the second second second second second second second second second second second second second s		Contraction of the second second			3-34	64	3-17	3'-62	2'-10"	2 == "
25	66	16 × 25 20 × 25			the second second second	Toppen and the same of the same	54"	3-12"	74"	3'-43"	3'-82	2'-83"	1言"
31.	12	16 × 20 16 × 25	9'-7"	9-04	2-57.	1-44	64"	3'-24"	104	4-34	4'-8±"	2'-81	24"
	512E 6 8 10 12 14 17 21 25	SIZE       Nº         G       4         B       4         IO       G         I2 $\frac{2}{4}$ I4       8         I7       8         21       10         25 $\frac{6}{6}$ 31       12	SIZE       №       SIZE         G       4 $IG \times 25$ B       4 $20 \times 25$ IO       G $IG \times 25$ I2       2 $IG \times 25$ I4       8 $IG \times 25$ I7       8 $20 \times 25$ 21       10 $20 \times 25$ 25       G $IG \times 25$ 21       10 $20 \times 25$ 23 $I2 \times 25$ $IG \times 25$ 24 $I0 \times 25$ $I0 \times 25$	SIZE       Nº       SIZE       A $6$ 4 $16 \times 25$ $4'-6"$ $8$ 4 $20 \times 25$ $3'-9"$ $10$ 6 $16 \times 25$ $4'-6"$ $12$ $2$ $16 \times 25$ $5'-0"$ $14$ 8 $16 \times 25$ $5'-9"$ $17$ 8 $20 \times 25$ $7'-6"$ $21$ $10$ $20 \times 25$ $9'-0"$ $25$ $6$ $16 \times 25$ $9'-6"$	SIZE         Nº         SIZE         A         B           6         4 $16 \times 25$ $4^{+}6^{"}$ $4^{+}2\frac{1}{4}^{"}$ 8         4 $20 \times 25$ $3^{+}9^{"}$ $3^{+}3\frac{5}{8}^{"}$ 10         6 $16 \times 25$ $4^{+}6^{"}$ $4^{+}2\frac{1}{4}^{"}$ 12 $\frac{2}{4}$ $\frac{16 \times 25}{20 \times 25}$ $5^{+}0^{"}$ $4^{+}6\frac{5}{8}^{"}$ 14         8 $16 \times 25$ $5^{+}9^{"}$ $5^{+}4\frac{5}{8}^{"}$ 17         8 $20 \times 25$ $7^{+}6^{"}$ $7^{+}0\frac{5}{8}^{"}$ 21         10 $20 \times 25$ $9^{+}0^{-}0^{"}$ $8^{+}6\frac{1}{4}^{"}$ 25 $6^{"}_{6}$ $\frac{16 \times 25}{20 \times 25}$ $9^{+}6^{"}_{-}$ $9^{+}0\frac{1}{4}^{"}$	SIZE         Nº         SIZE         A         B         L           6         4         IG * 25 $4'-6"$ $4'-2\frac{1}{4}"$ $1'-0\frac{1}{2}"$ 8         4         20 * 25 $3'-9"$ $3'-3\frac{5}{8}"$ $1'-8\frac{1}{2}"$ 10         6         I6 * 25 $4'-6"$ $4'-2\frac{1}{4}"$ $1'-8\frac{1}{2}"$ 12         2         I6 * 25 $4'-6"$ $4'-2\frac{1}{4}"$ $1'-8\frac{1}{2}"$ 14         8         I6 * 25 $5'-9"$ $5'-4\frac{5}{8}"$ $1'-10\frac{1}{2}"$ 17         8         20 * 25 $7'-6"$ $7'-0\frac{5}{8}"$ $1'-8\frac{1}{2}"$ 21         10         20 * 25 $9'-0"$ $8'-6\frac{1}{4}"$ $1'-8\frac{1}{2}"$ 25         6 $20'*25$ $9'-6"$ $9'-0\frac{1}{4}"$ $1'-10\frac{1}{2}"$	SIZE       Nº       SIZE       A       B       L       M         6       4 $16 \times 25$ $4^{+}6^{+}$ $4^{+}2\frac{1}{4}$ $1^{+}0\frac{1}{2}$ $1^{+}5^{+}$ 8       4 $20 \times 25$ $3^{+}9^{+}$ $3^{+}3\frac{5}{8}^{+}$ $1^{+}8\frac{1}{2}^{+}$ $2^{+}0\frac{5}{8}^{+}$ 10       6 $16 \times 25$ $4^{+}6^{+}$ $4^{+}2\frac{1}{4}$ $1^{+}8\frac{1}{2}^{+}$ $2^{+}0\frac{5}{8}^{+}$ 12 $2^{+}$ $16 \times 25$ $5^{+}0^{+}$ $4^{+}6\frac{5}{8}^{+}$ $1^{-}10\frac{1}{2}^{+}$ $1^{-}11\frac{3}{8}^{+}$ 14 $8^{-}16 \times 25$ $5^{+}9^{+}$ $5^{-}4\frac{5}{8}^{+}$ $1^{-}10\frac{1}{2}^{+}$ $1^{-}11\frac{3}{8}^{+}$ 17 $8^{-}20 \times 25$ $7^{+}6^{+}$ $7^{+}0\frac{5}{8}^{+}$ $1^{-}8\frac{1}{2}^{+}$ $2^{+}0\frac{5}{8}^{+}$ 21 $10^{-}20 \times 25$ $9^{+}0^{-}0^{+}$ $1^{-}8\frac{1}{2}^{+}$ $2^{+}0\frac{5}{8}^{+}$ 25 $6^{-}16 \times 25$ $9^{+}-6^{+}$ $9^{+}-0\frac{1}{4}^{+}$ $1^{-}10\frac{1}{2}^{+}$ $1^{-}11\frac{3}{8}^{+}$ 31 $12^{-}16 \times 20$ $9^{+}-7^{+}$ $9^{+}-0\frac{1}{4}^{+}$ $1^{-}2\frac{1}{4}^{+}$ $1^{-}4\frac{3}{4}^{+}$	SIZE       N <sup>2</sup> SIZE       A       B       L       IM       N         6       4       IG × 25       4'-6"       4'-2 <sup>1</sup> / <sub>4</sub> "       I'-0 <sup>1</sup> / <sub>2</sub> "       I'-5"       5 <sup>3</sup> / <sub>4</sub> "         8       4       20 × 25       3'-9"       3'-3 <sup>5</sup> / <sub>8</sub> "       I'-0 <sup>1</sup> / <sub>2</sub> "       I'-5"       5 <sup>3</sup> / <sub>4</sub> "         10       6       IG × 25       4'-6"       4'-2 <sup>1</sup> / <sub>4</sub> "       I'-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "         12       2       I6×25       5'-0"       4'-6 <sup>5</sup> / <sub>8</sub> "       I'-10 <sup>1</sup> / <sub>2</sub> "       I'-11 <sup>3</sup> / <sub>8</sub> "       5 <sup>3</sup> / <sub>4</sub> "         14       8       IG × 25       5'-9"       5'-4 <sup>5</sup> / <sub>8</sub> "       I'-10 <sup>1</sup> / <sub>2</sub> "       I'-11 <sup>3</sup> / <sub>8</sub> "       5 <sup>3</sup> / <sub>4</sub> "         17       8       20 × 25       7'-6"       7'-0 <sup>5</sup> / <sub>8</sub> "       I-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "         21       10       20 × 25       9'-0"       8'-6 <sup>1</sup> / <sub>4</sub> "       I'-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "         25       6       IG × 25       9'-0"       8'-6 <sup>1</sup> / <sub>4</sub> "       I'-10 <sup>1</sup> / <sub>2</sub> "       I'-11 <sup>3</sup> / <sub>8</sub> "       5 <sup>3</sup> / <sub>4</sub> "	SIZE       Nº       SIZE       A       B       L       M       N       P         6       4       16 × 25       4'-6"       4'-24"       1'-02"       1'-5" $5\frac{3}{4}$ "       2'-44"         8       4       20 × 25       3'-9"       3'-35"       1'-62"       2'-05" $6\frac{3}{4}$ "       3'-34"         10       6       16 × 25       4'-6"       4'-24"       1'-82"       2'-05" $6\frac{3}{4}$ "       3'-34"         10       6       16 × 25       4'-6"       4'-24"       1'-82"       2'-05" $6\frac{3}{4}$ "       3'-34"         12       2       16 × 25       5'-0"       4'-65"       1'-102"       1'-111"       5 <sup>3</sup> /4"       3'-12"         14       8       16 × 25       5'-9"       5'-45"       1'-102"       1'-111"       5 <sup>3</sup> /4"       3'-34"         17       8       20 × 25       7'-6"       7'-05"       1'-82"       2'-05"       6 <sup>3</sup> /4"       3'-34"         21       10       20 × 25       9'-0"       8'-64"       1'-82"       2'-05"       6 <sup>3</sup> /4"       3'-34"         25       6       16 × 25       9'-0"       8'-64"       1'-82"       2'-05"	SIZE       Nº       SIZE       A       B       L       M       N       P       R         6       4       16 × 25       4'-6"       4'-2 <sup>1</sup> / <sub>4</sub> "       1'-0 <sup>1</sup> / <sub>2</sub> "       1'-5"       5 <sup>4</sup> / <sub>4</sub> "       2'-4 <sup>3</sup> / <sub>4</sub> "       5 <sup>1</sup> / <sub>4</sub> "         8       4       20 × 25       3'-9"       3'-3 <sup>5</sup> / <sub>8</sub> "       1'-0 <sup>1</sup> / <sub>2</sub> "       1'-5"       5 <sup>4</sup> / <sub>4</sub> "       3'-3 <sup>3</sup> / <sub>4</sub> "       6 <sup>1</sup> / <sub>4</sub> "         10       6       16 × 25       4'-6"       4'-2 <sup>1</sup> / <sub>4</sub> "       1'-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "       3'-3 <sup>3</sup> / <sub>4</sub> "       6 <sup>1</sup> / <sub>4</sub> "         12       2       16 × 25       5'-0"       4'-6 <sup>5</sup> / <sub>8</sub> "       1'-10 <sup>1</sup> / <sub>2</sub> "       1'-11 <sup>3</sup> / <sub>8</sub> "       5 <sup>3</sup> / <sub>4</sub> "       3'-1 <sup>1</sup> / <sub>2</sub> "       7 <sup>1</sup> / <sub>4</sub> "         14       8       16 × 25       5'-9"       5'-4 <sup>5</sup> / <sub>8</sub> "       1'-10 <sup>1</sup> / <sub>2</sub> "       1'-11 <sup>3</sup> / <sub>8</sub> "       5 <sup>3</sup> / <sub>4</sub> "       3'-1 <sup>1</sup> / <sub>2</sub> "       7 <sup>1</sup> / <sub>4</sub> "         17       8       20 × 25       7'-6"       7'-0 <sup>5</sup> / <sub>8</sub> "       1'-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "       3'-3 <sup>3</sup> / <sub>4</sub> "       6 <sup>1</sup> / <sub>4</sub> "         21       10       20 × 25       9'-0"       8'-6 <sup>1</sup> / <sub>4</sub> "       1'-8 <sup>1</sup> / <sub>2</sub> "       2'-0 <sup>5</sup> / <sub>8</sub> "       6 <sup>3</sup> / <sub>4</sub> "       3'-3 <sup>3</sup> / <sub>4</sub> "       6 <sup>1</sup> / <sub>4</sub> "         25	SIZE       Nº       SIZE       A       B       L       M       N       P       R       I         6       4       IG * 25       4'-6"       4'-24"       I'-02"       I'-5" $5\frac{3}{4}$ "       2'-44" $54$ "       2'-24"         8       4       20 * 25       3'-9"       3'-35"       I'-02"       2'-05" $6\frac{3}{4}$ "       3'-34" $64^{1}$ "       3'-14"         10       6       IG * 25       4'-6"       4'-24"       I'-82"       2'-05" $6\frac{3}{4}$ "       3'-34" $64^{1}$ "       3'-14"         12       2       I6 * 25       5'-0"       4'-65"       I'-102"       I'-118"       54"       3'-12"       74"       3'-44"         14       8       I6 * 25       5'-9"       5'-45"       I'-102"       I'-118"       54"       3'-12"       74"       3'-44"         17       8       20 * 25       7'-6"       7'-05"       I'-82"       2'-05"       64"       3'-34"       644"       3'-14"         21       10       20 * 25       7'-6"       7'-05"       I'-82"       2'-05"       64"       3'-34"       644"       3'-14"         22       6       I6	SIZE       Nº       SIZE       A       B       L       M       N       P       R       I       U         6       4       16 * 25       4'-6"       4'-24"       1'-02"       1'-5" $5\frac{3}{4}$ " $2'-4\frac{3}{4}$ " $5\frac{1}{4}$ " $2'-2\frac{3}{4}$ " $2'-62^{-1}$ "         8       4       20 * 25       3'-9"       3'-35"       1'-02"       2'-05" $6\frac{3}{4}$ "       3'-3 $\frac{3}{4}$ " $6\frac{1}{4}$ "       3'-1 $\frac{3}{4}$ "       3'-62"         10       6       16 * 25       4'-6"       4'-24"       1'-82"       2'-05" $6\frac{3}{4}$ "       3'-3 $\frac{3}{4}$ " $6\frac{1}{4}$ "       3'-1 $\frac{3}{4}$ "       3'-62"         10       6       16 * 25       5'-0"       4'-65"       1'-102"       1'-11 $\frac{3}{6}$ "       5-3 $\frac{3}{4}$ "       3'-12"       7 $\frac{1}{4}$ "       3'-4 $\frac{3}{4}$ "       3'-62"         12       2       16 * 25       5'-9"       5'-4 $\frac{5}{6}$ "       1'-102"       1'-11 $\frac{3}{6}$ "       5 $\frac{3}{4}$ "       3'-12"       7 $\frac{1}{4}$ "       3'-4 $\frac{3}{4}$ "       3'-8 $\frac{1}{2}$ "         14       8       16 * 25       5'-9"       5'-4 $\frac{5}{6}$ "       1'-102"       1'-11 $\frac{3}{6}$ "       3'-3 $\frac{3}{4}$ "       6 $\frac{1}{4}$ "       3'-1 $\frac{3}{4}$ "       3'-4 $3$	SIZE       Nº       SIZE       A       B       L       IM       N       P       R       I       U       V         6       4       I6 * 25       4'-6"       4'-24"       I'-02"       I'-5" $5\frac{3}{4}$ "       2'-4 $\frac{3}{4}$ " $5\frac{1}{4}$ "       2'-2 $\frac{3}{4}$ "       2'-62"       2'-0"         8       4       20 * 25       3'-9"       3'-3 $\frac{5}{8}$ "       I'-02"       2'-05"       6 $\frac{3}{4}$ "       3'-3 $\frac{3}{4}$ "       6 $\frac{1}{4}$ "       3'-1 $\frac{3}{4}$ "       3'-62"       2'-10"         10       6       I6 * 25       4'-6"       4'-24"       I'-82"       2'-05"       6 $\frac{3}{4}$ "       3'-3 $\frac{3}{4}$ "       6 $\frac{1}{4}$ "       3'-1 $\frac{3}{4}$ "       3'-62"       2'-10"         12       2       16 * 25       5'-0"       4'-65"       1'-102"       1'-11 $\frac{3}{8}$ "       5 $\frac{3}{4}$ "       3'-12"       7 $\frac{1}{4}$ "       3'-4 $\frac{3}{4}$ "       3'-8 $\frac{1}{2}$ "       2'-8 $\frac{3}{4}$ "         14       8       16 * 25       5'-9"       5'-4 $\frac{5}{8}$ "       1'-102"       1'-11 $\frac{3}{8}$ "       3'-3 $\frac{3}{4}$ "       6 $\frac{1}{4}$ "       3'-4 $\frac{3}{4}$ "       3'-8 $\frac{1}{2}$ "       2'-8 $\frac{3}{4}$ "         17       8       20 * 25       7'-6"       7'-058"       1'-8 $\frac{1}{2}$ "



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13 67

COMBINATION

FILTER-MIXING BLOW-THRU,

BOXES

FOR THRU

CLIMATE HAND

DLERS E CHANGERS®

DATE: 11-16-77

CLCH-S-72

SIZES

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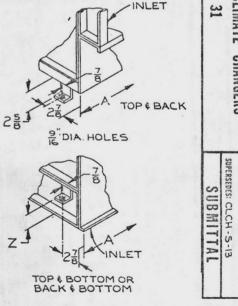
NOI.

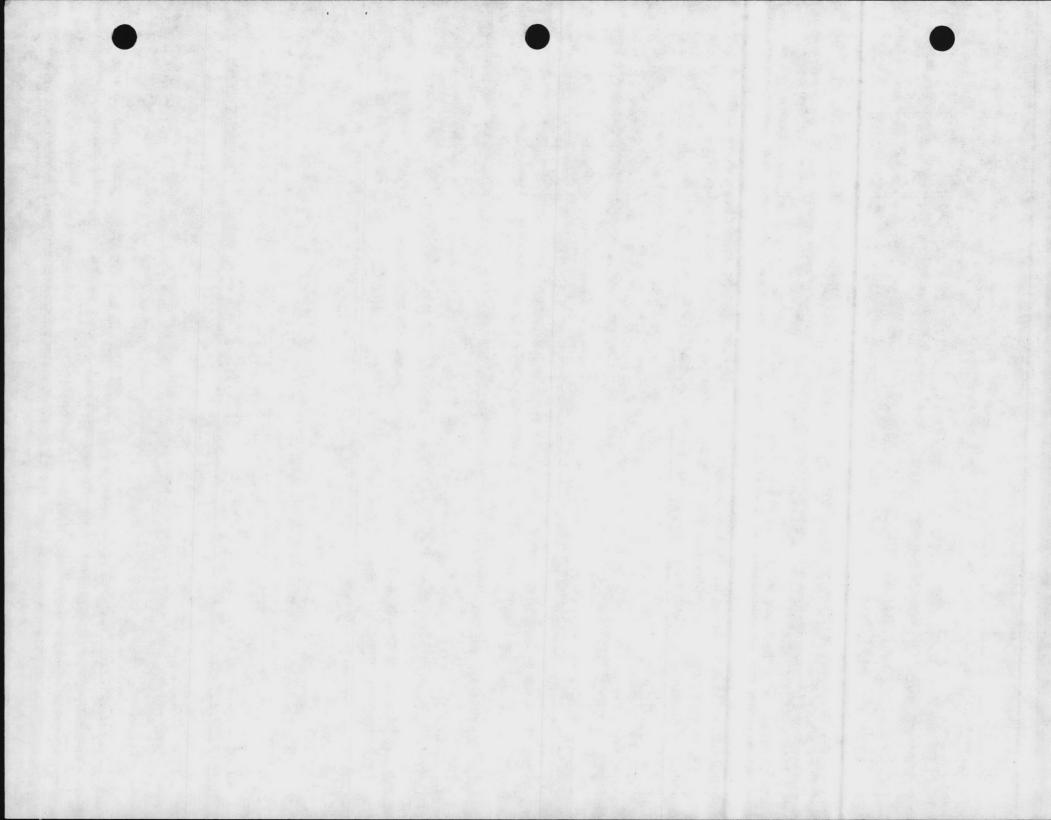
AIR

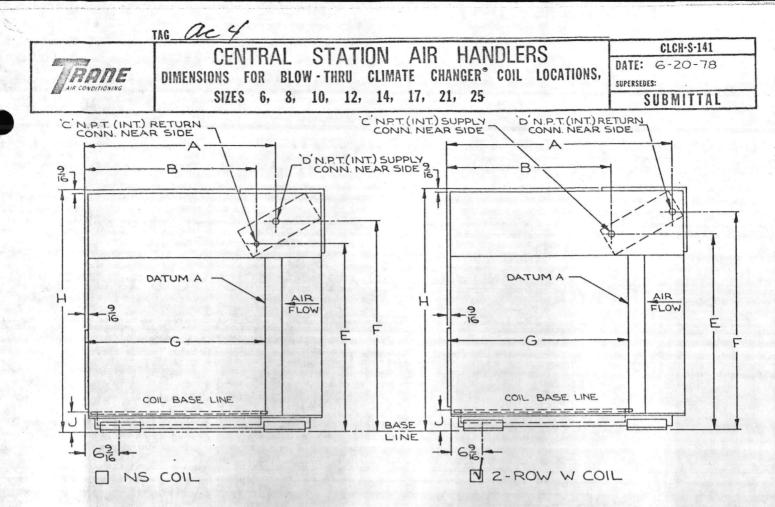
TAG

.

FLOOR MOUNTING LEGS







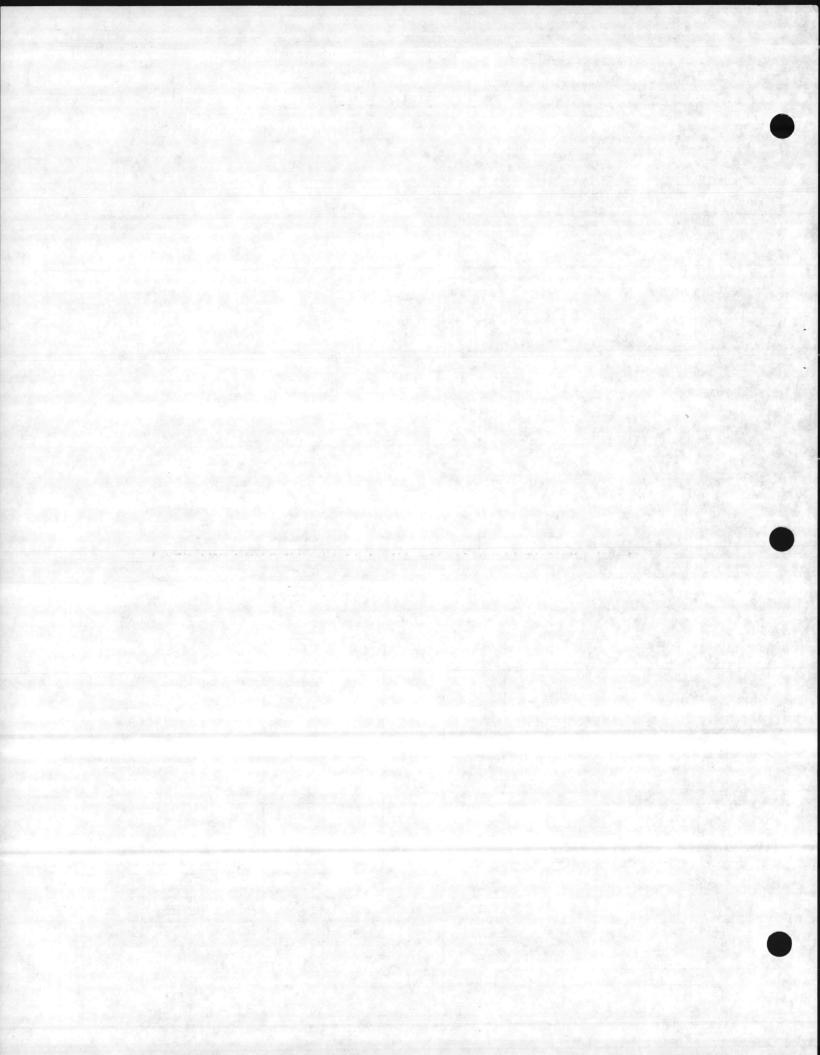
### GENERAL NOTES

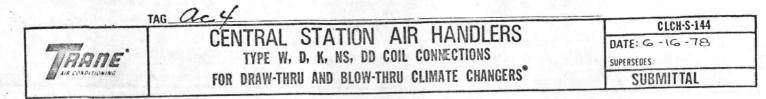
I. COIL CONNECTIONS MAY BE RIGHT OR LEFT AS SPECIFIED ON THE ORDER.

2. SEE DRAWINGS CLCH-S-144, CLCH-S-145, AND CLCH-S-146 FOR COIL CONNECTION DIMENSIONS.

3. DATUM A' IS COIL INTAKE MOUNTING LINE.

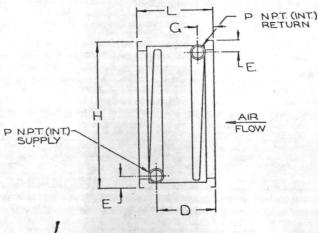
UNI		COIL SIZE	A	В	С	D	E	F	G	Н	J
6	NS	12×36	1'-829"	1'-6 21"	1"	11	2'-327"	2'-632	1'-1155"	3'-416"	316"
6	2-ROWW	12×36	2'-215"	1'-44"	14"	14"	2'-65"	2'-93"	1-118	3'-4"	316
8	NS	18×30	2'-5""	2'-0=	۱"	z	3'-115"	3'-616"	2'-5 \$	4'-5""	316
8	2-ROW W	18×30	2'-7"	1-516	22"	212"	2'-7 16"	3'-0 7	2'-5	4'-5"6"	316
IC	NS	18×39	2'-5="	2'-0="	1"	2"	3-115	3-615	2'-51	4-516	316"
10	2-ROW W	18×39	2'-7"	1-516	212"	21	2'-716	3'-07	2'-5	4-516"	316"
12	NS	18×48	2'-5"6"	2'-0"	l a	2"	3'-515"	3-1010	2-516	4-916	З"
12	2-ROWW	18×48	3'-3 [6"	2'-116"	212"	212"	3'-916"	4-25	2'-515"	4-916	З"
14	NS	18×57	2-516	2'-0""	۱"	2"	3'-515"	3-1010	2'-516"	4-916"	З"
14	2-ROW W	18×57	3-3%	2'-116"	212"	2½"	3-915	4-25	2'-516	4-916	З"
17	NS	18×69	2'-5"6"	2'-0?"	1	2"	3-25	3-73	2'-5 =	4-516	416"
17	2-ROW W	18×69	3-15	1-118	212"	2±"	3'-54"	3-101	2'-5 \$"	4-516	416
21	NS	18×84	2'-5"	2'-0?"	1" -	2"	3-25	3'-73"	2'-5\$"	4-516	416"
1 21	2-ROW W	18×84	3-15	1-115	212"	2½"	3'-54"	3'-101	2'-5	4-516	416"
25	S NS	18×99	2'-64"	2-13"	1"	2"	3'-5 3"	3-101	2-515	4-916	4"
25	5 2-ROWW	18×99	3'-216"	2'-07"	212"	212"	3'-9"	4-25	2-515	4-916	4"

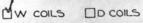




GENERAL NOTE

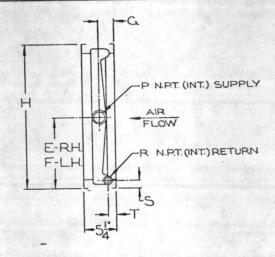
I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.

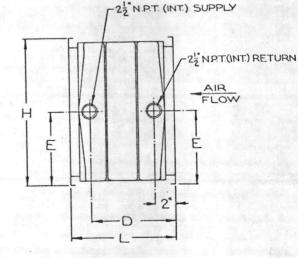




DK COILS

									1					
					62.00		2-	ROW	4-	ROW	ے <sub>د</sub>	ROW	8-	ROW
		COIL	H	E	G	P	L	D	L	D	L	D	L	D
[		12	131	19"	21	14"	61"	43	92:	73"	121	103	152	133
		18	192	24	15"	212"	61"	4%	912"	7%	121	10%	152"	13%
		24	25 2	24"	15	21:	61"	4 9"	91"	79"	121	10%	152	13%
	J	30	312	21"	115 "	21"	61	416	91"	7 3"	121	102"	152	132
	Y	33	342	21.	15:	21	61	416	912"	72"	121	10 %	152	13%





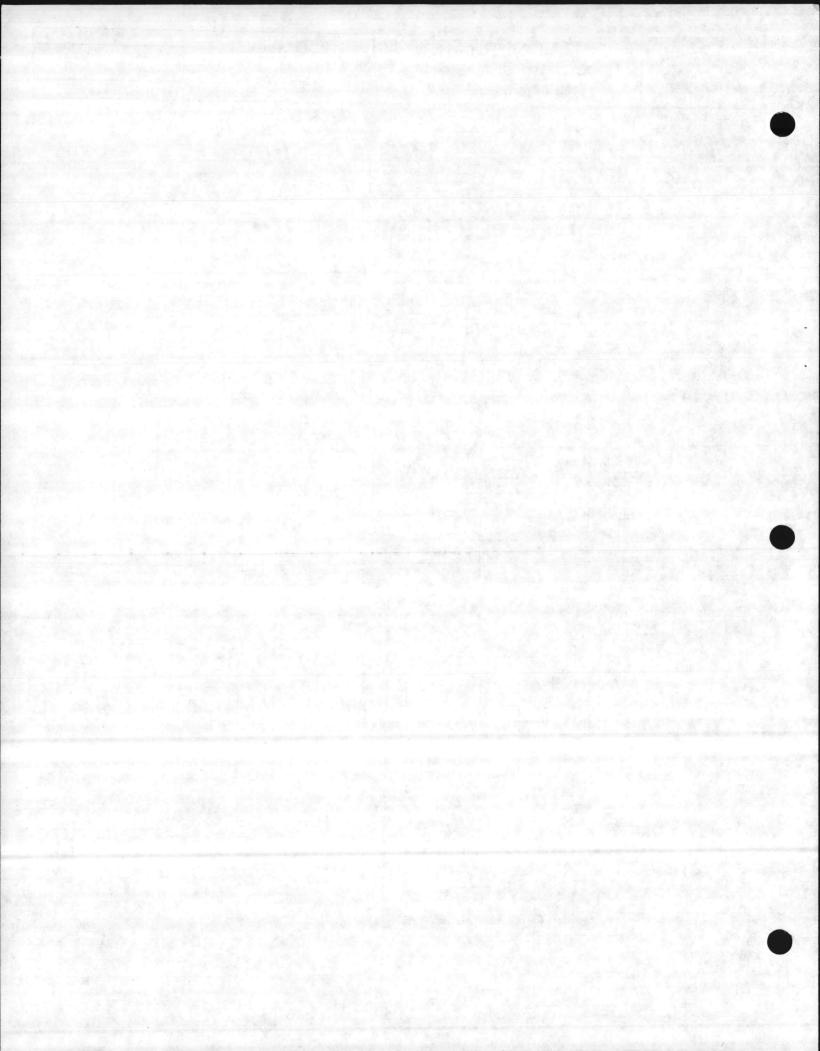
I-ROW NS COIL

COIL	H	E	F	G	P	R	S	Т
12	132	54"	81"	$2\frac{3}{4}$	12"	۱"	110	1510
18	192"	84	114"	212"	2"	۱"	13"	1516
24	2.52"	114"	144"	21	212"	14"	. 12"	14"
30	312"	144"	174	21	З.	14"	12"	14
33	341:	174"	174"	21"	3"	14"	112"	14

DD COIL

			and states	4.	ROW	B-ROW		
	COIL	H	E	L	D	L	D	
	18	192	94	912"	712"	152	132	
	24	252	123	91."	72"	151	132	
1.20	30	312"	154	91'	72"	152	132	
	33	342	174	91"	712"	15 2	132	





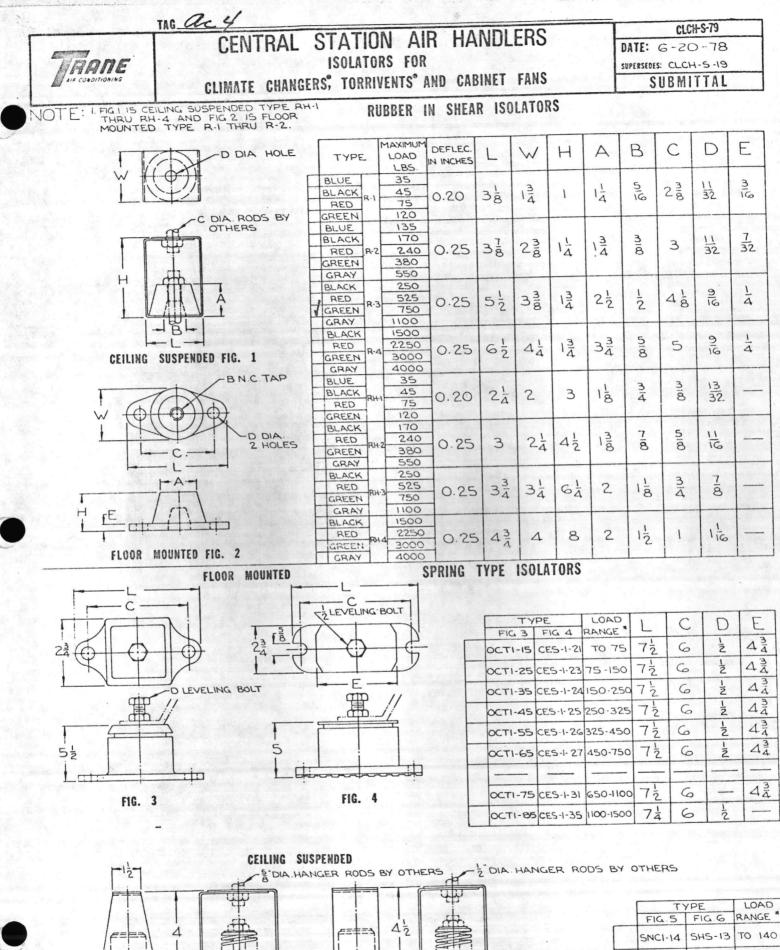
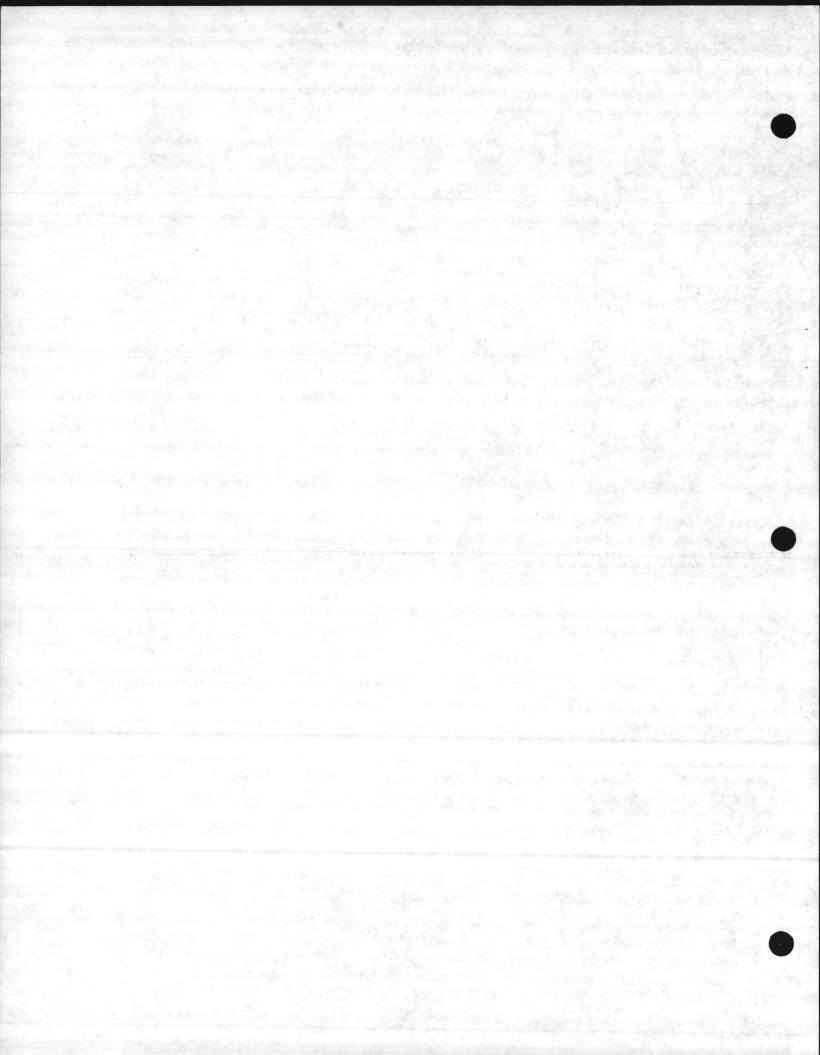


FIG. 5



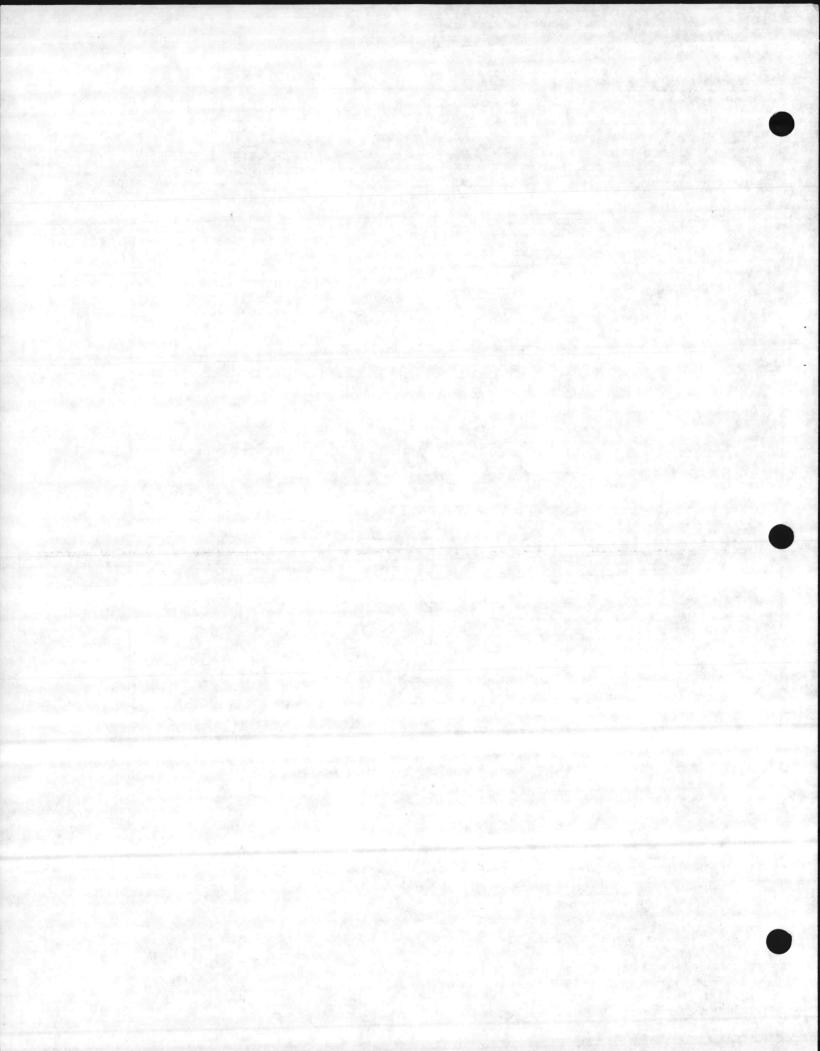
14	SNCI-14	SHS-13	10 140
	SNCI-26	SHS-14	50 - 260
	SNCI-45	SHS-17	100-450
1.1	SNCI-70	SH5-18	200-700

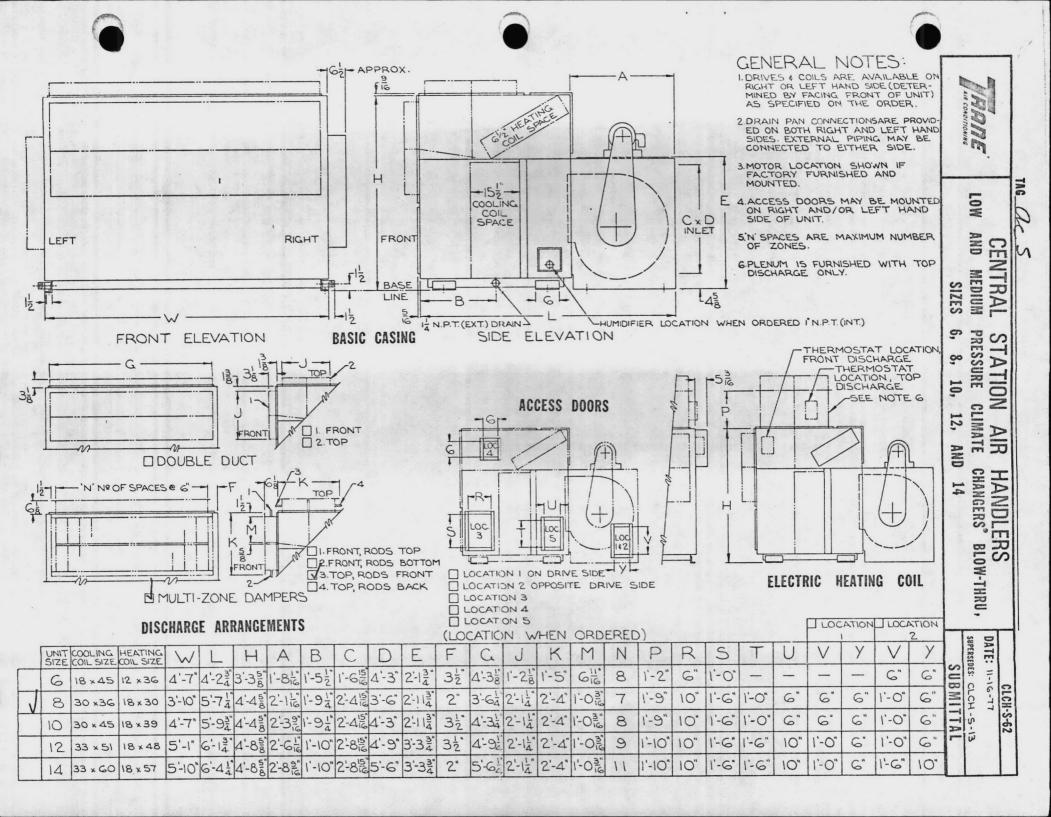


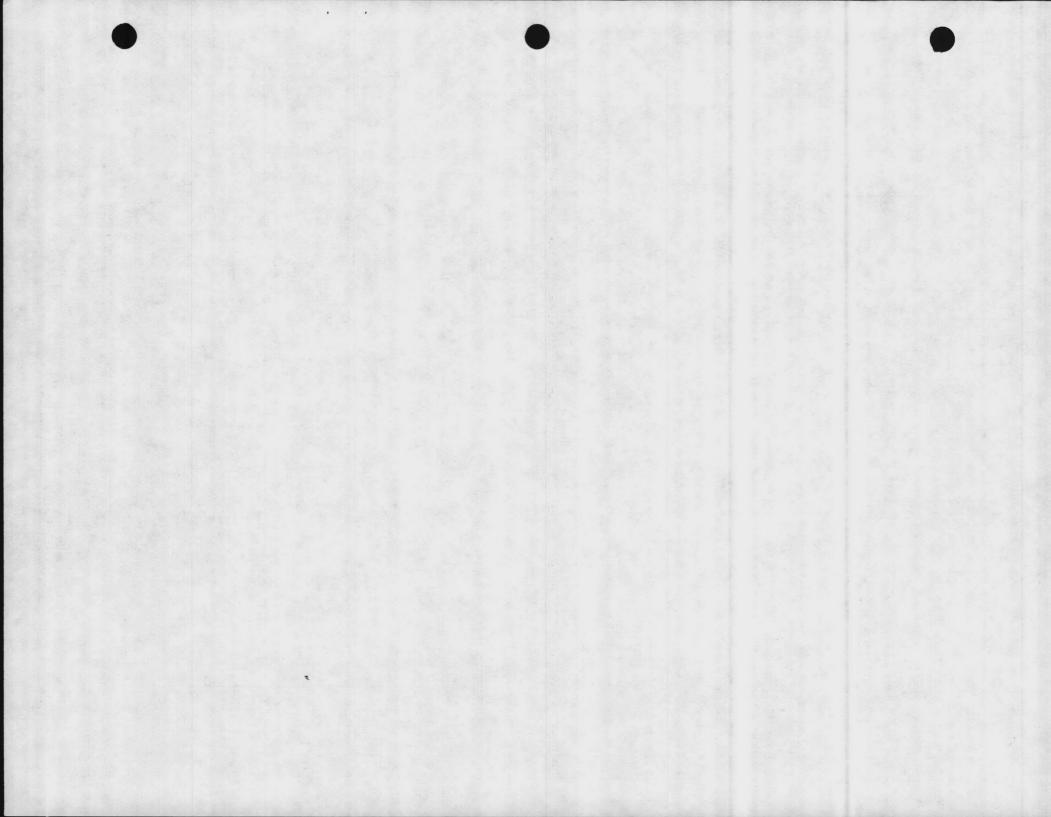
## SUBMITTAL DATA BLOW-THRU CLIMATE CHANGER®

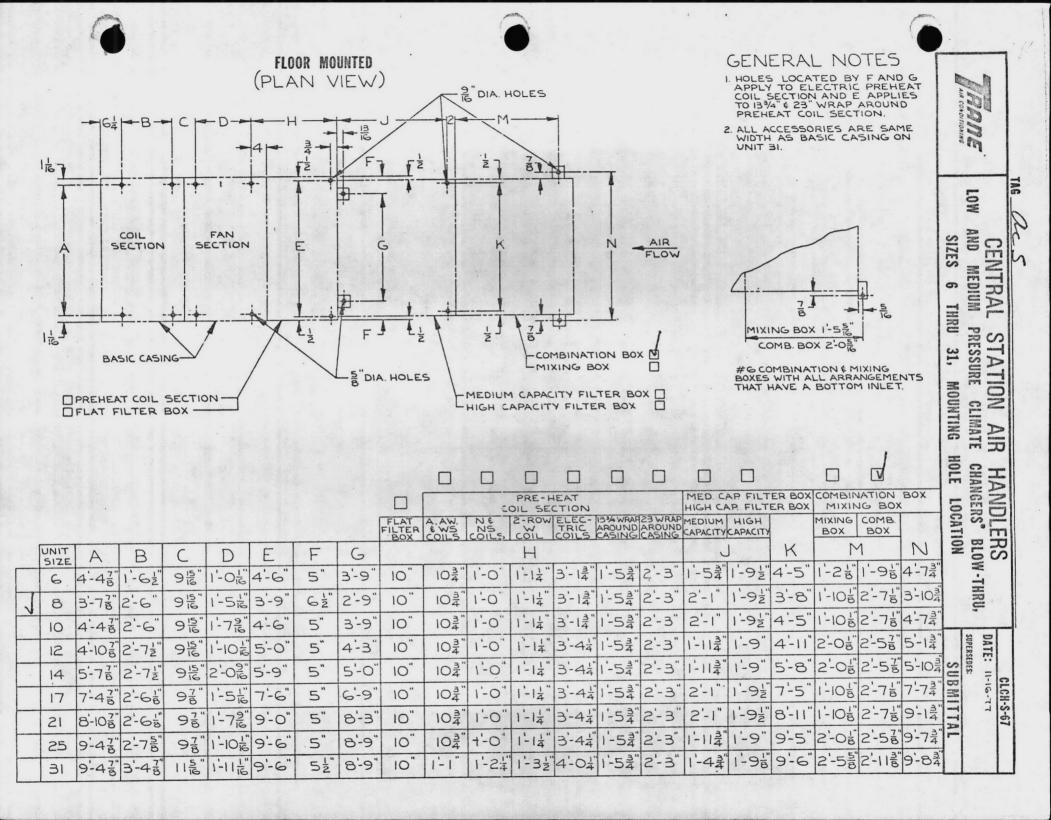


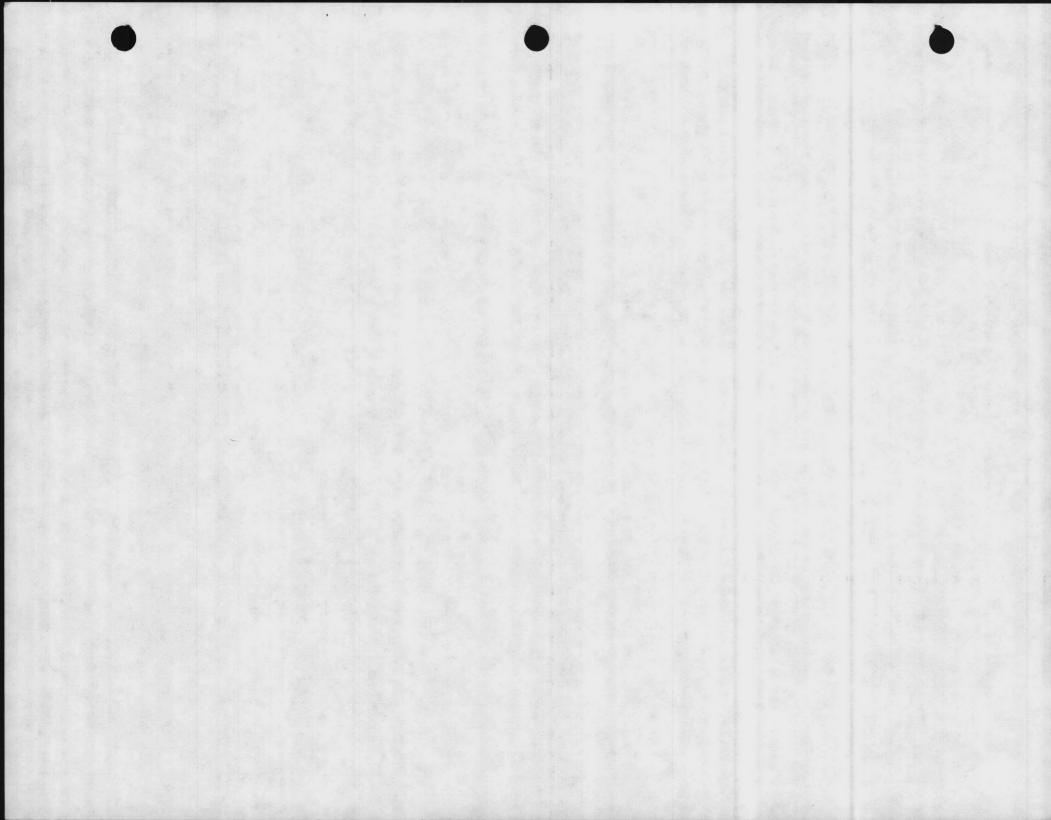
QUANTITY 1 MODEL 8 Medium				edium harge	m pressure Multizone TRANE SALES e Top rods front ORDER NO. K					SALES NO. KF	F3-J094					
TAGGIN	AC-	5		1												and the second second second second second second second second second second second second second second second
FAN						MOTOR						SUBMITTAL APPROVAL DRWGS				
SCFM         4164           ESP         1.0           TSP         2.0           BHP         2.5           RPM         1200           DRIVE SERVICE FACTOR         Variable 1.5						HP         3           RPM         1800           FRAME         182T           ELECTRICAL         460/60/3           TYPE         Open           MOUNT         Left						Clch S/MS1 Clch S62 Clch S67				
C COIL BANK MBH EAT °F LAT °F						COIL	F	TYPE STEA	GPM, MPRESS. T. TEMP.	WATER °F	TEMP.	WPD (FT)				
CH	PREHEATSECT		A.C.		DB -HW	Coi			two							an a gran a farmar a san a san a san a san a san a san a san a san a san a san a san a san a san a san a san a San a san
CY	COLD DECK		127		76. FIN	364.	054		7.77	CIRCUI		26			1.1 SUPPLY	
	COIL BANK	QTY	TYPE	ROWS	SER.	WIDE	LONG	PER	COIL	PER	TURBS.	TUBE M	ATERIAL	1	ECTION	St getting
SR	PREHEAT SECTION HOT	No	ne•	HW	Coi	ls	n di	istwo	r.k	$\langle$	>					
10	COLD DECK	1	W	· 4	16	30	36	$\square$	$\square$		ves	copr	ber	rig	ht	Clch S141 Clch S144
				ORIE	1. 19. A.							G OPTI				1
FILTER BOX     none       COMB. FILTER MIX BOX     yes       FILTERS     throwaway       MIXING BOX     none       PREHEAT SECTION     none       Access section     none       STEAM GRID HUMID.     none       Access boors     none       BAFFLES     #60 hot deck						DOUBLE DUCT     none       MULTIZONE (NO. ZONES)     2       UL LISTING     none       FAN TYPE     FC       FAN PARALLEL CONTROL     none       INLET VANES     1" 3/4 1b       INSULATION     yes						Clch 572				
BELT GUARDS <u>yes</u> ISOLATORS <u>rubber in shear</u>							Combination filter Mixing box opening top & bottom rods left						Clch S79			
						10	O SAME COMMENT AS FOR AC-1						BLANK OF BOTTOM OPENING			





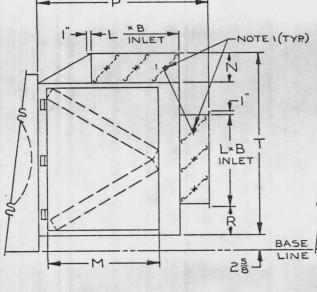


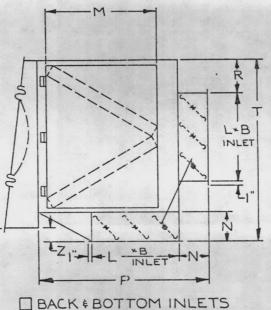






COMBINATION FILTER - MIXING BOXES



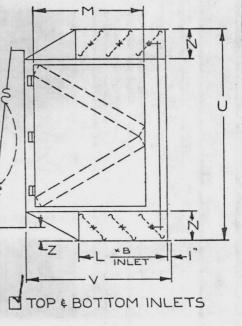


### TOP & BACK INLETS

### GENERAL NOTES

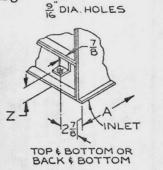
I. DRIVE ROD LOCATED NEAR AND FAR SIDE. 2. FILTER DOORS HINGED ON DOWNSTREAM SIDE. 3. BOX WITH TOP AND BOTTOM INLET, DOOR MAY BE NEAR OR FAR SIDE. OTHER BOXES, DOORS

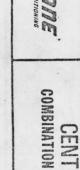
	UNIT		FILTERS	A	B		M	N	P	R	Т	U	V	Ζ
	6	Nº 4	SIZE	4'-6"	4'-2'4"	1-01	1-5"	54"	2'-43"	54	2'-23	2'-6'2"	2'-0"	18"
J	8	4	20 × 25	3'-9"	ਤ'-3ੇਂ	1-81	2'-05"	64"	3-34	64"	3'-134"	3'-6'2"	2'-10"	215"
	10	6	16 *25	4-6	4-24	1-81	2'-05"	64"	3-34	64"	3-13"	3'-6'	2-10"	2늘"
	12	24	16 × 25 20 × 25	5-0"	4-65	1'-10±"	1-113	54"	3-12"	74	3'-43	3-82	2-83	15
	14	8	16 × 25	5-9"	5-45	1-101	1-113	54	3-12"	74"	3-43	3'-82	2-84	
	17	8	20 × 25	7'-6"	7'-0툴"	1-81	2'-05"	64"	3-34	64"	3-14	3'-6'	2'-10"	518"
	21	10	20 × 25	9'-0"	8-64	1-81	2'-05"	64"	3'-34	64	3-17	3-62	2'-10"	5 <sup>1</sup> / <sub>8</sub>
	25	66	16 × 25 20 × 25	9'-6"	9-04	1-102	1-113	A CONTRACT OF CONTRACT	3-12"	74"	3'-4#"	3'-82	2'-84	
	31	12		9'-7"	9'-04	2-27	1-44	64	3'-24"	104	4-34	4-82	2'-81	2="



INLET TOP & BACK 25

FLOOR MOUNTING LEGS

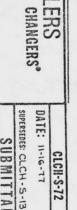




TAG

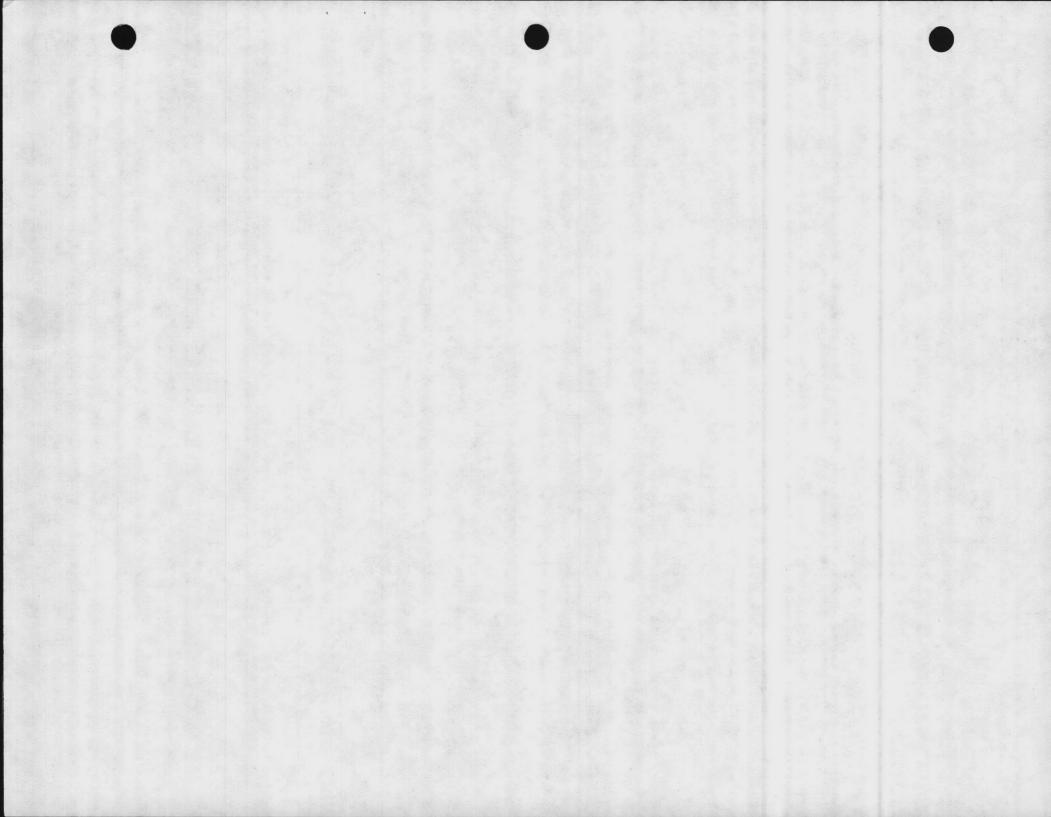
'RA

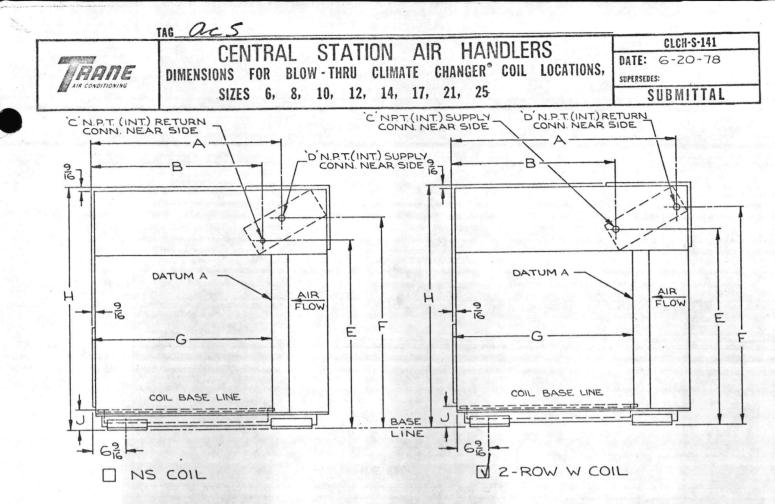
FILTER-MIXING BLOW-THRU, -S TA -SIZES NO BOXES 5 AIR FOR THRU CLIMATE HANDL 31



11-16-77 CLCH-S-72

SUBMITTAL





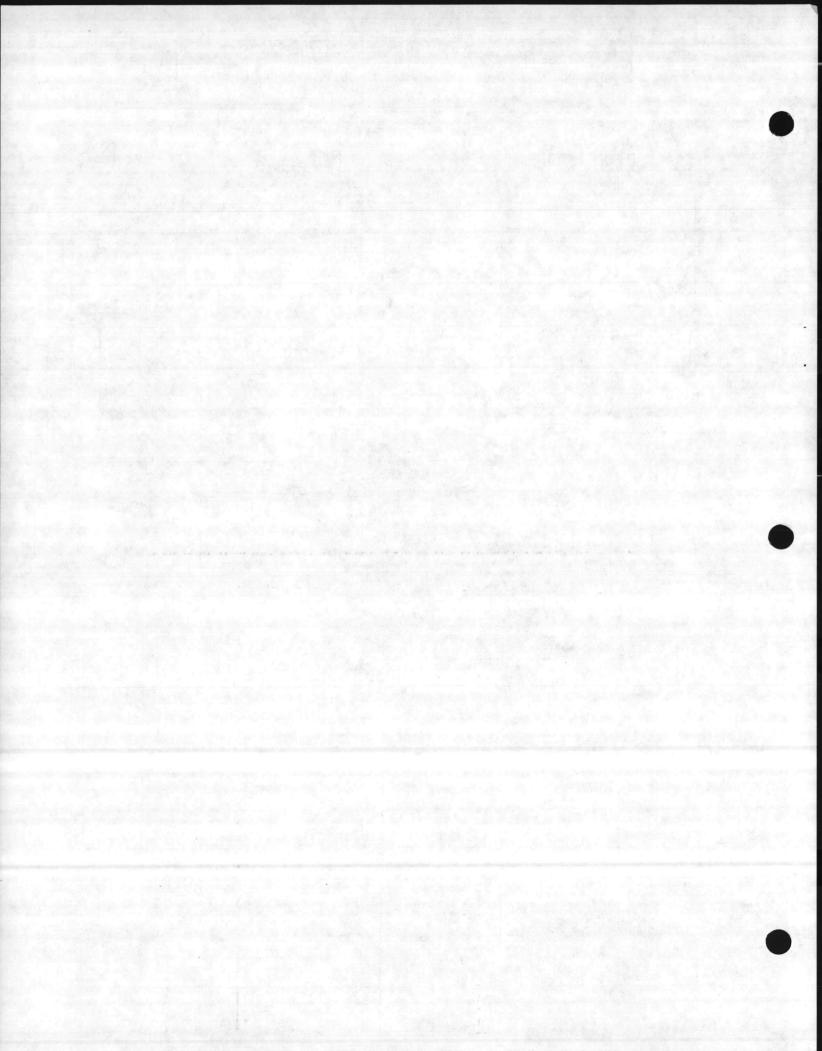
#### GENERAL NOTES

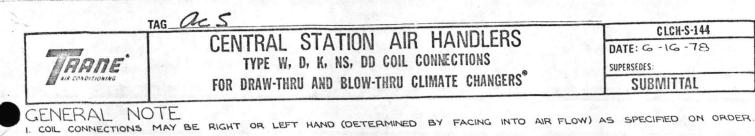
I. COIL CONNECTIONS MAY BE RIGHT OR LEFT AS SPECIFIED ON THE ORDER.

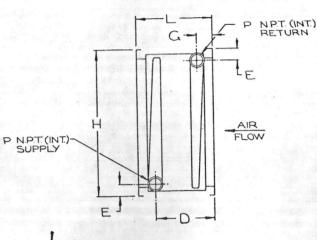
2. SEE DRAWINGS CLCH-S-144, CLCH-S-145, AND CLCH-S-146 FOR COIL CONNECTION DIMENSIONS.

3. DATUM A' IS COIL INTAKE MOUNTING LINE.

.	UNIT	TYPE OF COIL	COIL	A	В	C	D	E	F	G	Н	J
	6	NS	12×36	1'-832	1'-632"	1"	112"	2'-327"	2'-632	1'-118"	3-416	316"
	6	2-ROWW	12×36	2'-215"	1'-44"	14"	14"	2'-65"	2'-98	1-115	3'-4"5"	31E
	8	NS	18×30	2'-5 16"	2'-0=	1	2"	3'-118"	3'-616"	2'-5'	4-516"	316"
J	8	2-ROW W	18×30	2'-7"	1-516	22"	21	2'-7 16"	3'-015	2'-58	4'-5"	315"
	10	NS	18×39	2-53	2'-0="	1"	2"	3-115	3'-615"	2'-51	4-516	316"
	10	2-ROWW	18×39	2'-7"	1-516"	212"	2±"	2-75	3'-07	2-55	4-516"	316"
	12	NS	18×48	2'-5"6"	2'-0"	1"	2"	3-513"	3-101	2-515	4-916	З"
	12	2-ROWW	18×48	3'-3 [6"	2'-116"	21	21	3'-916"	4-25	2'-515"	4-916	З"
	14	NS	18×57	2'-5"6"	2'-0""	1	2"	3-515		2'-516"	4-916	З"
	14	2-ROWW	18×57	3-3%	2'-116	212"	212"	3'-91"	4-25	2'-51	4-916	З"
git i i	17	NS	18×69	2'-5 =="	2'-0"	1"	2"	3-25	3-73	2'-5 =	4-516	416"
	17	2-ROW W	18×69	3'-1"5"	1-118	2½"	2±"	3'-54"	3-102"	2-55	4-51	416"
	21	NS	18×84	2'-5"	2'-0?	1" -	2"	3-25	3'-73"	2'-5	4-516	4话
apo	21	2-ROW W	18×84	3-15	1-118"	212"	212"	3'-54"	3'-101	2'-5	4-516	416"
	25	. NS	18 × 99	2'-63"	2-14"	1	2"	3'-5 ह	3'-10'	2-515	4-916	4"
	25	2-ROWW	18×99	3-216	2'-016	2½"	212"	3'-9"	4-25	2-515	4-916	4



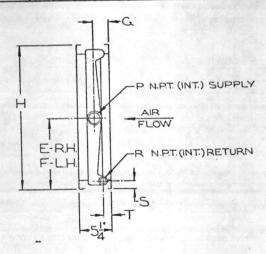


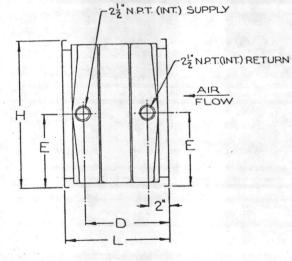


WW COILS D COILS

									1					
					•		2-	ROW	4-	ROW	6-	ROW	8-	ROW
		COIL	H	E	G	P	L	D	L	D	L	D	L	D
Г		12	132	19"	21	14"	61"	43"	92	7318	121	103"	152	133"
F		18	192	24	15"	21:	61"	4 210	912	7%	121	10%	152"	13%
F		24	25 2	$2\frac{1}{4}^{*}$	15	21	61"	4 16	912	7%	121	10%	152	1.3 %
1	J	30	312	24	15.	212"	61	4%	91"	7 26	122	10%	152	132"
1	-	33	342	21	115.	21	612	416	91	7%	122	10 %	152	132

K COILS





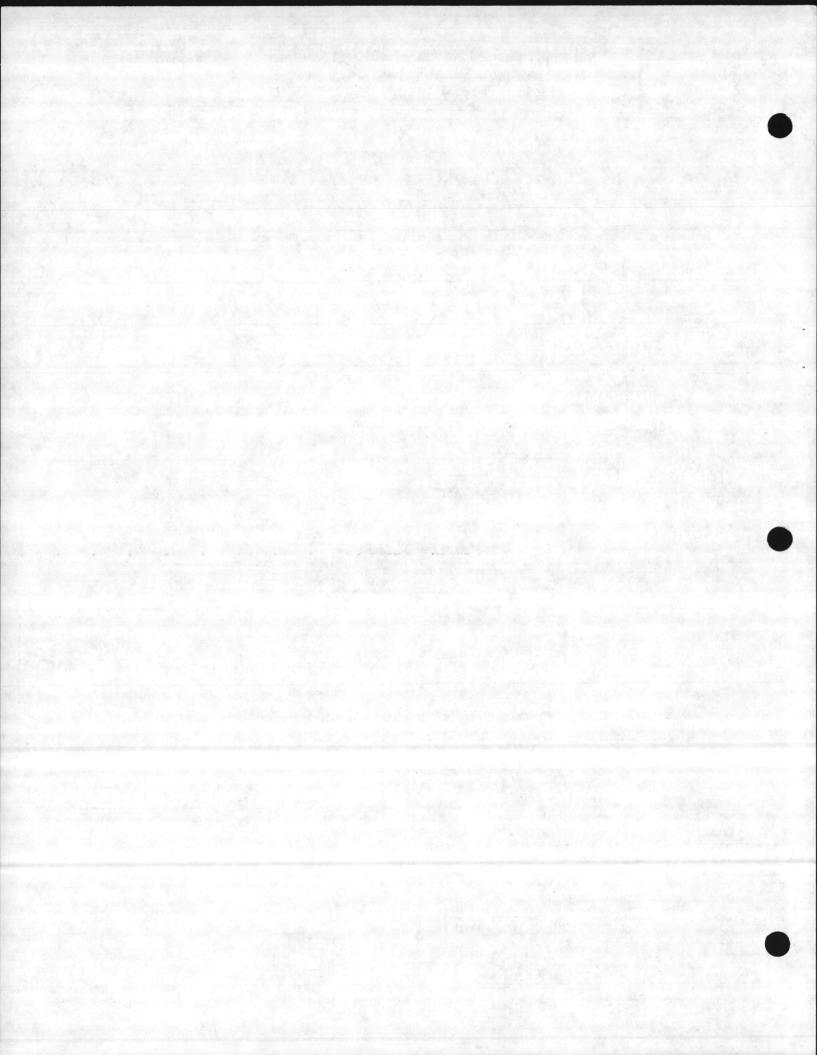
- I-ROW NS COIL

COIL	H	E	F	G	P	R	S	Т
 12	132	54"	81	23"	12"	١	13"	15
18	192"	84	114"	212"	2"	۱"	13"	15
24	251"	114"	144"	21"	21:	14"	12"	14"
30	312"	144"	174	212"	3.	14"	12"	14
33	341	174	174"	21"	3"	14"	112"	14"

DD COIL

			4.	ROW	8-1	ROW
COIL	H	E	L	D	L	D
18	191	94"	912"	712"	152	132
24	252	123	912"	72"	151"	132
30	312"	154	91"	72"	152	132
33	342	174	91	71:	152	132





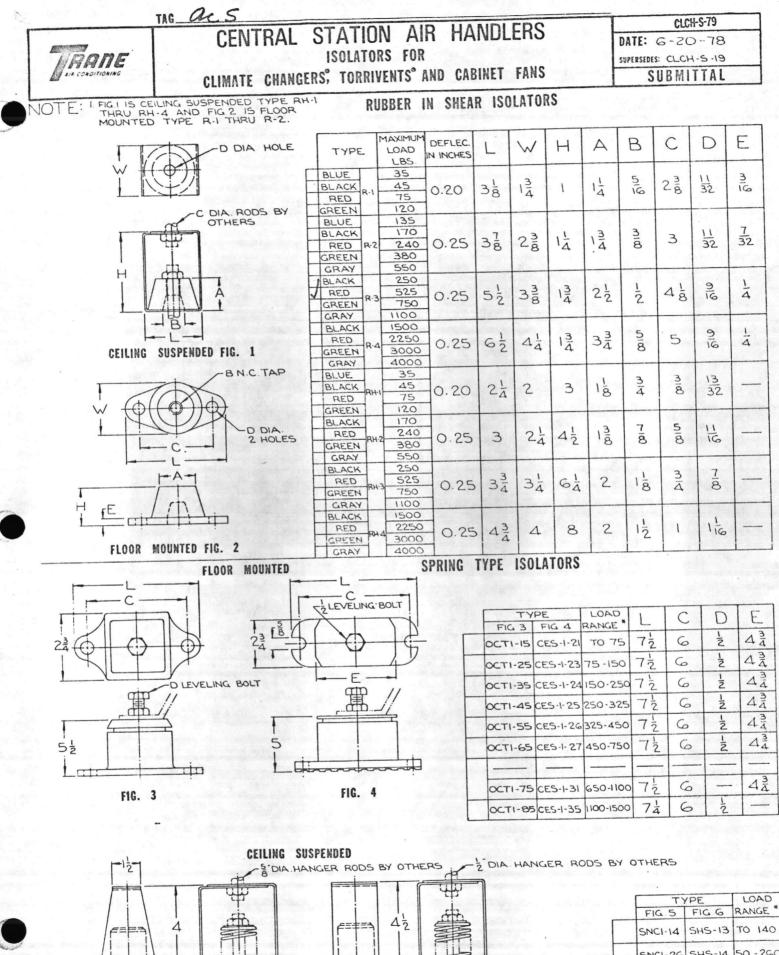
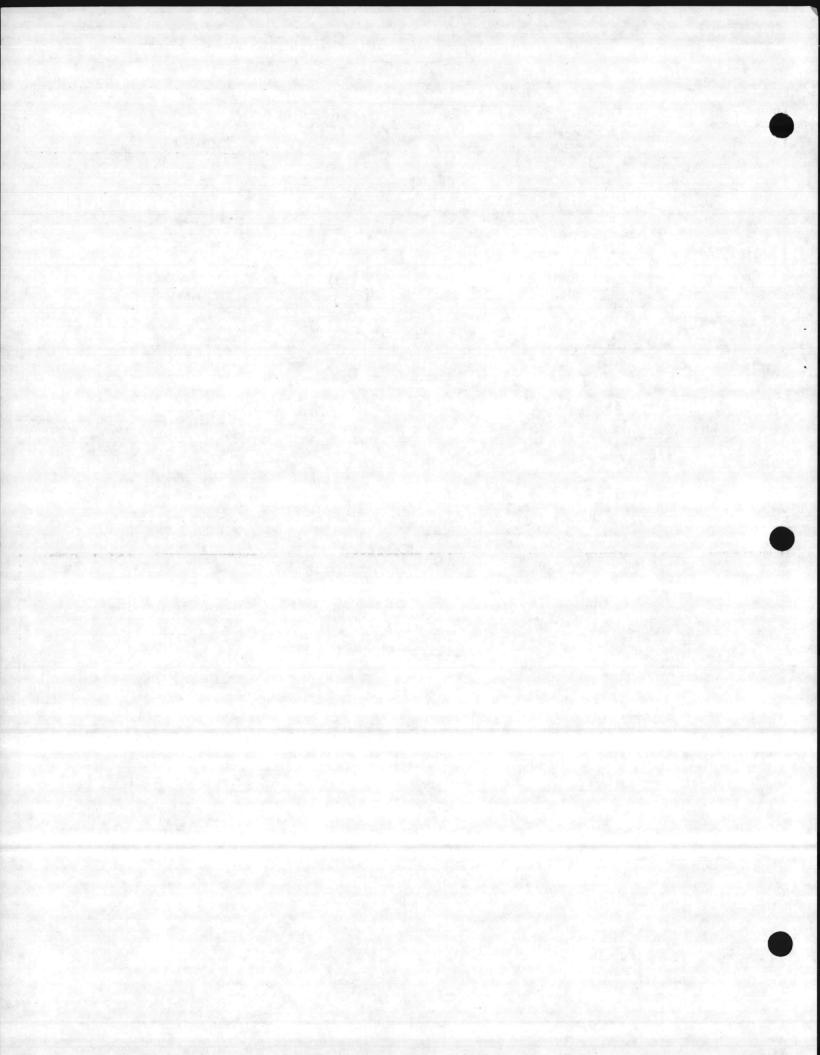


FIG. 5

FIG. 6

	SNCI-14	SHS-13	TO 140
	SNCI-26	SHS-14	50 - 260
hel	SNCI-45	SHS-17	100-450
inter a	SNCI-70	SH5-18	200-700

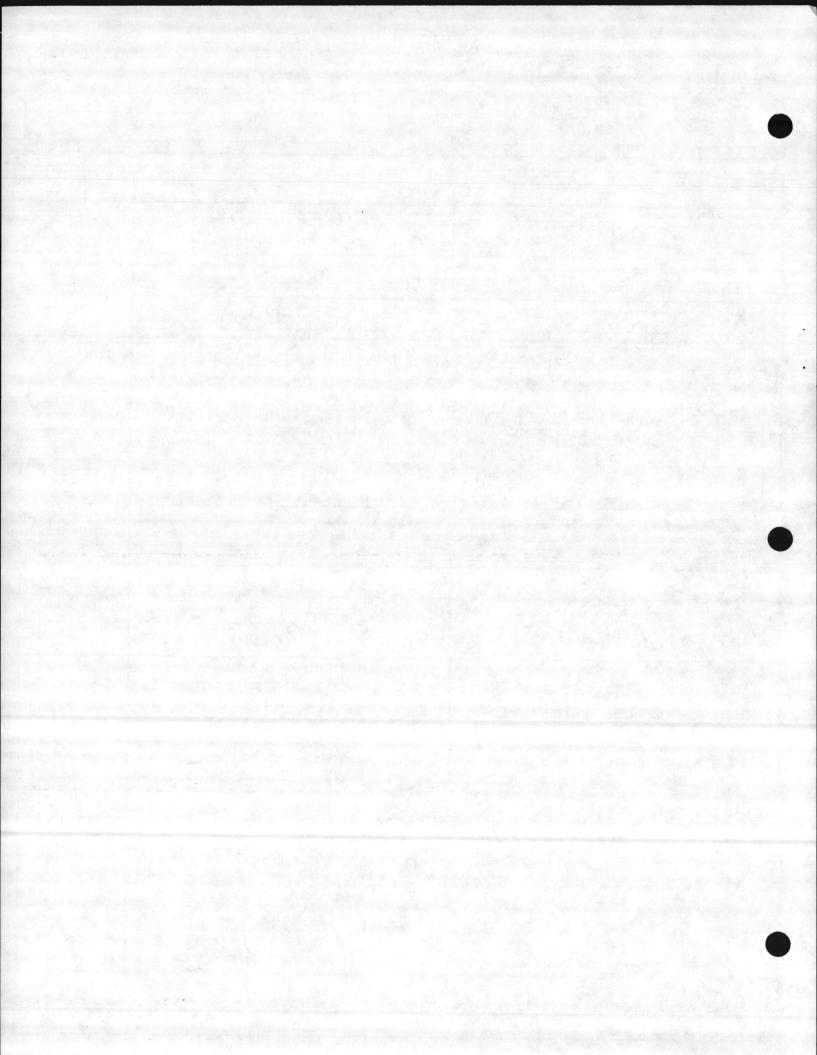


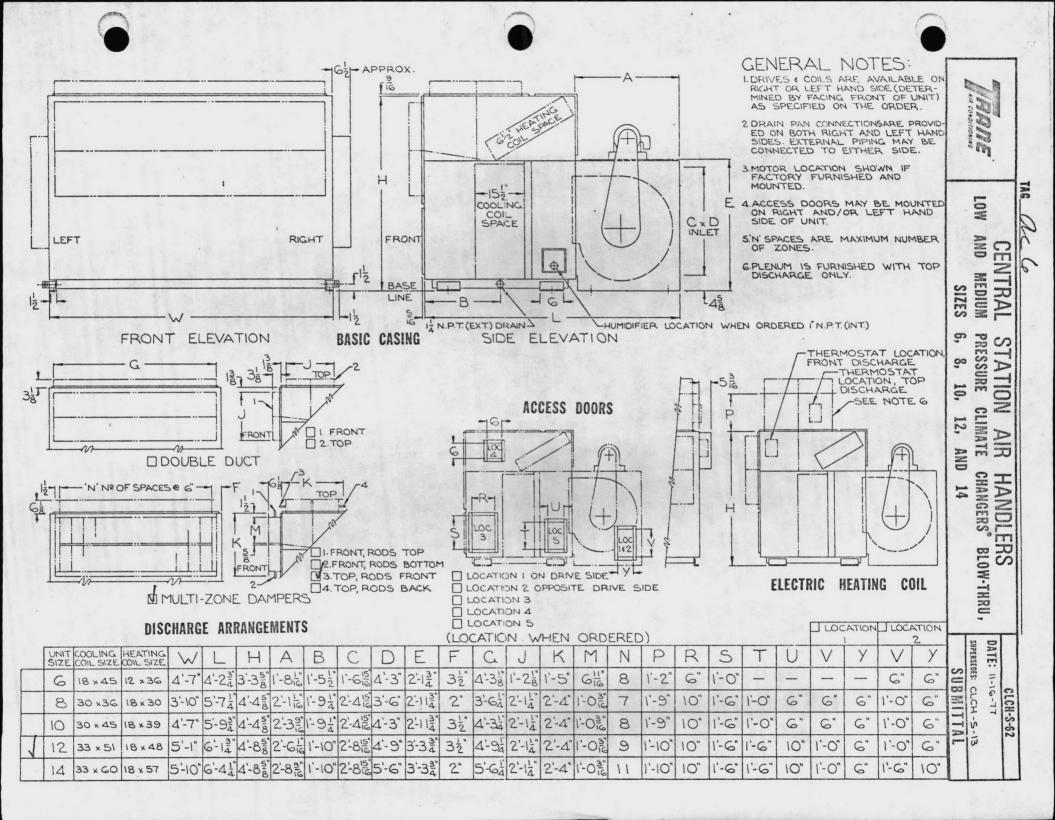
# SUBMITTAL DATA BLOW-THRU CLIMATE CHANGER®

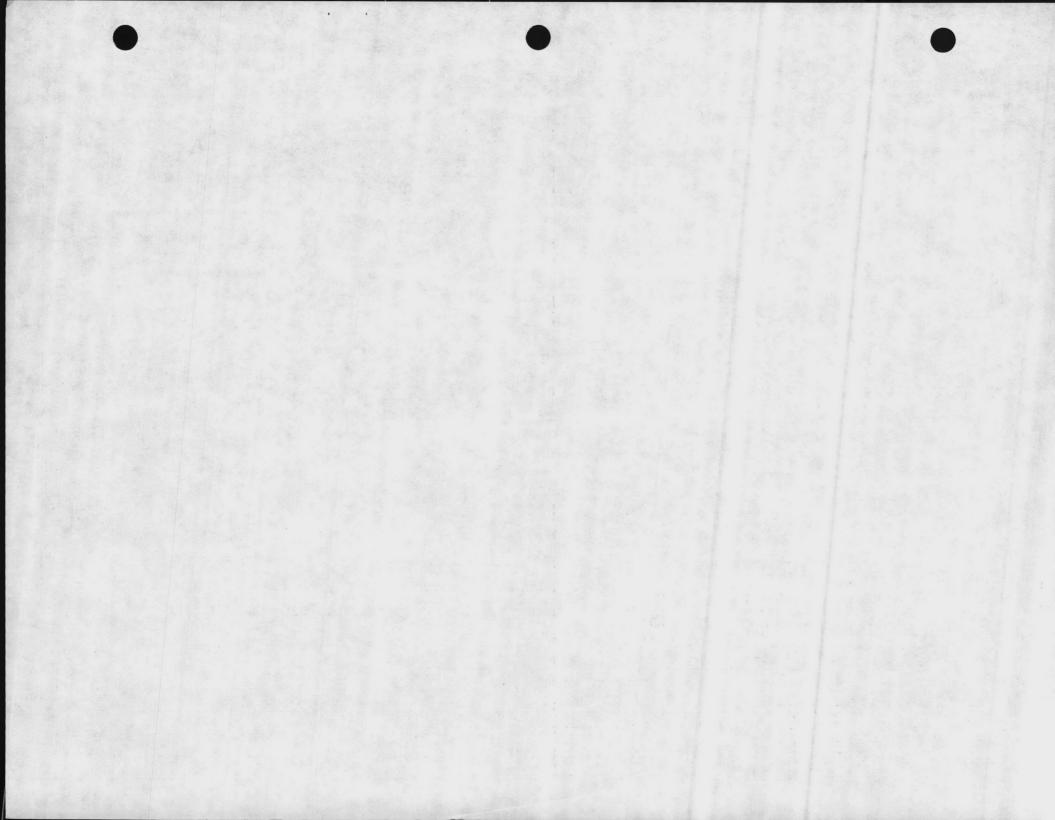


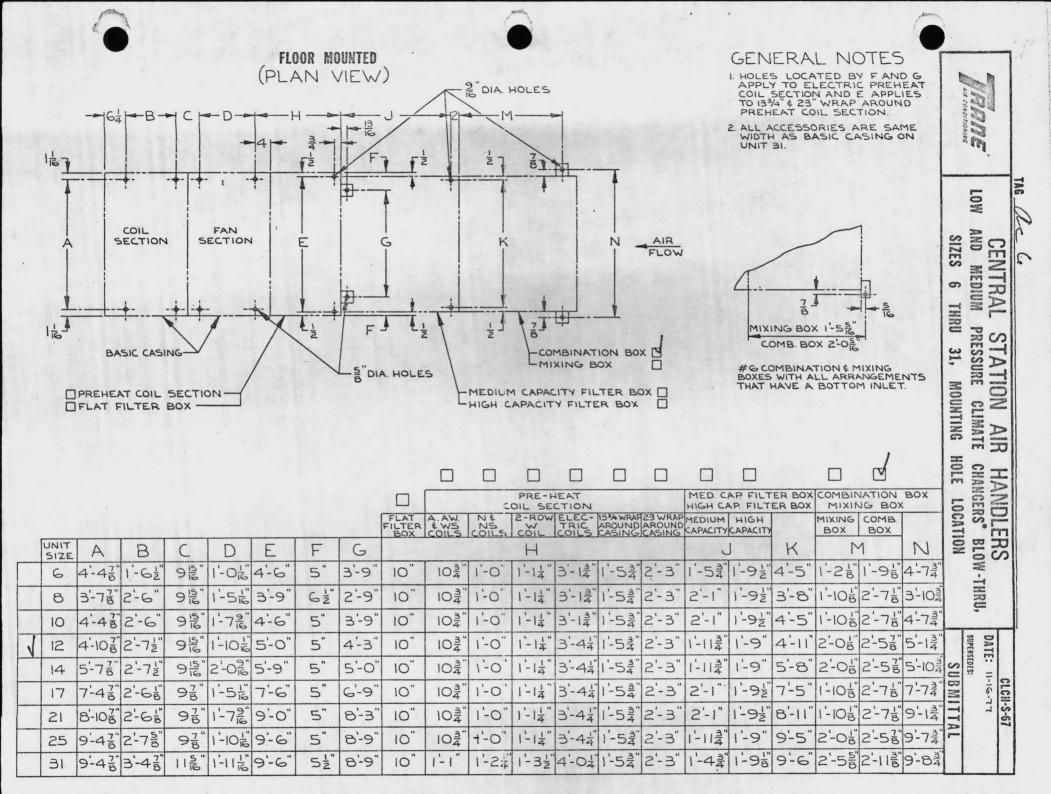
00/	NT	ידוי 1				M	ODEL	12 dis	Low   char	pres ge T	sur op	ro	Multi: ds fro	zone ont		ORDER	SALES NO.	KF3-	1094
TAC	GGI	NG AC	:6			<u>,                                     </u>								- 7 - <u>7</u> 94 					
No. of Concession, Name				FA	N	1.00				-			M	IOTOR	add are	- Jester			ITTAL
sci	M	and the second second			568	6	100 100 100			HP			3		1999, 299, 299, 299, 299, 299, 299, 299,				VAL DRWGS
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TSI					1.5					FRA	ME		18		12			Clch	S62
вн					2.9		<u> </u>	-		ELE	CTRI	CAL		0/60/	3			Clch	567
RP	м				775					TYP	E		Op Le						
DR	IVE	SERVICE FAC	TOP		Var	iab	le l	• 5		MOU	NT			1.				1	
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1	AP	COIL BANK		1 /	ĸw	DB	WB	DB		APD	F	TY	PE STEA	MPRESS. . TEMP.	IN	OUT	(FT)		
	A	PREHEAT SECT	ION	1									ar in the second		-		-	- Sand	
	C I	HOT DECK		Nor	ne -l-	WC	coils	; in	duct	work				1.0	1.0	.0 0	12.7	1. 16.73	
c	T Y	COLD DECK		199	2	78.	966	957	.055.			-	W	46	40	18.8	1	-	
0	D	COIL BANK	IOT.	TYPE	ROWS	FIN		ZE	TOT.CIR. PER	/ /	CIRC	ER	TURBS.	TUBE M	ATERIAL	1.00	SUPPLY		
1	ES		-	1		SER.	WIDE	LONG	COIL	COIL	DIS	ST.				CON	TECTION	1.1.1	
L	CR	PREHEAT	-	-			-		X	X	>								
S	I P	нот		No	ne	HW	Coi	s i	n dud	E WO	prk.	/							
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		DECK		W	14	15	1	51	-				yes	cop	Del		igne	Jeren	5144
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м	XIN	IG BOX		1	none	Э		4.347			TYP				FC			144	
PF	REH	EAT SECTION			non					FAN	PAR	RALL	EL CONT	ROL	none				
AC	CE	SS SECTION		38	non		<u></u>			INL	ETV	ANES	1		none 1" 3		lb	1.128	
ST	ΕA	M GRID HUMID	•		non					INSU	JLAT	ION			yes	1-		1.33	
		SS DOORS		-	non #70	bo	t de	ck		GAL	.v. D	RAIN	PAN LIN	ER	100		e dan sala	- Contra	
		LES			yes	110	c uc			CDEC.	-1.4.1	EEAT	URES:						
		GUARDS			rub	ber	in	shea	r									Clcł	s79
150		ATORS		-			S. W.	and g	1.6	Co	mb i	na	tion	filte	r Mix	ing	box		
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PAGE 6 OF 8

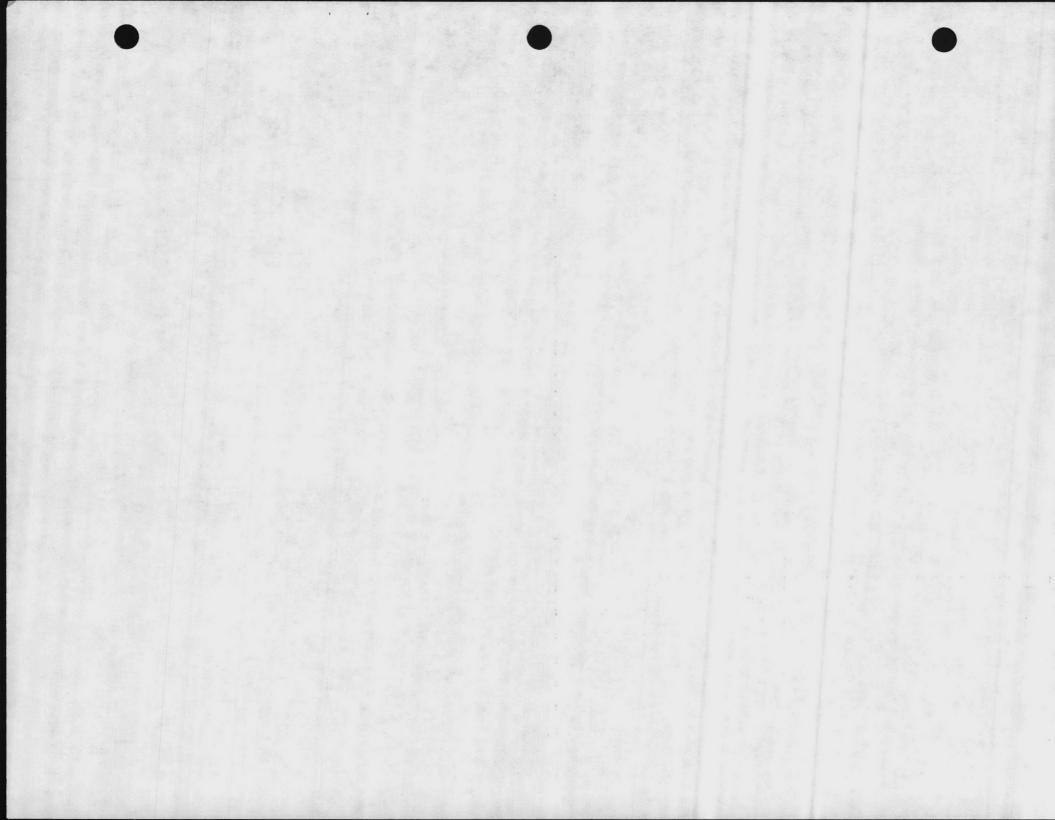






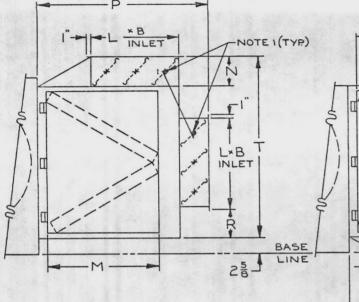


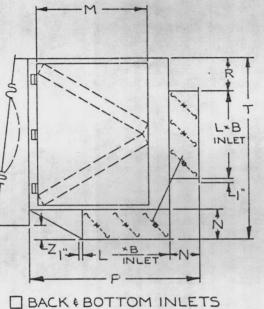
and the second second





COMBINATION FILTER - MIXING BOXES



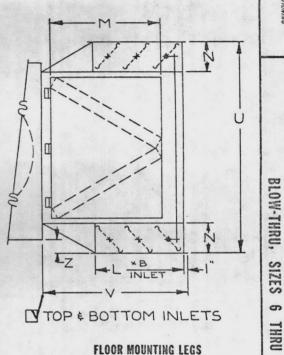


TOP & BACK INLETS

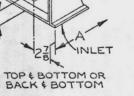
### GENERAL NOTES

I. DRIVE ROD LOCATED NEAR AND FAR SIDE. 2. FILTER DOORS HINGED ON DOWNSTREAM SIDE. 3. BOX WITH TOP AND BOTTOM INLET, DOOR MAY BE NEAR OF FAR SIDE. OTHER BOXES, DOORS ARE NEAR AND FAR SIDE.

	UNIT	Nº	FILTERS	A	B	L	Μ	N	Ρ	R	Т	U	V	Ζ
[.	6	4	16 × 25	4'-6"	4-24	1'-012"	1-5"	53			2'-23	2'-6'2"	2'-0"	18"
	8	4	20 × 25	3'-9"	3-35"	1-82	2'-05"	63	3-34	64"	3'-13"	3-61	2-10"	25"
	10	6	16 * 25	4-6	4-24	1-8±	2'-05"	63"	3-34	64	3-13"	3'-6'="	2'-10"	54.
J	12	24	16 × 25 20 × 25	5-0"	4-65	1'-10 <sup>1</sup>	1'-113	54	3-12"	74	3'-43	3-8:	2'-83	
	14	в	16 × 25	5-9"	5-45	1-101	1,-113,	54"	3-12"	74"	3-44	3-82	2-83	
	17	8	20 × 25	7'-6"	7'-0툴"	1-81	2'-05"	64"	3-34	64"	3-17	3-62	2'-10"	218"
	21	10	20 × 25	9'-0"	8-64	1-82	2'-05"	64"	3'-34"	64	3-17	3-62	2'-10"	2 == "
	25	66	16 × 25 20 × 25	9'-6"	9-04	1-10불	1-113		and the second second	74	3-44	3'-82	2'-83	1号"
	ЭІ	12	16 × 20 16 × 25	9'-7"	9-04	2-25	1-44	634"	3-24	104	4-34	4-82	2-81	24"



INLET TOP & BACK 25 2. DIA. HOLES



Z



COMBINATION CENT RAL FILTER-MIXING S TA -NOI. BOXES 5 AIR FOR THRU HAND CLIMATE 31

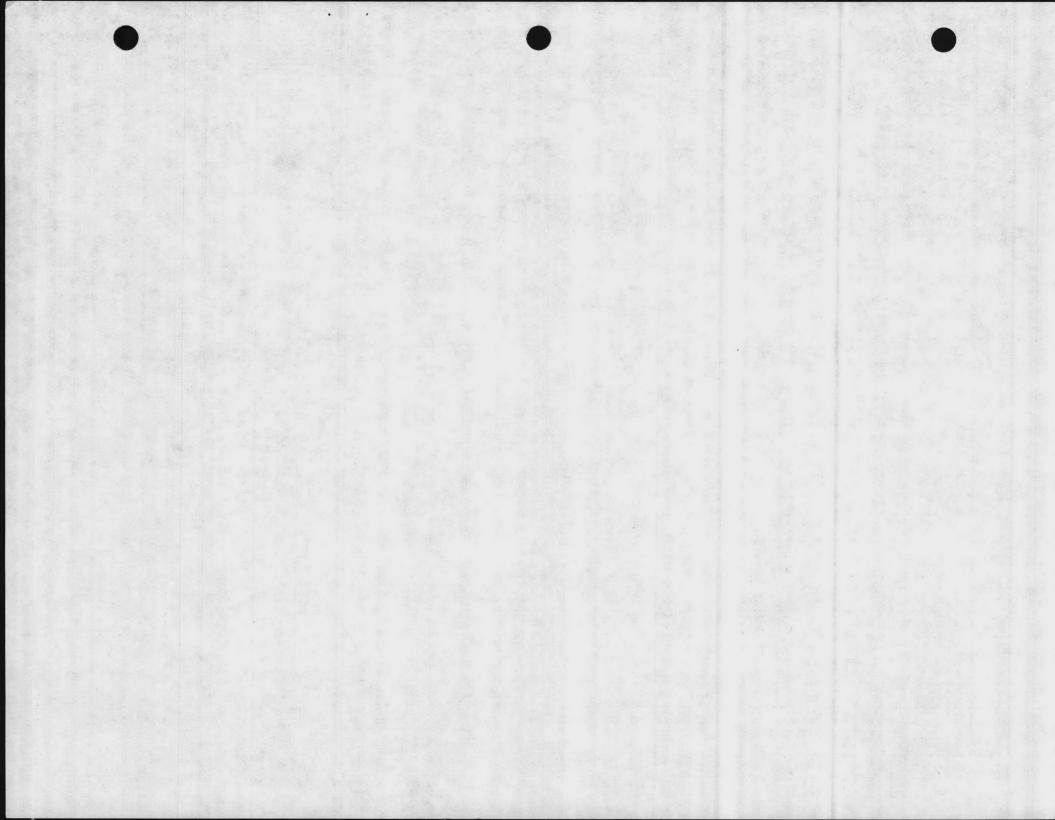
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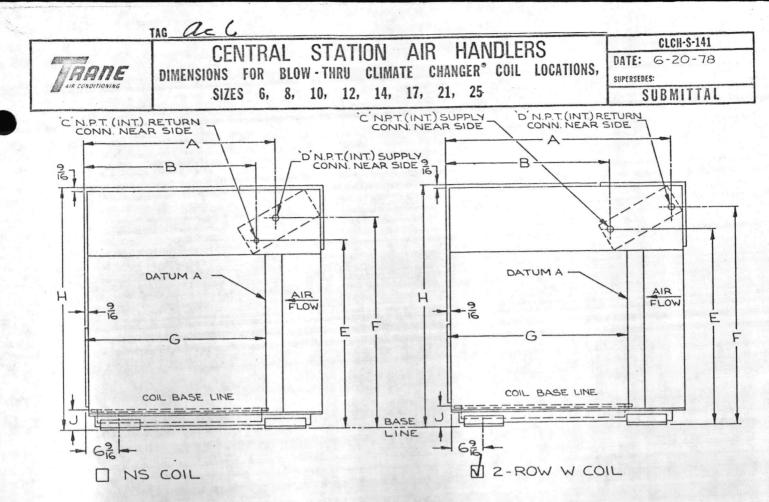
CHANGERS"

DATE: 11-16-77

CLCH-S-72

SUBMITTA





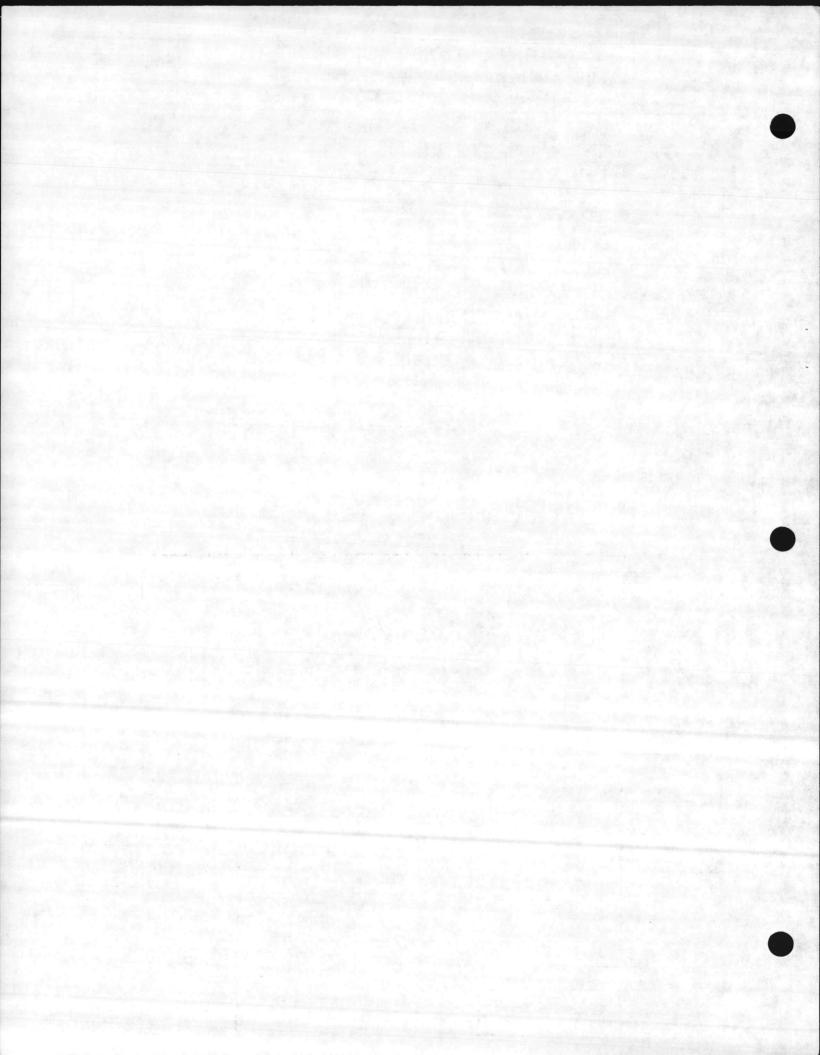
#### GENERAL NOTES

I. COIL CONNECTIONS MAY BE RIGHT OR LEFT AS SPECIFIED ON THE ORDER.

2. SEE DRAWINGS CLCH-S-144, CLCH-S-145, AND CLCH-S-146 FOR COIL CONNECTION DIMENSIONS.

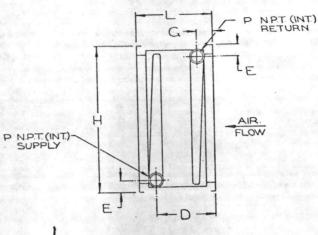
3. DATUM 'A' IS COIL INTAKE MOUNTING LINE.

	UNIT	TYPE OF COIL	COIL	A	В	C	D	E	F	G	H	J
	6	NS	12×36	1'-829"	1'-6 32"	1"	12"	2'-327"	2'-632	1-118	3-416	316"
	6	2-ROWW	12×36	2'-215"	1'-44"	14"	14"	2'-65"	2'-93"	1-115	3'-4"5"	316
1	8	NS	18×30	2-516	2'-0=	1	2"	3'-112"	3'-615"	2'-5 15"	4'-5"	316
	8	2-ROW W	18×30	2'-7"	1-516	22"	212"	2'-7 16	3'-015	2'-5'	4'-5"	316
	10	NS	18×39	2'-5"	2'-03"	1"	2"	3-15	3'-615"	2'-5	4'-5 16"	316
	10	Z-ROWW	18×39	2'-7"	1-510	212"	21	2-75	3'-016	2'-5\$"	4-516	316
	12	NS	18×48	2'-5"6"	2'-0""	1"	2"	3'-513"	3'-1016	2-515	4-916	З"
J	12	2-ROWW	18×48	3'-3"	2'-116"	21	212"	3'-916"	4-25	2'-516"	4-916	З"
	14	NS	18×57	2-5"6"	2'-0""	Ι"	2"	3-516	3-101	2'-516"	4-916"	З"
	14	2-ROWW	18×57	3-3%	2'-116	21	212"	3-915	4-25	2'-516	4-916	З"
	17	NS	18×69	2'-5흖"	2'-0"	1"	2"	3-25	3-73	2'-5 5	4-516	416"
	17	2-ROW W	18×69	3-15	1-118	212"	2±"	3'-54"	3-102	2-55	4-516	416"
	21	NS	18×84	2'-5"	2'-0?	l" -	2"	3-25	3'-73"	2'-5	4-516	416"
	21	2-ROW W	18×84	3-15	1-118"	212"	212"	3'-54"	3-102	2-55	4-516	416
	25	NS	18×99	2'-64"	2-14	1	2"	3'-5 3"	3'-10불"	2-515	4-916	4"
	25	2-ROWW	18×99	3-216	2'-016	21	21	3'-9"	4-25	2'-515	4-916	4"



and the second second	TAG ac 6	CLCH-S-144
TRANE	CENTRAL STATION AIR HANDLERS TYPE W, D, K, NS, DD COIL CONNECTIONS	DATE: G - 1G - 78 SUPERSEDES:
AIR CONDITIONING	FOR DRAW-THRU AND BLOW-THRU CLIMATE CHANGERS"	SUBMITTAL

GENERAL NOTE I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.



DK COILS WW COILS D COILS

								1				1. N.S.	
				•		2-	ROW	¥ 4-	ROW	6-	ROW	8-	ROW
	COIL	H	E	G	P	L	D	L	D	L	D	L	D
	SIZE	132	19"	21	14"	61	43	92	78	121	103"	152	138
1	18	192	24	15	212"	61"	4916	91:	7%	121	10%	152"	13%
-	24	252	24"	15	21	61"	4 9"	91:	79"	121	10%	152	1.3%
	30	315	24	1516	21	61"	4%	912	7 9"	121	10%	152	132"
J	33	342	21	115.	21		416	91	7%	121	10 %	152	13%

T

150

15:

14"

14

14

S

113

13

12"

12

112"

R

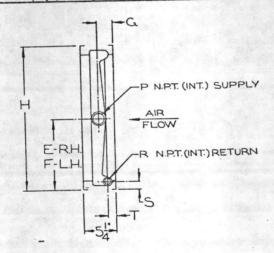
1"

1"

14"

14"

14



P

12

2"

212

3

3"

G

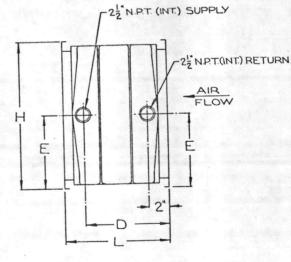
23

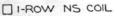
212

212

212

212





F

81

114

144

174

174

E

54

84

114"

144

174

COIL

12

18

24

30

33

H

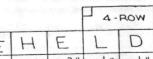
132

1912"

252

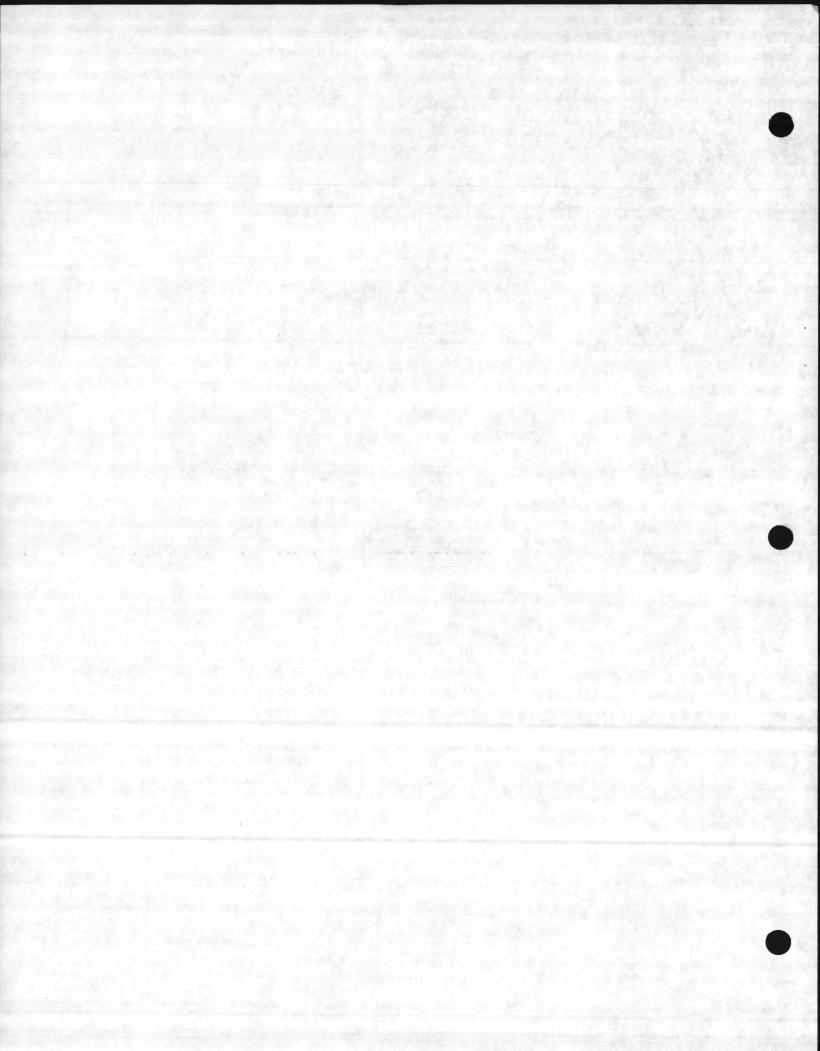
312

3412



DD COIL

8-ROW COIL D L SIZE 151 132 72 94 912 192 18 72 152 132 123" 912 252 24 152 132 154 912 72 312" 30 152 132 912 72 342 174 33



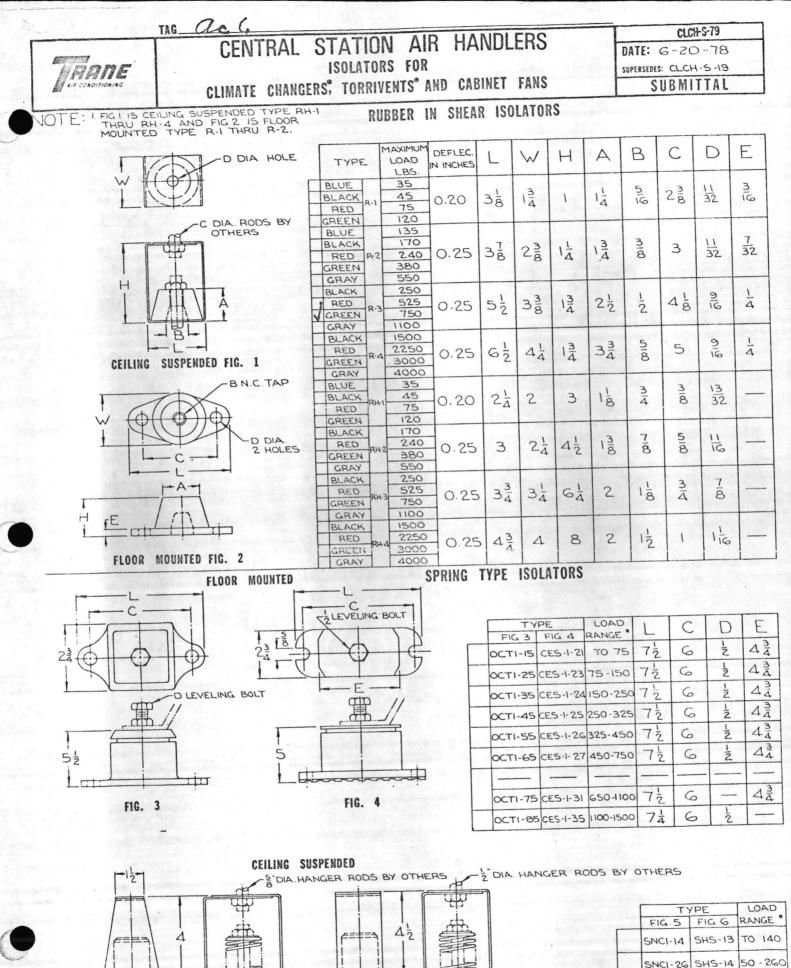


FIG. 6

21

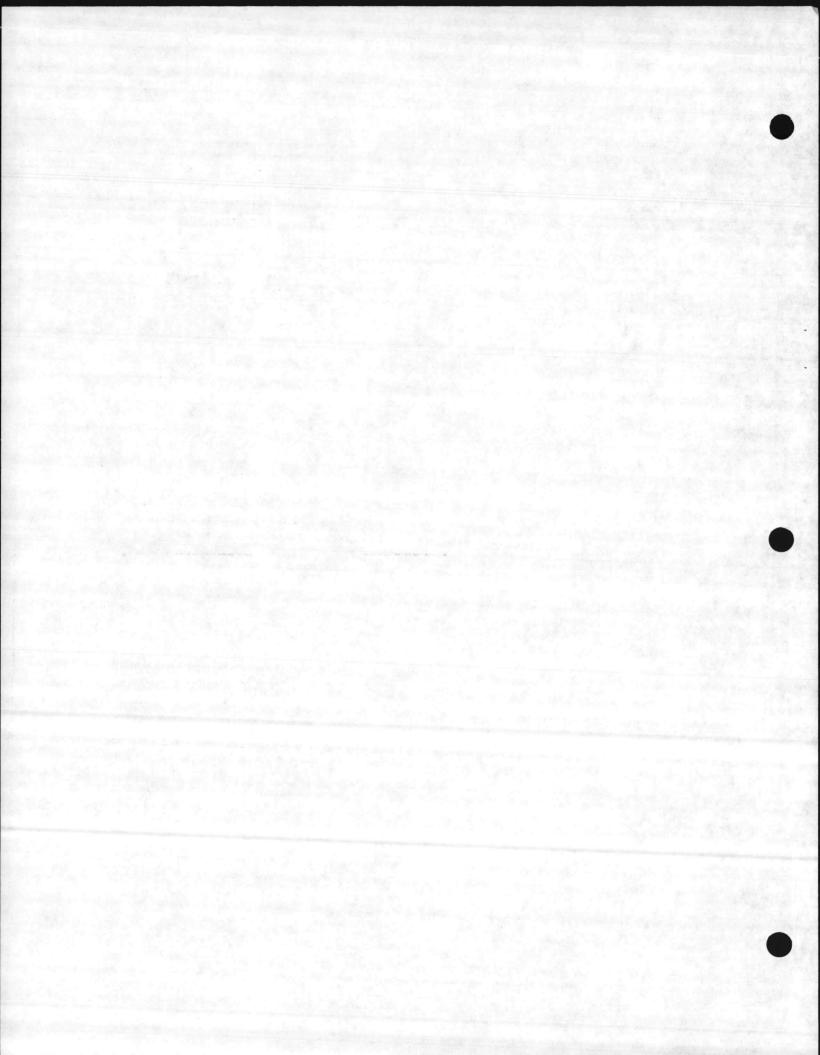
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FIG. 5

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SNCI-70 SHS-18 200-700

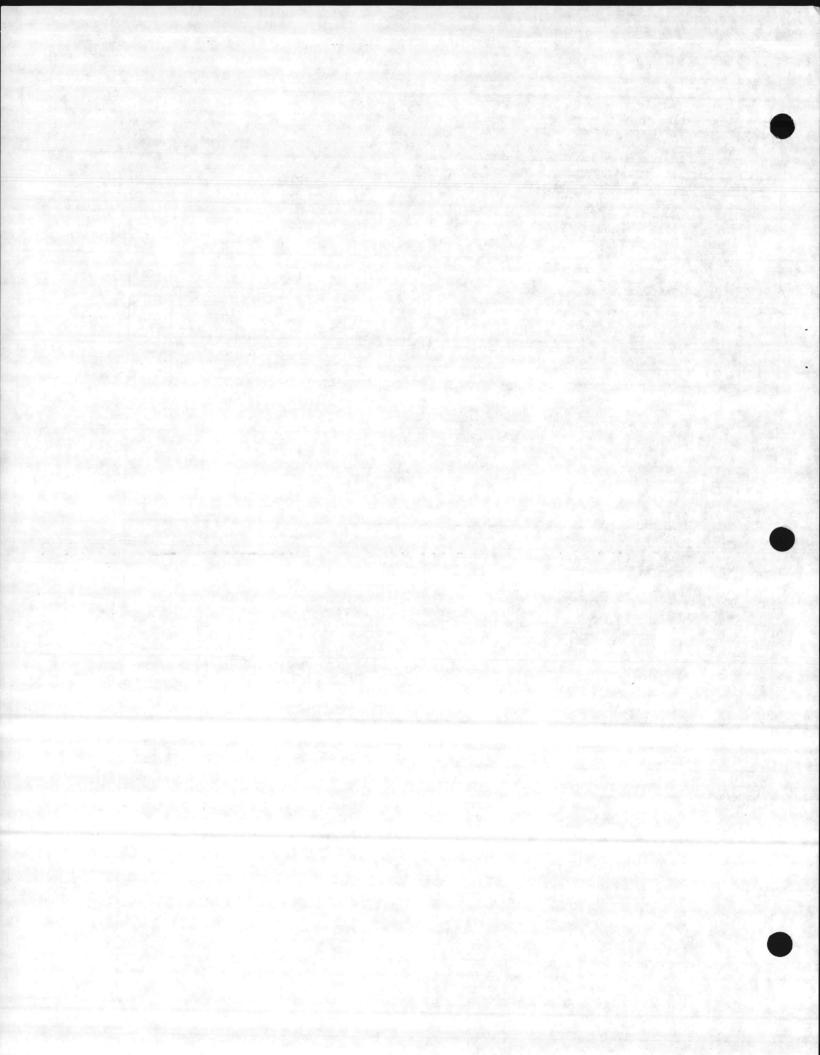


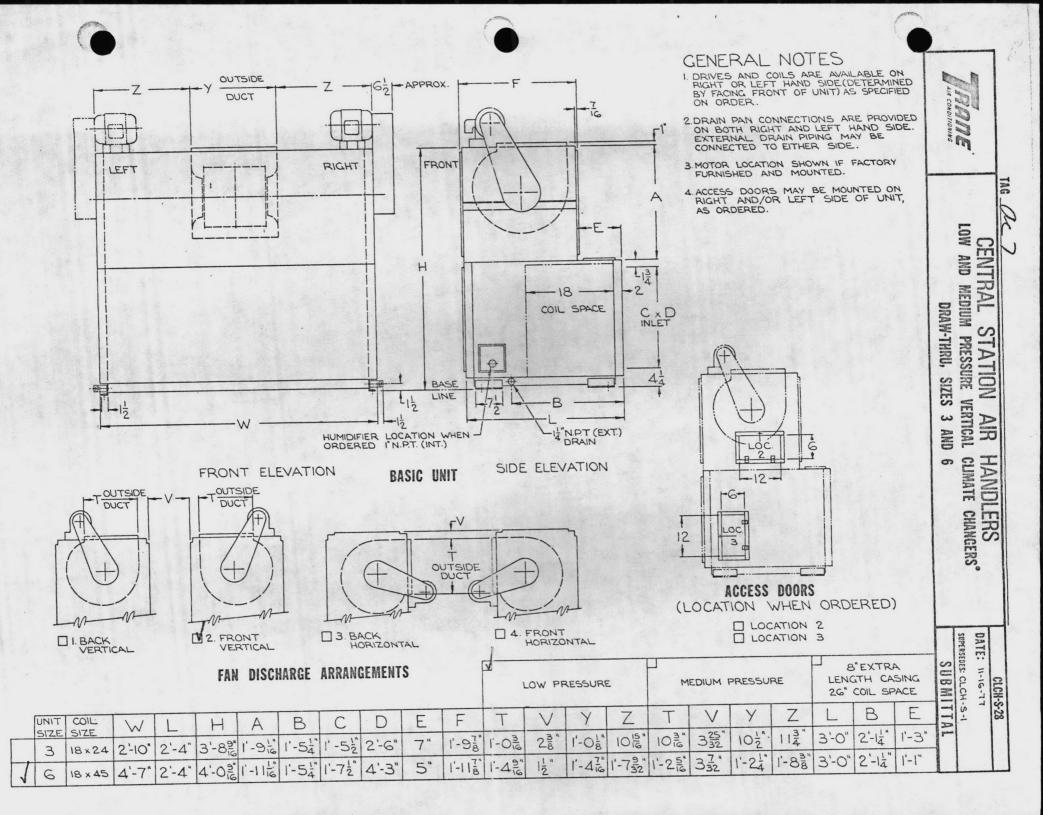
## SUBMITTAL DATA DRAW-THRU CLIMATE CHANGER®

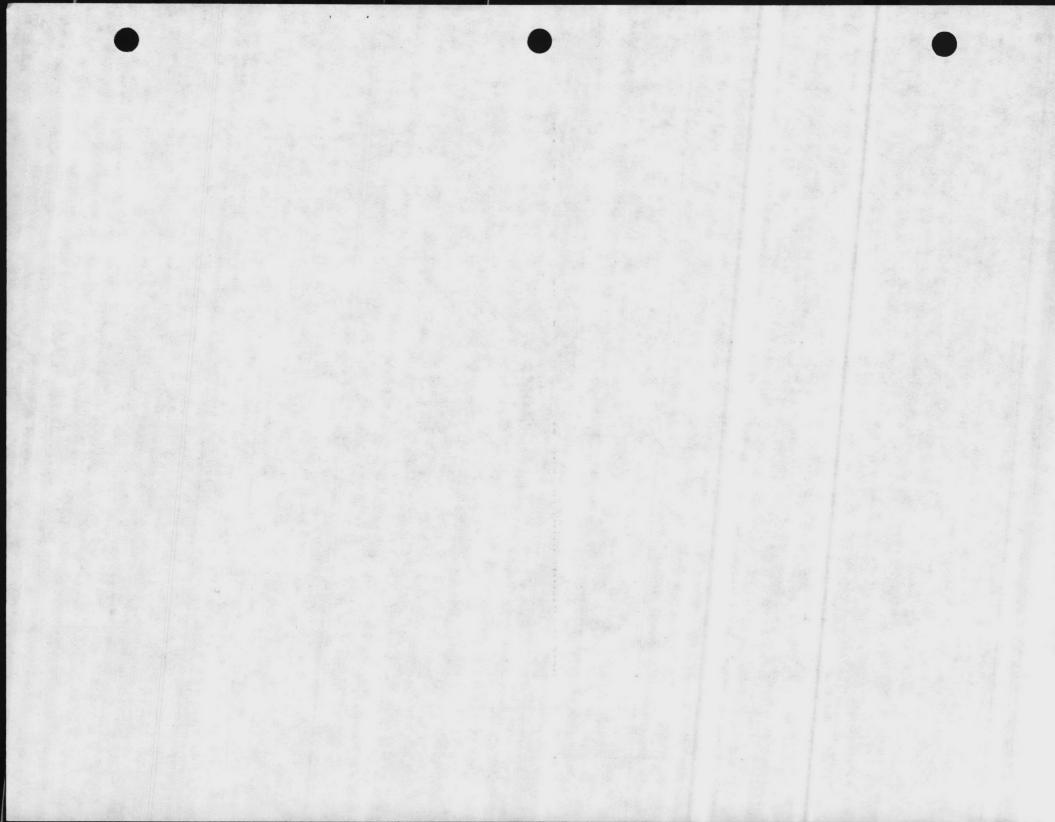


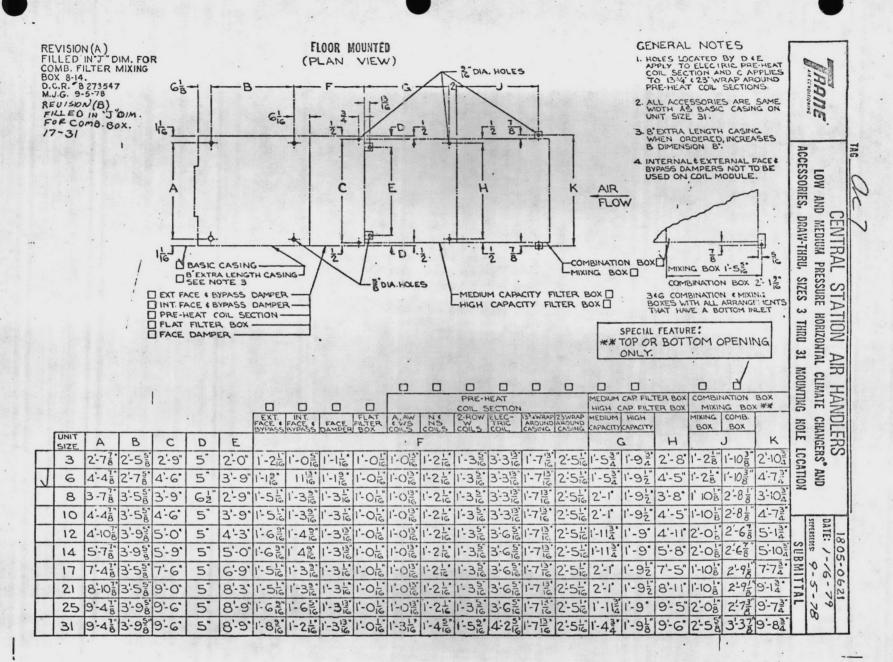
PAGE 7 OF 8

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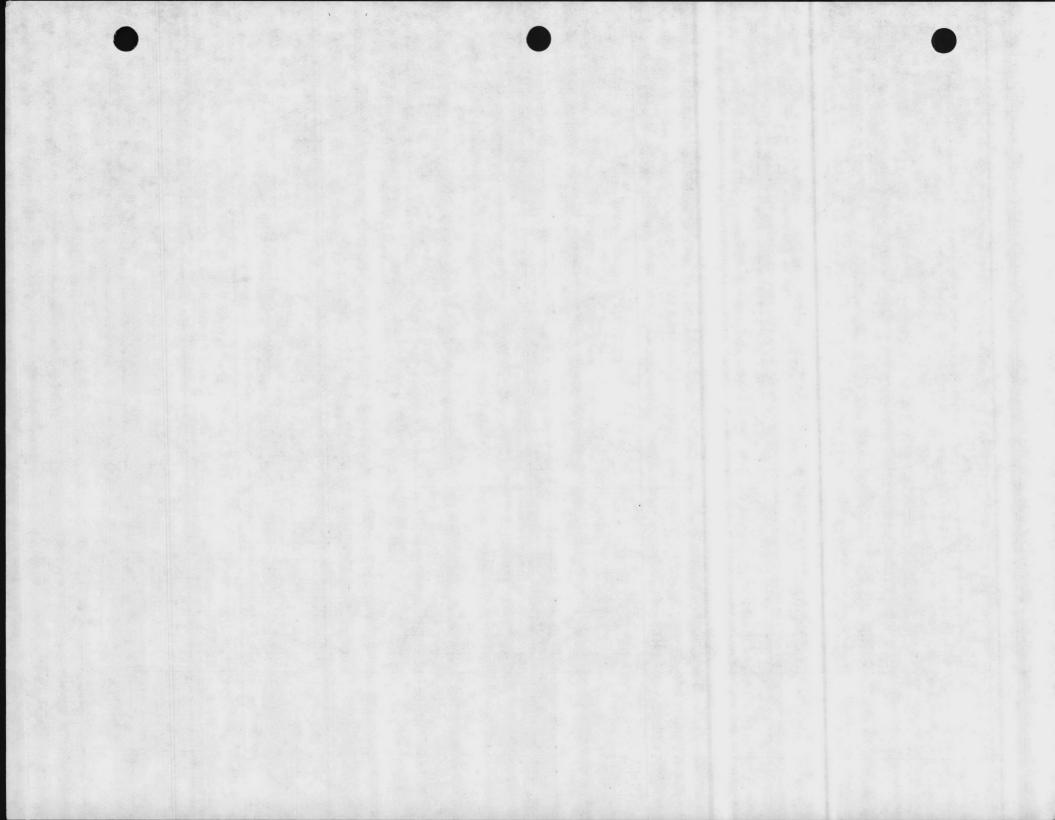


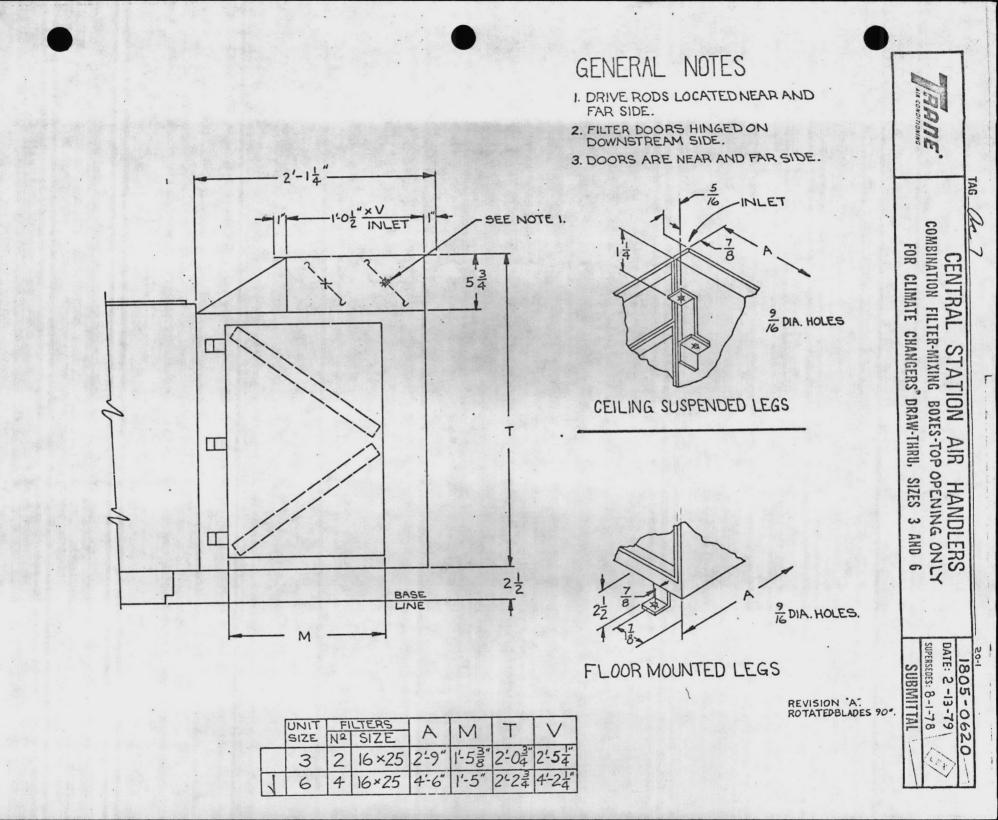


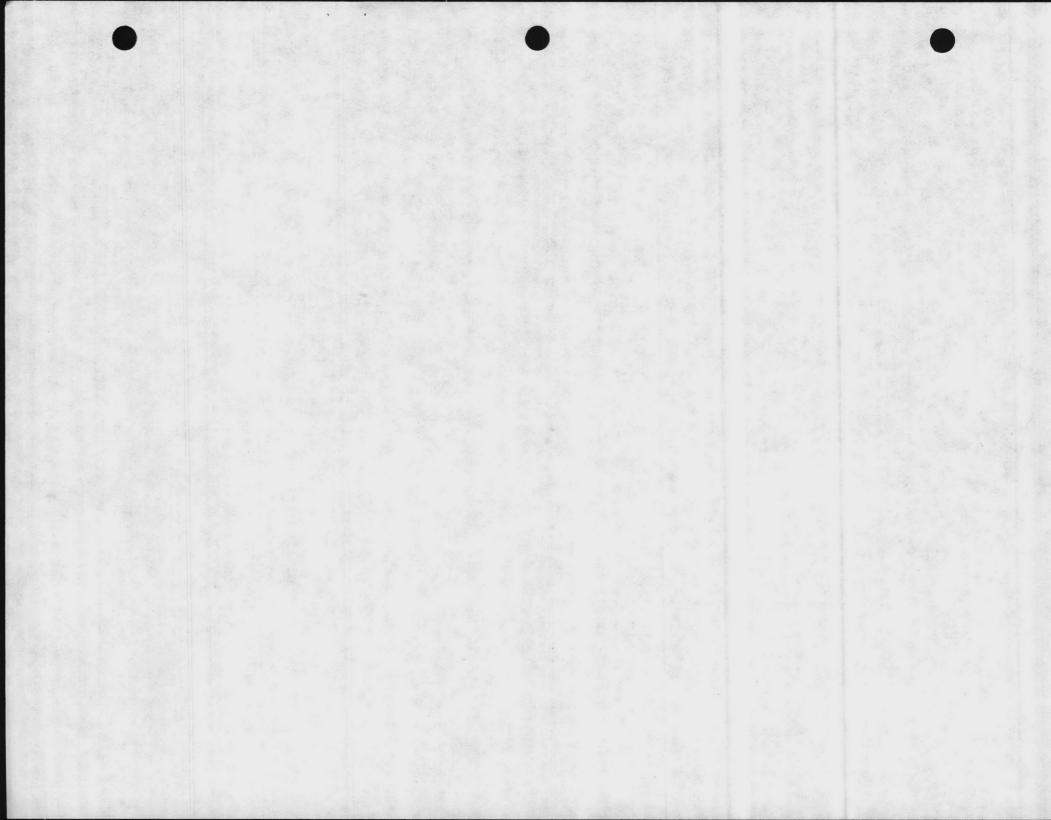


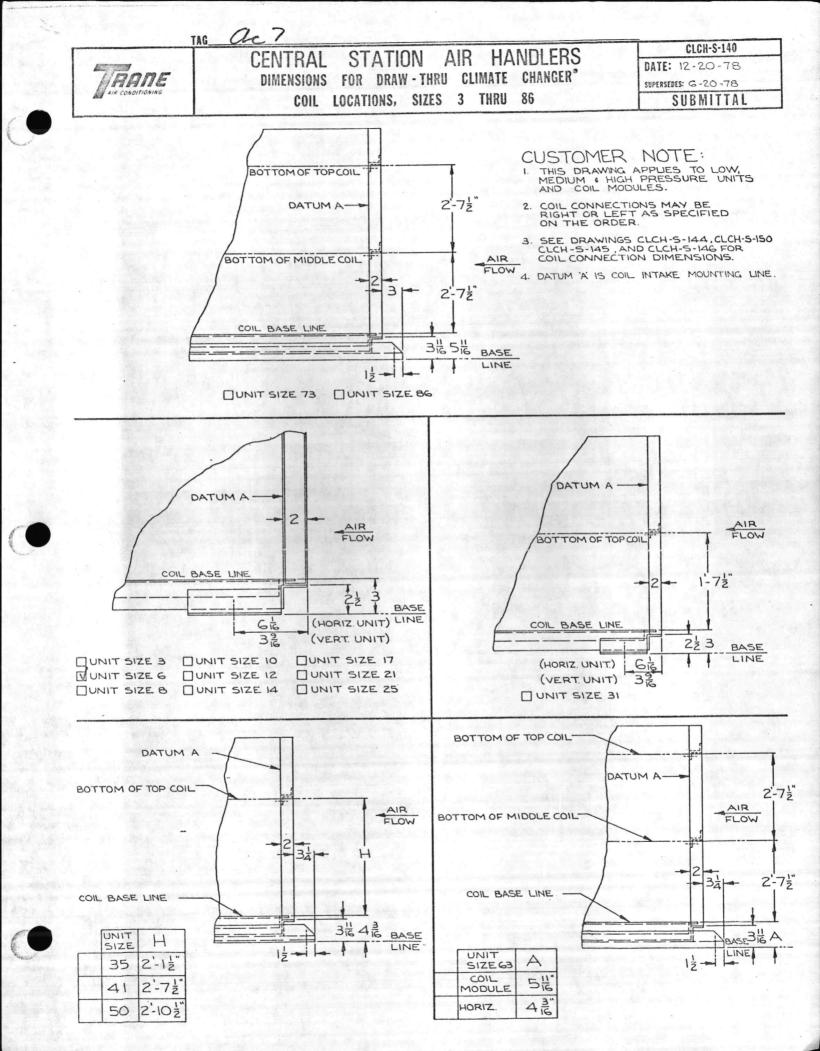
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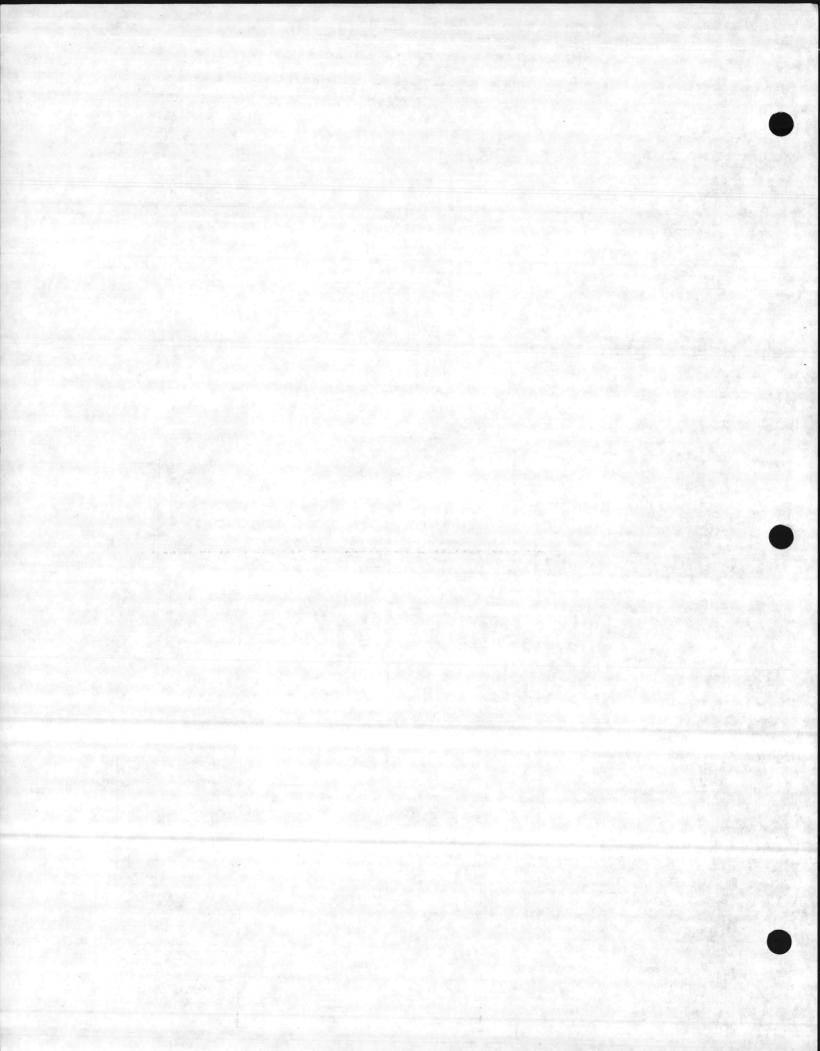
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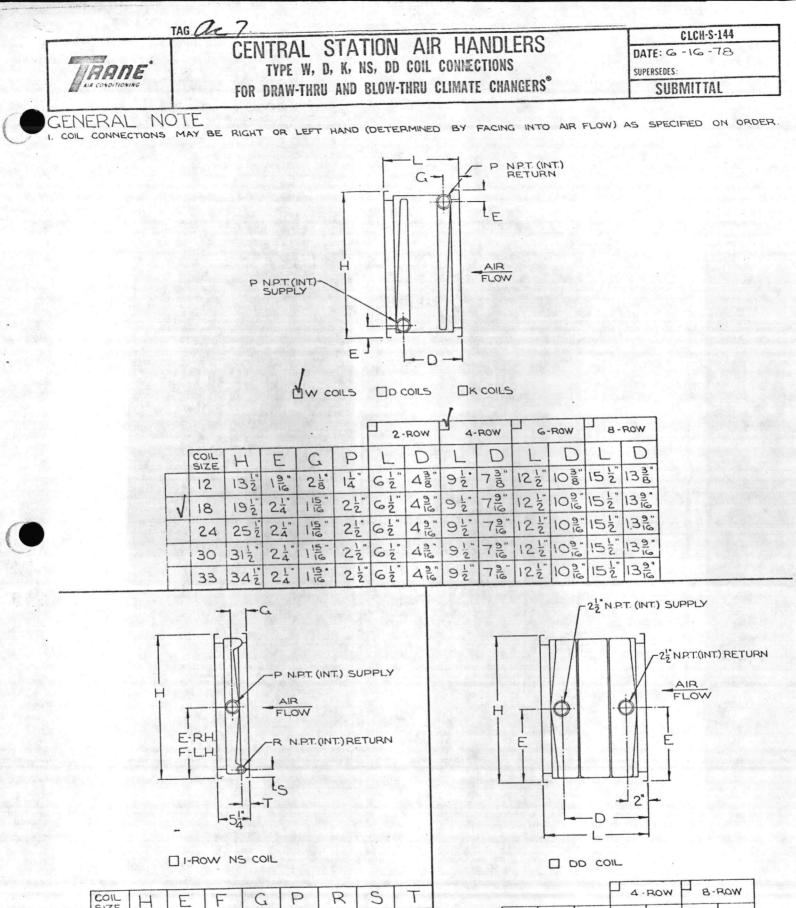






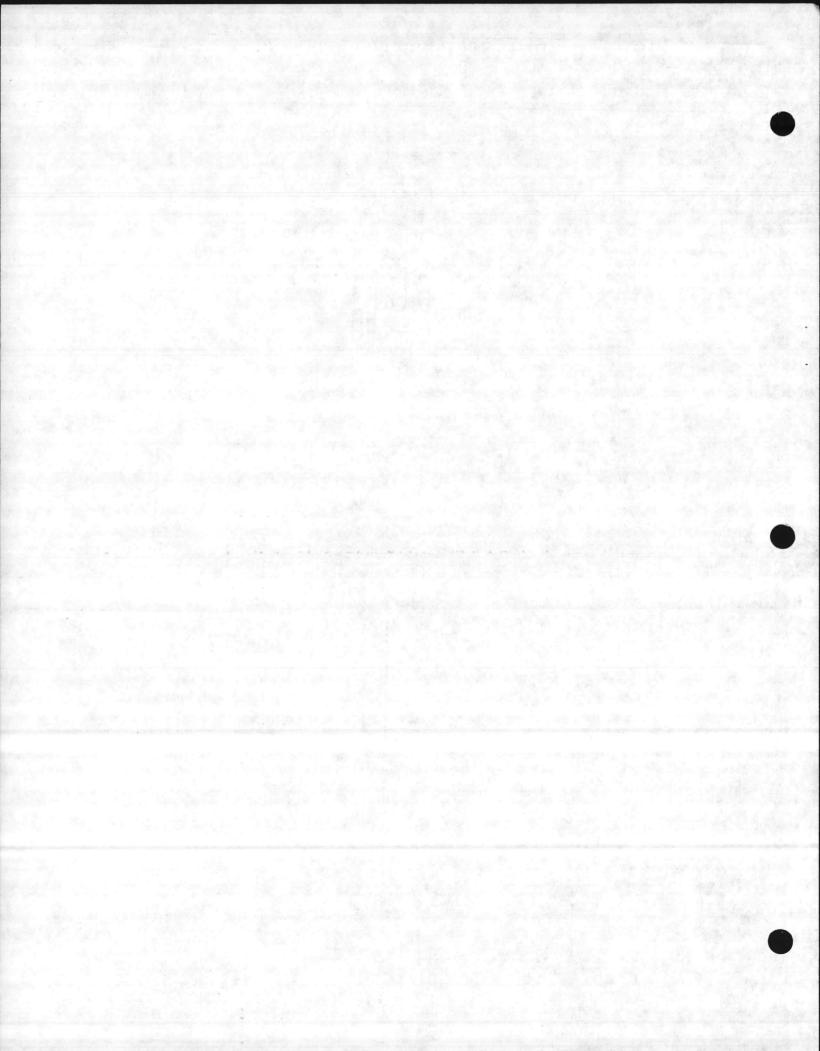






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	COIL	H.	E	F	G	P	R	S	T
	12	132	54"	81	$2\frac{3}{4}$ "	12"	1"	113"	15:
	18	192"	84	114"	212"	2"	۱"	13"	15"
		252"		144"	21:	21:	14"	12"	14"
	30	312"	144"	174	22"	3"	14"	12"	14"
1	33	341	174	174"	21	3"	14"	112"	14"

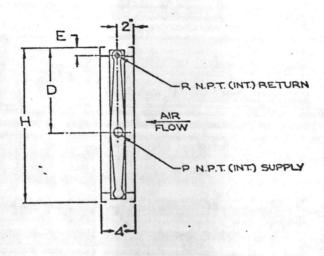
			4-	ROW	- 8-1	ROW
SIZE	H	E	L	D	L	D
18	192	94"	912"	712"	152	132
24	252	123	91"	72"	151"	132
30	312"	154	91:	72	152	132
33	342	174	91"	71:	152	132
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TAG\_ac 7 CLCH-S-150 CENTRAL STATION AIR HANDLERS DATE: 6-20-78 HAMAME ANA CONDITIONING TYPE WS AND WC COIL CONNECTIONS SUPERSEDES: FOR DRAW-THRU CLIMATE CHANGERS" SUBMITTAL

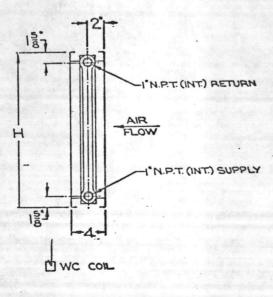
## GENERAL NOTES:

I COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.

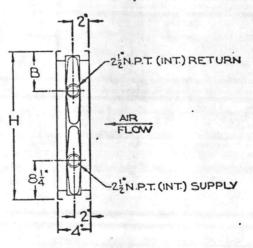


DWC COIL

	OIL	H	D	E	P	R
	24	25 2	132"	13.	14	14
	30	312	174"	15	21	12
1	33	341	184	15:	212"	12"

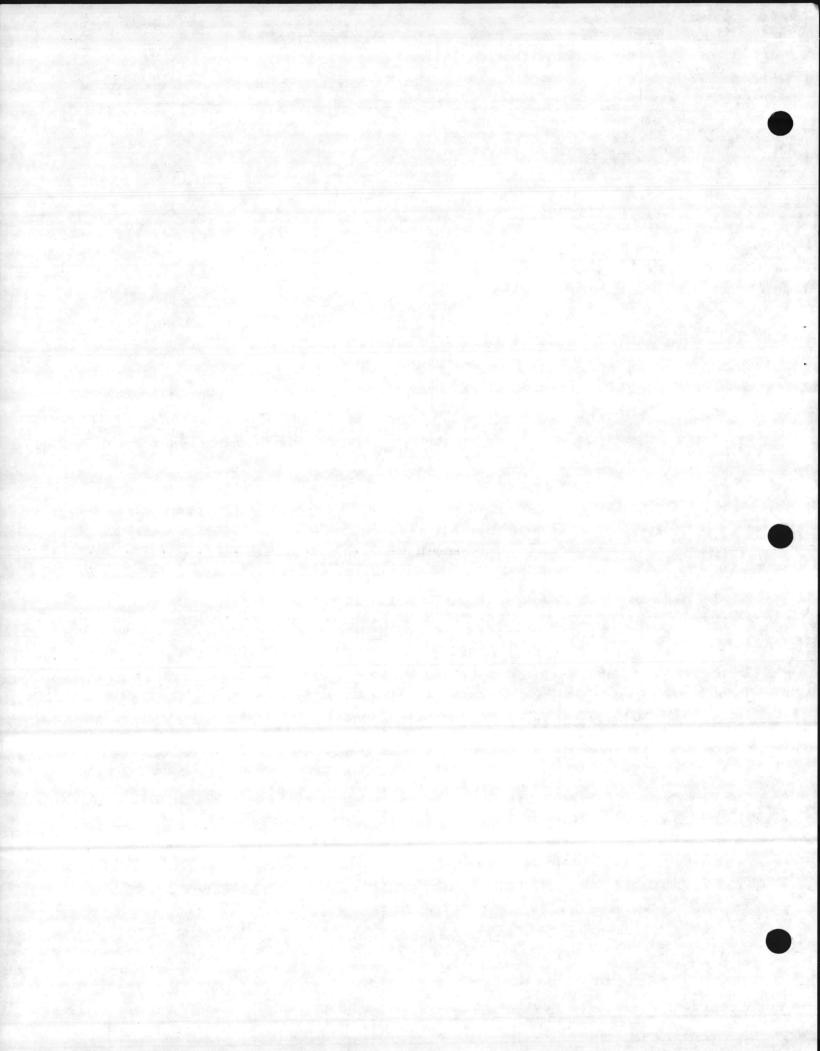


	COIL	H
	12	132
1	18	191



DI-ROW WS COIL

COIL	H	B
30	312	84
33	342	94



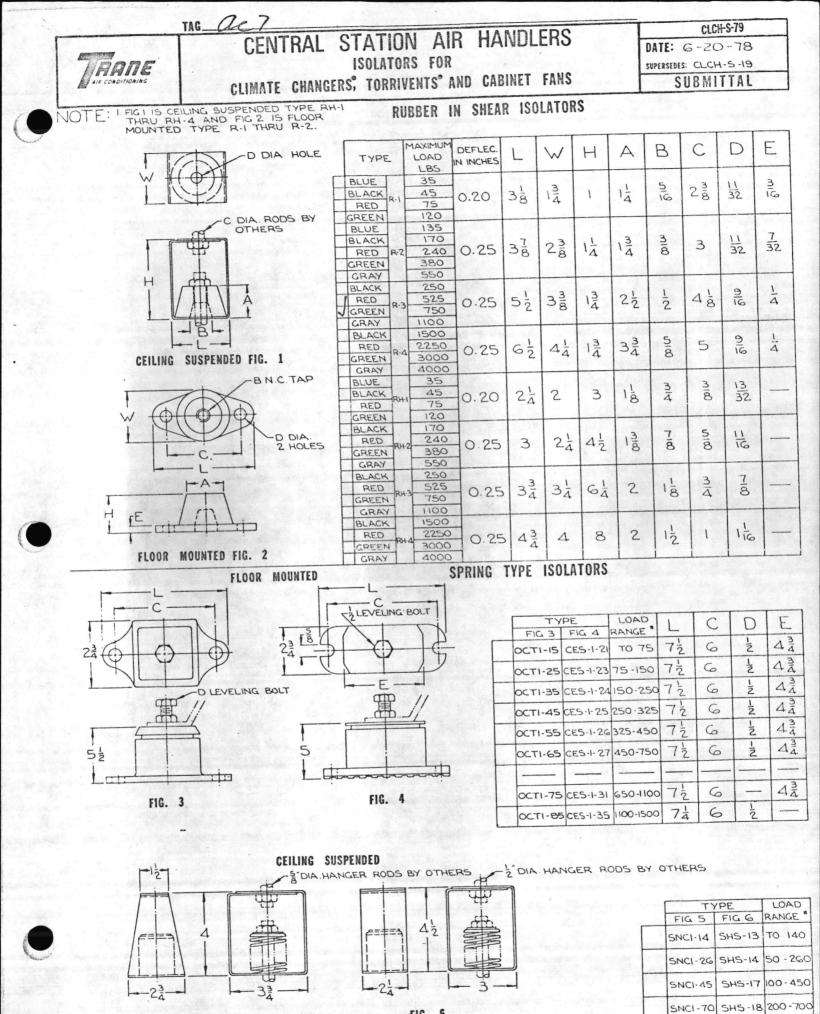
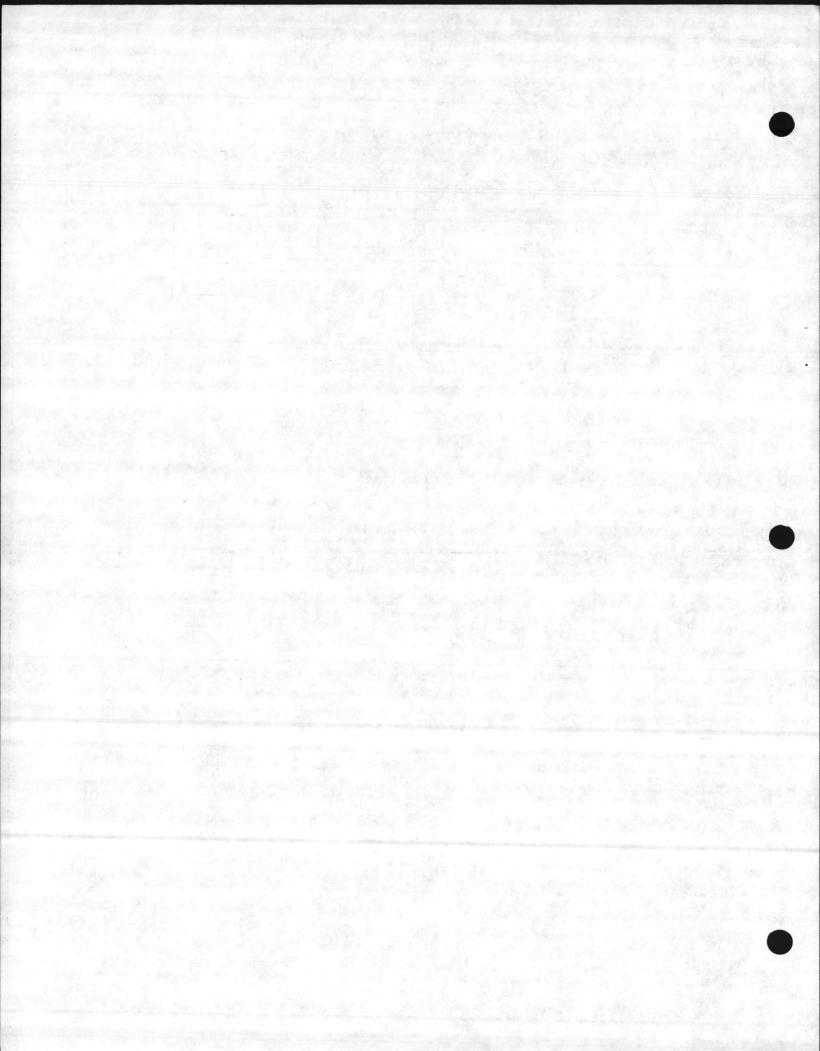


FIG. 6

SNC1-70

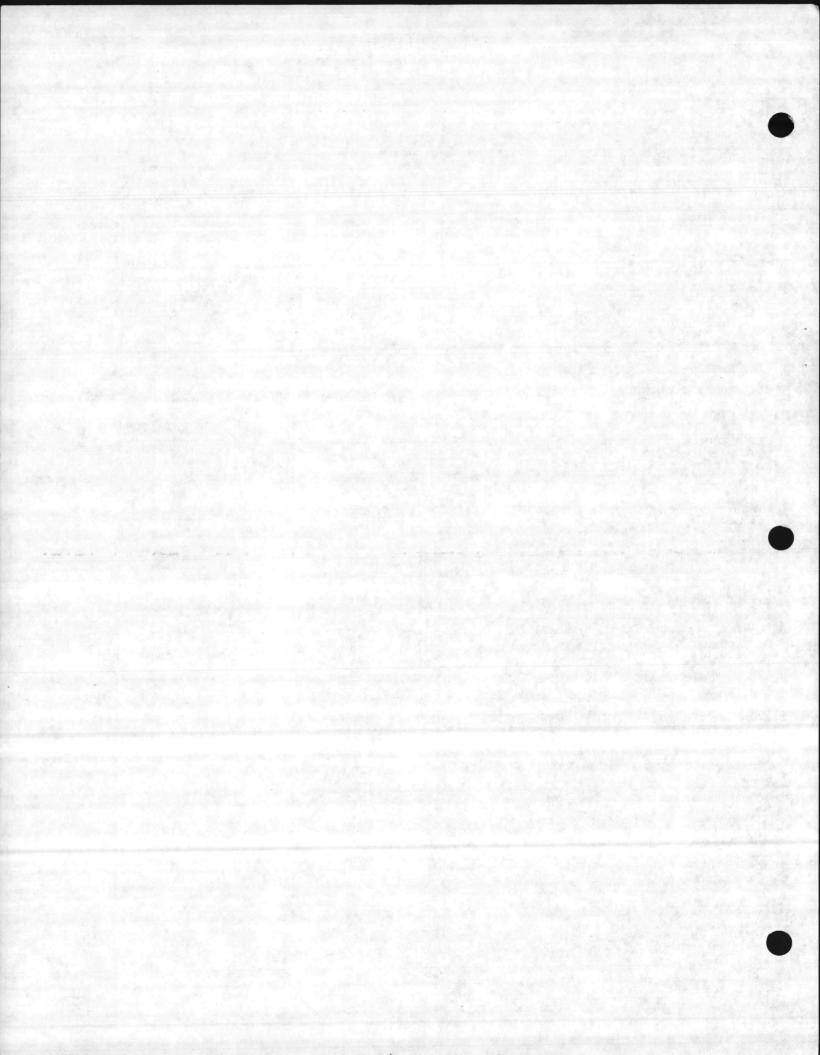


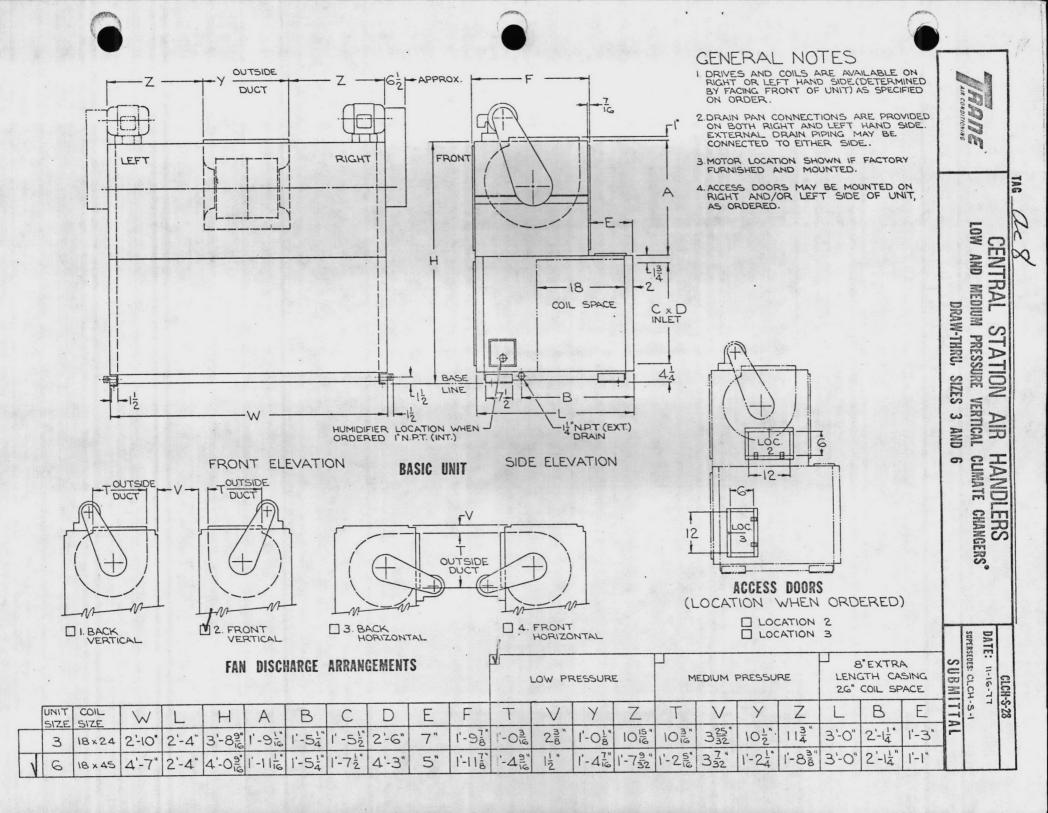
### SUBMITTAL DATA DRAW-THRU CLIMATE CHANGER®

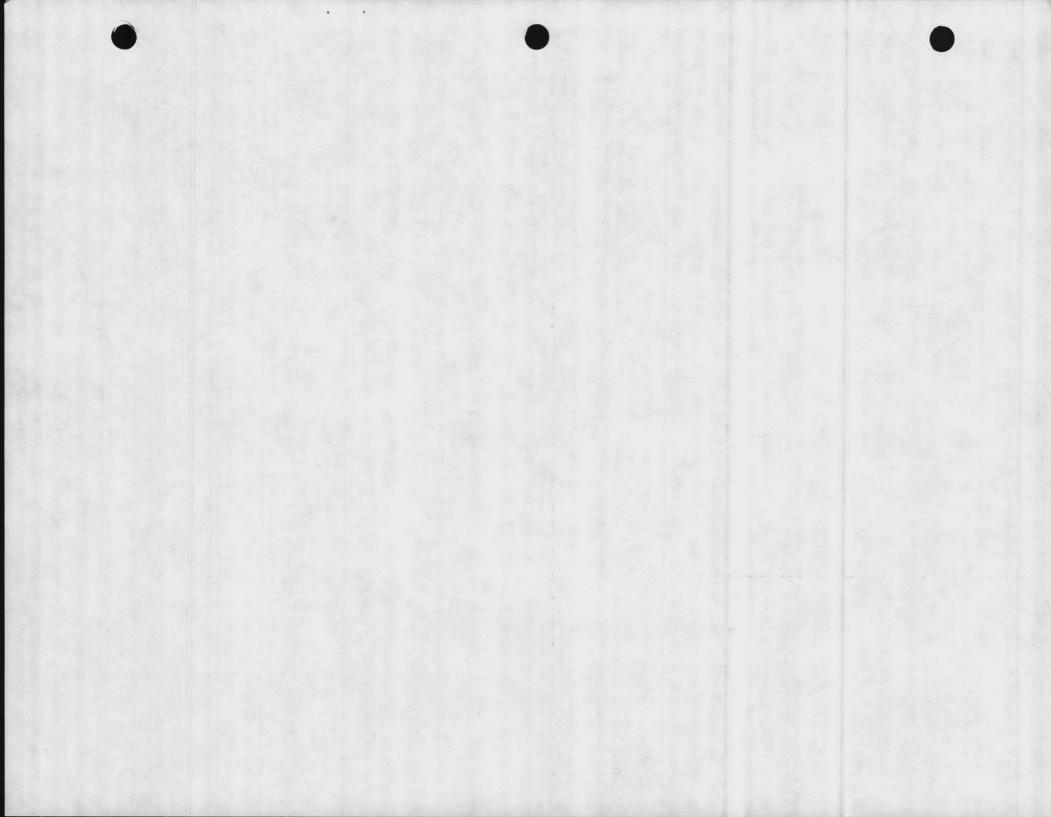


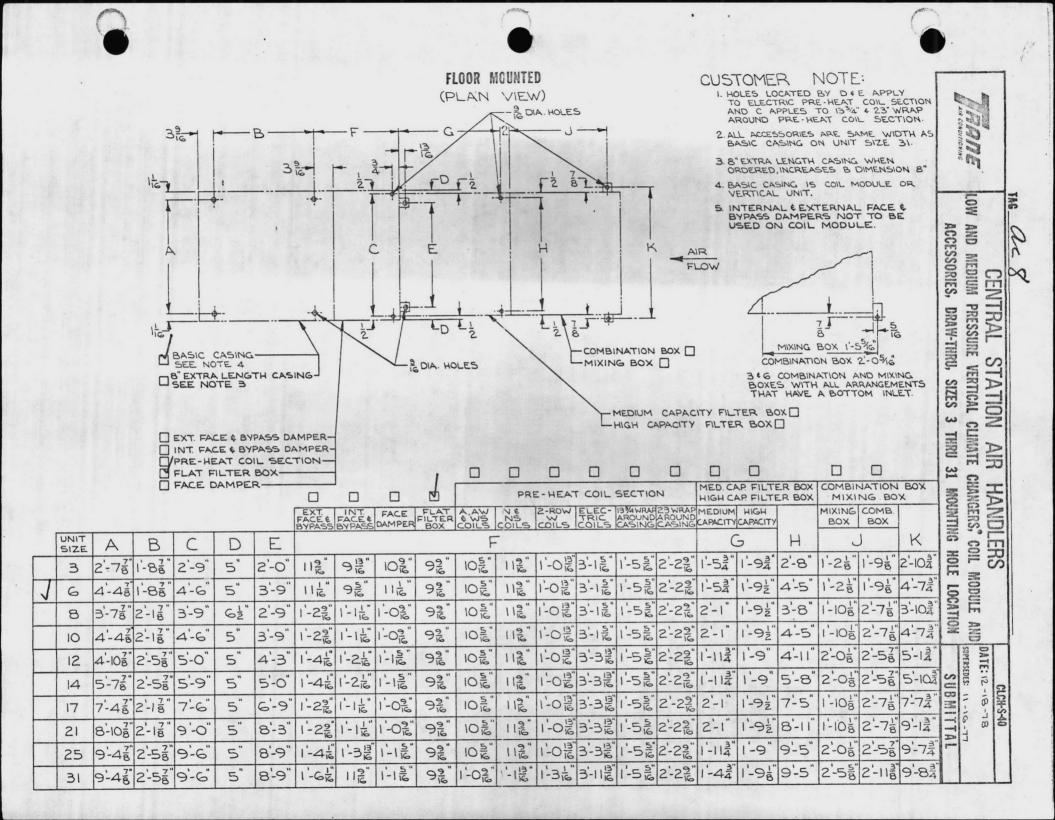
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AC BE	CCE	DIFIER SS DOOR GUARD TORS	APPR		no ye ru	ne s bbe	r in	she	ar		AM C		omm	ENT	AS	FOR	Clch	S 79
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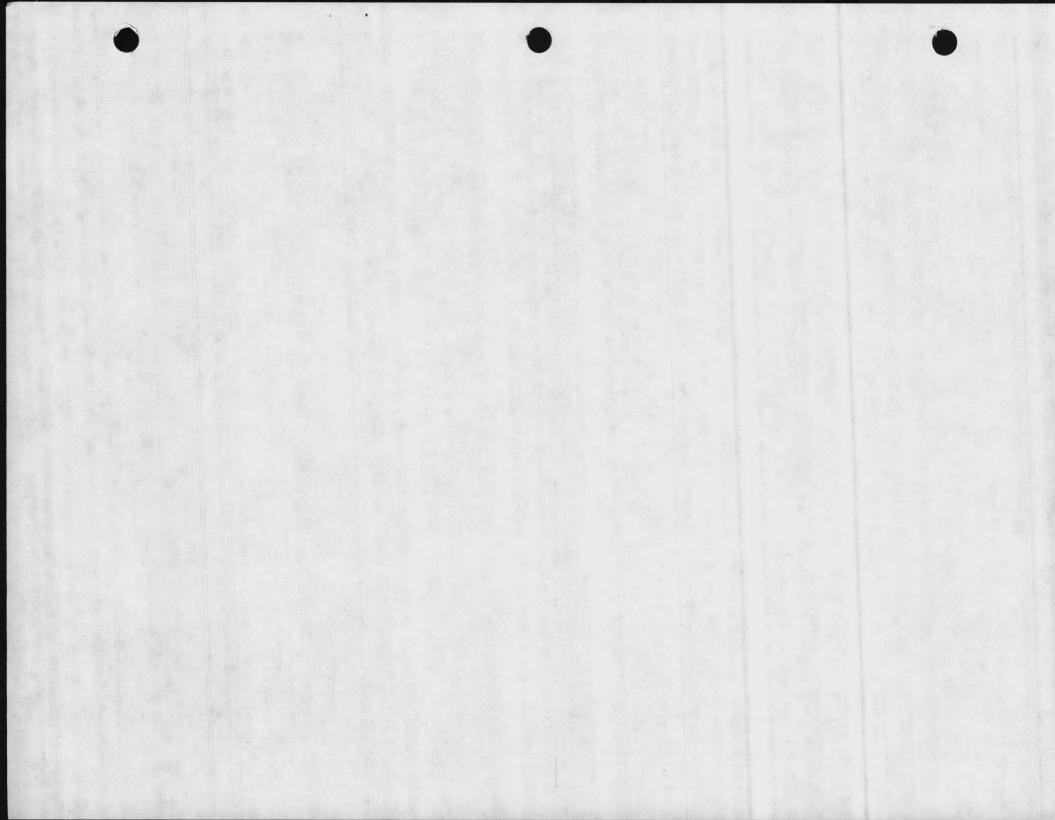
PAGE 8 OF 8

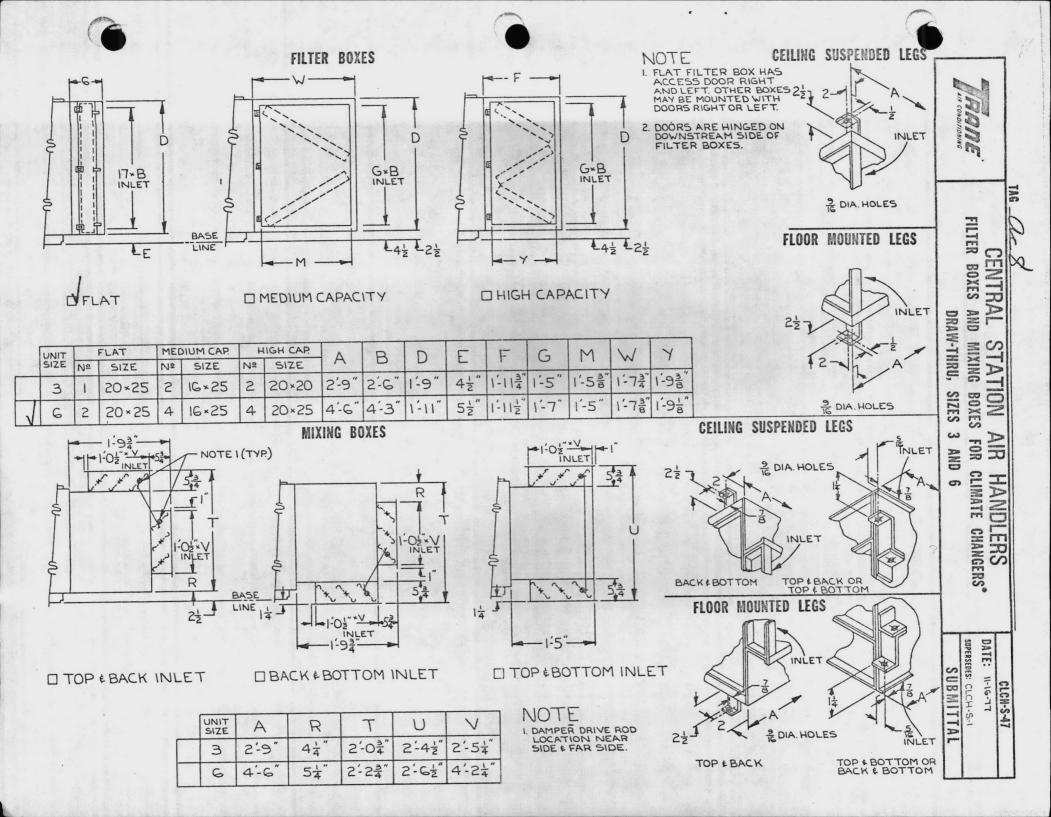


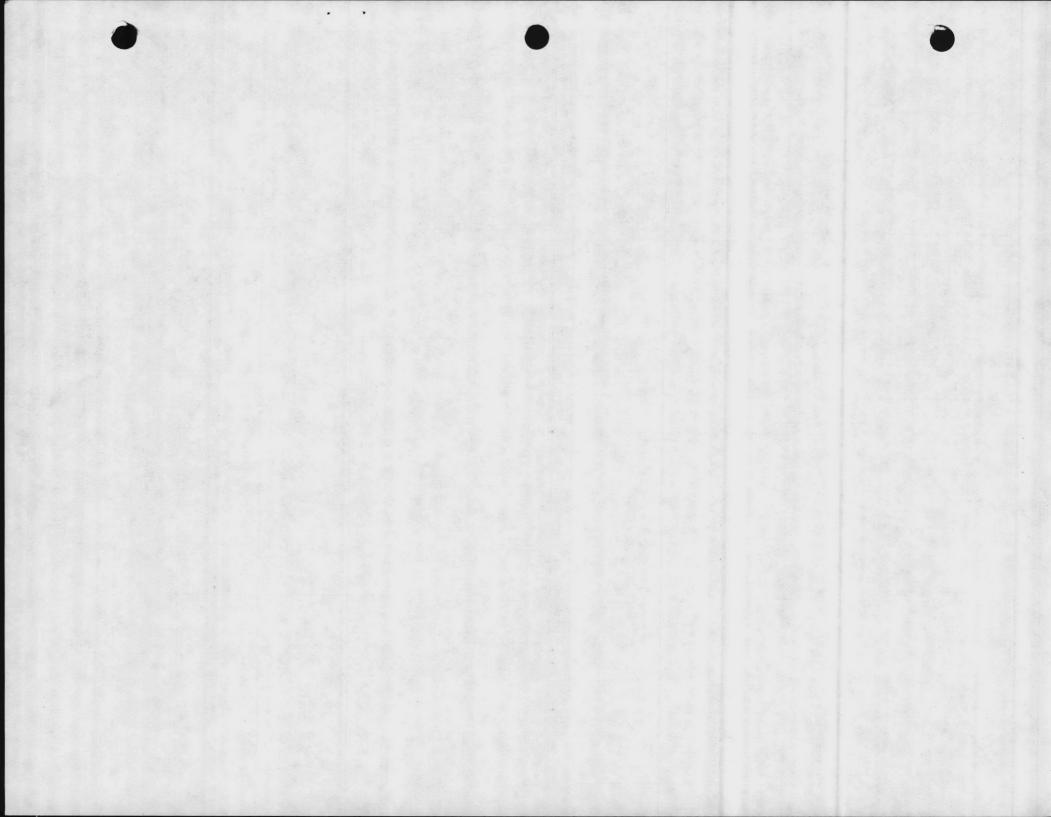


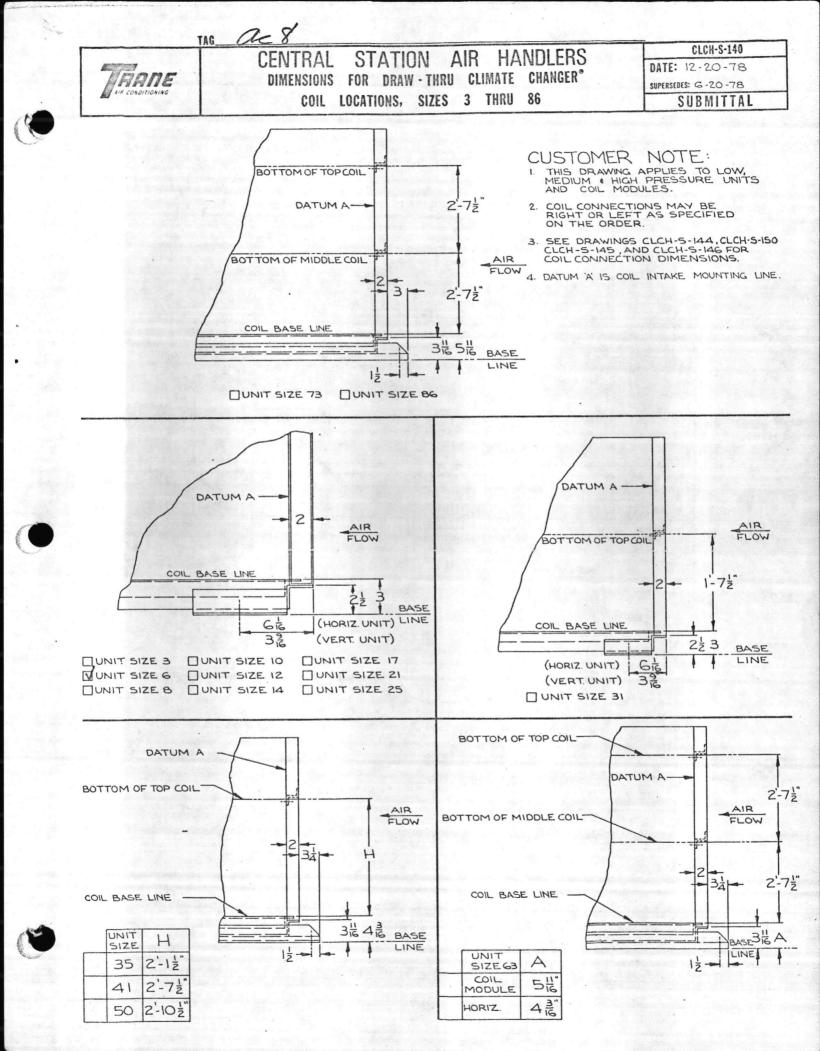


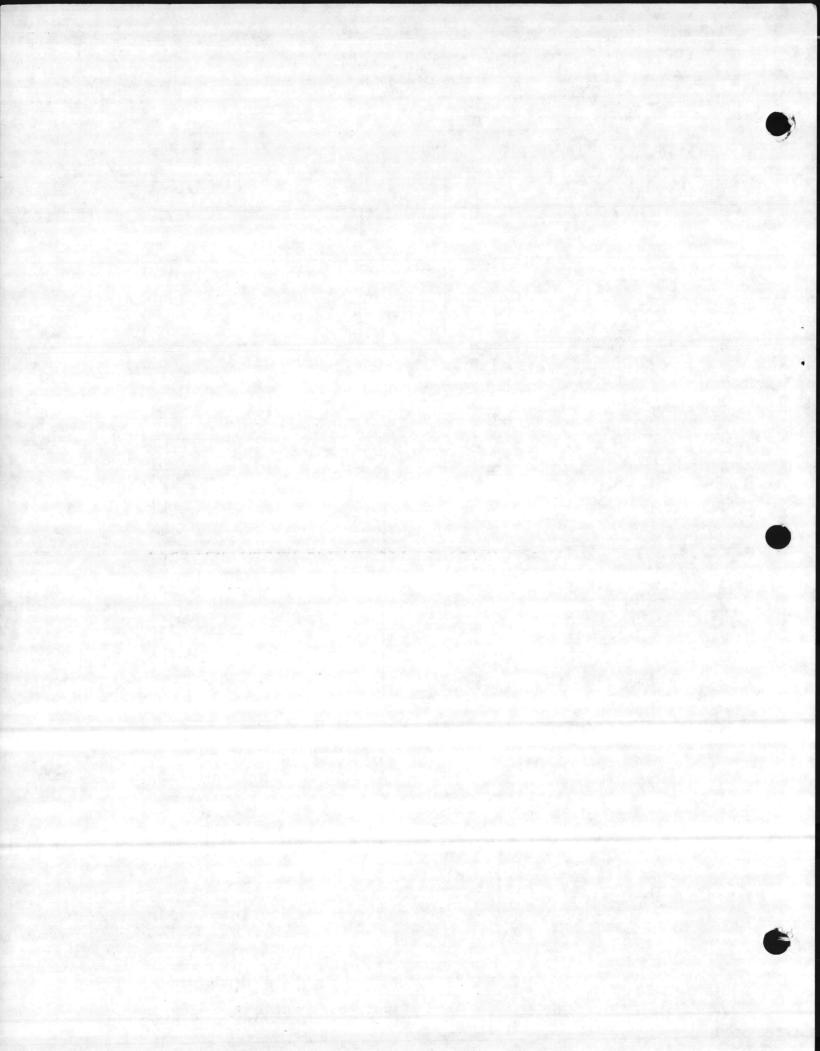


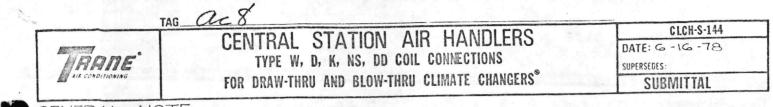




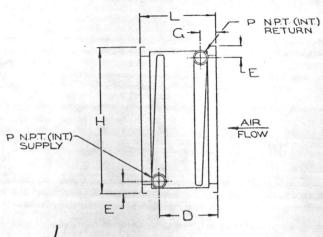






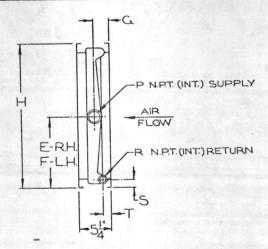


GENERAL NOTE 1. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.



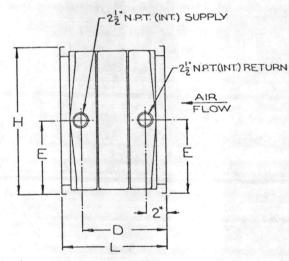
W COILS D COILS CK COILS

									1					-
							2-	ROW	4-	ROW	6-	ROW	8-	ROW
		COIL	H	E	G	P	L	D	L	D	L	D	L	D
[		12	131	19"	21	14"	61"	43	912	718	121	103"	152	133
1	J	18	192	24	15	212"	61"	4%	912"	7%	121	10%	152"	13%
-	-	24	25 2	24"	15	21	61"	4 %	91:	7%	$12\frac{1}{2}$	10%	152	13%
		30	312	21"	15:	212"	61"	4%	912"	7%	122	10%	152	139"
		33	342	24	115.	21	61	416	91:	72"	121	10 %	1512"	13%



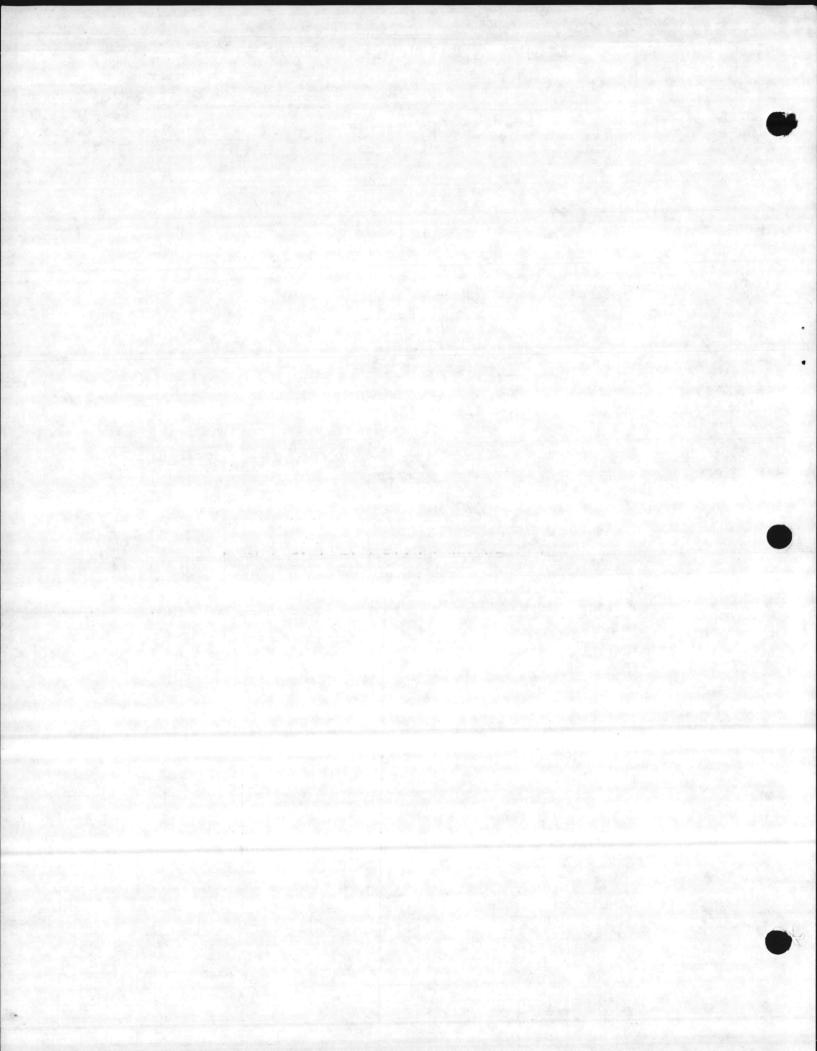
#### I-ROW NS COIL

COIL	Н	E	F	G	P	R	S	Т
 12	131	54"	81"	$2\frac{3}{4}$	12"	۱"	13"	15
18	192"	84	114"	212"	2"	1"	13"	150
24	252"	114"	144"	21	21:"	$1\frac{1}{4}$ "	12"	14"
 30	312"	144"	174	21	З"	14"	12"	14"
33	341	174	174"	21	З"	14"	112"	14"



DD COIL

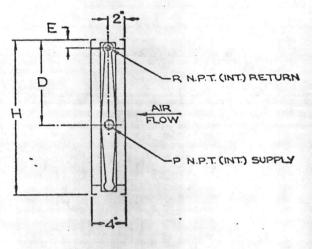
		_	4-	ROW	8-1	ROW
COIL	H	E	L	D	L	D
18	1912"	94"	91"	712"	152	132
24	252	123	91"	72"	151"	132
30	3112"	154	91'	712"	152	132"
33	342	174"	91"	712"	1512	132



	CENTRAL CTATION AID UANDIEDC	CLCH-S-150
15 mm	CENTRAL STATION AIR HANDLERS	DATE: 6-20-78
TAAne	TYPE WS AND WC COIL CONNECTIONS	SUPERSEDES:
EJ AIR CONDITIONING	FOR DRAW-THRU CLIMATE CHANGERS	SUBMITTAL

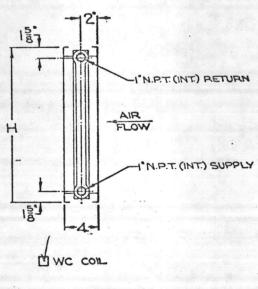
## GENERAL NOTES:

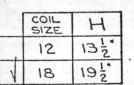
I. COIL CONNECTIONS MAY BE RIGHT OR LEFT HAND (DETERMINED BY FACING INTO AIR FLOW) AS SPECIFIED ON ORDER.

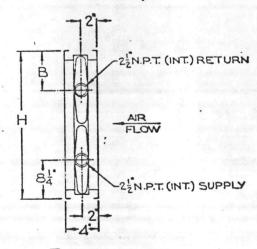


WC COIL

SIZE	H	D	E	P	R
24	251	132	13.	14	14
30	312	171	15:	21:	12
33	341	183.	15.	212"	12"

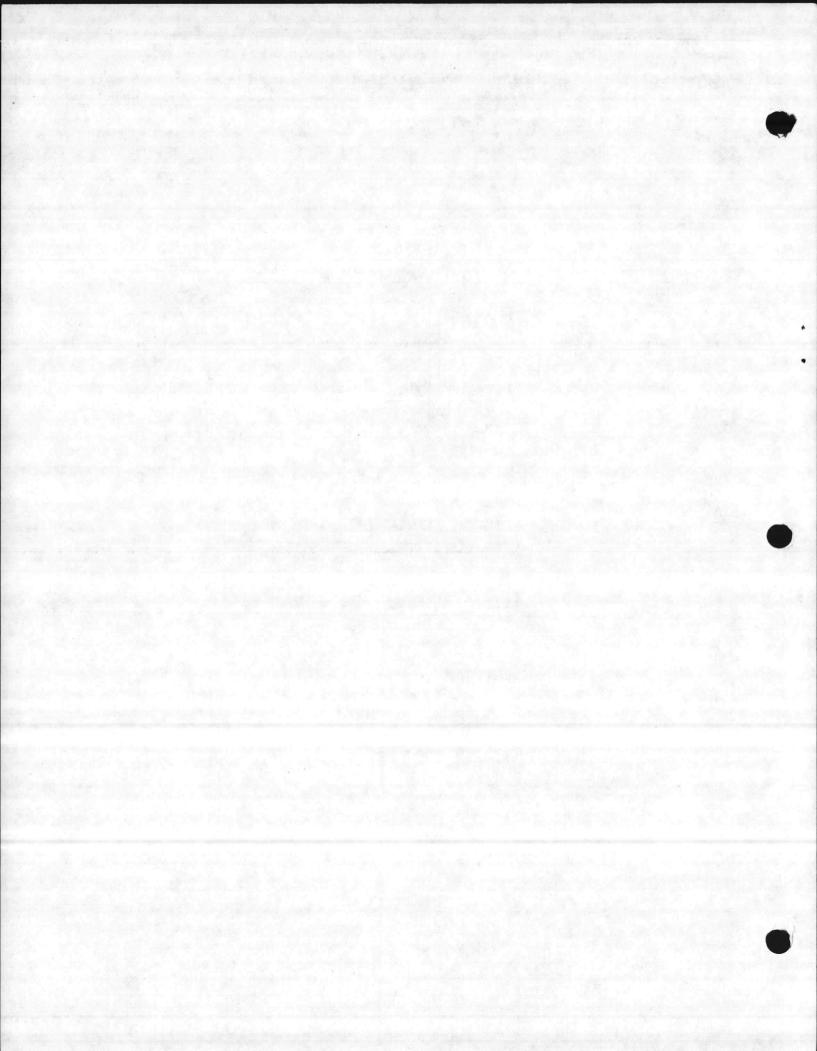






- I-ROW WS COIL

	COIL	H	B
	30	312	84
- 4	33	342	94*



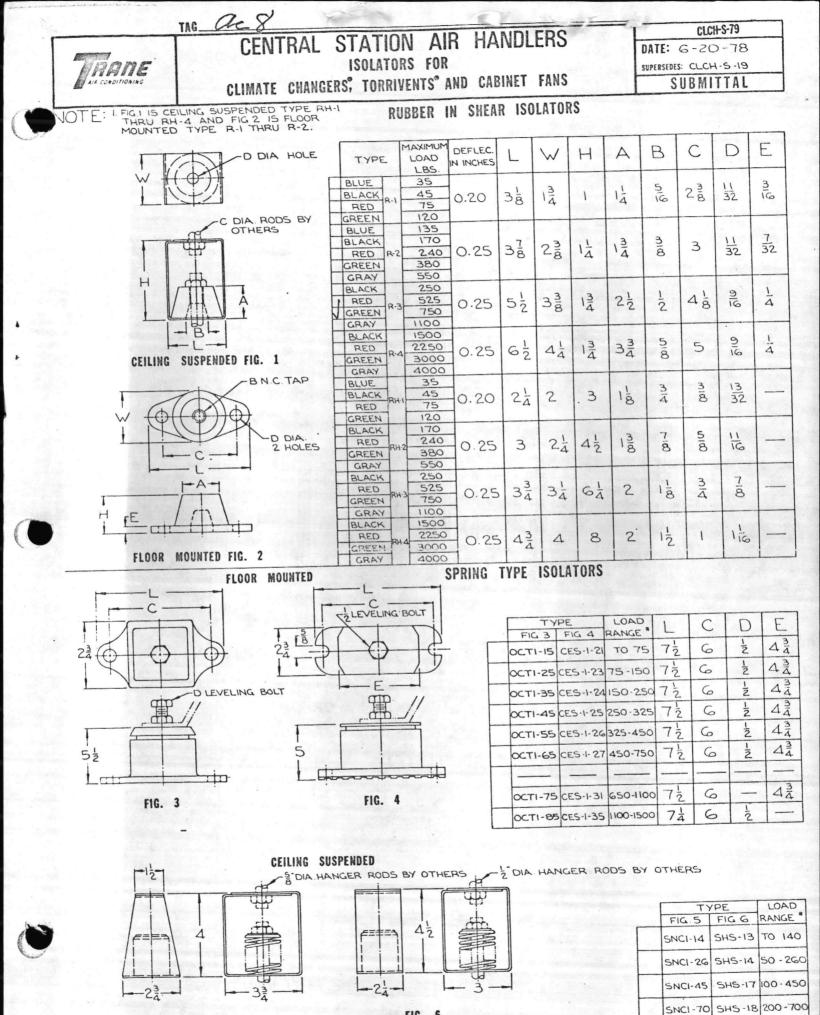
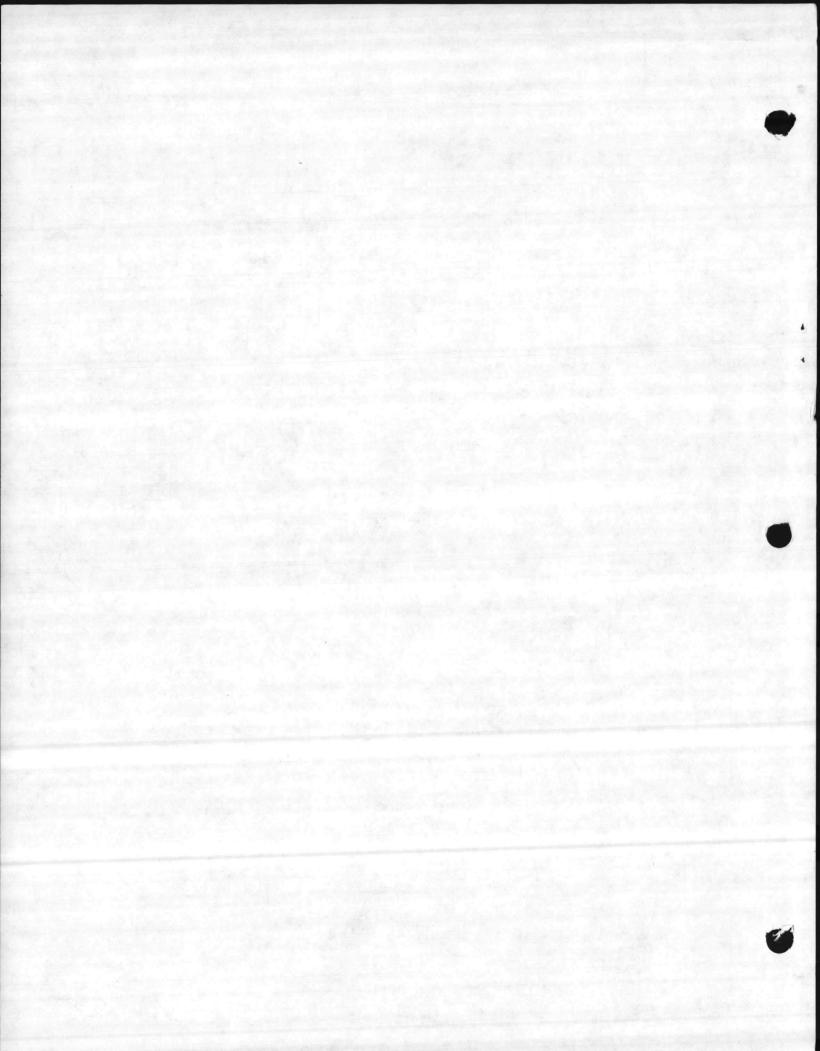
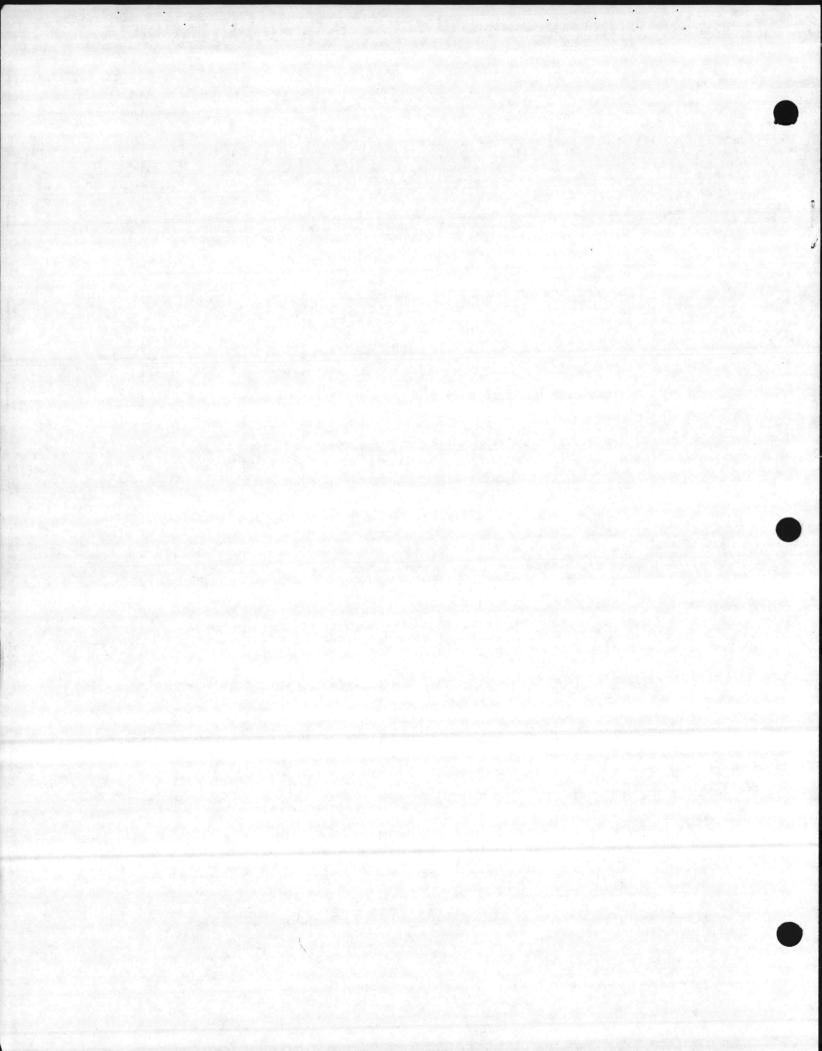


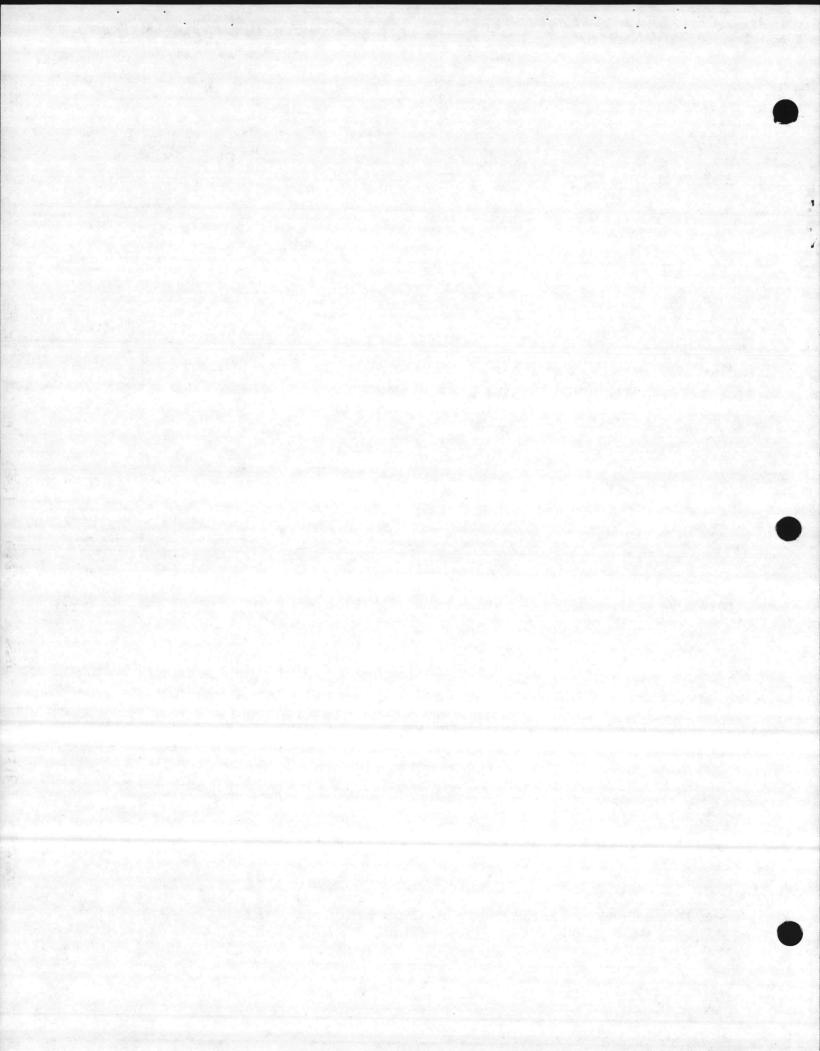
FIG. 6



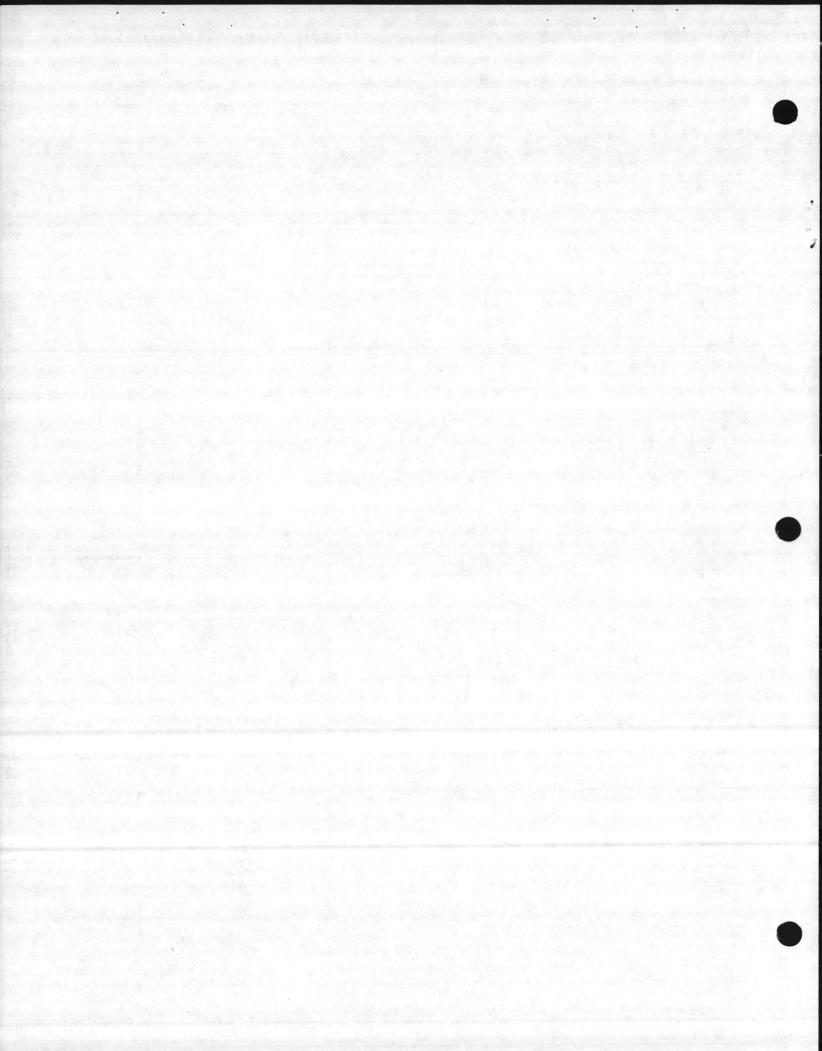
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ARC	HITECT				- <u>Service</u>	<u></u>			-				STAMP			1	STANDARD COILS	÷.
			a. <u>199</u> 2				t de s										Cooling	_ก
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R		NDONAN,	[NC.					-									W - Std., Single Row Serp.	- u
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JRD	ER DATE	CUSTOM	ER ORDER N	NUMBER	•	USTOMER A	CCOUNT N	0.									K Cleanable, Single Row Serp P-2-2 Tube Serpentine	•
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÷	C 160 .	ORDERING	NO.		TAGGIN		COIL		FINNE	DFACE				AIR	TURBS	CHAN.	ASingle Pass, Opp. End Conn. N -Non Freeze, Opp. End Conn.	a
EM	<b>өт</b> ү.	SUBMITTAL		1	INSTRUCTIO	DNS	(1)	WIDE	LONG	SER- IES	MAT'L (2)	NO.		(4)	(5)	HOLES	NS-Non Freeze, Same End Conn. T&ST-Single Tube Serp. Same	71
		0812-0		HWC-	-3				~ .			~ .			0	VES D	End Conn. 1 and 2 row.	U
4	1	B28160 0812-0		HWC-	-4		WC	18	24	16	A	01	A	HR	0	YESD	WATER COILS	_
В	1	B28160	100 C	inc	and ages		WC	18	24	16	A	01	A	HR		Q NO	AWSingle Pass, Opp. End Conn. WCTwo Pass, Same End Conn.	
		0812-0	093 1	HWC-	-5									181	I	YES D	T&ST-Single Tube Serp. Same End Conri. 1 and 2 row.	51
C	1	B28160		11.0	,		WC	18	24	15	A	01	A	HR	T	YES D	TT2 Tube Serp., Same End Conn. 1 and 2 row.	U
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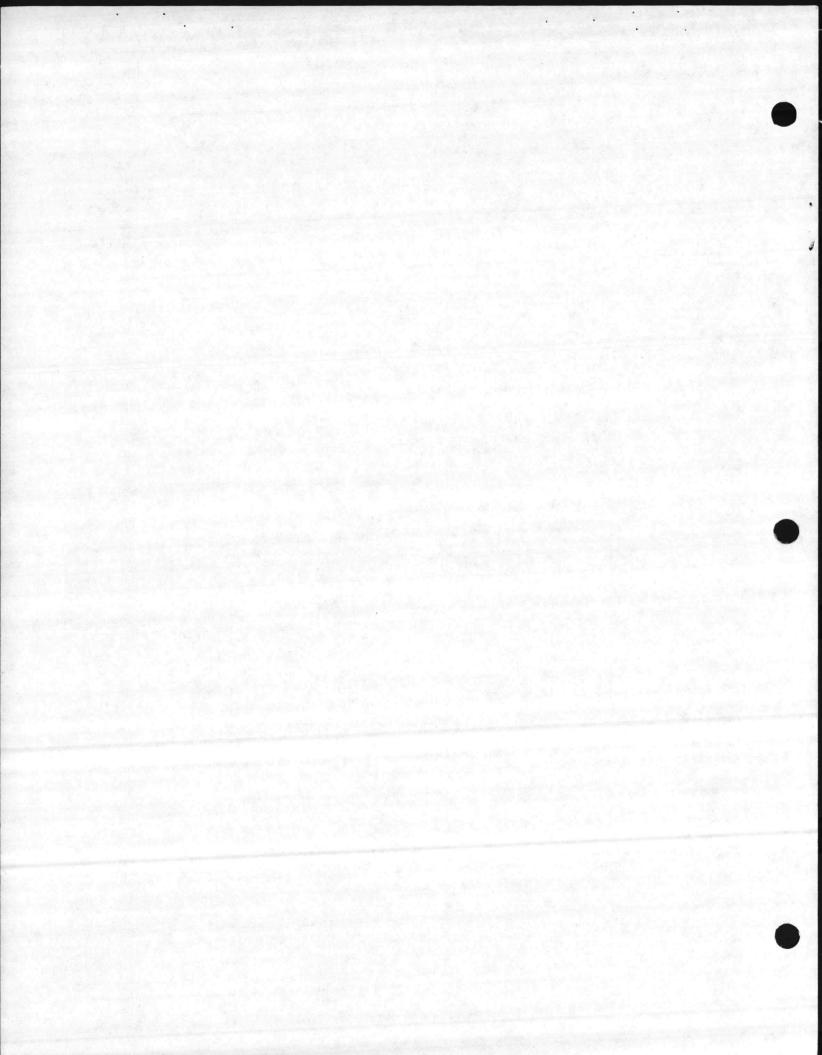
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F G H J K	HWC- HWC- HWC- HWC- HWC-	-10 -11 -12	MECHAN	4620 1215 2230 1855 2310 -	Аля VELOCITV PPM 1026 810 743 824 770 770 770 770 770 770 770 77	85 	ENTER- 0 1NG 0 66. 66. 66. 66. 66. 66. 66. 66	ARD	V- <u>DB</u> G <u>WB</u> 84.0 84.0 84.0 76.3 76.3 76.3 76.3 76.3 76.3 76.3	GPM OR PSIG 5.0 1.3 2.0 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	OR SUC 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8		аня поснез ор н <sub>2</sub> о 	5 9 5	ATER EET <sup>1</sup> 20		B-Std. Red Brass C-035 Wall R B. D-049 Wall R B. D-049 Wall R B. E-049 CU NI (Process Colls Only) AIR FLOW AN CONNECTION S ORDERING AIR FLOW SYMBOL DIRECTION SYMBOL DIRECTION NUR Vertical Dow VUR Vertical Dow VUL Vertical Dow VUL Vertical Dow VUL Vertical Dow VUL Vertical Dow VUL Vertical Dow VUL Vertical Dow VUL Vertical Dow SUPPLY: Pipe Conn. 1 discharge side of Coll: TURBULATORS OR C WATER COILS I with Turbulators O without Turbulators Retrigerant Dr HTHW C Ber-Number of Circuits (Tubes Fed) FLUID TYPE 12 - Retrigerant 12 25 - Steam W - Water G % Glycol SALES ORDER NUMB	IDE SUPPIP N CON Rig Le Rig C C Rig Le Rig Le Rig Le Rig Le Rig Le Rig Le Rig Le Rig Le Rig Rig Rig Le Rig Rig Rig Rig Le Rig Rig Rig Rig Rig Le Rig Rig Rig Rig Le Rig Rig Rig Le Rig Rig Rig Rig Rig Rig Rig Rig
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FGHJK	HWC- HWC- HWC- HWC- HWC-	-10 -11 -12	MECHAN	4620 1215 2230 1855 2310 - VICAL S TUBES: 5/4 FINS: Concession 16 FINS: Concession 1	Аія VELOCITV PPM 1026 810 743 824 743 824 770 5PECIFICA 5° OD Seamless for North 6° OD Seamless for North 6° OD Seamless for North 6° OD Seamless for North 6° OD Seamless for North 6° OD Seamless for North 6° OD Seamless for North 10° OD Seamles	22 42 42 30 36 36 XTIONS All types except N i and NS. - - - - - - - - - - - - - - - - - - -	ENTER- 0 1NG V 669 669 669 669 669 669 669 66	ARD	V- <u>DB</u> G <u>WB</u> 84.0 84.0 84.0 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.3 76.5 75.5 76.5 75.5 7	GPM OR PSIG 5.00 1.33 2.00 1.44	OR SUC 1 8 1 8 1 8 1 8 1 8 1 8 1 8 1 8		аня INCHES OF H20 	5 9 5	ATER EET <sup>1</sup> 20		B-Std. Red Brass C-035 Wall R B. D-049 Wall R B. E-049 CU NI (Process Colls Only) AIR FLOW AN CONNECTION S ORDEFING AIR FLOW SYMBOL DIRECTION SYMBOL DIRECTION NUR HORIZONIA HE HORIZONIA VUR Vertical Day VUL Vertical Day VUL Vertical Day VUL Vertical Day SUPPLY Pide Conn. 1 alscharge side of Coll: TURBULATORS OR C WATER COILS T With Turbulators O write of Circuits (Tubes Fed) SALES ORDER NUMB KF 3 - J095	IDE SUPPLY SUP SUPPLY SUPPLY SUPPLY SUPPLY SUPPLY SUPPLY SUP SUP SUP SUP SUP SUP SUP SUP SUP SUP

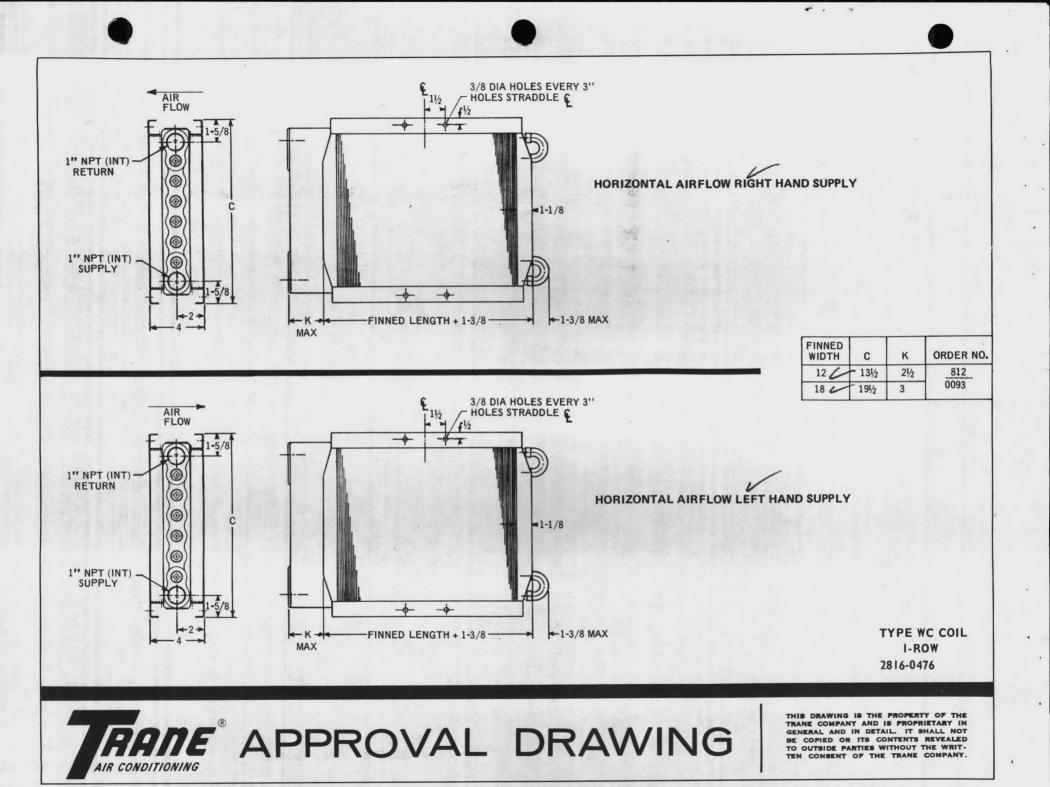


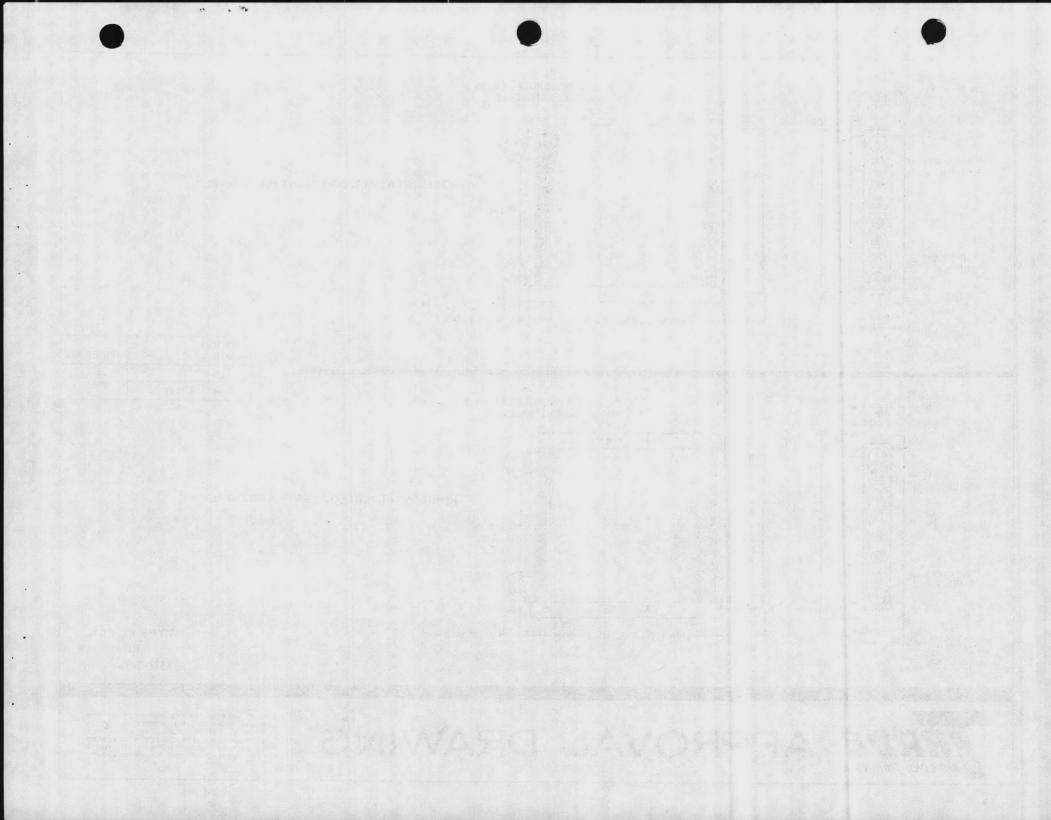
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WC-13	CTIONS	5сFM 273	AIR VELOCITY FPM 0 910		ENTER- D	B ING	V- <u>DB</u> WB	GPM OR PSIG	ENT.TEN OR SUC		AIR NCHES F H20	WA FE H	TER ET 2 <sup>0</sup>		A-Standard Copper B-Std. Red Brass C035 Wall R B. D049 Wall R B. E049 CU Ni (Process Colis Only) ORDERING AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW SYMBOL DIRECTION HR - Horizontal VUR - Vertical UD
WC-13 WC-14	стіонs 3 '+	SCFM	AIR VELOCITY FPM 0 910		ENTER- D ING W 58.	4 1 4 1	<u>v-</u> <u>w</u> <u>84+0</u> <u>84+0</u>	GPM OR PSIG	ENT.TEM OR SUC 18	0	AIR NCHES	WA FE H	TER ET 2 <sup>0</sup>		AStandard Copper BStandard Copper BStd. Red Brass C035 Wall R-B. D049 Wall R-B. E049 CU NI (Process Colis Only) AIR FLOW AND CONNECTION SID ORDERING AIR FLOW SYMBOL DIRECTION HR Horizontal HL Horizontal HL Horizontal
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WC-13 WC-14 WC-15	CTIONS 3 1 2	5сFM 273	AIR VELOCITY FPM 0 910 0 570	76	ENTER- D ING W 58.	4 1 4 1 4 1	<u>v-</u> <u>w</u> <u>84+0</u> <u>84+0</u>	GPM OR PSIG	ENT.TEM OR SUC 18	0	AIR NCHES F H20	WA FE H	TER ET 2 <sup>0</sup>		A-Standard Copper B-Std. Red Brass C035 Wall R B. D049 Wall R B. E049 CU NI (Process Colis Oniv) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW SYMBOL DIRECTION HR HORIZONIA HR HORIZONIA VUR Vertical UD VUR Vertical UD- VDR Vertical Down SUPPLY Pipe Conn. faci discharge side of Coli-
WC-13 WC-14 WC-15 WC-16	ctions           3           +           5           5           5	<sup>5СРМ</sup> 273 57	AIR VELOCITY FPM           0         910           0         570           0         300	76 16	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5 • 9 1 • 7	ENT.TEM OR SUC 18 18 18		• 38	WA FE H	• 5		AStandard Copper BStandard Copper BStd. Red Brass C035 Wall R-B. D049 Wall R-B. E049 CU Ni (Process Coils Only) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW S SYMBOL DIRECTION HR Horizontal- VUR Vertical UB- VUR Vertical UB- VUR Vertical Down- VDR Vertical Down- VDR Vertical Down-
WC-13 WC-14 WC-15 WC-16	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58.	4 1 4 1 4 1 4 1	84.0 84.0 84.0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		A-Standard Copper B-Std. Red Brass C035 Wall R B. D049 Wall R B. E049 CU NI (Process Colis Oniy) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW SYMBOL DIRECTION MR -Horizontal ML Horizontal VUR -Vertical Dow VDR -Vertical Dow SUPPLY Pipe Conn. fact discharge side of Coli TURBULATORS OR CIRC WATER COILS T With Turbulators O - Without Turbulators
WC-13 WC-14 WC-15 WC-16	ctions           3           +           5           5           5	всям 273 57 30	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	арм ок рыс 5 • 9 1 • 7 • 9	ENT.TEM OR SUC 18 18 18		• 38	WA FE H;	• 5		AStandard Copper BStandard Copper BStd. Red Brass C035 Wall R-B. D049 Wall R-B. E049 CU Ni (Process Coils Only) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW S SYMBOL DIRECTION HR Horizontal VUR Vertical UD VUR Vertical UD VUR Vertical UD VUR Vertical Down VDL Vertical Down VDL Vertical Down SUPPLY Pipe Conn. facil discharge side of Coil: TURBULATORS OR CIRC WATER COILS T with Turbulators
WC-13 WC-14 WC-15 WC-16	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18 18 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		A-Standard Copper B-Std. Red Brass C035 Wall R B. D049 Wall R B. E049 CU NI (Process Colls Only) ORDERING AIR FLOW SYMBOL DIRECTION MR - Horizontal VUR - Vertical UD- VUL - Vertical UD- VUR - Vertical UD- VUR - Vertical Down SUPPLY Pipe Conn. fact discharge side of Coll: TURBULATORS OR C:RC WATER COILS T With Turbulators Retrigerant or HTHW Colls Retrigerant or HTHW Colls
WC-13 WC-14 WC-15 WC-16	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18 18 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		AStandard Copper BStandard Copper BStandard Copper C035 Wall R-B. D049 Wall R-B. E049 CU Ni (Process Colis Oniy) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW S SYMBOL DIRECTION HR Horizontal VUR Vertical UD- VUR Vertical UD- VUR Vertical OD- VUR Vertical OD- VDR Vert
WC-13 WC-14 WC-15 WC-16 WC-17	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18 18 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		AStandard Copper BStandard Copper BStandard Copper C035 Wall R-B. D049 Wall R-B. E049 Wall R-B. E049 CU Ni (Process Coils Only) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW S SYMBOL DIRECTION HR Horizontal- VUR Vertical UD- VUR Vertical UD- VUR Vertical UD- VUR Vertical Down VUR Vertical Down SUPPLY Pipe Conn, fact discharge side of Coll- TURBULATORS OR CIRC WATER COILS T With Turbulators O- Without Turbulators Der-Number of Circuits Req (Tubes Fed) FLUID TYPE 12 - Refrigerant 22
WC-13 WC-14 WC-15 WC-16 WC-17	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18 18 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		A-Standard Copper B-Std. Red Brass C035 Wall R B. D049 Wall R B. E049 CU NI (Process Colis Oniv) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW SYMBOL DIRECTION MR -Horizontal WUR -Vertical De- VUL -Vertical Down VUR - Vertical Down SUDPLY Pipe Conn. fact discharge side of Coli: TURBULATORS OR CIRC WATER COILS T With Turbulators O - Without Turbulators Retrigerant or HTWE Colis Ber-Number of Circuits Red (Tubes Fed) FLUID TYPE 12 - Retrigerant 12
WC-13 WC-14 WC-15 WC-16 WC-17	ctions           3           +           5           5           5	всем 273 57 30 62	Air VELOCITY FPM           0         910           0         570           0         300           0         620	76 16 10 17	ENTER- D ING W 58. 58. 58. 58.	4 1 4 1 4 1 4 1	84+0       84+0       84+0       84+0       84+0       84+0	GPM OR PSIG 5.9 1.7 .9 2.1	ENT.TEM OR SUC 18 18 18		AIR NCHES F H₂0 • 38 • 15 • 05 • 18	WA FE H;	• 5		AStandard Copper BSta. Red Brass C035 Wall R-B. D049 Wall R-B. E049 Wall R-B. E049 CU Ni (Process Coils Only) CONNECTION SIDI ORDERING AIR FLOW 4 SYMBOL DIRECTION HR Horizontal- VUR Vertical Ub- VUR Vertical Ub- VUR Vertical Down- VUR VER EXCENTION- SUPPLY PIDE Conn. factor BUPPLY PIDE CONN
INSTRU- IWC-13 IWC-14 IWC-15 IWC-16 IWC-17	CTIONS 3 4 5 7 7	зсям 273 57 30 62 58 -	VELOCITY PPM 0 910 0 570 0 300 0 620 6 - 586	76 16 10 17 17	ENTER- D ING W 58. 58. 58. 58. 58.		84.0 84.0 84.0 84.0 84.0 84.0	GPM OR PSIG 5 • 9 1 • 7 • 9 2 • 1 4 • 1	ент.тем оя suc 18 18 18 18		• 38 • 15 • 05 • 18 • 16	WA FE H;	• 5		AStandard Copper BSta. Red Brass C035 Wall R-B. D049 Wall R-B. E049 Wall R-B. E049 CU Ni (Process Coils Only) CONNECTION SIDI ORDERING AIR FLOW 4 SYMBOL DIRECTION HR Horizontal- VUR Vertical Ub- VUR Vertical Ub- VUR Vertical Down- VUR VER EXCENTION- SUPPLY PIDE Conn. factor BUPPLY PIDE CONN
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INSTRU- IWC-13 IWC-14 IWC-15 IWC-16 IWC-17	CTIONS 3 4 5 7 7	<u>зс</u> FM <u>273</u> <u>57</u> <u>30</u> <u>62</u> <u>58</u> <u>-</u> <u>58</u> <u>-</u> <u>СНАNICAL</u> <u>тивез:</u> <u>Fins-</u> <u>CHANICAL</u>	AIR VELOCITY FPM           0         910           0         570           0         300           0         620           6         - 586           .         586	76 16 10 17 17 17	58. 58. 58. 58. 58. 58. 58. 58.		84.0 84.0 84.0 84.0 84.0 84.0 84.0 84.0	G & CO	ENT. TEM OR SUC 18 18 18 18 18 18 18 18 18 18		• 38 • 15 • 05 • 18 • 16	WA FE H;	• 5		AStandard Copper BSta. Red Brass C035 Wall R-B. D049 Wall R-B. E049 Wall R-B. E049 CU Ni (Process Coils Only) AIR FLOW AND CONNECTION SIDI ORDERING AIR FLOW S SYMBOL DIRECTION HR Horizontal VUR Vertical UD- VUR Vertical UD- VUR Vertical UD- VUR Vertical UD- VUR Vertical OD- VUR Vertical OD- VDR Vertical OD- VER VERTICAL VERTIC
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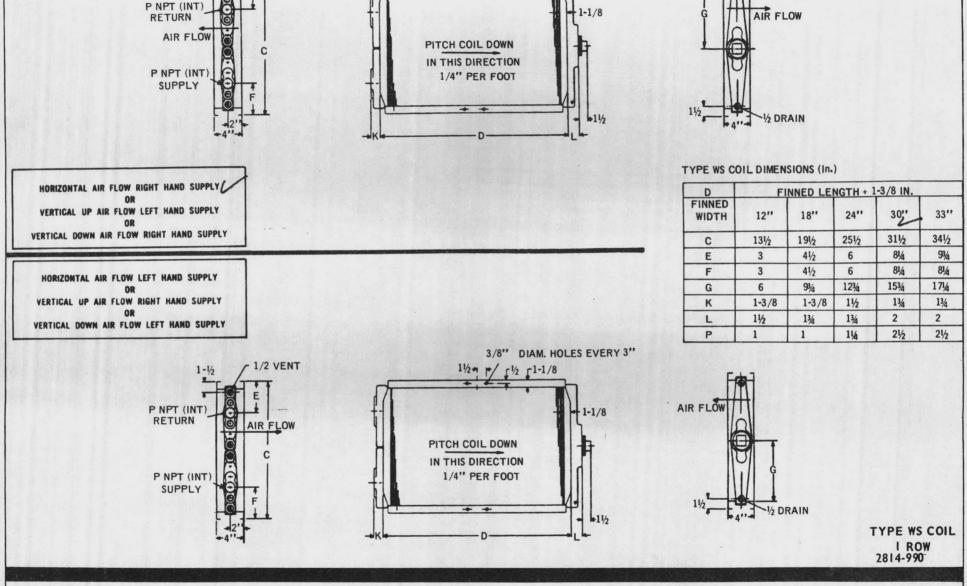


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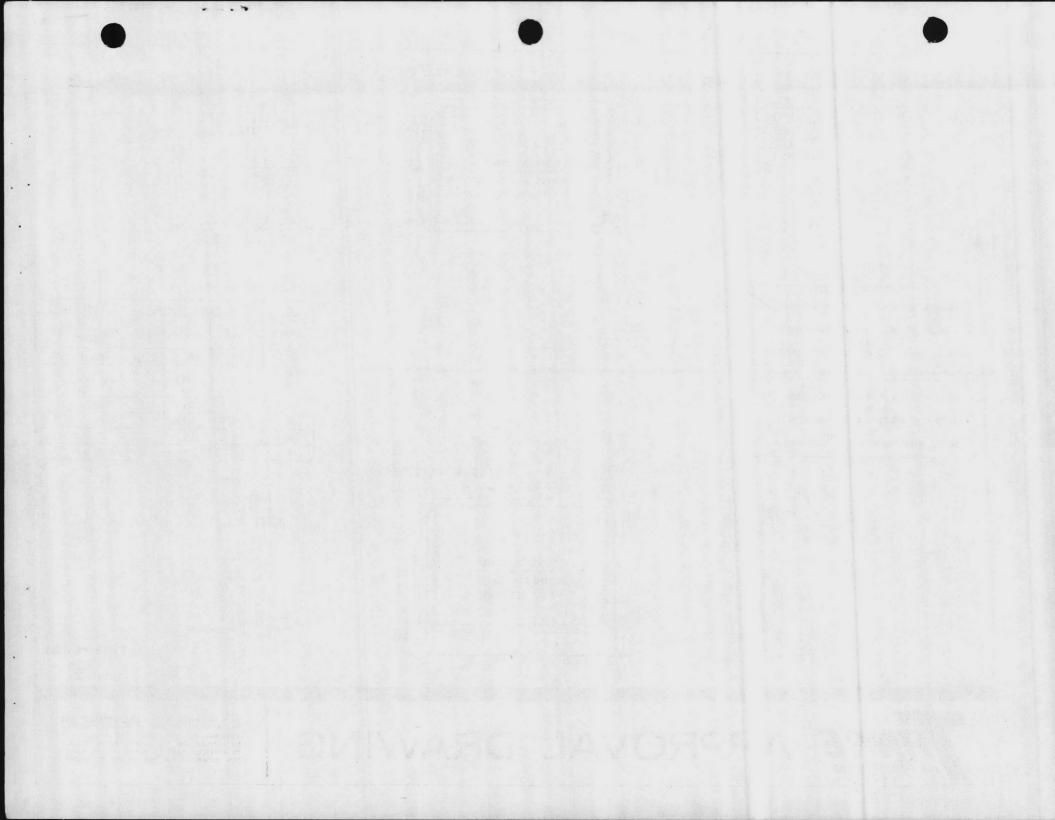


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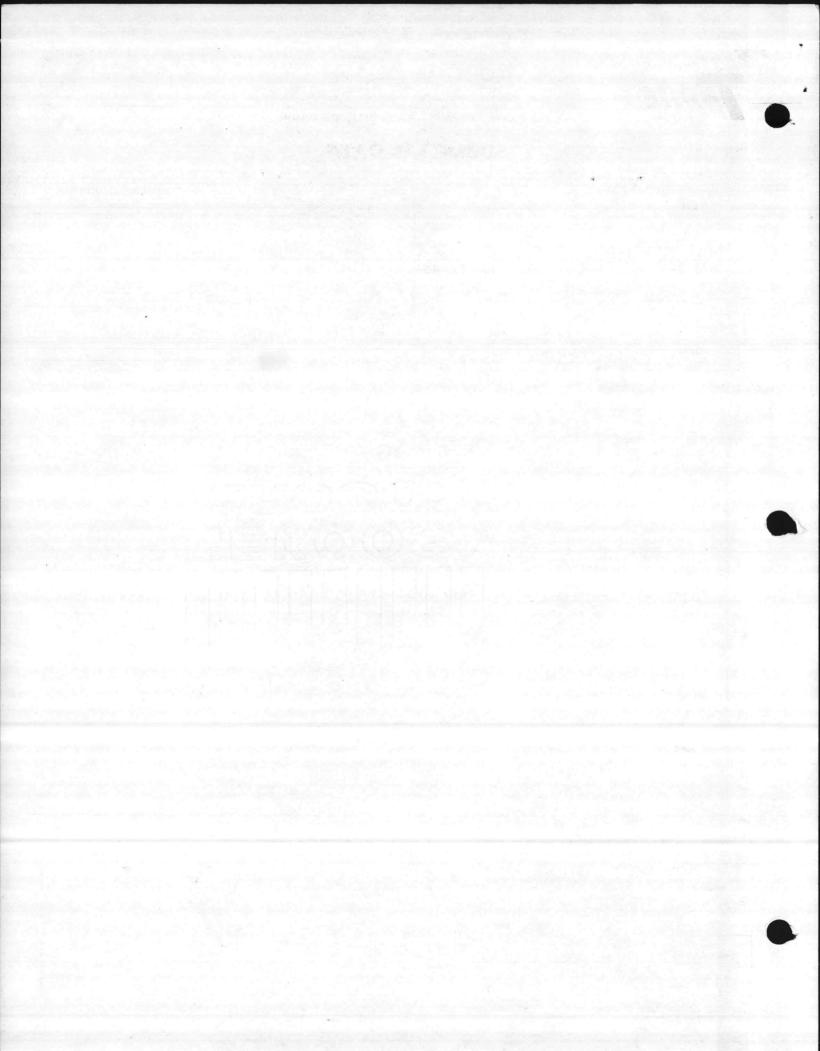


THE TRANE COMPANY -- LA CROSSE, WISCONSIN

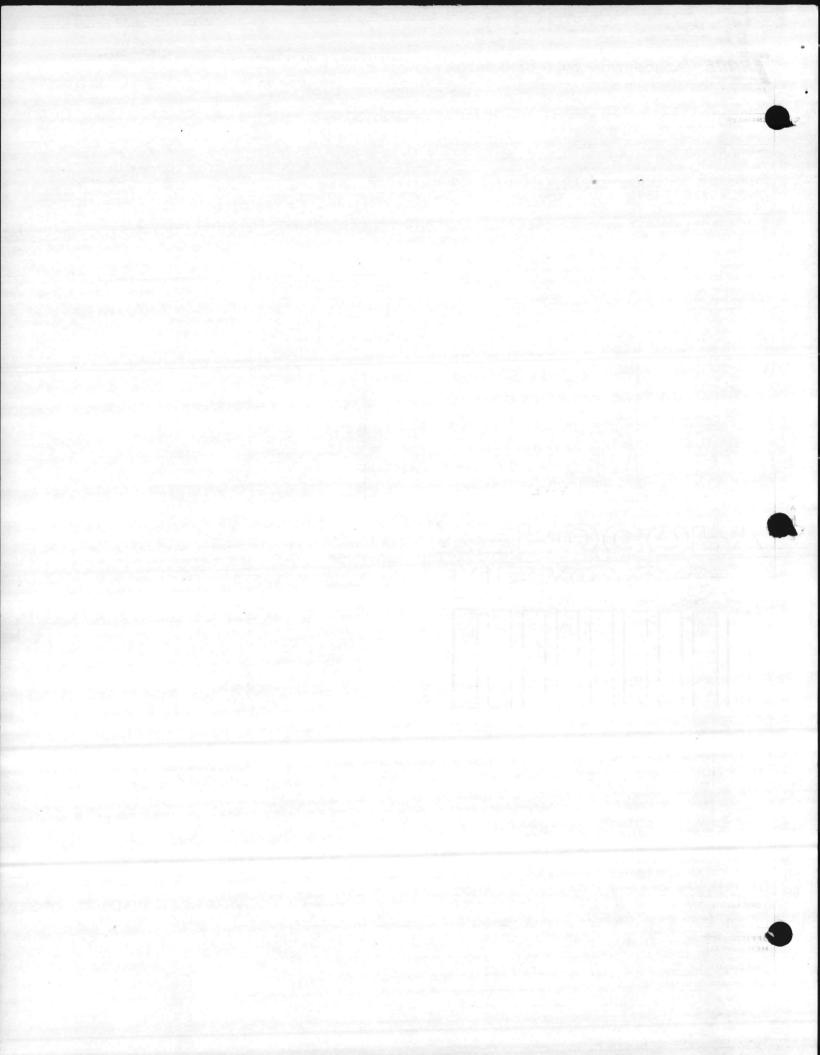
## SUBMITTAL DATA

ORDER NUMBER 1464	DATE	TRANE ORDER NUMBER
SORRELLS P & H CO., INC. P.O. BOX 9604 GREENSBORO, NORTH CAROLINA 27408	3-22-79 R COM(0) BLDG. 2619 CAMP LEJEUNE, NOP CAMP LEJEUNE, NOP	
	ENGINEER R S NOONAN INC	
MODEL SPECIFICATIONS AND TAGGING	K.S. NOUNAN, INC.	
SINGLE STAGE ABSORPTION UNIT, AB	SÇ-02A	
		PAGE 1 OF 2
	P.O. BOX 9604 GREENSBORO, NORTH CAROLINA 27408 MODEL SPECIFICATIONS AND TAGGING	SORRELLS P & H CO., INC. P.O. BOX 9604 GREENSBORO, NORTH CAROLINA 27408 E COM(0) BLDG. 261 CAMP LEJEUNE, NOI E C T ENGINEER R.S. NOONAN, INC.

Drawings in this submittal package describe the equipment we propose to furnish for this project and are submitted for approval to manufacture.



Real	ABSORPTION COLD GENERATOR								DATE SH	IPPED	BILL OF LADI	NG NO. INVOIC	E DATE	F3-J	D93
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ENGINEER									MARK PACKAGES					1	
PROJECT	ANI	D LOCATIO	DN												
ORDER		ATE	CUSTOM	ER ORDE	R NO.	USTOMER	ACCOL	UNT NO.	SHIP VIA	<u></u>				COLLEC	T []
ORDER DATE CUSTOMER ORDER NO. CUSTOMER ACCOUNT NO. 3-22-79 1464												-		PREPAI	> 0
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		CONDENSATE HEAT EXCHANGER													
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DS2-F3-F093

SORRELLS P & H CO., INC. GREENSBORO, NORTH CAROLINA PAGE 1 OF 1

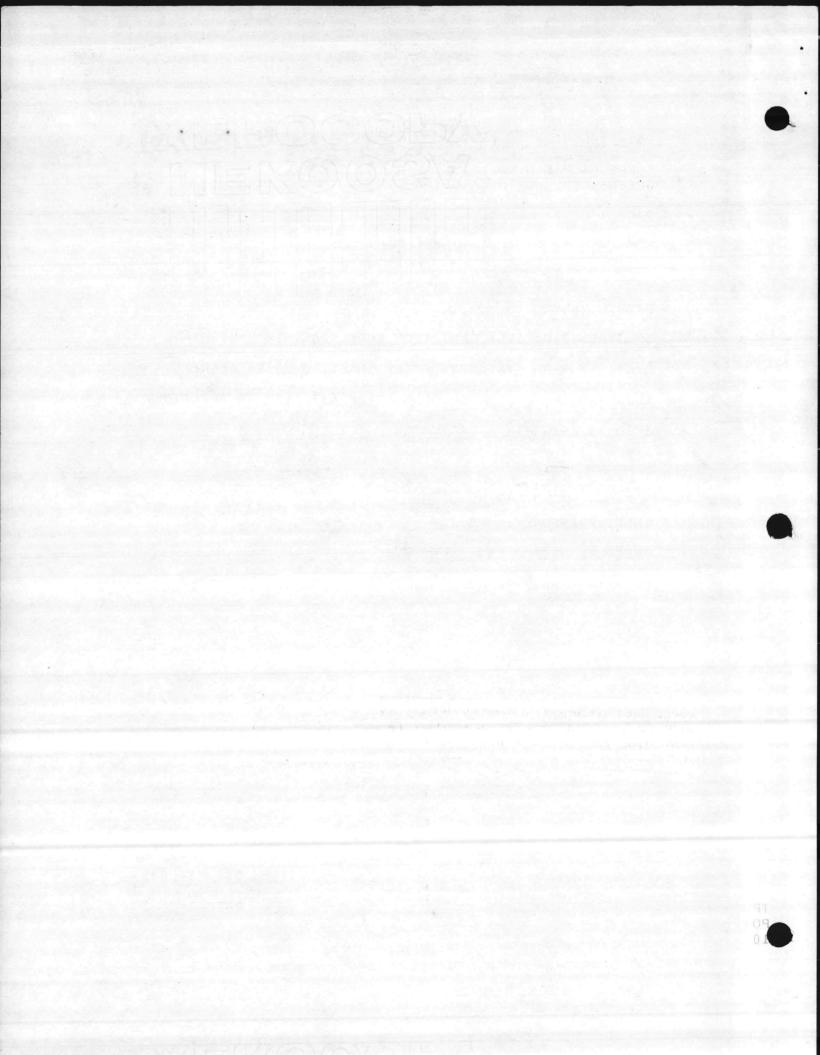
### FISHER VALVE

3" TYPE 7810, 125# CAST IRON BODY, CAST IRON FISHTAIL DISC, 17-4 PH STAINLESS STEEL SHAFT, 0 TO 80 DEGREES ROTATION, PUSH DOWN TO OPEN, TYPE 656 SIZE 30 ACTUATOR, 3 TO 15 PSIG AIR TO ACTUATOR

STEAM SERVICE INLET PRESSURE 14 PSIG PRESSURE DROP 2 PSI FLOW 3395 LBS/HR

> DS2-F3-J093 PAGE 1 OF 1

TP PO





FILE: TRANE REFRIGERATION PRODUCTS LIQUID CHILLERS-ABSORPTION Cold Generator Model ABSC Submittal





## SINGLE STAGE Absorption Cold Generator®

MODELS ABSC-02A, C2A STEAM

#### MECHANICAL SPECIFICATIONS

#### A. CONSTRUCTION

All units are of hermetic, single shell design, leak tested, and shipped factory assembled and evacuated. Standard method of shipment for this unit is via truck to the designated delivery site excluding Alaska and Hawaii.

Standard absorber and concentrator tubes are Cupro-Nickel. Standard condenser and evaporator tubes are copper. All tubes are individually replaceable from either end of the unit and the tube ends rolled into annular grooves in the tube sheets. All headers are removable for free access to the tube bundles and are tested for  $1\frac{1}{2}$  times the design pressure.

All units are equipped with a single factory wired and mounted, hermetic pump-motor assembly having three bronze impellers on a single stainless steel shaft rotating in carbon bearings. The motor and pump assembly is cooled and lubricated by cool, distilled and magnetically strained refrigerant water. Unit pump motor replaceable without breaking unit vacuum. Unit pump service (bearings, shaft, impellers) can be performed without solution removal.

A factory wired and mounted purge system, consisting of a Cupro-Nickel purge drum and electric motor driven vacuum pump, removes noncondensables from the unit. The machine is automatically protected against re-entry of noncondensables during purging by the discharge reed valve on the purge pump.

The "J" tube extending from the concentrator to the absorber permits recirculation of hot Lithium Bromide solution through the heat exchanger to facilitate decrystallization.

The concentrator connection is flanged and matched in size to the control valve.

#### **B. PNEUMATIC PANEL**

Includes the following factory wired and mounted items:

- 1. Chilled water temperature controller
- 2. Pneumatic-electric pressure switch
- 3. Solenoid air valve
- 4. Pneumatic temperature gauge
- 5. Supply air pressure gauge
- 6. Branch air pressure gauge
- 7. Optional start-up demand limiter

#### C. ELECTRIC CONTROL PANEL

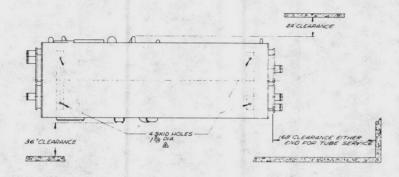
Includes the following factory wired and mounted items:

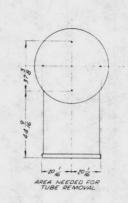
- 1. Terminal block
- 2. Control power transformer and separately fused 115 volt single phase control circuit.
- 3. Motor temperature cutout and low temperature cutout.
- 4. Time delay relay for dilution cycle.
- 5. Motor starter.
- 6. Purge motor fuse.
- 7. External lights to indicate operation of the unit, pumps, and purge system.
- 8. Internal wiring for operation on 200, 460, or 575 volt, 3-phase, 60 cycle power.

#### D. INSULATION REQUIRED

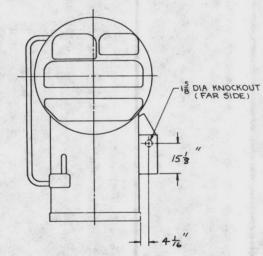
Total insulation required 46 sq. ft.

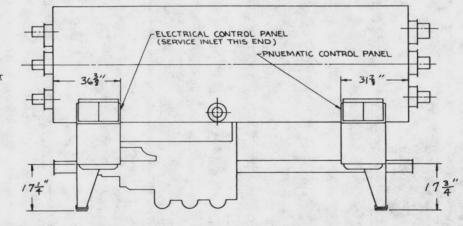
- 1. Evaporator water boxes.
- 2. Refrigerant float chamber.
- 3. Refrigerant float chamber piping.
- 4. Pump motor lubrication lines.
- 5. Refrigerant pump housing.
- 6. Refrigerant spray tree piping.
- 7. Evaporator return piping.

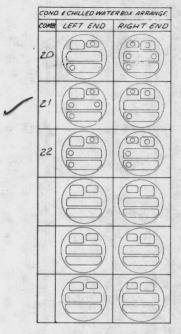












MAX. RIGGING WT. \$ 12,000 OPERATING WT. \$ 16,350 FLOOR LOADING P.S. \$ 45

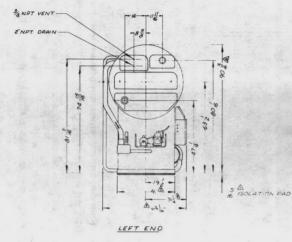
LEFT END

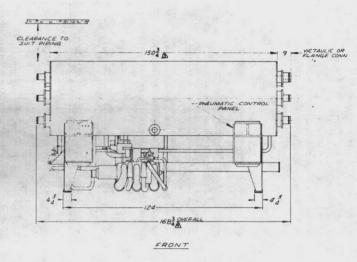
S

FRONT

#### PANEL LOCATION DATA

1	2 - PASS EITHER END	3-PASS EITHER END	4. PASS EITHER END	SORT PASS EITHER END	6.PASS EITHER END
11	- 18 - 18 -	6 CONN - 18 18 SIDE	- 18 3 18 3 -	- 4"CONN - 19% - 19% - 510E	- 4 CONN - 19 8 - 19 8 -
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9			· ····································	i i i i i i i i i i i i i i i i i i i	· · · · · · · · · · · · · · · · · · ·

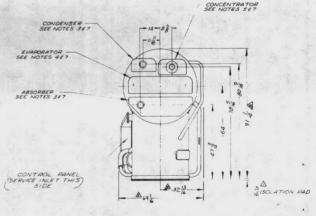






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- I OVERALL LENGTH, WIDTH & HEIGHT DIMENSIONS MAY VARY FROM THOSE SHOWN 13.
- 2. DIMENSIONS FROM FLOOR TO WATER CONNECTIONS MAY VARY FROM THOSE SHOWN \$ 1/2.
- 3 CONDENSER & ABSORBER STO WATER CONN ARE 5" -150" PIPE CONN GROOVED FOR USE WITH STYLE 77 VICTAULIC COUPLINGS
- 4 EVAPORATOR STD WATER CONN ARE 150" PIPE CONN GROOVED FOR USE WITH STYLE 77 VICTAULIC COUPLINGS (SEE REQUIRED CONN DE TAIL FOR CONN SIZE & LOCATION LEFT OR RIGHT SUPPLY)
- 5. CONCENTRATOR STD CONN ARE 150" AMERICAN STD FLAT FACED STEEL FLANGES SIZED TO SUIT STEAM
- 6 UNIT TO BE INSTALLED ON LEVEL SURFACE.
- 7. 300 & GROOVED PIPE ALONG WITH 150 & 300 \* FLANGES ARE AVAILABLE BY SPECIAL ORDER (BOLT HOLES ON ALL FLANGE WATER CONN STRADDLE VERTICAL CENTER LINES).
- 8 ALL VENTS ARE & NRT ALL DRAINS ARE 3/4 NRT. UNLESS OTHERWISE SPECIFIED
- 9. FOR GERMAN CODE (TUV), WORKING PRESSURE IS 0.5 ATU.



RIGHT END

DIMENSIONAL DATA

#### Form No. E2622-5255E

	TU	BING			COVE	RS	CONNECTION	DAGODO	SUPPLY	
SECTIONS	CU	CUNI	150#	300#	PIPE STUBS FLANGES		SIZES	PASSES	SUPPLY	
Evaporator	R		X		Ŕ		4" 5" 6"	7, 6, 5 4 3, 2	R	
Absorber		X	¥		R		5″	3	RL	
Condenser			-		R		5″	1	R L	
Concentrator	-	X	50#	ONLY	-	X	Sized to Suit Steam Valve	1	R —	

TABLE 2 - Electrical Data

UNIT	PHASE AND	1	UNIT PUL	MP MOTOR	R DATA		MAIN DISCOL	NNECT DATA
MODEL	FREQUENCY	BHP	VOLTS	FLA	SFA	LRA	LINE SIZE	FUSE SIZE
ABSC-01A	30	5	200	18.6	20.9	120	10	40
THRU	60 CPS	1 2	460	8.1	8.9	46	12	20
ABSC-02A	1.		575	6.2	6.7	34	14	15

FLA - Full Load Amps

SFA - Service Factor Amps

LRA - Locked Rotor Amps

#### RECOMMENDED CONTRACTOR RESPONSIBILITIES

- 1. Contractor shall install unit on a level surface. A neoprene isolation pad assembly, furnished by the manufacturer, shall be placed under the unit.
- 2. Contractor shall furnish and install condenser bypass piping if such is required by the manufacturer for satisfactory operation of the unit.
- 3. The contractor shall provide access in the piping adjacent to the machine to allow removal of headers for inspection, cleaning or removal of tubes.
- 4. The (electrical) contractor shall furnish and install, external to the electric control panel, a separately fused disconnect.
- 5. The (control) contractor shall furnish and install all necessary air piping external to the control panel.
- 6. Gauge cocks and thermometer wells shall be provided and installed by the contractor for temperature and pressure readings at the inlet and outlet of the evaporator, at the inlet and outlet of the absorber, and the outlet of the condenser. A pressure gauge shall be installed at the inlet to the concentrator on steam machines. Gauge cocks and thermometer wells shall be installed in the hot water piping as shown on the plans when required.
- 7. Balancing valves shall be provided by the contractor in all external water circuits to balance and trim

the system.

- 8. Strainers shall be installed by the contractor ahead of all pumps and automatic modulating valves to insure proper pump and valve operation.
- 9. Steam traps shall be of the float and thermostatic type, designed for low pressure operation and have the capacity to handle a minimum of ...... lbs. per hour of condensate with zero psig at the outlet of the concentrator.
- 10. The contractor shall insulate the chilled water headers and any other portion of unit that will sweat under normal operating conditions.
- 11. The contractor shall supply a flow switch in the chilled water circuit which shall be interlocked with the electrical control circuit of the unit so that the unit will operate only when there is flow in the circuit.
- 13. (High pressure steam systems only.) The contractor shall install a safety relief valve upstream from the steam supply capacity control valve to protect the valve itself. As dictated by local Code, a 15 PSIG Relief Valve may also be required between the steam valve and the machine.



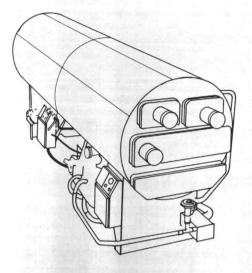
FILE INFORMATION DIVISION TAB - TRANE REFRIGERATION PRODUCTS PRODUCT TAB - LIQUID CHILLERS-ABSORPTION Cold Generators MODEL TAB - Model C LITERATURE ITEM - Wiring LITERATURE FILE NO.

ABSC-W-6

UNIT WIRING

Since The Trane Company has a policy of continuous product improvement, it reserves the right to change specifications and design without notice. The installation and servicing of the equipment referred to in this booklet should be done by qualified experienced technicians.

**JANUARY, 1978** 



# SINGLE STAGE Absorption Cold Generator®

STEAM WITH STEAM STARTUP STABILIZER AND POSITIVE CONCENTRATION LIMIT

	MOI	DELS	ARSC			
					004	
UIA,	OIB,	010,	OIE,	01H,	02A,	
02C,	02F,	02J,	03F,	03J,	04B,	
04F,	05C,	05J,	06C,	07C,	080,	
09D,	, 11/	A, 13	2A,	14C,	160	

TABLE	1	-	Electrical	Data	(60	Cycle)	)
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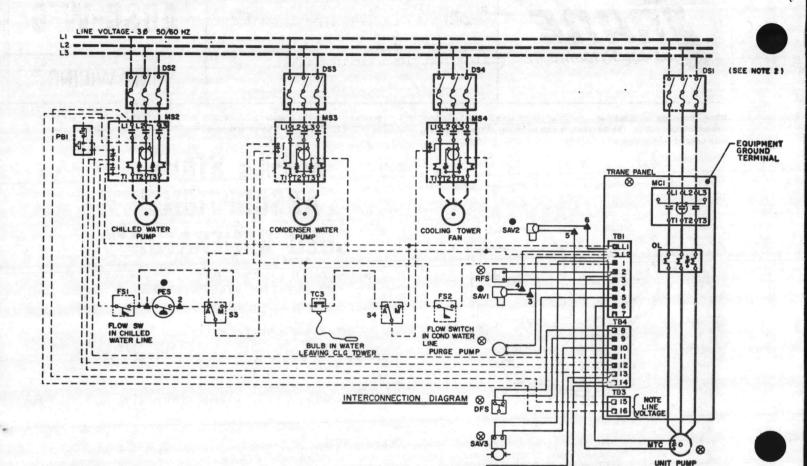
UNIT SIZE	PHASE AND FREQUENCY	HP (4)	VOLTS	FLA (5)	SFA (6)	LRA (7)	HEATER (8)	MIN. CKT. AMPACITY (9)	MAX. FUSE SIZE (10)
01A	3 Phase		200	18.6	20.9	120	H-36	28	45 AMP
THRU	60 Hz	5	460	8.1	8.9	46	H-26	12	20 AMP
02A			575	6.2	6.7	34	H-22	9	15 AMP
02C	3 Phase	He Are	200	24.2	27.6	136	H-39	34	50 AMP
THRU	60 Hz	712	460	10.5	12	58	H-29	15	25 AMP
05C			575	8.6	9.6	46	H-27	12	20 AMP
05J	3 Phase		200	32.2	36.8	186	H-41	44	70 AMP
THRU	60 Hz	10	460	14	16	81	Н-33	20	30 AMP
06C	C. C. Starting		575	11.2	12.6	55	H-29	15	25 AMP
07C	3 Phase		200	49.5	55.2	299	H-45	66	110 AMP
THRU	60 Hz	15	460	21.5	24	130	H-37	29	50 AMP
11A			575	16.5	20	95	H-34	22	35 AMP
12A	3 Phase		200	96	106	570	H-20	124	200 AMP
THRU	60 Hz	30	460	40	45	295	H-43	52	90 AMP
16C		10.0	575	32	36	236	H-41	41	70 AMP

1. Control Circuit is 115 Volts.

Machines have a 0.75 KVA control power transformer with a minimum of 150 volt amperes capacity available for external load.
 Purge pump and control circuit are fused separately with

- 10A-125V Fusetrons.
- 4. HP is motor horsepower
- 5. FLA is Full Load Amps
- 6. SFA is Service Factor Amps
- 7. LRA is Locked Rotor Amps
- 8. Cutler Hammer quick trip heaters coils AMP rated.
- 9. Minimum circuit ampacity based on NEC 430-24.
- 10. Dual element fuse (Class K5, Time Delay) based on NEC 430-52.

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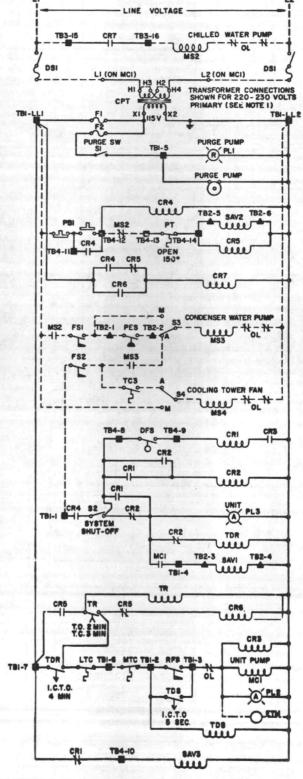
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BULB IN

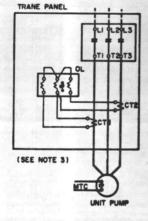
ABSORPTION UNIT

ITEM	DESCRIPTION	LOCATION	FURNISHED	
PBI	PUSH BUTTON STATION	REMOTE	OTHERS	
MCI	MAGNETIC CONTACTOR	ELECT PANEL	TRANE	
MS2	MAG-X-LINE START LINE VOLT	REMOTE	OTHERS	
MS3,4	MAG-X-LINE START 115 V	REMOTE	OTHERS	
PES	PNEUMATIC ELECT SW	PNEU PANEL	TRANE	
\$3,4	S.P.D.T. SWITCH	REMOTE	OTHERS	
TC3	TEMP. CONTROL	REMOTE	OTHERS	
TBI, 3, 4	TERMINAL STRIP	ELECT PANEL	TRANE	
TB2	TERMINAL STRIP	PNEU PANEL	TRANE	
SAVI,2	SOLENOID AIR VALVE	PNEU PANEL	TRANE	
RFS	REFRIGERANT FLOW SW	UNIT	TRANE	
TDR	TIME DELAY RELAY	ELECT PANEL	TRANE	
LTC	LOW TEMP CONTROL	ELECT PANEL	TRANE	
PL1-3	PILOT LIGHTS	ELECT PANEL	TRANE	
\$1,2	SELECTOR SWITCH	ELECT PANEL	TRANE	
F1,2	FUSE	ELECT PANEL	TRANE	
DSI-4	FUSIBLE DISCONNECT SW	REMOTE	OTHERS	
CPT	CONTROL PWR TRANSF	ELECT PANEL	TRANE	
FSI,2	FLOW SWITCH	REMOTE	DTHERS	
MTC	MOTOR TEMP CONTROL	UNIT	TRANE-	
CTI,2	CURRENT TRANSFORMER	ELECT PANEL	TRANE	- SEE NOTE
SAV3	SOLENOID AIR VALVE	UNIT	TRANE	
DFS	POS.CONC. LIMIT FLOAT SW	UNIT	TRANE	
TR	PULSE TIMER	ELECT PANEL	TRANE	
PT	PRE-HEAT TERMINATION	ELECT PANEL	TRANE	
TDS	TIME DELAY SWITCH	ELECT PANEL	TRANE	
CRI-7	CONTROL RELAY	ELECT PANEL	TRANE	
ETM	ELAPSE TIME METER	ELECT PANEL	TRANE	- SEE NOTE

2



LINE DIAGRAM



LEGEND

CLUCITIC CONTRACT ON TRANE UNIT. ITEM FURNISHED & LOCATED IN PREUMATIC PANEL ON UNIT. WIRING BY THE TRANE CO. WIRING BY OTHERS. TERMINALS ON TB IN ELECTRIC PANEL. TERMINALS IN PREUMATIC PANEL

- 4. WHEN ELAPSE TIME METER IS CALLED FOR ON SALES ORDER ETM WILL BE FURNISHED AND WIRED BY TRANE

I FOR ALL OTHER VOLTAGE APPLICATIONS SEE CONTROL TRANSFORMER NAMEPLATE FOR CONNECTION DIAGRAM

- 2: WHEN FACTORY MOUNTED DISCONNECTION DIAGRAM 2: WHEN FACTORY MOUNTED DISCONNECT SWITCH IS CALLED FOR ON SALES ORDER, DSI WILL BE MOUNTED ON UNIT AND WIRED TO PANEL BY TRANE 3. CJRRENT TRANSFORMERS REQUIRED AND FURNISHED BY TRANE CO. ONLY ON CI2A, CI4C, CI6C 200V OR 230V UNITS

2304-1096

3

TABLE 2 - Electrical Data (50 Cycle)

UNIT SIZE	KW INPUT	PHASE AND FREQUENCY	HP (4)	VOLTS	FLA (5)	LRA (7)	HEATER (8)	MIN. CKT. AMPACITY (9)	MAX. FUSE SIZE (10)
ABSC-01A	3.8	3 Phase	(1)	190	18.6	88	H-35	27	45 AMP
ABSC-01B	3.8	50 Hz	5	220	20.0	100	H-35	28	45 AMP
ABSC-01C	4.2	50 m2		380	9.3	44	H-26	14	20 AMP
ABSC-01E	4.2			415	10.5	47	H-28	15	20 AMP
ABSC-01H	5.1	3 Phase		190	26.0	110	H-38	37	60 AMP
ABSC-02A	5.4	50 Hz	7 <sup>1</sup> 2	220	23.0	127	Н-37	32 .	*50 AMP
ABSC-02C	5.8			380	13.0	55	H-30	18	30 AMP
ABSC-02F	7.0	a hard and		415	12.0	67	H-29	17	25 AMP
ABSC-02J	7.2								
ABSC-03F	7.5	3 Phase		190	33.0	146	H-40	45	ZO AMP
ABSC-03J	8.3	50 Hz	10	220	30.0	168	H-39	41	70 AMP
ABSC-04B	8.3	10000		380	16.5	73	H-33	23	35 AMP
ABSC-04F	8.5	the management of the		415	16.0	89	Н-33	23	35 AMP
ABSC-05C	8.8	3 Phase		190	50.0	240	H-44	67	110 AMP
ABSC-05J	8.0	50 Hz	15	220	46.0	278	H-43	61	100 AMP
ABSC-06C	10.3	San San San San San San San San San San		380	25.0	120	H-38	33	50 AMP
ABSC-07C	10.4	Constant of the		415	24.5	147	H-38	33	50 AMP
ABSC-08C	11.0	and select the		1.00	1.1.1		10. 6. 8. 8. 4	n na Alighe al	
ABSC-09D	13.9			in the state	a and the		i colso hero	phase in the	
ABSC-11A	15.1	and the second second			S. 4. 8 1 1	Sec. 1	1.0000000	and the second	
ABSC-12A	17.0	3 Phase		190	80.0	590	H-16	104	175 AMP
ABSC-14C	17.0	50 Hz	30	220	69.0	510	H-14	89	150 AMP
ABSC-16C	29.0			380 415	40.0	295 270	H-42 H-42	52 48	90 AMP 80 AMP

1. Control Circuit is 115 Volts.

 Machines have a 0.75 KVA control power transformer with a minimum of 150 volt amperes capacity available for external load.

 Purge pump and control circuit are fused separately with 10A-125V Fusetrons.

4. HP is motor horsepower.

5. FLA is Full Load Amps.

6. SFA is Service Factor Amps.

7. LRA is Locked Rotor Amps.

8. Cutler-Hammer quick trip heater coils - AMP rated.

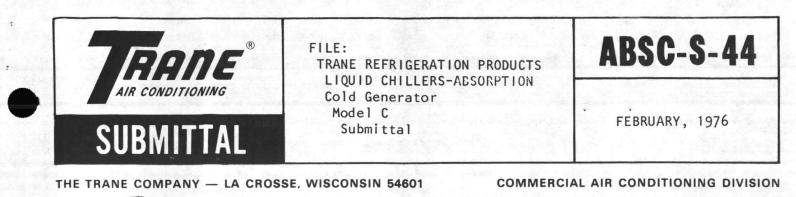
9. Minimum circuit ampacity based on NEC 430-24.

10. Dual element fuse (Class K5, Time Delay) based on NEC 430-52.

MODEL NUMBER DESCRIPTION -

MODEL NUMBER DESCRIPTI	ON
$\frac{AB}{DNIT}$	$-\frac{3}{L} \frac{BC}{UNIT OPTIONS}$ A - None
	B - Positive Concentration Limit C - Demand Limiter
<u>TYPE</u>	D - Start-up Steam Stabilizer
Circle Chara	E - Economizer Valve
Single Stage	F - Special Tubing
	G - Special Control Panel
DEVELOPMENT SEQUENCE	J - Special
TONNAGE         01A - 101 Tons       04F - 465 Tons         01B - 112 Tons       05C - 520 Tons         01C - 129 Tons       05J - 590 Tons         01E - 148 Tons       06C - 665 Tons         01H - 148 Tons       07C - 750 Tons         02A - 200 Tons       08C - 852 Tons         02C - 228 Tons       09D - 955 Tons         02J - 294 Tons       12A - 1250 Tons         03J - 385 Tons       16C - 1660 Tons         04B - 420 Tons       90	NO. OF PASSES (EVAPORATOR) 1 - 1 Pass 2 - 2 Pass 3 - 3 Pass 4 - 4 Pass 5 - 5 Pass 6 - 6 Pass 7 - 7 Pass 8 - 8 Pass DESIGN SEQUENCE ENERGY INPUT
3 - 200-60-3 $4 - 460-60-3$ $5 - 575-60-3$ $6 - 220-50-3$ $7 - 380-50-3$ $8 - 415-50-3$ $9 - Special$	S - Steam W - Hot Water H`- High Temp Hot Water X - Special





### ABSORPTION COLD GENE STEAM/DEMAND START-UP STABILIZER **MODEL ABSC**

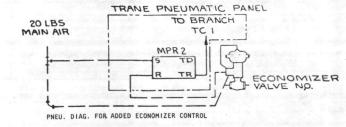
PIPING AND PNEUMATIC CONTROL

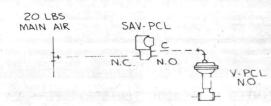
TRANE PNEUMATIC PANEL MPR 5 . TCI D.A. REC: CONT TO ECONOMIZER CONTROL TC 20 LBS. PE B N.O. STEAM VALVE 6-9L85 Q N.C PNEU. TEMP GAUGE (SEE NOTE - I) О STEAM VALVE - B (OPTIONAL) RS MPR4 TD TCI TR TRANSMITTER GRADUAL SWITCH 9 SAV2  $\cap$ TC2 d N O TEMPCON' RESTRICTOR AIR TANK

PNEUMATIC DIAGRAM FOR CONTROL WITH STEAM START-UP STABILIZER AND DEMAND LIMITER

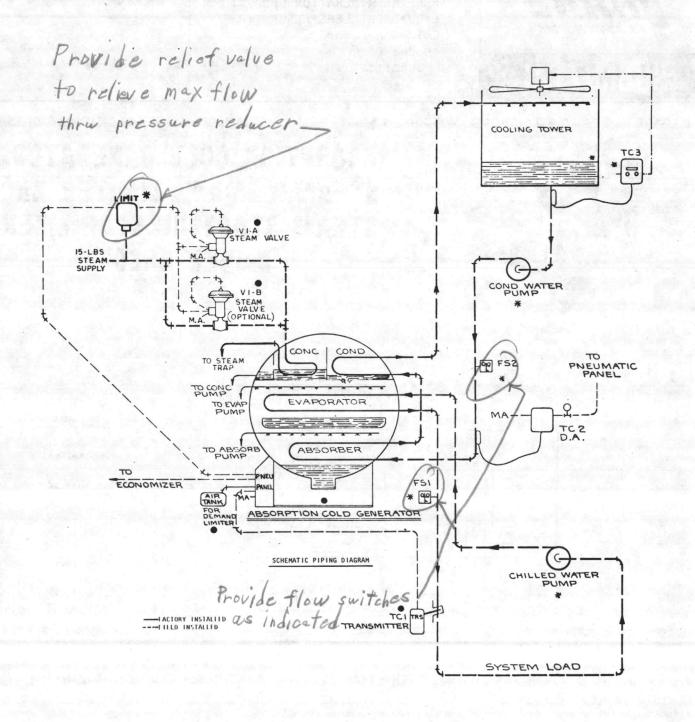
- TC1 DIRECT ACTING RECEIVER/CONTROLLER TC2 - DIRECT ACTING TEMPERATURE CONTROLLER TRS - TEMPERATURE SENSOR - TRANSMITTER
- SAV1 SOLENOID AIR VALVE

- ----FACTORY INSTALLED
- PE PREMATIC ELECTRIC SWITCH MPR5 MULTI-PURPOSE RELAY (LOW PRESSURE SELECTOR)
- MPR2 REVERSING MULTI-PURPOSE RELAY
- MPR4 MULTI-PURPOSE RELAY (CHARACTERIZED MINIMUM PRESSURE -
  - LOW PRESSURE SELECTOR)





PNEU. DIAG. FOR ADDED V-PCL CONTROL

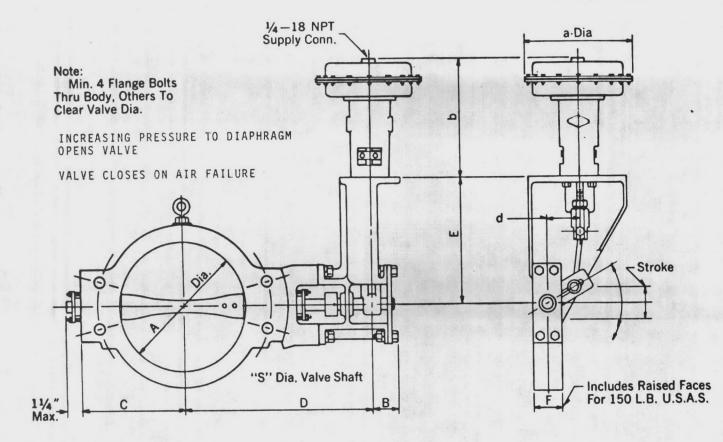


LEGEND • ITEMS FURNISHED BY TRANE AS STANDARD EQUIPMENT • ITEMS FURNISHED BY OTHERS. M.A. - INDICATES MAIN AIR CONNECTIONS

NOTE 1 - WHEN ONE STEAM VALVE IS USED AND WHEN PILOT POSITIONER IS SUPPLIED, SET PILOT POSITIONER ON VALVE VI-A TO 5-15 LBS. WHEN TWO STEAM VALVES ARE USED, SET PILOT POS. ON VALVE VI-A TO 5-10 LBS. AND PILOT POS. ON VALVE VI-B TO 10-15 LBS.

1602-0215D

K.L.C.



#### TABLE 1 - DIMENSIONS

ACT-	VALVE SIZE	Dimensions In Inches									Flange Dimensions 125-150 Lb. USAS				
UATOR		A	в	С	D	E	F	G	S	Bolt Circle	Bolt Dia.	Bolt Holes	Flange Dia.		
30	2	2	15/8	31/4	91/8	11	15/8		3/8	43/4	5/8	4	6		
30	21/2	21/2	15/8	33/4	95/8	11	15/8	1000	3/8	51/2	5/8	4	7		
30	3	3	15/8	4	91/8	11	15/8		3/8	6	5/8	4	71/2		
30 OR 40	4	4	15/8	43/4	105/8	11	13/4		1/2	71/2	5/8	8	9		
30 CR 40	5	5	15/8	51/4	111/8	11	13/4		1/2	81/2	3/4	8	10		
40	6	6	15/8	53/4	115/8	11	13/4		1/2	91/2	3/4	8	11		
60	8	8	21/8	7	141/8	11	17/8		5/8	113/4	3/4	8	131/2		

# TABLE 2 - ACTUATOR DIMENSIONS656FISHER DIAPHRAGM ACTUATOR

		100	Dimensi	ions In	Inches
Size	a	b	d-60°	d-90°	stroke
30	113%	121/4	1%	13,	2
40	13%	17%	31/4	21:	31/2
60	185.	27%	31/4	2%	4

HAN CONDITIONING

TAG

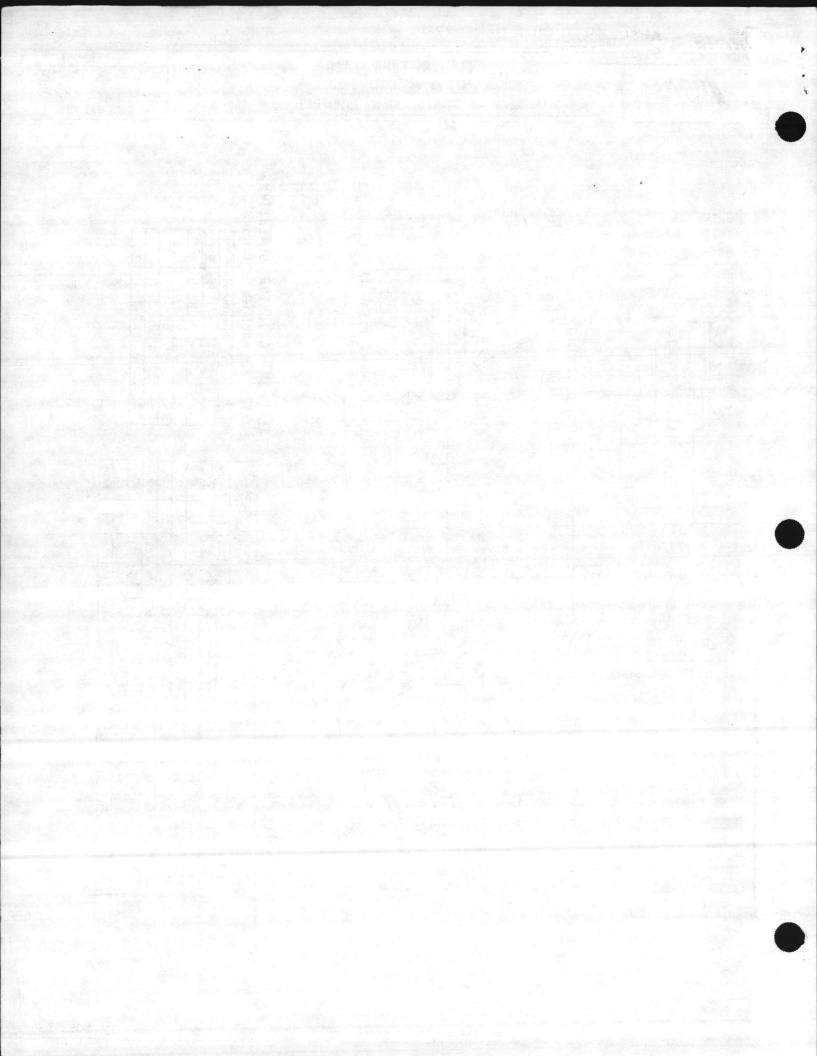
FISHER TYPE 7810 MEDIUM PATTERN BUTTERFLY CONTROL VALVE. LOW PRESSURE STEAM SINGLE - STAGE ABSORPTION LIQUID CHILLERS

SUBMITTAL

DATE:

ABSC-S-52

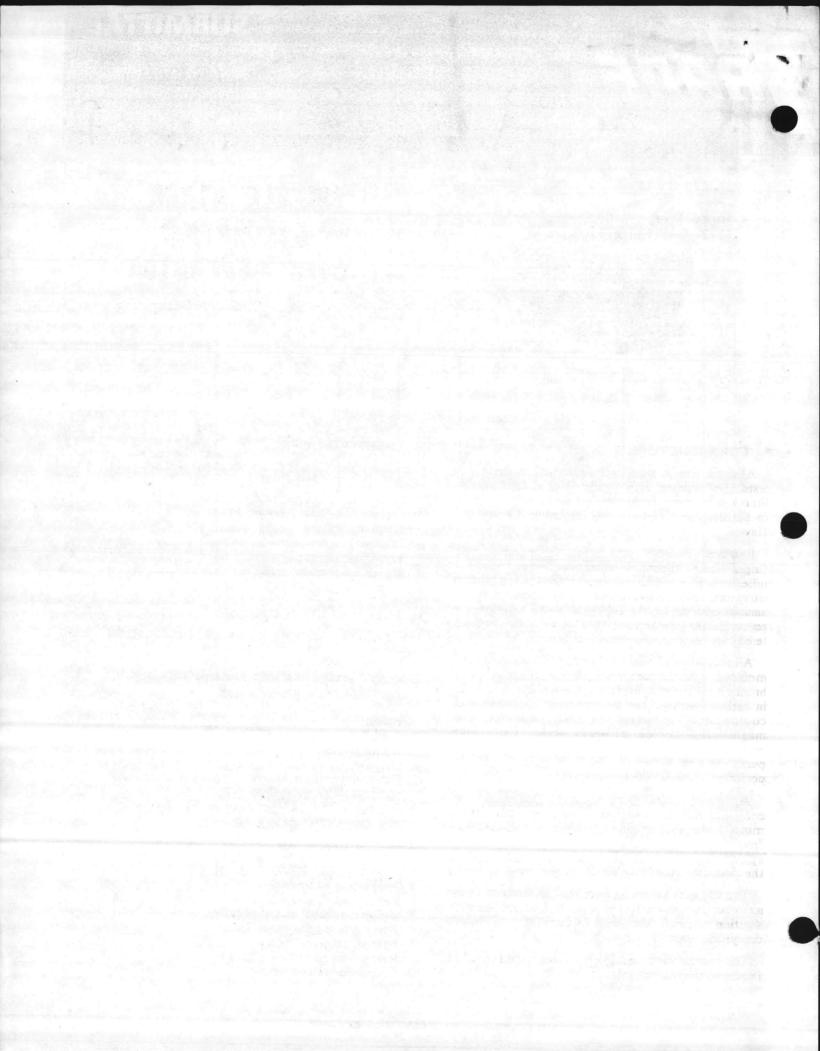
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PRO.		D LOCATION					Sec.					
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TAG	CH	1-1			ABS		ODE 1		4:			
-	-	The same derived scheme space of some states			CAPAC		RGE MOTO			115/60/1		
TEM	QTY	MODEL			(TON	IS)	MP MOTOR			460 v/60/3	TRANE AB	SORPTION COLD
А	1	ABSC-02A	4-SA-L	+BC	175		and to h			LRA 46	GENERATO	RS INCORPORAT
	+				OPERATING	CONDI	TIONS	1.24			THESE ADV	ANCED FEATURE
		SECTION		GPM	EW.F	LW	F	1	PD. FT.	PASSES		
		EVAPORATOR	L	506	48.4	40.	0 .00	005	23.5	4		
		ABSORBER	L	and the second		and a star	1.20			3		
		CONDENSER	R	700	85.0	100.	3 .00	005	19.5	1	1. ABILITY	TO START AND
		CONC (H.W.)	R					1.2.5			the second second second second second second second second second second second second second second second se	E WITH COOLING
		CONC (H)	-		ATER TEMP.	-			SHU T-OF	F)	ASLOWA	EMPERATURE
		CONC (STM)	R	14		VALVI			PSIG TO	MACHINE		
				#/HR	33	95	(		.F SUPE	ERHEAT	1.1	
	1.1	LA CROSSE	USEO	NLY		% STRO	KE		DEGREE	SROTATION		ED PUMP AND
	-	(NOTE			RE SELECTEI	SE.)	PSI DROP	T	(2)	IN FLANGE		RANT COOLED, C PUMP - ONLY
		ECONOMIZER			WITH							INGPART
		DEMAND LIMIT	ER		WITH				wi тн 🗌		Contraction in	
		FLANGED WATE	R CONN	ECTIONS	WITH				WI ТН			ND FLOATING
		STEAM START-	UP STA	BILIZER	WITH					-	1	TRATOR SUPPORTS
		POSITIVECONCE	INTRATIC	N LIMIT	WITH	XX			WITH			
		CONDENSATE H				2.63			WITH		5 CUNI CON	NCENTRATOR
		SHIPPING CON								ASSEMBLED		ORBER TUBING
		DUAL UNIT OP			SERIES		ARALLEL		SEPAR	PSIG		
						<u> </u>						
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1-30.272-4 -- (1175)

SUBMITTAL DATA



AIR CONDITIONING

FILE: TRANE REFRIGERATION PRODUCTS LIQUID CHILLERS-ABSORPTION Cold Generator Model ABSC Submittel

## SUBMITTAL

JUNE 1975 SUPERSEDES 62622 5255 DATED MAY, 973



## SINGLE STAGE ABSORPTION COLD GENERATOR

MODELS ABSC-02A, C2A STEAM

#### MECHANICAL SPECIFICATIONS

#### A. CONSTRUCTION

All units are of hermetic, single shell design, leak tested, and shipped factory assembled and evacuated. Standard method of shipment for this unit is via truck to the designated delivery site excluding Alaska and Hawaii.

Standard absorber and concentrator tubes are Cupro-Nickel. Standard condenser and evaporator tubes are copper. All tubes are individually replaceable from either end of the unit and the tube ends rolled into annular grooves in the tube sheets. All headers are removable for free access to the tube bundles and are tested for 1½ times the design pressure.

All units are equipped with a single factory wired and mounted, hermetic pump-motor assembly having three bronze impellers on a single stainless steel shaft rotating in carbon bearings. The motor and pump assembly is cooled and lubricated by cool, distilled and magnetically strained refrigerant water. Unit pump motor replaceable without breaking unit vacuum. Unit pump service (bearings, shaft, impellers) can be performed without solution removal.

A factory wired and mounted purge system, consisting of a Cupro-Nickel purge drum and electric motor driven vacuum pump, removes noncondensables from the unit. The machine is automatically protected against re-entry of noncondensables during purging by the discharge reed valve on the purge pump.

The "J" tube extending from the concentrator to the absorber permits recirculation of hot Lithium Bromide solution through the heat exchanger to facilitate decrystallization.

The concentrator connection is flanged and matched in size to the control valve.

#### **B. PNEUMATIC PANEL**

Includes the following factory wired and mounted items:

- 1. Chilled water temperature controller
- 2. Pneumatic-electric pressure switch
- 3. Solenoid air valve
- 4. Pneumatic temperature gauge
- 5. Supply air pressure gauge
- 6. Branch air pressure gauge
- 7. Optional start-up demand limiter

#### C. ELECTRIC CONTROL PANEL

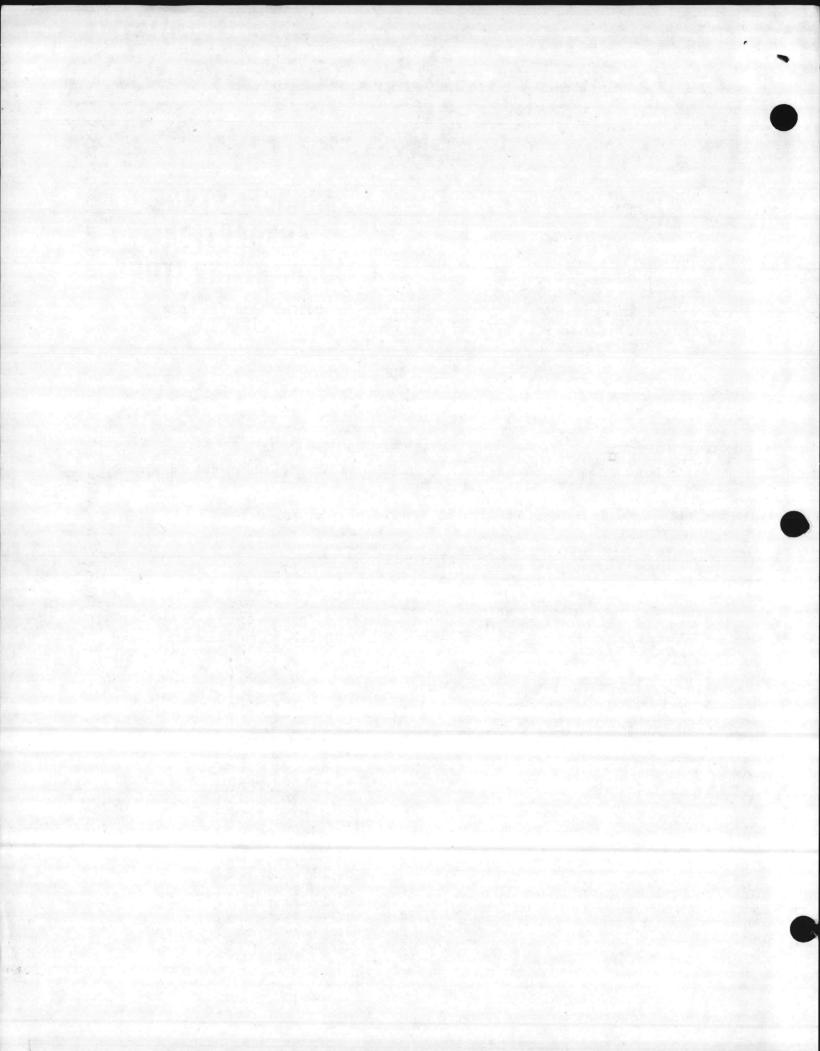
Includes the following factory wired and mounted items:

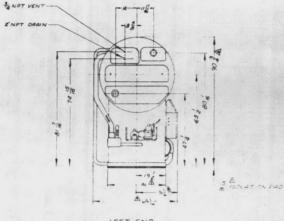
- 1. Terminal block
- 2. Control power transformer and separately fused 115 volt single phase control circuit.
- 3. Motor temperature cutout and low temperature cutout.
- 4. Time delay relay for dilution cycle.
- 5. Motor starter.
- 6. Purge motor fuse.
- 7. External lights to indicate operation of the unit, pumps, and purge system.
- 8. Internal wiring for operation on 200, 460, or 575 volt, 3-phase, 60 cycle power.

#### D. INSULATION REQUIRED

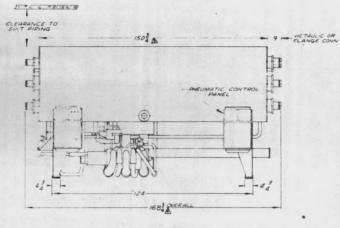
Total insulation required 46 sq. ft.

- 1. Evaporator water boxes.
- 2. Refrigerant float chamber.
- 3. Refrigerant float chamber piping.
- 4. Pump motor lubrication lines.
- 5. Refrigerant pump housing.
- 6. Refrigerant spray tree piping.
- 7. Evaporator return piping.





LEFT END



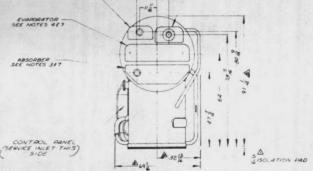
-14-183--"" 0 (0) 0 4

CONCENTRATOR SEE NOTES 547

#### NOTES:

N

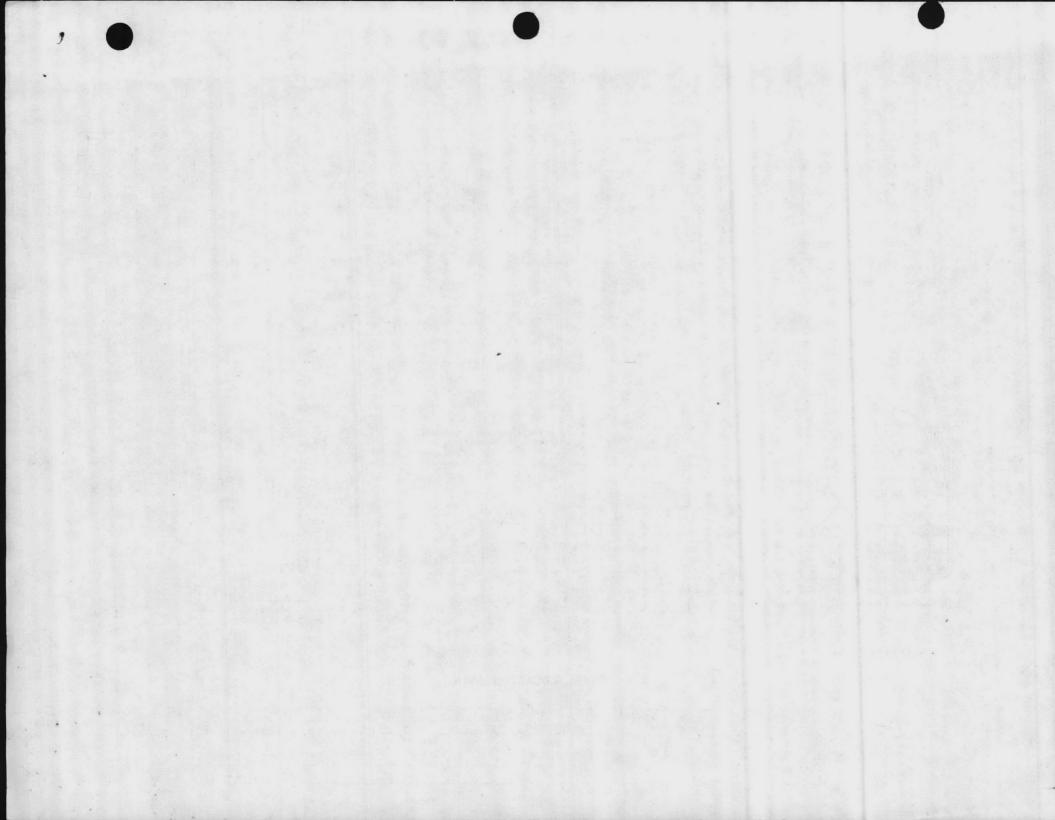
- I OVERALL LENGTH, WIDTH & HEIGHT DIMENSIONS MAY VARY FROM THOSE SHOWN 13.
- 2 DIMENSIONS FROM FLOOR TO WATER CONNECTIONS MAY VARY FROM THOSE SHOWN : 1/2. 3 CONDENSER & ABSORBER STO WATER CONN ARE 5 -150" PIPE CONN GROOVED FOR USE WITH STYLE 77 VICTAULIC COUPLINGS
- 4 EVAPORATOR STD WATER CONN ARE 150" PIPE CONN GROOVED FOR USE WITH STYLE 77 VICTAULIC COUPLINGS (SEE REQUIRED CONN DETAIL FOR CONN SIZE & LOCATION LEFT OR RIGHT SUPPLY)
- 5. CONCENTRATOR STD CONN ARE 150 AMERICAN STD FLAT FACED STEEL FLANGES SIZED TO SUIT STEAM VALUE (SECONDER) 6 UNIT TO BE INSTALLED ON LEVEL SURFACE
- 7. 300" GROOVED PIPE ALONG WITH 150" & 300" FLANGES ARE AVAILABLE BY SPECIAL ORDER (BOLT HOLES ON ALL FLANGE WATER CONN STRADDLE VERTICAL CENTER LINES).
- & ALL VENTS ARE 'ANAT ALL DRAINS ARE 'ANAT UNLESS OTHERWISE SPECIFIED
- 9. FOR GERMAN CODE (TUV), WORKING PRESSURE IS 0.5 ATU.

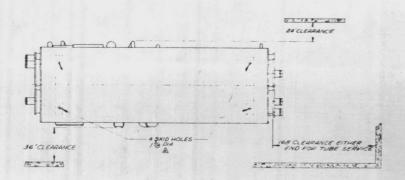


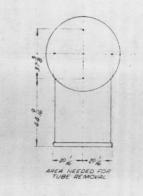
RIGHT END

DIMENSIONAL DATA

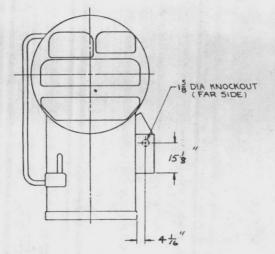
#### Form No. E2622-5255E





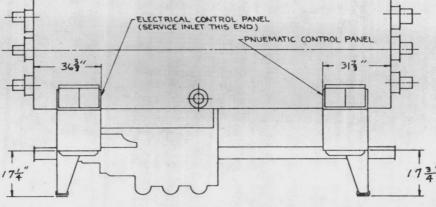


INSTALLATION DATA



LEFT END

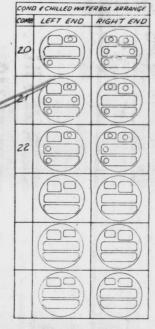
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FRONT

#### PANEL LOCATION DATA

	2 - PASS EITHER END	3.PASS EITHER END	4. PASS EITHER END	SORT PASS EITHER END	6 PASS EITHER END	
1	- 8 - 8 -	6 CONN - 18 8 510E	5 CONN - 18 3 18 3 -	- 4 CONN - 19 1 - 19 1 - 50E	4 CONN - 19 - 19 -	
DETAI		a 11	01, 20	6 11	2: 10	
1			-			



MAX RIGGING WT # 12000 OPERATING WT # 16,350 FLOOR LOADING PS.I # 45

"

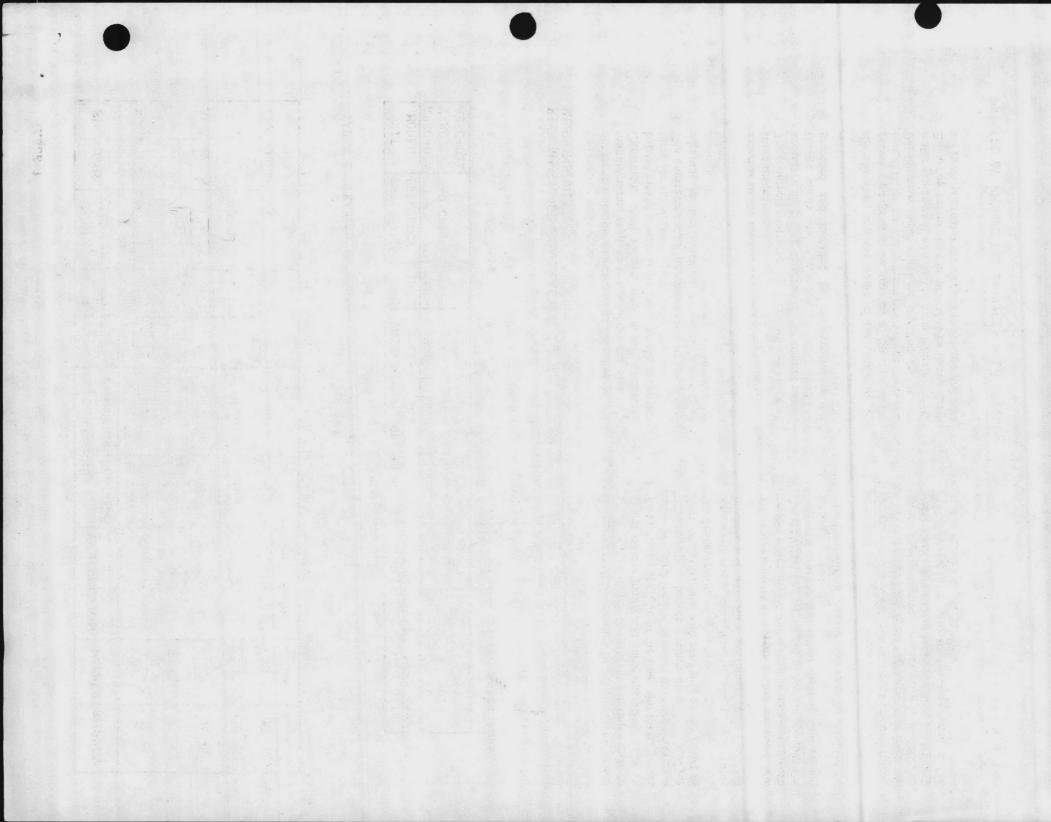


TABLE 1

SECTIONS	1	BING CUNI	150#	300#	COVE PIPE STUBS		CONNECTION SIZES	PASSES	SUPPLY
Evaporator		<b>B</b>	1 or		P		4" 5" 6"	7, 6, 5 4 3, 2	RL
Absorber	-	X	Ø				5″	3	R (L
Condenser	Ø		P				5″		RL
Concentrator	-	X	50#	ONLY	-	X	Sized to Suit Steam Valve		R -

TABLE 2 - Electrical Data

UNIT	PHASE AND	1.	UNIT PUN	MP MOTOR	DATA		MAIN DISCON	NNECT DATA
MODEL	FREQUENCY	BHP	VOLTS	FLA	SFA	LRA	LINE SIZE	FUSE SIZE
ABSC-01A	30	5	200	18.6	20.9	120	10	40
THRU	60 CPS		460	8.1	8.9	46	12	20
ABSC-02A			575	6.2	6.7	34	14	15

FLA - Full Load Amps

SFA - Service Factor Amps

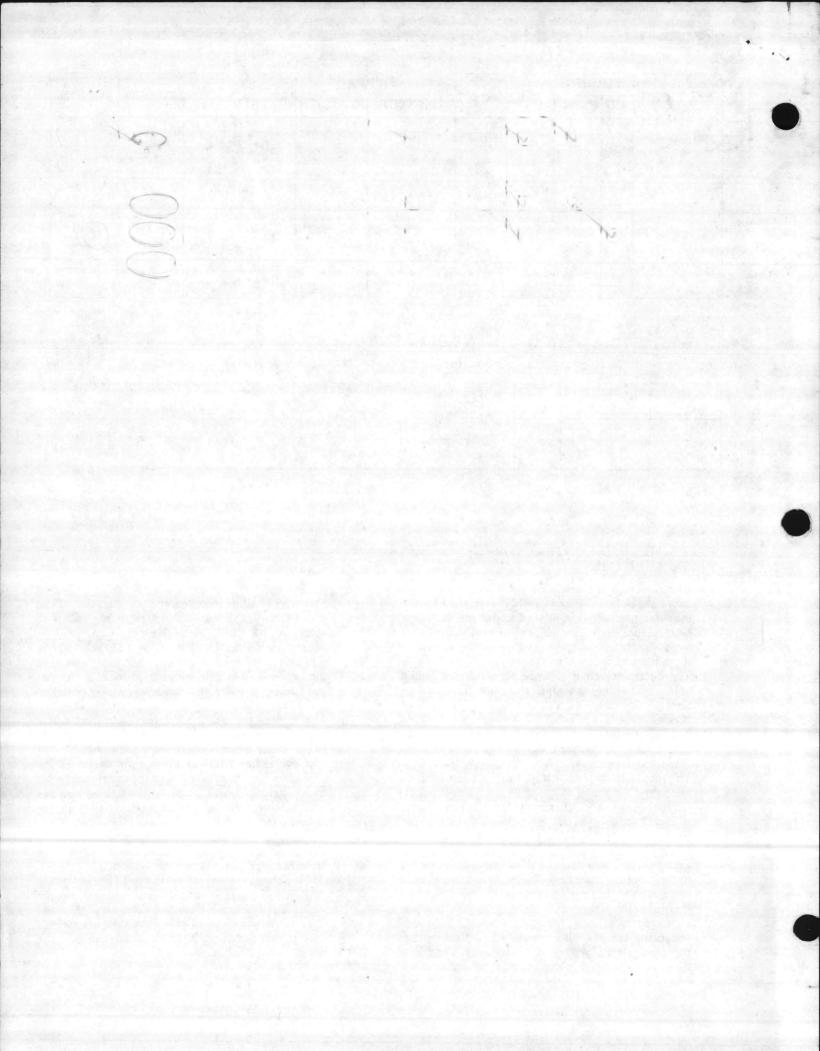
LRA - Locked Rotor Amps

#### RECOMMENDED CONTRACTOR RESPONSIBILITIES

- 1. Contractor shall install unit on a level surface. A neoprene isolation pad assembly, furnished by the manufacturer, shall be placed under the unit.
- 2. Contractor shall furnish and install condenser bypass piping if such is required by the manufacturer for satisfactory operation of the unit.
- The contractor shall provide access in the piping adjacent to the machine to allow removal of headers for inspection, cleaning or removal of tubes.
- 4. The (electrical) contractor shall furnish and install, external to the electric control panel, a separately fused disconnect.
- 5. The (control) contractor shall furnish and install all necessary air piping external to the control panel.
- 6. Gauge cocks and thermometer wells shall be provided and installed by the contractor for temperature and pressure readings at the inlet and outlet of the evaporator, at the inlet and outlet of the absorber, and the outlet of the condenser. A pressure gauge shall be installed at the inlet to the concentrator on steam machines. Gauge cocks and thermometer wells shall be installed in the hot water piping as shown on the plans when required.
- Balancing valves shall be provided by the contractor in all external water circuits to balance and trim

the system.

- Strainers shall be installed by the contractor ahead of all pumps and automatic modulating valves to insure proper pump and valve operation.
- 9. Steam traps shall be of the float and thermostatic type, designed for low pressure operation and have the capacity to handle a minimum of ...... lbs. per hour of condensate with zero psig at the outlet of the concentrator.
- 10. The contractor shall insulate the chilled water headers and any other portion of unit that will sweat under normal operating conditions.
- 11. The contractor shall supply a flow switch in the chilled water circuit which shall be interlocked with the electrical control circuit of the unit so that the unit will operate only when there is flow in the circuit.
- Electrical wiring and controls shall be installed by the contractor in accordance with the manufacturer's recommended system.
- 13. (High pressure steam systems only.) The contractor shall install a safety relief valve upstream from the steam supply capacity control valve to protect the valve itself. As dictated by local Code, a 15 PSIG Relief Valve may also be required between the steam valve and the machine.



Chet Adams Company Sales Engineers

AIR CONDITIONING EQUIPMENT

VENTILATING

AIR POLLUTION SYSTEMS

EATING

ENERGY CONSERVATION

March 7, 1979

		ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORFOLK, VIRGINIA 23511
	SUBMITTAL D.	APPROVED
		APPROVED AS NOTED 5212
		DISAPPROVED
		SUBJECT TO THE REQUIREMENTS OF
Project:	Replace Heating & Air Condition	100 NTRACT NO. N62470-77 C- 2563
	COM (0) Building 2615 Camp LeJeune, North Carolina	APPROVAL OF A SUBMITTAE DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON-
Engineer:	R. S. Noonan	TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA-
Contractor:	Sorrells Plumbing & Heating Co. Greensboro, North Carolina	BLE FOR PROVIDING PROPER PHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES,
Order No.:	1467	ETC., AS REQUIRED.
Sales Rep.:	Chet Adams Company Greensboro, North Carolina	REVIEWER \$ 2. Juth pare 5-10-29
Manufacturers:	ILG Industries	FOR OFFICER IN CHARGE OF CONSTRUCTION

#### EXHAUST FANS

#### EF-1, 2, 5, 7, 8, and 9

- 6 Model CCH-1000 Direct Drive In-Line Mounted Centrifugal Ceiling AN-20643 Ventilators, 848 CFM @ 1/8" S.P., <sup>1</sup>/<sub>4</sub> HP Motor, 115 volts, single phase, with bird screen, and disconnect switch and backdraft damper. EF-1¢2 MUST SUPPLY 525 CFM @ 1/4" S.P.
- EF-3 EF-9 11 11 675 CFM @ 14" S.P.
  - 1 Model CCH-500 Ditto Above, except 250 CFM @ 1/8" S.P., 1/25 HP. Ditto

#### EF-4 and EF-6

2 - Model CCH-250 Ditto Above, except 155 CFM @ 1/8" S.P., 1/40 HP. Ditto

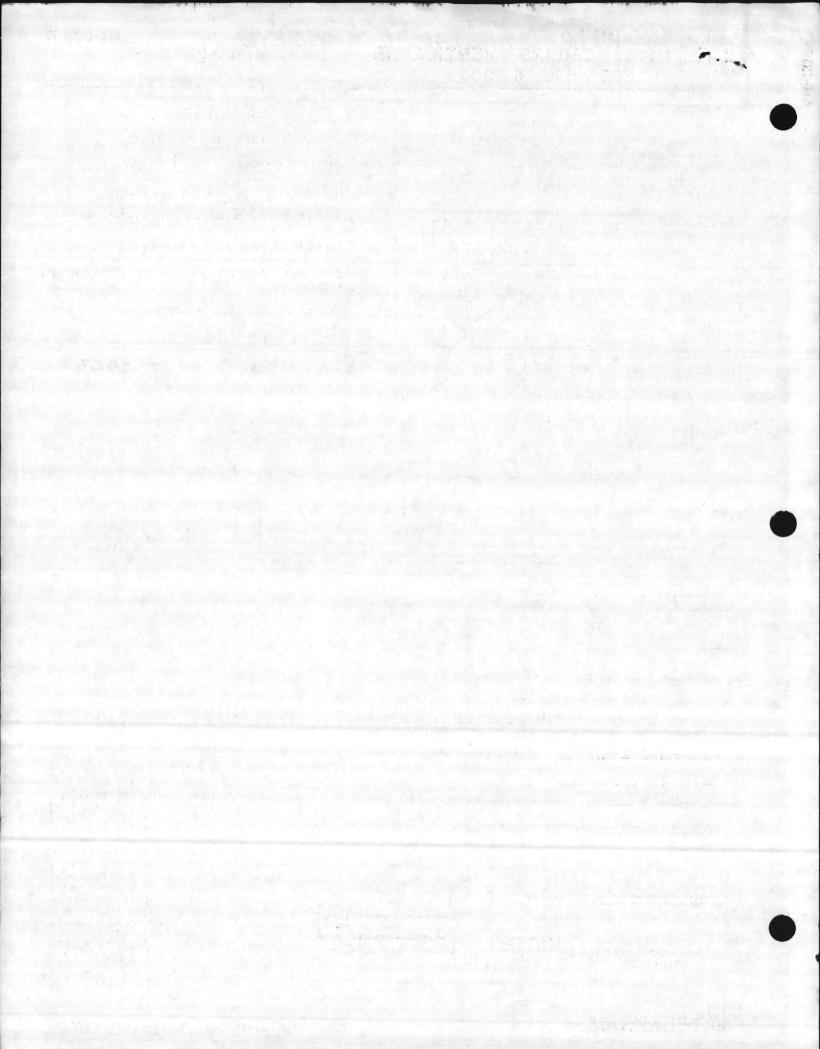
#### EF-10

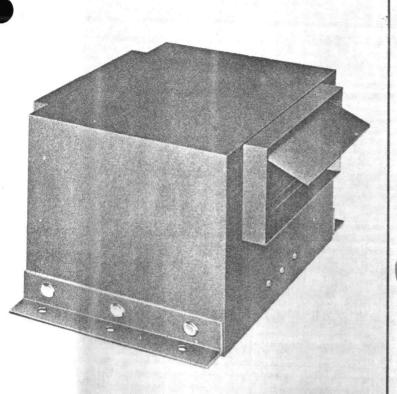
1 - Model 17CLD-3 In-Line Duct Fan, 2500 CFM @ 1/8" S.P., 3/4 HP, 115 volts, single phase.

AN21111

Dwg. Nos.

RALEIGH, N. C. 27605 Box 10401 919/828-3366 CHARLOTTE, N. C. 28212 Suite 1148 0000 Monroe Road 704/568-3178 GREENVILLE, S. C. 29602 P. O. Box 2592 303./268-3550



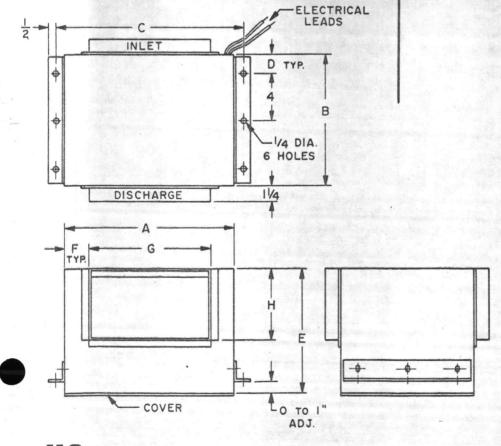


- FEATURES -

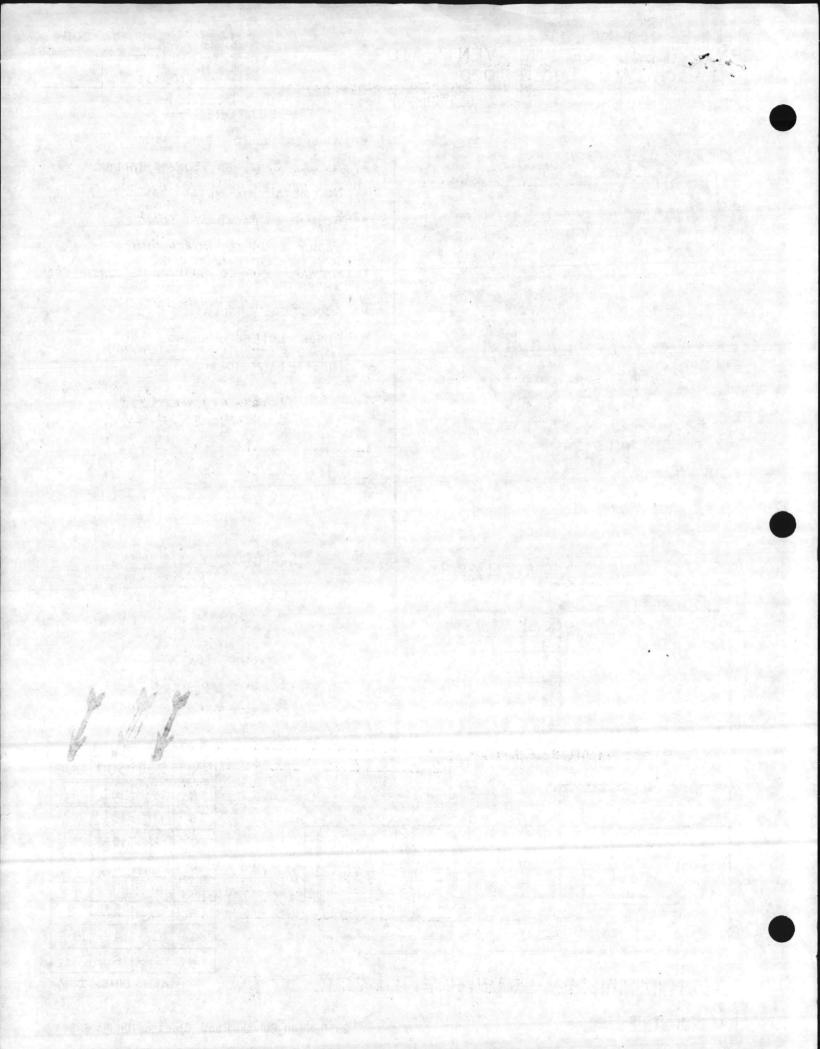
- . WHISPER QUIET PERFORMANCE .
- · AMCA CERTIFIED SONE RATINGS.
- NO METAL TO METAL CONTACT.
- ALUMINUM BACKDRAFT DAMPER.
- · EASILY REMOVED POWER UNIT .
- FORWARD CURVED ALUMINUM CENTRIFUGAL WHEEL.
- · ACCOSTICAL INSULATION .
- . RUGGED STEEL HOUSING.
- · DIRECT-DRIVE DESIGN.

SPEC. CALLS FOR ALUMINUM

MOTOR SHALL BE COMPLETELY SHIELDED FROM AIR STREAM



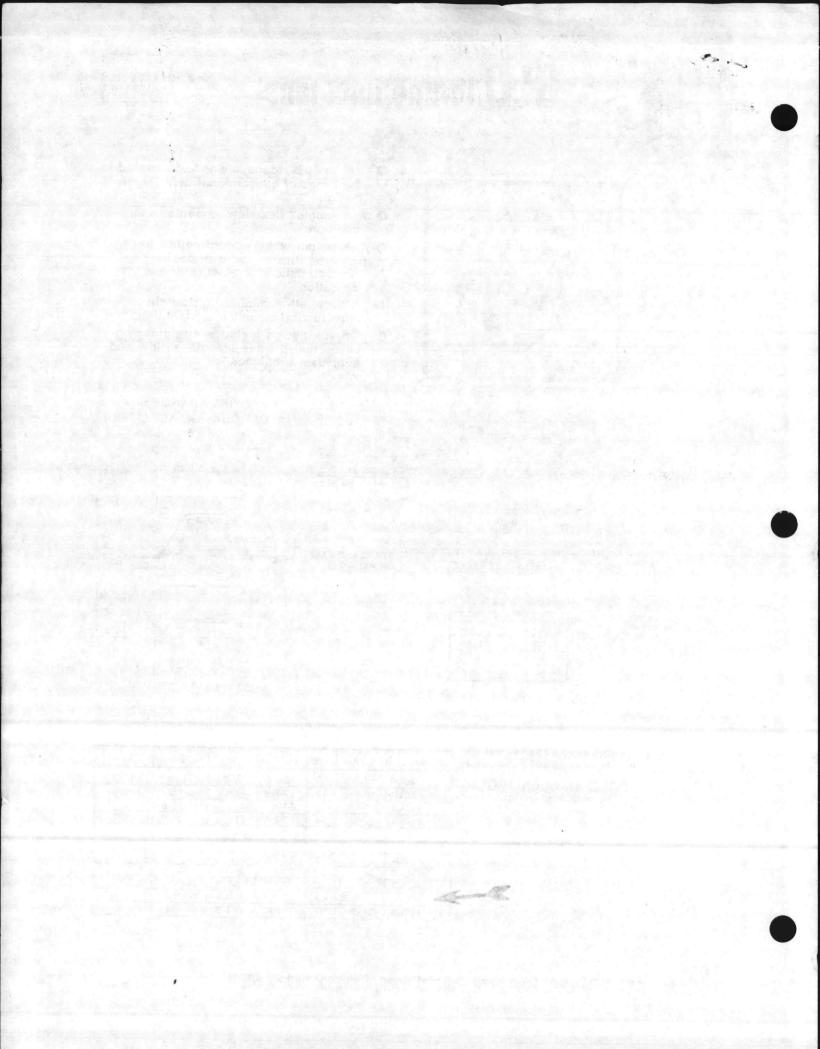
		M	7
UNIT	250	500	1000
Α	144	18 1/8	24 <u>1</u> 6
В	11	13 =	161/8
С	16	1978	25 <u>13</u>
D	19/16	19 <u>7</u> 2 <u>9</u> 16	416
E	$10\frac{1}{2}$	12	1434
F	232	2 1/32	3
G	1016	14 16	18 1/16
н	61/16	61/16	916



**CLD** in-line duct fans AN21111 Up to 50% space savings-compared to duct fans of conventional centrifugal design "All-angle" flexibility-mounts in any position Aluminum wheel-direct-connected to motor-with full non-overloading characteristics for quiet, efficient operation Sturdy, all-aluminum lightweight construction simplifies installation Unique design includes straightening vanes that provide smooth airflow and minimize turbulence MOTOR MUST BE COMPLETELY SHIELDED FROM AIR STREAM .437 x .875 SLOTS OPTIONAL ON ALL SIZES DIA. B.C. "D" B DIA. J .343 x .750 SLOTS VERTICAL MOUNTING BRACKETS STANDARD BASE (3-REQUIRED EQUALLY SPACED ON ALL SIZES C 1 ON D DIA. B.C.) SIZE H J 6 3-1/2 7-10 11-14 4-1/2 10 W DIA 15-19 14 5-1/2 B DIA. A DIA. dimensions E W С D Model A В 7-3/8 7-17/32 9 12-5/8 15-3/8 7CLD 14-1/4 7CLD through 19CLD 9-19/32 9CLD 18-3/8 12-7/8 19-5/8 9-1/2 12 11-3/16 10-15/32 10CLD 18-3/8 12 17-7/8 23 11-3/16 11-3/32 17-7/8 23 11CLD 21-3/4 14 17-7/8 23 11-3/16 12 12CLD 21-3/4 14 12-11/16 12-29/32 17-7/8 26 13CLD 24-3/4 16 12-11/16 14-1/16 26 24-3/4 17-7/8 14CLD 16 14-7/8 15 30-3/8 22-1/4 15CLD 29 20 16-9/16 30-3/8 14-7/8 22-1/4 16CLD 20 29 16-1/4 17-9/16 17CLD 22-1/4 33-1/8 31-3/4 22 19-3/8 22-1/4 33-1/8 16-1/4 19CLD 31-3/4 22

LG INDUSTRIES INC. 2850 North Pulaski Road, Chicago, Illinois 60641

PRINTED IN U.S.A.



Chet Adams Company

VENTILATING

HEATING

Sales Engineers AIR CONDITIONING EQUIPMENT

. ENERGY CONSERVATION

March 7, 1979

	<u>SUBMITTAL D.</u>	ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND TA NORFOLK, VIRGINIA 23511 APPROVED AS NOTED DISAPPROVED
Project:	Replace Heating & Air Condition COM (0) Building 2615 Camp LeJeune, North Carolina	
Engineer:	R. S. Noonan	APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR
Contractor:	Sorrells Plumbing & Heating Com Greensboro, North Carolina	CALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER FHYSICAL DIMEN-
Order No.:	1467	SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED.
Sales Rep.:	Chet Adams Company Greensboro, North Carolina	REVIEWER \$ 2 12th DATE 5-10-79
Manufacturer:	Farr Company	FOR OFFICER IN CHARGE OF CONSTRUCTION

#### CARBON FILTERS

CF-1

Dwg. Nos.

Bltn. B-2202-2B B-55326-D

1 - Size 1 x 5 Model 3 CF Glide/Pack Carbon Filter Side Access System, with Activated Carbon (45# per 1,000 CFM).

#### CF-2 and CF-9

2 - Size 1 x 3 Ditto Above.

AIR POLLUTION SYSTEMS

### CF-3, 6, 7, and 8

4 - Size 1 x 2 Ditto Above.

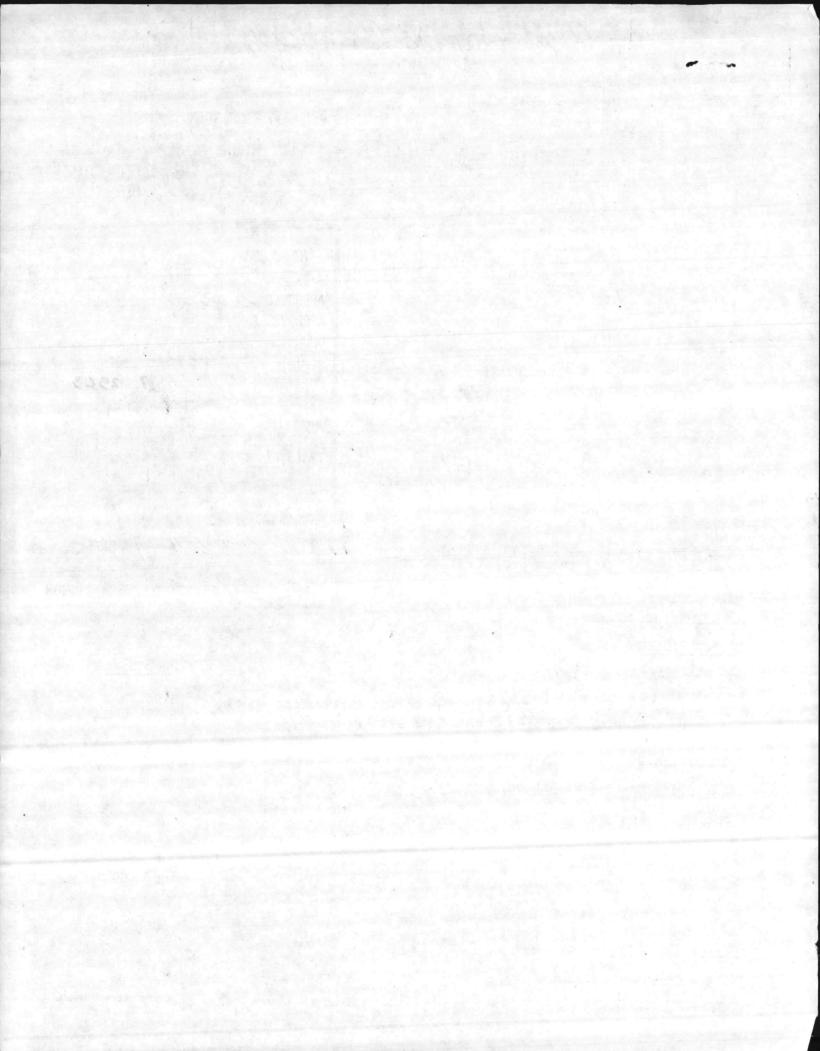
#### CF-4 and 5

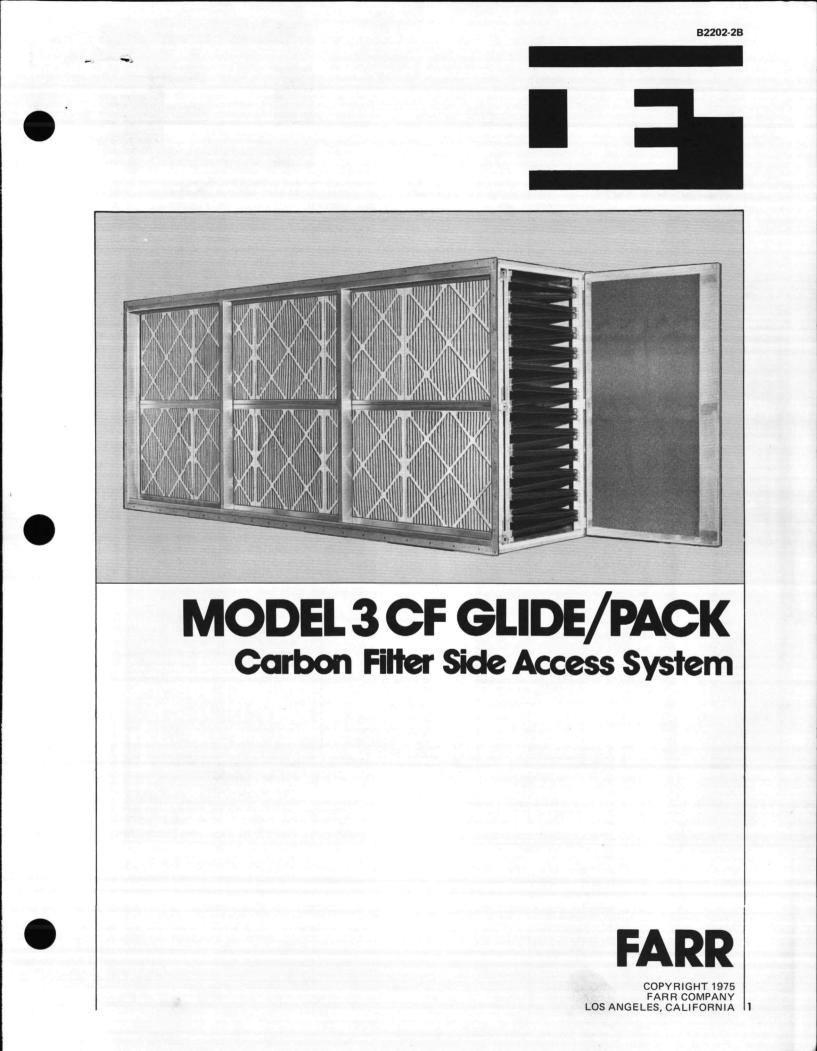
2 - Size 2 x 2 Ditto Above.

#### CF-10, 11, and 12

3 - Size 1 x 1 Ditto Above.

RALEIGH, N. C. 27605 Box 10401 919/828-3366 GREENSBORO, N. C. 27402 Box 3073 919/273-0566 CHARLOTTE, N. C. 28212 Suite 114B 6000 Monroe Road 704/568-3178 GREENVILLE, S. C. 29602 P. O. Box 2592 803/268-3550





### Application

The CF Glide/Pack side access system is a high velocity air purification unit.

By means of its unique design and use of a high grade of activated carbon<sup>\*</sup> it provides high performance odor adsorption. The use of a particulate pre-filter is recommended.

Ideally suited to economically meet the following application requirements:

Permit the recirculation (all or part) of ventilating air, saving heating costs in the winter and cooling costs in the summer.

Purification and odor removal of outdoor air required for ventilation. Eliminate odors from exhaust air.

### Design & Construction

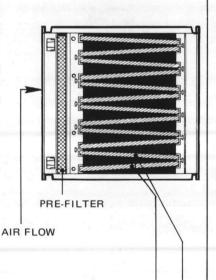
The Farr CF Glide/Pack is compatible with both the Model 3 HP and NS Glide/Pack systems. These units may be installed in a variety of arrangements, at convenient points in the system.

A pre-filter track, which allows the addition of a pre-filter is a standard feature of the housing.

Each cell slides smoothly along a special heavy-duty extruded slide track. Plastic foam gasketing on access doors prevents air bypass.

### Details of Construction

- 1. Slide tracks are anodized aluminum extrusions.
- 2. Hinges and latches are zinc plated steel.
- 3. Housing and doors are reinforced 16 ga. galvanized steel.
- 4. Pre-filter track for 2" panel type pre-filters is built into each housing.
- Housing includes weather resistant gaskets as standard equipment.
- Special Primer on exterior surfaces is available at additional cost for units that are to be painted in the field. It will also provide added weather resistance.
- Half filter width increments (e.g. 1/2, 1 1/2, etc.) are available in particulate filters (series 12 & 24 HP, 21 & 32 NS) but not in carbon filters (series CF).



CARBON

### Installation

CF Glide/Pack units are shipped factory assembled. Because of the installed weight, it is required that the CF Glide/Pack always be installed in an upright orientation.

A minimum side clearance of 33 inches is required for servicing carbon cells through a side access door.

Holes have been pre-punched in the flanges to allow mating with the duct, Model 3 HP or NS Glide/Packs, or other equipment. Caulk all joints to prevent leakage.

Carbon cells (and pre-filters) are installed by simply sliding into position as shown in illustration.

### Maintenance

When the activated carbon in the cells has reached its practical saturation they may be reactivated by: (1) a factory exchange of cells; (2) refilling the cells locally with fresh carbon.

Additional information on determining the remaining life of carbon and adsorption ability of activated carbon for various materials is available in Farr Bulletin F-226.

If pre-filter is used, a differential pressure gauge is recommended to determine filter change out frequency.

### **Pre-filters**

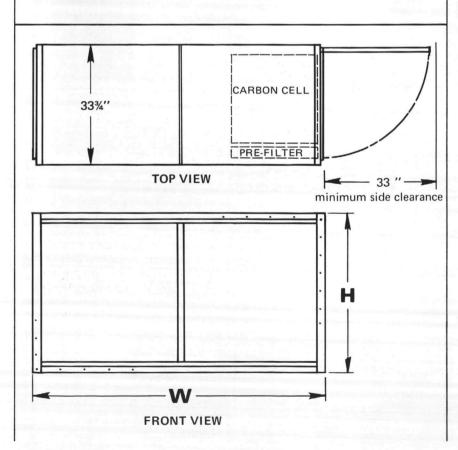
Each Model 3 CF Glide/Pack has a built-in pre-filter track to accommodate a 2" panel type filter. The Farr 30/30 disposable pleated filter is recommended for this purpose. The 30/30 filters will give the best possible protection against dirt build up on the carbon cells.



\*The activated carbon has a minimum rating on the carbon tetrachloride activity test of 60%;

	Perform	ance						
		(		LIDE/PA		1		
	(W) WIDTH DES	SIGNATIO	N 1	2	3	4	5	6
	(H) HEIGHT	WIDTH (INS.)	24	48	72	96	120	144
DESIGNATION HEIGHT No. (INS.)						FM		
	1/2	15¼	1000	2000	3000	4000	5000	6000
	1	271/4	2000	4000	6000	8000	10000	12000
	1½	391/2	3000	6000	9000	12000	15000	18000
	2	51½	4000	8000	12000	16000	20000	24000
	21/2	63¾	5000	10000	15000	20000	25000	30000
	3	75¾	6000	12000	18000	24000	30000	36000

CF Glide/Pack rated capacities (CFM) are @ 500 FPM and 0.45 inches W.G. resistance (units may be operated from 50% to 120% of the rated capacities, with corresponding changes in pressure drop.) Each unit contains 1.42 cu. ft. of carbon per 1000 CFM, the maximum allowable temperature is 140<sup>o</sup>F.



### How to Specify

The factory-fabricated Glide/Pack shall be a self-contained unit manufactured by the air filter manufacturer. It shall be fabricated of heavy gauge galvanized steel suitably braced. It shall incorporate extruded aluminum tracks designed to accommodate filter panels. Special neoprene gaskets shall be provided around each access door to insure an air tight seal. The filter section shall have two access doors to permit cell replacement from either side. Each filter housing shall have pre-filter section to hold panel type pre-filters. Filter section shall be Model 3 CF Glide/Pack as manufactured by the Farr Company, Los Angeles, California. Housing shall be 33¾" deep.

Final filter panels shall be full flow high velocity, carbon filter type. Each housing shall contain 1.42 cu. ft. of carbon per 1000 CFM at normal velocity.

The activated carbon shall be contained in removable cells constructed of high heat, medium impact polystyrene plastic, to withstand corrosion. The cells shall contain internal separators to minimize the settling of the carbon and shall be capable of being refilled by the owner.

Pre-filters shall be nominal 2" thick Farr Type 30/30 or Type 44 (insert proper description if prefilters are required).

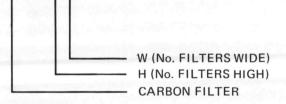
#### MODEL 3 CF GLIDE/PACK INSTALLED WEIGHT (lbs.)

#### WIDTH DESIGNATION NO. 1/2 HEIGHT 11/2 **DESIGNATION NO.** 21/2

### How to Order

- 1. Determine CFM requirements of the installation.
- Find CF Glide/Pack models with CFM capacities meeting your requirements, then check dimensions to find the best unit. (Selection guide on page 3.
- 3. Order CF Glide/Pack (includes carbon cells) per instructions below.

ORDERING INFORMATION: Specify Model, series, size (and Primed if desired). EXAMPLE: Model 3 Glide/Pack, Series CF, size 2 X 4, PRIMED



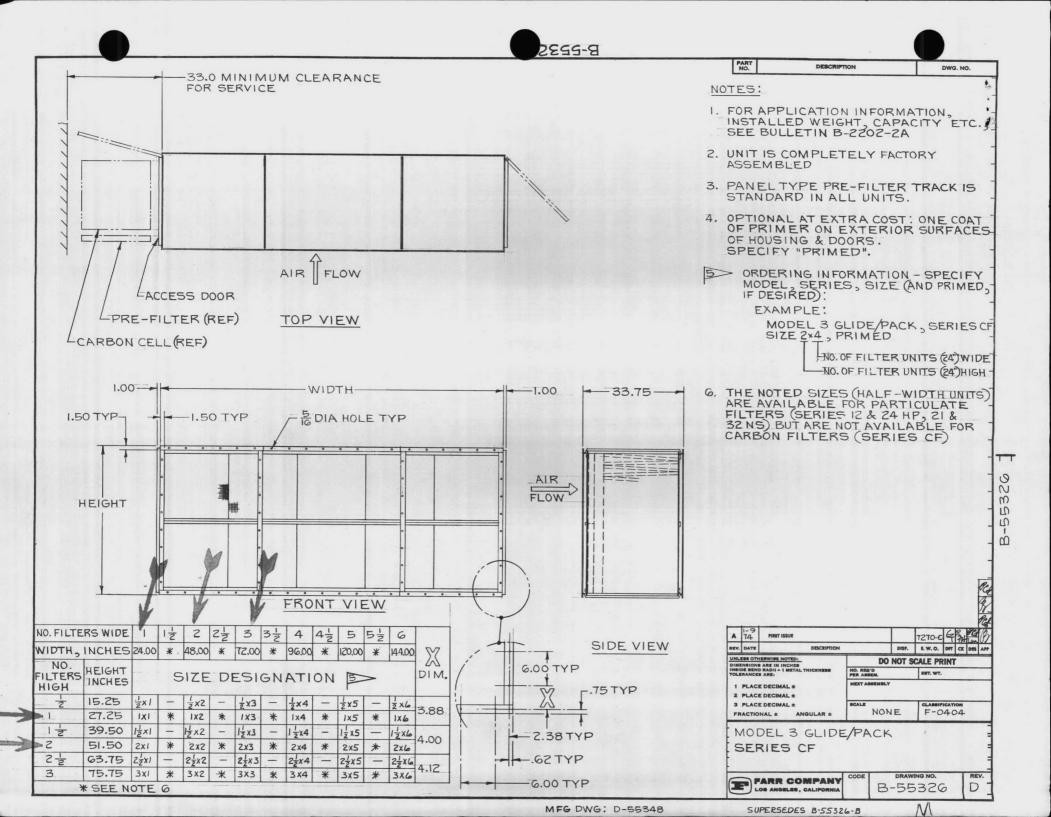
PRIMED: Extra cost option of primer on exterior surface of housing and doors.

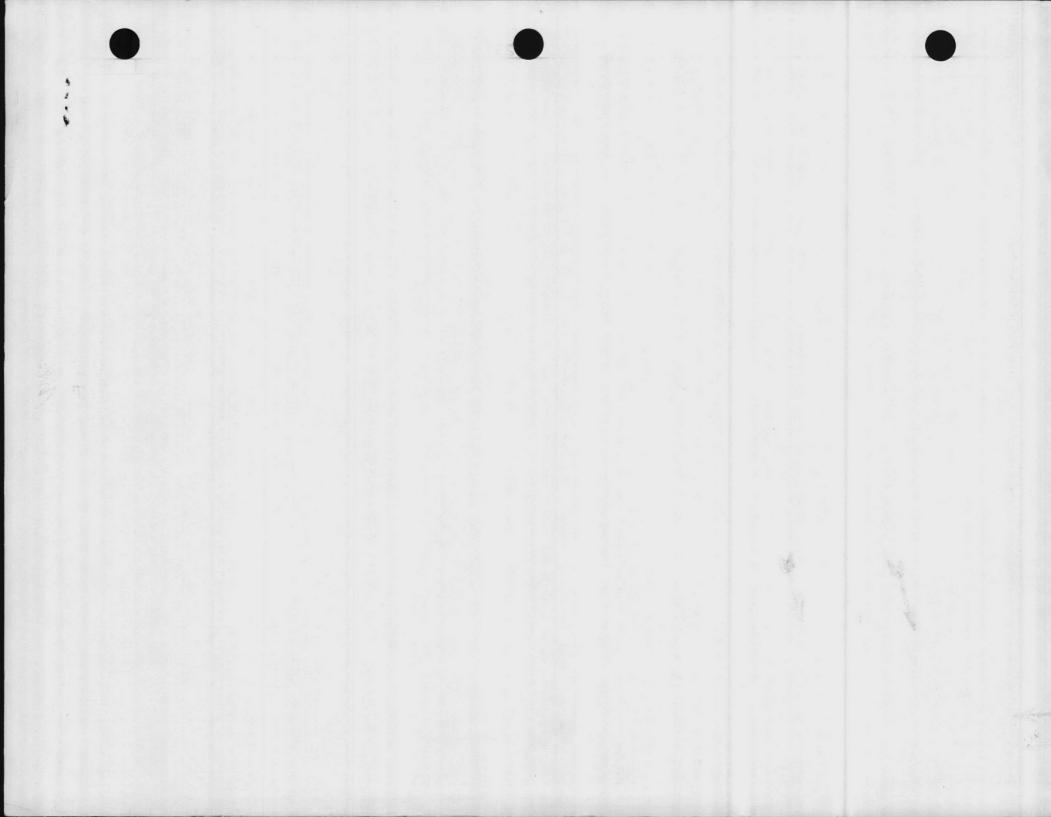


FARR COMPANY P.O. Box 92187 Airport Station, Los Angeles, CA 90009 (213) 772-5221

In Canada: FARR COMPANY LTD. Montreal







### Date: 3-20-79. MECHANICAL SPECIFICATIONS FRICK COMPANY "CTO" COOLING TOWER

PROJECT CAMP	LEJEUNE, N.C. BLOG. 2615 13 RUMBING & HEATING P.O. 1463, FRICK PRE-ORDER12
CUSTOMER JORREL	17 FLIMBING FREATING - 100- 1707 - 1-1-1-1-1-1-1-
ENGINEER	
	All galvanized steel, factory assembled, forced draft, counter-flow blow-through design.
CONSTRUCTION:	Galvanized steel pan (14 ga. & 12 ga.) and centrifugal fans mounted beneath the sloping undersides of the pan. Heavy gauge galvanized steel channel and angle framework.
FAN DISCHARGE DUCT:	Galvanized steel fan discharge duct (16 ga.) extended into pan to increase fan efficiency and prevent water from entering fans.
DRAIN PAN VINYL LINER:	Frick exclusive "Vinyl Liner" is 6 mils-9 mils of vinyl copolymar coating for added corrosion and lea resistance. Vinyl liner provides a dense impermeable barrier that is unaffected by water treatment chemicals.
FAN WHEELS:	Forwardly curved centrifugal fans fabricated from galvanized steel. Fan wheels are statically and dynamically balanced with shaft as an assembly, on the unit. Fan housings are galvanized steel with removable curved inlet orifice rings.
FAN SHAFT:	4" diameter tubular shaft with necked down heavy wall bearing journals at ends. Fabricated from SA-1010-1020 steel tubing.
BEARINGS:	Heavy duty, self-aligning, grease packed ball bearings with extended lubrication fittings to front of unit for ease in serviceability.
FAN MOTOR:	Ball bearing, open drip-proof with 1.15 S.F. suitable for outdoor service. Motor is mounted on adjustable motor base.
DRIVES:	Drives are designed for 150% of motor nameplate horsepower. V-belt type with taper lock sheaves, mounted and aligned at factory.
FAN GUARD SCREENS:	Screens are galvanized steel (14 ga. wire) painted with rust resistant coating.
STRAINER:	All hot dip galvanized steel and removable. Holes in strainer are smaller than orifice in spray nozzles.
ACCESS:	Galvanized steel circular access doors at both ends of unit held in place by wing nuts. Access doors are gasketed to prevent leakage.
HEAT TRANSFER SECTION:	Galvanized steel panel construction (14 ga.) that is separable from fan/pan section.
WET DECK SURFACE:	Cross fluted impregnated asbestos with double folded edges on both sides. Flutes are for proper air distribution and added structural stability. Impregnated asbestos is non-combustible and will not burn.
WATER DISTRIBUTION:	Spray nozzle system with large orifice none clogging nozzles and galvanized pipe supply headers. Nozzles are made of ABS plastic to be resistant to chemical attack.
ELIMINATORS:	Eliminators are constructed from galvanized steel (20 ga. & 18 ga.) and are removable in easily handled sections. Eliminators have three directional changes with hooked leaving edge.
FINISH:	Unit is given double corrosion protection with a chromate primer coat and a corrosion resistant top coat.
MAKE-UP FLOAT ASSY:	Brass float valve and rod with adjustable plastic ball.

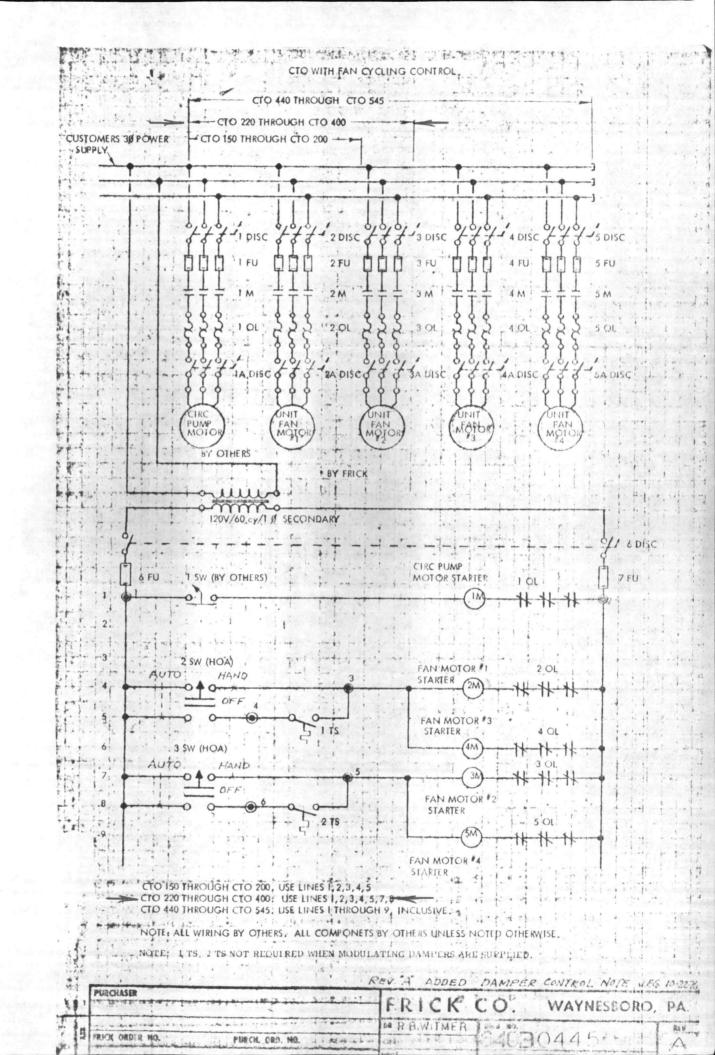
Sugar and

• Delivery of your equipment is contingent upon both the approval and return of these drawings. Delay in approval may compel us to reschedule your equipment for later production dates than specified in our contract due to conflict with other contractual commitments. Please avoid all delay and return approved prints promptly."

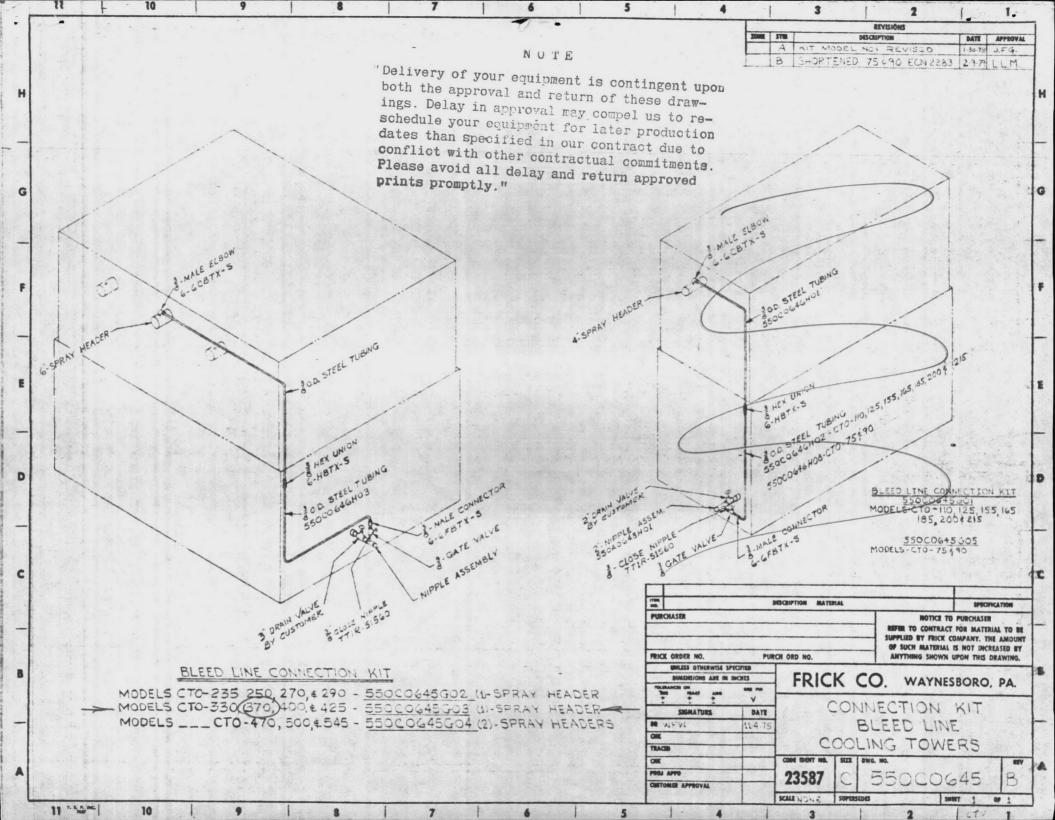
ATLANTIC DIVISION NAVAL FACILITIES ENGINEERNG COMMAND NORFOLK, VIRGINIA 23511
APPROVED AS NOTED 328
DISAPPROVED SUBJECT TO THE REQUIREMENTS OF CONTRACT NO. N 62470-77-0-2563
APPROVAL OF A SUBMITTAL DOES NOT INCLUDE APPROVAL OF ANY DEVIATION FROM THE CON- TRACT REQUIREMENTS UNLESS THE CONTRACTOR CALLS ATTENTION TO AND SUPPORTS THE DEVIA- TION THE CONTRACTOR SHALL BE RESPONS- IBLE FOR PROVIDING PROPER FHYSICAL DIMEN- SIONS & WEIGHTS, COORDINATION OF TRADES, ETC., AS REQUIRED. REVIEWER Do DATE 5-10-79

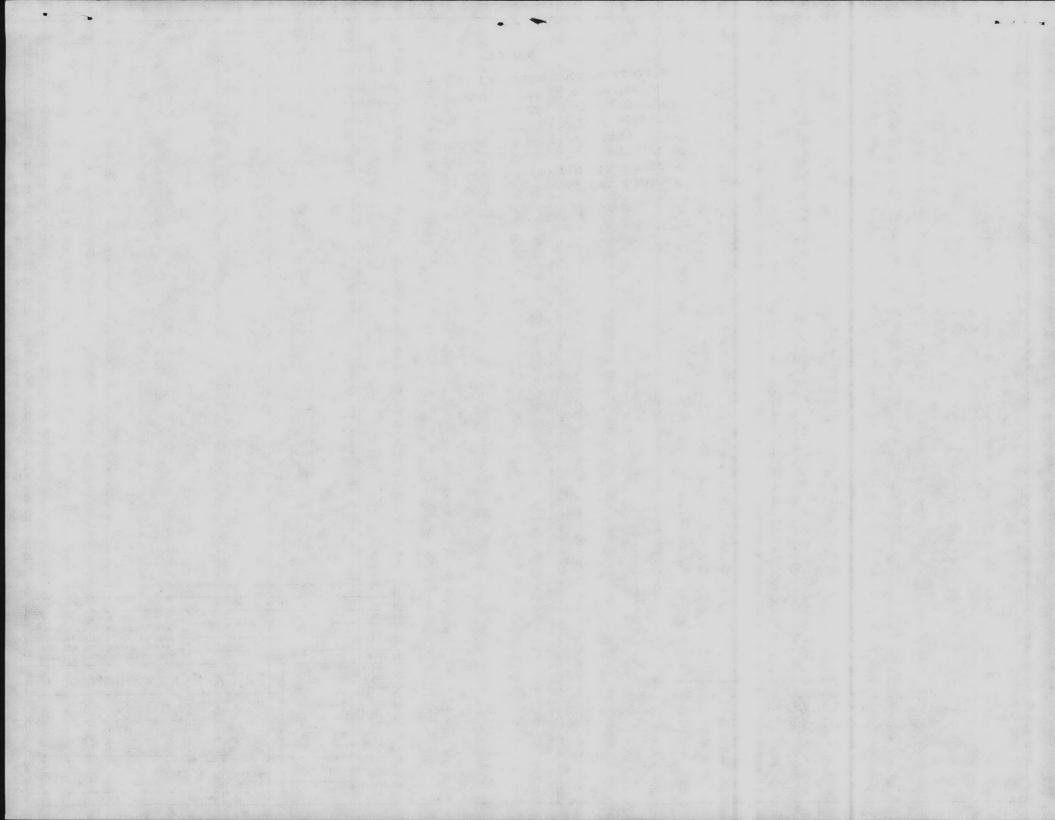
FOR OFFICER IN CHARGE OF CONSTRUCTION

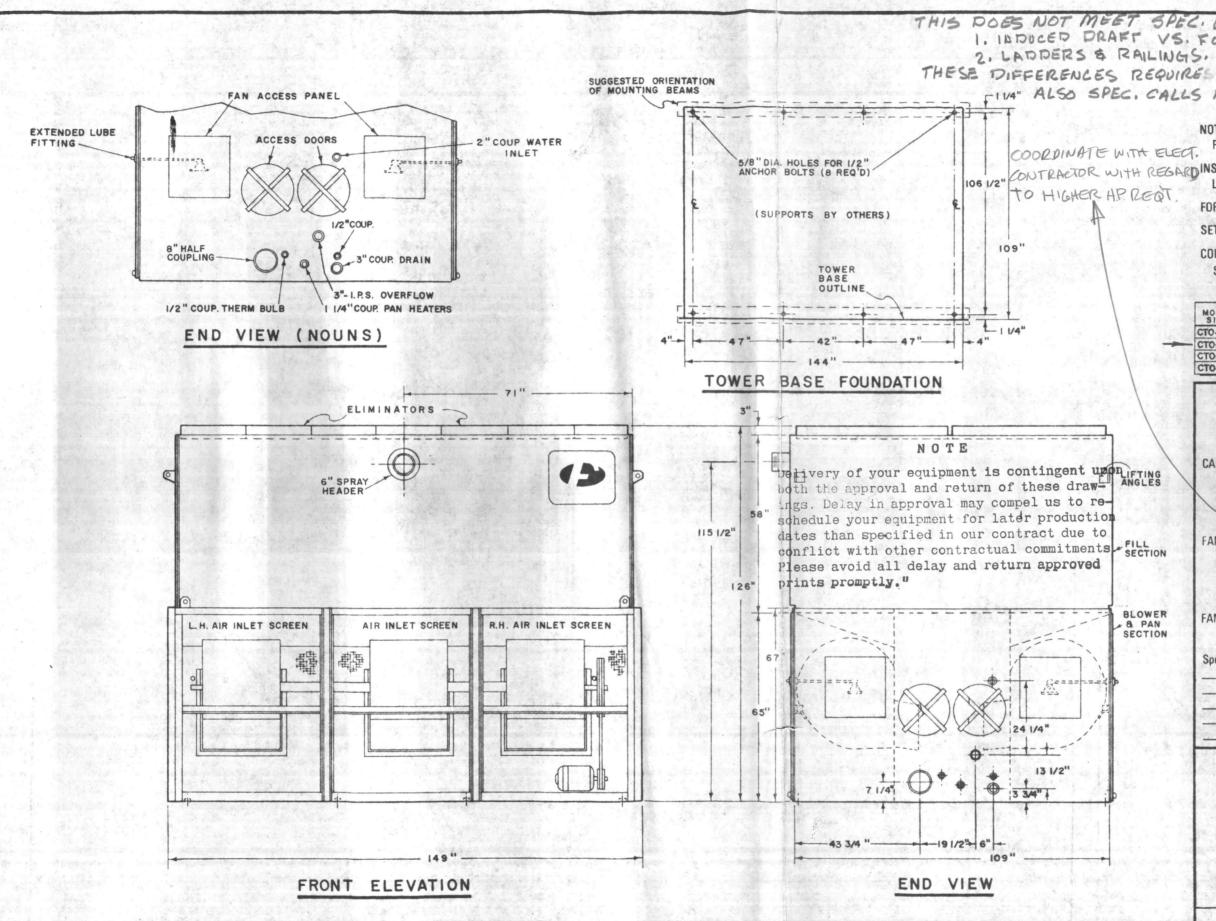
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Delivery of your equipment is contingent upon both the approval and return of these drawings. Delay in approval may compel us to reschedule your equipment for later production dates than specified in our contract due to conflict with other contractual commitments. Please avoid all delay and return approved prints promotly "







THIS DOES NOT MEET SPEC. WITH REGARD TO: 1. INDUCED DRAFT VS. FORCED DRAFT THESE DIFFERENCES REQUIRES APPROVAL OF DILLC.C. FINA" ALSO SPEC, CALLS FOR VIBRATION CUT-OUT SWITCH NOTE TO INSTALLER: ALLOW ADJUSTMENT IN EACH PLANE FOR EXTERNALLY PREFABRICATED PIPING 106 1/2" CONTRACTOR WITH REGARD INSTALL BETWEEN BLOWER AND COIL SECTIONS TWO (2) FOR START UP FILL PAN TO TOP OF OVERFLOW - 131/2" DEPTH SET FLOAT FOR 11" DEPTH WATER LEVEL COIL SECTION AND BLOWER/PAN SECTION SHIPPED SEPARATELY, ASSEMBLE AS SHOWN AT JOBSITE MODEL WEIGHT (LBS) SUMP SIZE OPERATING SHIPPING (GALS) CTO-330 10,290 7,370 337 CTO-370 10,440 7,510 CTO-400 10,440 7,510 ) CTO-425 10,895 7,930 337 CAPACITY 846 GPM From 103 °F EWT To 85 °F LWT At 78 OF FWRT FAN MOTOR \_ 2 (aty). 20 HP) 1800 RPM Phase 60 Cycle 460 Vol O.P.P. Type. BLOWER FAN DRIVE Based On \_\_\_\_ In, ESP (H<sub>2</sub>O) SECTION Special Remarks or Options STANDARD LINIT AS 15 SUBMITTAL DATA Certified For DORRELLS YLUMBING & HEATING 1 REENSBORD. N FRE ORDER 12 Frick Order No. 1463 Customers Order No. Date 3.20 579 **COOLING TOWER - CTO** S FFICK COMPANY BY KEP **SEPT 1978** WAYNESBORD. PA. 17268 . 717 / 762-2121

