502-968-6274
606-233-1283

BROWN Sprinkler Corporation

AUTOMATIC SPRINKLER SYSTEMS

4705 Pinewood Rd., Louisville, Kentucky 40218
742A Werne Drive, Lexington, Kentucky 40504

TO:

FIRM McCarthy

FAX Nº 254-1303

ATTN. Brian Hoerr

RE Sprinkler Cabinets & Wrenches

FROM: The Sprinkler Cabinets, Extra Heads and wrenches have all been installed in the Mechinal Room where the Fire pump is located.

NAME Danny Ledford

DATE 8/17/90

TOTAL PAGES: 1
(INCLUDING COVER SHEET)

LEXFAX 606-233-1283 voice
606-254-6644 fax

1,217

UNIVERSITY OF KENTUCKY

CHANDLER MEDICAL CENTER 1989 ADDITION

LEXINGTON, KENTUCKY

OPERATION AND MAINTENANCE MANUAL

Prepared by.....

Brown Sprinkler Corporation
742 A Werne Drive
Lexington, Kentucky 40504

phone 606 233-1283

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FIRE PROTECTION DRAWINGS		
SHEET	DESCRIPTION	
1 of 16	Underground Plans, Notes, Fire Pump, Steam Tunnel Sprks.	
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4 of 16	Ground Floor Sprinklers	West
5 of 16	Ground Floor Sprinklers	Trans. Tower & Mech. Room
6 of 16	First Floor Sprinklers	East
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16 of 16	Helicopter Hangar, Heli-Pad Sprinklers	

OPERATION & MAINTENANCE MANUAL

Part 1)
Operation & Maintenance for all valves. In particular; Valve Tag designations and what they control; Valve Location Charts per floor.

Part 2)
Operation & Maintenance of Fire Pump Valves ONLY; In particular; the normal operating position of valves; position of valves for testing and repair operations.

Operation & Maintenance of Floor Control Valves ONLY; In particular; Restoring systems to normal operation after a fire; Testing of individual systems.

Part 3)
Operation & Maintenance of the SUPERTROL 4800 Pre-Action System for the Second Floor Operating Rooms.

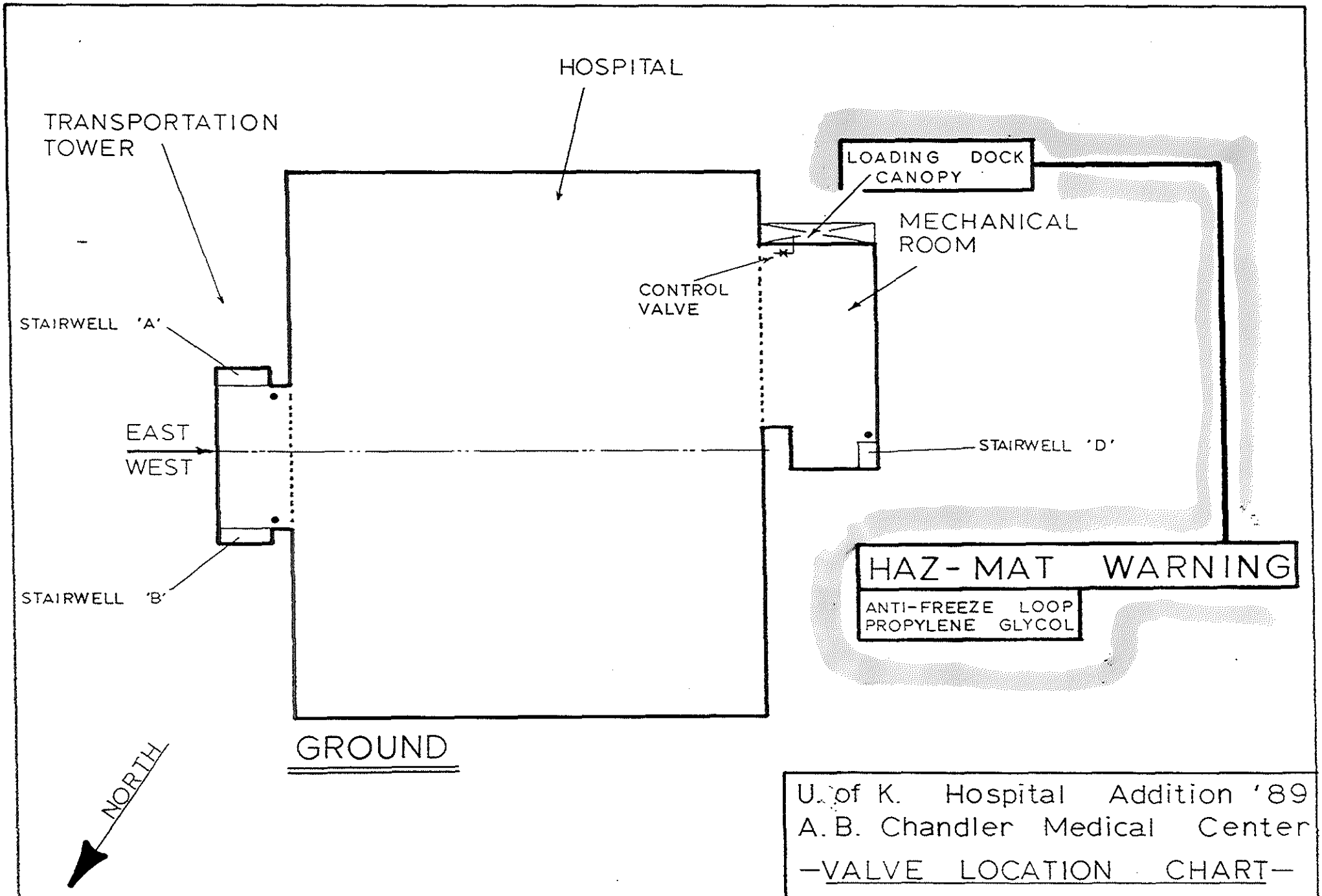
Part 4)
Operation & Maintenance of the Heli-Pad Foam Cabinet Systems.

Part 5)
Operation & Maintenance of the HALON 1301 System for Room HA621.

Part 6)
Equipment Listing, starting with the index and covering sections I through V of the approved Equipment List.

Part 7)
Equipment Listing, covering sections VI through X.

Part 8)
Equipment Listing, covering sections XI through XIII.



U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

PRODUCT NAME: PROPYLENE GLYCOL INDUSTRIAL

Effective Date: 03/20/88 Date Printed: 04/21/88 MSDS:000248

1. INGREDIENTS:

Propylene glycol CAS# 000057-55-6 99%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: 370F, 188C
VAP PRESS: 0.22 mmHg @ 20C, 68F
VAP DENSITY: 2.62
SOL. IN WATER: Complete
SP. GRAVITY: 1.038 20/20C, 68F
APPEARANCE: Colorless liquid.
ODOR: Odorless.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 218F, 103C
METHOD USED: PMCC

FLAMMABLE LIMITS
LFL: 2.6%
UFL: 12.5%

EXTINGUISHING MEDIA: Water fog, alcohol foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus.

(Continued on Page 2)

MATERIAL SAFETY DATA SHEET

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FIRE & EXPLOSION HAZARDS: Not available.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus.

(Continued on Page 2)

6. HEALTH HAZARD DATA: (CONTINUED)

Incidental to industrial exposure.

INHALATION: A single prolonged (hours) inhalation exposure is not likely to cause adverse effects. Mists are not likely to be hazardous.

SYSTEMIC & OTHER EFFECTS: Repeated excessive ingestion may cause central nervous system effects. Did not cause cancer in long-term animal studies. Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus. In animal studies, has been shown not to interfere with reproduction. Results of in vitro ("test tube") mutagenicity tests have been negative. Results of mutagenicity tests in animals have been negative.

7. FIRST AID:

EYES: Irrigate immediately with water for at least 5 minutes.

SKIN: Wash off in flowing water or shower.

INGESTION: No adverse effects anticipated by this route of exposure.

INHALATION: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

(Continued on Page 4)

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Dow Industrial Hygiene Guide is 10 mg/m3 mist, 400 ppm vapor.

VENTILATION: Good general ventilation should be sufficient.

RESPIRATORY PROTECTION: When airborne exposure guidelines and/or comfort levels may be exceeded, use an approved air-purifying respirator.

SKIN PROTECTION: Use impervious gloves when prolonged or frequently repeated contact could occur.

EYE PROTECTION: Use safety glasses. Where contact with liquids is likely, chemical goggles are recommended because eye contact with this material may cause pain, even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

REGULATORY REQUIREMENTS:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

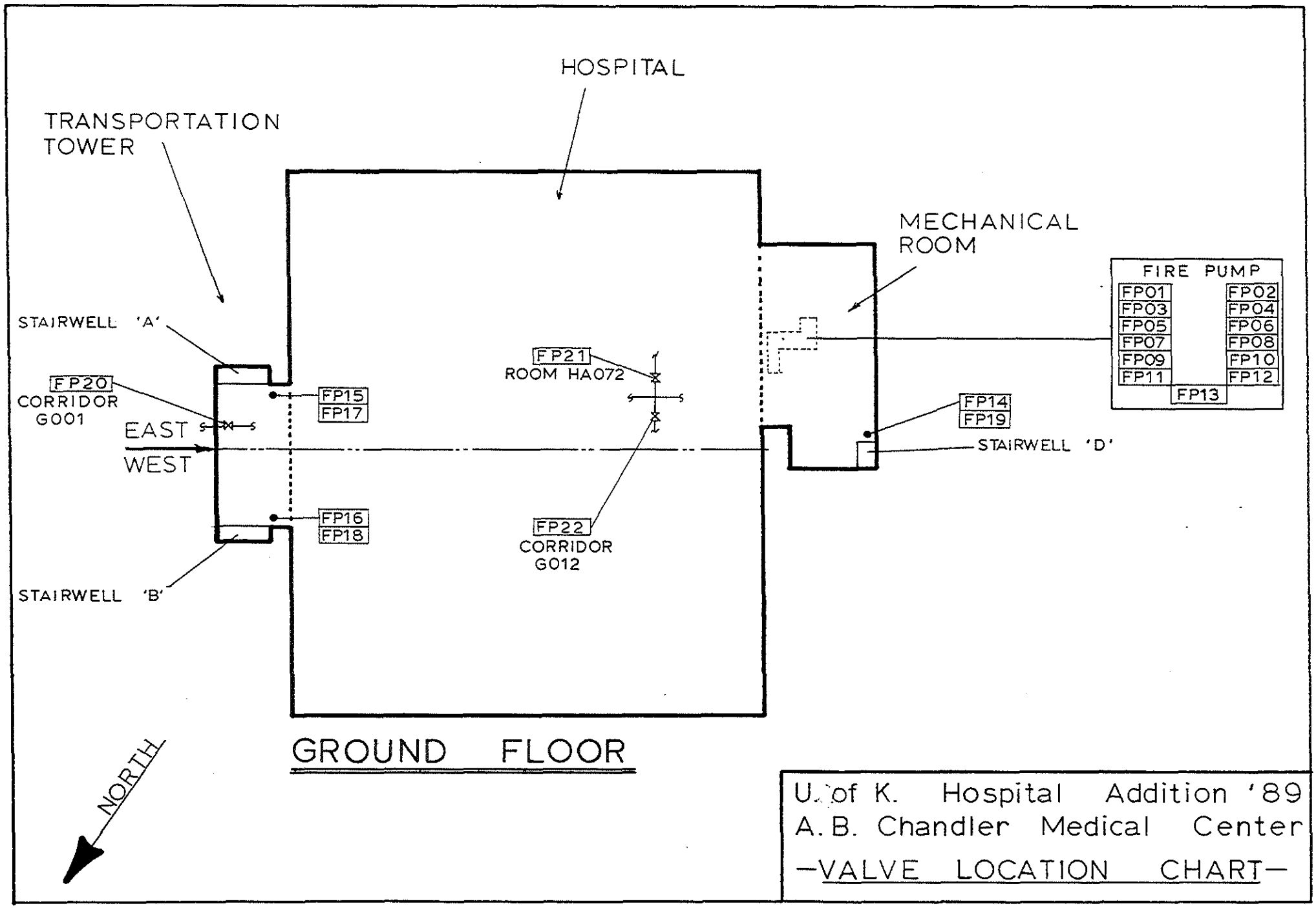
SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Exercise reasonable care and caution.

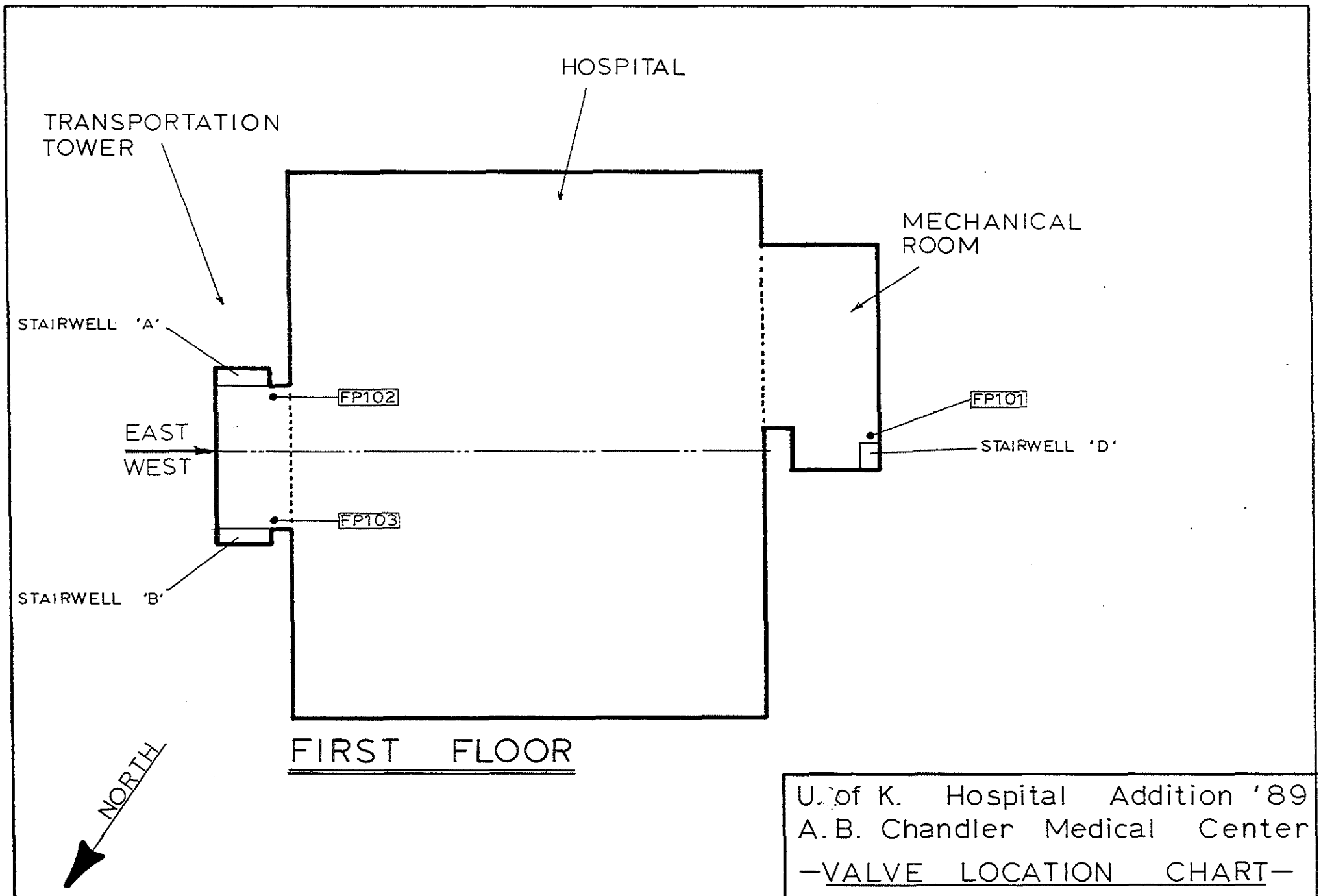
MSDS STATUS: Revised Section 9.

(Continued on Page 5)

CHANDLER MEDICAL CENTER %%%%% 1989 ADDITION
VALVE CHART MASTER LIST

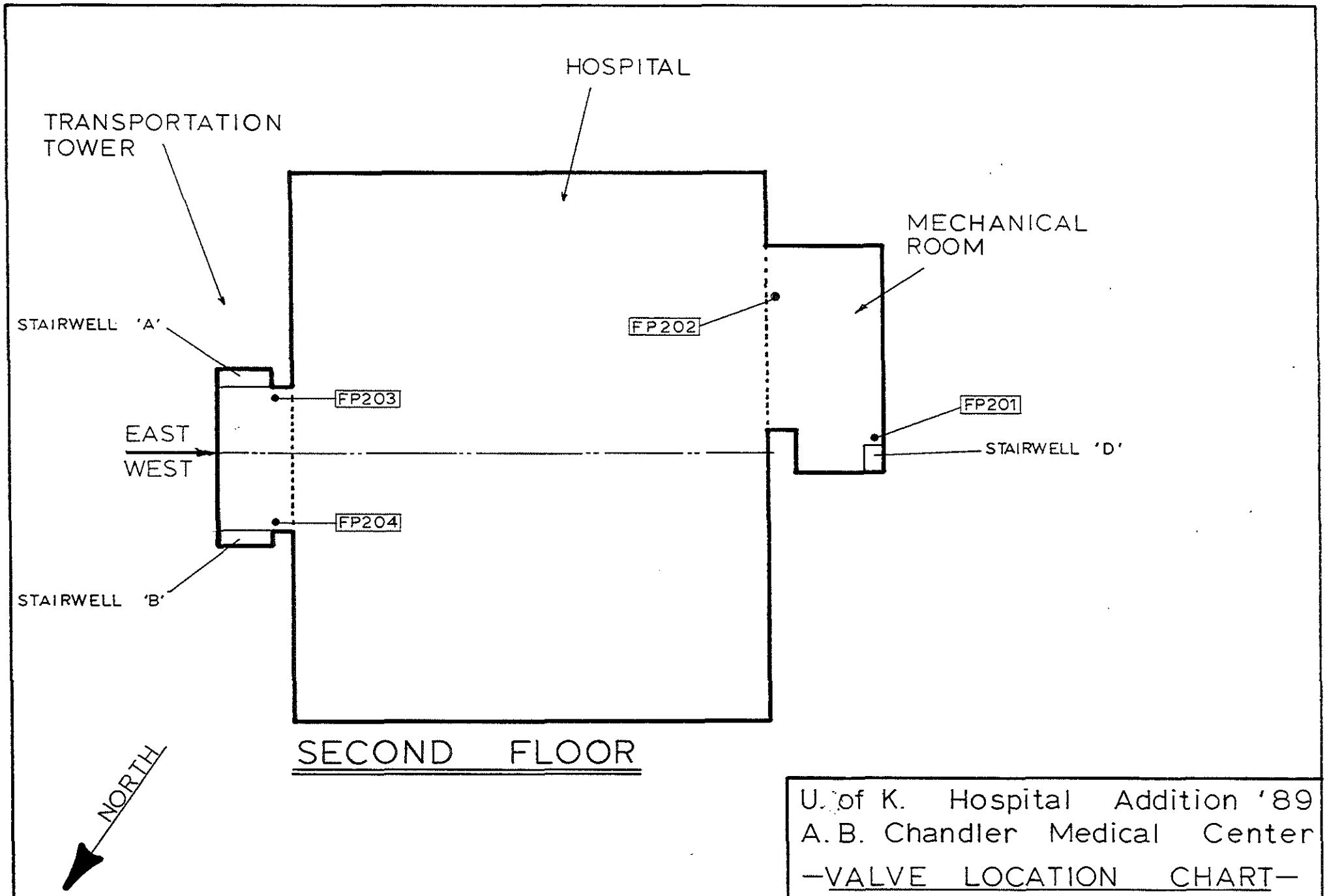
TAG	FLR.	VALVE DESCRIPTION	
FP01	GROUND	Mechanical Room Main Fire Water Supply Shut-off 1	
FP02	GROUND	Mechanical Room Main Fire Water Supply Shut-off 2	
FP03	GROUND	Mechanical Room Fire Pump Shut-off 1	
FP04	GROUND	Mechanical Room Fire Pump Shut-off 2	
FP05	GROUND	Mechanical Room By-Pass Water Shut-off 1	
FP06	GROUND	Mechanical Room By-Pass Water Shut-off 2	
FP07	GROUND	Mechanical Room Jockey Pump Shut-off 1	
FP08	GROUND	Mechanical Room Jockey-Pump Shut-off 2	
FP09	GROUND	Mechanical Room Flow Test Devices Main Shut-off	
FP10	GROUND	Mechanical Room Venturi Flow Meter Shut-off 1	
FP11	GROUND	Mechanical Room Venturi Flow Meter Shut-off 2	
FP12	GROUND	Mechanical Room Test Header Shut-off	
FP13	GROUND	Steam Tunnel	Sprks.
FP14	GROUND	Mechanical Room	Sprks.
FP15	GROUND	East Sys. Hospital & Transportation Tower	Sprks.
FP16	GROUND	West Sys. Hospital & Transportation Tower	Sprks.
FP17	GROUND	Stairwell 'A' Standpipe Shut-off	
FP18	GROUND	Stairwell 'B' Standpipe Shut-off	
FP19	GROUND	Stairwell 'D' Standpipe Shut-off	
FP20	GROUND	Sectional Control Valve Into Existing Hospital	
FP21	GROUND	Interior East Hose Cabinets Standpipe Shut-off	
FP22	GROUND	Interior West Hose CabinetS Standpipe Shut-off	
FP101	FIRST	Mechanical Room	Sprks.
FP102	FIRST	East Sys. Hospital & Transportation Tower	Sprks.
FP103	FIRST	West Sys. Hospital & Transportation Tower	Sprks.
FP201	SECOND	Mechanical Room	Sprks.
FP202	SECOND	Mechanical Room Operating Rooms Pre-Action	Sprks.
FP203	SECOND	East Sys. Hospital & Transportation Tower	Sprks.
FP204	SECOND	West Sys. Hospital & Transportation Tower	Sprks.
FP301	THIRD	Mechanical Room	Sprks.
FP302	THIRD	East Sys. Hospital & Transportation Tower	Sprks.
FP303	THIRD	West Sys. Hospital & Transportation Tower	Sprks.
FP401	FOURTH	Mechanical Room	Sprks.
FP402	FOURTH	East Sys. Hospital & Transportation Tower	Sprks.
FP403	FOURTH	West Sys. Hospital & Transportation Tower	Sprks.
FP501	FIFTH	Transportation Tower Only	Sprks.
FP601	SIXTH	Mechanical Room	Sprks.
FP602	SIXTH	Roof Helipad Foam Unit (Hangar Side)	
FP603	SIXTH	Roof Helipad Foam Unit (Transprt. Twr. Side)	
FP604	SIXTH	East Sys. Hospital & Transportation Tower	Sprks.
FP605	SIXTH	West Sys. Hospital & Transportation Tower	Sprks.
FP701	SEVENTH	Helicopter Hangar	Sprks.
FP702	SEVENTH	East System Transportation Tower	Sprks.
FP703	SEVENTH	West System Transportation Tower	Sprks.
FP801	EIGHTH	Transportation Tower	Sprks.
FP901	MACHRM	Machine Room	Sprks.
FP1001	FANROOM	Fan Room	Sprks.

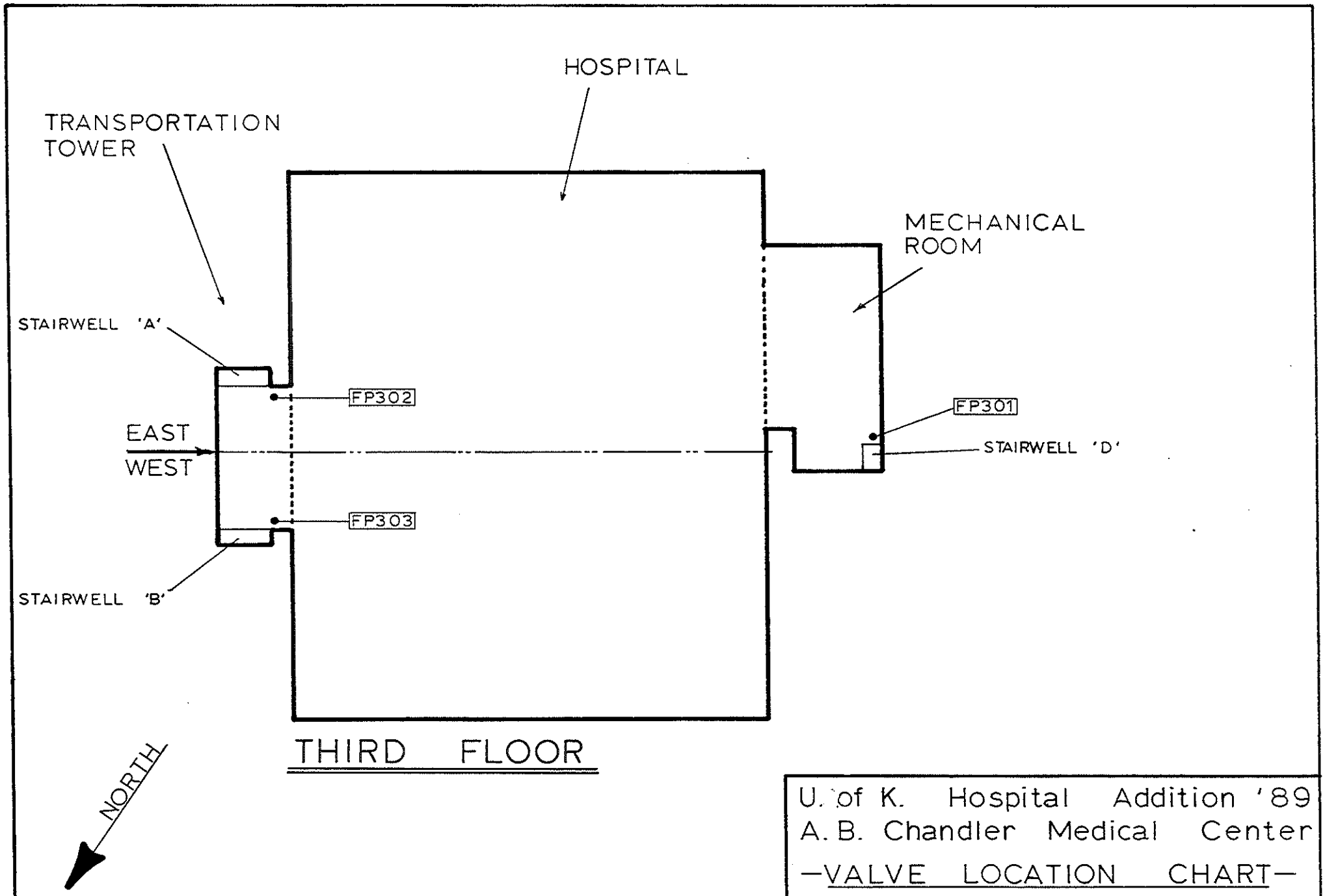

HOSPITAL
TRANSPORTATION TOWER
MECHANICAL ROOM
FIRE PUMP
FP01
FP02
FP03
FP04
FP05
FP06
FP07
FP08
FP09
FP10
FP11
FP12
FP13
STAIRWELL 'A'
FP20
CORRIDOR G001
EAST
WEST
FP15
FP17
FP21
ROOM HA072
FP14
FP19
STAIRWELL 'D'
FP16
FP18
FP22
CORRIDOR G012
STAIRWELL 'B'
NORTH
GROUND FLOOR
U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—



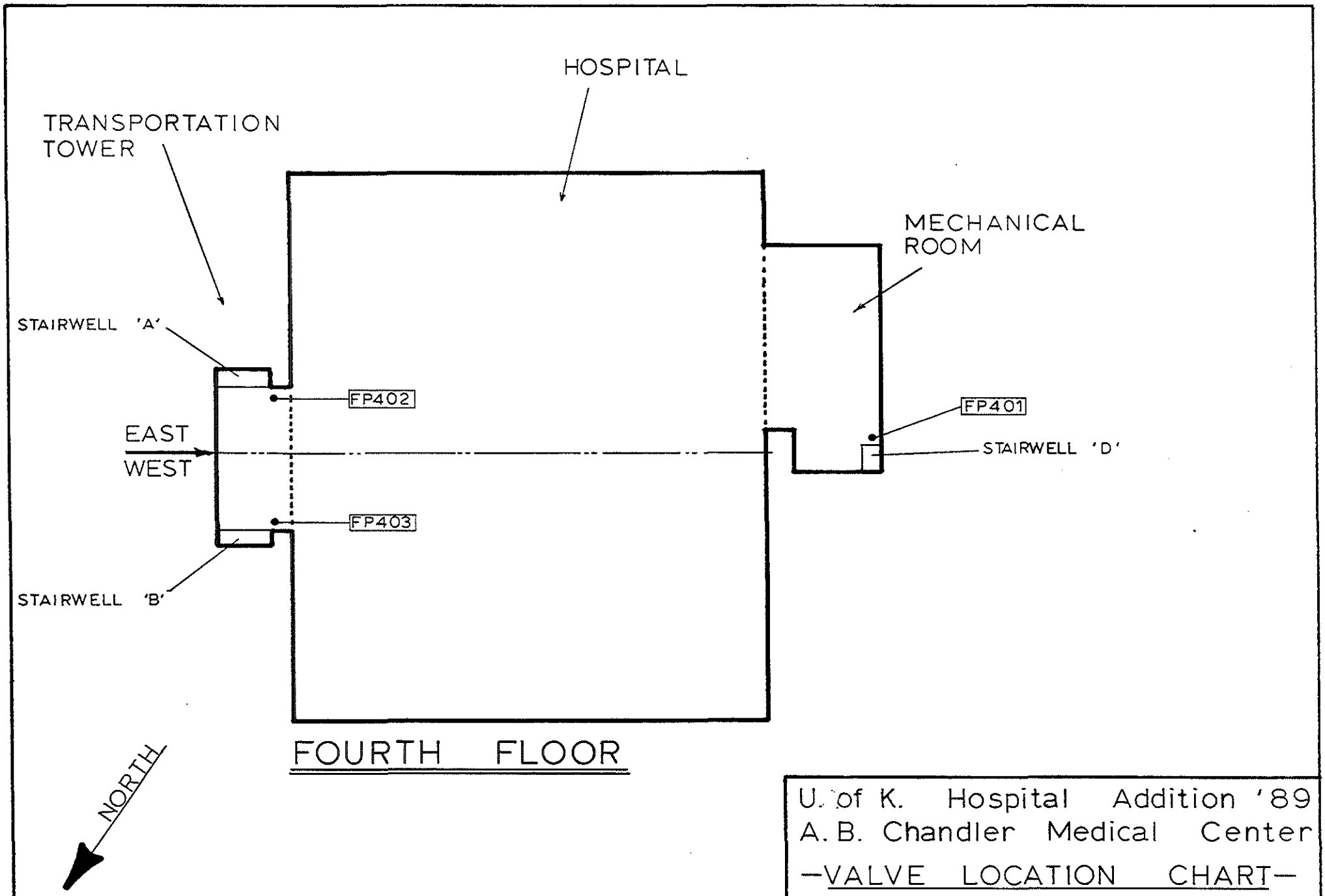
FIRST FLOOR

U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—


HOSPITAL
TRANSPORTATION TOWER
MECHANICAL ROOM
STAIRWELL 'A'
FP202
FP203
FP201
EAST
WEST
STAIRWELL 'D'
FP204
STAIRWELL 'B'
SECOND FLOOR
NORTH
U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

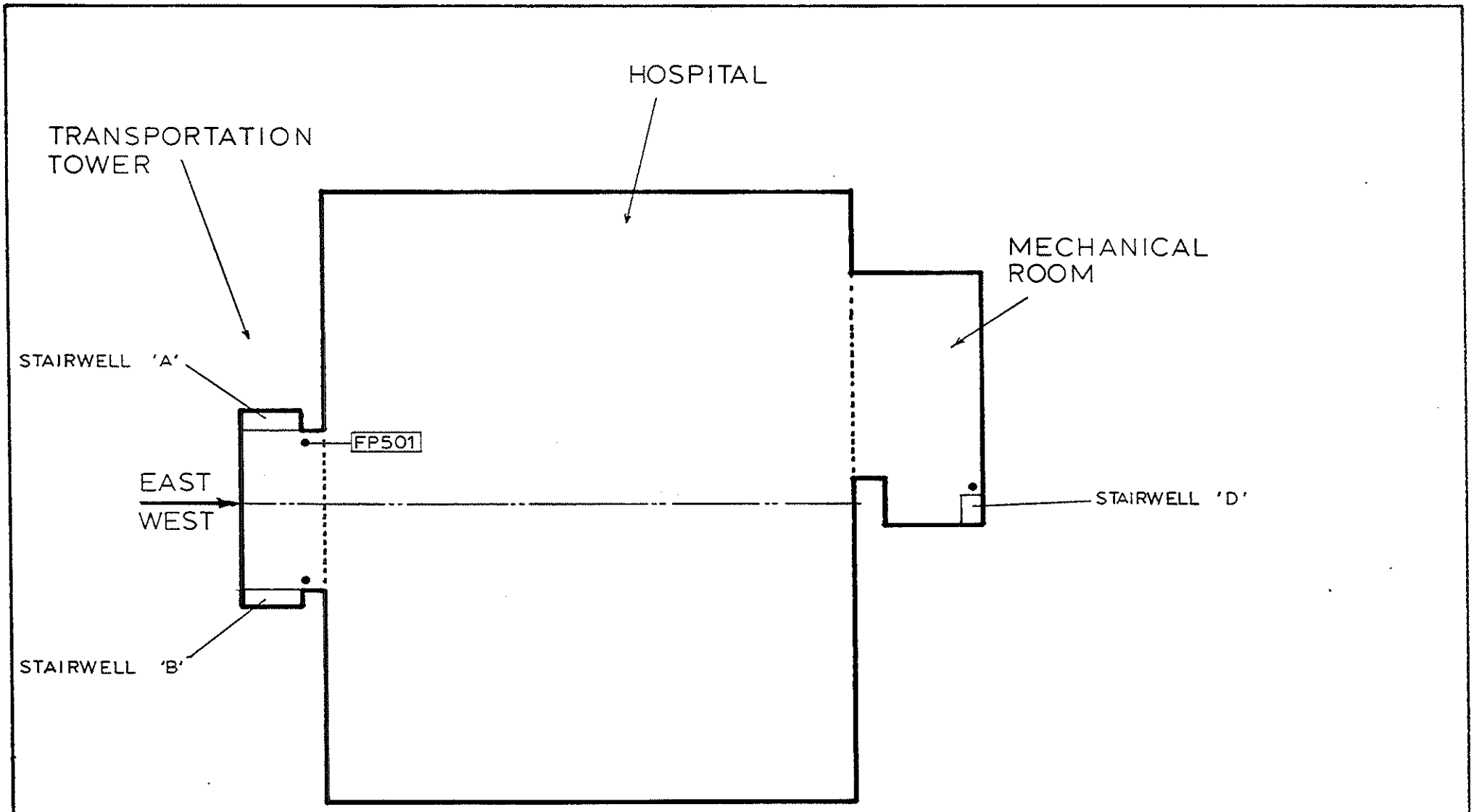


U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

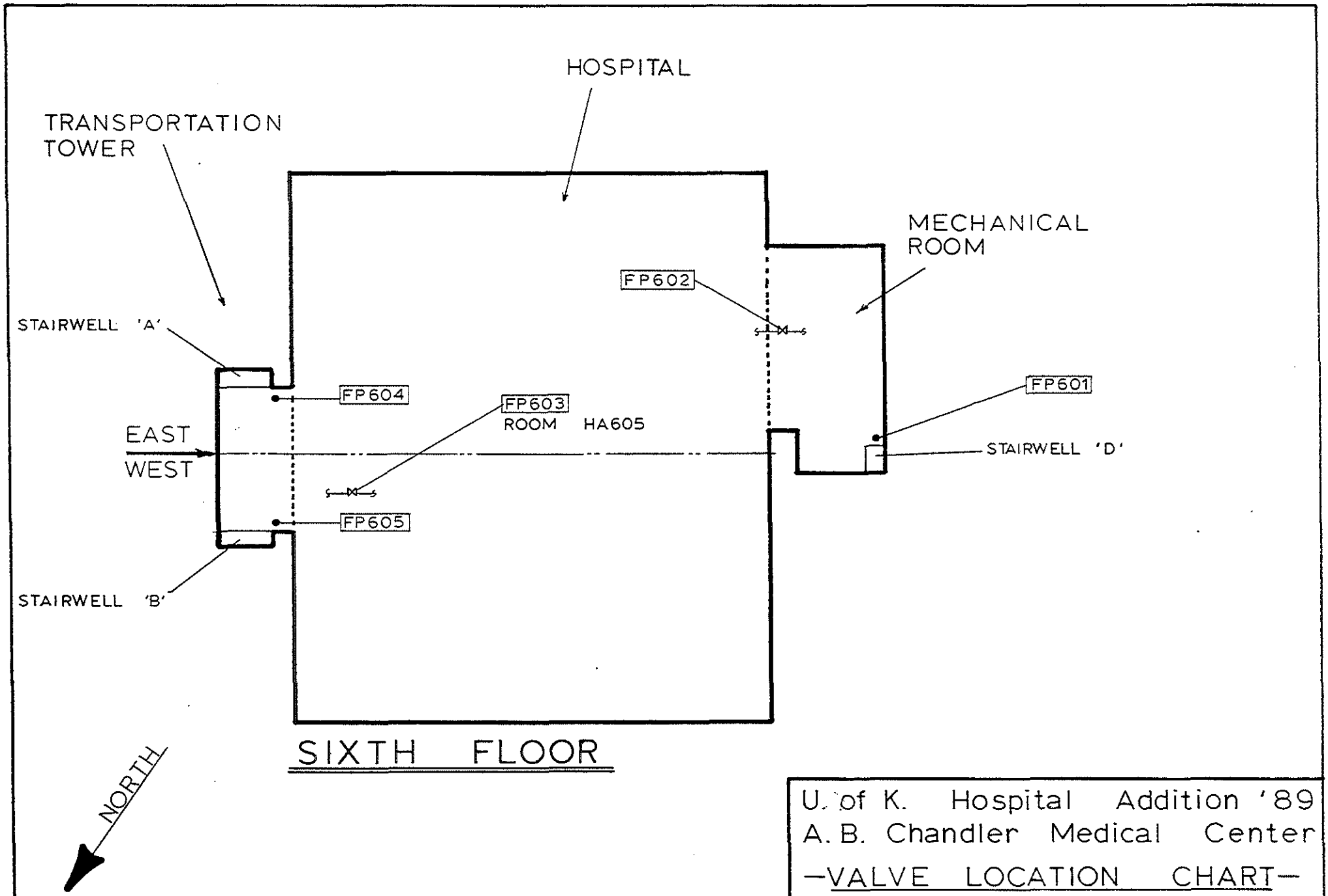


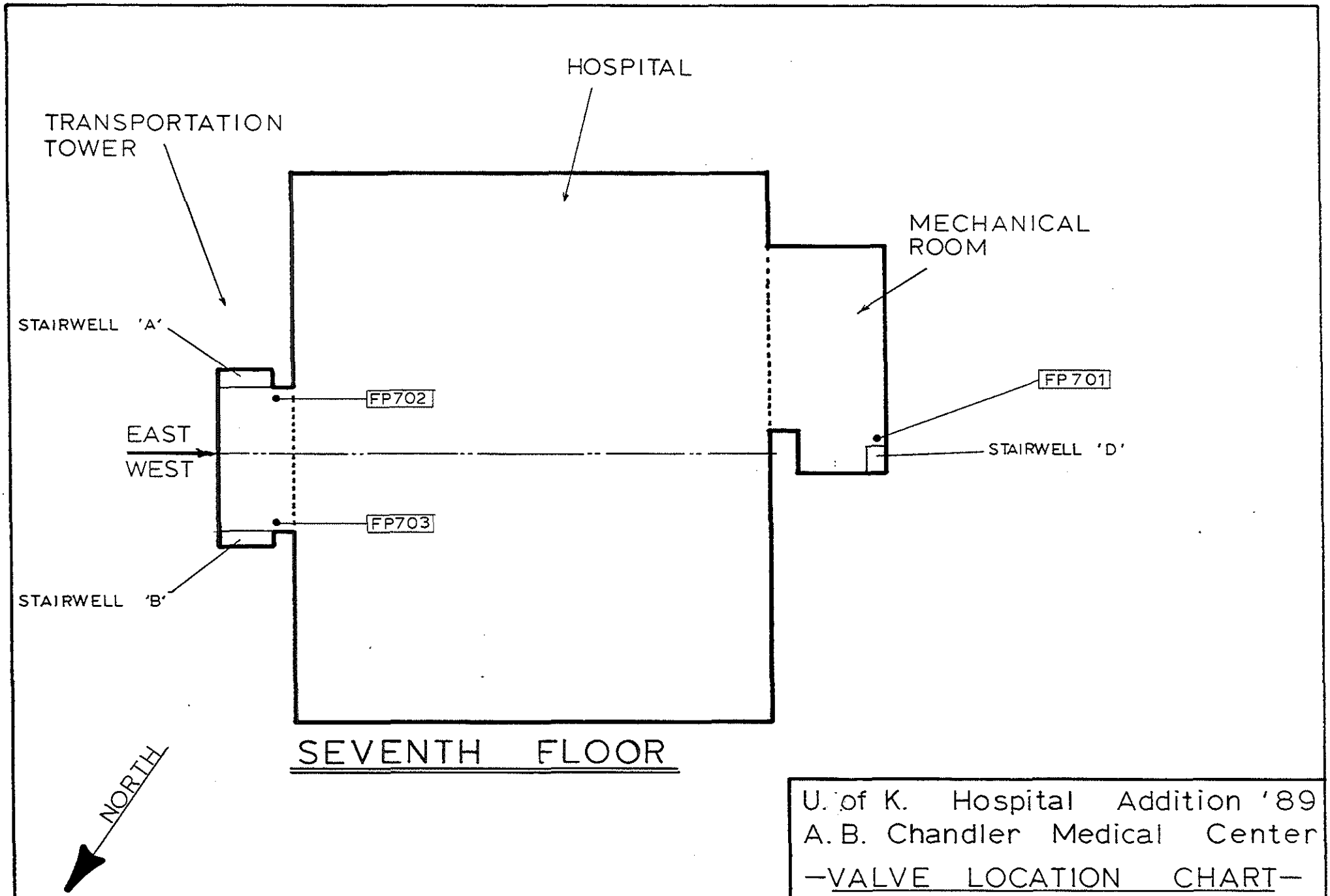
FOURTH FLOOR

U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

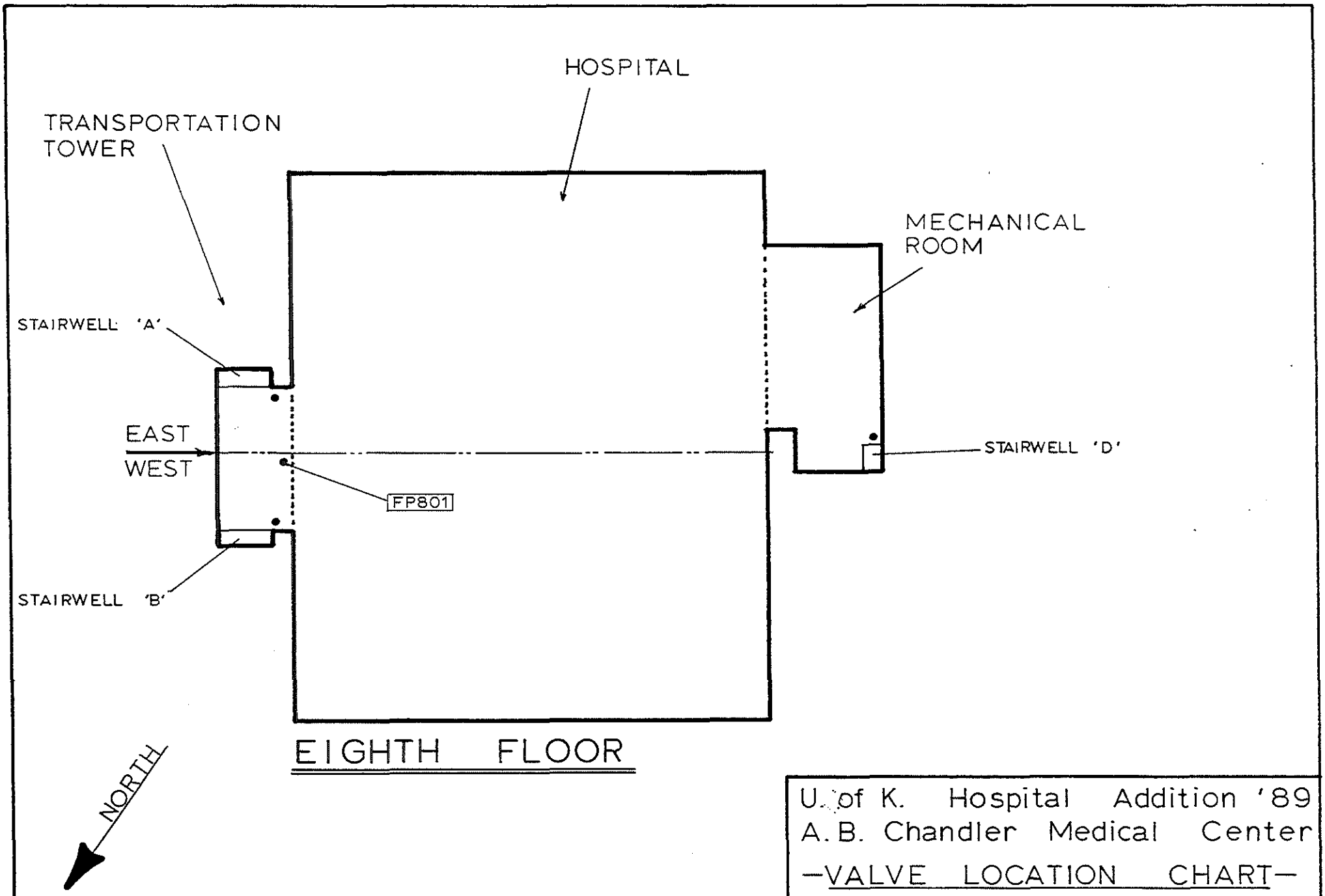


U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—


HOSPITAL
TRANSPORTATION TOWER
MECHANICAL ROOM
FP602
STAIRWELL 'A'
FP604
FP603
ROOM HA605
FP601
EAST
WEST
STAIRWELL 'D'
FP605
STAIRWELL 'B'
SIXTH FLOOR
NORTH
U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

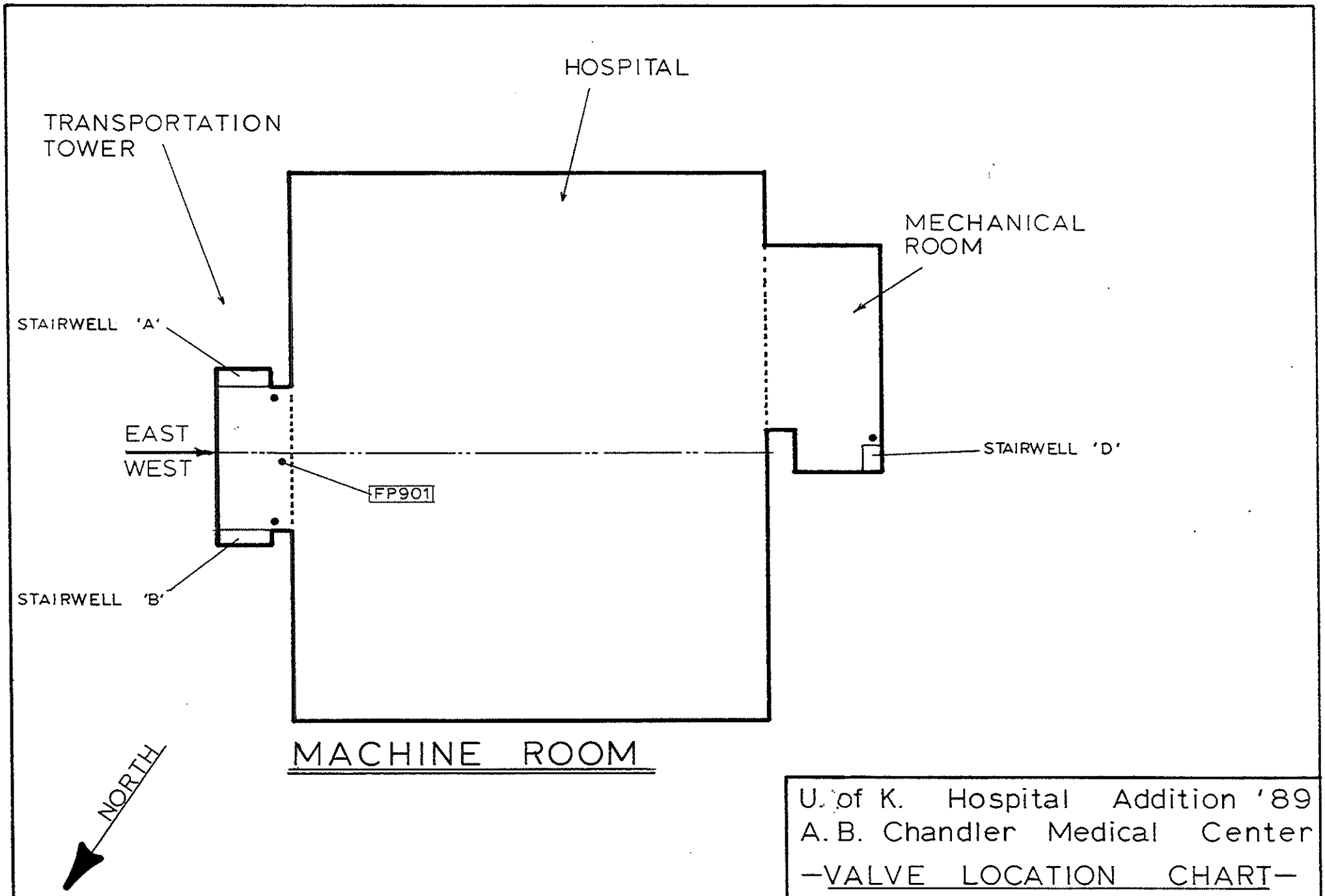


U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

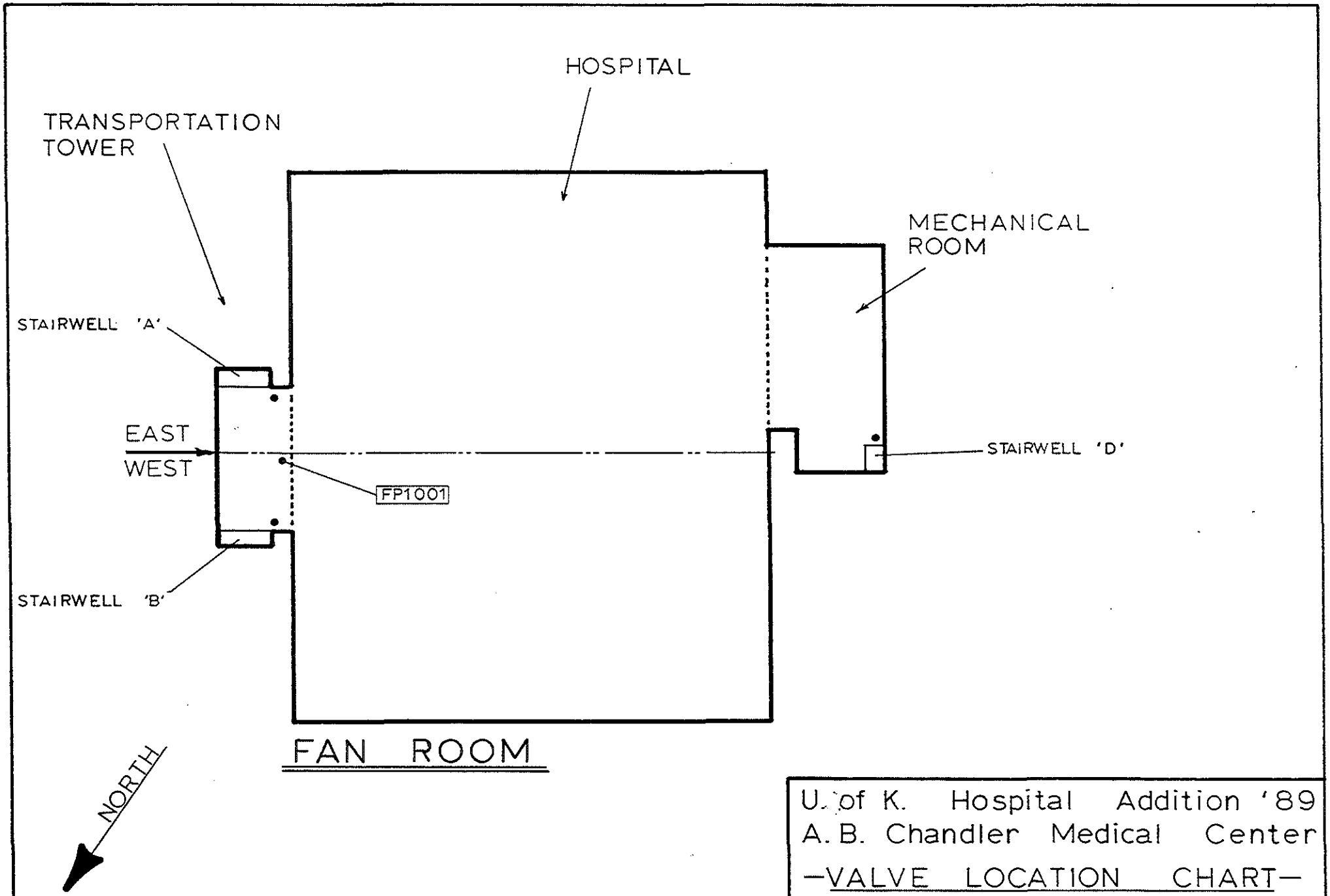


EIGHTH FLOOR

U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—



U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—



U. of K. Hospital Addition '89
A. B. Chandler Medical Center
—VALVE LOCATION CHART—

OPERATION & MAINTENANCE MANUAL
COVERING: FIRE PUMP VALVES ONLY

Valves Affected:

FP01 through FP12

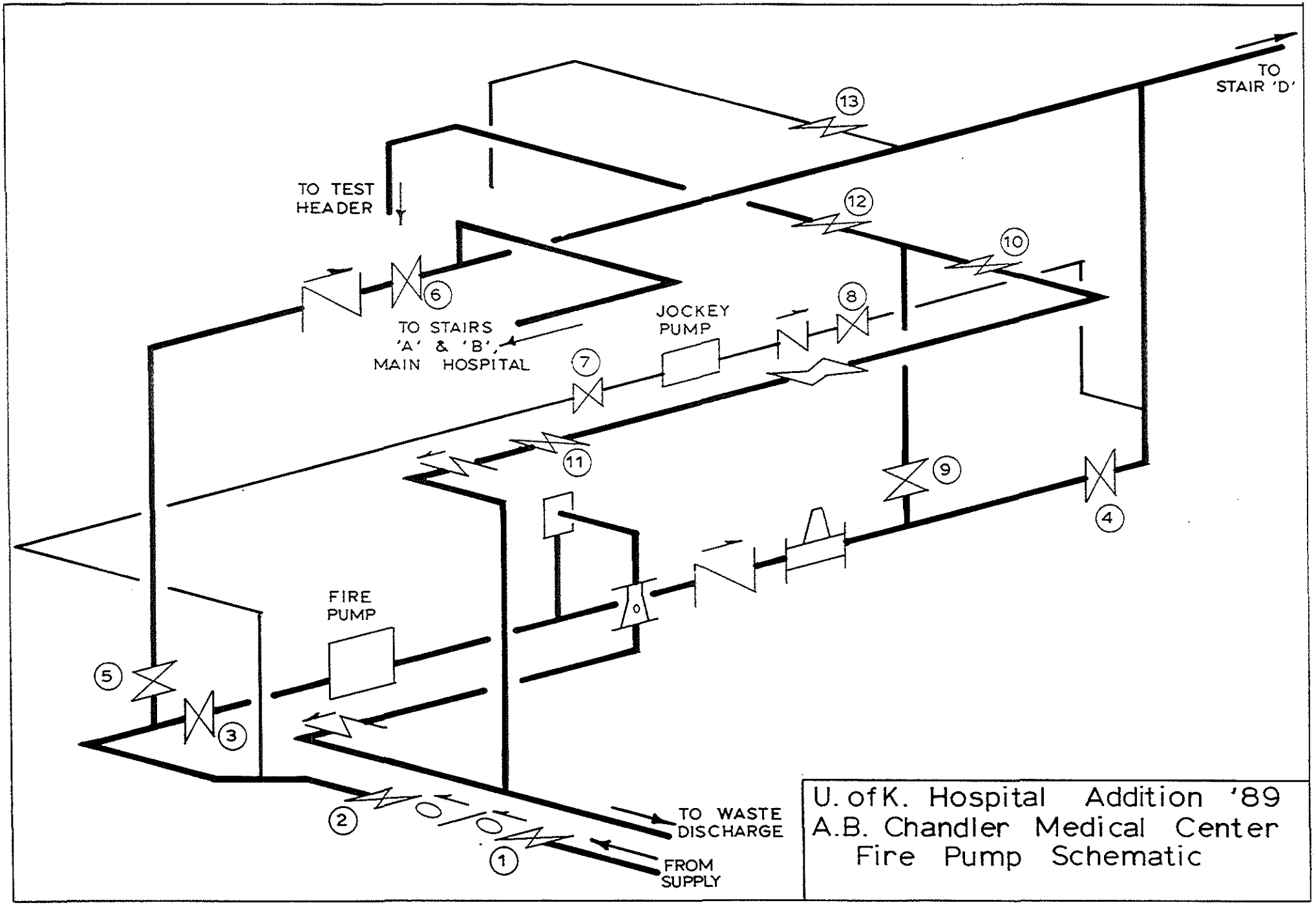
FIRE PUMP VALVES OPERATING POSITIONS

SITUATION		VALVE	1	2	3	4	5	6	7	8	9	10	11	12
Normal Operation note 'A'			OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT
Pump Test		Test Header	OPEN	OPEN	OPEN	SHUT	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	OPEN
		Venturi	OPEN	OPEN	OPEN	SHUT	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT
Repair		By-Pass Check Valve	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT
		Venturi Flow Meter	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT
NOTE: The following conditions will result in a partially impaired fire protection system.														
Repair		Fire Pump	note 'C'											
		Pump Suction Ctrl. Va.	note 'C'	OPEN	OPEN	SHUT	SHUT	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT
		Relief Valve	note 'C'											
		Jockey Pump note 'D'		OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT	SHUT	SHUT
WARNING: The following condition will result in a TOTALLY impaired fire protection system. notes 'B','C','D'														
Repair		Backflow Preventer		SHUT	SHUT	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	SHUT	SHUT	SHUT	SHUT

NOTE 'A' NOTIFY HOSPITAL SECURITY BEFORE MOVING VALVES FROM NORMAL POSITIONS.
NOTE 'B' NOTIFY FIRE DEPARTMENT BEFORE MOVING VALVES FROM NORMAL POSITIONS.
NOTE 'C' TURN OFF FIRE PUMP CONTROLLER.
NOTE 'D' TURN OFF JOCKEY PUMP CONTROLLER.

SECURITY PHONE _____

FIRE DEPARTMENT _____



U. of K. Hospital Addition '89
A.B. Chandler Medical Center
Fire Pump Schematic

OPERATION & MAINTENANCE MANUAL
COVERING: FLOOR CONTROL VALVES ONLY

Valves Affected:

FP13
FP201, FP203, FP204
FP401 through FP403
FP601, FP604, FP605
FP801
FP1001
FP101 through FP103
FP301 through FP303
FP501
FP701 through FP703
FP901

If there has been a fire, shut control valve to fire area off AFTER instructed to do so by the Fire Department. Proceed to next page for instructions on restoring a system.

RESTORING A SYSTEM BACK TO SERVICE AFTER A FIRE

1) Notify Hospital Security of the system being restored, and what valve is being opened.
2) Send one (1) person with radio to Ground Floor Mechanical Room, and turn off the jockey pump and fire pump controllers at their respective panels. DO NOT TURN any valves. Stay near panels.
3) Replace fused sprinkler on system with new sprinkler of same make and temperature.
4) Slowly open valve to system being restored. Opening valve too rapidly could result in severe water hammer and damage the system piping.
5) Turn on ONLY Jockey Pump Controller at panel, and wait for system to reach the required pressure.
6) After system is pressurized, turn on Fire Pump Controller at panel.
7) Notify Hospital Security that the system has been restored.

TESTING A SYSTEM

1) Notify Hospital Security of the system being tested.
2) Notify Fire Department that a test will be made.
3) Send one (1) person with radio to Ground Floor Mechanical Room. Shut off the jockey pump and fire pump controllers at their respective panels. DO NOT TURN any valves. Stay near panels.
4) Open 1" globe valve near the floor control valve of the system being tested.
5) Wait for a flow signal to reach the Hospital Security alarm panel. Shut off 1" globe valve after signal has been received.
6) Turn on ONLY Jockey Pump Controller at panel, and wait for system to reach the required pressure.
7) After system is pressurized, turn on Fire Pump Controller at panel.
8) Notify Hospital Security that the system has been restored.
9) Notify Fire Department that the test has been completed.

OPERATION & MAINTENANCE MANUAL
COVERING:SUPERTROL 4800 PRE-ACTION SYSTEM

Valves Affected:

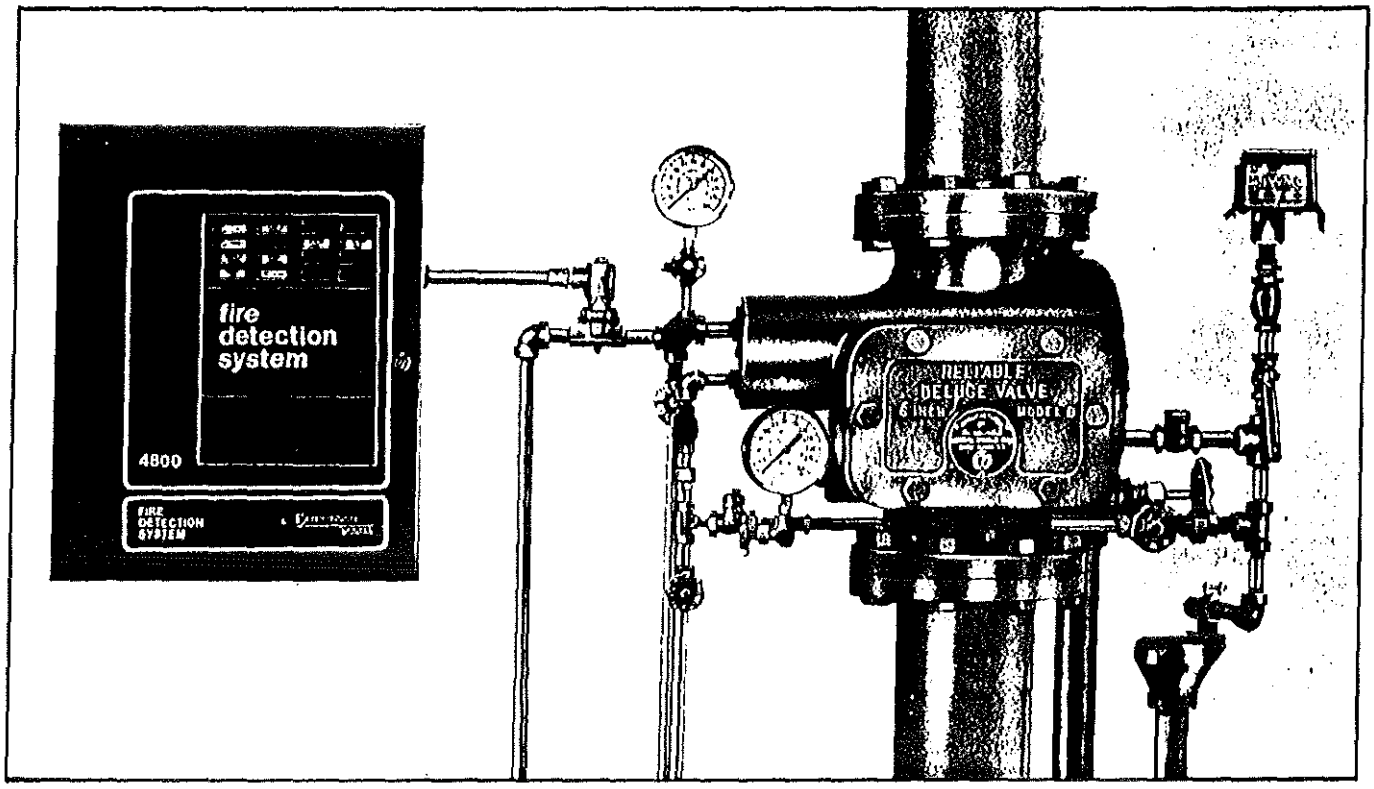
FP202 Second Floor Mechanical Room

Reliable®

Model 4800 Supertrol Electrical Systems

Instructions for Installation, Operation, Care and Maintenance

Listed by Underwriters Laboratories, Inc. Approved by Factory Mutual Research Corporation, and other fire insurance and governmental agencies in the United States and foreign countries.



CLASS "B" DETECTOR CIRCUITRY
SINGLE-ZONE PANEL
THERMAL DETECTOR 302-135
MODEL "B" AIR COMPRESSOR

The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

System Description

General

Supertrol Electrical Systems are supervised, low voltage, fire detection systems which control the operation of Reliable Deluge Valves. Supertrol operated Deluge Valve Systems provide positive supervised electric-hydraulic control of:

Deluge Systems – Figure 1

- Open Sprinkler located in hazardous areas.
- Open spray nozzles located to protect a specific hazard.

Pre-Action System – Figure 2

- Automatic, sealed sprinklers located in unheated areas or areas in which it is desirable to keep piping empty prior to a fire.

Approvals

UL – Supertrol Components Listed
FM – Supertrol Single Area and Two Area Systems Using Thermal Detectors and Class A Detector Wiring Approved
N.Y. City BS&A No. 546-72-SA

Description

All Reliable Supertrol operated Deluge Valve Systems are composed of two main sections:

I. Supertrol Electrical Detection and Actuation Section

This section detects the fire either thermally or by detecting products of combustion and operates the Deluge Valve. Any listed 24 Vdc normally open 2 wire detector; for example, thermal detectors or smoke detectors in either photoelectric or ionization types may be used with this system. The Model 4800 Control Panels are the heart of the Supertrol system. This unique panel is available in three versions:

1. Single Area Control Panel – Controls One Deluge Valve in one fire area.
2. Two Area Control Panel – Controls Two Deluge Valves in two separate fire areas.
3. Single Area Cross Zoned Control Panel – Two independent groups of detectors are intermixed and cross zoned to control one Deluge Valve in one fire area. Each group of detectors is spaced in accordance with the detector listing.

All panels supply power to operate detectors, alarms and solenoid valves. All detectors, wiring and solenoid valves are constantly supervised such that electrical faults cause a trouble alarm to sound. The Model 4800 Control Panel accommodates either Class A Detector Circuitry – a single break or single ground fault in the detector loop does not impair normal fire operation, or Class B Detector Circuitry – a single break or ground fault results in a trouble signal but normal fire operation may be impaired.

In the event of a primary (120 Vac) power failure, the system automatically switches to battery power. The batteries will supply power for a minimum of 90 hours. The Model 4800 Control Panel contains a charging circuit which constantly maintains the batteries at full charge.

The components which make up the Supertrol Electrical Detection and Actuation Section are:

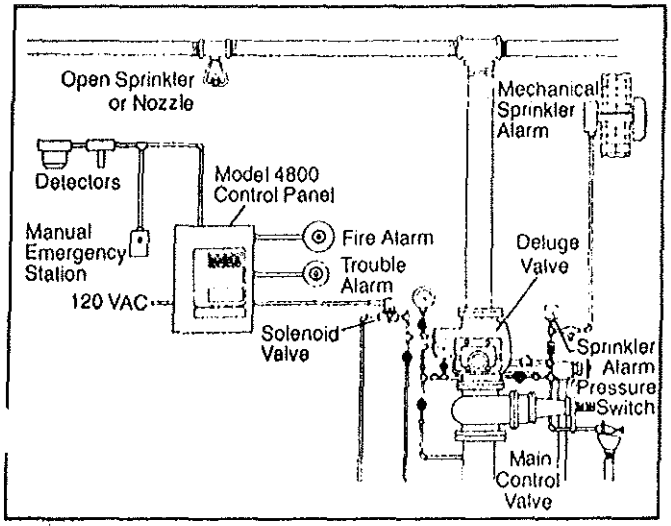
- Fire Detectors
  - Thermal Detectors
  - Smoke Detectors
- Manual Emergency Stations
- Model 4800 Control Panels
  - Standby Batteries
- Electric Alarms
- Solenoid Valve

II. Water Delivery and Distribution Section

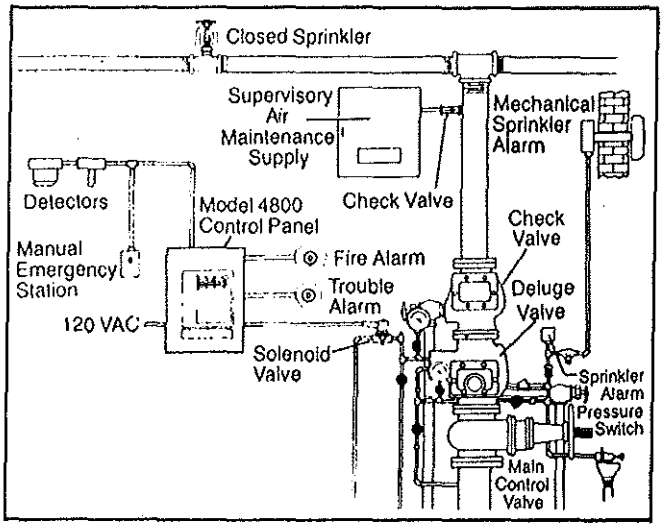
This section delivers and distributes water or other extinguishing agents at the fire. When operated by the Supertrol System, the Deluge Valve releases the extinguishing agent into a network of piping supplying sprinklers or nozzles. The sprinklers or nozzles efficiently distribute the extinguishing agent at the fire source.

The components which make up the water delivery and distribution section are:

- Deluge Valve
- Electric Sprinkler Alarm
- Mechanical Sprinkler Alarm
- Check Valve With Drain – Pre-Action System Only
- Supervisory Air Maintenance Supply – Pre-Action System Only
- Nozzle or Sprinklers



Supertrol Electric Deluge System
Fig. 1



Supertrol Electric Pre-Action System
Fig. 2

System Installation And Service

General

Control Panel–The Model 4800 Control Panel current output is 3 amps maximum. The total current drain for all system components; remote trouble signal, alarm bell, solenoid valve and smoke detectors must not exceed this output.

The control unit, standby batteries and rectifier are in one cabinet. The cabinet should be mounted close to the Deluge Valve.

All wiring shall be installed in accordance with the National Electrical Code and the manufacturers drawings. Wires no smaller than No. 14 AWG shall supply A.C. power to the panel. The panel requires 120 Vac, 1.2 amp input power.

Prior to connecting the Control Panel or installing circuit cards, complete all wiring for the detectors, alarm and trouble bells, A.C. power, and solenoid valve.

Check all wiring for continuity and shorts. Connect detector, alarm and trouble bell and solenoid valve wiring to the panel as shown on the appropriate field wiring diagram. Install circuit cards in the positions shown on the field wiring diagram. Prior to connecting batteries and A.C. power, refer to specific panel installation instructions and the appropriate Test Outline for sequence and correct operating indications.

The Model PS1245 gelled electrolyte batteries are maintenance free and leak proof. These batteries require 48 hours to reach full charge after connection to the panel.

Detectors–Smoke detectors must be an approved normally open two wire type without auxiliary relay and must be compatible with the 20 ± 1 Vdc full wave rectified, regulated and filtered detector circuit panel supplied power. They must be installed in accordance with approved spacing and with the manufacturers instructions. No more than 20 smoke detectors shall be installed per detector circuit loop. Any number of approved normally open thermal detectors or manual emergency stations may be installed in the detector circuit loop. Thermal detectors must be installed in accordance with approved spacing and with the manufacturers instructions. Thermal detectors and/or manual emergency stations may be intermixed with smoke detectors in the same detector circuit.

The detector loop resistance shall not exceed 100 ohms. Loop resistance may be measured as follows:

a. Disconnect detector circuit loop wires from panel.
b. Short terminals of detector furthest from panel.
c. Measure resistance–each of the disconnected wires to the other.
d. Resistance shall not exceed 100 ohms.

Maximum wire length is as follows:

Wire Size	Pull Length To Furthest Detector	Total Loop Length
18 AWG	5,000'	10,000'
16 AWG	8,000'	16,000'
14 AWG	12,000'	24,000'
12 AWG	20,000'	40,000'

Continuity of detector loop wiring must be maintained when adding detectors, as shown on the field wiring diagram, to maintain loop supervision. In addition, both legs of the circuit must be broken when connected to the detector terminal screw. When wired in this manner, any attempt to disconnect a detector will operate the trouble signal.

The detector circuit will lock-up for either an alarm or trouble condition. After the alarm or trouble condition is corrected, operate the reset switch to restore the system to normal.

Alarm Bell–A polarized alarm bell should be located where the alarm will readily be noticed. An end of line resistor must be installed after the alarm bell as shown on the field wiring diagram to maintain circuit supervision. If no alarm device is connected, circuit continuity must be maintained; a 4.7K ohm resistor must be connected across the alarm bell circuit terminals. Never short or jumper these terminals. Wire size for alarm bell circuit should be No. 14 AWG.

Trouble Indication–The Common Circuits Card CC48R includes a buzzer which sounds for trouble conditions. A remote trouble bell may be connected to the trouble bell circuit terminals. Circuit polarity must be observed if a polarized bell is used. No end of line resistor should be used since this circuit is not supervised; the trouble bell circuit terminals if not used, must be left vacant.

Solenoid Valve–The solenoid valve must be installed with its "in" port toward the Deluge Valve Wet Pilot Trim tee. See the Electrical Operation section of Bulletin 503 when used with a Model A Deluge Valve or Bulletin 501 when used with a Model B or BX Deluge Valve. The ½" piping connecting the solenoid valve to the wet pilot line trim is field supplied.

The solenoid valve circuit is supervised when wired as shown on the Field Wiring Diagrams. No E.O.L. resistor is to be used. Never jumper or short the solenoid valve circuit terminals.

Gate Valve Tamper Switch Model SGV–Subject to approval of the authority having jurisdiction, a gate valve tamper switch may be connected to terminals 18 and 19 on the field wiring terminal strip. Remove the jumper wire from those terminals prior to making the connection. The gate valve position indicator switch contacts must be closed when the gate valve is open.

Valves and Trim–When used in a Supertrol System, the Deluge Valve should be trimmed using the Basic and Wet Pilot Line Trim Sets, refer to Bulletin 501/503 for details. The Basic Trim provides the connections for a Mechanical Sprinkler Alarm as well as for a Sprinkler Alarm Pressure Switch.

Any check valve capable of reliably sealing 1-1½ psi supervisory air pressure may be used as the Main System Check Valve in a Pre-Action system. A drain and trimmings to provide 6" to 10" of prime water must be installed on the system side of this check valve. Refer to the valve manufacturers bulletin for installation details. A Pre-Action system must be absolutely leak tight to properly maintain supervisory air pressure.

Sprinkler Alarm Pressure Switch–The Reliable Sprinkler Alarm Pressure Switch is installed in the Deluge Valve Basic Trim. It is pressure operated to actuate electric alarms when water flows in the system. Refer to the installation sheet packed with each switch and Bulletin 608 for details.

Mechanical Sprinkler Alarm – The Reliable Model C Mechanical Sprinkler Alarm is operated by water flow when the Deluge Valve has been tripped. Refer to Bulletin 613 for installation information.

Supervisory Air Supply – The Models B and C Supervisory Air Supplies include a separate check valve assembly. The check valve is to be connected at the sprinkler piping with its flow arrow pointing toward the sprinkler piping. This connection can be made at any convenient location on the system side of the main system check valve.

Testing

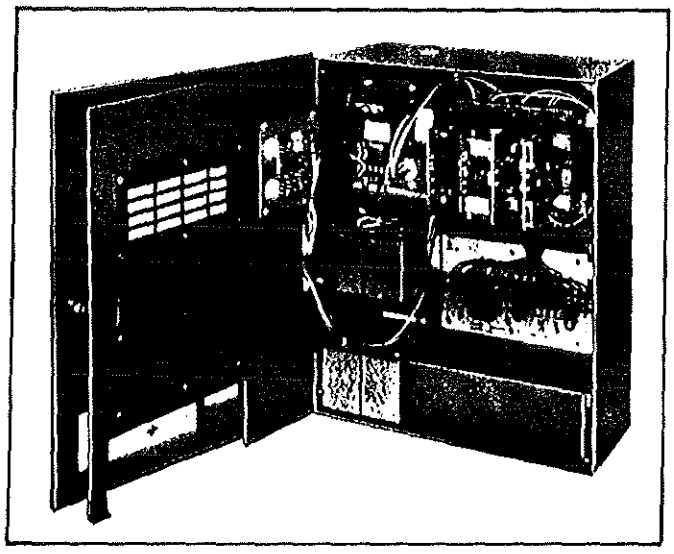
Refer to the section entitled "Testing Detection System Without Operating Deluge Valve" of Bulletin 501/503 prior to testing.

Warning – When system is tied into an auxiliarized fire alarm box the local Superintendent of Fire Alarms should be present during all testing. He will connect the city circuit to the box and shunt the box until the test is completed. He should also be present to shunt the box any time a test is made on the auxiliarized system.

Detectors – Close main control valve prior to testing detectors. Test detectors with test unit. When detectors have returned to normal, push reset button on panel. After completion of tests, reset Deluge Valve per Bulletin 501/503 and open main system control valve.

Emergency Stations – Close main control valve prior to testing. Test by opening station with test key. Restore emergency station to normal condition, push reset button on panel. Reset Deluge Valve per Bulletin 501/503 and open system control valve at termination of testing.

Regularity of Testing – System should be tested frequently, at least twice a year. Tests shall be made under the direct supervision of the owner and/or the authorities having jurisdiction. A complete record shall be made of all tests. After each test the system shall be restored to the normal operating condition. Tests should be held during daylight hours and all occupants shall be notified in advance as to the time of testing and sounding of alarms.



Model 4800 Control Panel

The Reliable Supertrol Model 4800 Control Panels are compact single enclosure units combining power supply, stand by batteries, battery charger, detector, alarm and solenoid valve controls. This series of control panels is available in single area or two area or single area cross zoned versions. This series of control panels is of modular design with each control panel containing:

Model PS 24-3P Main Power Supply and Battery Charger.

A full wave rectified 24 Vdc fused output is provided from a fused 120 Vac input. Power supply output is 3 amps at 24 Vdc unregulated. The battery charger is intended specifically for gelled electrolyte batteries. Maximum battery recharge capability is 40 ampere-hours in a 48 hour recharge period.

Model MB48 Motherboard

The motherboard provides receptacles for each of four circuit cards. Interconnecting wiring for the power supply, switch module, circuit cards and field wiring terminal strip is also provided within the motherboard.

Circuit Cards

Four circuit cards are provided with the Model 4800 Control Panel. Each circuit card performs specific circuit functions:

Model PM48 Power Monitor Card

This circuit card filters and regulates the DC from the power supply. In addition, the AC power and the battery power, which operate the system are supervised. Switch over to battery power is controlled by this circuit card. L.E.D. annunciation of the following conditions are provided by this card: AC ON, AC LOW, AC Trouble, Battery Trouble, Ground On System and Card Missing.

Model CC48R Common Circuits Card

This card provides the common alarm and trouble outputs for the system. Alarm bell output, auxiliary dry alarm and trouble contacts and the panel trouble buzzer are operated by this card. L.E.D. annunciation of the following conditions are provided by this card: Alarm bell, circuit trouble, system trouble, alarm silenced, system alarm and alarm loop short circuit.

Trouble and Auxiliary Alarm Contact Rating –
1 amp Max @ 120 Vac
2 amp Max @ 24 Vdc

Model 2Z2WA/B Detector Card

This card provides supervised and regulated power for either Class A or Class B detector circuits. The detector loops are current limited which allows the use of pull stations, heat detectors, waterflow switches and two wire smoke detectors. L.E.D. trouble and alarm annunciation is provided for each detector circuit.

Specifications

Max Open Circuit Loop Voltage — 20 ± 1 Vdc (Filtered)
Max Short Circuit Loop Current — 45 ± 5 mA per circuit
Max Standby Detector Current — 3 + 0 – .25 mA per circuit
Min Alarm Initiating Current — 15 mA
Max Loop Resistance — 100 ohm per circuit

End of Line Resistor—4.7 K ohm ± 10%, ½ Watt
Auxiliary Alarm Contacts—1 amp Max @ 24 Vdc
0.5 amp Max @ 120 Vac

Model 2ZRU Releasing Card

This card provides 24 Vdc power to operate the solenoid valve and supervises the solenoid circuit for open circuit faults. This card provides L.E.D. annunciation of trouble or alarm conditions for each solenoid valve circuit.

Field Wiring Terminal Strip

A separate Field Wiring Terminal Strip provides convenient, rugged and readily accessible labeled screw terminal connections for all field wiring.

Switch Module

The panel is provided with a dead front door which contains annunciator nameplates and a switch module. The five switches contained on the switch module are:

- Silence Switch–Silences alarm and panel trouble buzzer.
- Reset Switch–Restores system to normal after an alarm.
- Lamp Test Switch–Tests all L.E.D.'s simultaneously.
- City Disconnect Switch–Not used. Should always remain in down position.
- Fire Drill Switch–Allows testing alarm bells and auxiliary dry contacts.

Model 4800 Supertrol Panel Installation

- Surface mount the control panel in the same area as the deluge valve.
- Prior to connecting the control panel or installing circuit cards, complete all wiring to detectors, alarm and trouble bells, and solenoid valve as shown on the appropriate field wiring diagram. Observe compliance with all applicable codes.
- Thermal and smoke detectors may be intermixed in the same detector circuit.
- Check all wiring for short circuits and continuity.
- Connect detector, alarm bell, trouble bell and solenoid valve wiring to the field wiring terminal strip according to the field wiring diagram. Alarm and trouble bell polarity must be observed.
- Connect the *non-energized* A.C. power wires to the terminals indicated on the field wiring diagram.
- Connect the chassis ground wire to the designated terminal.
- Install (4) batteries with their terminal sides out, in the areas designated. *Do Not Install* battery jumper wires, but install all other battery wires per field wiring diagram.
- Install each of 4 circuit cards in the designated slots. Each card and slot is identified. The component side of the card must face right.
- Test per appropriate Control Panel Test Outline.
- Circuit continuity must be maintained across terminals 9-10, 11-12, 16-17. Never short or jumper these terminals. If no devices are connected, install a 4.7K ohm ½ watt resistor.
- If problems are encountered during testing, see trouble shooting guide on p. 21.

Field Wiring Diagrams for the Single Area Control Panel are shown on the following figures:

Fig.	Detector Type	Detector Circuit Wiring	Approvals
3	Thermal	Class A	UL Listed, FM Approved
4	Smoke	Class A	UL Listed
5	Thermal	Class B	UL Listed
6	Smoke	Class B	UL Listed

Field Wiring Diagrams for the Two Area Control Panel are shown on the following figures:

Fig.	Detector Type	Detector Circuit Wiring	Approvals
7	Thermal	Class A	UL Listed, FM Approved
8	Smoke	Class A	UL Listed
9	Thermal	Class B	UL Listed
10	Smoke	Class B	UL Listed

Field Wiring Diagrams for the Single Area Cross Zoned Panel are shown on the following figures:

Fig.	Detector Type	Detector Circuit Wiring	Approvals
11	Thermal	Class A	UL Listed
12	Smoke	Class A	UL Listed
13	Thermal	Class B	UL Listed
14	Smoke	Class B	UL Listed

Model 4800 Supertrol
Single Area Control Panel

This Reliable Control Panel is used where one fire area is protected by one Deluge Valve. This panel provides detector, alarm and solenoid valve circuitry for the operation of one Deluge Valve. The necessary power supply, as well as standby emergency power supply, battery charger and rectifier circuitry are contained within this panel.

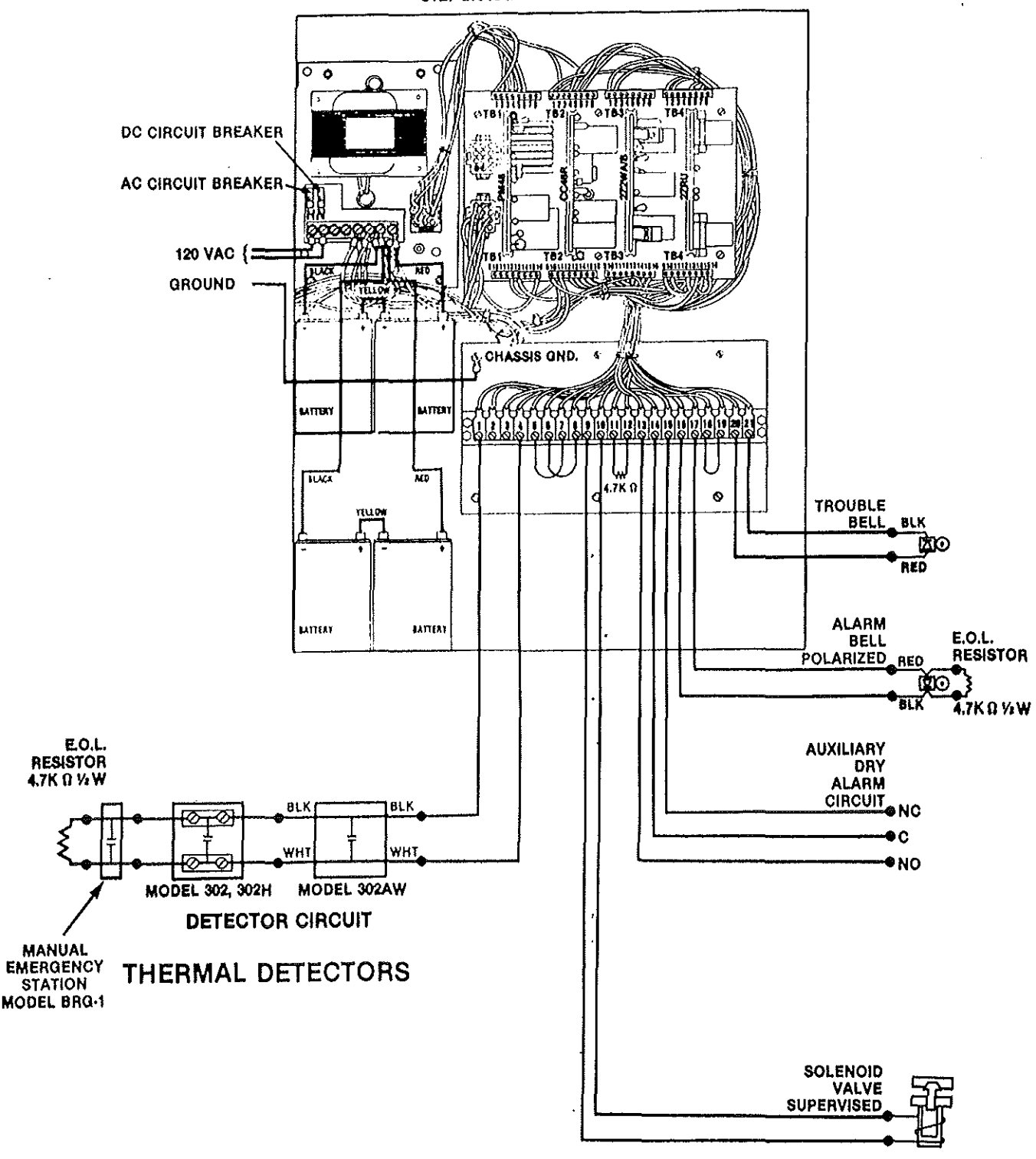
Test Outline Single Area Control Panel																				Detector Circuit		Solenoid Valve	
Operation	Simulates	Panel Buzzer	Alarm Bell	Trouble Bell	Solenoid Valve Operation	A.C. On	A.C. Low	A.C. Trouble	Batt. Trbl.	Ground on System	Card Missing	Alarm Ckt. Short*	Alarm Bell Trouble	Vacant	System Trouble	Alarm Silenced	Alarm	Trbl.	Alarm	Trbl.	Alarm
1. Initial Set Up:																							
a) Connect Battery Jumpers. No A.C.		On		On			On	On							On								
b) Press Silence Switch				On			On	On							On								
2. Power A.C. Line	Normal Standby Condition					On																	
3. Press Lamp Test		On				On	On	On	On	On	On	On	On	On	On	On	On	On	On	On	On		
4. a) Extend A.C. Circuit Breaker Button	A.C. Power Failure	On		On			On	On							On								
b) Depress A.C. Circuit Breaker Button	A.C. Power Restored					On																	
5. Temporarily Remove Both Battery Jumpers	Battery Failure	On		On		On			On						On								
6. Disconnect Wire From Terminal 16	Break In Alarm Bell CKT.	On		On		On							On		On								
7. Temporarily Short Terminals 16 & 17	Short In Alarm Bell CKT.	On		On		On						On	On		On								
8. Temporarily Short to Ground Terminals 1, 4, 5 & 8 Individually	Ground Fault	On		On		On				On					On								
9. Disconnect Wire From Terminal 9	Break In Solenoid Valve CKT.	On		On		On									On					On			
10. Disconnect Wire From Terminal 4	Break In Detector CKT.	On		On		On									On			On					
11. Temporarily Short Terminals 1 & 2 (For Class A Only) or 1 & 4 (For Class B Only)	Detector Operation		On		On	On											On		On		On		
Press Silence					On	On										On	On		On		On		
Press Reset						On																	
12. Operate Detector	Fire		On		On	On											On		On		On		
Press Reset						On																	

*Red L.E.D. visible only with inner door open.

Fig. 5

FIELD WIRING DIAGRAM - SINGLE AREA CONTROL PANEL

- Class 'B' Detector Circuit Wiring
- Thermal Detector:
  Interior, Models 302 and 302H
  Weather Proof, Model 302AW
- U.L. Listed



Trouble Shooting Guide for Model 4800 Supertrol Control Panel

The following table provides a simplified trouble shooting guide which indicates corrective action for the more common problems which may occur. This guide first separates the panel and the field wiring (Steps A thru C). The panel is then tested (Step D). If the panel tests properly in Step D, the problem has then been isolated to the field wiring. Steps E1 thru E8 systematically reconnect the panel and the field wiring. This allows the problem to be specifically located and corrected in the field wiring.

Prior to testing, notify the local Superintendent of Fire Alarms, then close main valve.

A. Disconnect A.C. power from panel.

B. Disconnect one end of each yellow battery jumper wire.

C. Disconnect all external wiring from control panel. Install jumper wire and resistor to field wiring terminal strip as follows:

1. Jumper the following terminals (if jumper wire is present, it must remain) on the field wiring terminal strip: 1 to 3, 2 to 4, 5 to 7, 6 to 8 and 18 to 19.
2. Connect a 4.7K ohm ½ watt resistor across the following terminals (if a resistor is present, do not add another but verify its resistance – 4.7K ohm, replace if faulty): 9 & 10, 11 & 12 and 16 & 17.
3. Terminals 13, 14, 15, 20 and 21 remain vacant.

D. Test Panel as follows:

Operation	Panel Indication
1. Connect both yellow jumpers Connect AC Power. Reset both circuit breakers. Press silence and reset switches.	AC ON
2. Press Lamp Test Switch	All L.E.D.'s & Buzzer ON
3. Release Lamp Test Switch	AC ON

The above indication is normal therefore external wiring should be investigated.

E. The external circuit containing the problem may be identified by observing the control panel lights when reconnecting each external circuit, individually:

1. Alarm Circuit – Remove resistor from terminals 16 and 17 and connect alarm bell, observing correct polarity.

SYMPTOM	PROBABLE CAUSE	CORRECTION
• Alarm Bell Trouble • System Trouble	Open Circuit in Wiring	Repair
	E.O.L. Resistor Omitted	Install
• Alarm Bell Trouble • System Trouble • Alarm CKT. Short (Red L.E.D. On Open Inner Door Observe Top L.E.D. on CC48R Card)	Non Polarized Bell installed	Replace with polarized Bell.
	Short in Alarm CKT.	Repair
	Polarity Reversed	Correct Bell polarity.

2. Trouble Bell Circuit – Connect trouble bell to terminals 20 and 21 observing correct polarity.

• Bell does not ring during trouble condition. Simulate trouble by temporarily removing wire from terminal 1.	Polarity Reversed	Correct Polarity
	Open CKT. in Wiring	Repair
	Faulty Bell	Replace
	Bell of Incorrect Voltage	Replace with 24 Vdc Bell.

3. Solenoid Valve Circuit – Remove resistor from terminals 9 and 10 and connect solenoid valve.

• Solenoid Valve Trouble • System Trouble	Open CKT. in Wiring	Repair
	Open CKT. in Solenoid	Replace

4. Additionally for Two Area Panel – Remove resistor from terminals 11 and 12 and connect solenoid valve 2.

• Solenoid Valve 2 Trouble • System Trouble	Open CKT. in Wiring	Repair
	Open CKT. in Solenoid	Replace

5. Detector Circuit 1 Class A – Prior to connecting wires to panel, confirm continuity between wires to be connected to terminals 1 and 3, 2 and 4 and that no continuity exists between wires to be connected to terminals 1 and 2, 3 and 4. Remove jumpers from terminals 1 and 3, 2 and 4. Connect wires from detectors to terminals 1, 2, 3 and 4 per appropriate field wiring diagram.

• Detector CKT. 1 Trouble • System Trouble	Open in Either Detector Loop	Repair
• Ground on System • System Trouble	Short to Ground on Either Detector Loop Wire	Repair
• Detector CKT. 1 Alarm • Alarm	Short, Loop to Loop	Repair
	Detector Activated	Remove Heat or Smoke, Press Reset Switch
	Detector Faulty	Replace

CONTINUED

6. Detector Circuit 1 Class B – Remove jumpers from terminals 1 and 3, 2 and 4. Connect wires from detectors to terminals 1 and 4 per appropriate field wiring diagram.

SYMPTOM	PROBABLE CAUSE	CORRECTION
• Detector CKT. 1 Trouble • System Trouble	Open in Detector Loop	Repair
	E.O.L. Resistor Omitted	Add
• Ground on System • System Trouble	Short to Ground on Either Detector Loop Wire	Repair
• Detector CKT. 1 Alarm • Alarm	Short, Wire to Wire	Repair
	Detector Activated	Remove Heat or Smoke, Press Reset Switch
	Detector Faulty	Replace

7. Additionally for Cross Zoned and Two Area Panels:
Detector Circuit 2 Class A – Prior to connecting wires to panel, confirm continuity between wires to be connected to terminals 5 and 7, 6 and 8 and that no continuity exists between wires to be connected to terminals 5 and 6, 7 and 8. Remove jumpers from terminals 5 and 7, 6 and 8. Connect wires from detectors to terminals 5, 6, 7 and 8 per appropriate field wiring diagram.

• Detector CKT. 2 Trouble • System Trouble	Open in Either Detector Loop	Repair
• Ground on System • System Trouble	Short to Ground on Either Detector Loop Wire	Repair
• Detector CKT. 2 Alarm • Alarm	Short, Loop to Loop	Repair
	Detector Activated	Remove Heat or Smoke, Press Reset Switch
	Detector Faulty	Replace

8. Detector Circuit 2 Class B – Remove jumpers from terminals 5 and 7, 6 and 8. Connect wires from detectors to terminals 5 and 8 per appropriate field wiring diagram.

• Detector CKT. 2 Trouble • System Trouble	Open in Detector Loop	Repair
	E.O.L. Resistor Omitted	Add
• Ground on System • System Trouble	Short to Ground on Either Detector Loop Wire	Repair
• Detector CKT. 2 Alarm • Alarm	Short, Wire to Wire	Repair
	Detector Activated	Remove Heat or Smoke, Press Reset Switch
	Detector Faulty	Replace

Supervisory Air Maintenance Supplies

General

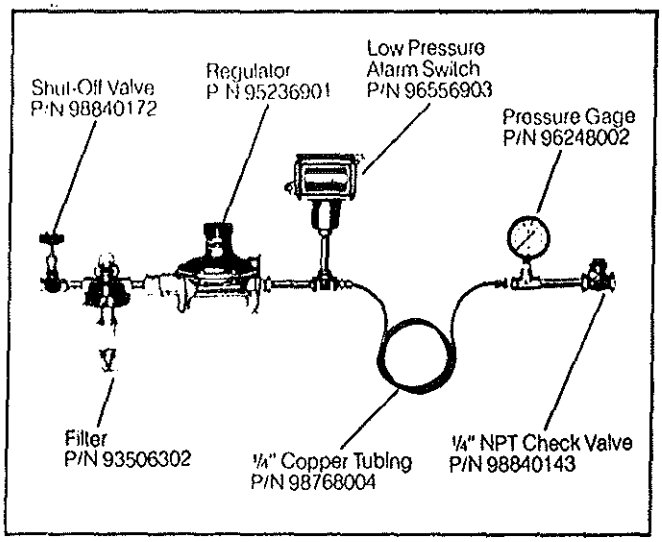
Reliable Supervisory Air Maintenance Supplies provide low pressure air to the sprinkler piping of a pre-action system. Leakage, such as caused by damage to the piping or closed sprinklers, will cause the supervisory air pressure to drop thereby activating an alarm or an alarm circuit.

Model C Air Maintenance Device

Model	Part No.	Description	Low Pressure Alarm Switch Elec. Rating
C	6704030000	Supervisory Air Supply – Owners Air	Single Pole, Double Throw, 15 Amp, 120/240 Vac 10 Amp, 12 Vdc Inductive 0.50 Amp, 125 Vdc Inductive

W x H x D Inches	Shipping Wgt. Lbs.	Approvals
26 x 15 x 6	9	UL Listed FM Approved

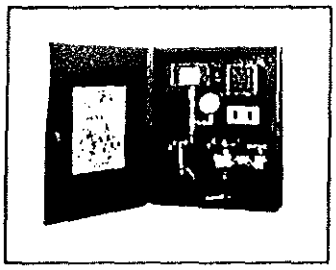
The Model C Air Maintenance Device is a supervisory air supply for use where a clean, dependable and continuous (24 hours per day, 7 days per week) owners air source is available. The ¼" NPT check valve is to be connected at the sprinkler piping with its flow arrow pointing towards the sprinkler piping. The ¼" copper tubing is used to connect the check valve/gage assembly to the ¼" tee at the regulator outlet. The Model C Air Maintenance Device reduces 50 to 150 psi supply pressures to approximately 30 oz/in² outlet pressure. A separate, unsupplied alarm must be connected to the low air alarm switch, this switch is factory set to transfer contacts when the supervisory pressure falls below approximately 11 oz/in².



Model B Air Compressor Panel

Model	Part No.	Description	Elec. Req'm.
B	6702010000	Self-contained Supervisory Air – Compressor Panel	120 Vac, 60 Hz, 1.5 Amp

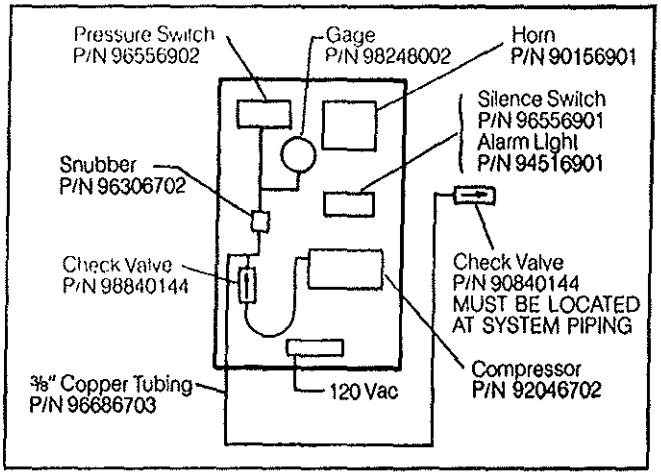
W x H x D Inches	Mounting Dim W x H Inches	Shipping Wgt. Lbs.	Approvals
16 x 20 x 6	14¼ x 18¼	27	UL Listed FM Approved



The Model B Air Compressor Panel is a self-contained supervisory air supply. The panel is supplied with a separate assembly consisting of a check valve, copper tubing and tubing connector. The ¼" NPT check valve must be installed at the sprinkler piping with its flow arrow pointing towards the sprinkler piping. The copper tubing connects the other end of the check valve to the air compressor panel air outlet.

The panel is intended for wall mounting and contains an integral alarm horn. The panel will supply approximately 30 oz/in² air pressure and the alarm will sound for pressures less than approximately 11 oz/in². A silence switch is provided to silence the alarm horn (but not the alarm light) while supervisory pressure builds up or repairs are made. OS&Y monitor switch connections are terminals M1 and M2. Monitor switch contacts must be open when OS&Y valve is open. 120 Vac power connections are terminals L1 and L2.

Note: 1. Small capacity compressor requires long initial fill time.
2. Special wrench P/N6917000000 for pressure switch cover screws located on top of switch



Maintenance

Model B Air Compressor Panel

The following table provides a simplified trouble shooting guide which indicates the necessary corrective maintenance for the more common problems which may occur.

	Symptom	Probable Cause	Correction
A.	Pressure Too Low 1. Compressor runs continuously	Leak	Isolate system from compressor panel and test as follows: 1. Remove ⅜" tubing from ¼" check valve at system riser and cap with finger as a seal 2. Run compressor until gage indicates pressure. 3. With compressor off, relieve pressure to bring gage into readable range, then reseal. 4. Steady gage indicates no leak at panel; therefore leak is in system–repair. 5. Dropping gage indicates leak at panel–repair or replace leaking component.
	2. Compressor doesn't run	No power at panel	Provide power at panel
		Pressure Switch out of adjustment.	Adjust as follows: 1. Remove cover using special wrench taped to pressure switch. 2. Adjust hex screw at center using ¼" open end wrench. 3. Raise set point by moving wrench handle to right. 4. Lower set point by moving wrench handle to left. 5. Adjust switch to turn compressor on at 25 ± 1 oz/in² on decreasing pressure. Note that this adjustment may require horn adjustment. See C below.
B	Compressor cycles excessively	Leak upstream of ¼" valve at system riser	Repair, See A 1 Above.
C.	Horn sounds before compressor starts as pressure decreases (silence switch in normal position).	Pressure switch out of adjustment	Adjust as follows: 1. Remove cover using special wrench taped to pressure switch. 2. Adjust hex screw at left using ¼" open end wrench. 3. Raise horn set point by moving wrench handle to left. 4. Lower horn set point by moving wrench handle to right. 5. Adjust switch to turn horn on at 11 ± 1 oz/in² on decreasing pressure.

Reliable®

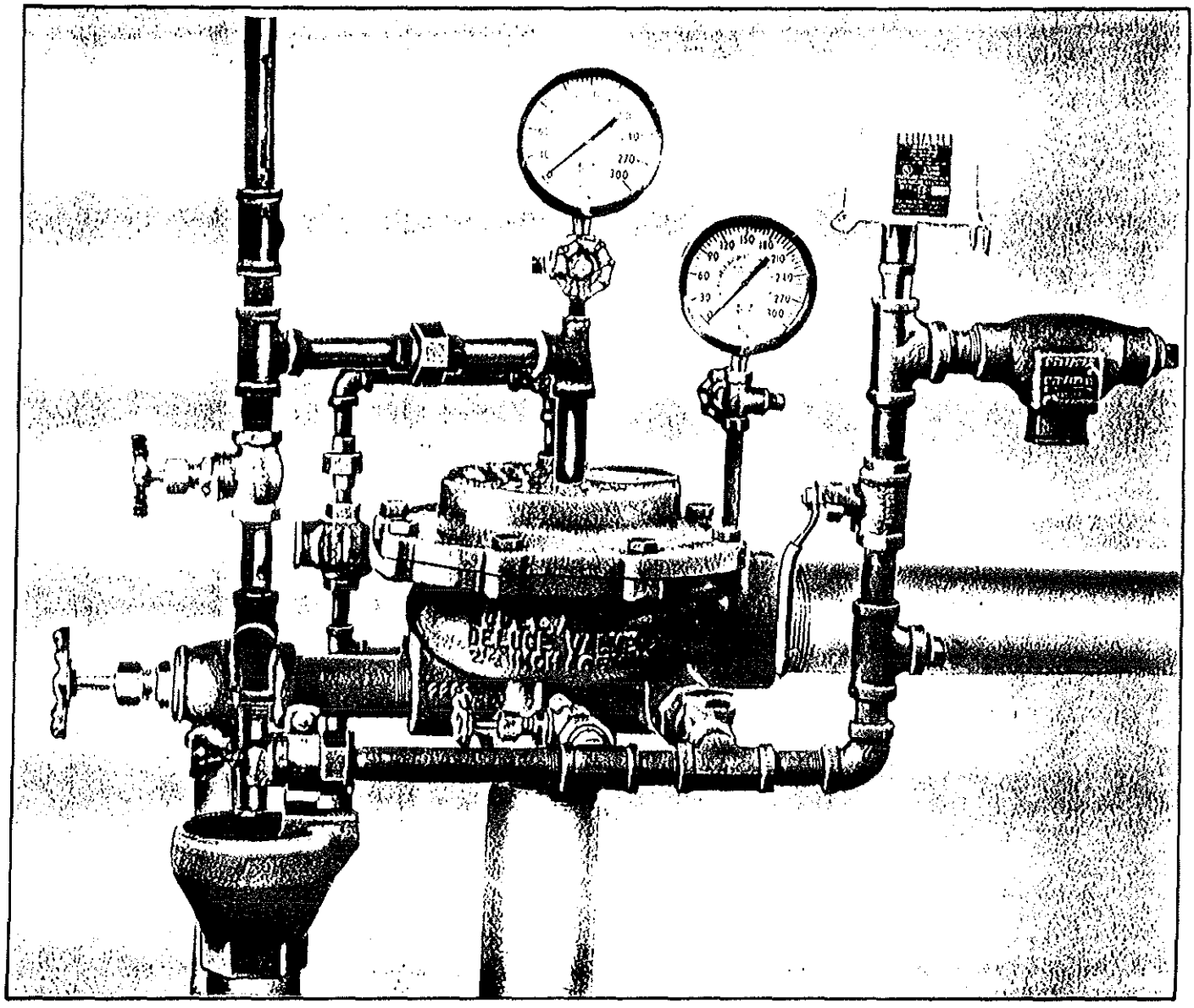
Model A Deluge Valve

SUPERTROL 4800

Instructions for Installation, Operation, Care and Maintenance

2½" Size Wet, Dry Pilot Line Actuation Details

Listed by Underwriters Laboratories, Inc. Approved by Factory Mutual Research Corporation, and other fire insurance and governmental agencies in the United States and foreign countries.



The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

General

The Reliable Model A 2½" Deluge Valve is a hydraulically operated differential diaphragm type valve designed for use as the primary control valve in deluge, preaction, or special types of fire protection systems.

The valve is easily reset by external hydraulic means which eliminates the need for removing cover plates.

The basic trim set is used with every Model A 2½" Deluge Valve. This trim set provides drain, top chamber supply, alarm, alarm test and gauge connections.

Two alternate actuation trim sets, Wet Pilot Line or Dry Pilot Line, provide connections for actuation by Wet Pilot Sprinklers and devices, Hydraulic Manual Emergency Pull Boxes, Solenoid Valves or Dry Pilot Sprinklers and devices. Actuation by solenoid valves enables a full range of electrical detectors to be used for remote sensing.

Valve Operation

Reliable's Model A 2½" Deluge Valve is a quick opening hydraulically operated, diaphragm actuated type valve. The Model A consists of three chambers, top (pressurized), outlet (normally dry) and inlet (pressurized). The three chambers are isolated from each other by the diaphragm and piston and compression limited seat seal. In the closed position (Figure 1) supply pressure in the top chamber acts across the diaphragm and piston holding the piston on the seat against inlet supply pressure. The diaphragm pressure area is greater than the seat pressure area providing a force imbalance of about 3 to 1.

When a fire is detected, the top chamber is vented to atmosphere through the outlet port via opened actuation devices. The top chamber pressure cannot be replenished from the restricted inlet port, and the chamber pressure falls instantaneously. When the top chamber pressure reaches about ⅓ the supply pressure, the upward force of the supply pressure acting on the piston face is greater than the downward force of the diaphragm and the piston moves up to the open position (Figure 2).

Once the piston has opened water flows from the supply through the Deluge Valve into the piping system and alarm outlet to the alarm devices. The valve maintains the open position until the open releasing device(s) is closed.

Caution: The Releasing Device must be maintained open to prevent closing of the Model A Deluge Valve.

After system shutdown, the valve is easily reset, without special tools by restoring detection devices to the closed position by resetting or replacing the device. Once the detection device is closed and supply pressure is resupplied to the top chamber, the deluge valve will close. The external hydraulic reset feature of the Model A 2½" Deluge Valve provides a means for simple, economical system testing which is one essential facet of a good maintenance program.

Valve Description

1. Rated working pressure 175 psi (12, 1 bar)
2. Factory hydrostatic test pressure 350 psi (24, 1 bar)
3. End and trim connections—Three valve connection styles are available.
   a. 2½" American Standard taper pipe threads inlet and outlet per ANSI B2.1.
      - Threaded opening per ANSI B2.1.
      - Reliable's standard trim sets are compatible with American Standard taper pipe threads.
      - Color—Light Gray
   b. 2½" Grooved Inlet and Outlet
      - Threaded openings per ANSI B2.1.
      - Reliable's standard trim sets are compatible with Grooved Valves
      - Color—Light Gray

U.S. Groove Dimensions in Inches			
Outlet Dia.	Groove Dia.	Groove Width	Outlet Face to Groove
2.875	2.720	5/16	1/8

   c. 2½" (65 mm) British Standard pipe threads inlet and outlet per BS21-1973

Model A Deluge Valve

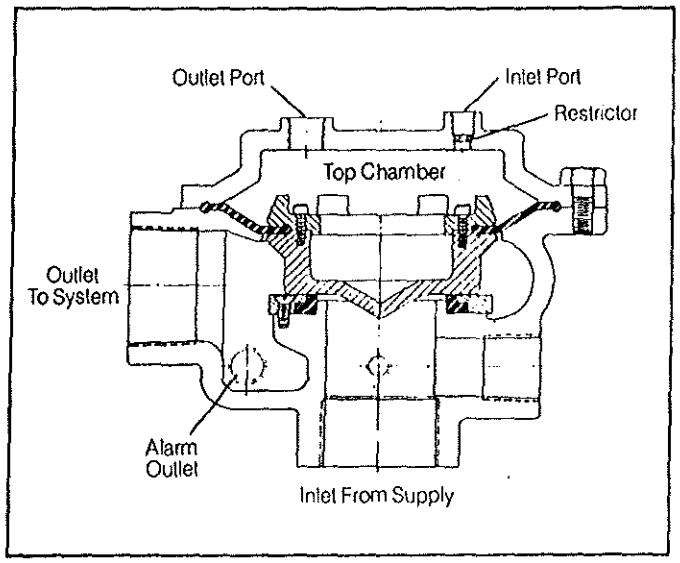


Figure 1—Closed Position

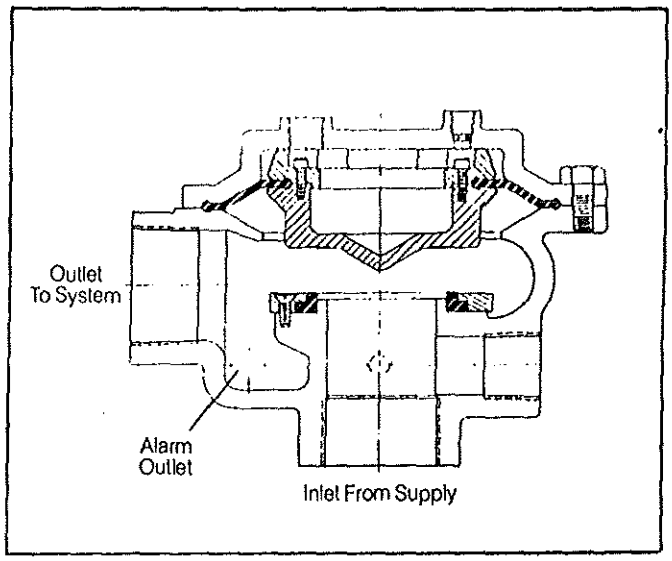


Figure 2—Open Position

- Threaded Openings per BS21-1973
- Reliable's standard trim sets may be used with Metric Valves providing trim is assembled carefully and extra thread sealant is applied to connections between valves and trim.
- Color—Light Blue

4. Shipping Weight—49 lbs. (22 Kg)
5. Friction Loss—Expressed in Equivalent Length of Pipe, Based on Hazen & Williams formula with C = 120. Equiv. Length = 17.1 ft.
6. Installation position Vertical.

Trim Description

The trimmings for the Reliable Model A Deluge Valve are arranged for rapid, easy compact attachment and serve as connection points to Reliable Alarm and other devices.

The Model A Deluge Valve trim sets are:

a. Basic trim set.
b. Wet pilot line trim set.
c. Dry pilot line trim set.

The basic trim set (Figure 3) is used with every Model A Deluge Valve. This trim set provides the supply pressure gauge, the 1¼" main drain connection, the alarm connection, the alarm test connection and the top chamber supply connection.

The wet pilot line trim set (Figure 3) is connected to the top chamber outlet. This trim set is used when wet pilot sprinklers, hydraulic manual emergency pull boxes or solenoid valves are used for actuation. The wet pilot line trim set includes a gauge to read top chamber pressure, a globe valve for manual operation of the deluge valve and a connection for the actuation device.

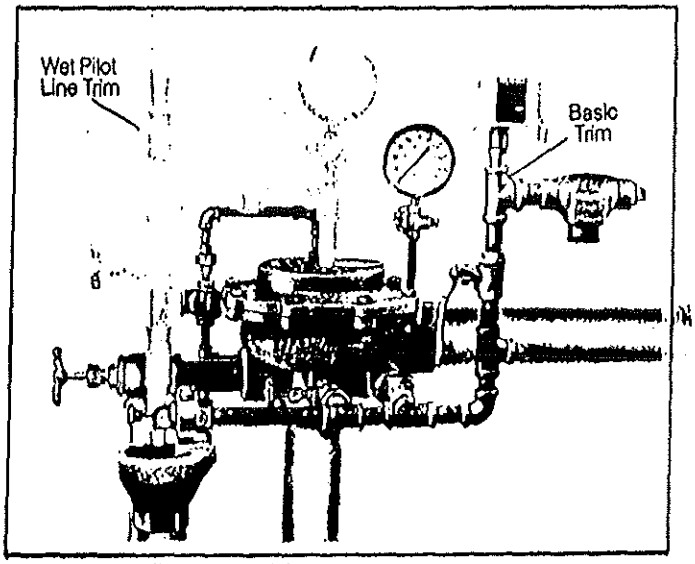


Figure 3—Model A Deluge Valve with Basic Trim and Wet Pilot Line Trim

All valves are listed and approved by Underwriters Laboratories, Inc. and Factory Mutual Research Corp. only when used with the valve manufacturer's trim sets.

Basic Trim

The Basic Trim is required on all Reliable Deluge Valves regardless of the application. It contains those components which are required on all installations, such as the 1¼" Main Drain Connection, the Alarm Connection, Alarm Test Connection, and Top Chamber Supply Connections. The Model A 2½" Deluge Valve has 6 tapped openings for the attachment of the trimmings. Each opening is marked on the valve to indicate its use.

The recommended sequence of attaching the basic trimmings is as follows:

Refer to Figures 5 and 6

1. Install Nipple (27) in the tapped opening marked Test. Install the Globe Valve (8) on the Nipple (27), the flow arrow is to point away from the deluge valve. Install the Nipple (31) on the end of the Globe Valve (8), then install ½ of the Union (19) on the Nipple (31).
2. Install the Nipple (24) in the tapped opening marked ALARM. Install ½ of the Union (18) on the Nipple (24).
3. It is recommended to bench assemble the remainder of the alarm, test trim as follows:

   Install the other ½ of the Union (19) on Nipple (30). Install Tee (14) on Nipple (30). Hold this sub-assembly aside. Install the other ½ of Union (18) to another Nipple (24). Install Check Valve (9) and Nipple (24) with the flow arrow pointing away from Union half (18). Install another Nipple (24) to Check Valve (9), then install Tee (13) on Nipple (24). Join this sub-assembly to the previous sub-assembly using Nipple (23). Tighten the sub-assemblies together at the juncture of Tee (14), Nipple (23) and Tee (13) checking the alignment of Union halves (19) and (18) with their mating halves previously installed in the valve body test and alarm threaded openings. Now attach this loop to the valve at the Unions (19 and 18).
4. Continue to assemble the alarm-test trim as shown by Figure 5.

Note: The Strainer (4) must be installed to protect the mechanical sprinkler alarm nozzle. The strainer should be installed to permit easy access for cleaning.

5. Install the Nipple (27) in the opening marked SUPPLY. Install the Tee (15), Nipple (30) and Check Valve (10) assuring the arrow allows water to flow from the opening marked SUPPLY. Install the remainder of the supply trim from the Check Valve (10) to the Unions (19) and from the Tee (15) to the Pressure Gauge (6) as shown. Complete the supply trim from the opening marked IN on the cover to the Union (19).
6. Install the 1¼" Drain Valve (7) to the deluge valve "Drain" threaded opening using the Nipple (20).

Deluge Valve Basic Trimming Parts List

Item No.	Part No.	Description	No. Req'd.
1	71010471	Drip Cup Assembly	1
2	78653100	Ball Drip Valve ½"	1
3	98840105	Ball Valve ½"	1
4	78650200	Strainer ¾"	1
5	98727605	Strainer ¼"	1
6	98248001	Gauge Water ¼"	1
7	98840106	Valve Angle 1¼"	1
8	98840172	Globe Valve ¼"	2
9	98840181	Valve Horiz. Check ½"	1
10	98840143	Valve Horiz. Check ¼"	1
11	98840160	Valve Gauge 3 Way ¼"	1
12	98761601	Tee ½" x ½" x ¾"	1
13	98761603	Tee ½" x ½" x ½"	2
14	98761605	Tee ½" x ½" x ¼"	1
15	98761606	Tee ¼" x ¼" x ¼"	2
16	98164401	Ell ½"	1
17	98164402	Ell ¼"	4

Wet Pilot Line Trim

The Wet Pilot Line Trim is the more versatile of the trim sets required for actuation. It is used when the detection method is a wet pilot line of sprinklers, electrical heat actuated devices, or other electrical control detectors. The Wet Pilot Line Trim set provides a gauge to read top chamber pressure, a hand valve for manual operation of the deluge valve and an opening for connection to the operating mechanism. The Wet Pilot Line Trim set has been designed to allow the installer to loop the solenoid drain into the standard wet trim when electric solenoid actuation is utilized. This eliminates installing an additional drip cup. Refer to Figure 8 for the arrangement and required installer supplied piping.

Item No.	Part No.	Description	No. Req'd.
18	98805200	Union ½"	1
19	98805201	Union ¼"	3
20	98523256	Nipple 1¼" x 3"	1
21	98523242	Nipple ¾" x 2"	1
22	98523204	Nipple ½" x 6"	1
23	98523209	Nipple ½" x 2"	4
24	98523210	Nipple ½" x 1½"	4
25	98523217	Nipple ¼" x 6"	1
26	98523211	Nipple ¼" x 4½"	2
27	98523219	Nipple ¼" x 3"	2
28	98523212	Nipple ¼" x 2½"	1
29	98573220	Nipple ¼" x 2"	1
30	98523213	Nipple ¼" x 1½"	7
31	98523214	Nipple ¼" x CL.	2
32	98604401	Plug ¾"	1
33	98604402	Plug ½"	1
34	98604403	Plug ¼"	1

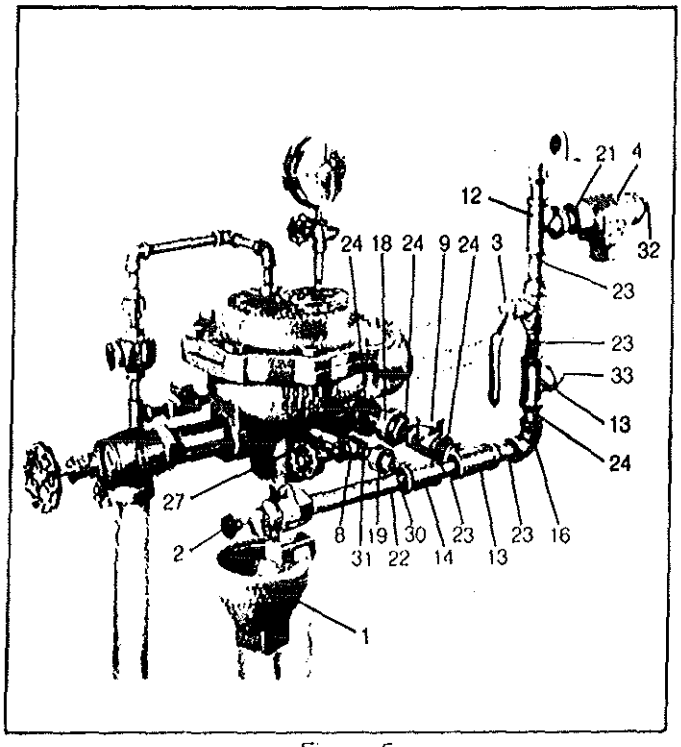


Figure 5

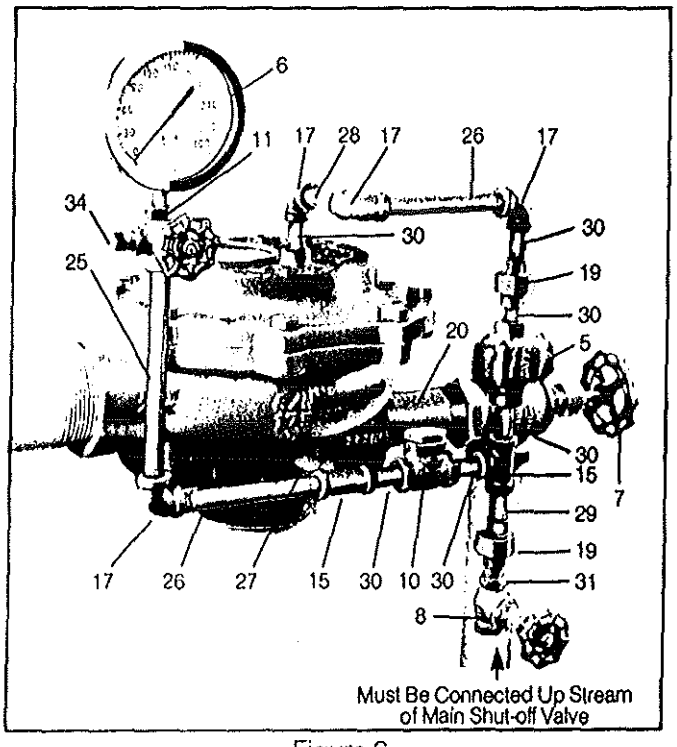


Figure 6

Refer to Figure 7 for installation of the Wet Pilot Line Trim.

Note 1:

Drain pipe from Cup, J should be run as direct as possible to an open drain. If it be absolutely necessary to connect it to the 1¼" main drain line, install a check valve in the drip cup drain line at least 4 feet below the drip cup so as to give proper head for discharge of water into the main drain line.

Wet Pilot Line Trim Parts List

Item No.	Part No.	Description	No. Req'd.
1	98840171	Globe Valve ½"	1
2	98248001	Water Gauge ¼"	1
3	98840160	Valve Gauge 3 Way ¼"	1
4	98761603	Tee ½" x ½" x ½"	3
5	98761604	Tee ½" x ¼" x ½"	1
6	98164401	Ell ½"	1
7	98805200	Union ½"	1
8	98523230	Nipple ½" x 3"	4
9	98523208	Nipple ½" x 2½"	1
10	98523209	Nipple ½" x 2"	1
11	98523210	Nipple ½" x 1½"	2
12	98523214	Nipple ¼" x CL.	1
13	98604403	Plug ¼"	1
14	98604402	Plug ½"	2

Electrical Operation

The wet pilot line trim kit is also used for electrical actuation.

In this case the solenoid valve is the means of actuation. The solenoid valve piping may be looped into the standard wet trim by installer supplied fittings to avoid the need of a separate drip cup or drain line. See Fig. 8 for arrangements. Details on the electrical portion of this system can be found in Reliable Bulletin No. 706 "Supertrol Mod. 4800 Electrical Systems".

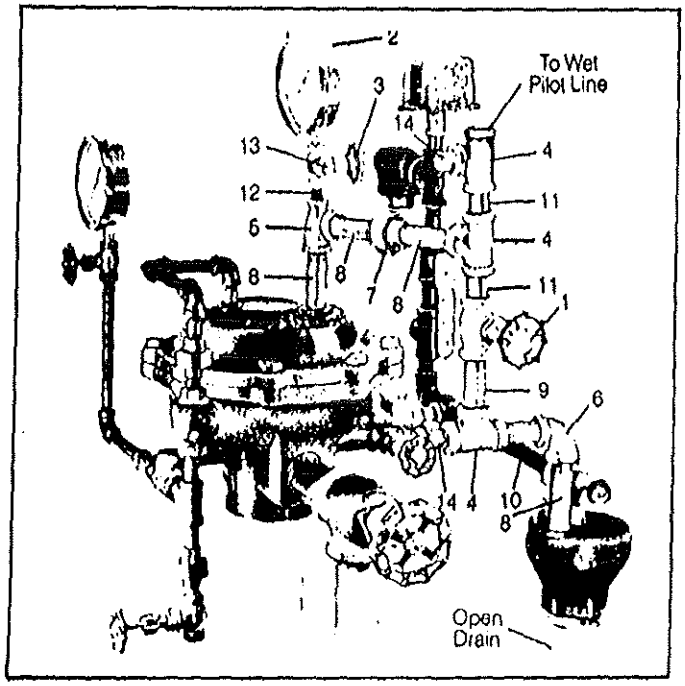


Figure 7—Wet Pilot Line Trim

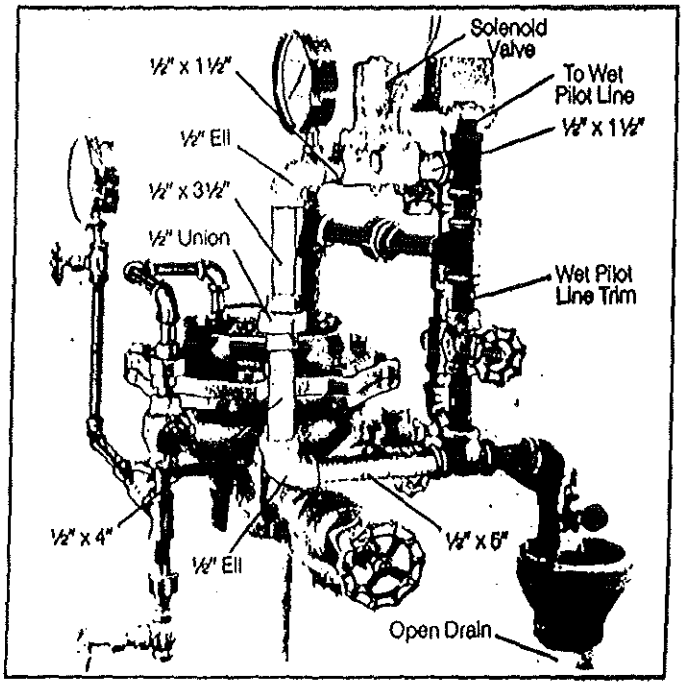


Figure 8—Deluge Valve Pilot Line Trim with Field Supplied Electrical Actuation Loop

2½" Deluge Valve Parts

Item No.	Part No.	Description	No. Req'd.
1	91006402	Body	1
2	92106402	Cover	1
3	95616402	Soc. Flat Hd. Cap Scr.	6
4	96006402	Retainer Ring	1
5	91906402	Piston	1
6	95606402	Soc. Hd. Cap Scr.	8
7	92206402	Rubber Facing	1
8	95306402	Clamping Ring	1
9	93406402	Rubber Seal	1
10	91106123	Cover Bolt	8
11	94206406	Orifice Inlet	1

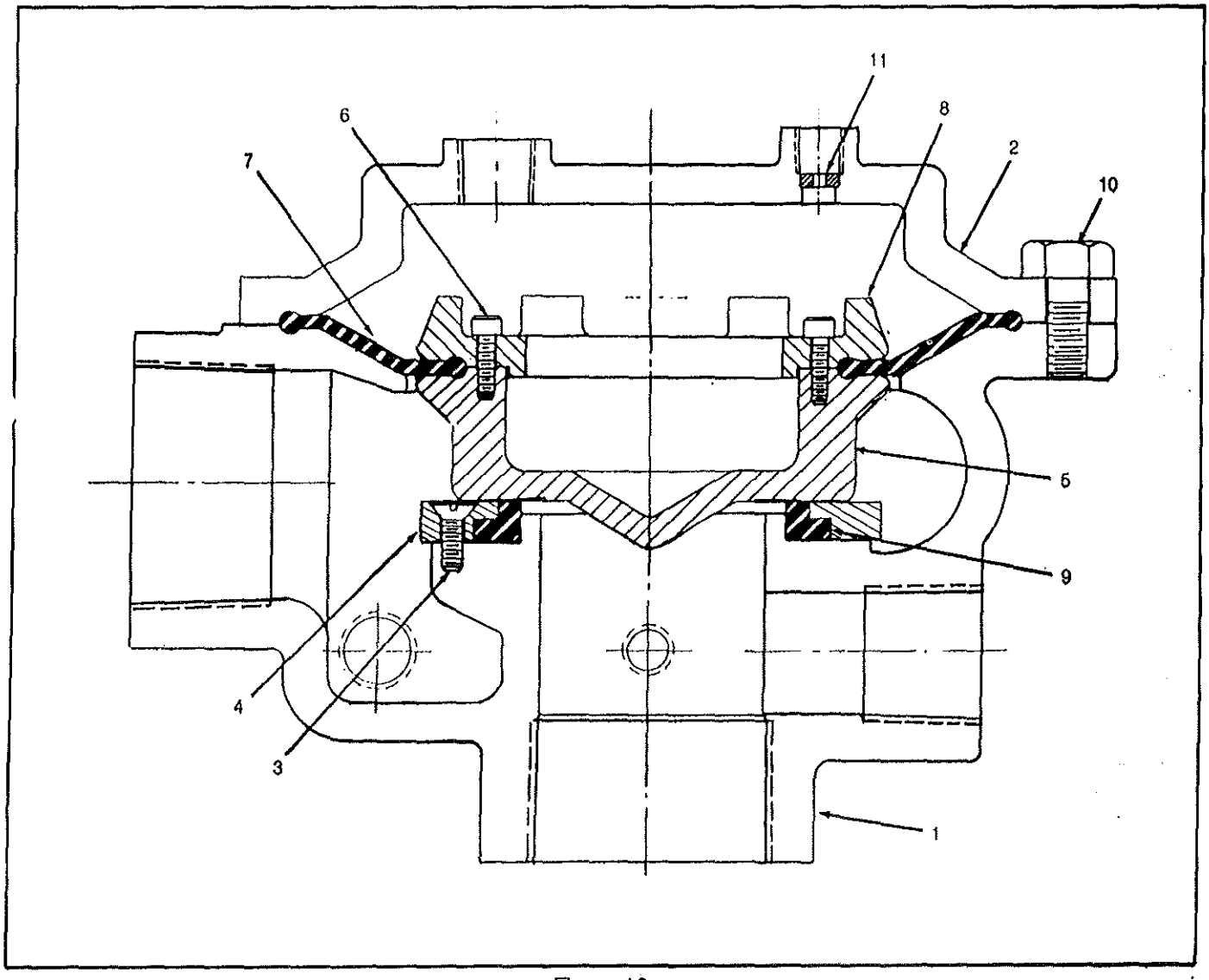


Figure 10

Resetting Deluge Valve

Refer to Figs. 11

1. Close valve controlling water supply to deluge valve.
2. Open main drain Valve A and drain system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped. Open Valve B
4. Push in plunger of ball drip Valve H to force ball from its seat.
5. Inspect and replace any portion of the detection system subjected to fire conditions.
6. Open Valve C and allow water to fill the top chamber. Close Valve B
7. Bleed all air from actuation piping.

C. Electrical Actuation—Open the solenoid valve by operating a detector or a manual pull station. While water is flowing through the solenoid allow the solenoid valve to close. Refer to Bulletin No. 706 "Supertrol Model 4800 Elect. Sys."

8. Open slightly the valve controlling water supply to deluge valve, closing main drain Valve A, when water flows. Observe if water leaks through ball drip Valve, H, into Drip Cup, J. If no leak occurs the water seat is tight. Open slowly but fully the valve controlling water supply to deluge valve, and seal in the open position.
9. Close Valve C.

Inspection and Testing

Refer to Figs. 11

1. Water Supply—Be sure valves controlling water supply to deluge valve are open fully and sealed in this position.
2. Alarm—Be sure Valve F is open and sealed in this position.
3. Other Trimming Valves—Check that Valve E is open and Valves B, C, and G are closed.
4. Ball Drip Valve—Push in on plunger of Valve H to be sure ball check is off its seat. If no water appears, the deluge valve water seat is tight.
6. Actuation Mechanism—Check outlet of actuating mechanism (i.e., Dry Pilot Line Actuator, Solenoid Valve, or Hydraulic Manual Pull Boxes for leakage).
7. Testing Alarms—Open Valve G, permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor). After testing, close Valve G securely. Push in on plunger of Valve H until all of the water has drained from the alarm line.
8. Operation Test—Open Valve B

   Note: Operation of Valve B will cause the deluge valve to trip.

Testing Detection System Without Operating Deluge Valve

1. Close the valve controlling water supply to deluge valve and open 1¼" drain Valve A, Fig. 11 on deluge system.
2. Open the ¼" Globe Valve C, Fig. 11 on the deluge trim that allows water to enter the top chamber.
3. Operate Detection System—

   C. Electrical Actuation—Refer to Bulletin 706

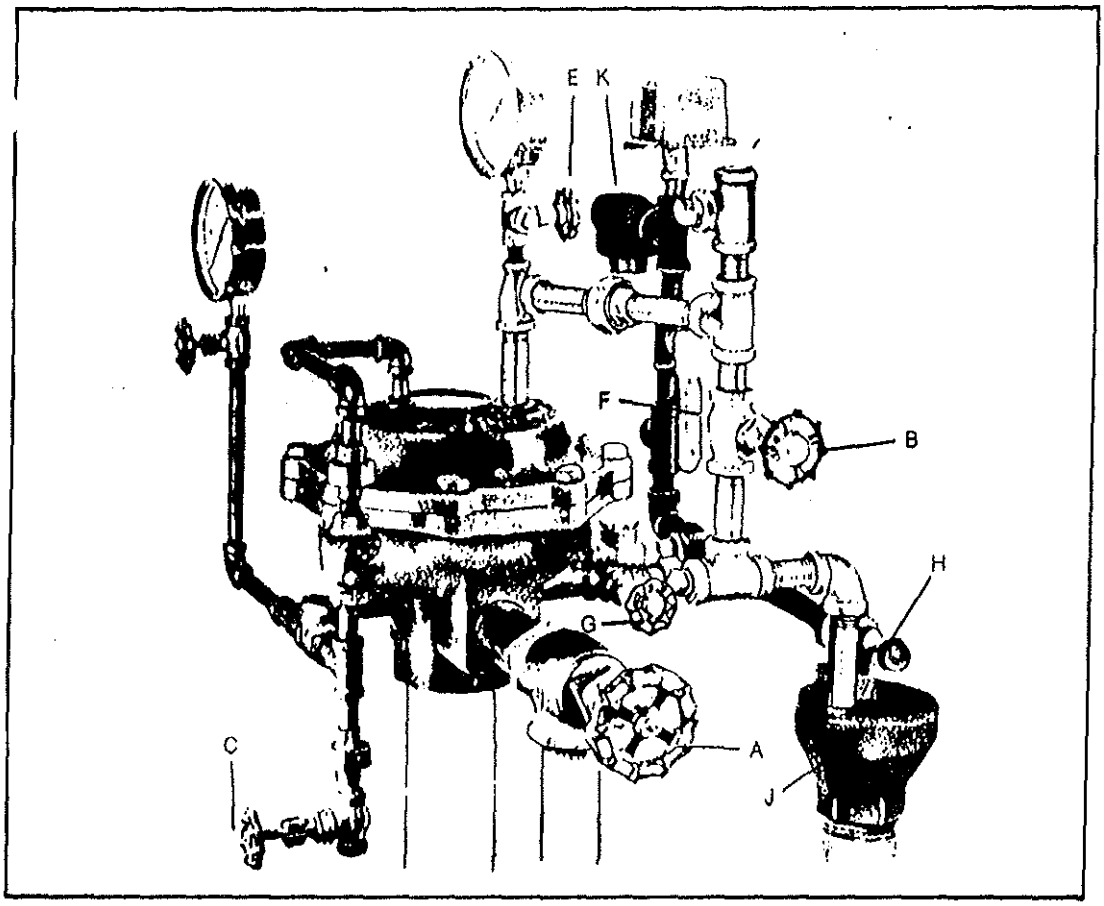
4. Operation of the Detection System must result in a sudden drop of water pressure in the deluge valve top chamber.
5. Reset Detection System—Reverse operations performed in step 3 above.
6. Open slightly valve controlling water supply to deluge valve, closing 1¼" drain Valve A, Fig. 11 when water flows. Open slowly but fully valve controlling water supply to deluge valve and seal in the open position.
7. Check ball drip valve for leakage.
8. Close Valve C.

Maintenance

Refer to Figs. 6, 7, 10, 11

Mechanical Sprinkler Alarm (Water Motor) not operating: This is most likely caused by a clogged screen in Strainer K, Fig. 11. Proceed as follows: remove plug from strainer, remove and clean the screen. Replace the screen and plug and tighten securely.

2. Steady Water Flow into Drip Cup. This condition is caused by water leaking past the Piston Seat Seal (9) or past the Diaphragm (7), Fig. 10. To locate and correct the trouble, proceed as follows.
   a. Carry out steps 1 through 4 of Resetting Deluge Valve Instructions.
   b. Assure the Alarm Test Valve G is tightly closed.
   c. Open Valve C and Close Valve B, then push the plunger on the ball drip Valve H. If water flows from the ball drip the Diaphragm (7) is leaking and must be replaced; proceed as follows:
      1) Close Valve C and open Valve B
      2) Break the trim at the Unions (19) & (7), Fig. 6 & 7. Remove 8 cover bolts (10).
      3) Lift the cover and partial trim from the valve body.
      4) Remove the assembled Piston (5) and Diaphragm (7), Fig. 10.
      5) Remove 8 Screws (6) holding the Diaphragm Clamping Ring (8). Remove the Clamping Ring (8) and Diaphragm (7).
      6) Install a new Diaphragm (7) with the cone shape facing away from the Piston (5) Face. Install the Clamping Ring (8) and Screws (6) and alternately tighten the screws until the clamping ring is metal to metal tight to the piston.
      7) Install the assembled piston and diaphragm in the body. Install the cover and align the diaphragm O-ring end to fit the Body (1) and Cover (2) grooves.
      8) Install the 8 Cover Bolts (10) alternately tightening until the cover has metal to metal contact with the body.
      9) Reconnect the trim at the unions.
      10) Repeat paragraphs 2a, 2b and 2c above.
   d. If no leakage was found in 2c above, then close Drain Valve A and slightly open the Valve controlling water supply pressure to the deluge valve. Wait 15 minutes, then push the plunger on the ball drip. If water flows from the ball drip, the Piston Seat Seal (9) is leaking and must be replaced; proceed as follows:
      1) Remove the Cover (2) and Piston (5) following steps 2c (1 through 4) above.
      2) Remove 6 Screws (3) holding the Seat Seal Retainer Ring (4). Remove the Retainer Ring (4) and Seat Seal (9).
      3) Clean the seal cavity in the Valve Body (1) and Retainer Ring (4). Place a new Seal (9) in the Valve Body (1).
      4) Install the Retainer Ring (4) and Screws (3) and alternately tighten the screws until the retainer ring is in metal to metal contact with the valve body.
      5) Clean the Piston (5) face and reassemble the valve following steps 2c (7 through 9) above.
      6) Repeat all leakage testing following steps 2a, 2b, 2c and 2d above.
   e. Reset and test the deluge valve in accordance with previous sections.



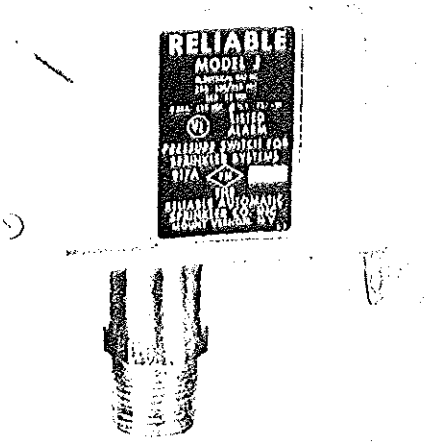
Model A Deluge Valve with Basic and Wet Pilot Line Trim

NOTE:
Electric Actuation Loop not shown. Refer to figure 8.

Figure 11

BULLETIN 609F

MODEL J



RELIABLE®

ELECTRIC SPRINKLER ALARM SWITCH

INSTRUCTIONS for . . . Installation, Operation, Care and Maintenance

Installed and Serviced by RELIABLE DISTRIBUTORS

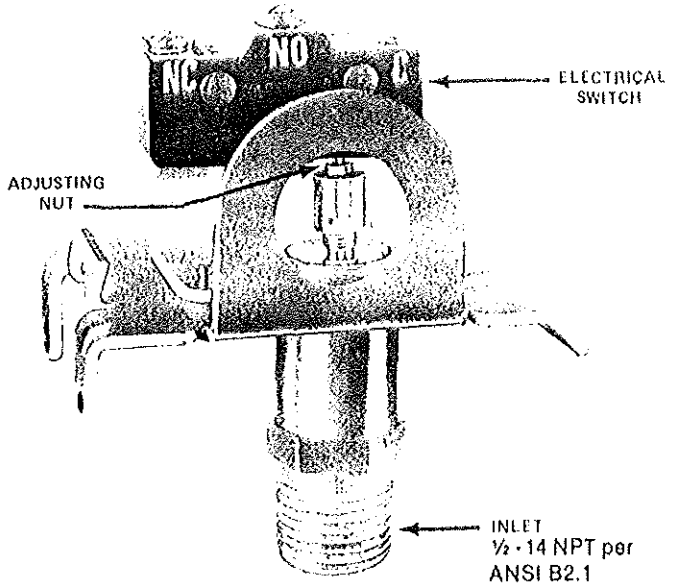
Listed by Underwriters' Laboratories, Inc. Approved by Factory Mutual Research Corporation, and other fire insurance and governmental agencies in the United States and foreign countries.

Manufactured by
THE RELIABLE® AUTOMATIC SPRINKLER CO., INC.
525 North MacQuesten Parkway
Mount Vernon, N.Y. 10552
(914) 668-3470

8-81 2M (B) PRINTED IN U.S.A.

INSTRUCTIONS

The equipment presented in this bulletin is to be installed in accordance with the latest published standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.



(For wiring diagram—see inside of front cover plate)

INSTALLATION

1. Screw the switch into the outlet provided for it in Alarm (Wet) or Dry Pipe Valve Trimmings. (See separate Alarm or Dry Pipe Valve bulletins for outlet location.)
2. Unfasten Switch Cover Screws and remove cover.
3. Connect ½" conduit or armored cable to the hole in the Switch Housing. (Electrical wiring should be in accordance with the National Electrical Code and other related standards.)
4. Run wiring and connect it to Switch Terminal Screws to suit the desired circuit arrangement.
5. Refasten the Switch Cover to the Housing.

ADJUSTMENT

The Switch is factory set to make or break a circuit at 4 to 6 PSI on rising pressure. This setting should serve most field conditions. Pressure settings may be changed by turning the Adjusting Nut. To raise the pressure setting turn the Adjusting Nut in a clockwise direction. (to left)

PRESSURE RATING

Adjustable range 2 to 20 PSI – Proof Pressure 300 PSI. Note: Proof Pressure is the maximum pressure the Switch will withstand without appreciably affecting the settings.

ELECTRICAL RATINGS

Single Pole, Double Throw. Suitable for ambient temperatures up to 180°F. Enclosure: NEMA 1

15 Amps, 125/250 Volts AC–10 Amps, 12 Volts DC–0.5 Amps, 125 Volts DC–0.25 Amps, 250 Volts DC–¼ HP, 125 Volts AC–½ HP, 250 Volts AC–125 VA Pilot Duty, 125/250 Volts AC.

OPERATION

When an alarm (Wet) or Dry Pipe Valve is operated by the fusing of one or more Automatic Sprinklers due to fire, water flows through the piping that connects the Sprinkler Alarm Switch to the Alarm or Dry Pipe Valve. As water pressure is introduced at the Sprinkler Alarm Switch Inlet the Diaphragm moves against the load spring, forcing plunger to actuate the Snap-Acting Electric Switch and thus complete the electrical circuit and operate the alarm.

The Alarm continues to sound or be transmitted as long as water is flowing through the Sprinkler System. It may be shut off by closing the Alarm Control Valve located in the piping line connecting the Sprinkler Alarm Switch with the Alarm (Wet) or Dry Pipe Valve.

Reliable Model J Sprinkler Alarm Switch is self-setting after each operation.

TESTING

1. Alarm Valve Installations

Refer to separate Alarm Valve Bulletin

The Sprinkler Alarm Switch may be tested without disturbing the Alarm Valve by opening the Alarm Test Valve located in the piping connecting it with the Alarm Valve.

To test the Sprinkler Alarm Switch and the Alarm Valve, open the 1" Inspectors Test Connection. It is usually located on the end or top line of the system and its opening is the equivalent to the fusing of one automatic sprinkler.

2. Dry Pipe Valve Installations

Refer to separate Dry Pipe Valve bulletins.

To test the Sprinkler Alarm Switch open the Alarm Test Valve located in the piping connecting the Switch with the Dry Pipe Valve.

Note: *Where the Sprinkler Alarm Switch is installed with Model C Dry Pipe Valve (refer to Bulletin No. 306B) it is necessary to open the drain line and close after flow has been stopped.*

INSPECTION AND MAINTENANCE

1. See separate pamphlet "Care and Maintenance of Sprinkler Systems."
2. Check inside of Switch Housing for any accumulation of dust, dirt or other foreign matter.
3. Be sure that wiring insulation is in good condition and wiring is fastened securely to the Switch Terminals.

SEQUENCE OF OPERATION
FOAM CABINET
CHANDLER MEDICAL CENTER

1. OPEN FRONT OF FOAM CABINET.
2. PUSH LIGHTED BUTTON TO ACTIVATE FOAM SYSTEM.
3. BUILDING FIRE ALARM NOTIFIED.
4. UNREEL HOSE TO DESIRED LENGTH.
5. AIM NOZZLE AT BASE OF FIRE.
6. OPEN HANDLE ON NOZZLE
7. WHEN FIRE IS EXTINGUISHED, CLOSE NOZZLE.

ANGUS LOW PRESSURE
Variable Foam Eductors

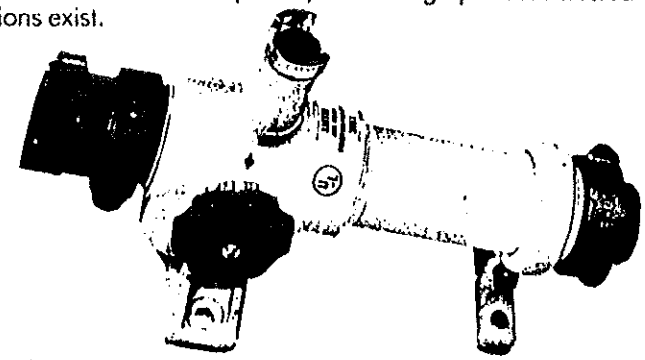
These low pressure (60-150 psi at inlet) eductors when matched with Angus Foam-making nozzles provide the simplest possible means of supplying the foam to the fire—where it is needed.

They can be placed at the pumper or any other convenient location thus giving the nozzle operator a considerable freedom of movement to concentrate on fighting the fire.

Light and corrosion resistant they have been designed for minimum pressure drop (only 22% for type 225, 28% for type 450 and 32% for type 900). This significantly lower pressure loss than other eductors of similar water flows are due to a very simple energy recovery system activated by a pressure balancing valve. The controlled water flow ensures constant, correct foam concentrate induction over the entire flow/pressure range (60-150 psi). Also due to these unique features the length of hose lay between the eductor and the foam nozzle can be at least twice the normal recommended length.

Rate of induction can be varied at will within the range 1%-to 6%. All Angus eductors are color coded to ensure the correct match with the Foam-making nozzle.

Angus eductors are also most suitable for inclusion in the industrial installation especially where high pressure fluctuations exist.



CONSTRUCTION:

The body, barrel and mounting feet are of corrosion resistant aluminum which will withstand the effect of sea water.

The internal parts of Venturi tube system and the pressure balancing valve (in the energy recovery system) are injection moulded from a high strength plastic material, selected for its outstanding dimensional stability in the presence of water and foam compounds of all kinds.

Pick up tube connection incorporates a non return valve which prevents accidental dilution of concentrate by water.

The filter and metering control pin are of stainless steel.

SPECIFICATION:

Body, barrel, feet — corrosion resistant aluminum
Venturi tube and valve — high strength plastic material
Filter, metering and control pin — stainless steel
Pick up tube connection — hermaphrodite coupling chrome plated brass
Connectors — see below
Color — yellow epoxy with color code to identify type

PERFORMANCE

Eductor	Flow At 100 psi gpm	Working Pressure Range psi	Induction %	Standard Connections	Hose Dia Eductor To Nozzle	Length Of Hose Line Eductor To Nozzle[x]	Color Code
IND225	60	60 - 150	1 - 6	NST 1½" or IPT	1½"	300 ft	Plain Yellow
IND450	120	60 - 150	3 - 6	1½" NST or 2" or 2½" IPT	1½" xx 2" 2½"	600 ft	Red Band
IND900	240	60 - 150	3 - 6	NST 2½" or IPT	2½"	1200 ft	Blue Band

x at 150 psi at inlet into eductor;
xx when using 1½" dia hose with 120 gpm eductor reduce hose lay to 150/200 ft. max.

Use eductor IND225 with **NOZZLES** B225 F225 F225H MLX225 ; IND450 with **NOZZLES** F450 F450H MLX450 ; IND900 with **NOZZLES** F900 F900H

WARNING

1) Most fog or automatic/constant flow nozzles may be used with Angus eductors but the user must verify efficiency of the matched pair.
2) Any eductor and foam nozzle must be matched, i.e. their flow should be similar otherwise the eductor may become inoperative.

	Type 225 & 450	Type 900
Length With Connectors	14.75"	20.90"
Overall Height	7.50"	7.50"
Distance Base to Ctr of Connector	3.20"	3.40"
Width	5.90"	5.90"
Weight With Connectors	6.30 lbs	9.60 lbs

Bulletin 503B

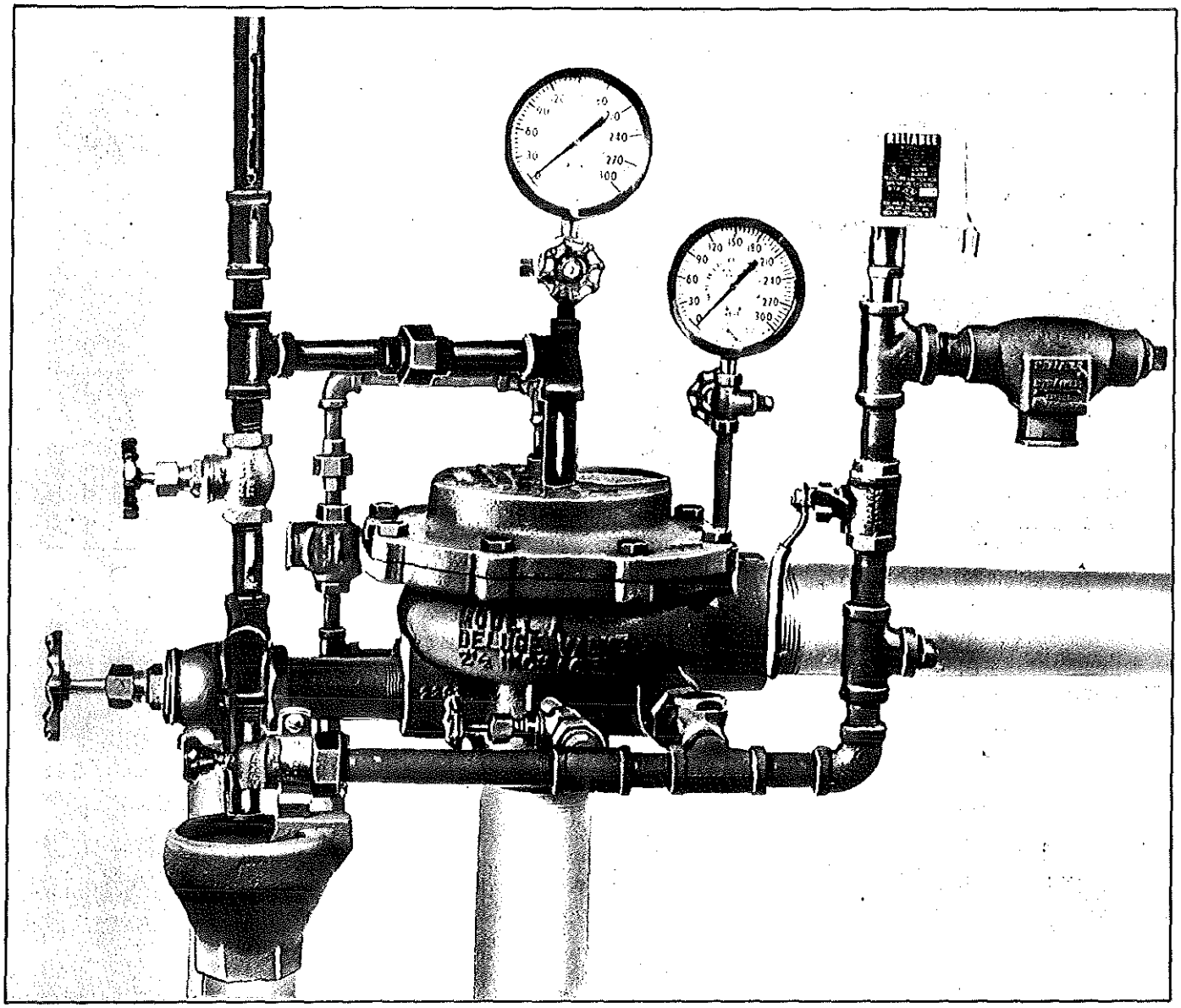
Reliable®

Model A Deluge Valve

Instructions for Installation, Operation, Care and Maintenance

2½" Size Wet, Dry Pilot Line Actuation Details

Listed by Underwriters Laboratories, Inc. Approved by Factory Mutual Research Corporation, and other fire insurance and governmental agencies in the United States and foreign countries.



The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

General

The Reliable Model A 2½" Deluge Valve is a hydraulically operated differential diaphragm type valve designed for use as the primary control valve in deluge, preaction, or special types of fire protection systems.

The valve is easily reset by external hydraulic means which eliminates the need for removing cover plates.

The basic trim set is used with every Model A 2½" Deluge Valve. This trim set provides drain, top chamber supply, alarm, alarm test and gauge connections.

Two alternate actuation trim sets, Wet Pilot Line or Dry Pilot Line, provide connections for actuation by Wet Pilot Sprinklers and devices, Hydraulic Manual Emergency Pull Boxes, Solenoid Valves or Dry Pilot Sprinklers and devices. Actuation by solenoid valves enables a full range of electrical detectors to be used for remote sensing.

Valve Operation

Reliable's Model A 2½" Deluge Valve is a quick opening hydraulically operated, diaphragm actuated type valve. The Model A consists of three chambers, top (pressurized), outlet (normally dry) and inlet (pressurized). The three chambers are isolated from each other by the diaphragm and piston and compression limited seat seal. In the closed position (Figure 1) supply pressure in the top chamber acts across the diaphragm and piston holding the piston on the seat against inlet supply pressure. The diaphragm pressure area is greater than the seat pressure area providing a force imbalance of about 3 to 1.

When a fire is detected, the top chamber is vented to atmosphere through the outlet port via opened actuation devices. The top chamber pressure cannot be replenished from the restricted inlet port, and the chamber pressure falls instantaneously. When the top chamber pressure reaches about ⅓ the supply pressure, the upward force of the supply pressure acting on the piston face is greater than the downward force of the diaphragm and the piston moves up to the open position (Figure 2).

Once the piston has opened water flows from the supply through the Deluge Valve into the piping system and alarm outlet to the alarm devices. The valve maintains the open position until the open releasing device(s) is closed.

Caution: The Releasing Device must be maintained open to prevent closing of the Model A Deluge Valve.

After system shutdown, the valve is easily reset, without special tools by restoring detection devices to the closed position by resetting or replacing the device. Once the detection device is closed and supply pressure is resupplied to the top chamber, the deluge valve will close. The external hydraulic reset feature of the Model A 2½" Deluge Valve provides a means for simple, economical system testing which is one essential facet of a good maintenance program.

Valve Description

1. Rated working pressure 175 psi (12, 1 bar)
2. Factory hydrostatic test pressure 350 psi (24, 1 bar)
3. End and trim connections—Three valve connection styles are available.
   a. 2½" American Standard taper pipe threads inlet and outlet per ANSI B2.1.
      - Threaded opening per ANSI B2.1.
      - Reliable's standard trim sets are compatible with American Standard taper pipe threads.
      - Color—Light Gray
   b. 2½" Grooved Inlet and Outlet
      - Threaded openings per ANSI B2.1.
      - Reliable's standard trim sets are compatible with Grooved Valves
      - Color—Light Gray

U.S. Groove Dimensions In Inches			
Outlet Dia.	Groove Dia.	Groove Width	Outlet Face to Groove
2.875	2.720	5/16	5/8

   c. 2½" (65 mm) British Standard pipe threads inlet and outlet per BS21-1973

Model A Deluge Valve

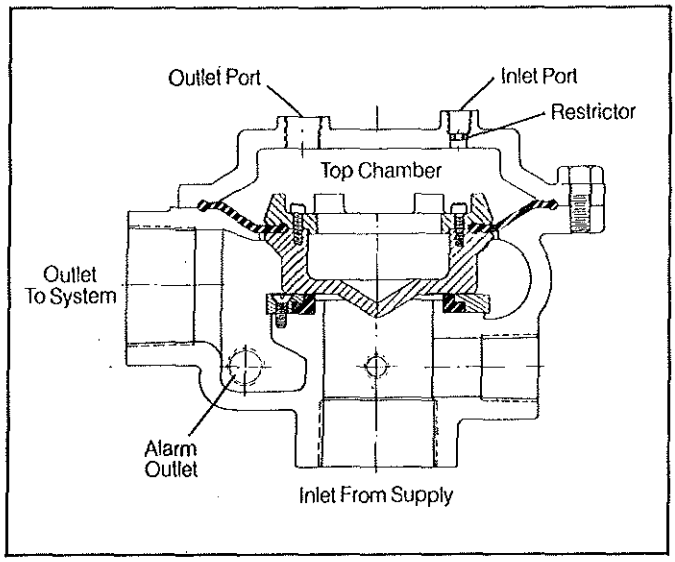


Figure 1—Closed Position

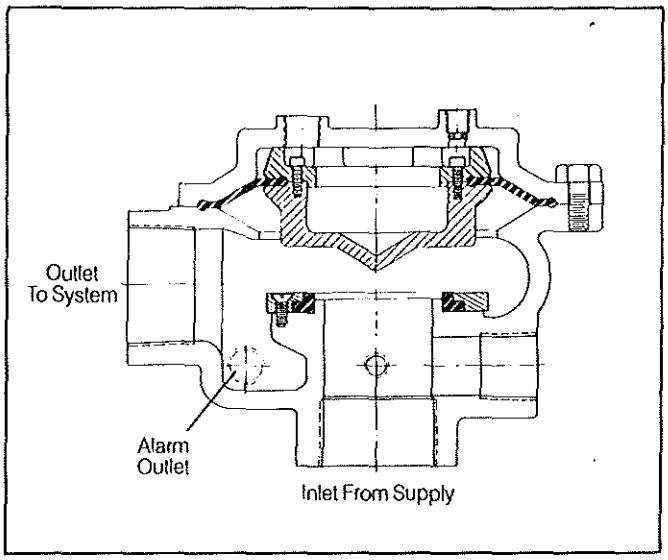


Figure 2—Open Position

- Threaded Openings per BS21-1973
- Reliable's standard trim sets may be used with Metric Valves providing trim is assembled carefully and extra thread sealant is applied to connections between valves and trim.
- Color—Light Blue

4. Shipping Weight—49 lbs. (22 Kg)
5. Friction Loss—Expressed in Equivalent Length of Pipe, Based on Hazen & Williams formula with C = 120. Equiv. Length = 17.1 ft.
6. Installation position Vertical.

Trim Description

The trimmings for the Reliable Model A Deluge Valve are arranged for rapid, easy compact attachment and serve as connection points to Reliable Alarm and other devices.

The Model A Deluge Valve trim sets are:

a. Basic trim set.
b. Wet pilot line trim set.
c. Dry pilot line trim set.

The basic trim set (Figure 3) is used with every Model A Deluge Valve. This trim set provides the supply pressure gauge, the 1¼" main drain connection, the alarm connection, the alarm test connection and the top chamber supply connection.

The wet pilot line trim set (Figure 3) is connected to the top chamber outlet. This trim set is used when wet pilot sprinklers, hydraulic manual emergency pull boxes or solenoid valves are used for actuation. The wet pilot line trim set includes a gauge to read top chamber pressure, a globe valve for manual operation of the deluge valve and a connection for the actuation device.

The dry pilot line trim set (Figure 4) is used when dry pilot sprinklers or devices are used as the actuation means. The dry pilot line trim set includes the dry pilot actuator, air and water pressure gauges, low air pressure warning switch, air relief valve and the connection for the actuation device. The dry pilot line actuator is fully described in Bulletin 504.

All valves are listed and approved by Underwriters Laboratories, Inc. and Factory Mutual Research Corp. only when used with the valve manufacturer's trim sets.

Basic Trim

The Basic Trim is required on all Reliable Deluge Valves regardless of the application. It contains those components which are required on all installations, such as the 1¼" Main Drain Connection, the Alarm Connection, Alarm Test Connection, and Top Chamber Supply Connections. The Model A 2½" Deluge Valve has 6 tapped openings for the attachment of the trimmings. Each opening is marked on the valve to indicate its use.

The recommended sequence of attaching the basic trimmings is as follows:

Refer to Figures 5 and 6

1. Install Nipple (27) in the tapped opening marked Test. Install the Globe Valve (8) on the Nipple (27), the flow arrow is to point away from the deluge valve. Install the Nipple (31) on the end of the Globe Valve (8), then install ½ of the Union (19) on the Nipple (31).
2. Install the Nipple (24) in the tapped opening marked ALARM. Install ½ of the Union (18) on the Nipple (24).
3. It is recommended to bench assemble the remainder of the alarm, test trim as follows:

   Install the other ½ of the Union (19) on Nipple (30). Install Tee (14) on Nipple (30). Hold this sub-assembly aside. Install the other ½ of Union (18) to another Nipple (24). Install Check Valve (9) and Nipple (24) with the flow arrow pointing away from Union half (18). Install another Nipple (24) to Check Valve (9), then install Tee (13) on Nipple (24). Join this sub-assembly to the previous sub-assembly using Nipple (23). Tighten the sub-assemblies together at the juncture of Tee (14), Nipple (23) and Tee (13) checking the alignment of Union halves (19) and (18) with their mating halves previously installed in the valve body test and alarm threaded openings. Now attach this loop to the valve at the Unions (19 and 18).
4. Continue to assemble the alarm-test trim as shown by Figure 5.

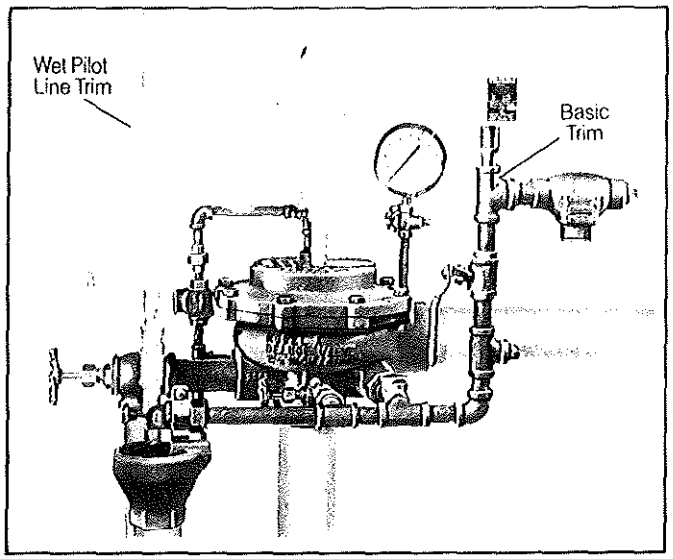


Figure 3—Model A Deluge Valve
with Basic Trim and Wet Pilot Line Trim

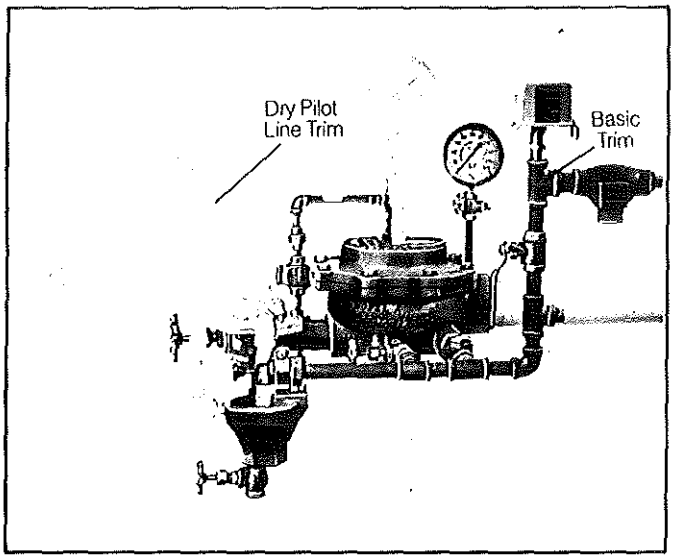


Figure 4—Model A Deluge Valve
with Basic Trim and Dry Pilot Line Trim

Note: The Strainer (4) must be installed to protect the mechanical sprinkler alarm nozzle. The strainer should be installed to permit easy access for cleaning.

5. Install the Nipple (27) in the opening marked SUPPLY. Install the Tee (15), Nipple (30) and Check Valve (10) assuring the arrow allows water to flow from the opening marked SUPPLY. Install the remainder of the supply trim from the Check Valve (10) to the Unions (19) and from the Tee (15) to the Pressure Gauge (6) as shown. Complete the supply trim from the opening marked IN on the cover to the Union (19).
6. Install the 1¼" Drain Valve (7) to the deluge valve "Drain" threaded opening using the Nipple (20).

Deluge Valve Basic Trimming Parts List

Item No.	Part No.	Description	No. Req'd.
1	71010471	Drip Cup Assembly	1
2	78653100	Ball Drip Valve ½"	1
3	98840105	Ball Valve ½"	1
4	78650200	Strainer ¾"	1
5	98727605	Strainer ¼"	1
6	98248001	Gauge Water ¼"	1
7	98840106	Valve Angle 1¼"	1
8	98840172	Globe Valve ¼"	2
9	98840181	Valve Horiz. Check ½"	1
10	98840143	Valve Horiz. Check ¼"	1
11	98840160	Valve Gauge 3 Way ¼"	1
12	98761601	Tee ½" x ½" x ¾"	1
13	98761603	Tee ½" x ½" x ½"	2
14	98761605	Tee ½" x ½" x ¼"	1
15	98761606	Tee ¼" x ¼" x ¼"	2
16	98164401	Ell ½"	1
17	98164402	Ell ¼"	4

Wet Pilot Line Trim

The Wet Pilot Line Trim is the more versatile of the trim sets required for actuation. It is used when the detection method is a wet pilot line of sprinklers, electrical heat actuated devices, or other electrical control detectors. The Wet Pilot Line Trim set provides a gauge to read top chamber pressure, a hand valve for manual operation of the deluge valve and an opening for connection to the operating mechanism. The Wet Pilot Line Trim set has been designed to allow the installer to loop the solenoid drain into the standard wet trim when electric solenoid actuation is utilized. This eliminates installing an additional drip cup. Refer to Figure 8 for the arrangement and required installer supplied piping.

Item No.	Part No.	Description	No. Req'd.
18	98805200	Union ½"	1
19	98805201	Union ¼"	3
20	98523256	Nipple 1¼" x 3"	1
21	98523242	Nipple ¾" x 2"	1
22	98523204	Nipple ½" x 6"	1
23	98523209	Nipple ½" x 2"	4
24	98523210	Nipple ½" x 1½"	4
25	98523217	Nipple ¼" x 6"	1
26	98523211	Nipple ¼" x 4½"	2
27	98523219	Nipple ¼" x 3"	2
28	98523212	Nipple ¼" x 2½"	1
29	98573220	Nipple ¼" x 2"	1
30	98523213	Nipple ¼" x 1½"	7
31	98523214	Nipple ¼" x CL.	2
32	98604401	Plug ¾"	1
33	98604402	Plug ½"	1
34	98604403	Plug ¼"	1

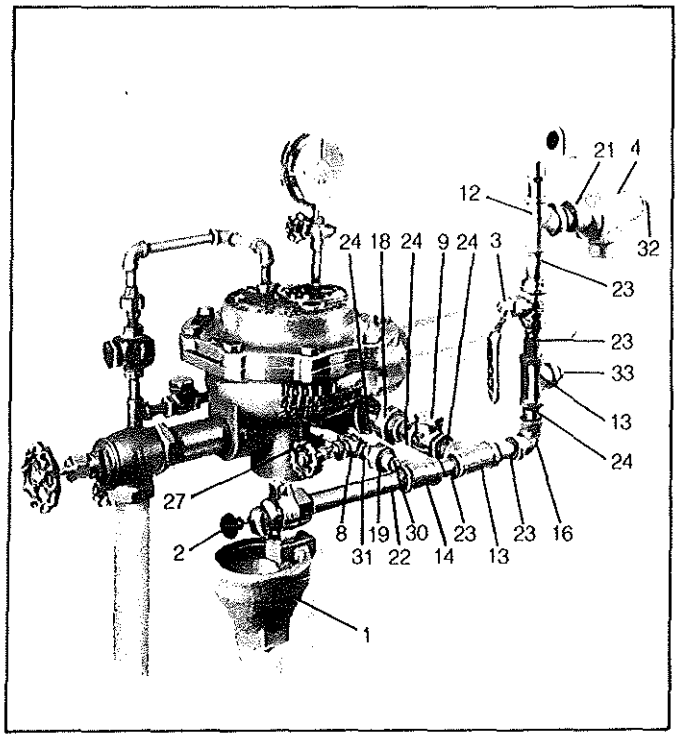


Figure 5

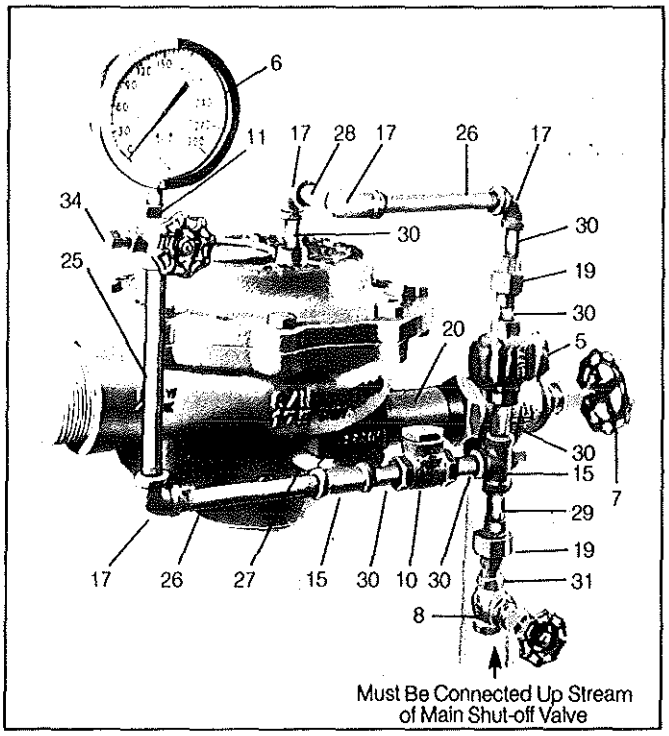


Figure 6

Refer to Figure 7 for installation of the Wet Pilot Line Trim.

Note 1:

Drain pipe from Cup, J should be run as direct as possible to an open drain. If it be absolutely necessary to connect it to the 1¼" main drain line, install a check valve in the drip cup drain line at least 4 feet below the drip cup so as to give proper head for discharge of water into the main drain line.

Wet pilot trim operation is the simplest method of automatic operation of a deluge valve. It consists of a line of closed sprinklers located over the area to be protected. This line contains water under pressure and it is connected to the outlet of the top chamber of the Deluge Valve (See Figure 7). When one of the sprinklers fuses the top chamber is vented and the deluge valve operates. The wet pilot line is only a detection system and does not contribute to controlling the fire.

Wet Pilot Line Trim Parts List

Item No.	Part No.	Description	No. Req'd.
1	98840171	Globe Valve ½"	1
2	98248001	Water Gauge ¼"	1
3	98840160	Valve Gauge 3 Way ¼"	1
4	98761603	Tee ½" x ½" x ½"	3
5	98761604	Tee ½" x ¼" x ½"	1
6	98164401	Ell ½"	1
7	98805200	Union ½"	1
8	98523230	Nipple ½" x 3"	4
9	98523208	Nipple ½" x 2½"	1
10	98523209	Nipple ½" x 2"	1
11	98523210	Nipple ½" x 1½"	2
12	98523214	Nipple ¼" x CL.	1
13	98604403	Plug ¼"	1
14	98604402	Plug ½"	2

Hydraulic Manual Pull Boxes (See Reliable Bulletin 506) provide a remote manual method of operation. They are to be used as an adjunct to the automatic detection system as required.

Caution: A wet pilot line is to be installed subject to the following restriction:

a) The wet pilot line actuation device must be continuously maintained in the open position when actuated, to prevent the 2½" deluge valve from reclosing.

b) It is not to be installed in an area subject to freezing.

c) It is not to be installed in an area where temperatures in excess of 150°F (65°C) are anticipated.

d) It is to be installed in accordance with the following table. See Reliable Hydraulic Data Book for combination height and distance limitations.

Average Service Pressure at Valve—PSI (Kg/sq. cm)		Maximum Height of Wet Pilot Line Above Valve—Ft. (Meters)	
20	(1.406)	6.2	(1.9)
40	(2.812)	15.4	(4.7)
60	(4.218)	26.1	(7.9)
80	(5.624)	35.3	(10.7)
100	(7.030)	46.2	(14.2)
120	(8.436)	56.9	(17.3)
140	(9.842)	67.7	(20.6)
160	(11.248)	80.0	(24.4)
175	(12.302)	83.1	(25.3)

e) NFPA Pamphlet No. 13, or the authority having jurisdiction should be consulted for spacing requirements.

Electrical Operation

The wet pilot line trim kit is also used for electrical actuation.

In this case the solenoid valve is the means of actuation. The solenoid valve piping may be looped into the standard wet trim by installer supplied fittings to avoid the need of a separate drip cup or drain line. See Fig. 8 for arrangements. Details on the electrical portion of this system can be found in Reliable Bulletin No. 704 "Supertrol Model 2000 Electrical Systems".

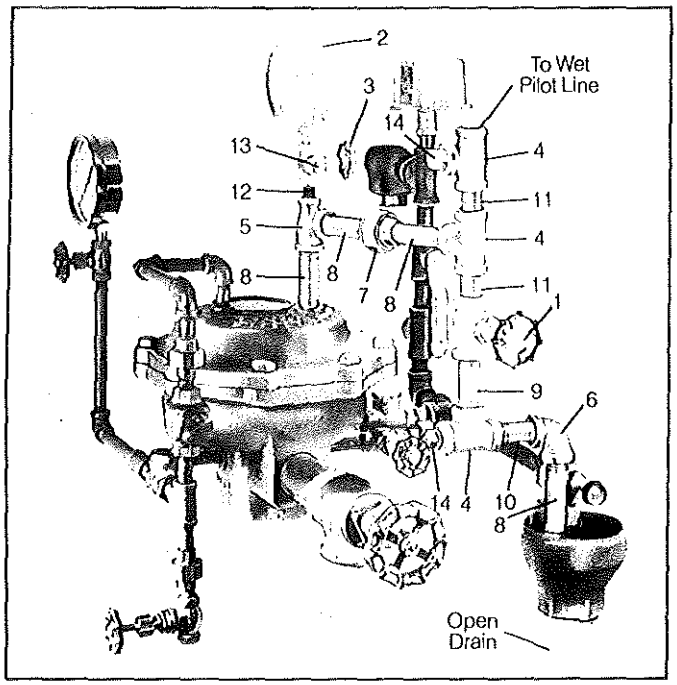


Figure 7—Wet Pilot Line Trim

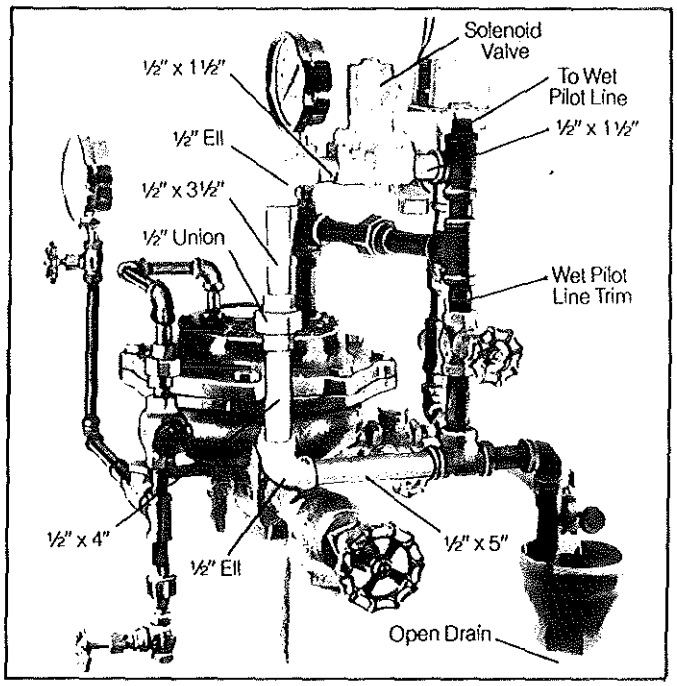


Figure 8—Deluge Valve Pilot Line Trim with Field Supplied Electrical Actuation Loop

Dry Pilot Line Trim

Dry Pilot Line Operation is used in areas which are subject to freezing conditions or to obtain installed sprinkler heights and Pipe lengths greater than allowed for Wet Pilot Line Trim. Dry Pilot Operation uses a pilot line of closed sprinklers containing air under pressure located in the area to be protected. This pressurized line is connected to a Dry Pilot Line Actuator. (See Reliable Bulletin No. 504 "Dry Pilot Line Actuator" for complete information on the operation, testing and maintenance of this device.) The Dry Pilot Line Actuator functions very much like a miniature Dry Pipe Valve. In areas where moisture laden air could cause freezing or other problems in the Dry Pilot Line, the use of a cylinder of dry compressed gas such as Nitrogen is suggested. Approved gas handling regulators and connections are then recommended.

When one of the sprinklers fuse, the air pressure is reduced, thus opening the Dry Pilot Line Actuator which causes the Deluge Valve to trip.

NFPA Pamphlet No. 13, or the authority having jurisdiction should be consulted for spacing requirements.

The Dry Pilot Line Trim includes gauges to read both the air and water pressure, a low air pressure warning switch, an air relief valve, the Dry Pilot Line Actuator and connections for the Dry Pilot Line of Sprinklers. Refer to Fig. 9 for installation of the Dry Pilot Line Trim.

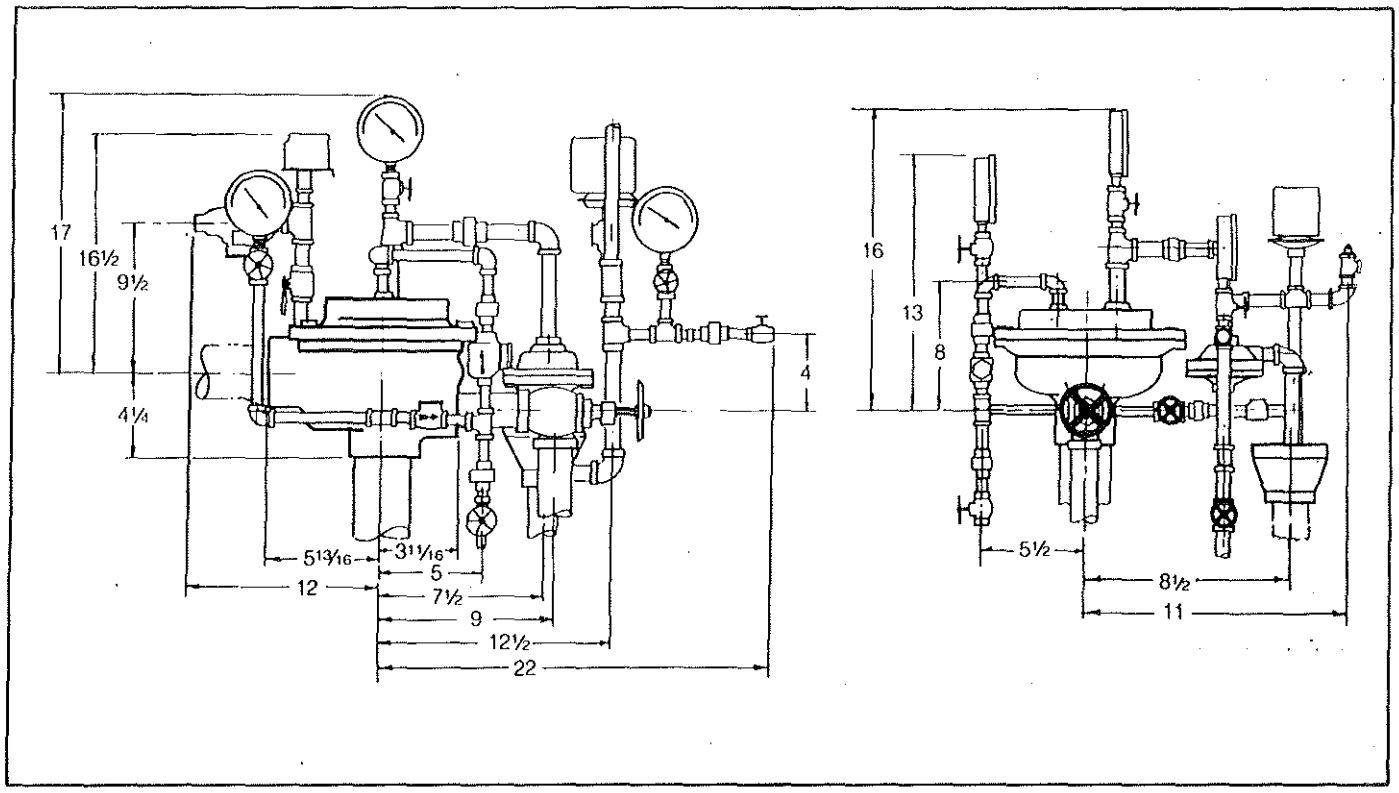
Connect Air Supply to Air Inlet side of Dry Pilot Line Actuator as shown in Figure 9. Table 1 specifies the air pressure to be used in a Dry Pilot Line. It is strongly recomended that the appropriate automatic air maintenance device be used to safeguard against valve tripping due to air pressure leaks in the dry pilot line. See Bulletins 250 and 251 for Air Maintenance Device information. Install Dry Pilot Line and Hydraulic Manual Pull Boxes as required. Wire Low Air Pressure Switch, 2, to warning device. Pressure Switch is factory set to close a circuit at 25 PSI.

Caution: When using devices other than sprinklers for dry pilot line actuation, the device must continuously maintain the open position after actuation to prevent the actuator and deluge valve from reclosing.

Table 1

Water Pressure (PSI)	Air Pressure to be Pumped into Dry Pilot Line (PSI)	
Maximum	Not Less Than	Not More Than
20	10	20
50	15	25
75	20	30
100	25	35
125	30	40
150	35	45
175	40	50

Installation Measurements in Inches



Dry Pilot Line Actuator Trimming Parts List

Item No.	Part No.	Description	No. Req'd.
1	71030000	Dry Pilot Line Actuator	1
2	98728800	Pressure Switch 3/8" Fitting	1
3	98840141	Restrictor Check Valve 1/4"	1
4	98248000	Air Pressure Gauge 1/4"	1
5	98248001	Water Pressure Gauge 1/4"	1
6	98840190	Relief Valve 1/2"	1
7	98840171	Globe Valve 1/2"	1
8	98840160	Valve Gauge 3 Way 1/4"	2
9	98761603	Tee 1/2" x 1/2" x 1/2"	2
10	98761604	Tee 1/2" x 1/4" x 1/2"	1
11	98761607	Tee 1/2" x 1/2" x 3/8"	1
12	98761605	Tee 1/2" x 1/2" x 1/4"	1
13	98761606	Tee 1/4" x 1/4" x 1/4"	1
14	98164401	Ell 1/2"	4

Item No.	Part No.	Description	No. Req'd.
15	98805200	Union 1/2"	1
16	98805201	Union 1/4"	1
17	98048011	Hex Bush. 3/4" to 1/4"	1
18	98523204	Nipple 1/2" x 6"	1
19	98523206	Nipple 1/2" x 5"	1
20	98523207	Nipple 1/2" x 4"	1
21	98523230	Nipple 1/2" x 3"	5
22	98523209	Nipple 1/2" x 2"	3
23	98523221	Nipple 1/2" x Cl.	2
24	98523236	Nipple 3/8" x 2 1/2"	1
25	98523213	Nipple 1/4" x 1 1/2"	3
26	98523214	Nipple 1/4" x Cl.	1
27	98604403	Plug 1/4"	2
28	98840170	Globe Valve 3/4"	1

Note: Item 3 Restrictor Check Valve Must be used in trim. Valve will not operate properly without this item.

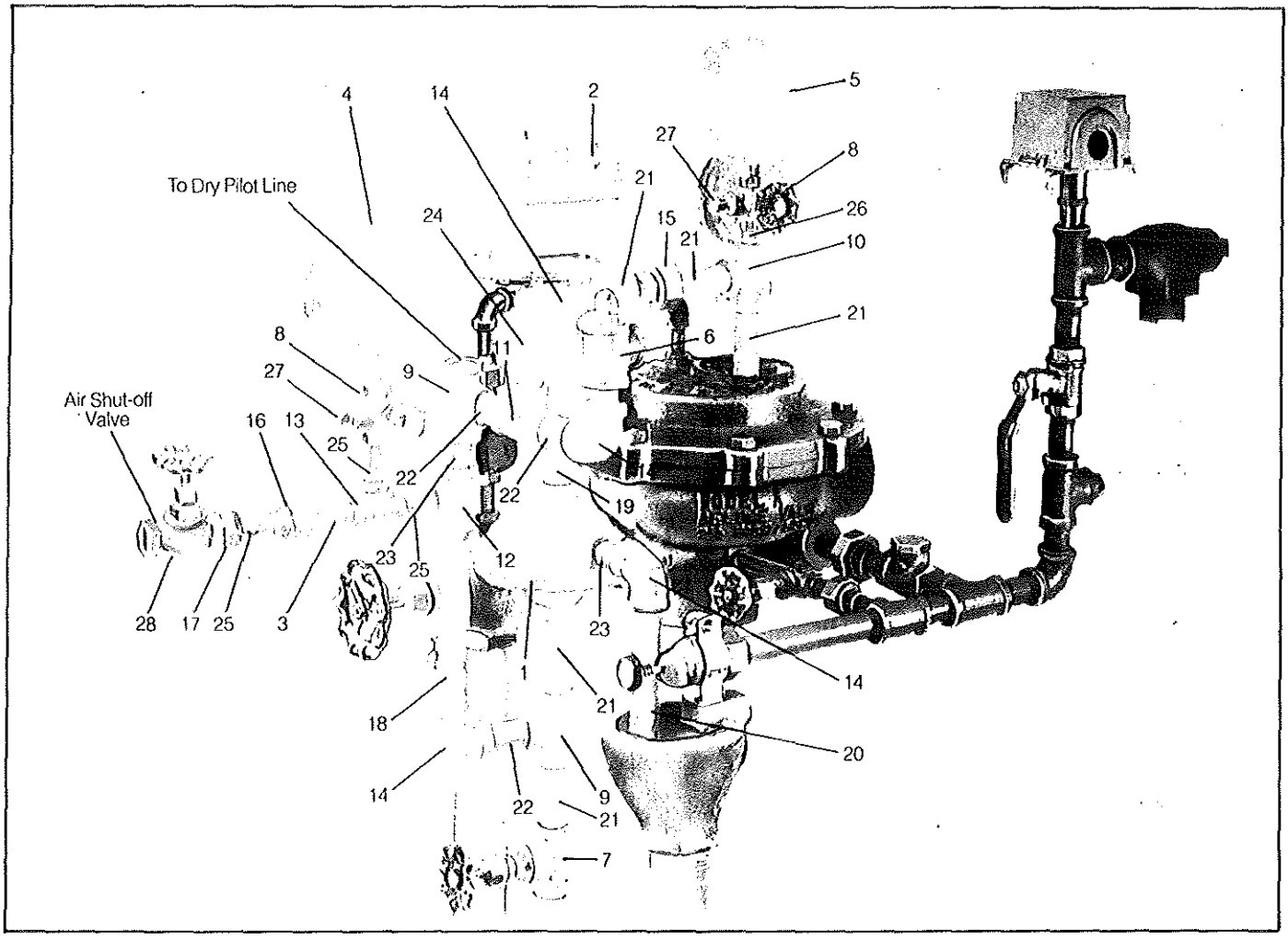


Figure 9
Dry Pilot Line Trim

2½" Deluge Valve Parts

Item No.	Part No.	Description	No. Req'd.
1	91006402	Body	1
2	92106402	Cover	1
3	95616402	Soc. Flat Hd. Cap Scr.	6
4	96006402	Retainer Ring	1
5	91906402	Piston	1
6	95606402	Soc. Hd. Cap Scr.	8
7	92206402	Rubber Facing	1
8	95306402	Clamping Ring	1
9	93406402	Rubber Seal	1
10	91106123	Cover Bolt	8
11	94206406	Orifice Inlet	1

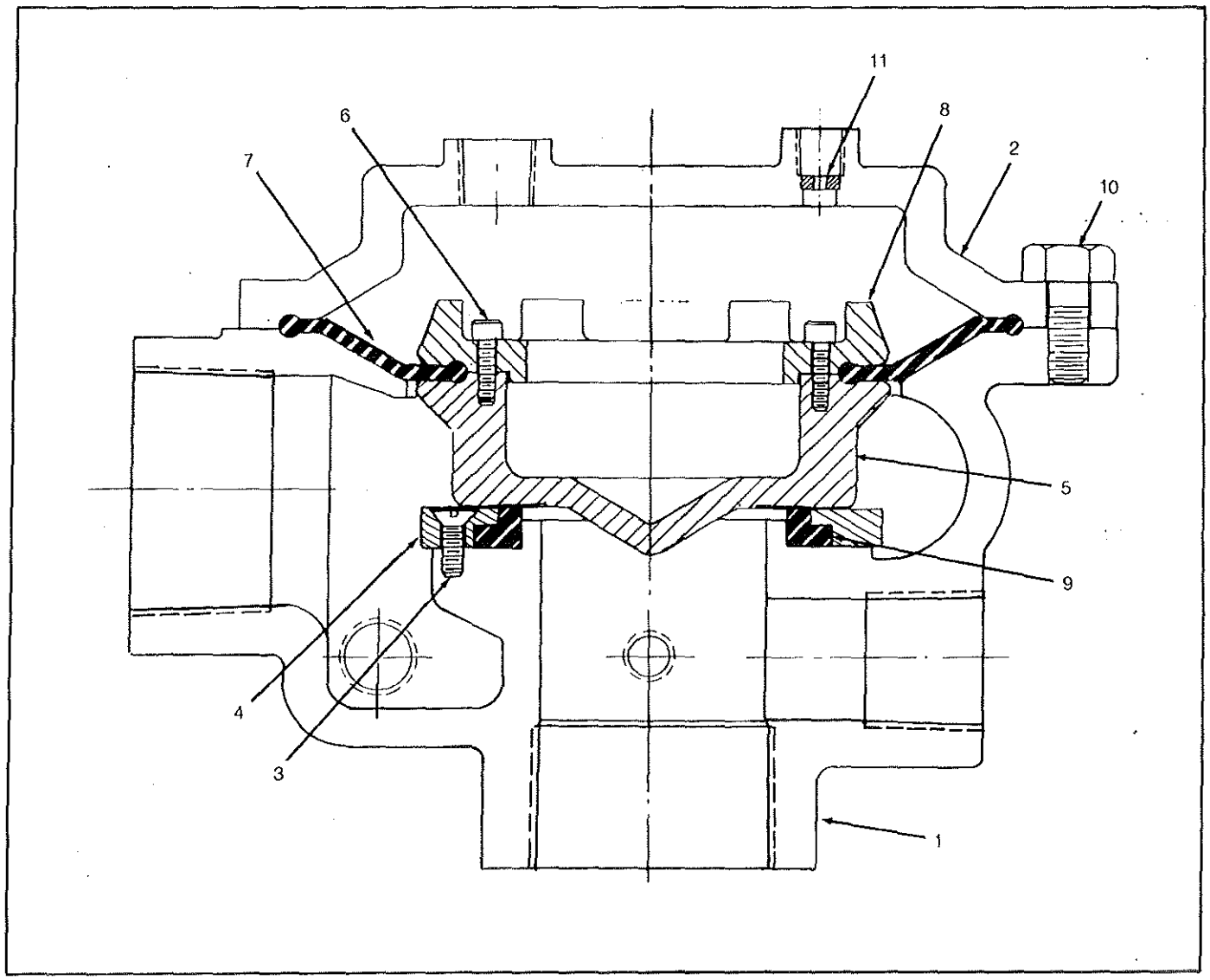


Figure 10

Resetting Deluge Valve

Refer to Figs. 11 & 12

1. Close valve controlling water supply to deluge valve.
2. Open main drain Valve A and drain system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped. Open Valve B or L.
4. Push in plunger of ball drip Valve H to force ball from its seat.
5. Inspect and replace any portion of the detection system subjected to fire conditions.
6. Open Valve C and allow water to fill the top chamber. Close Valve B or L.
7. Bleed all air from actuation piping.
   A. Wet Pilot Line—Bleed the wet pilot line at the high point until all of the air is removed.
   B. Dry Pilot Line—Allow water to flow through the pilot line actuator, then apply air pressure into the dry pilot line until it conforms to Table 1 as indicated on Gauge P.
   C. Electrical Actuation—Open the solenoid valve by operating a detector or a manual pull station. While water is flowing through the solenoid allow the solenoid valve to close. Refer to Bulletin No. 704, "Supertrol Model 2000 Electrical System."
8. Open slightly the valve controlling water supply to deluge valve, closing main drain Valve A, when water flows. Observe if water leaks through ball drip Valve, H, into Drip Cup, J. If no leak occurs the water seat is tight. Open slowly but fully the valve controlling water supply to deluge valve, and seal in the open position.
9. Close Valve C.

Inspection and Testing

Refer to Figs. 11 & 12

1. Water Supply—Be sure valves controlling water supply to deluge valve are open fully and sealed in this position.
2. Alarm—Be sure Valve F is open and sealed in this position.
3. Other Trimming Valves—Check that Valve E is open and Valves B, C, and G are closed.
4. Ball Drip Valve—Push in on plunger of Valve H to be sure ball check is off its seat. If no water appears, the deluge valve water seat is tight.
5. Dry Pilot Line—Check gauge pressure for conformance to Table 1.
6. Actuation Mechanism—Check outlet of actuating mechanism (i.e., Dry Pilot Line Actuator, Solenoid Valve, or Hydraulic Manual Pull Boxes for leakage).
7. Testing Alarms—Open Valve G, permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor). After testing, close Valve G securely. Push in on plunger of Valve H until all of the water has drained from the alarm line.
8. Operation Test—Open Valve B or L.

   Note: Operation of Valve B or L will cause the deluge valve to trip.

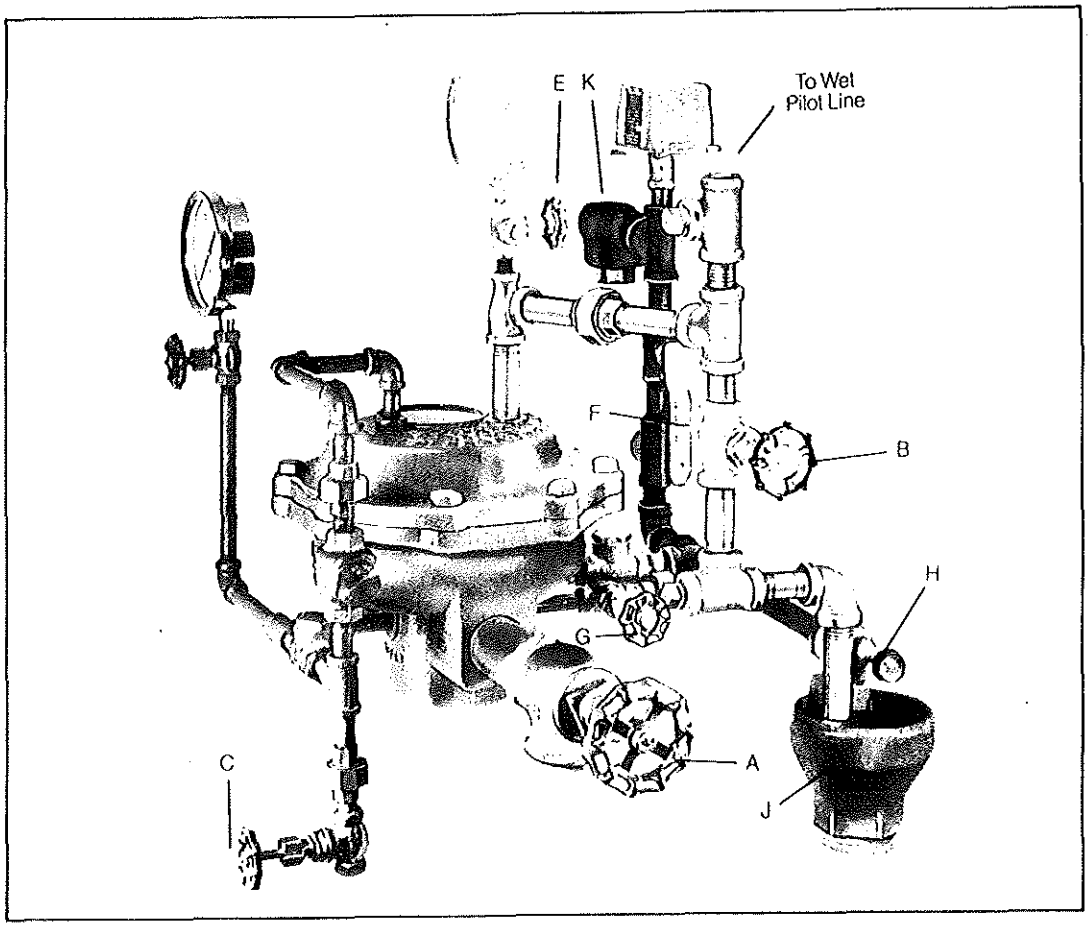
Testing Detection System Without Operating Deluge Valve

1. Close the valve controlling water supply to deluge valve and open 1¼" drain Valve A, Fig. 11 on deluge system.
2. Open the ¼" Globe Valve C, Fig. 11 on the deluge trim that allows water to enter the top chamber.
3. Operate Detection System—
   A. Wet Pilot Line—Open Valve B, Fig. 11.
   B. Dry Pilot Line—Open Valve L, Fig. 12.
   C. Electrical Actuation—Refer to Bulletin No. 704.
4. Operation of the Detection System must result in a sudden drop of water pressure in the deluge valve top chamber.
5. Reset Detection System—Reverse operations performed in step 3 above.
6. Open slightly valve controlling water supply to deluge valve, closing 1¼" drain Valve A, Fig. 11 when water flows. Open slowly but fully valve controlling water supply to deluge valve and seal in the open position.
7. Check ball drip valve for leakage.
8. Close Valve C.

Maintenance

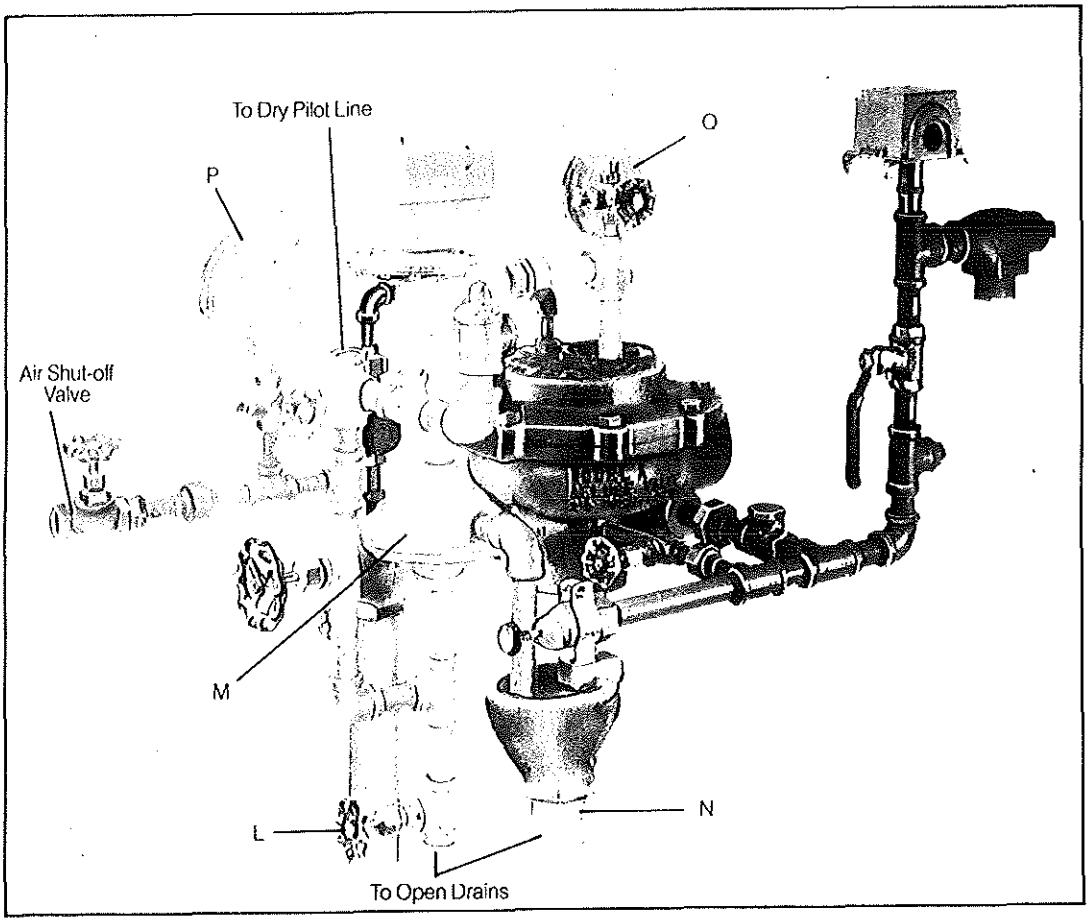
Refer to Figs. 6, 7, 10, 11

1. Mechanical Sprinkler Alarm (Water Motor) not operating: This is most likely caused by a clogged screen in Strainer K, Fig. 11. Proceed as follows: remove plug from strainer, remove and clean the screen. Replace the screen and plug and tighten securely.
2. Steady Water Flow into Drip Cup. This condition is caused by water leaking past the Piston Seat Seal (9) or past the Diaphragm (7), Fig. 10. To locate and correct the trouble, proceed as follows.
   a. Carry out steps 1 through 4 of Resetting Deluge Valve Instructions.
   b. Assure the Alarm Test Valve G is tightly closed.
   c. Open Valve C and Close Valve B or L then push the plunger on the ball drip Valve H. If water flows from the ball drip the Diaphragm (7) is leaking and must be replaced; proceed as follows:
      1) Close Valve C and open Valve B or L.
      2) Break the trim at the Unions (19) & (7), Fig. 6 & 7. Remove 8 cover bolts (10).
      3) Lift the cover and partial trim from the valve body.
      4) Remove the assembled Piston (5) and Diaphragm (7), Fig. 10.
      5) Remove 8 Screws (6) holding the Diaphragm Clamping Ring (8). Remove the Clamping Ring (8) and Diaphragm (7).
      6) Install a new Diaphragm (7) with the cone shape facing away from the Piston (5) Face. Install the Clamping Ring (8) and Screws (6) and alternately tighten the screws until the clamping ring is metal to metal tight to the piston.
      7) Install the assembled piston and diaphragm in the body. Install the cover and align the diaphragm O-ring end to fit the Body (1) and Cover (2) grooves.
      8) Install the 8 Cover Bolts (10) alternately tightening until the cover has metal to metal contact with the body.
      9) Reconnect the trim at the unions.
      10) Repeat paragraphs 2a, 2b and 2c above.
   d. If no leakage was found in 2c above, then close Drain Valve A and slightly open the Valve controlling water supply pressure to the deluge valve. Wait 15 minutes, then push the plunger on the ball drip. If water flows from the ball drip, the Piston Seat Seal (9) is leaking and must be replaced; proceed as follows:
      1) Remove the Cover (2) and Piston (5) following steps 2c (1 through 4) above.
      2) Remove 6 Screws (3) holding the Seat Seal Retainer Ring (4). Remove the Retainer Ring (4) and Seat Seal (9).
      3) Clean the seal cavity in the Valve Body (1) and Retainer Ring (4). Place a new Seal (9) in the Valve Body (1).
      4) Install the Retainer Ring (4) and Screws (3) and alternately tighten the screws until the retainer ring is in metal to metal contact with the valve body.
      5) Clean the Piston (5) face and reassemble the valve following steps 2c (7 through 9) above.
      6) Repeat all leakage testing following steps 2a, 2b, 2c and 2d above.
   e. Reset and test the deluge valve in accordance with previous sections.



Model A Deluge Valve with Basic and Wet Pilot Line Trim

Figure 11



Model A Deluge Valve with Basic and Dry Pilot Line Trim

Figure 12

Manual Emergency Station—
Model BRG-1 Single Pole
Model BRG-1F Two Pole

This break glass station is provided with a test-reset key. Semi-flush mount on conduit. This station is operated by a pull on the cover. This causes a key latch to act against a retaining mechanism until adequate force is applied to open the station. As the station opens, a switch is released to initiate an alarm.

The retainer is a replaceable glass rod which is not broken when key tested. When operated, the cover hangs down (and cannot be made to stay in a closed position) indicating that the station was used to turn in the alarm.

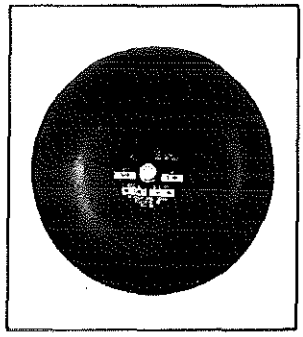
Resetting is easily accomplished by use of a test- reset key.

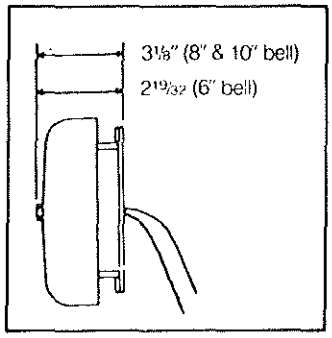
The Model BRG-1F 2 pole version must be used with cross zoned panels.

Electrical Rating: 1 amp
@ 6-125 Volts
UL Listed
FM Approved

Supertrol Alarm Bells
Model KMS

Available in 3 sizes; 6", 8" and 10" dia.
Low Current Drain: 30mA @ 24 Vdc
Polarized
Mounts to 4" square outlet box.
High efficiency motor driven striker.
Red enamel finish.
UL Listed.
6" — Model KMS-6-24Vdc/P
8" — Model KMS-8-24Vdc/P
10" — Model KMS-10-24Vdc/P
Model WBB weather proof back box available for outdoor use.



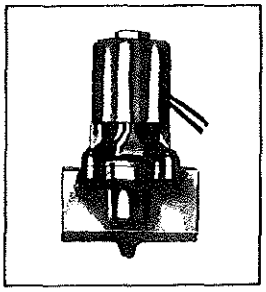


Supertrol Solenoid Valve

The Supertrol Solenoid Valve is a 24 Vdc pilot operated diaphragm solenoid valve. This valve is used to release water from the Deluge Valve control chamber thus operating the Deluge Valve.

Description

Model No. LV2LBX25
½" female NPT inlet and outlet piping connections.
Nominal voltage 24 Vdc.
Holding current .35 amp.
Valve normally closed—
Powered to open.



Batteries

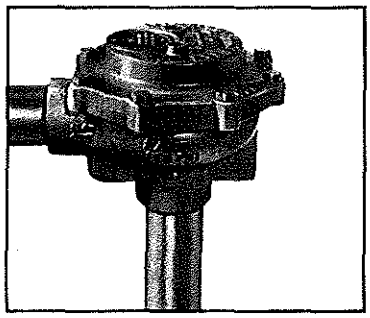
Model No. PS 1245 4 Required
Electrical— 12 Volt Gel Cell Type
5 AMP HR Capacity
@ 20 HR Rate—Each
Dimensions—5²¹/₃₂"L x 2⁹/₁₆"W x 3⅞"H

II. Supertrol Water Delivery and Distribution Section

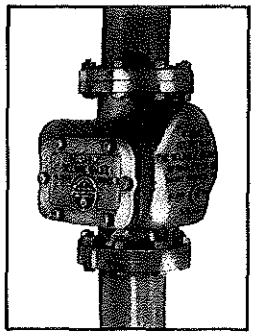
This section provides piping supervision and delivers and distributes water or other extinguishing agent at the fire. When operated by the Model 4800 Supertrol System, the Deluge Valve releases the extinguishing agent at the fire source.

Reliable Deluge Valve

The Reliable Model B, BX (4" and 6") or Model A (2½") Deluge Valves control the flow of water or other extinguishing agent to the fire zone. Bulletins 500 and 502 describe the valves in detail. When used in a Supertrol System, the valve requires the Basic Trim Set and the Wet Pilot Line Trim Set which are described in Bulletins 501 and 503.



Model A Deluge Valve



Model B & BX Deluge Valve

Check Valve—Pre-Action System Only

A check valve capable of reliably sealing at pressures as low as 1½ psi is required downstream of the deluge valve. Prime water is required in a pre-action system to a level of 6" to 10" above the check valve clapper. A drain valve and trimmings to provide 6" to 10" of prime water must be installed on the system side of the check valve clapper.

OPERATION & MAINTENANCE MANUAL
COVERING:HELI-PAD FOAM CABINET SYSTEMS

Valves Affected:

FP602	Sixth Floor Mechanical Room
FP603	Room HA605

Reliable®

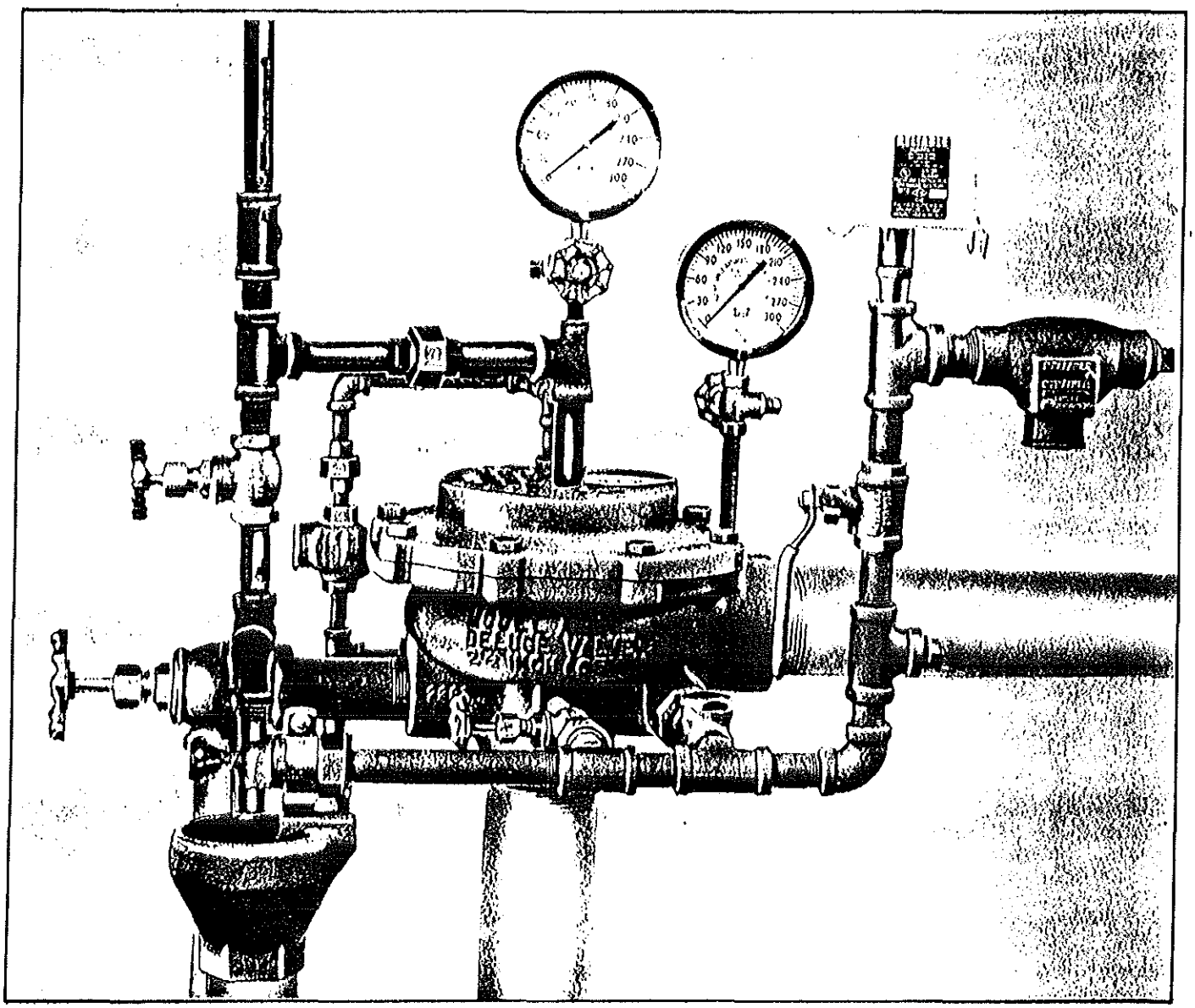
Model A Deluge Valve

FOAM SYSTEM

Instructions for Installation, Operation, Care and Maintenance

2½" Size Wet, Dry Pilot Line Actuation Details

Listed by Underwriters Laboratories, Inc. Approved by Factory Mutual Research Corporation, and other fire insurance and governmental agencies in the United States and foreign countries.



The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

FOAM SYSTEM

Resetting Deluge Valve

Refer to Figs. 11

1. Close valve controlling water supply to deluge valve.
2. Open main drain Valve A and drain system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped. Open Valve B
4. Push in plunger of ball drip Valve H to force ball from its seat.
5. Inspect and replace any portion of the detection system subjected to fire conditions.
6. Open Valve C and allow water to fill the top chamber. Close Valve B
7. Bleed all air from actuation piping.

C. Electrical Actuation—Open the solenoid valve by operating a detector or a manual pull station. While water is flowing through the solenoid allow the solenoid valve to close. Refer to Bulletin No. 706 "Supertrol Model 4800 Elect. Sys."

8. Open slightly the valve controlling water supply to deluge valve, closing main drain Valve A, when water flows. Observe if water leaks through ball drip Valve, H, into Drip Cup, J. If no leak occurs the water seat is tight. Open slowly but fully the valve controlling water supply to deluge valve, and seal in the open position.
9. Close Valve C.

Inspection and Testing

Refer to Figs. 11

1. Water Supply—Be sure valves controlling water supply to deluge valve are open fully and sealed in this position.
2. Alarm—Be sure Valve F is open and sealed in this position.
3. Other Trimming Valves—Check that Valve E is open and Valves B, C, and G are closed.
4. Ball Drip Valve—Push in on plunger of Valve H to be sure ball check is off its seat. If no water appears, the deluge valve water seat is tight.
6. Actuation Mechanism—Check outlet of actuating mechanism (i.e., Dry Pilot Line Actuator, Solenoid Valve, or Hydraulic Manual Pull Boxes for leakage).
7. Testing Alarms—Open Valve G, permitting water from the supply to flow to the electric sprinkler alarm switch and to the mechanical sprinkler alarm (water motor). After testing, close Valve G securely. Push in on plunger of Valve H until all of the water has drained from the alarm line.
8. Operation Test—Open Valve B.

   Note: Operation of Valve B will cause the deluge valve to trip.

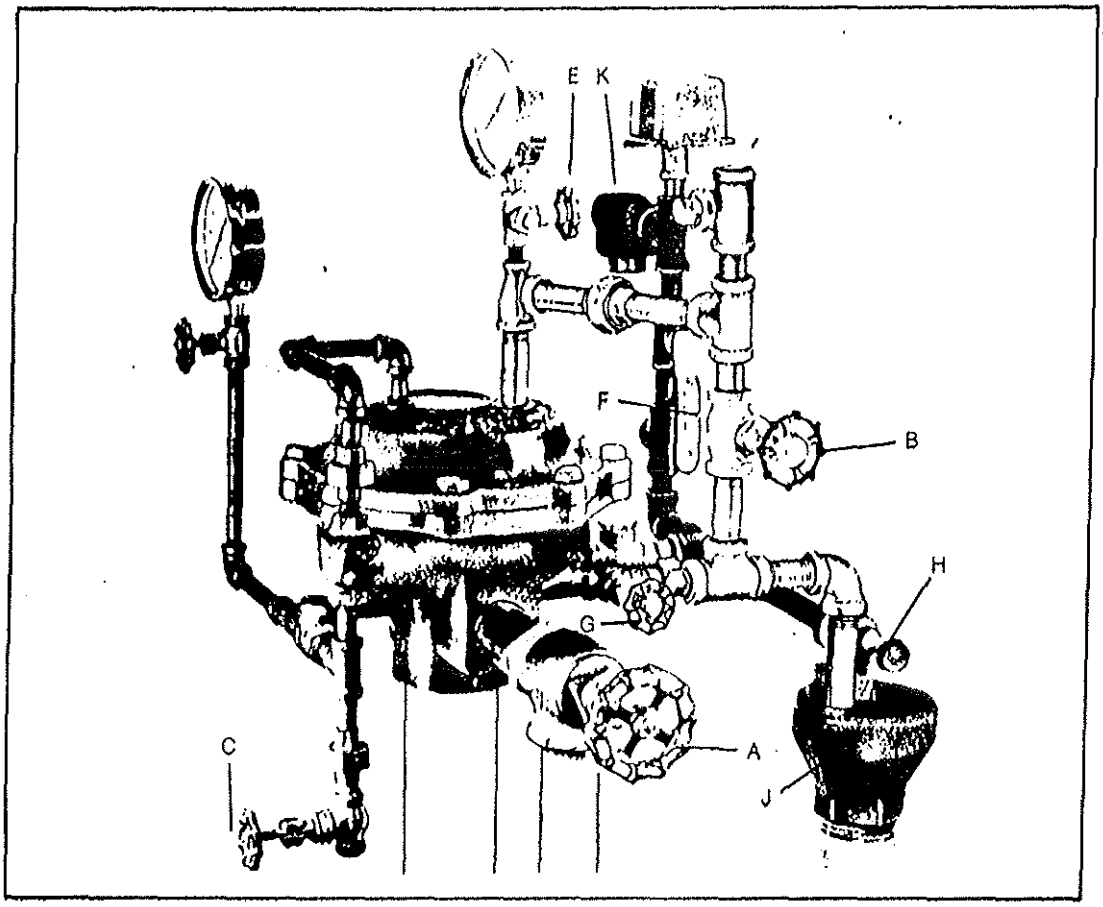
Testing Detection System Without Operating Deluge Valve

1. Close the valve controlling water supply to deluge valve and open 1¼" drain Valve A, Fig. 11 on deluge system.
2. Open the ¼" Globe Valve C, Fig. 11 on the deluge trim that allows water to enter the top chamber.
3. Operate Detection System—

   A. FOAM —Open Valve B, Fig. 11.

4. Operation of the Detection System must result in a sudden drop of water pressure in the deluge valve top chamber.
5. Reset Detection System—Reverse operations performed in step 3 above.
6. Open slightly valve controlling water supply to deluge valve, closing 1¼" drain Valve A, Fig. 11 when water flows. Open slowly but fully valve controlling water supply to deluge valve and seal in the open position.
7. Check ball drip valve for leakage.
8. Close Valve C.

Maintenance explained in SUPERTROL 4800



Model A Deluge Valve with Basic and Wet Pilot Line Trim

NOTE :
Electric Actuation Loop not shown. Refer to figure 8.

Figure 11

HALON 1301 SYSTEM SEQUENCE OF OPERATION

I. First Detector Alarm:

A. First Detector Alarm.
   1. The alarm bell will sound.
      a. The bell can be silenced by alarm 1 silence switch on front panel.
   2. The alarm display on panel face will light indicating cicuit is alarmed.
   3. Building fire alarm notified.

II. Second Alarm:

A. Second Detector Alarm.
   1. The alarm horn will sound.
   2. Pre-discharge display on the panel will be on.
   3. The horn can be silenced by alarm 2 silence switch on front panel.

B. The Time Delay Sequence Will Start. Display Will Show Countdown.
   1. The operator now has 20 seconds until the Halon discharges.
   2. Halon discharge can be aborted by depressing and holding the abort button for the alarmed zone.
   3. If the operator releases the abort button before resetting the panel, the system will complete the remainder of 20 second countdown and discharge.

III. Discharge:

A. Discharge.
   1. Activates light and horn.
   2. Discharge display on panel comes on.
   3. System discharges Halon 1301.

IV. Resetting The Control Unit:

A. Resetting the control unit.
   1. If no problem is apparent, the control unit can be reset by depressing the alarm reset switch located on panel facing, for approximately 5 seconds. If detectors continue to alarm, repeat step and fan alarmed detectors. (This can also be done between first and second detector alarm.)

V. Manual Discharge:

A. Manual Discharge.
   1. If a major fire problem is apparent, the system can be discharged manually by pulling the manual pull station located by a door leading from the protected area.

IV. System Trouble:

A. System Trouble.

1. System trouble could occur from:
   a. Power loss (110V).
   b. Detector Removed.
   c. Broken wire on any device.
   d. Battery power loss.

2. If trouble occurs due to power loss, the power on the control panel will go out and a trouble alarm occurs. Switch trouble silence switch to left. When AC power is restored, power light will come on and the trouble alarm will sound. Put trouble silence switch back in "normal" position.
3. If trouble alarm sounds and the problem is not evident (loss of power, removed detector, etc.), assistance can be obtained by calling Vulcan Fire Systems, Inc., (502) 499-1520.

OPERATION & MAINTENANCE MANUAL
EQUIPMENT INDEX

I. FITTINGS
- A. Screwed
- B. Grooved
- C. Flanged
- D. Mechanical Joint (Underground)
- E. Uni-Flanged

II. PIPE
- A. Black A.S.T.M. A.N.S.I. schedule 120
  - 1. Standard Schedule 40
- B. Ductile Iron Class 50 Standard

III. HANGERS
- A. Hanger Rings
- B. Clevis Rings
- C. All-Thread Rod
- D. Top Beam Clamps
- E. Nuts and Washers
- F. Riser Clamps
- G. Expansion Casings

IV. VALVES
- A. Gate Valves
  - 1. Rising Stem O.S.&Y.
  - 2. Non-Rising Stem P.I.V.
  - 3. Butterfly
- B. Swing Check Valves
- C. Detector Check Valves
- D. Globe Valves
- E. Angle Valves

V. RELIABLE SUPERTROL 4800 PREACTION SYSTEM
- A. Panel
- B. Detectors
  - 1. Thermal Type
- C. Alarm Bells
- D. Batteries
- E. Deluge Valve Reliable Model "A"
- F. Electric Sprinkler Alarm Switch
- G. Air Compressor & Air Maintenance Device

VI. SPRINKLERS
- A. Wet Type
  - 1. Upright
  - 2. Pendent

VII. ALARMS & SIGNALLING DEVICES
- A. Tamper Switch
  - 1. OSYSU-A2
  - 2. PIVSU-A2
- B. Waterflow Indicator
- C. Electric Sprinkler Alarm Switch

VIII. MISCELLANEOUS

- A. Spare Head Cabinet
- B. Escutcheons
- C. Sprinkler Wrenches
- D. Automatic Ball Drip
- E. Sight Drain
- F. Sight Test Connection
- G. Pressure Gauges
  1. Water
  2. Air
- H. Identification Signs
- I. Siamese Fire Department Connections
  1. Sidewalk Style

IX. BACKFLOW PREVENTERS

X. FIRE HOSE RACK CABINETS

A. Cabinet Style	fig. SS-1506-F
1. Recessed with flush trim	
B. Door Style	
1. Flush Solid -- Stainless Steel	
C. Angle Valve	
1. 1 1/2" double female	fig. 4070-B
2. 2 1/2" female x male	fig. 4065-B
D. Hose Rack	fig. 2510-A
E. Rack Nipple	fig. 2755-B
F. Fire Hose	
1. Single Jacket	fig. 2901-N
a. neoprene-lined	
b. 100 feet	
G. Hose Coupling	fig. 2934-B
H. Adjustable Fog Nozzle	fig. 2962-B
I. Miscellaneous Equipment	
1. Automatic Drain & Vent	fig. 2760-B
2. 1 1/2" Wall Plate	fig. 2750
3. 2 1/2" Wall Plate	fig. 2751
4. Spanner Wrench w/Clip	
a. 1 1/2" size	fig. 6050-BR
b. 2 1/2" size	fig. 4625-B
5. 2 1/2" Cap & Chain	fig. 4625-B
J. Fire Extinguishers	
1. 10-lb. ABC Dry Chemical	fig. 3010
2. 9-lb. HALON 1211	fig. 3009

XI. HELIPORT AND HELICOPTER HANGAR EQUIPMENT

A. Brown Sprinkler Corporation Sketch 2974-B

B. Foam-Making Equipment

1. ANSUL Extinguishing Agent Data Sheet
2. ANGUS Foam Nozzle F450H
3. ANGUS Low Pressure Foam Eductor IND450
4. Rectangular Foam Tank w/Cover 30 gal.
5. HAYWARD Bulkhead Fitting

C. Foam Delivery Equipment

1. BOSTON 100' 1-1/2" Hose
2. Hose Reel FD-47

D. Foam Activation Equipment

1. Manual Control Switch NEMA 1
2. Skinner Solenoid LV2LBX25
3. AC/DC Transformer

E. Valves

1. RELIABLE Deluge Valve Model A

F. Metal Cabinet

G. Dry Chemical Equipment

1. GUARDIAN Wheeled Cylinder w/Nitrogen

XII. HALON 1301 EQUIPMENT

A. Containers

1. Size to be 60# cylinder
2. Mounting data shown on drawing

B. Pre-Engineered Nozzles

C. Container Accessories

1. Main-Reserve Shuttle Valve
2. Pressure Switch
3. Reload Kit

D. Detectors

1. Photoelectric Type
2. Ionization Type

E. Control Accessories

1. Manual Release Switch
2. System Abort Switch
3. Main Reserve Switch
4. Keyed Abort Switch
5. Low Pressure Switch

F. Instructional Signs

G. Batteries

H. Control Panel

I. Audio-Visual Alarm Devices

1. Alarm Bell
2. Strobe Horn

XIII. FIRE PUMP EQUIPMENT

A. Patterson Fire Pump Equipment
   1. Drawing AC-9574-1
   2. Drawing AD-5481
   3. Drawing 6 MABS-DF
   4. Rotational View
   5. Drawing L1
   6. Drawing L2
      a. part #1 Air Release Valve
      b. part #2 Suction Dial
      c. part #3 Discharge Dial
      d. part #4 Style #1 Casing Relief Valve
      e. part #7 Hose Angle Valves
   7. Drawing L3
      a. part #9 Enclosed Waste Cone
   8. Drawing L4-2
      a. part #16 Item 'C' Outside Hose Valve Hdr.

B. Gerand Engineering
   1. Fire Pump Test Meter Model 'K'
   2. Grooved Venturi Style

C. Clayton Valve
   1. Pump Suction Control Valve Model 50B-5KG

D. Burks Pumps
   1. Close Coupled Turbine Jockey Pump Series 'CS'

E. Controllers
   1. Patterson Jockey Pump Controller
   2. Metron Fire Pump Controller w/Transfer Switch

F. Muesco, Inc.
   1. Automatic Pressure Relief Valve
      angle style number 1116FM

G. Kennedy Valve
   1. fig. #68 O.S.&Y. Gate Valve
   2. fig. #126 Swing Check Valve
   3. fig. #911 FM WE Butterfly Valve

H. Star Sprinkler
   1. Model #20 Wafer Check Valve

I. Potter Electric Signal Company
   1. Tamper Switch type OSYSU-A2
   2. Tamper Switch type PIVSU-B2

cast iron threaded — Class 125, (standard)

pressure ratings, psi { saturated steam: 125 / liquid & gas at 150° F: 175

Grinnell standard and extra heavy cast iron threaded fittings are manufactured in accordance with American National Standards ANSI B16.4 (except plugs and bushings, ANSI B16.14). Dimensions also conform to Federal specifications, WW-P-501 (except plugs and bushings WW-P-471).

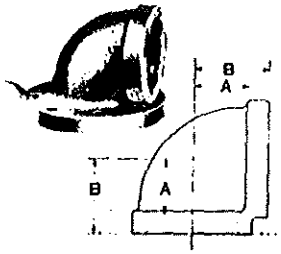
Grinnell standard and extra heavy fittings in this section, sizes ¼ - 12 inch, are included in the "List of Inspected Fire Protection Equipment and Materials" issued by the Underwriters' Laboratories, Inc.

elbows

90° elbow
straight: fig. 351

pitched: fig. 354◉

flanged and threaded
fig. 371♦



A: center to end of pipe
B: center to face of fitting

size, in.	A in.	B in.	weight (approx) each, lb fig. 351 black	fig. 351 galv.	fig. 371 black
¼	½	1⅜	.16	.17	....
⅜	9/16	1⅜	.25	.26	....
½	11/16	1⅛	.40	.41	....
¾	13/16	1⅜	.60	.61	....
1	15/16	1½	.92	.95	....
1¼	1⅛	1¾	1.44	1.46	....
1½	1⅜	1 15/16	1.95	2.00	....
2	1⅝	2¼	3.13	3.21	....
2½	1 15/16	2 11/16	4.94	5.13	10.22
3	2⅜	3⅛	7.21	7.40	13.25
3½	2⅝	3⅝	9.67	....	18.22
4	2 15/16	3 15/16	12.17	12.67	21.56
5	3⅜	4½	21.46	22.32	28.13
6	3⅞	5⅛	31.33	33.33	40.50
8	5⅛	6⅞	64.56	67.14	80.06

♦ Sizes 4 inch and larger have two bolt holes tapped for stud or tap bolts.
◉ Available in sizes ½ inch through 2 inch only, tapped to pitch ¼ inch in 1 foot; cast with letter "P" on body.

45° elbow: fig. 356

flanged and threaded
fig. 372

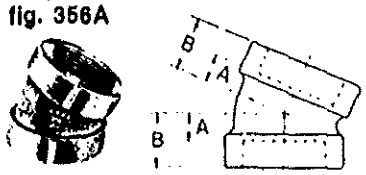
A: center to end of pipe
B: center to face of fitting

size, in.	A in.	B in.	weight (approx) each, lb fig. 356 black	fig. 356 galv.	fig. 372 black
¼	7/16	¼	.16	.17	....
⅜	7/16	5/16	.23	....	....
½	7/16	⅜	.37	.38	....
¾	½	1	.55	.56	....
1*	9/16	1⅛	.83	.88	....
1¼	⅝	1¼	1.33	1.36	....
1½	11/16	1 7/16	1.79	1.83	....
2	1	1 11/16	2.89	2.96	....
2½	1 1/16	1 15/16	4.29	4.35	....
3	1 5/16	2⅜	6.44	6.65	....
3½	1⅜	2⅝	8.42	....	....
4	1 7/16	2⅞	10.64	11.22	19.88
5	1⅝	3 7/16	16.98	17.38	....
6	2 7/16	3 7/16	26.02	26.19	35.31
8	2⅞	4¼	50.17	52.00	64.41

* 1" size available in 1 x ½ reducing size, black or galvanized.

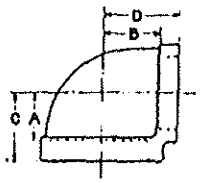
elbows, *cont'd*

22½° elbow
fig. 356A



size, in.	A in.	B in.	weight (approx) each, lb. black	weight (approx) each, lb. galvanized
¾	⅝	⅞	.52	•
1	¾	1	.80	•
1¼	⅞	1⅛	1.40	•
1½	1	1¼	1.64	•
2	1⅛	1⅜	2.50	•
2½	1¼	1⅝	3.95	•

90° elbow
***reducing:* fig. 352**



size, in.		A in.	B in.	C in.	D in.	weight (approx) each, lb. black
½	⅜	⅝	1⅛	1⅛	1⅛	.34
	¼	⅝	¾	1⅛	1⅛	.40
¾	½	1⅛	1⅜	1⅜	1¼	.51
1	¾	1⅛	1⅜	1⅜	1⅜	.76
	½	1⅛	1⅜	1¼	1⅜	.67
1¼	1	1⅜	1⅛	1⅜	1⅛	1.21
	¾	1⅜	1⅛	1⅜	1⅜	1.02
	½	1⅛	1⅛	1⅜	1½	1.07
1½	1¼	1⅜	1¼	1⅛	1⅜	1.74
	1	1	1¼	1⅜	1⅛	1.44
	¾	⅞	1⅜	1½	1⅛	1.56
	½	¾	1¼	1⅜	1⅜	1.53
2	1½	1⅜	1½	2	2⅛	2.59
	1¼	1⅜	1⅜	1⅜	2⅛	2.33
	1	1⅛	1⅜	1¼	2	2.08
	¾	1⅜	1½	1⅜	2	2.20
	½	1⅜	1⅜	1½	1⅜	2.22
2½	2	1⅜	1⅛	2⅛	2⅛	4.01
	1½	1⅜	1⅛	2⅛	2⅛	3.68
	1¼	1⅜	1¼	2⅛	2⅜	3.41
	1	1	1¼	1⅛	2⅛	2.93
3	2½	1⅛	2⅛	2⅛	3⅛	6.44
	2	1⅛	2¼	2⅛	2⅛	5.35
	1½	1⅛	2⅛	2⅛	2⅛	5.65
	1¼	1⅛	2⅛	2⅛	2⅛	5.98
3½	3	2⅛	2⅛	3⅛	3⅜	8.95
4	3½	2⅛	2⅛	3½	3⅛	11.89
	3	2⅛	2⅛	3¼	3⅜	10.63
	2½	2⅛	2¼	3¼	3⅜	11.27
	2	2⅛	2⅛	3¼	3⅜	11.89
5	4	2 13/16	3 5/16	4	4⅜	16.47
	3	2 13/16	3 7/16	4	4⅜	19.00
	2½	2 13/16	3½	4	4⅜	19.88
6	5	3⅜	3 13/16	4⅜	5	26.66
	4	2 13/16	3⅞	4 1/16	4 15/16	23.53
	3	2 5/16	3 13/16	3 9/16	4 13/16	19.43
8	6	4 3/16	5⅛	5 9/16	6⅜	51.11

A, B:
center to end of pipe

C, D:
center to face of fitting

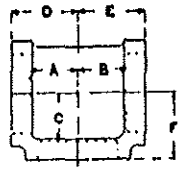
• Not stocked

Class 125, (standard)

pressure ratings, psi { saturated steam: 125 / liquid & gas at 150° F: 175

tees

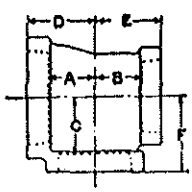
straight tee
fig. 358



A, B, C: center to end of pipe
D, E, F: center to face of fitting

size, in.	A in.	B in.	C in.	D in.	E in.	F in.	wgt (approx) each, lb. black	wgt (approx) each, lb. galv.
¼	½	½	½	13/16	13/16	13/16	.22	.23
⅜	⅝	⅝	⅝	1	1	1	.35	.36
½	11/16	11/16	11/16	1⅛	1⅛	1⅛	.56	.58
¾	13/16	13/16	13/16	1⅜	1⅜	1⅜	.84	.85
1	15/16	15/16	15/16	1½	1½	1½	1.25	1.31
1¼	1¼	1¼	1¼	1¾	1¾	1¾	2.03	2.07
1½	1⅜	1⅜	1⅜	1 15/16	1 15/16	1 15/16	2.70	2.72
2	1¾	1¾	1¾	2¼	2¼	2¼	4.23	4.33
2½	1 15/16	1 15/16	1 15/16	2 11/16	2 11/16	2 11/16	6.67	6.79
3	2⅜	2⅜	2⅜	3⅛	3⅛	3⅛	10.00	10.16
3½	2⅝	2⅝	2⅝	3⅜	3⅜	3⅜	13.29	13.82
4	2 11/16	2 11/16	2 11/16	3¾	3¾	3¾	16.33	16.99
5	3⅜	3⅜	3⅜	4½	4½	4½	27.33	27.67
6	3⅞	3⅞	3⅞	5⅛	5⅛	5⅛	40.85	41.40
8	5⅜	5⅜	5⅜	6⅜	6⅜	6⅜	79.00	81.25

reducing tee
fig. 359



A, B, C:
center to end of pipe

D, E, F:
center to face of fitting

½	½	⅜	11/16	11/16	¾	1⅛	1⅛	1⅛	.57	....
		¼	11/16	11/16	13/16	1⅛	1⅛	1⅛	.57	....
	¼	½	11/16	11/16	⅝	1⅛	1⅛	1⅛	.59	....
¾	¾	½	13/16	13/16	13/16	1⅜	1⅜	1¼	.76	....
		⅜	13/16	13/16	13/16	1⅜	1⅜	1¼	.75	....
		¼	15/16	15/16	⅞	1⅜	1⅜	1⅜	.62	....
	½	¾	13/16	13/16	13/16	1⅜	1¼	1⅜	.75	....
		½	11/16	11/16	13/16	1⅜	1⅛	1¼	.64	....
	¼	¾	13/16	13/16	13/16	1⅜	1¼	1⅜	.79	....
1	1	¾	13/16	13/16	13/16	1¼	1¼	1⅜	.68	....
1	1	¾	13/16	13/16	15/16	1⅜	1⅜	1⅜	1.11	....
		½	13/16	13/16	15/16	1¼	1¼	1⅜	1.01	1.03
		¼	13/16	13/16	1¼	1¼	1¼	1⅜	1.01	....
	¾	1	15/16	15/16	15/16	1½	1⅜	1½	1.13	....
		¾	15/16	15/16	15/16	1⅜	1⅜	1⅜	1.00	....
		½	13/16	13/16	15/16	1¼	1⅜	1⅜	.89	....
	½	1	15/16	15/16	15/16	1½	1⅜	1½	1.08	....
		¾	15/16	15/16	15/16	1⅜	1¼	1⅜	.91	....
		½	13/16	¾	15/16	1¼	1⅜	1⅜	.90	....
	¼	1	15/16	15/16	15/16	1½	1¼	1½	1.08	....
¾	¾	1	15/16	15/16	15/16	1⅜	1⅜	1⅜	.99	....
½	½		1	1	15/16	1⅜	1⅜	1⅜	1.00	....
1¼	1¼	1	15/16	15/16	1⅛	1⅜	1⅜	1 11/16	1.73	....
		¾	15/16	15/16	1⅛	1⅜	1⅜	1⅜	1.57	....
		½	13/16	13/16	1⅛	1⅜	1⅜	1⅜	1.47	....
	1	1¼	1⅛	1⅛	1⅛	1¾	1 15/16	1¾	1.79	....
		1	15/16	15/16	1⅛	1⅜	1⅜	1 15/16	1.53	1.56
		¾	15/16	15/16	1⅛	1⅜	1⅜	1⅜	1.36	....
		½	13/16	13/16	1⅛	1⅜	1¼	1⅜	1.27	1.30
	¾	1¼	1⅛	1⅛	1⅛	1¾	1⅜	1¾	1.73	....
		1	15/16	15/16	1⅛	1⅜	1⅜	1 13/16	1.43	....
		¾	15/16	15/16	1⅛	1⅜	1⅜	1⅜	1.27	....
	½	1¼	1⅛	1⅛	1⅛	1¾	1⅜	1¾	1.64	....
		1	15/16	15/16	1⅛	1⅜	1⅜	1 13/16	1.38	....
	½	½	13/16	13/16	1⅛	1⅜	1⅜	1⅜	1.00	....
1	1	1¼	1⅛	1⅛	15/16	1 11/16	1 11/16	1⅜	1.49	....

GRUVLOK COUPLINGS FOR GROOVED END IPS PIPE

Gruvlok couplings for grooved end pipe are available in various nominal pipe sizes. The variety of coupling designs provides a universal means for the connection of pipe, pipe fittings, and other pipe system components.
The wide assortment of GRUVLOK couplings and gasket styles permits selection of the most suitable combination for a specific application, thus providing the most versatile and economical pipe system installation.

Material Specifications

Housing:

Malleable Iron conforming to ASTM A-47
or
Ductile Iron conforming to ASTM A-536

Coatings:

Rust Inhibiting paint - color: RED
Hot Dipped Zinc Galvanize
For other coating requirements contact ITT Grinnell

Gaskets:

Elastomers with properties as designated by ASTM D-2000 for each gasket grade.
Refer to the Gasket Selection Guide on page 32 for details.

Bolts and Nuts:

Heat treated, oval-neck track head bolts and heavy hex nuts of carbon steel conforming to ASTM A-183 with a minimum tensile strength of 110,000 psi.
Bolts and nuts are provided electroplated as standard. Stainless steel bolts and nuts are also available.
Contact ITT GRINNELL for details.

General Coupling Data Chart Notes

1	2	3	4	5	6		7			8		9
Nominal Size Inches mm	Pipe O.D. Inches mm	Max. Wk. Pressure PSI MPa	Max. End Load Lbs. N	Range of Pipe End Separation Inches mm	Deflection from ℄		Coupling Dimensions			Coupling Bolts		Approx. Wt. Ea. Lbs. kg.
					Per Coupling Degrees	Pipe in./ft. mm/meter	X	Y	Z	Quantity	Size Inches mm	
							Inches Millimeters					

1 Gruvlok couplings are identified by Nominal Pipe Size.

2 IPS Outside Diameter.

3 Maximum line pressure, including surge, to which a joint should be subjected. Working pressure ratings are based on standard wall steel pipe with standard cut grooves in accordance with Gruvlok specifications on page 49. For Performance Data on other than standard pipe, refer to page 51. **Note: for one time field test only** the maximum joint working pressure may be increased to 1-1/2 times the figure shown.

4 Maximum end load from all internal and/or external forces to which the joint can be subjected based on standard wall steel pipe with standard cut grooves in accordance with Gruvlok specification on page 49.

5 Range of pipe end separation normally available on the standard cut grooved pipe. The maximum linear movement at the coupling joint is the difference between maximum and minimum pipe end separations. For standard roll groove steel pipe reduce the value by 50%.

6 Maximum allowable deflection of pipe from centerline when using standard cut grooved steel pipe. For standard roll grooved steel pipe reduce the values by 50%.

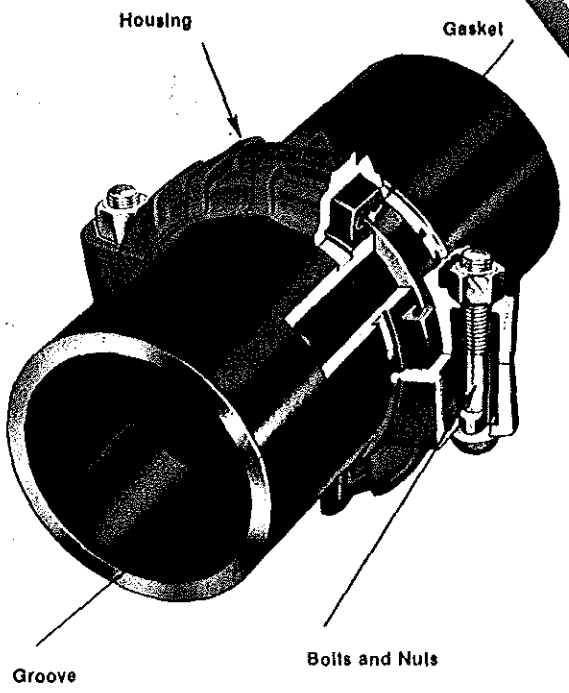
7 "X", "Y", and "Z" are external dimensions for reference purposes only.

8 The quantity of bolts equals the number of housing segments per coupling.

9 Approximate weight for fully assembled coupling with gasket, bolts, and nuts.

GROOVED PIPING SYSTEM

Victaulic®



The Victaulic® Grooved Piping Method is the most versatile, economical and reliable piping system available. Up to three times faster than welding, easier and more reliable than threading or flanging, the Victaulic Grooved Piping Method offers a combination of mechanical advantages unmatched by any competitive pipe joining method.

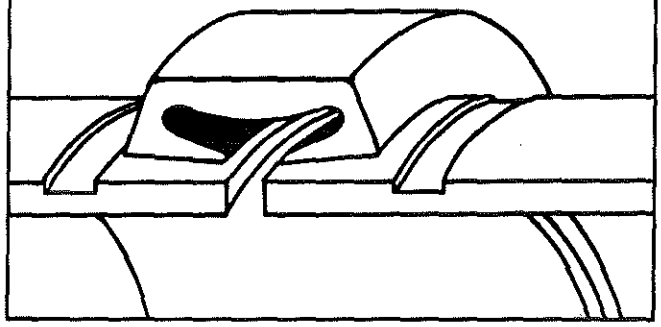
The system incorporates four basic components—the gasket, housing, bolts/nuts and the groove.

GASKET

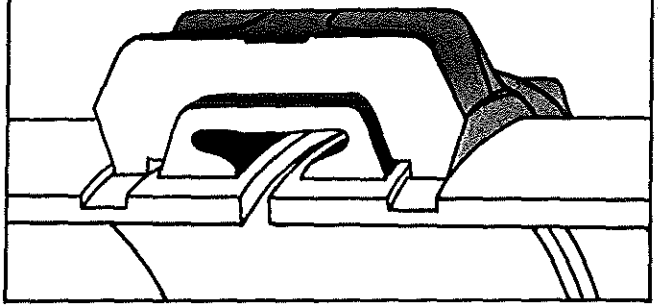
The resilient elastomeric gasket conforms to the internal cavity of the housing and seals against the pipe as the housing segments are tightened. It is pressure responsive . . . sealing action increases as the internal pressure increases. This creates a permanent, leak-tight triple seal.

Unique "C" shaped gasket forms a triple seal

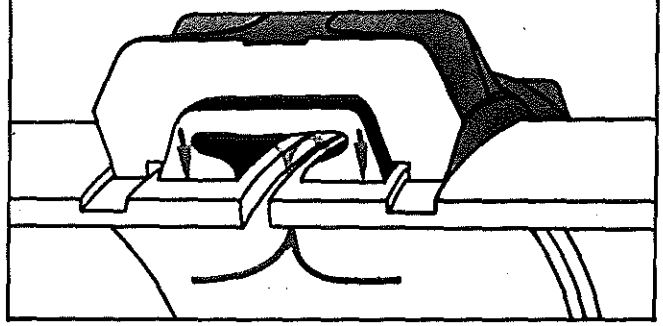
Seals between the pipe ends and the groove



Surrounded, reinforced and slightly compressed by the housing



Seal is enhanced by pressure or vacuum in the line



c. Iron flanged | Class 125 (standard)

pressure ratings, psi { saturated steam: 1 to 12 inch: 125; 14 to 24 inch: 100 / liquid & gas at 150° F: 1 to 12 inch: 175

ıpecifications

\ll Standard or "Class 125" Cast Iron Flanged ittings in sizes listed are made to American lational Standard ANSI B16.1 and are marked 125 or pipe sizes 12-inch and smaller; 100 for pipe sizes 4-inch and larger; and have plain faces. Unless otherwise specified, they are shipped with flanges aced and drilled American National Standard. Dimensions conform to federal specification: WW-406.

TT Grinnell fittings in this section, up to 16-inch nclusive, are included in the "List of Inspected ire Protection Equipment and Materials" issued by the Underwriters' Laboratories, Inc.

:oating

langed fittings are available both black and galvanized. Consult an ITT Grinnell representative for ıvailable sizes.

ıizes

Size of all fittings scheduled indicates nominal inside diameter of ports.

Standard reducing elbows carry the same dimensions center-to-face as regular elbows of largest straight size.

Sizes 18", 20" and 24" reducing on the outlet in the following sizes are to short body pattern and are to the dimensions shown as follows:

All tees, crosses and laterals reducing on the run only have the same center-to-face and face-to-face dimensions as a straight fitting of the size of the largest opening. Sizes 16" and smaller reducing on the outlet have same dimensions as a straight fitting of the size of the largest opening.

Reducing Tees and Reducing Crosses

Nominal Pipe Size	Size of Outlet and Smaller	Center to Face Run	Center to Face Outlet or Side Outlet
18"	12"	13"	15½"
20"	14"	14"	17"
24"	16"	15"	19"

Reducing Laterals

Nominal Pipe Size	Size of Outlet and Smaller	Center to Face Run	Center to Face Run	Center to Face Branch
18"	8"	25"	1"	27½"
20"	10"	27"	1"	29½"
24"	12"	31½"	½"	34½"

All Reducing Fittings in the sizes 18", 20" and 24" can also be supplied to Straight Size dimensions if specified. Prices on application.

To order reducing companion flanges, specify threaded or reduced size first, then the outside diameter of flange wanted. For instance, if a reducing flange is required to connect a 5-inch pipe to an 8-inch flanged valve or fitting having a 13½-inch o.d. flange, order: 5 x 13½-inch standard reducing flange.

dimensions

Bolt holes, for bolts smaller than 1¼ inches in diameter are drilled ⅛ inch larger than bolt diameter; for bolts 1¼ inch and larger, bolt holes are ¼ inch larger than bolt diameter. Bolt holes straddle the center line. Bolt holes are spot faced on order only.

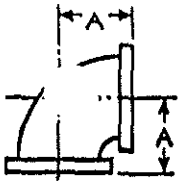
tolerances

An inspection limit of plus or minus ⅛ inch shall be allowed on all center to contact surface dimensions for sizes up to and including 10 inches; plus or minus ⅛ inch on sizes larger than 10 inches. Inspection limit of plus or minus ⅛ inch shall be allowed on all contact surface to contact surface dimensions for sizes up to and including 10 inches; plus or minus ⅛ inch on sizes larger than 10 inches. The largest opening in the fitting governs the tolerance to be applied to all openings.

■ Patterns are designed to produce castings having the wall thicknesses given in the tables. The wall thicknesses of the castings at no point shall be less than 87½ per cent of the dimensions given.

elbows

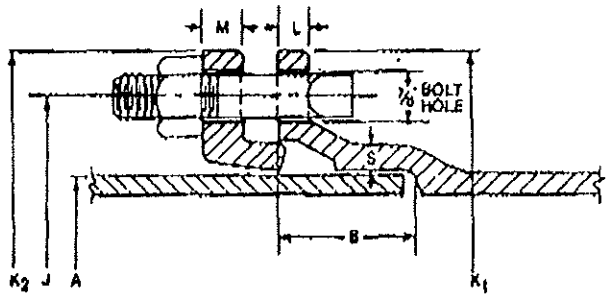
90° straight elbow
Fig. 801



A: center to face

size, in.	A in.	diameter of flange, in.	thickness of flange (min) in.	wall thickness■ in.	wgt (approx) each, lb.
1½	4	5	7/16	5/16	9
2	4½	6	5/8	5/16	14
2½	5	7	11/16	5/16	19
3	5½	7½	3/4	3/8	24
3½	6	8½	13/16	7/16	31
4	6½	9	13/16	½	41
5	7½	10	15/16	½	52
6	8	11	1	9/16	68
8	9	13½	1⅛	⅝	110
10	11	16	1⅜	¾	175
12	12	19	1¼	13/16	260
14 O.D.	14	21	1⅜	⅞	350
16 O.D.	15	23½	1⅜	1	470
18 O.D.	16½	25	1⅜	1⅛	580

Mechanical Joint Bell Dimensions



Accessories

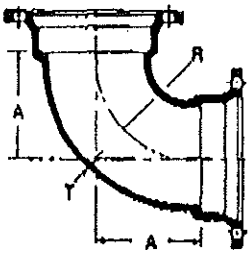
Size	Bolts No.	Bolts Size	Bolts Lgth.
4	4	¾	3¼
6	6	¾	3½
8	8	¾	3½
10	8	¾	3½
12	8	¾	3½
14	10	¾	4
16	12	¾	4

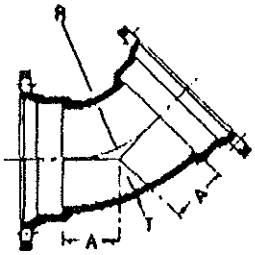
Table of Dimensions

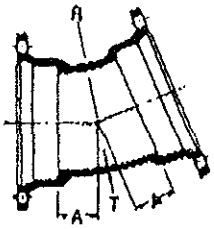
Size	A	B	J	K_1	K_2	L	M'	S
4	4.80	2.50	7.50	9.06	9.12	.60	0.75	.39
6	6.90	2.50	9.50	11.06	11.12	.63	0.88	.43
8	9.05	2.50	11.75	13.31	13.37	.66	1.00	.46
10	11.10	2.50	14.00	15.62	15.62	.70	1.00	.47
12	13.20	2.50	16.25	17.88	17.88	.73	1.00	.49
14	15.30	3.50	18.75	20.31	20.25	.79	1.25	.56
16	17.40	3.50	21.00	22.56	22.50	.85	1.31	.57

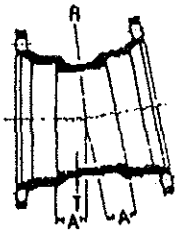
†For ductile-iron glands this thickness is required only surrounding the bolt holes.

Bends









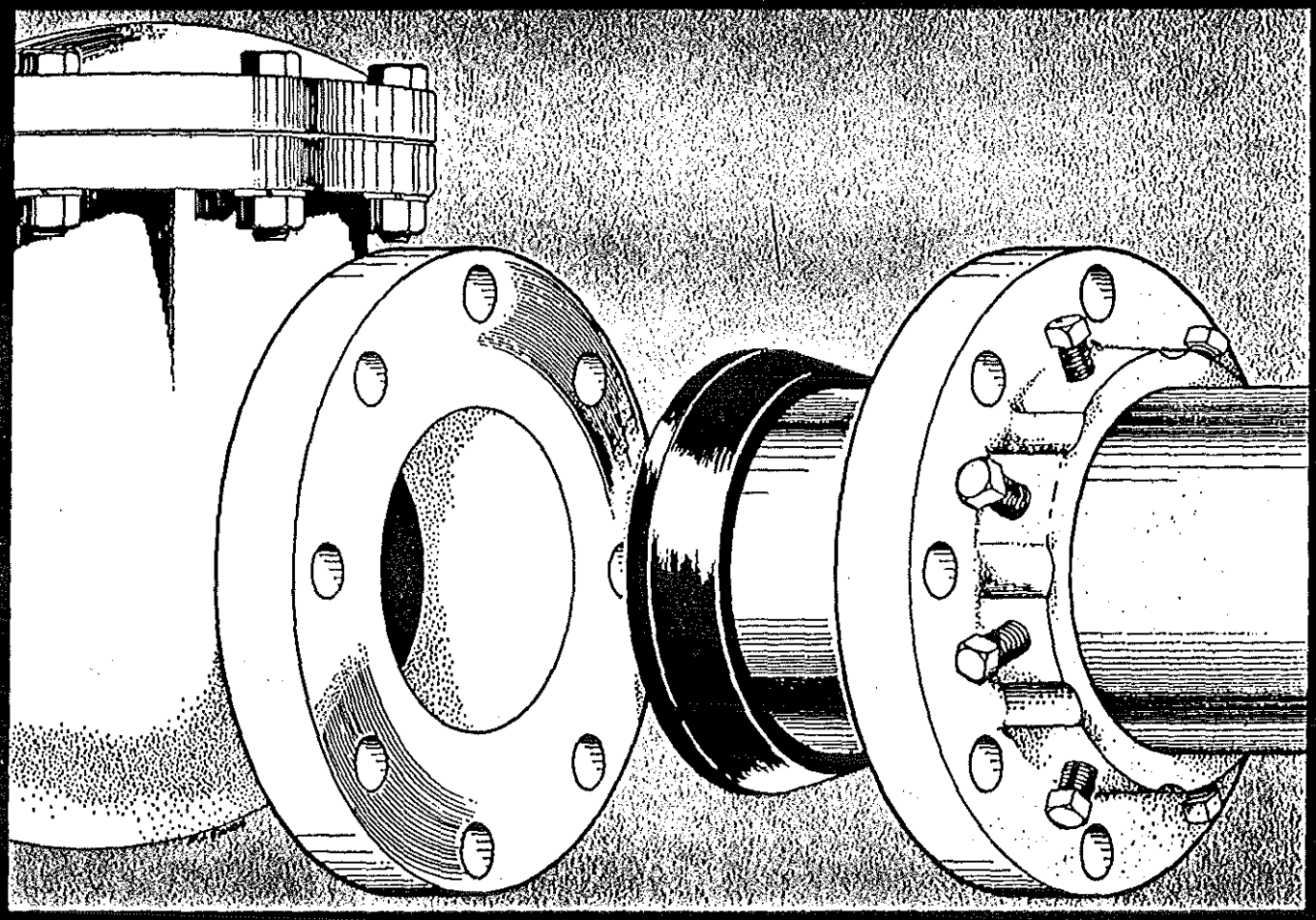
Size	¼ Bends Dimensions T	¼ Bends Dimensions A	¼ Bends Dimensions R	¼ Bends Weights	⅛ Bends Dimensions A	⅛ Bends Dimensions R	⅛ Bends Weights	1/16 Bends Dimensions A	1/16 Bends Dimensions R	1/16 Bends Weights	1/32 Bends Dimensions A	1/32 Bends Dimensions R	1/32 Bends Weights
4	.35	4.75	4.5	29	2.50	4.81	20	1.50	6.66	18	1.25	10.70	16
6	.37	6.25	8.0	44	3.25	7.25	36	2.25	10.50	32	1.50	13.26	30
8	.39	7.25	7.0	64	4.25	8.44	54	2.50	11.80	46	1.75	15.80	42
10	.41	9.25	9.0	98	5.00	10.86	78	3.00	14.35	64	2.00	18.36	58
12	.43	10.25	10.0	125	6.00	13.25	105	3.50	16.90	84	2.25	20.90	74
14	.51	12.00	11.5	191	5.50	12.06	150	3.93	17.25	125	2.59	21.25	114
16	.52	13.00	12.5	239	5.98	13.25	181	3.98	17.50	158	2.62	21.50	143

*4"–12" fittings comply with ANSI/AWWA C153/A21.53
14"–16" fittings are similarly designed and are per manufacturer's standard

Joint dimensions in inches for mechanical joint fittings

NOTE: WEIGHTS DO NOT INCLUDE JOINT MATERIAL.

JOIN THE UNI-FLANGE CONNECTION



UNI-FLANGE CORP.

TECHNICAL DATA AND AVAILABILITY

Flange Material
Manufactured from Ductile Iron ASTM A536 Grade 65-45-12 Drilling to ANSI B16.1 - Class 125 & 250 / ANSI B16.5 - Class 150 & 300.

Design
Uni-Flange has been designed to meet the test requirements of ANSI B16.1 -Class 125 and 250 / ANSI B16.5 -Class 150 and 300.

Set Screw Material
AISI 4140 Steel. Tensile 190,000 psi minimum. Heat treated and zinc plated.

Gasket Availability
Standard Gasket supplied with the Uni-Flange is SBR (BUNA-S), suitable for water and wastewater, and most moderate chemicals. Temperature range 65°F to 212°F.

The following alternative gaskets are also available, and color coded as indicated:

EPDM (Ethylene Propylene)-green suitable for 65°F to 350°F.

CR (Neoprene) - yellow suitable for 65°F to 212°F.

NBR (Buna - N, Nytril, Hycar) - orange suitable for 65°F to

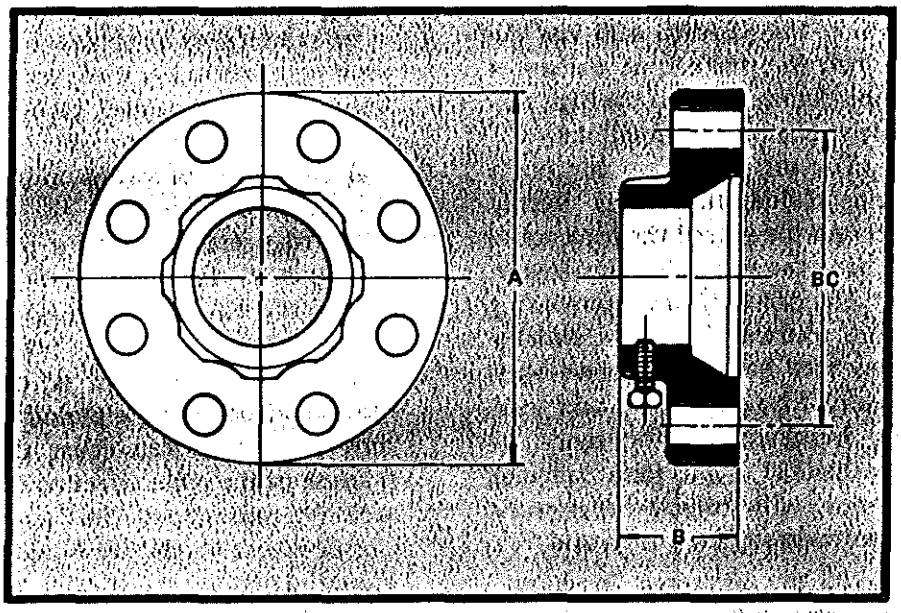
FPM (Viton) - red suitable for 50°F to 450°F.

Hydrostatic Test Pressure
Uni-Flanges are capable of withstanding the following hydrostatic test without leakage.

SERIES 200 - Class 125/150
2 in. - 8 in. 600 psi
10 in. - 12 in. 525 psi
SERIES 400 - Class 125/150
2 in. - 12 in. 750 psi
14 in. - 24 in. 300 psi
30 in. - 48 in. 150 psi
SERIES 420 - Class 250/300
2 in. - 12 in. 800 psi

Applications
Uni-Flanges are designed to handle the following water working pressures at a temperature of 20°F to 150° F.

SERIES 200 - Class 125/150
2 in. - 8 in. 200 psi
10 in. - 12 in. 175 psi
SERIES 400 - Class 125/150
2 in. - 12 in. 250 psi
14 in. - 24 in. 150 psi
30 in. - 48 in. 100 psi
SERIES 420 - Class 250/300
2 in. - 12 in. 400 psi



Series 200 - S/Class 150 Series 200 - C/Class 125

NOM. PIPE SIZE	STEEL PIPE O.D. 200-S	CAST IRON PIPE O.D. 200-C	A	B	B.C.	BOLT HOLE DIA.	SET SCREWS NO.	SET SCREWS SIZE	WGT. APPROX. (LBS.)
2	2.375	2.50	6	1 13/16	4 3/4	3/4	2	1/2 x 1	3.5
2½	2.875	*N/A	7	1 13/16	5 1/2	3/4	4	1/2 x 1	4.0
3	3.500	3.96	7½	1 13/16	6	3/4	4	1/2 x 1	5.0
4	4.500	4.80	9	1 7/8	7 1/2	3/4	4	1/2 x 1	7.7
5	5.563	*N/A	10	1 7/8	8 1/2	7/8	8	1/2 x 1	8.7
6	6.625	6.90	11	1 7/8	9 1/2	7/8	8	1/2 x 1	10.0
8	8.625	9.05	13½	2 1/4	11 3/4	7/8	8	5/8 x 1 1/4	16.5
10	10.750	11.10	16	2 1/4	14 1/4	1	12	5/8 x 1 1/4	22.0
12	12.750	13.20	19	2 1/4	17	1	12	5/8 x 1 1/4	31.0

Dimensions in inches

Series 400 - S/Class 150 Series 400 - C/Class 125

NOM. PIPE SIZE	STEEL PIPE O.D. 400-S	CAST IRON PIPE O.D. 400-C	A	B	B.C.	BOLT HOLE DIA.	SET SCREWS NO.	SET SCREWS SIZE	WGT. APPROX. (LBS.)
2	2.375	2.50	6	2	4 3/4	3/4	4	1/2 x 1	5
2½	2.875	*N/A	7	2 1/16	5 1/2	3/4	4	1/2 x 1	7
3	3.500	3.96	7½	2 1/16	6	3/4	4	1/2 x 1	8
3½	4.000	*N/A	8½	2 1/16	7	3/4	8	1/2 x 1	9
4	4.500	4.80	9	2 1/16	7 1/2	3/4	8	1/2 x 1	11
5	5.563	*N/A	10	2 1/8	8 1/2	7/8	8	5/8 x 1 1/4	13
6	6.625	6.90	11	2 1/8	9 1/2	7/8	8	5/8 x 1 1/4	14
8	8.625	9.05	13½	2 1/8	11 3/4	7/8	8	5/8 x 1 1/4	21
10	10.750	11.10	16	2 3/16	14 1/4	1	12	5/8 x 1 1/4	38
12	12.750	13.20	19	2 1/4	17	1	12	5/8 x 1 1/4	56
14	14.000	15.30	21	2 5/8	18 3/4	1 1/8	12	5/8 x 1 1/4	70
16	16.000	17.40	23½	2 11/16	21 1/4	1 1/8	16	5/8 x 1 1/4	79
18	18.000	19.50	25	2 13/16	22 3/4	1 1/4	16	3/4 x 2	90
20	20.000	21.60	27½	2 15/16	25	1 1/4	20	3/4 x 2	145
24	24.000	25.80	32	3 1/8	29 1/2	1 3/8	20	3/4 x 2	175
30	30.000	32.00	38¾	4	36	1 3/8	28	1 x 2 1/4	270
36	36.000	38.30	46	4 1/2	42 3/4	1 5/8	32	1 x 2 1/4	400
42	42.000	44.50	53	4 3/4	49 1/2	1 5/8	36	1 x 2 1/4	495
48	48.000	50.80	59½	4 7/8	56	1 5/8	44	1 x 2 1/4	660

Dimensions in inches

Series 420 - S/Class 300 Series 420 - C/Class 250

NOM. PIPE SIZE	STEEL PIPE O.D. 420-S	CAST IRON PIPE O.D. 420-C	A	B	B.C.	BOLT HOLE DIA.	SET SCREWS NO.	SET SCREWS SIZE	WGT. APPROX. (LBS.)
2	2.375	2.50	6½	2 1/4	5	3/4	8	1/2 x 1	7
2½	2.875	*N/A	7½	2 3/8	5 7/8	7/8	8	1/2 x 1	10
3	3.500	3.96	8¼	2 7/16	6 5/8	7/8	8	1/2 x 1	13
3½	4.000	*N/A	9	2 7/16	7 1/4	7/8	8	1/2 x 1	16
4	4.500	4.80	10	2 7/16	7 7/8	7/8	8	5/8 x 1 1/4	21
5	5.563	*N/A	11	2 9/16	9 1/4	7/8	8	5/8 x 1 1/4	27
6	6.625	6.90	12½	2 9/16	10 5/8	7/8	12	5/8 x 1 1/4	38
8	8.625	9.05	15	2 5/8	13	1	12	5/8 x 1 1/4	57
10	10.750	11.10	17½	2 7/8	15 1/4	1 1/8	16	5/8 x 1 1/4	74
12	12.750	13.20	20½	3	17 3/4	1 1/4	16	5/8 x 1 1/4	104

*N/A - Cast Iron Pipe Not Manufactured in These Sizes

Dimensions in inches

kler systems shall be designed to withstand a working pressure of not less than 175 psi (12.1 bars).

Table 3-1.1.1 Pipe or Tube Materials and Dimensions

Materials and Dimensions	Standard
Ferrous Piping (Welded and Seamless)	
†Spec. for Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use	ASTM A795
†Spec. for Welded and Seamless Steel Pipe	ANSI/ASTM A53
Wrought Steel Pipe	ANSI B36.10M
Spec. for Elec.-Resistance Welded Steel Pipe	ASTM A135
Copper Tube (Drawn, Seamless)	
†Spec. for Seamless Copper Tube	ASTM B75
†Spec. for Seamless Copper Water Tube	ASTM B88
Spec. for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube	ASTM B251
Brazing Filler Metal (Classification BCuP-3 or BCuP-4)	AWS A5.8
Solder Metal, 95-5 (Tin-Antimony-Grade 95TA)	ASTM B32

†Denotes pipe or tubing suitable for bending (*see 3-1.1.7*) according to ASTM standards.

3-1.1.2* When welded and seamless steel pipe listed in Table 3-1.1.1 is used and joined by welding as referenced in 3-7.2 or by roll grooved pipe and couplings as referenced in 3-7.3, the minimum nominal wall thickness for pressures up to 300 psi (20.7 bars) shall be in accordance with Schedule 10 for sizes up to 5 in. (127 mm); 0.134 in. (3.40 mm) for 6 in. (152 mm); and 0.188 in. (4.78 mm) for 8- and 10-in. (203- and 254-mm) pipe; or as modified in 3-1.1.5, or as defined in 3-1.1.6.

3-1.1.3 When steel pipe listed in Table 3-1.1.1 is used and joined by threaded fittings referenced in 3-7.1 or by couplings used with pipe having cut grooves, the minimum wall thickness shall be in accordance with Schedule 30 [in sizes 8 in. (203 mm) and larger] or Schedule 40 [in sizes less than 8 in. (203 mm)] pipe for pressures up to 300 psi (20.7 bars).

3-1.1.4* Copper tube as specified in the standards listed in Table 3-1.1.1, used in sprinkler systems, shall have a wall thickness of Type K, L, or M.

3-1.1.5* Other types of pipe or tube may be used if investigated and listed for this service and installed in accordance with their listing limitations, including installation instructions. Pipe or tube shall not be listed for portions of an occupancy classification.

3-1.1.6 Whenever the word pipe is used in this standard it shall be understood to also mean tube.

3-1.1.7 Pipe Bending. Bending of steel pipe (Schedule 40) and copper tube (Types K and L) may be accomplished when bends are made in conformance with good installation practices and show no kinks, ripples, distortions, reduction in diameter, or any noticeable deviations from round. The minimum radius of a bend shall be 6 pipe diameters for pipe sizes 2 in. (51 mm) and smaller, and 5 pipe diameters for pipe sizes 2½ in. (64 mm) and larger.

3-2* Definitions. (*See Figure A-3-2.*)

Risers. The vertical pipes in a sprinkler system.

System Riser. The aboveground supply pipe directly connected to the water supply.

Feed Mains. Mains supplying risers or cross mains.

Cross Mains. Pipes directly supplying the lines in which the sprinklers are placed.

Branch Lines. Lines of pipe, from the point of attachment to the cross main (or similar connection) to the end sprinkler, in which the sprinklers are directly placed.

3-3 Special Provisions Applicable to Piping.

3-3.1 Rack Storage. For sprinklers in storage racks see NFPA 231C, *Standard for Rack Storage of Materials.*

3-3.2* Provision for Flushing Systems. All sprinkler systems shall be arranged for flushing. Readily removable fittings shall be provided at the end of all cross mains. All cross mains shall terminate in 1¼-in. (33-mm) or larger pipe. All branch lines on gridded systems shall be arranged to facilitate flushing.

3-3.3 Stair Towers. Stairs, towers, or other construction with incomplete floors, if piped on independent risers, shall be treated as one area with reference to pipe sizes.

3-3.4 Return Bends. Return bends shall be used when pendent sprinklers are supplied from a raw water source, mill pond, or from open-top reservoirs. Return bends shall be connected to the top of branch lines in order to avoid accumulation of sediment in the drop nipples.

Exception No. 1: Return bends are not required for deluge systems.

Exception No. 2: Return bends are not required when dry-pendent sprinklers are used.

3-3.4.1 In revamping existing systems, when it is not necessary to retain sprinklers in the concealed space, a nipple not exceeding 4 in. (102 mm) in length and of the same pipe thread size as the sprinkler being removed, may be used with 1-in. (25-mm) pipe and fittings for the other portions of the return bend to a single sprinkler in an area.

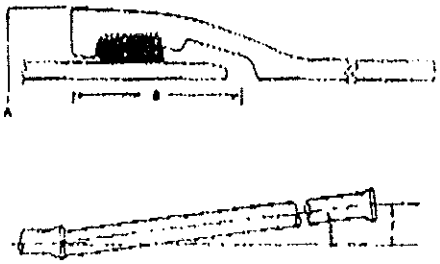
3-3.4.2 In revamping existing systems when it is necessary to retain sprinklers in the concealed space, the return bend shall be not less than 1 in. (25 mm) throughout to a single sprinkler in each area.

3-3.5 Piping to Sprinklers Below Ceilings.

3-3.5.1 In new installations expected to supply sprinklers below a ceiling, minimum 1 in. (25 mm) outlets shall be provided.

Super Bell-Tite®

Super Bell-Tite



Size	Pipe Barrel: Super Bell-Tite Mechanical Joint — Thick. Class	Thick.*	O.D.*	A Bell O.D.	B Bell Depth	X Dell. Angle	Laying Length 18 ft.: Wt. Per Lgth.†	18 ft.: Max. Dell. Y	Laying Length 20 ft.: Wt. Per Lgth.†	20 ft.: Max. Dell. Y
In		In.	In.	In.	In.	deg.	lb.	In.	lb.	In.
3	51	0.26	3.66	5.68	3.01	5	185	19		
	52	0.29	3.96	5.68	3.01	5	185	19		
	53	0.31	3.96	5.68	3.01	5	200	19		
	54	0.34	3.96	5.68	3.01	5	220	19		
	55	0.37	3.96	5.68	3.01	5	235	19		
	56	0.40	3.96	5.68	3.01	5	250	19		
4	51	0.26	4.80	6.80	3.26	5	215	19		
	52	0.29	4.80	6.80	3.26	5	235	19		
	53	0.32	4.80	6.80	3.26	5	255	19		
	54	0.35	4.80	6.80	3.26	5	275	19		
	55	0.38	4.80	6.80	3.26	5	300	19		
	56	0.41	4.80	6.80	3.26	5	320	19		
6	50	0.25	6.90	8.91	3.51	5	300	19	335	21
	51	0.28	6.90	8.91	3.51	5	335	19	370	21
	52	0.31	6.90	8.91	3.51	5	365	19	405	21
	53	0.34	6.90	8.91	3.51	5	400	19	440	21
	54	0.37	6.90	8.91	3.51	5	430	19	480	21
	55	0.40	6.90	8.91	3.51	5	465	19	515	21
	56	0.43	6.90	8.91	3.51	5	495	19	550	21
8	50	0.27	9.05	11.29	3.76	5	430	19	476	21
	51	0.30	9.05	11.29	3.76	5	475	19	525	21
	52	0.33	9.05	11.29	3.76	5	520	19	576	21
	53	0.36	9.05	11.29	3.76	5	560	19	620	21
	54	0.39	9.05	11.29	3.76	5	605	19	670	21
	55	0.42	9.05	11.29	3.76	5	645	19	715	21
	56	0.45	9.05	11.29	3.76	5	690	19	765	21
10	50	0.29	11.10	13.46	4.01	5	570	19	630	21
	51	0.32	11.10	13.46	4.01	5	625	19	690	21
	52	0.35	11.10	13.46	4.01	5	680	19	750	21
	53	0.38	11.10	13.46	4.01	5	730	19	810	21
	54	0.41	11.10	13.46	4.01	5	785	19	870	21
	55	0.44	11.10	13.46	4.01	5	840	19	930	21
	56	0.47	11.10	13.46	4.01	5	890	19	990	21
12	50	0.31	13.20	15.65	4.26	5	725	19	805	21
	51	0.34	13.20	15.65	4.26	5	790	19	877	21
	52	0.37	13.20	15.65	4.26	5	855	19	948	21
	53	0.40	13.20	15.65	4.26	5	920	19	1,020	21
	54	0.43	13.20	15.65	4.26	5	980	19	1,090	21
	55	0.46	13.20	15.65	4.26	5	1,050	19	1,160	21
	56	0.49	13.20	15.65	4.26	5	1,110	19	1,230	21
14	50	0.33	15.30	17.87	4.51	3	900	11	995	12
	51	0.36	15.30	17.87	4.51	3	975	11	1,080	12
	52	0.39	15.30	17.87	4.51	3	1,050	11	1,165	12
	53	0.42	15.30	17.87	4.51	3	1,125	11	1,245	12
	54	0.45	15.30	17.87	4.51	3	1,200	11	1,330	12
	55	0.48	15.30	17.87	4.51	3	1,275	11	1,415	12
	56	0.51	15.30	17.87	4.51	3	1,350	11	1,495	12
16	50	0.34	17.40	20.04	4.76	3	1,080	11	1,170	12
	51	0.37	17.40	20.04	4.76	3	1,145	11	1,265	12
	52	0.40	17.40	20.04	4.76	3	1,230	11	1,360	12
	53	0.43	17.40	20.04	4.76	3	1,315	11	1,455	12
	54	0.46	17.40	20.04	4.76	3	1,400	11	1,550	12
	55	0.49	17.40	20.04	4.76	3	1,490	11	1,645	12
	56	0.52	17.40	20.04	4.76	3	1,575	11	1,740	12
18	50	0.35	19.50	22.19	4.80	3			1,360	12
	51	0.38	19.50	22.19	4.89	3			1,460	12
	52	0.41	19.50	22.19	4.80	3			1,565	12
	53	0.44	19.50	22.19	4.89	3			1,675	12
	54	0.47	19.50	22.19	4.89	3			1,780	12
	55	0.50	19.50	22.19	4.89	3			1,890	12
	56	0.53	19.50	22.19	4.89	3			1,995	12
20	50	0.36	21.60	24.31	5.01	3			1,545	12
	51	0.39	21.60	24.31	5.01	3			1,665	12
	52	0.42	21.60	24.31	5.01	3			1,786	12
	53	0.45	21.60	24.31	5.01	3			1,905	12
	54	0.48	21.60	24.31	5.01	3			2,025	12
	55	0.51	21.60	24.31	5.01	3			2,140	12
	56	0.54	21.60	24.31	5.01	3			2,260	12
24	50	0.38	25.80	28.57	5.13	3			1,950	12
	51	0.41	25.80	28.57	5.13	3			2,095	12
	52	0.44	25.80	28.57	6.13	3			2,240	12
	53	0.47	25.80	28.57	5.13	3			2,385	12
	54	0.50	25.80	28.57	5.13	3			2,525	12
	55	0.53	25.80	28.57	5.13	3			2,670	12
	56	0.56	25.80	28.57	5.13	3			2,810	12

*Thicknesses and O.D. tolerances shall be in accordance with ANSI/AWWA C151/A21.51 and C111/A21.11 respectively.

†Including bell; calculated weight of pipe rounded off to nearest 5 lb.

3% CASH DISCOUNT

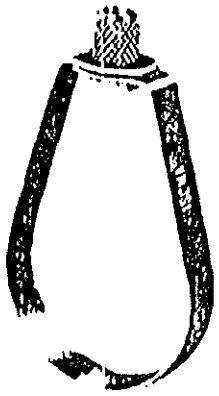
applies to invoices dated 1st to 15th when paid by 25th of same month and invoices dated 16th to 31st when paid by 10th of the following month.

)UANTITY PRICES INCLUDE COMBINATIONS OF ANY SIZE AND/OR PRODUCTS LISTED

	Rod Size	Std. Box Qty.	Weight Per 100 (Approx.)	NET PRICE PER 100 PCS.
."	3/8"	100	7 Lbs.	
3"	3/8"	100	7	
	3/8"	100	8	
	3/8"	100	8	
	3/8"	100	9	
	3/8"	100	10	
."	3/8"	100	21	
	3/8"	50	23	
	3/8"	50	26	
	3/8"	50	33	
	1/2"	25	38	
	1/2"	20	74	
	1/2"	20	87	

MODEL NO. 130

"Light Duty"

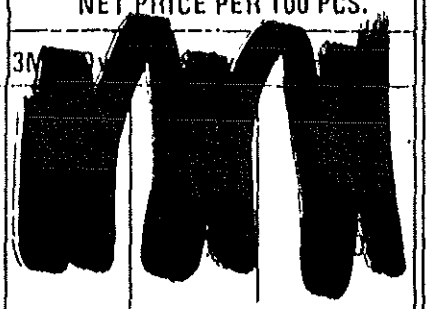


Light Duty Swivel Ring Hanger For Smaller N.F.P.A. Rod Sizes Only.

mplete Support Requirements

- CLEVIS HANGERS
- RISER CLAMPS
- CONCRETE INSERTS
- U-BOLTS
- THREADED BOLT
- ROD COUPLINGS
- LAG SCREWS
- CENTER LOADING BEAM CLAMPS

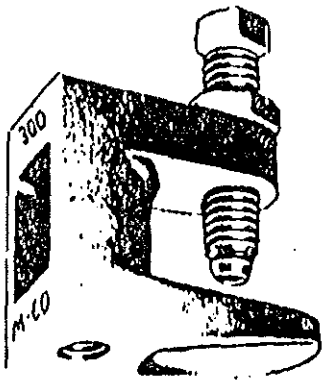
	App'd. Max. Pipe	Std. Box Qty.	Weight Per 100 (Approx.)	NET PRICE PER 100 PCS.
d	4"	100	33 Lbs.	
e	8"	50	64	
	8"	50	64	
	8"	25	78	
	8"	25	71	



uggested Shipping Quantity
3" 4800 pcs. Full Pallet

"THE MICHIGAN CLAMP"

MODEL NO. 300



Malleable/Ductile Iron Universal/Reversible Beam

• ... must be tightened into tapered portion of beam flange between 1/4 and 1/2 turn past ... point

PHD Manufacturing, Inc.

• CONTINUOUS THREAD ROD - MODEL 20

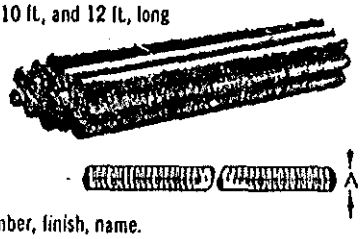
DIMENSION IN INCH

A-ROD DIAMETER	WT. PER 100 FT.	MAX. LOAD 650°F	MAX. LOAD 750°F
¼	12#	240#	210#
⅜	29#	610#	540#
½	54#	1130#	1000#
⅝	83#	1800#	1600#
¾	125#	2700#	2400#
⅞	165#	3770#	3360#

SAFETY FACTOR OF 5

• SIZE RANGE: ¼", ⅜", ½", ⅝", ¾", and ⅞", in 6 ft., 10 ft, and 12 ft, long
• MATERIAL: Low Carbon Steel

• FINISH: Plain or Electro-Zinc Plated
• MAXIMUM TEMPERATURE: 750°F



ORDERING: Specify, rod diameter, length, model number, finish, name.
(Roads available in 6ft., 10 ft., and 12 ft. lengths).

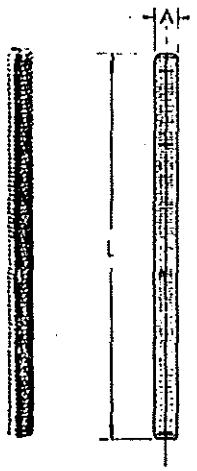
• FULLY THREADED STUDS - MODEL 10

• SIZE RANGE: ⅜", ½", ⅝", ¾", and ⅞" coarse threads UNC-2A
• MATERIAL: Low Carbon Steel
• FINISH: Plain

ORDERING: Specify stud size, length in inches, model number, name.

APPROXIMATE WEIGHT PER 100 PCS.					
	DIAMETERS				
LENGTH	⅜	½	⅝	¾	⅞
2	4.8#	9.0#	13.8#	20.8#	27.5#
2½	6.0#	·	·	·	·
3	7.2#	13.5#	20.8#	31.3#	41.3#
3½	8.4#	·	·	·	·
4	9.6#	18.0#	27.7#	41.7#	55.0#
4½	10.8#	·	·	·	·
5	12.0#	22.5#	34.6#	52.0#	68.8#
5½	13.2#	·	·	·	·
6	14.4#	27.0#	41.5#	62.5#	82.5#
6½	15.6#	·	·	·	·
7	16.8#	31.5#	48.4#	72.9#	96.3#
7½	18.0#	·	·	·	·
8	19.2#	36.0#	55.4#	83.3#	110.0#
8½	20.4#	·	·	·	·
9	21.6#	40.5#	62.3#	93.8#	123.8#
9½	22.8#	·	·	·	·
10	24.0#	45.0#	69.2#	104.2#	137.5#
10½	25.2#	·	·	·	·
11	26.4#	49.5#	76.0#	114.6#	151.3#
11½	27.6#	·	·	·	·
12	28.8#	54#	83.0#	125.0#	165.0#

OTHER LENGTHS ON SPECIAL ORDERS ONLY



• J-BEAM BOLT - MODEL 60

• SIZE RANGE: ⅜" dia. thru ⅞" dia.
• MATERIAL: Carbon Steel
• FINISH: Plain

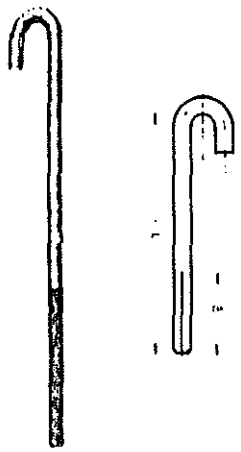
SERVICE: The J-Beam bolts are used to support piping from the top flange of beam where headroom is limited.

ORDERING: Specify rod size, length, model number, name.

DIMENSIONS IN INCHES

ROD SIZE	PIPE SIZE	B	WT. PER 100 PCS. LENGTH - INCHES							MAX. LOAD
			4	5	6	7	8	10	12	
⅜	½ - 2	2½	19#	22#	25#	28#	32#	38#	44#	240#
½	2½ - 3½	2½	33#	39#	45#	50#	56#	67#	78#	400#
⅝	4 - 5	2½	52#	60#	70#	78#	87#	100#	120#	700#
¾	6	3	75#	88#	100#	110#	126#	150#	175#	1050#
⅞	8	3½	102#	120#	135#	153#	170#	200#	240#	1500#

SAFETY FACTOR OF 5

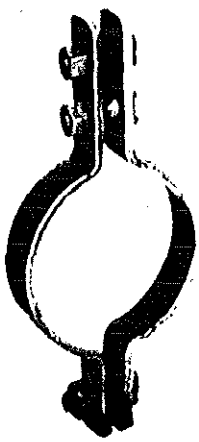


STANDARD PIPE CLAMP

Pipe Size	List Price Each 520 Plain	List Price Each 521 E.G.	Std. Package	Wt. Each (In Lbs.)	Regularly Furnished
1/2			25	.29	Low carbon steel. Plain or E.G. as specified by Model No.
3/4			25	.33	
1			25	.34	
1-1/4			25	.38	
1-1/2			25	.88	*Complies with Fed. Spec. WW-H-171 (type 4) or MSS SP-69 (type 4)
2			25	1.10	
2-1/2			20	1.24	
3			10	1.38	
3-1/2			10	1.50	
4			Bulk	2.25	
5			"	2.58	
6			"	5.42	
8			"	6.25	
10			"	13.00	
12			"	15.18	
14			"	20.40	
16			"	22.30	
18			"	31.60	
20			"	35.80	
24			"	53.20	(Formerly Model 700)

520 521 Ordering: Specify pipe size and model number

DOUBLE BOLT PIPE CLAMP



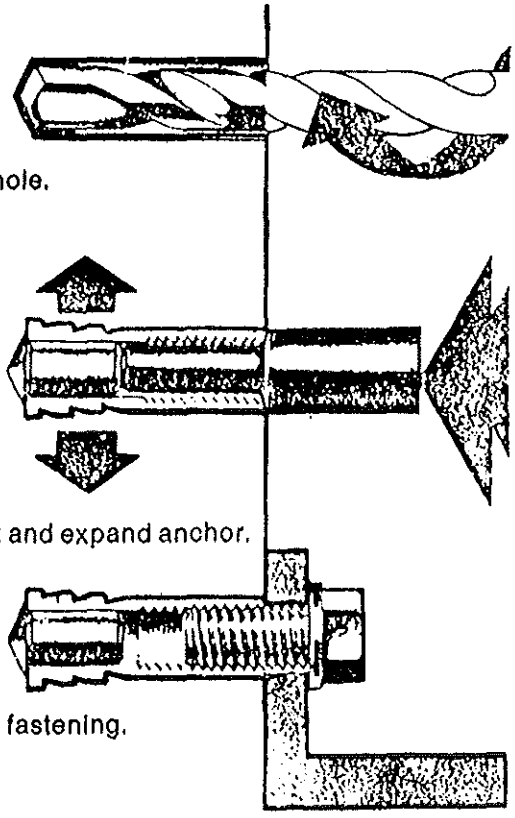
Pipe Size	List Price Each	Std. Package	Wt. Each (In Lbs.)	Regularly Furnished
3/4	$	25	.83	Plain low carbon steel
1		25	1.00	
1-1/4		25	1.07	
1-1/2		10	2.30	*Complies with Fed. Spec. WW-H-171 (type 3) and MSS SP-69 (type 3)
2		10	2.60	
2-1/2		10	2.70	
3		10	3.00	
3-1/2		10	3.28	
4		Bulk	6.67	
5		"	7.00	
6		"	11.45	
8		"	13.15	
10		"	19.80	
12		"	22.25	
14		"	37.68	
16		"	41.40	
18		"	44.87	
20		"	57.25	
24		"	65.90	(Formerly Model 800)

525 Ordering: Specify pipe size

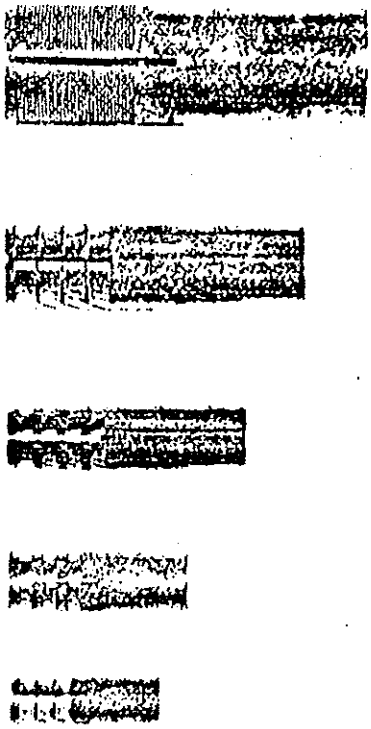
Steel Flush Anchors

One piece, pre-assembled anchors, including internal expander plug.

Easy as 1-2-3



1. Drill hole.
2. Insert and expand anchor.
3. Make fastening.



- Thin wall construction means smaller hole for comparable bolt. You get faster drilling, lower bit costs, less worker fatigue.
- Zinc plated to U. S. Government specifications.
- Hole depth is not critical, eliminating failures due to overdrilling. TZD anchors are expanded by an insert set from the top, instead of using the bottom of the hole as a ram.
- Can be recessed, if desired.
- Anchors securely in all grades of concrete (internal expander plug eliminates problem of incomplete engagement with bottom-set plugs in very hard or soft concrete).

	Cat. No.	Thread Size	Thread Length	Overall Length	TE 17 Bit Size
	TZD ¼	¼-20	7/16"	1"	TE 5/16-6
	TZD 5/16	5/16-18	½"	1 3/16"	TE 13/32-6
•	TZD ⅜	⅜-16	15/32"	1 1/16"	TE 7/16-6
•	TZD ½	½-13	11/16"	2"	TE 9/16-6
•	TZD ⅝	⅝-11	⅞"	2 ⅜"	TE 11/16-6

• (UL) listed

Hilti setting tools available for hand or drill setting.

KENNEDY IRON GATE VALVES Outside-Screw-and-Yoke (OS&Y)

Underwriters' / Factory Mutual

Kennedy Outside-Screw-and-Yoke Gate Valves are designed for use in cold water fire line piping systems.

Bonnet markings "UA" and "◄FM►" signify these valves are listed by Underwriters' Laboratories and approved by Factory Mutual Fire Insurance companies.

Working Pressures:
2½" through 12" Cold Water,
Non-Shock 175 lbs.
14" Cold Water, Non-Shock 150 lbs.

Hydrostatic Test Pressures:
2½" through 12" Seat & Shell 350 psi.
14" Seat & Shell 300 psi.

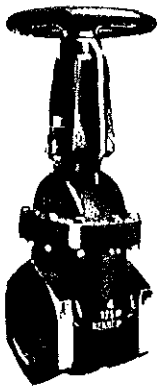


FIG. 67
SCREWED
SIZES: 2½" THRU 4"
Page 32

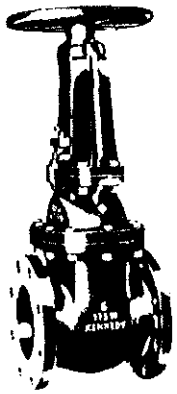


FIG. 68
FLANGED
SIZES: 2½" THRU 14"
Page 31

FIG. 681
BELL
SIZES: 3" THRU 14"
Page 37

Construction:

- Iron Body
- Bronze Mounted
- Double Disc
- Parallel Seats

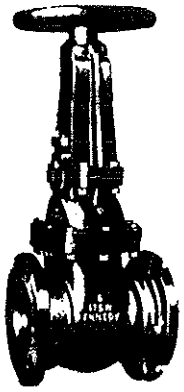


FIG. 671
MECHANICAL JOINT
SIZES: 3" THRU 14"
Page 33

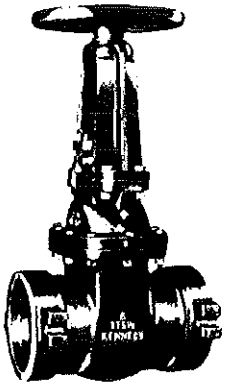


FIG. 673
ASBESTOS CEMENT
SIZES: 3" THRU 14"
Page 35

FIG. 672
FLANGED AND MECHANICAL JOINT
SIZES: 3" THRU 14"
Page 34

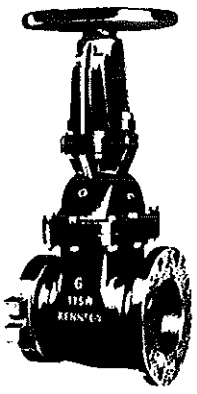


FIG. 674
FLANGED AND ASBESTOS CEMENT
SIZES: 3" THRU 14"
Page 36

KENNEDY IRON GATE VALVES for Indicator Posts (P. I. V.)

Underwriters' / Factory Mutual

These Iron Gate Valves are for use in underground piping cold water systems. Two of them, Fig. 703X and Fig. 704X, are designed for and normally used in conjunction with Fire Hydrants. These Valves are referred to as P.I.V. (Post Indicator Valves) and are designed for use with Indicator Posts and are furnished with an Indicator Post Flange.

Bonnet markings "UL" and "◄FM►" signify these valves are listed by Underwriters' Laboratories and approved by Factory Mutual Fire Insurance Companies.

Working Pressures:
4" through 12" Cold Water, Non-Shock 175 lbs.
14" Cold Water, Non-Shock 150 lbs.

Hydrostatic Test Pressures:
4" through 12" Seat & Shell 350 psi.
14" Seat & Shell 300 psi.

Construction:
- Iron Body
- Double Disc
- Parallel Seats
- Bronze Mounted
- Non-Rising Stem

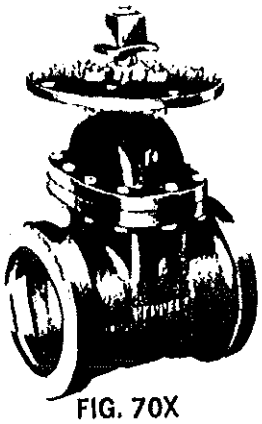


FIG. 70X
BELL ENDS
SIZES: 4" THRU 14"

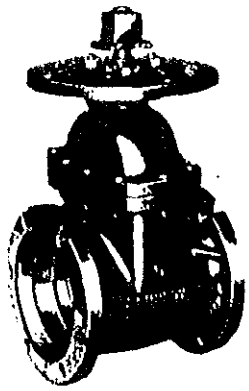


FIG. 71X
MECHANICAL JOINT ENDS
SIZES: 4" THRU 14"

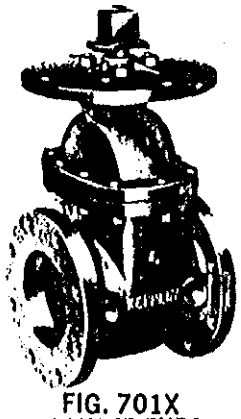


FIG. 701X
FLANGED ENDS
SIZES: 4" THRU 14"

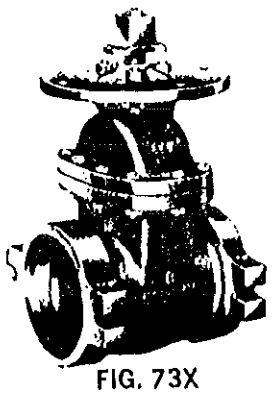


FIG. 73X
ASBESTOS CEMENT ENDS
SIZES: 4" THRU 14"

FIG. 703X
FLANGED AND MECH. JOINT ENDS
SIZES: 4" THRU 14"

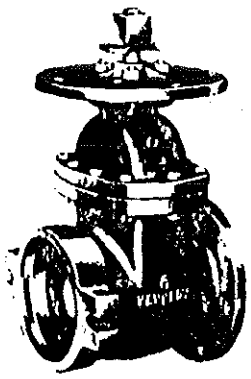


FIG. 704X
FLANGED AND ASB. CEMENT ENDS
SIZES: 4" THRU 14"

INDICATOR POSTS

■ Vertical Type
■ Adjustable

Underwriters' / Factory Mutual

FIG. 54120
FIG. 54124
FIG. 54125
FIG. 54126
FIG. 54127
FIG. 54128
FIG. 54129

INDICATOR POST

Part No.	DESCRIPTION	MATERIAL	A.S.T.M. SPEC.
1	Cap Bolts	Steel	A-307 Grade B
2	Seal Wire	(Customer Furnished)	
3	Snap Ring	Steel-Cadmium Plated	
4	Operating Stem Nut	Bronze	B-62
5	Oil Hole		
6	Cover	Cast Iron	A-126 Class B
7	Target Nut	Bronze	B-62
8	Target Plates	Aluminum	
9	Target Plate Screws	Bronze Rod	B-16
10	Window	Plexiglass	
11	Ferrule Screws	Steel, Brass Plated	
12	Ferrule	Malleable Iron	A-47
13	Top Section	Cast Iron	A-126 Class B
14	Wrench	Malleable Iron	A-47
15	Stem (1" Sq.)	Steel	A-108
16	Set Screws	Steel	A-307 Grade B
17	Cotter Pin	Bronze Rod	B-16
18	Coupling	Cast Iron	A-126 Class B
19	Hubnut	Cast Iron	A-126 Class B
20	Packing	"O"-Rings	
21	Stuffing Box Plate	Cast Iron	A-126 Class B

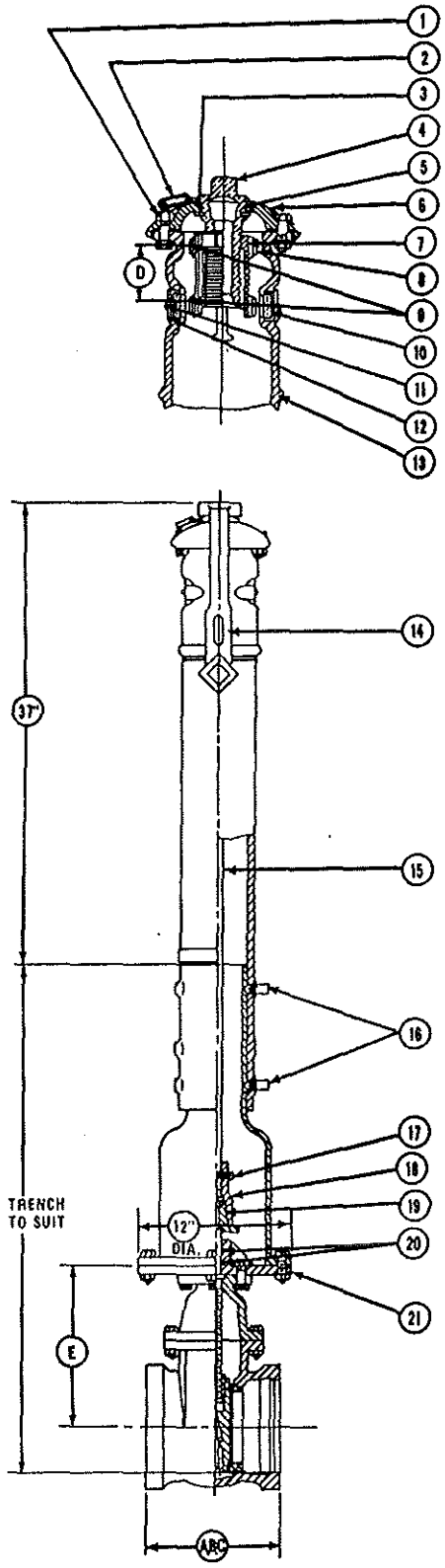
SIZE	A	B	C	D	E	F
4	9	12 3/8	9 7/16	1 1/8	10	13 1/2
6	10 1/2	12 13/16	11 1/4	1 5/8	13 7/16	19 1/2
8	11 1/2	13 3/4	10 7/8	2 1/8	17 1/4	26 1/2
10	13	14 7/16	13	2 3/4	20 5/8	32 1/2
12	14	15 5/16	14	3 1/4	24 1/4	38
14	15	16	17	2 13/16	27 11/16	45

A = FLANGED BODY F TO F — FIG. 701X
B = BELL END BODY (SHOWN) — FIG. 70X
C = MECHANICAL JOINT BODY — FIG. 71X
D = DISTANCE BETWEEN OPEN AND CLOSED PLATES
F = NUMBER OF TURNS TO OPEN

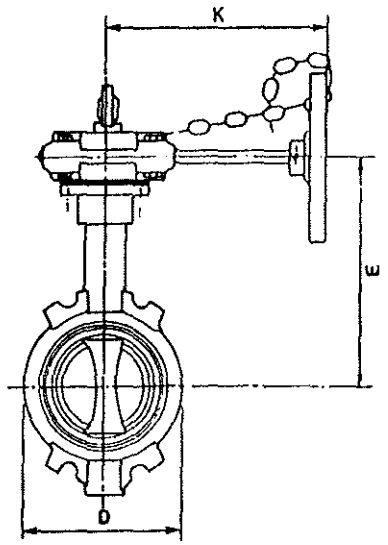
ADJUSTABLE INDICATOR POSTS — DEPTHS OF TRENCH

Valve Size	Post figure number						
	54120	54124	54125	54126	54127	54128	54129
	Depth of trench						
4	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"
6	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"
8	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"
10	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"
12	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"
Wt. of Post Only	175 lb.	227 lb.	244 lb.	246 lb.	248 lb.	250 lb.	252 lb.

MARKINGS
UA
FM
YEAR
THE KENNEDY VALVE MFG. CO.



JMB SENTRY WAFER BUTTERFLY VALVE



- Ductile iron body totally encapsulated with integral seat EPDM rubber
- Nickel plated brass disc (AISI 316 on request)
- AISI 420 stem

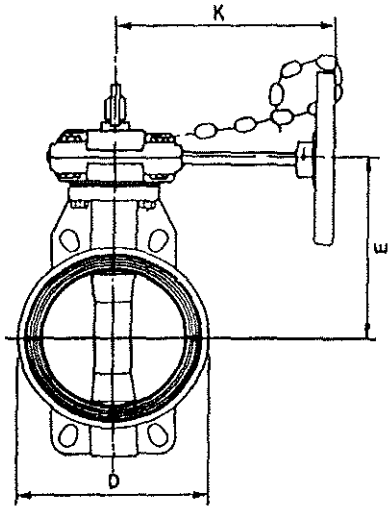
LISTED FOR 175 PSI.W.P.

Size	2"	2" ½	3"	4"	5"	6"	8"
Face to Face	1.693	1.811	1.811	2.047	2.205	2.205	2.362
D	3.819	4.567	5.197	5.984	7.165	8.150	10.31
E	8.82	9.09	9.41	10.00	10.60	11.50	12.50
K	7.32	7.32	7.32	7.32	7.32	7.60	7.60
WEIGHTS (LBS)	17.4	18.3	19.1	22.0	25.7	31.0	39.8

- Test Pressure : 350 psi
- Maximum Working Temp : 250 °F
- Face to Face : API 609/MSS SP 67
- Flange adaptation : ANSI B 16-5 class 150

Available with factory-installed internal tamper switch, consisting of two UL Listed microswitches rated at 3 amp./115 volts. Provisions are made for installation of outside tamper switch manufactured by others.

JMC VIGILANTE WAFER/LUG BUTTERFLY VALVE



- Ductile iron body
- EPDM seat
- Rilsan coated ductile iron disc (AISI 316 on request)
- AISI 420 stem

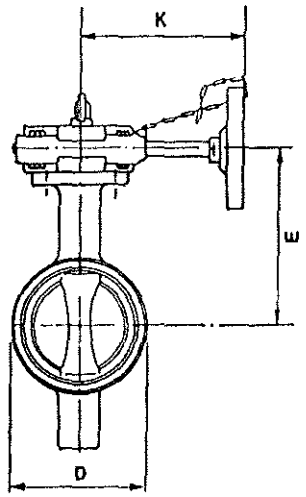
LISTED FOR 300 PSI.W.P.

Size	2"	2" ½	3"	4"	5"	6"	8"
Face to Face	1.693	1.811	1.811	2.047	2.205	2.205	2.362
D	3.700	4.212	4.960	5.906	7.047	8.031	10.20
E	5.51	5.83	6.10	6.69	7.48	8.07	9.29
K	7.32	7.32	7.32	7.32	7.32	7.60	7.60
WEIGHTS (LBS)	20.7	21.8	23.3	27.7	33.20	38.70	47.50

- Test Pressure : 350 psi
- Maximum Working Temp : 250 °F
- Face to Face : API 609/MSS SP 67
- Flange adaptation : ANSI B 16-5 class 150

Available with factory-installed internal tamper switch, consisting of two UL Listed microswitches rated at 3 amp./115 volts. Provisions are made for installation of outside tamper switch manufactured by others.

JPL WATCHMAN GROOVED-END BUTTERFLY VALVE



- Ductile iron body (with polyamid coating)
- EPDM rubber moulded disc
- AISI 420 stem

LISTED FOR 175 PSI.W.P.

FM APPROVED

Size	2"	2" ½	3"	4"	5"	6"	8"
Face to Face	—	3.819	3.819	4.567	5.827	5.827	5.236
D	—	2.874	3.500	4.500	5.563	6.626	8.626
E	—	5.315	5.591	6.889	7.362	8.268	9.213
K	—	7.32	7.32	7.32	7.32	7.60	7.60
WEIGHTS (LBS)	—	18.9	19.8	23.8	29.5	41.4	47.3

- Test Pressure : 350 psi
- Maximum Working Temp : 250 °F

Available with factory-installed internal tamper switch, consisting of two UL Listed microswitches rated at 3 amp./115 volts. Provisions are made for installation of outside tamper switch manufactured by others.

X3 - 10/87

Contact for further information

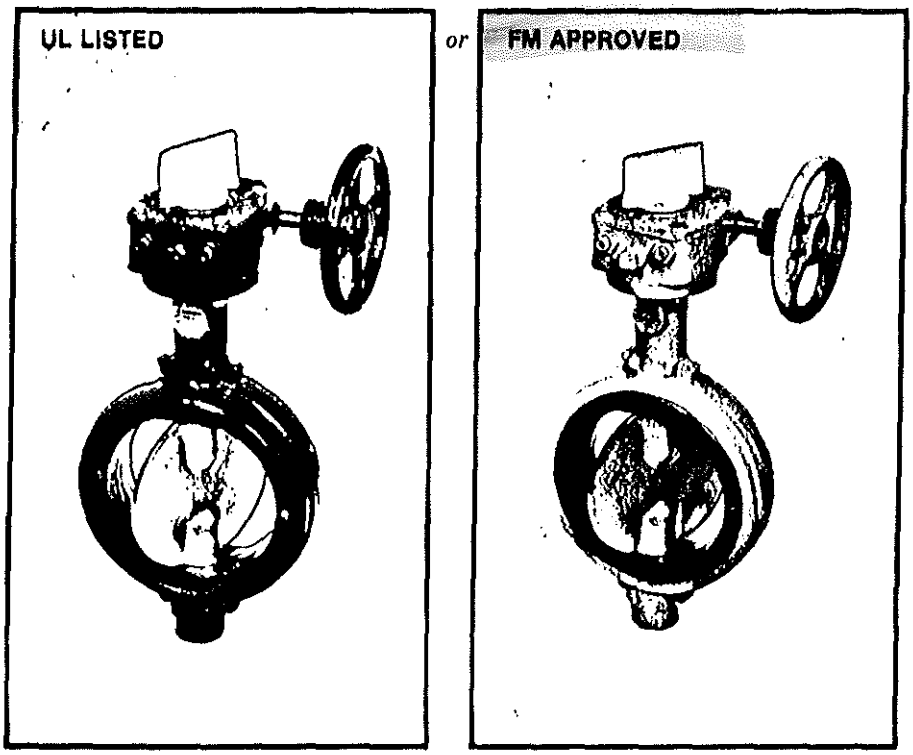
SPRINK, INC.

A member of the JAMES HARDIE INDUSTRIES GROUP

P. O. BOX 3158 • FULLERTON, CA 92634

Phone (714) 999-0323
FAX: (714) 999-0631

KENNEDY VALVE BUTTERFLY VALVES



Specifically Designed For Use On Fire Protection Systems and Rated At 175 PSI Working Pressure

Sizes 4, 5, 6, 8, 10 and 12 inch
UL Listed *or* FM Approved

Wafer or Lug Body
Lightweight
Easy to Install: Suitable for installation between ANSI 125 lb. flanges.
No gaskets required.
Permanently sealed stems
Resilient seating for bubbletight shut-off.
Corrosion resistant construction.
Gear type actuators, factory installed, have sequential shearing protection, easy-to-read flag type position indicators, and are fitted with a 1/2" NPT connection for the addition of a monitor switch, if required.

HOW TO ORDER

Valve Size
Figure Number — 911 UL or 911 FM
Body Style — Wafer or Lug
Accessories — (If required)
Remote Indicator (Available on Indicating Butterfly Valve)
Post Indicator Valve Assembly (Fig. 911 UL only)
Lock-Out Option (Chain)
Monitor Switches
Chainwheel
Chain Length

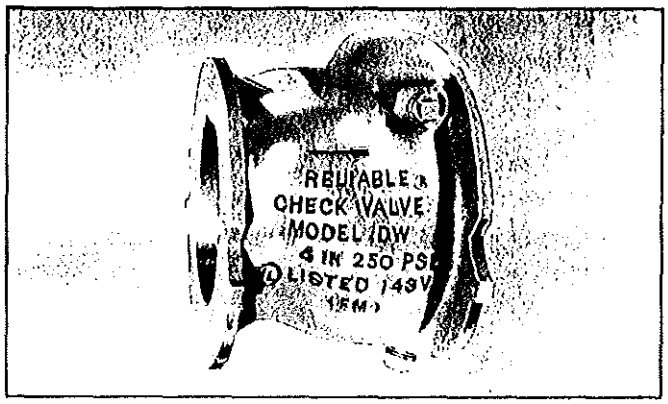
KENNEDY VALVE
Division of ITT Grinnell Valve Co., Inc.

Reliable®

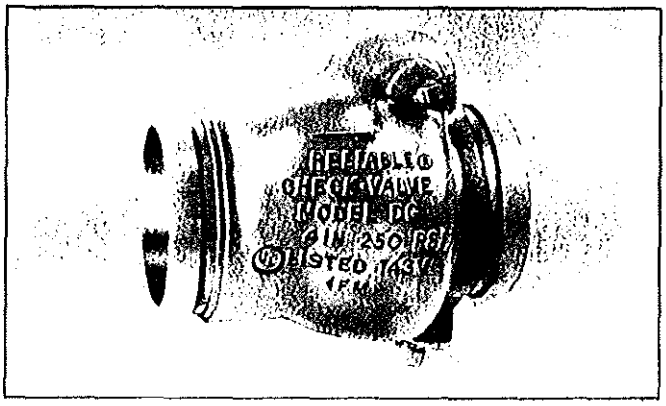
Model D 4" Swing Check Valves

Features

1. Two connection styles available:
   Wafer type—Model DW
   Grooved end type—Model DG
2. Easily installed compact lightweight design
3. Resilient 'O' ring seating provides: Leaktight sealing, antistick operation, simple field replacement
4. Approved for vertical and horizontal installation
5. Listed by Underwriters Laboratories, Inc. Approved by Factory Mutual Research Corporation, N.Y. City, B.S. & A. No 587-75-SA



Model DW Wafer Check Valve



Model DG Grooved End Check Valve

Reliable Model D Swing Check Valves are general purpose valves which perform all regular check valve duties Both models are approved for use in fire protection systems, typical applications include connections between public water supplies and private fire systems, at the discharge from fire pumps, at gravity tank connections and at fire department pumper connections. These valves provide leak tight, non stick operation through the use of a resilient 'O' ring seal installed in the valve's seat. This seal is field replaceable for easy maintenance.

The Model DW Wafer Check Valve is easily installed between standard Class 125 flanges with gaskets using one set of flange studs. Inspection and repairs are easily accomplished by loosening the studs and slipping the valve out from between the flanges.

The Model DG Grooved End Check Valve is also easily installed using mechanical grooved couplings. This valve also provides easy inspection and repair by removing the couplings and slipping the valve out from between its connections.

The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

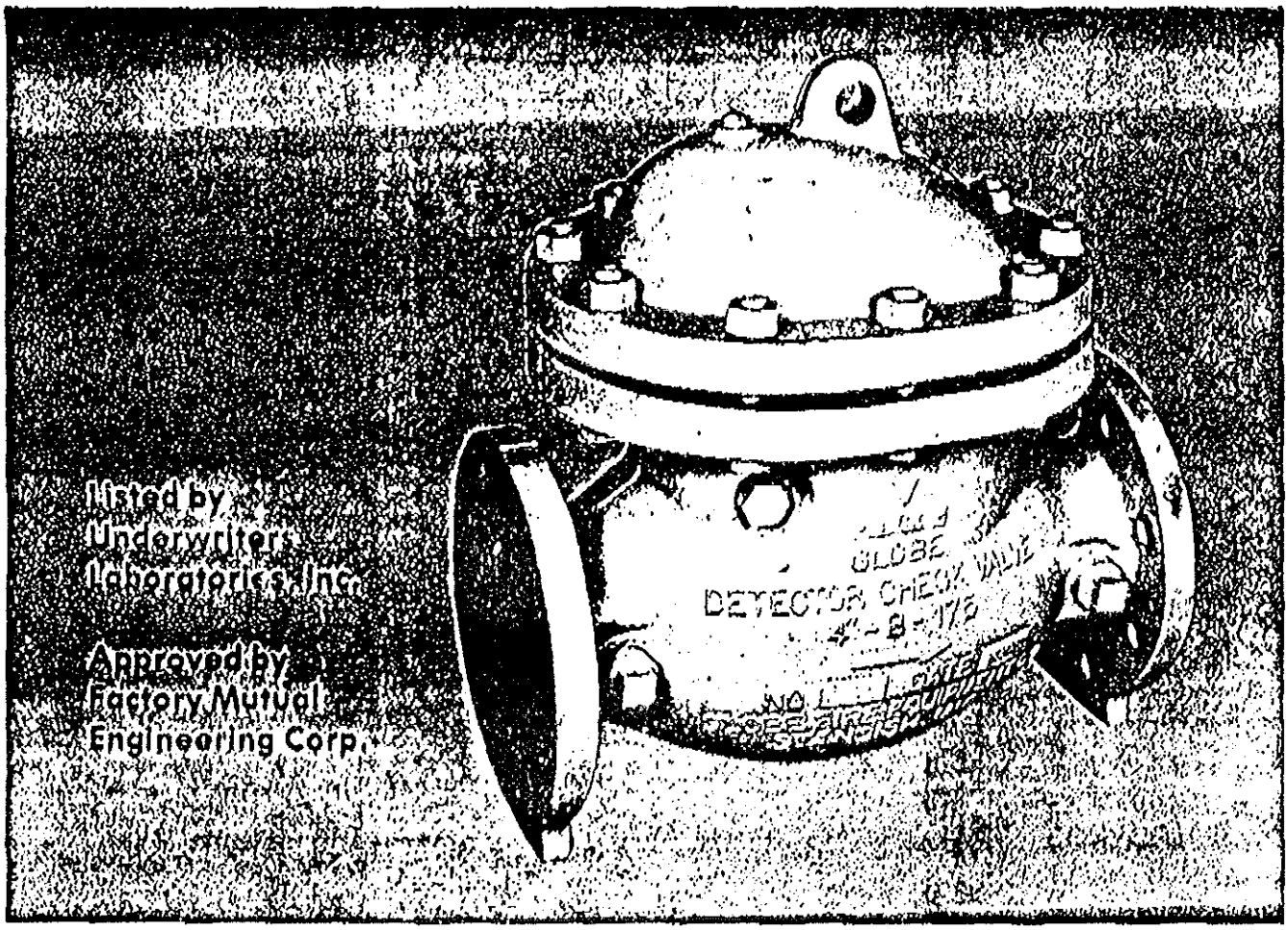
STAR®

Model 20–6″, 8″ and 10″ Check Valves

The Star Model 20—6″, 8″, and 10″ check valves are designed for reliability and easy maintenance with replaceable clapper facings and non-stick coated clappers. The valves are approved for installation in the vertical position. When the piping is installed horizontally, the hinge pin should be in the vertical position.

MODEL B
DETECTOR CHECK VALVE

4, 6 and 8-inch sizes



DESCRIPTION

The Globe Model B Detector Check Valve detects leakage of water from water mains supplying fire protection services. In addition, they will detect the unauthorized use of water in water supply lines when coupled with an appropriate water meter.

OPERATION

When installed in water supply mains the Detector Check Valve, with an appropriate meter in a by-pass connection, provides a means of recording low rates of water flow through the main. When water flow demands exceed the capacity of the by-pass meter, the main clapper in the Detector Check Valve will open offering a moderate resistance to such additional flows. The differential pressure across the valves main seat is approximately two pounds per square inch at the point when the clapper begins to open.

GLOBE FIRE EQUIPMENT CO.

4077 Air Park Drive • Standish, Michigan 48658
Phone 517-846-4583
Cable Address: Globe Standish

BRONZE GATE VALVES

Underwriters' / Factory Mutual

Working pressures:
½"-2" Cold Water, Non-Shock 175 lbs.

- Outside-Screw-and-Yoke
- Wedge Disc

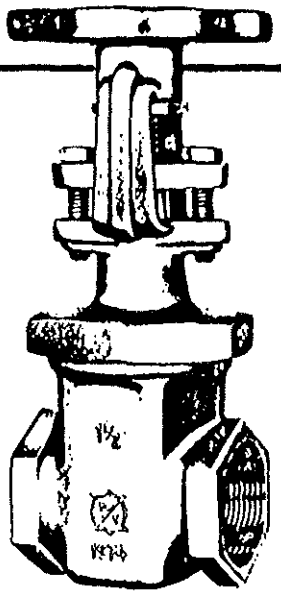
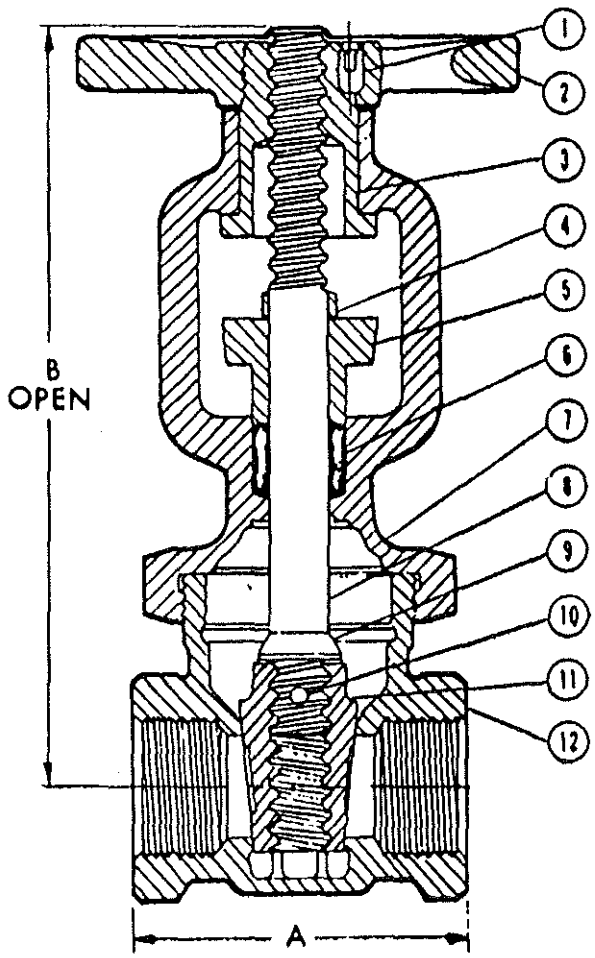


FIG. 66
Screwed Ends

HYDROSTATIC TEST PRESSURE: ½" — 2" Seat & Shell — 350 psi.

Part No.	DESCRIPTION	MATERIAL	A.S.T.M. SPEC.
1	Set Screw	Steel	
2	Handwheel	Mall. Iron	A-47
3	Yoke Bushing	Bronze	B-62
4	Gland Bolts	R.P Steel	A-307 GR. B
5	Packing Gland	Bronze	B-62
6	Packing	Teflon Impg. Asbestos	
7	Bonnet	Bronze	B-62
8	Stem	Sil. Bronze	B-371 Alloy A
9	Stem Collar	Sil. Bronze	B-371 Alloy A
10	Wedge Pin	Bronze	B-140-54 Alloy B
11	Wedge Disc	Bronze	B-62
12	Body	Bronze	B-62



SIZE	A	B
½	2 5/16	5 5/8
¾	2 7/16	6 1/16
1	2 7/8	7 1/16
1¼	3 1/8	8 11/16
1½	3 3/8	9 1/8
2	3 7/8	11 1/8

BODY MARKING

ONE SIDE
UL
◀FM▶
175W

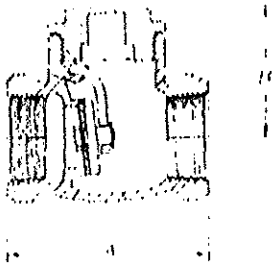
OPPOSITE SIDE
SIZE
KV
YEAR

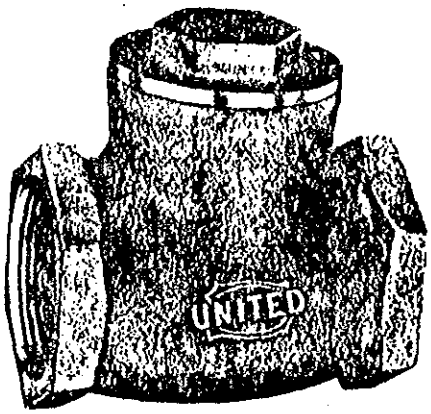
WEIGHT — POUNDS						
SIZE	½	¾	1	1¼	1½	2
WT.-LBS.	2.3	2.7	3.7	5.9	6.9	11.8

CHECK VALVES

SWING CHECK

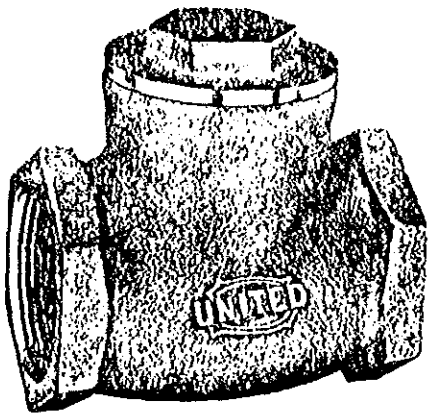
200 lbs. WOG
100% Hydrostatic Tested
Screwed Ends
Replaceable Rubber Disc
(Not recommended for steam)
Sizes: 1/4" - 2"
Body Material: Bronze conforming to ASTM B145-5A





99S

Size	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
A	1 57/64"	1 57/64"	2 9/64"	2 33/64"	3 1/32"	3 29/64"	3 13/16"	4 7/16"
B	1 7/32"	1 7/32"	1 9/32"	1 17/32"	2 1/16"	2 13/64"	2 31/64"	2 55/64"
Ship Wt. (lbs.)	.45	.45	.58	.81	1.22	1.81	2.41	3.42
Quan. Unit Pack	12	12	12	12	6	6	4	4
Quan. Per Case	60	60	60	60	30	18	12	12



99T

125 lbs. WSP
200 lbs. WOG
100% Hydrostatic Tested
Screwed Ends
Teflon* Disc
Body Material: Bronze conforming to ASTM B145-5A
Sizes 1/4" - 2"

For Replaceable Disk See Page 52

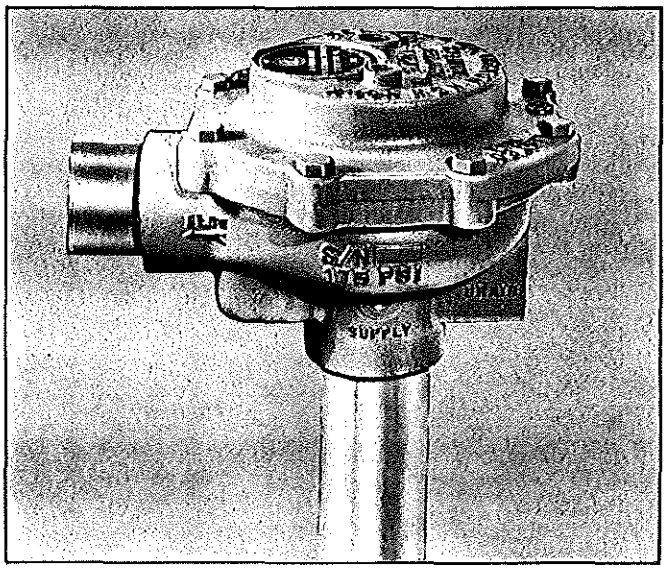
Reliable®

Model A Deluge Valve 2½"

Bulletin 502B

Features

1. Differential Diaphragm Type—Simple—Lightweight—Dependable Construction
2. Simply and Easily Trimmed for Actuation by:
   - Manual Devices
   - Wet Pilot Sprinklers
   - Dry Pilot Sprinklers
   - Solenoid Valves
3. Limited Compression Seat Seal
4. External Hydraulic Reset
5. Furnished in 2½" NPT, 2½" Grooved End, or 65 mm.
6. Separately Replaceable Diaphragm and Seat Seal
7. Listed by Underwriters Laboratories, Inc. & Underwriters' Laboratories of Canada. Approved by Factory Mutual Research Corporation & Fire Offices' Committee. NYC BS & A No. 587-75-SA



The Reliable Model A 2½" Deluge Valve is a hydraulically operated differential diaphragm type Deluge Valve used to control the water supply to a deluge or preaction system. Deluge systems use open sprinklers or nozzles as discharge outlets in the fire area while preaction systems use closed sprinklers or nozzles.

Both systems use separate detection devices to control the operation of the deluge valve. Two simple trim arrangements allow for actuation of the Reliable Model A Deluge Valve by manual, hydraulic, pneumatic or electric devices such as break glass stations, wet pilot or dry pilot sprinklers and thermal or smoke detectors.

The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

General

The Model A 2½" Deluge Valve is a direct diaphragm actuated valve. There are no moving linkages or mechanisms to wear or jam or internally reset. The direct diaphragm operation allows the valve to be reset by external hydraulic means. The valve has been ruggedly designed to provide many years of trouble free static and cyclic operation.

The design features a limited compression piston (clapper) rubber seal installed in the valve body. This feature prevents localized compression set of the rubber seal. Compression set of the clapper seal in other valves requires exact clapper to seat realignment when resetting and may cause reseating leakage. The limited compression is accomplished by a metal piston stop in the rubber seal to valve body retainer ring. The seal retainer ring metal stop allows the piston to squeeze the seal only a predetermined fixed amount regardless of inlet supply pressure. The piston cannot continue to compress the seal as the supply pressure increases causing higher piston closing forces.

The valve design also features a separately replaceable molded diaphragm which incorporates an O-ring end configuration on the inside and outside sealing diameters. The O-ring ends provide more positive retention, clamping and sealing of the diaphragm to piston and diaphragm to valve body and cover sealing surfaces.

The valve is externally hydraulically reset eliminating the lengthy process of removing cover plates. After the actuation device is reclosed or in the case of wet pilot sprinklers, replaced, pressure is resupplied to the upper portion of the diaphragm and piston. This causes the piston to close and reseat, resetting the deluge valve.

The design of Reliable's 2½" Deluge Valve provides for longer term trouble free positive operation without the need of internal linkage and clapper alignment for resetting.

Operation

Reliable's Model A 2½" Deluge Valve is a quick opening hydraulically operated, diaphragm actuated type valve. The Model A consists of three chambers, top (pressurized), outlet (normally dry) and inlet (pressurized). The three chambers are isolated from each other by the diaphragm and piston and compression limited seat seal. In the closed position (Figure 1) supply pressure in the top chamber acts across the diaphragm and piston holding the piston on the seat against inlet supply pressure. The diaphragm pressure area is greater than the seat pressure area providing a force imbalance of about 3 to 1.

When a fire is detected, the top chamber is vented to atmosphere through the outlet port via opened actuation devices. The top chamber pressure cannot be replenished from the restricted inlet port as rapidly as it is vented from the outlet port, and the chamber pressure falls instantaneously. When the top chamber pressure reaches about ⅓ the supply pressure, the upward force of the supply pressure acting on the piston face is greater than the downward force of the diaphragm and the piston moves up to the open position (Figure 2).

Once the piston has opened water flows from the supply through the Deluge Valve into the piping system and alarm outlet to the alarm devices. The valve maintains the open position until the open releasing device(s) is closed. Caution—The Releasing Device Must Be Maintained Open To Prevent Closing Of The Model A Deluge Valve.

Detection and Actuation

In general the Reliable Model A 2½" Deluge Valve can be actuated by any listed or approved device which opens sufficiently to vent the top chamber in response to a fire. The actuation device is simply connected to the top chamber outlet port. When the actuation device operates and vents the top chamber, the deluge valve opens.

Typical actuation devices include hydraulic break glass stations, wet or dry pilot sprinklers and solenoid valves. Devices such as wet or dry pilot sprinklers perform both the deluge valve actuation and the detection functions. No additional detectors are required when these devices are used.

The use of a solenoid valve for deluge valve actuation enables the numerous types of electrical fire detection

Model A Deluge Valve

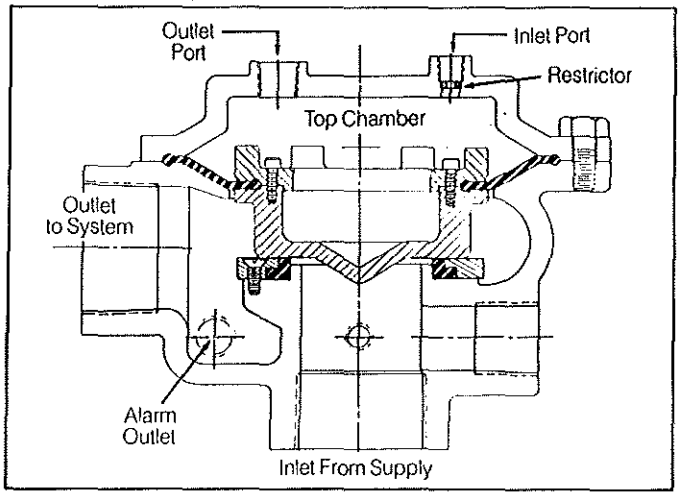


Figure 1
Closed Position

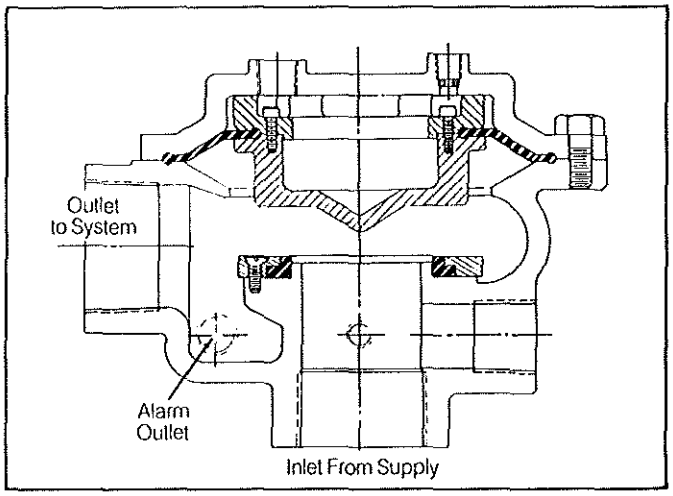


Figure 2
Open Position

devices to be used. Typical detection devices include electrical break glass stations, thermal detectors and ionization or photoelectric smoke detectors. The electric detection and actuation equipment is the Model 2000 Supertrol System which is described in Bulletins 703 and 704.

Valve Description

1. Rated working pressure 175 psi (12, 1 bar)
2. Factory hydrostatic test pressure 350 psi (24, 1 bar)
3. End and trim connections—Three valve connection styles are available.
   a. 2½" American Standard taper pipe threads inlet and outlet per ANSI B2.1.
      - Threaded opening per ANSI B2.1.
      - Reliable's standard trim sets are compatible with American Standard taper pipe threads.
      - Color—Light Gray
   b. 2½" Grooved Inlet and Outlet
      - Threaded openings per ANSI B2.1.
      - Reliable's standard trim sets are compatible with Grooved Valves
      - Color—Light Gray

U.S. Groove Dimensions in Inches			
Outlet Dia.	Groove Dia.	Groove Width	Outlet Face to Groove
2.875	2.720	5/16	5/8

   c. 2½" (65 mm) British Standard pipe threads inlet and outlet per BS21—1973
      - Threaded Openings per BS21—1973
      - Reliable's standard trim sets may be used with Metric Valves providing trim is assembled carefully and extra thread sealant is applied to connections between valves and trim.
      - Color—Light Blue
4. Shipping Weight—49 lbs. (22 kg)
5. Friction Loss—Expressed in Equivalent Length of Pipe, Based on Hazen & Williams formula with C = 120. Equiv. Length = 17.1 ft.
6. Installation position—Vertical.

Trim Description

The trimmings for the Reliable Model A Deluge Valve are arranged for rapid, easy compact attachment and serve as connection points to Reliable Alarm and other devices.

The Model A Deluge Valve trim sets are:
a. Basic trim set.
b. Wet pilot line trim set.
c. Dry pilot line trim set.

All valves are listed and approved by Underwriters Laboratories, Inc. and Factory Mutual Research Corp. only when used with the valve manufacturers trim sets.

The basic trim set (Figure 3) is used with every Model A Deluge Valve. This trim set provides the 1¼" main drain connection, the alarm connection, the alarm test connection and the top chamber supply connection and supply pressure gauge.

The wet pilot line trim set (Figure 3) is connected to the top chamber outlet. This trim set is used when wet pilot sprinklers, hydraulic manual emergency pull boxes or solenoid valves are used for actuation. The wet pilot line trim set includes a gauge to read top chamber pressure, a Globe valve for manual operation of the deluge valve and a connection for the actuation device.

The following table specifies the maximum wet pilot line height for use with the Reliable Model A Deluge Valve. Refer to the Reliable Hydraulic Data Book for combination height and distance limitations.

Table 1

Average Service Pressure At Valve		Maximum Height of Wet Pilot Line Above Valve	
PSI	bar	Ft.	Metres
20	1.38	6.2	(1.9)
40	2.76	15.4	(4.7)
60	4.14	26.1	(7.9)
80	5.52	35.3	(10.7)
100	6.89	46.2	(14.2)
120	8.27	56.9	(17.3)
140	9.65	67.7	(20.6)
160	11.03	80.0	(24.4)
175	12.07	83.1	(25.3)

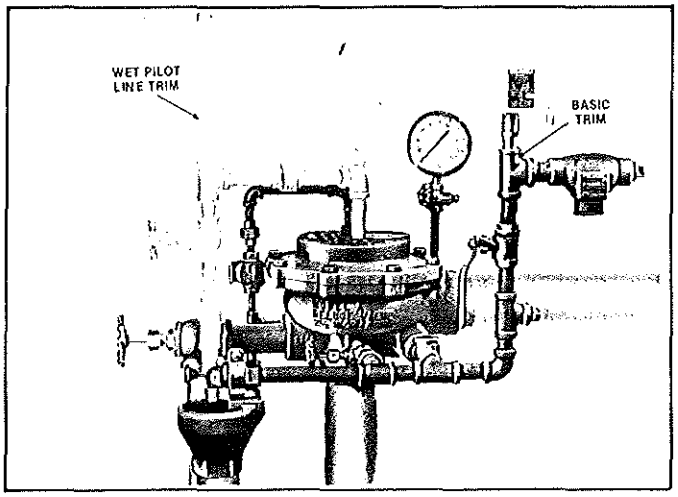


Figure 3—2½" Model A Deluge Valve with Basic Trim and Wet Pilot Line Trim

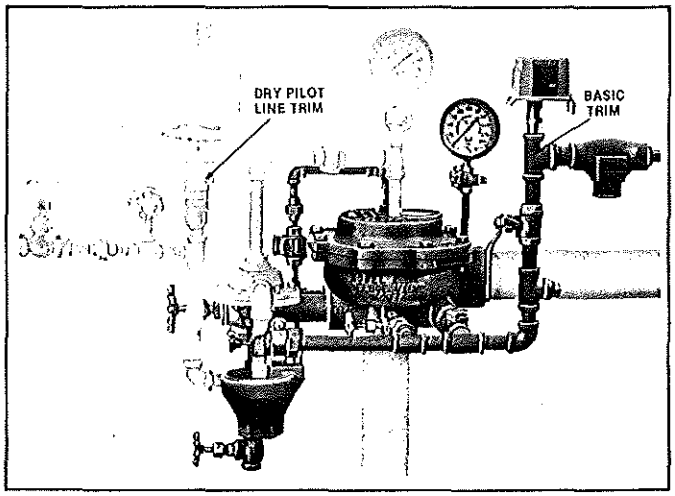


Figure 4—2½" Model A Deluge Valve with Basic Trim and Dry Pilot Line Trim

The dry pilot line trim set (Figure 4) is used when dry pilot line sprinklers or devices are used as the actuation means. The dry pilot line trim set includes the dry pilot line actuator, air and water pressure gauges, low air pressure warning switch, air relief valve and the connection for the actuation device. The dry pilot line actuator is fully described in Bulletin 504.

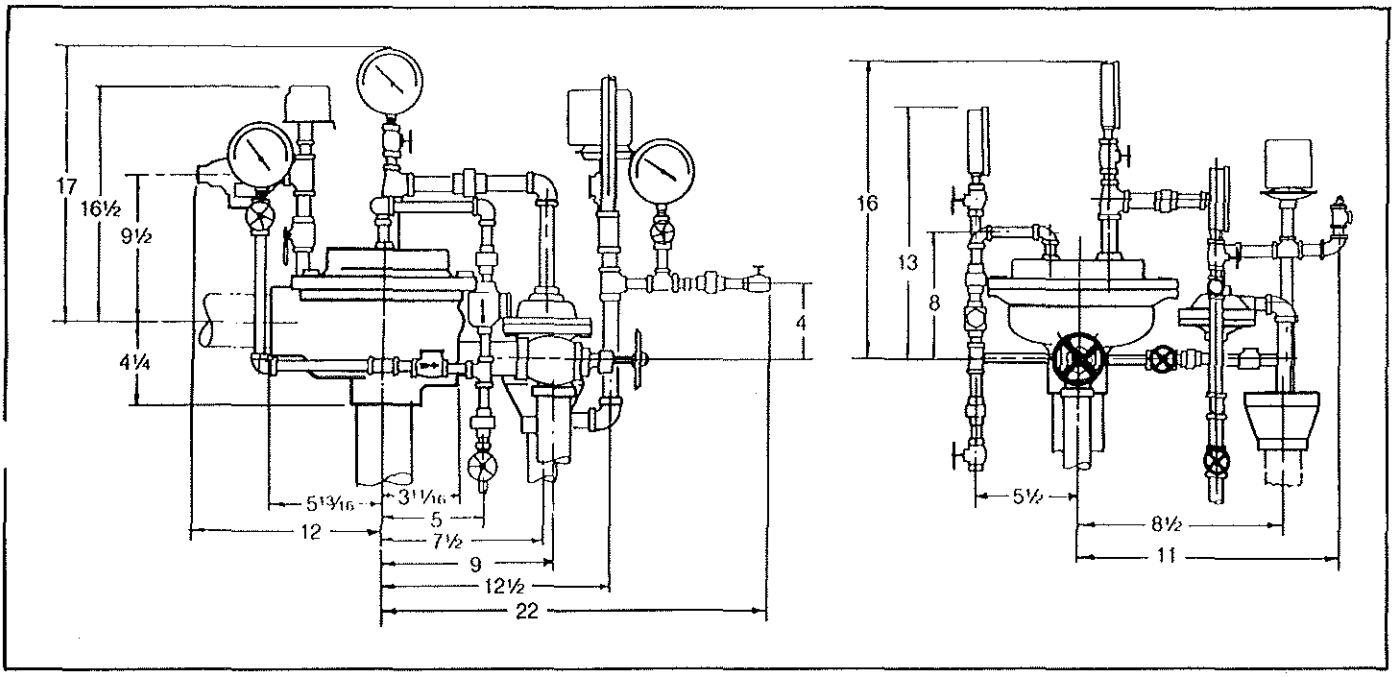
Table 2 provides the recommended air pressure when the dry pilot line trim set is used as the actuation means.

The Model A Hydraulic Manual Emergency Pull Box is described in Bulletin 506. This device may be used for manual emergency deluge valve operation with either the wet or dry pilot trim sets.

Table 2

Water Pressure (PSI)	Air Pressure to be Pumped into Dry Pilot Line (PSI)	
Maximum	Not Less Than	Not More Than
20	10	20
50	15	25
75	20	30
100	25	35
125	30	40
150	35	45
175	40	50

Installation Measurements in Inches



Ordering Information

Specify

- Valve Size—Either 2½" or 65 mm. When size is specified in mm, a metric valve per Valve Description Section 3.c will be supplied.
- Inlet and Outlet Connection—American Standard Taper Pipe Threads, Grooved End or British Standard Pipe Threads.
- Trim—The basic trim set must be used with every Model A Deluge Valve. Order either the Wet or Dry Pilot Line trim set depending on actuation method.
- Additional equipment—Air Maintenance Devices, Air Compressors, Supertrol Electric Detection and Actuation Equipment and Mechanical Sprinkler Alarms must be separately ordered. These devices are fully described in other bulletins.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Reliable Sprinkler Devices, protecting life and property for over 60 years, are approved by all fire insurance and government agencies, and are installed and serviced by Reliable's chain of representatives
Reliable representatives, located throughout the United States, Canada and foreign countries, have a life-time of experience and are as near as your telephone.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
525 North MacQuesten Parkway
Mount Vernon, New York 10552
(914) 668-3470

Reliable Model 4800 Supertrol System

General

Reliable Model 4800 Supertrol Systems are supervised low voltage electrical fire detection systems specially engineered to operate Reliable Deluge Valves. Reliable Model 4800 Supertrol operated Deluge Valves provide positive electric-hydraulic control for: Deluge Systems, Pre-Action Systems and Special Systems.

Approvals

UL--Supertrol Components Listed
FM--Supertrol Single Area and Two Area Systems Using Thermal Detectors and Ciass A Detector Wiring Approved
N.Y. City BS&A No. 546-72-SA

Deluge Systems

Deluge Systems are used in heated or unheated areas when fast application of water and complete envelopment of the burning material is required to achieve fire control or extinguishment.

Materials with high rates of heat release such as flammable liquids or other rapidly developing fires or moving materials such as conveyors are prime applications. Typical installations include coal conveyors, dip tanks, electrical transformers, aircraft hangars, oil refineries and chemical plants.

Normally open water outlets either sprinklers or nozzles are strategically located over the entire hazard in accordance with their particular spacing requirements. Water, controlled by a Deluge Valve is supplied to these outlets through a normally empty piping network. Detectors, either heat or smoke sensitive, also located throughout the hazardous area in accordance with their specific spacing requirements, sense the presence of fire and open the Deluge Valve. Water flows through the piping network and is discharged from all outlets simultaneously, completely enveloping the hazard with a protective water spray.

Pre-Action Systems

Pre-Action Systems are used in heated or unheated areas in which it is desirable to keep the piping empty prior to a fire. A pre-action system is particularly suited to protect properties in which there is a danger of serious water damage as a result of broken piping or damaged sprinklers—computers, libraries, rack storage are examples. Two items must occur for Pre-Action system operation: detector actuation and sprinkler fusing. A Pre-Action system has the advantages of both a dry sprinkler system—piping is dry prior to a fire, and a wet sprinkler system—water immediately discharges from a fire fused sprinkler while having advantages over both systems:

—Fire alarm sounds prior to fusing of a sprinkler.
—Trouble alarm sounds for piping or sprinkler damage.
—Speed of detection and early alarm is provided by fire detector.

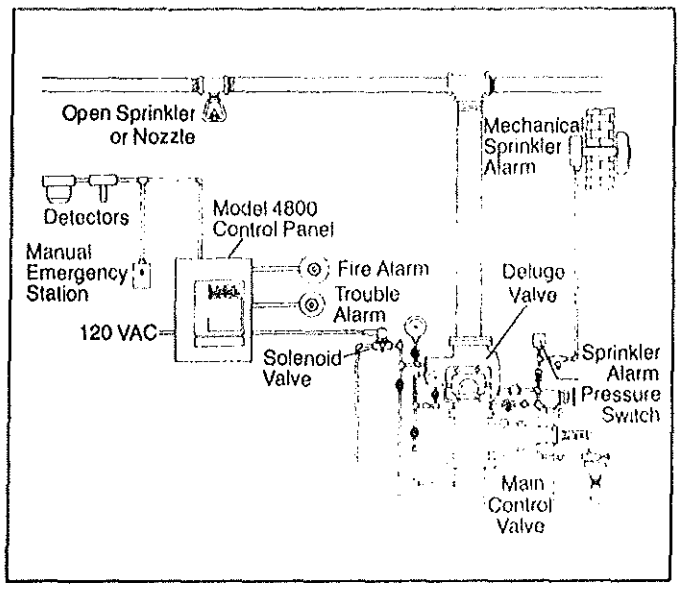
Normally closed sprinklers are located over the fire area. Water controlled by a Deluge Valve is supplied to these sprinklers through a normally dry piping network. Detectors, either heat or smoke actuated, are located throughout the area in accordance with their particular spacing requirements.

The detectors sense the presence of fire, sound alarms and open the Deluge Valve. Water fills the piping network and is discharged on a fire immediately upon sprinkler operation.

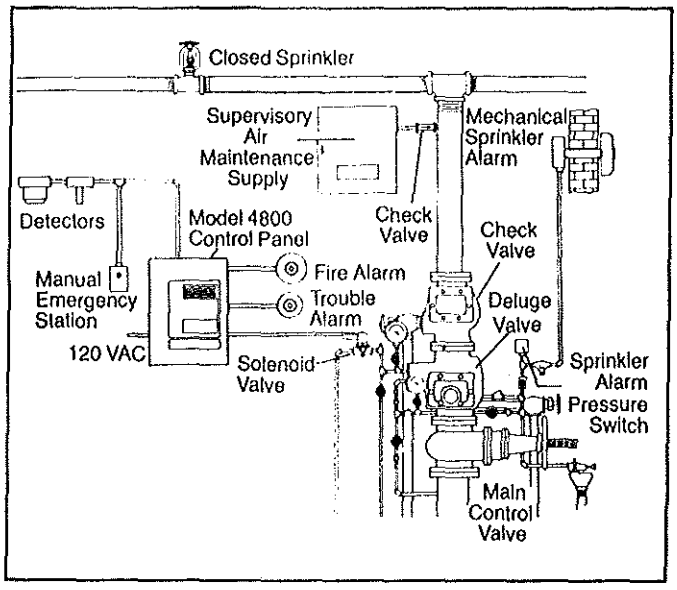
Sprinklers are supervised by an automatically maintained source of low pressure air. A check valve, mounted immediately above the Deluge Valve retains the supervisory air pressure. Sprinkler or piping damage causes a loss of air pressure, resulting in trouble alarms without operation of the Deluge Valve.

Special Systems

Reliable Model 4800 Supertrol Systems also find application in numerous special systems such as: Foam Systems or Combined Dry Pipe and Pre-Action Systems.



Supertrol Electric Deluge System
Fig. 1



Supertrol Electric Pre-Action System
Fig. 2

Supertrol System Description

Regardless of the system type (deluge, preaction or other), all Reliable Supertrol operated Deluge Valve Systems are composed of two main sections:

I. Electrical Detection and Actuation Section
II. Water Delivery and Distribution Section.

I. Supertrol Electrical Detection and Actuation Section

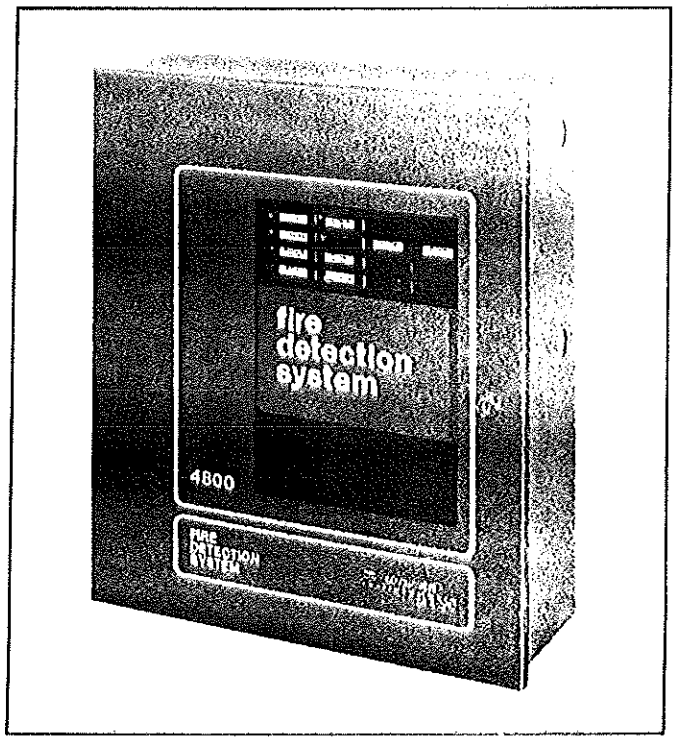
This section detects the fire either thermally or by smoke detection (photoelectric or products of combustion) or by manual operation and operates the Deluge Valve. Any listed 24 Vdc normally open 2 wire detector may be used with this system. The Model 4800 Control Panel is the heart of the Supertrol System. Available in three versions: Single Area or Two Area or Single Area Cross Zoned, these unique panels supply power to operate detectors, alarms and solenoid valve. All detectors, alarms, wiring and the solenoid valve are constantly supervised such that electrical faults cause a trouble alarm to sound.

All panels accept either Class A or Class B detector circuit wiring.

Class A detector wiring, required by FM utilizes 2 wires to each detector and 2 wires returning to the panel. With Class A wiring the panel will sound trouble alarms and operate with single and some multiple wiring faults.

Class B detector wiring utilizes 2 wires to each detector and an end of line resistor. With Class B wiring, the panel will sound trouble alarms but may not operate with wiring faults.

In the event of a primary (120 Vac) power failure, the system automatically switches to battery power. The batteries will supply power for a minimum of 90 hours. All Model 4800 Control Panels contain a charging circuit which constantly maintains the batteries at full charge.



Supertrol Model 4800 Control Panels

The Reliable Model 4800 Series of control panels are compact single enclosure units combining power supply, battery charger, batteries, detector, alarm and solenoid valve controls. This series of control panels is of modular design with each control panel containing:

- Main Power Supply
- Switch Module
- Motherboard
- Power Monitor Card
- Common Circuits Card
- Detector Circuit Card
- Deluge Release Card
- Standby Batteries
- Field Wiring Terminal Strip

Features—All Panels

- Class A or Class B Detector Circuit Wiring.
- Electrically supervised solenoid valve and polarized fire alarm bell—trouble signal sounds if a break occurs in these circuits.
- Auxiliary dry circuit alarm contacts.
- Operates with listed 24Vdc normally open two wire detectors or manual emergency station.
- Automatic Emergency Power—If AC power fails, battery powers alarms and keeps system operational for 90 hours minimum.
- Built in charger—Keeps batteries fully charged.
- AC and battery power supervised.
- UL Listed.
- FM Approved—Single Area and Two Area Panels when used with thermal detectors and Class A detector circuit wiring.
- N.Y. City B.S. & A. No. 546-72-SA
- Ease of expansion or conversion of installed panels.
- Ability to provide panels specially engineered for a particular job.
- Lamp test facility.
- Ground Fault indication.
- Short circuit indication.
- Convenient and rugged field wiring terminal strip.

Specifications

Electrical

Input power to panel,
Voltage . . . . . 120 Vac, Nominal
Current . . . . . 1.2 A max. at full load
Frequency . . . . . 50/60 Hz

Standby Batteries,
Voltage . . . . . 24 Vdc nominal
Type . . . . . Gel Cell

End-of-line resistors . . . . . 4.7K ohms, ± 10%, ½ Watt

Auxiliary Alarm Contacts:
Single Pole Double Throw (Form C)
Rating . . . . . 1 amp Max @ 120Vac
Rating . . . . . 2 amp Max @ 28Vdc

Mechanical

Dimensions 21"H, 17"W, 7"D

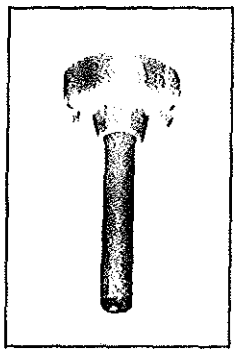
Fire Detectors

General

Listed 24 Vdc normally open 2 wire detectors (thermal, photoelectric or products of combustion) may be used in the Supertrol System. Relay bases for smoke detectors must not be used. Smoke detectors are not FM approved for use in deluge valve systems.

Reliable supplies the following types of detectors:

- Thermal Detector — Rate Anticipation Fixed Temperature Type



This detector operates within a controlled range of two to three degrees of its set point, regardless of the speed or rate of temperature rise. Under rapid heat conditions, the rate anticipation feature causes the detector to respond one to three degrees ahead of the setting. At the same time, however, it does not respond to momentary temperature fluctuations below the selected protection level eliminating false alarms.

The detector automatically resets itself after an alarm when temperature drops below the protection level; it is hermetically sealed, shock and corrosion resistant, and tamperproof.

Electrical Rating:

5 amp @ 6 to 125 Vac
1 amp @ 6 to 25 Vdc

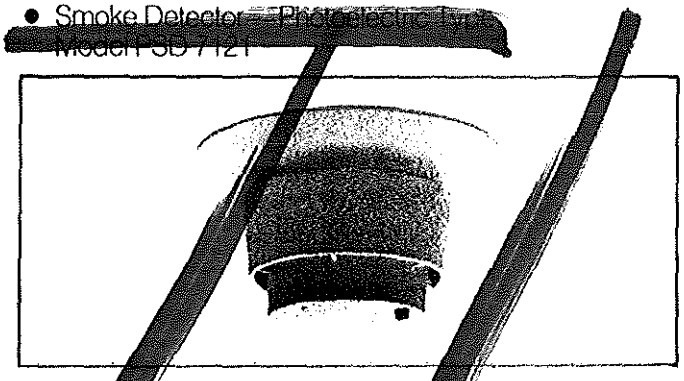
Model	Temperature °F		Approvals	UL Rating ft. x ft.	Mounting
	Operating	Max. Cell.			
302-135	135	100	UL, FM	50 x 50	Interior Vertical
302-200	200	150	UL, FM	50 x 50	Interior Vertical
302AW135	135	100	FM		All-Weather Vert.
302AW200	200	150	FM		All-Weather Vert.
302H135	135	100	UL, FM	40 x 40	Interior Horizontal
302H200	200	150	UL, FM	40 x 40	Interior Horizontal

FM spacing guide: 30 ft. x 30 ft.

Adaptor Plate — Mounts to 4" Octagonal Box

AP-P, White Plastic — 302 & 302AW
M2, Steel — 302 & 302AW
M2B, Steel — 302H

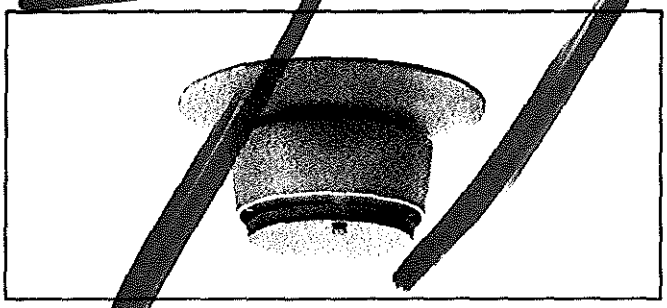
- Smoke Detector — Photoelectric Type
  Model PSD 7121



The Model PSD 7121 2 wire Photoelectric Smoke Detector responds to a broad spectrum of flaming and smoldering fire conditions. An infrared light source and a solid state photodiode sense light scattering due to smoke entry from any direction resulting in detector operation. A detector L.E.D. pulses at about 6 second intervals during normal standby conditions and switches to steady illumination during alarm conditions.

UL 268 Listed for Open Area Protection Spacing (Smooth Ceiling) — 30' Centers (900 sq. ft.)
Finish — Off White, Textured
Electrical — Nominal Voltage 12-32 Vdc
Standby Current 60 μA
Alarm Current 10-100 mA
Max. RMS Ripple — 50% of d.c. Input
Operating Temperature — 32°F to 100°F
Mounting Base — Model 70-201000-001
Mounts directly to a 3" round or 4" octagonal box.

- Smoke Detector Ionization Type
  Model CPD 7021



The Model CPD 7021 2 wire dual chamber Ionization Smoke Detector contains a minute amount of Americium 241 which ionizes the internal air making it conductive. Visible and invisible combustion products introduced from any direction cause a reduction of the conductivity of the ionized air resulting in detector operation. A detector L.E.D. pulses at about 6 second intervals during normal standby conditions and switches to steady illumination during alarm conditions.

UL 268 Listed for Open Area Protection Spacing (Smooth Ceiling) — 30' Centers (900 sq. ft.)
Max. Air Velocity 2000 FPM
Finish — Off White, Textured
Electrical — Nominal Voltage 18-40 Vdc
Standby Current 60 μA
Alarm Current 10-100 mA
Max. RMS Ripple — 50% of d.c. Input
Operating Temperature — 32°F to 100°F
Radioactive Source — Less than 1.0 Microcuries Americium 241
Mounting Base — Model 70-201000-001
Mounts directly to a 3" round or 4" octagonal box.

Manual Emergency Station
Model BRG-1 Single Pole
Model BRG-1F Two Pole

This break glass station is provided with a test-reset key. Semi-flush mount on conduit. This station is operated by a pull on the cover. This causes a key latch to act against a retaining mechanism until adequate force is applied to open the station. As the station opens, a switch is released to initiate an alarm.

The retainer is a replaceable glass rod which is not broken when key tested. When operated, the cover hangs down (and cannot be made to stay in a closed position) indicating that the station was used to turn in the alarm.

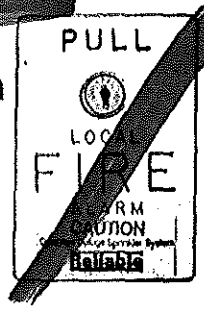
Resetting is easily accomplished by use of a test-reset key.

The Model BRG-1F 2 pole version must be used with cross zoned panels.

Electrical Rating: 1 amp @ 6-125 Volts

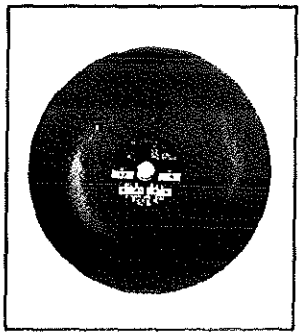
UL Listed

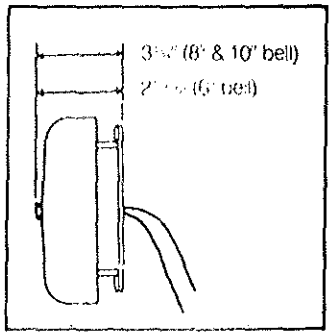
FM Approved



Supertrol Alarm Bells
Model KMS

Available in 3 sizes; 6", 8" and 10" dia.
Low Current Drain: 30mA @ 24 Vdc
Polarized
Mounts to 4" square outlet box.
High efficiency motor driven striker.
Red enamel finish.
UL Listed.
6" — Model KMS-6-24Vdc/P
8" — Model KMS-8-24Vdc/P
10" — Model KMS-10-24Vdc/P
Model WBB weather proof back box available for outdoor use.



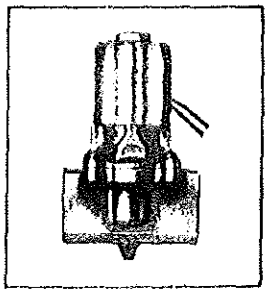


Supertrol Solenoid Valve

The Supertrol Solenoid Valve is a 24 Vdc pilot operated diaphragm solenoid valve. This valve is used to release water from the Deluge Valve control chamber thus operating the Deluge Valve.

Description

Model No. LV2LBX25
½" female NPT inlet and outlet piping connections.
Nominal voltage 24 Vdc.
Holding current .35 amp.
Valve normally closed—
Powered to open.



Batteries

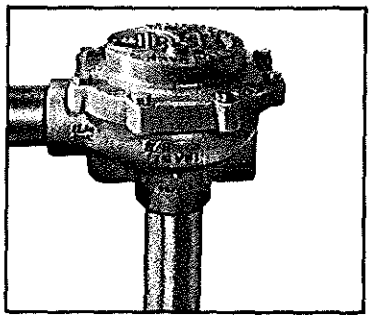
Model No. PS 1245 4 Required
Electrical— 12 Volt Gel Cell Type
5 AMP HR Capacity
@ 20 HR Rate—Each
Dimensions—5 21/32"L x 2 9/16"W x 3 7/8"H

II. Supertrol Water Delivery and Distribution Section

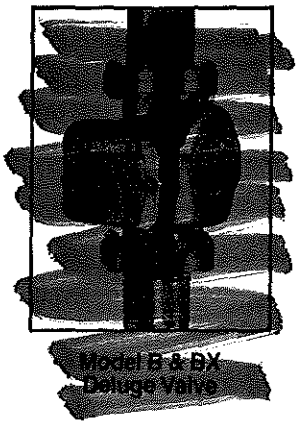
This section provides piping supervision and delivers and distributes water or other extinguishing agent at the fire. When operated by the Model 4800 Supertrol System, the Deluge Valve releases the extinguishing agent at the fire source.

Reliable Deluge Valve

The Reliable Model B, BX (4" and 6") or Model A (2½") Deluge Valves control the flow of water or other extinguishing agent to the fire zone. Bulletins 500 and 502 describe the valves in detail. When used in a Supertrol System, the valve requires the Basic Trim Set and the Wet Pilot Line Trim Set which are described in Bulletins 501 and 503.



Model A Deluge Valve



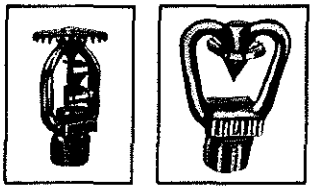
Model B & BX Deluge Valve

Check Valve—Pre-Action System Only

A check valve capable of reliably sealing at pressures as low as 1½ psi is required downstream of the deluge valve. Prime water is required in a pre-action system to a level of 6" to 10" above the check valve clapper. A drain valve and trimmings to provide 6" to 10" of prime water must be installed on the system side of the check valve clapper.

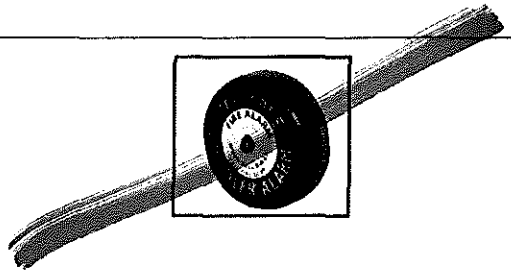
Reliable Sprinklers and Nozzles

Reliable Sprinklers and Nozzles efficiently distribute water at the fire source. Reliable Sprinklers, described in Bulletin 110, are used in Pre-Action Systems while Reliable Nozzles, described in Bulletin 106, find application in Deluge systems.



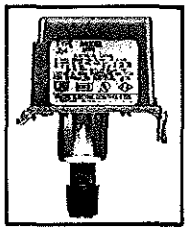
Reliable Mechanical Sprinkler Alarm

The Reliable Model C Mechanical Sprinkler Alarm provides a loud, distinctive alarm whenever water flows in the system. Installation and Maintenance instructions for the Mechanical Sprinkler Alarm are provided in Bulletin 613.



Reliable Sprinkler Alarm Pressure Switches

The Reliable Sprinkler alarm switches are pressure operated to provide electric alarms when water flows in the system. Alarm as well as control switches are described in Bulletin 608.

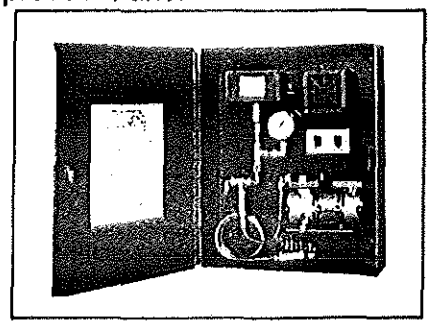


Reliable Supervisory Air Maintenance Supplies

Reliable Supervisory Air Maintenance Supplies provide low pressure (approximately 30 oz/in²) air to the sprinkler piping of a pre-action system. Leakage, such as that caused by damage to the piping or sprinklers, will cause the supervisory air pressure to drop. When the supervisory air pressure drops below approximately 11 oz/in² either an alarm is sounded (Model B Air Compressor Panel) or a switch operated (Model C Air Maintenance Device). The switch must be connected to operate a separate alarm (not supplied). Reliable Supervisory Air Maintenance Supplies are UL Listed and FM Approved.

Model B Air Compressor Panel

The Model B Air Compressor Panel is a self-contained supervisory air supply. The panel is intended for wall mounting and contains an integral alarm horn. Provisions for connection of an OS & Y monitor switch are also included.

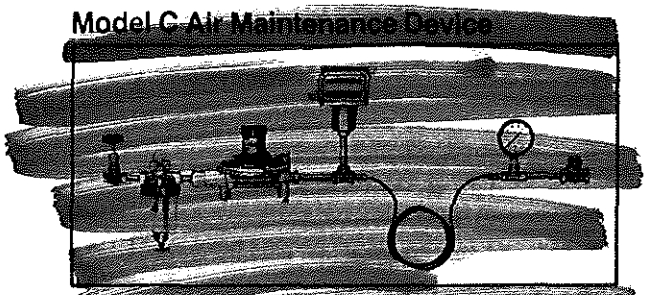


Note: Small capacity compressor requires long initial system fill time.

Model	Part No.	Description	Elec. Req'm.
B	6702010000	Self-contained Supervisory Air Compressor Panel	120 Vac, 60 Hz. 1.5 Amp.

W x H x D Inches	Mounting Dim. W x H Inches	Shipping Wgt. Lbs.	Approvals
16 x 20 x 6	14¼ x 18¼	27	UL Listed FM Approved

Model C Air Maintenance Device



The Model C Air Maintenance Device is a supervisory air supply for use where a clean, dependable and continuous (24 hours per day, 7 days per week) owners air source is available. The Model C Air Maintenance Device reduces 50 to 150 psi supply pressures to approximately 30 oz/in² outlet pressure. A separate, unsupplied alarm must be connected to the low air alarm switch.

Model	Part No.	Description	Low Pressure Alarm Switch Elec. Rating
C	6704030000	Supervisory Air Supply – Owners Air	Single Pole, Double Throw, 15 Amp, 120/240 Vac 10 Amp, 12 Vdc Inductive 0.50 Amp, 125 Vdc Inductive

W x H x D Inches	Shipping Lbs.	Approvals
20 x 15 x 6	9	UL Listed FM Approved

ORDERING INFORMATION

The Supertrol Components required for electrically operated Deluge or Pre-Action Systems should be selected from the following list:

RELIABLE MODEL 4800 SUPERTROL DELUGE AND PRE-ACTION SYSTEM COMPONENTS

Item	Model	Remarks	Described In Bulletin	System Type	
				Deluge	Pre-Action
Detectors Thermal	302 302H 302AW	Available in 135°F & 200°F Ratings Vertical Position, Interior Horizontal Position, Interior Vertical Position, All Weather	705	X	X
Adaptor Plate	AP-P M2 M2R	Mounts Thermal Detector to 4" Octagonal Box, One Required Per Detector. White Plastic—For 302 & 302AW Steel —For 302 & 302AW Steel —For 302H	705	X	X
Smoke Photoelectric Ionization, Products of Combustion	PSD7121 CPD7021		705	X	X
Base	70-201000-001	Mounts Either Smoke Detector to 3" Round Or 4" Octagonal Box One Required Per Detector	705	X	X
Manual Emergency Station Electric, Single Pole Electric, Two Pole	BRG-1 BRG-1T	SPDT, Use With Single & Two Area Panels DPDT, Must Be Used With Cross Zoned Panel	705	X	X
Supertrol 4800 Control Panel Single Area Or Two Area Or Single Area, Cross Zoned		Select One	705/706	X	X
Batteries	PS1245	4 Required Per Panel. Mount Inside Panel	705	X	X
Alarm Bell, Polarized Electric	KMS-6-24Vdc-P KMS-8-24Vdc-P KMS-10-24Vdc-P	Mounts Directly to 4" Square Box or Weatherproof Back Box 6" Diameter 8" Diameter 10" Diameter	705	X	X
Weatherproof Back Box	WBB	For Outdoor Use	705	X	X
Trouble Bell, Electric	Same as Alarm Bell		705	X	X
Solenoid Valve	LV2LBX25	24Vdc, Normally Closed	705	X	X
Deluge Valve	A B BX	2½" 4" or 6" 4" or 6" Externally Resetable	502/503 500/501 500/501	X	X
Basic Trim Wet Pilot Line Trim			501/503 501/503	X X	X X
Sprinkler Alarm Pressure Switch	J54-8295		608	X	X
Mechanical Sprinkler Alarm	C		613	X	X
Check Valve		Any Approved Check Valve Capable of Sealing 1½ PSI			X
Drain & Prime Water Trim		Drain and Prime Water Trim On System Side Of Check Valve Must Be Provided.			X
Supervisory Air Supply Air Maintenance Device or Air Compressor Panel	C B	For Use With Plant Air Supply: Required Pressure—50/150 PSI Self Contained Air Supply	705/706		X
Open Sprinklers Or Nozzles				X	
Closed Sprinklers		Do Not Use Dry Sprinklers In Pre-Action System			X

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Reliable Sprinkler Devices, protecting life and property for over 60 years, are approved by all fire insurance and government agencies, and are installed and serviced by Reliable's chain of representatives.
Reliable representatives, located throughout the United States, Canada and foreign countries, have a life-time of experience and are as near as your telephone.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
525 North MacQuesten Parkway
Mount Vernon, New York 10552
(914) 668-3470

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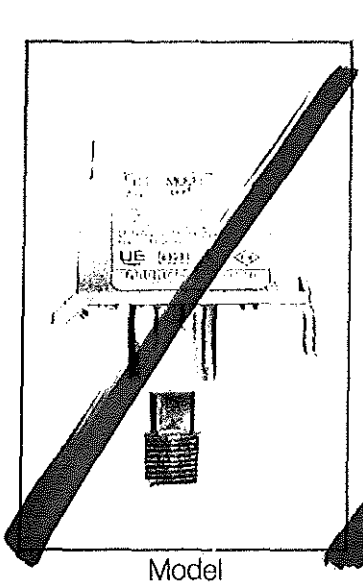
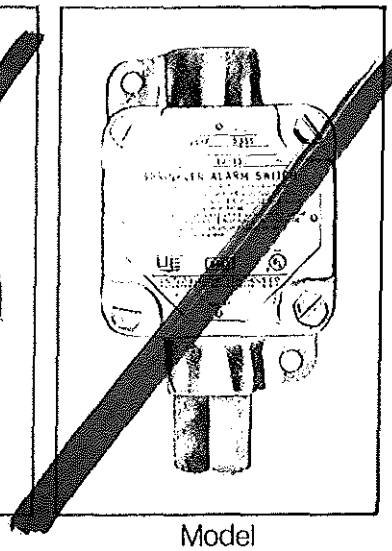
BULLETIN 608 J

Reliable®

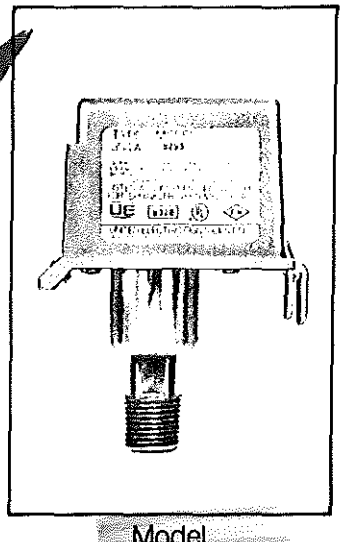
Sprinkler Pressure Switches



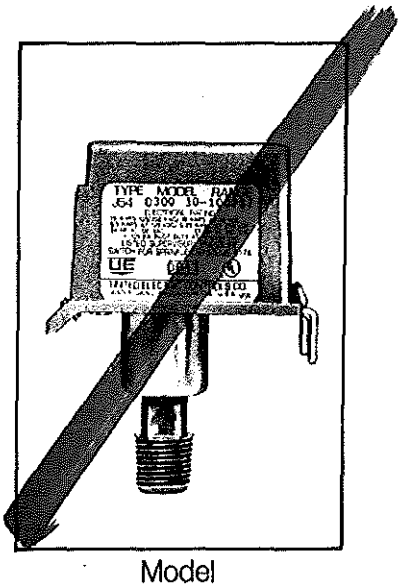
Model
J54 8295



Model
J88X 5355



Model
J54A 8295



Model
J54 8300

The Reliable Sprinkler Alarm Switches, Models J54 8295, J88X 5355 and J54A 8295, are pressure operated to actuate electric alarms when water flows in Wet, Dry, Preaction and Deluge Sprinkler Systems. These switches actuate on pressure rise between 4-8 psi and reset automatically on pressure fall.

The Model J54 8300 Switch is designed for supervisory applications (high or low pressure). It is adjustable over the pressure range of 10-100 psi and resets automatically on pressure fall.

Description

Model	Service	Range	Differential	Connection	Features	Approvals
J54 8295	Alarm	Factory Set 4-8 psi	.7 to 1.7 psi	½" NPT (Male)	(1) Single Pole Double Throw	UL Listed FM Approved NYC BS&A No. 588-76-SA
J88X 5355	Alarm	Factory Set 4-8 psi	2 ± 1 psi	¼" NPT (Female)	(1) Single Pole Double Throw (Explosion Proof)	UL Listed FM Approved
J54A 8295	Alarm	Factory Set 4-8 psi	.7 to 3.5 psi	½" NPT (Male)	(2) Single Pole Double Throw	UL Listed FM Approved
J54 8300	Control Supervisory	Adjustable 10-100 psi	1 to 2.5 psi	½" NPT (Male)	(1) Single Pole Double Throw	UL Listed NYC BS&A No. 588-76-SA (See Note)

Note: Designed to meet FM Approval upon submission of system to FM.

The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

Temperature
160°F Maximum.

Proof Pressure
300 psi. Proof pressure is the maximum pressure the switch may be subjected to without appreciably effecting performance.

Electrical
15 AMP, 120/240 VAC; pilot duty 125 VA, 120/240 VAC; 1/4 HP, 120 VAC; 1/2 HP, 240 VAC; 10 AMP, 12 VDC IND.; 0.50 AMP, 125 VDC IND.; 0.25 AMP, 250 VDC IND.

Installation
Refer to installation sheet packed with each switch. Electrical wiring should be in accordance with the National Electrical Code and applicable local codes. Caution: tighten switch by wrenching on flats provided, never by grasping the enclosure. See separate bulletins for connection points with Reliable's alarm, dry pipe and deluge valves.

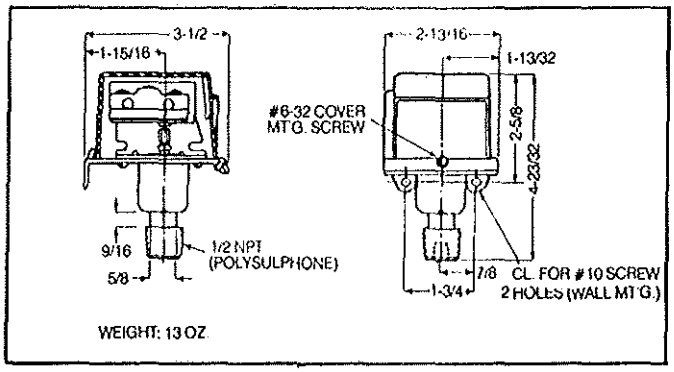


Figure 1

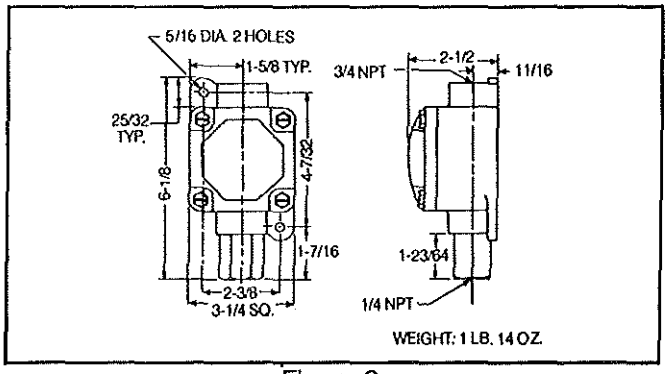


Figure 2

Installation Information

Model	Installation Dimensions	Installation Torque Limit	Electrical Access	Enclosure
J54 8295	Fig. 1	300 in.-lbs. (Polysulphone Inlet)	7/8" Dia. Hole (1/2" Conduit)	Lexan Tamper Proof Cover Screws. Wrench Supplied
J88X 5355	Fig. 2	— (Brass Inlet)	3/4" NPT (3/4" Conduit)	Aluminum Explosion Proof Class I Gr. C & D Class II Gr. E, F & G Class III
J54A 8295	Fig. 1	300 in.-lbs. (Polysulphone Inlet)	1 1/16" Dia. Hole (3/4" Conduit)	Lexan Tamper Proof Cover Screws. Wrench Supplied
J54 8300	Fig. 1	300 in.-lbs. (Polysulphone Inlet)	7/8" Dia. Hole (1/2" Conduit)	Lexan Tamper Proof Cover Screws. Wrench Supplied

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

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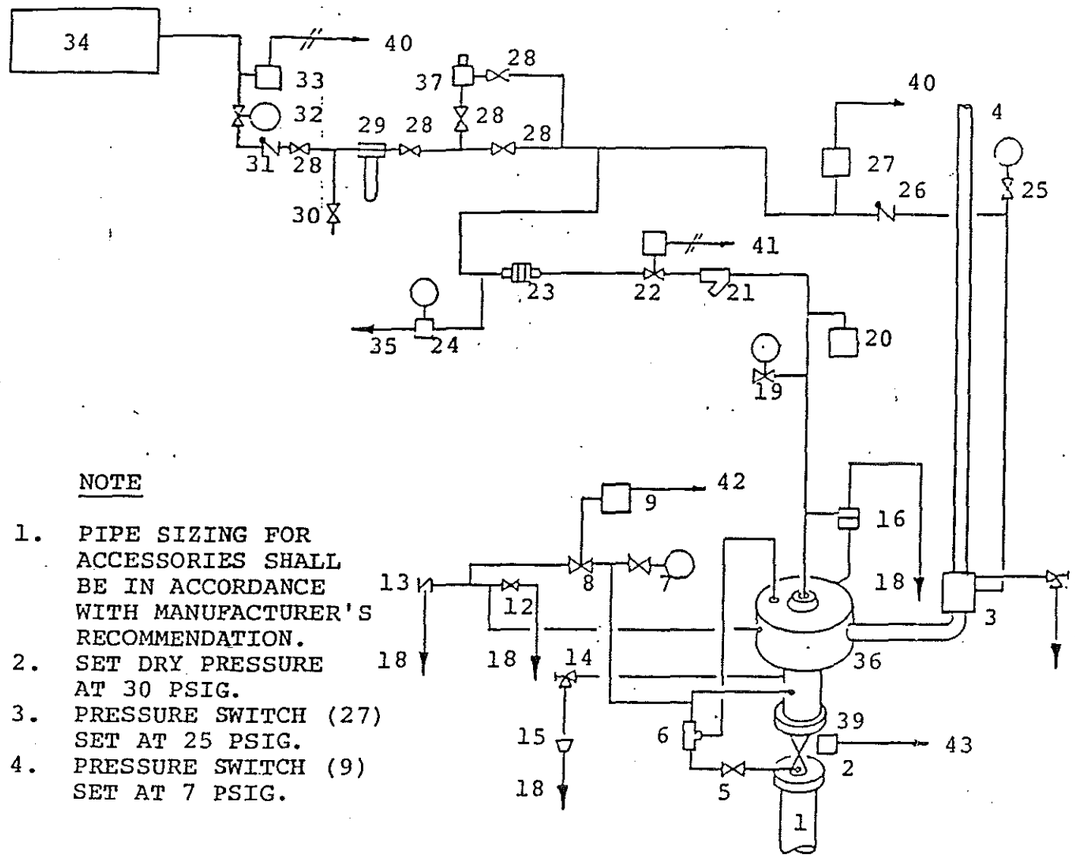


NOTE

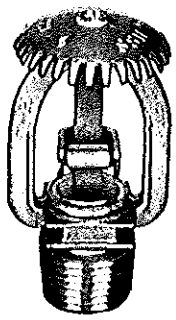
1. PIPE SIZING FOR ACCESSORIES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
2. SET DRY PRESSURE AT 30 PSIG.
3. PRESSURE SWITCH (27) SET AT 25 PSIG.
4. PRESSURE SWITCH (9) SET AT 7 PSIG.

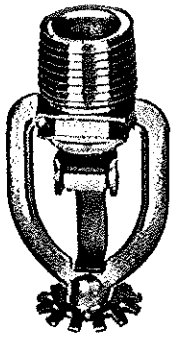
1. 4" WATER SUPPLY FROM WATER MAIN
2. WATER SUPPLY CONTROL VALVE
3. RUBBER SEAT CHECK VALVE
4. 4" TO SPRINKLER SYSTEM MAIN
5. PRIMING VALVE
6. STRAINER ORIFICE CHECK VALVE
7. WATER SUPPLY PRESSURE GAUGE & VALVE
8. ALARM TEST SHUTOFF VALVE
9. ALARM PRESSURE SWITCH
10. STRAINER
11. TO WATER MOTOR ALARM
12. AUXILIARY DRAIN VALVE
13. DRIP CHECK
14. TEST DRAIN VALVE
15. DRAIN CUP
16. P.O.R.V. (PRESSURE OPERATED RELIEF VALVE)
17. SYSTEM MAIN DRAIN VALVE
18. TO DRAIN
19. PRIMING PRESSURE GAUGE & VALVE
20. EMERGENCY RELEASE
21. STRAINER
22. SOLENOID VALVE
23. PNEUMATIC ACTUATOR (DIAPHRAGM BYPASS)
24. ACCELERATOR
25. SYSTEM PRESSURE GAUGE & VALVE
26. SOFT SEAT CHECK VALVE
27. AIR SUPERVISORY PRESSURE SWITCH
28. AIR SUPPLY CONTROL VALVE
29. DEHYDRATOR
30. MOISTURE TRAP PIPE TO FLOOR DRAIN
31. SOFT SEAT CHECK VALVE
32. AIR PRESSURE GAUGE
33. AIR SUPERVISORY PRESSURE SWITCH
34. AIR COMPRESSOR
35. TO ATMOSPHERE
36. DELUGE VALVE
37. AIR MAINTENANCE DEVICE
38. WATER MOTOR GONG
39. TAMPER SWITCH
40. TO FIRE ALARM (TROUBLE)
41. FROM FIRE ALARM
42. TO FIRE ALARM SIGNAL THAT VALVE HAS OPENED
43. TO FIRE ALARM

SCHEMATIC PRE-ACTION SYSTEM USING DELUGE VALVE - DOUBLE INTERLOCKED, SUPERVISED, ELECTRIC OPERATED

NO SCALE

Product Data: STANDARD SPRINKLER





Upright and Pendent Liquidator

Model LD-2

GENERAL DESCRIPTION

The **Liquidator sprinkler, Model LD-2,** is available in both upright and pendent types. The upright model is generally used where exposed piping installations are employed. The pendent sprinkler is used where there are finished ceilings or where the space above piping is not adequate. Both are available in either a ½" (12.7 mm) or a 17/32" (13.5 mm) orifice. The 17/32" orifice may be used on hydraulically calculated systems where lower operating water pressure exists.

Liquidator sprinklers feature streamlined center-strut construction. A bronze tube, sealed by two stainless steel balls, holds a fusible alloy. When the alloy melts, the balls are forced toward each other, releasing the tension mechanism which causes the sprinkler to operate. This unique design eliminates the problem of corrosion since the alloy is not exposed to atmospheric conditions. The danger of mechanical damage is also reduced by eliminating protruding links and levers.

TECHNICAL DATA

For use on wet pipe, dry pipe, deluge, preaction or preaction deluge fire protection systems. The 135° F temperature rating is **UL listed;** 165° F, 212° F, 280° F and 360° F ratings are **UL listed/FM approved.** See listing and approval chart for specific approvals.

Maximum Working Pressure:
175 psi (1206 kPa)

Discharge Coefficients:
½" orifice: K = 5.7
17/32" × ¾" orifice: K = 8.0
17/32" × ½" orifice: K = 7.5

Temperature Ratings:
135° F, 165° F, 212° F, 280° F, 360° F (57° C, 74° C, 100° C, 138° C, 182° C)

Physical Characteristics:
½" orifice (12.7 mm) with ½" NPT
17/32" orifice (13.5 mm) with ¾" and ½" NPT

Finishes:
165° F and 212° F in bronze, chrome-plated, lead-coated and wax-coated. 135° F, 280° F and 360° F in bronze and chrome-plated finishes. Wax coated sprinklers should be used in rooms with exposure to acids, chemicals or other corrosive fumes.

ORDERING INFORMATION

Please specify:
1. Sprinkler type (upright or pendent)
2. Orifice
3. NPT connection
4. Temperature rating
5. Finish
6. Quantity
7. Wrench quantity

Shipping Information:
½" size — 100 units packaged 16½" × 8½" × 6½", 19 lbs. (8.6 kgs.) 17/32" size — 100 units packaged 13½" x 11¾" x 11¾", 24 lbs. (10.9 kgs.) **U.S. Patent 4,376,465.**

MAINTENANCE AND SERVICE

Sprinkler inspections should be made on a regular basis to detect possible damage or alteration. **Caution: never hang objects from sprinklers.** Store sprinklers in a cool, dry place only.

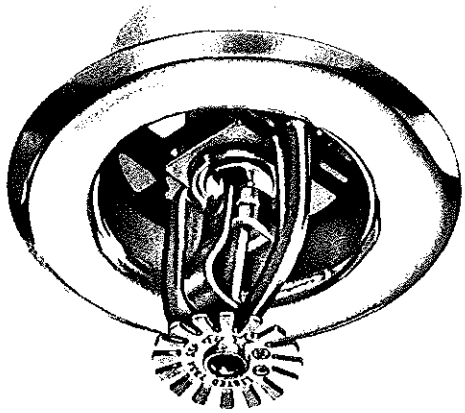
Automatic sprinklers should be replaced after 50 years of service, or if they are painted, corroded or damaged. A sprinkler that has been fused cannot be reassembled or reused. Replacement must be made with a sprinkler of the same size, type and temperature rating.

A specially designed **Model LD-2** wrench must be used to install **Model LD-2** sprinklers to prevent damage and insure warranty.

INSTALLATION

Sprinklers should be installed according to the latest published standards of the National Fire Protection Association or governing jurisdictional authorities. **Caution: Never install pendent sprinklers on a dry pipe system without first consulting the authorities having jurisdiction.** Special pendent sprinklers are available for dry pipe installation.

Product Data: STARMIST



GENERAL DESCRIPTION

The **Starmist** automatic sprinkler is designed for use in areas with finished ceilings where aesthetic appeal is important. Combining pleasing appearance with the ease of installation, the special escutcheon design allows for up to 1" adjustment after the ceiling is installed. In the event of fire, the simplified design of the flush pendent enables immediate and easy replacement. Full sprinkler protection is restored quickly. Each of the **Starmist** sprinklers feature streamlined center-strut construction. A bronze tube, sealed by two stainless steel balls, holds a fusible alloy. When the alloy melts, the balls are forced toward each other, releasing the tension mechanism which causes the sprinkler to operate. This unique design eliminates the problem of corrosion since the alloy is not exposed to atmospheric conditions. The danger of mechanical damage is also reduced by eliminating protruding links and levers.

TECHNICAL DATA

The temperature ratings 135°F, 165°F, and 212°F are UL and ULC listed and NYCBSA approved. 165°F and 212°F are FM approved for Light and Ordinary hazards groups I & II. 135°F is not FM approved.

Discharge Coefficients:
½" orifice K=**5.7 (82.2)**

Maximum Working Pressure:
175 psi (1206 kPS)

Temperature Ratings:
135°F, 165°F, and 212°F
(57°C, 74°C and 100°C)

Physical Characteristics:
½" orifice (12.7) with
½" NPT

Wrenches:
There are two types of wrenches available: 1. standard LD-2 (part no. 1849) 2. plastered ceiling (part no. 1959). Also available is the escutcheon assembly tool and gauge (part no. 1962).

ORDERING INFORMATION

Please specify:
1. Temperature rating
2. Finish of Sprinkler
3. Finish of escutcheon
4. Quantity
5. Wrench quantity
6. Escutcheon Assembly Tool quantity

Shipping Information:
100 sprinkler units packaged 16-½" x 8-½" x 6-½", 18 lbs. (8.2 kgs.) Escutcheons shipped separately, 50 units packaged 17-½" x 16" x 4", 10 lbs. (4.6 kgs.).

MAINTENANCE AND SERVICE

Sprinkler inspections should be made on a regular basis to detect possible damage or alteration. Automatic sprinklers should be replaced if they are painted, corroded or damaged. A sprinkler that has been fused cannot be reassembled and reused.

CAUTION:

This sprinkler should not be used if the space above the ceiling is used for delivery (positive pressure) in an HVAC system.

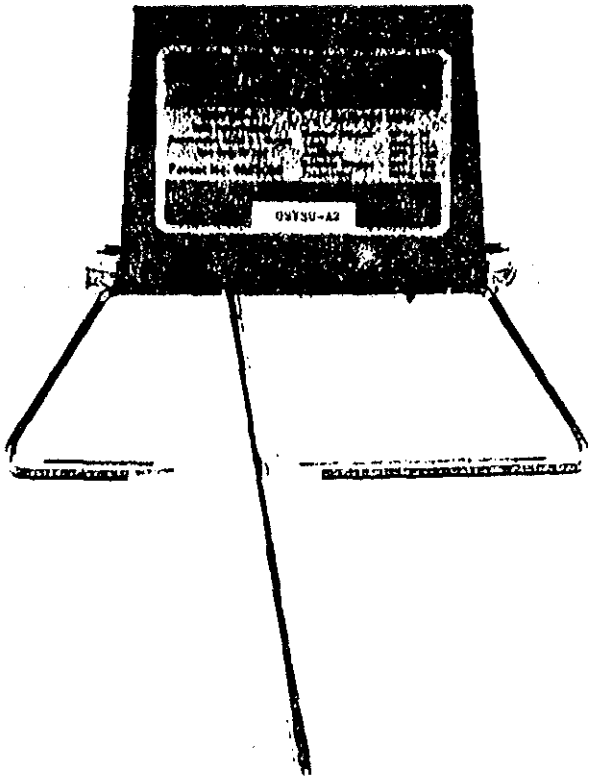
WARNING:

Installing any Star Sprinkler without using the special wrench manufactured by Star Sprinkler Corporation for the specific sprinkler may cause the sprinklers to operate improperly and will automatically void all warranties.

POTTER ELECTRIC SIGNAL CO.
2081 Craig Road • P.O. Box 28480
St. Louis, Mo. 63146 • (314)878-4321
Toll-Free (800)325-3936
TWX: 9107640909

OSYSU-A

OUTSIDE SCREW AND YOKE VALVE SWITCH



OSYSU-A1 Stk. No. 1010102
OSYSU-A2 Stk. No. 1010202

CHARACTERISTICS

U.L. LISTED & F.M. APPROVED

CONTACT RATINGS:
OSYSU-A1 — One set of S.P.D.T. (Form C)
OSYSU-A2 — Two sets of S.P.D.T. (Form C)
15 A @ 125/250 WAC
0.50 A @ 125 VDC
0.25 A @ 250 VDC

DIMENSIONS: 6.1"L x 2.3"W x 8.3"H
See Fig. 2 15.5cm.L x 5.7cm.W x 21.0cm.H

WEIGHT: 2 lb.
.9kg

ENCLOSURE: Cover: Die-cast Aluminum
Finished - - Red Spatter Enamel
Base: Formed Steel
All parts plated to resist corrosion.

COVER TAMPER: Mechanically Activated by cover removal.

ENVIRONMENTAL LIMITATIONS: -40°F/+140°F

The OSYSU-A is used to monitor the open position of an OS&Y (outside screw & yoke) type gate valve. This device is available in two models; the OSYSU-A1, containing one set of S.P.D.T. (Form C) contacts and OSYSU-A2, containing two sets of S.P.D.T. (Form C) contacts. These switches mount conveniently to most OS&Y valves ranging in size from ½" to 12". (For explosion proof requirements see model OSYS-U-EX, Bulletin 705)

TAMPER RESISTANT

Removing the cover causes the switches to operate. Either switch on the OSYSU-A2 may be disconnected from the tamper action by removing the tamper action tab or screw associated with that particular switch. (SEE PAGE 2)

WARNING

DISABLING THE TAMPER ACTION OF THE SWITCH ON THE OSYSU-A1 OR BOTH SWITCHES ON THE OSYSU-A2 WILL VOID UNDERWRITERS LABORATORIES' LISTING AND F.M. APPROVAL.

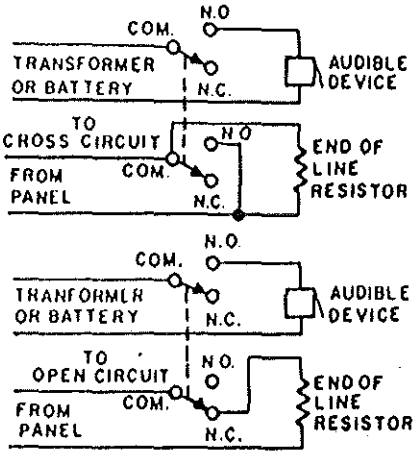
SERVICE USE:

Central Station	NFPA-71
Local	NFPA-72A
Auxiliary	NFPA-72B
Remote Station	NFPA-72C
Proprietary	NFPA-72D

TYPICAL ELECTRICAL CONNECTIONS

TYP. SWITCH ACTION

LOCAL AUDIBLE / CONTROL PANEL



LOCAL AUDIBLE / REMOTE TRANSMITTER

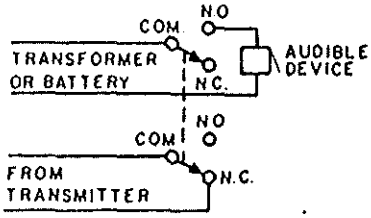
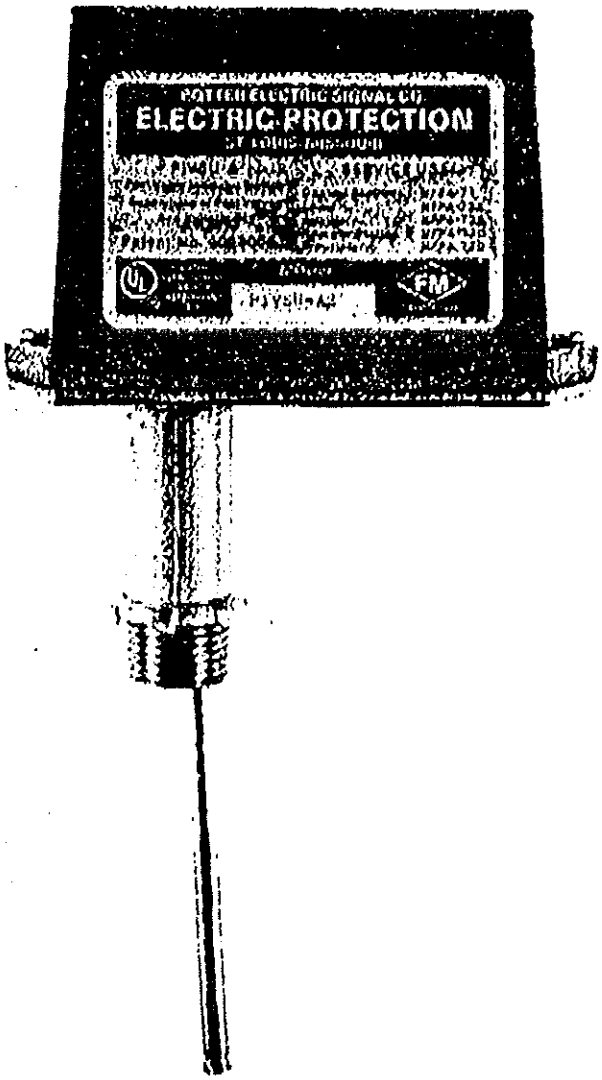


FIGURE 1 DWG. 5400655-15A

POTTER ELECTRIC SIGNAL CO.
2081 Craig Road • P.O. Box 28460
St. Louis, Mo. 63146 • (314)878-4321
Toll-Free (800)326-3936
TWX: 9107640909

PIVSU-A
POST INDICATOR VALVE SWITCH



PIVSU-A1 Stk. No. 1010104
PIVSU-A2 Stk. No. 1010204

CHARACTERISTICS

U.L. LISTED & F.M. APPROVED

CONTACT RATINGS:
PIVSU-A1 — One set of S.P.D.T. (Form C)
PIVSU-A2 — Two sets of S.P.D.T. (Form C)
15 A @ 125/250 VAC
0.50 A @ 125 VDC
0.25 A @ 250 VDC

DIMENSIONS: 4.7"L x 2.3"W x 8.3"H
12.0cm.L x 5.7cm.W x 21.0cm.H

WEIGHT: 2 lb. / .9 kg.

ENCLOSURE: Cover — Die-cast Aluminum
Finished — Red Spatter Enamel
Base — Formed Steel — All parts plated to resist corrosion.

COVER TAMPER: Mechanically Activated by Cover Removal.

ENVIRONMENTAL LIMITATIONS: -40°F/+140°F

USAGE OPTIONS: DEMCO, GRINNELL, PRATT, MUELLER, POWELL, CLOW, DRESSER, (Not all installations are U.L. Listed and F.M. Approved)

INSTALLATION KITS: Pratt Butterfly Valve Kits
PBK-S — 1000061
PBK-L — 1000062
Pratt Post Indicator Valve Kits
PVK-S — 100060

The PIVSU-A is a weather and tamper resistant switch which can be mounted on a Post Indicator or Butterfly Valve to monitor the open valve position. The PIVSU-A is available in two models; the PIVSU-A1, containing one set of S.P.D.T. (Form C) contacts and the PIVSU-A2, containing two sets of S.P.D.T. contacts. These switches will operate when the valve is intentionally or accidentally closed. The contacts can be used with any type of circuit.

The PIVSU-A is designed to be mounted in a ½" NPT tapped hole in the post indicator housing. The device should be located so that the trip rod of the switch has pressure applied to it by the indicator assembly when the valve is fully open and in a location on the valve where it is accessible for service.

TAMPER RESISTANT COVER

Removing the cover causes switches to operate. Either switch on the PIVSU-A2 may be disconnected from the tamper action by removing the tamper action screw associated with that particular switch. (See Page 2, Figure 2)

WARNING

DISABLING THE TAMPER ACTION OF THE SWITCH ON THE PIVSU-A1 OR BOTH SWITCHES ON THE PIVSU-A2 WILL VOID UNDERWRITERS LABORATORIES' LISTING AND F.M. APPROVAL.

SERVICE USE

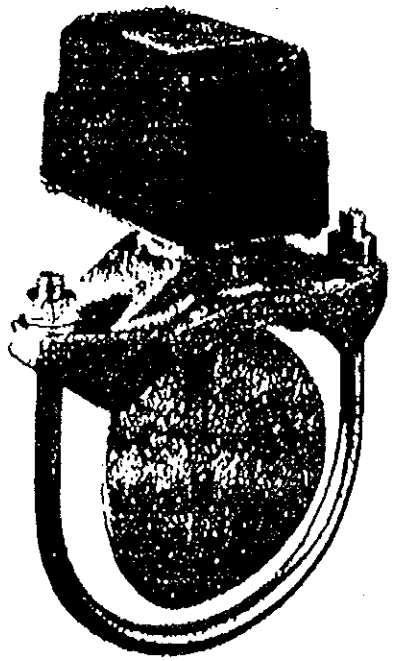
Central Station	NFPA-71
Local	NFPA-72A
Auxiliary	NFPA-72B
Remote Station	NFPA-72C
Proprietary	NFPA-72D

POTTER ELECTRIC SIGNAL CO.
2081 Craig Road • P.O. Box 28480
St. Louis, Mo. 63146 • (314)878-4321
Toll-Free (800)325-3936
TWX: 9107640909

VSR-D
VANE TYPE
WATERFLOW SWITCH

VANE TYPE WATERFLOW SWITCH FOR SERVICE PRESSURE UP TO 450 PSI

MINIMUM FLOW RATE FOR ALARM - 4 TO 10 GPM



The Model VSR–D is a vane type waterflow switch for use on wet sprinkler systems that do not have an alarm check valve. These units may also be used as sectional waterflow detectors on large sprinkler systems.

Sizes available: 2", 2½", 3", 3½", 4", 5", 6", 8".
10" SIZE AVAILABLE FOR SERVICE PRESSURES UP TO 250 PSI.

INSTALLATION: These devices may be mounted in a horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6 inches of a fitting which changes the direction of the waterflow or within 24 inches of a gate valve or drain.

Drain the system and drill a hole in the pipe using a circular saw in a slow speed drill. The 2 inch and 2½ inch devices require a 1¼ inch hole; all other sizes require a 2 inch hole.

Clean the inside of the pipe of all growth or other material for a distance equal to the pipe diameter on side of the hole.

Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Install the saddle strap and tighten nuts alternately to an eventual 50 FT.-LBS. of torque. See reverse side of this sheet.

The vane must not rub the inside of the pipe or bind in any way.

FLOW ADJUSTMENT: The small coil spring holds the vane in the normal position against the direction of the waterflow. It can be adjusted if necessary to restore the retard fully, but do not over-tighten, as this will decrease the sensitivity of the device.

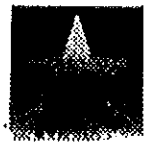
RETARD ADJUSTMENT: These units have an adjustable pneumatic retard to prevent false alarm due to water surge. The retard is adjustable from 0 to approximately 90 seconds.

CONTACTS: The Model VSR–D has two sets of form C (S. P. D. T.) contacts rated 10 amperes 125 or 250 volts A. C.; ½ ampere 125 volts D. C. ¼ ampere 250 volts D.C.

TESTING: Operation of the unit is checked by opening the "Inspection Test Valve" at the end of the sprinkler line.

STAR®

Sprinkler Emergency Cabinets



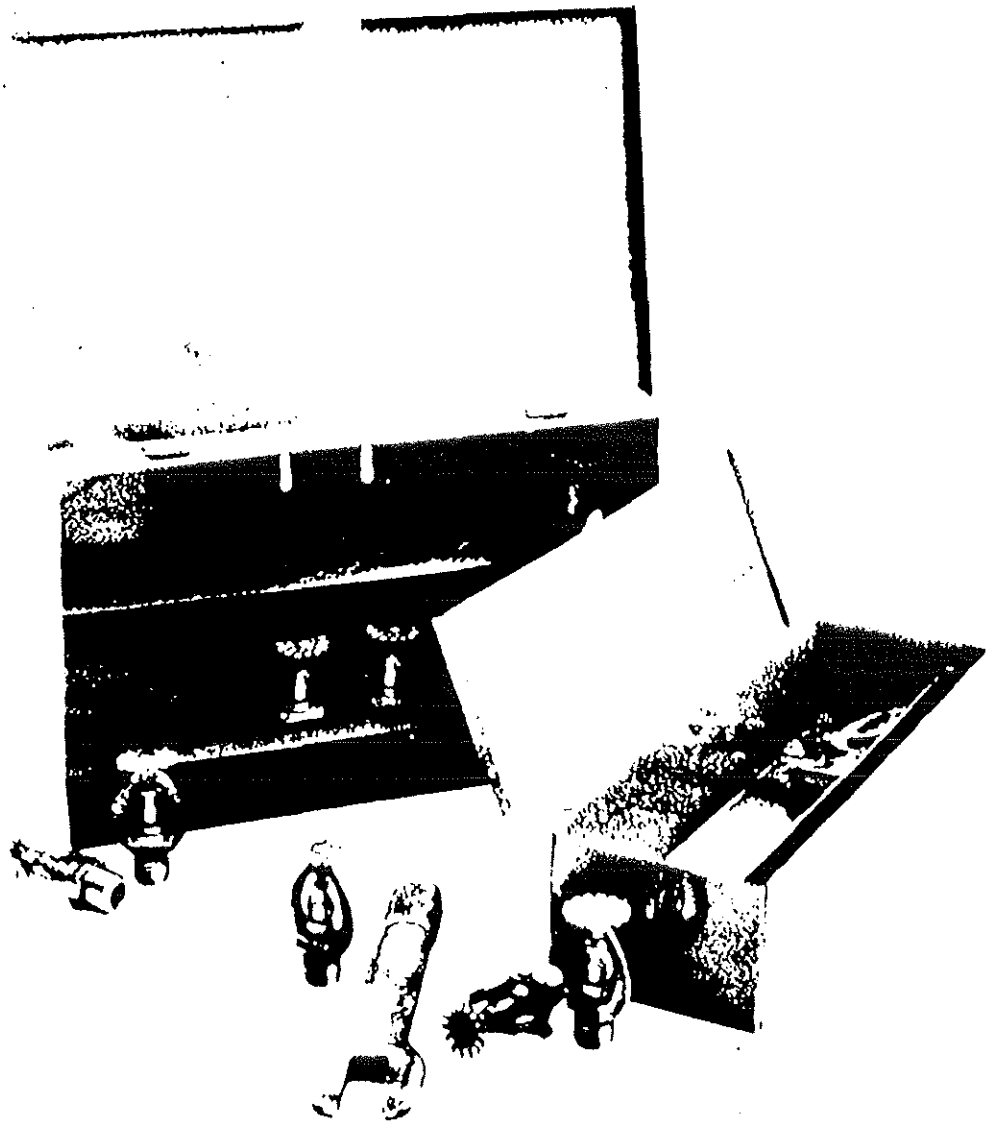
Star Sprinkler Emergency Cabinets are designed to accommodate a stock of six or twelve spare sprinklers and a sprinkler wrench. Constructed of heavy duty sheet metal and finished in attractive red enamel, these cabinets will accept all types of Star sprinklers, including both ½" and ¾" threads.

NFPA requires that emergency cabinets be maintained with a stock of spare sprinklers and a sprinkler wrench to allow immediate replacement of any sprinkler head which may become fused or damaged. The stock of sprinklers should include all types and temperatures that are installed on the premises in the following quantities

Sprinklers in System	Reserve Sprinklers Required
Under 300	6 sprinklers
300 to 1,000	12 sprinklers
Over 1,000	24 sprinklers

Under extraordinary conditions where it is anticipated that a larger number of sprinklers will open the stock of spare sprinklers should be increased accordingly.

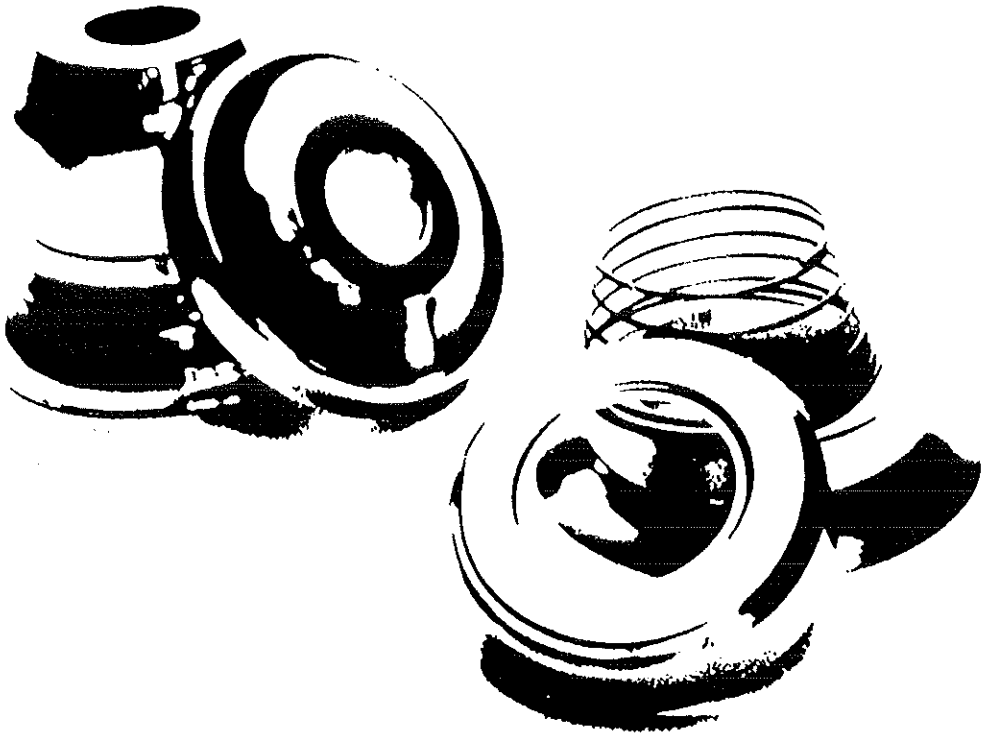
The cabinet should be installed where temperatures will not exceed 100° F. preferably on the valve riser. The Star Sprinkler Emergency Cabinet is furnished with holes and slots to accommodate easy wall or riser mounting



STAR

Sprinkler Escutcheons

Star Sprinkler Escutcheons are decorative plates designed to enhance the appearance of pendent and horizontal sidewall sprinklers When installed. Star Sprinkler Escutcheons cover the connecting pipe coupling and are held firmly in place against the ceiling or wall by the sprinkler head. Star Sprinkler Escutcheons accept ½" NPT male pipe threads and are available in several finishes



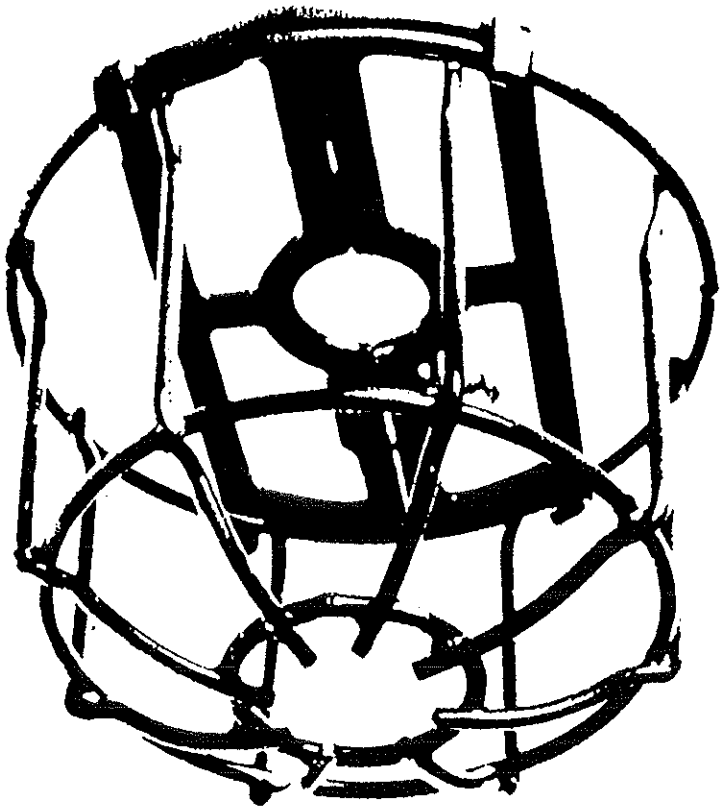
Sprinkler Wrenches

Each Star sprinkler has a corresponding sprinkler wrench for use in installation. It is important that the proper wrench is used to prevent damage to the sprinkler head. Each of the wrenches are made of durable lightweight aluminum and are designed to provide the proper leverage on the sprinkler head to prevent over tightening.

STAR®

Sprinkler Guard

Sprinklers subject to possible mechanical damage, such as those installed in low ceilings, storage racks, or under open gratings, should be protected by guards. The Star Sprinkler Guard is made of welded steel wire to withstand heavy impact. The simple two piece design is easy to install and can be used with upright, pendent, or sidewall sprinklers with ½" pipe threads.



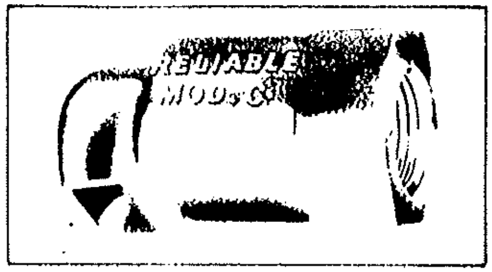
Reliable®

Automatic Ball Drip
Sight Drain
Drum Drip
Control Valve Seal
Fill Cup
Inspectors Test Connection
Pressure Gauges

Model C • Automatic Ball Drip

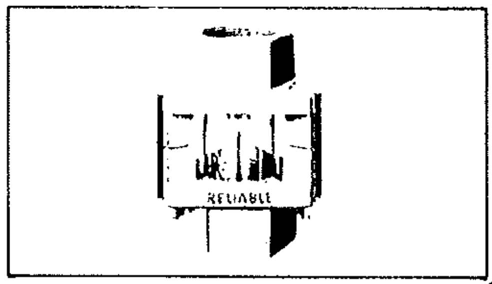
An automatic drain valve horizontally installed at the low point in the fire department connection piping of automatic sprinkler systems. Water pressure from fire department pumper closes this ball drip. It automatically re-opens when pressure ceases, permitting this piping to drain and thereby preventing freezing.

Made of bronze and available with ½″ or ¾″ NPT female pipe connection. Length: 2⁵⁄₁₆″



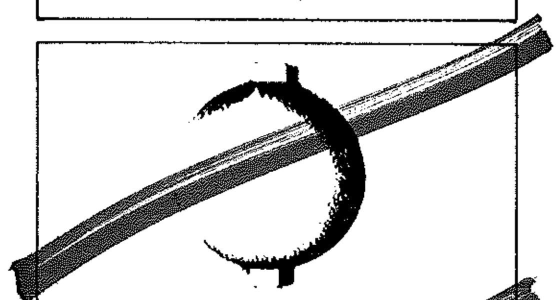
Model C • 2″ Sight Drain

Designed for installation in drain lines of sprinkler systems that connect with closed drains. Made of semi-steel with pyrex glass tube. Has 2″ NPT female pipe connection. Length: 6″



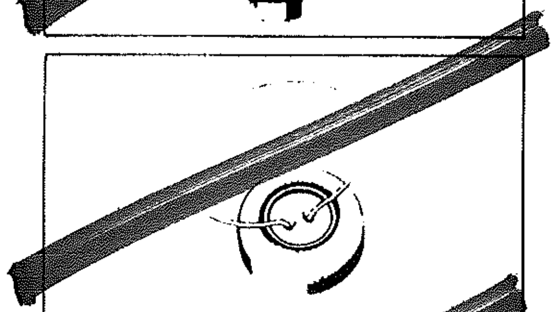
Model B • Drum Drip

Permits draining of low points in dry pipe systems without tripping the system. Made of cast iron with [illegible] NPT female pipe connection at each end. Diameter: 6″. Length: 7¾″.



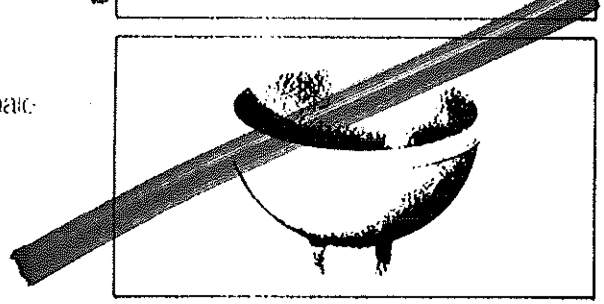
Model A • Control Valve Seal

Made of tin-plated steel. Two piece snap type construction. Outer piece holes sized for use with standard sealing wire (wire not included).
Diameter: ⅞″.



Model A • Fill Cup

Made of semi-steel. Available with [illegible] or [illegible] NPT female pipe connection. Cup diameter is [illegible] length 2¼″



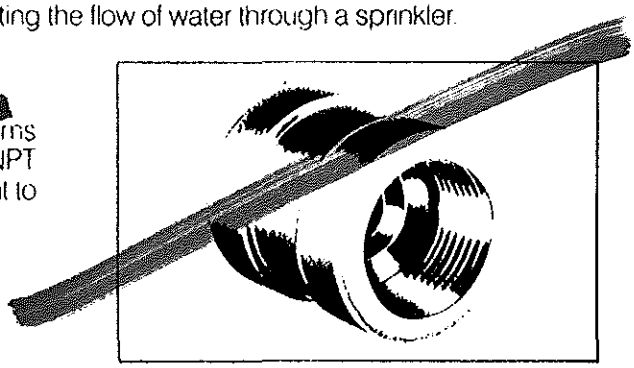
The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

Inspectors Test Connections

Installed in sprinkler systems to test alarms by simulating the flow of water through a sprinkler.

Model A • Blind Test Connection

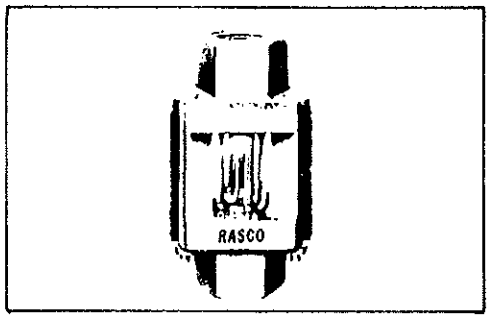
Designed for installation in test pipes of sprinkler systems that connect to open drains. Made of bronze with 1" NPT female pipe connections. Orifice gives flow equivalent to one nominal ½" orifice sprinkler.
Length: 1⅞".



Model B • Sight Test Connection

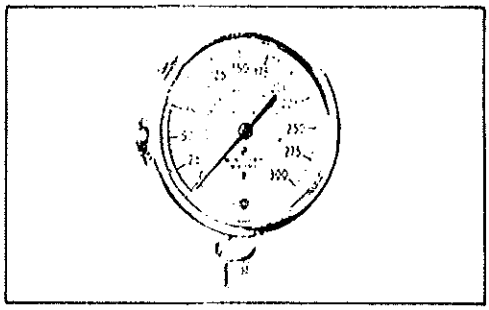
Designed for installation in test pipes of sprinkler systems that connect to closed drains.

Made of semi-steel with clear tube. Smooth bore non-corrosive orifice gives flow equivalent to one nominal ½" orifice sprinkler. Has 1" NPT pipe connection.
Length: 5 1/16".



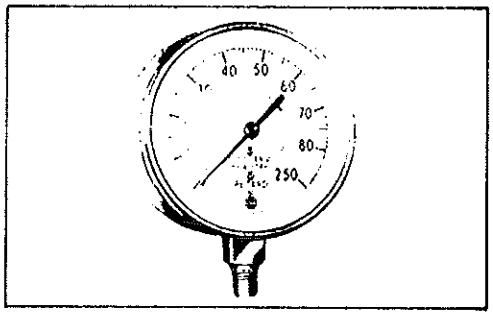
Model UA • Water Pressure Gauge

Range 0 to 300 lbs. in 5 lb. increments. ¼" NPT male pipe connection. Brass case—3½" diameter. Height: 4¾".



Model UA • Air Pressure Gauge

Range 0 to 250 lbs. in 1 lb. increments to 80 lbs. Retard type. ¼" NPT male pipe connection. Brass case—3½" diameter. Height: 4¾".



The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Reliable Sprinkler Devices, protecting life and property for over 60 years, are approved by all fire insurance and government agencies, and are installed and serviced by Reliable's chain of representatives.
Reliable representatives, located throughout the United States, Canada and foreign countries, have a life-time of experience and are as near as your telephone.

Manufactured by

Reliable

The Reliable Automatic Sprinkler Co., Inc.
525 North MacQuesten Parkway,
Mount Vernon, New York 10552
(914) 668-3470

Printed in U.S.A. 3/85

Reliable®

Model A Identification Signs

General Purpose Valve Control— Style A

Porcelain enameled 18 gauge steel 7" x 9" [illegible] diameter holes for easy mounting. ¼" diameter holes for attachment of Specific Identification Sign in center white space white letters on red background Bottom white space to be used for name and address of insurance authority having jurisdiction and for contractor's name and address

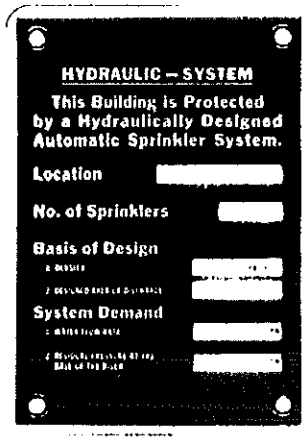
Fire Alarm— Style D

Attached [illegible] and [illegible] white letters on red background White space to be used for name [illegible] telephone number to call in case of emergency

Specific Identification— Style B

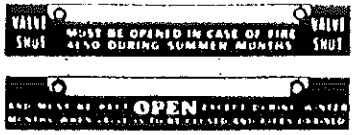
Used separately or fastened over white space of General Purpose Valve Control Sign Porcelain enameled, 18 gauge steel 6" x 2" [illegible] diameter attaching holes, white letters on red background Available in the following wording: MAIN DRAIN, DRAIN, AUXILIARY DRAIN, OPEN SPRINKLER DRAIN, INSPECTOR'S TEST, TEST VALVE ALARM TEST WATER MOTOR LINE AND OPEN SPRINKLER CONTROL

Hydraulic Calculated System— Style E



Attached [illegible] Embossed white enamel lettering on red enamel background 5" x 7" .200 diameter attaching holes

Cold Weather— Style C



Used to cover the word "OPEN" on the General Purpose Valve Control Sign. "OPEN" side of Cold Weather Sign to face out during summer months "VALVE SHUT" side to face out during winter months Porcelain enameled, 20 gauge steel, 8" x 1¼", [illegible]" diameter attaching holes, white letters on red background.

POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co

FREE STANDING FIRE DEPT. INLET CONNECTIONS

SELECTION INFORMATION

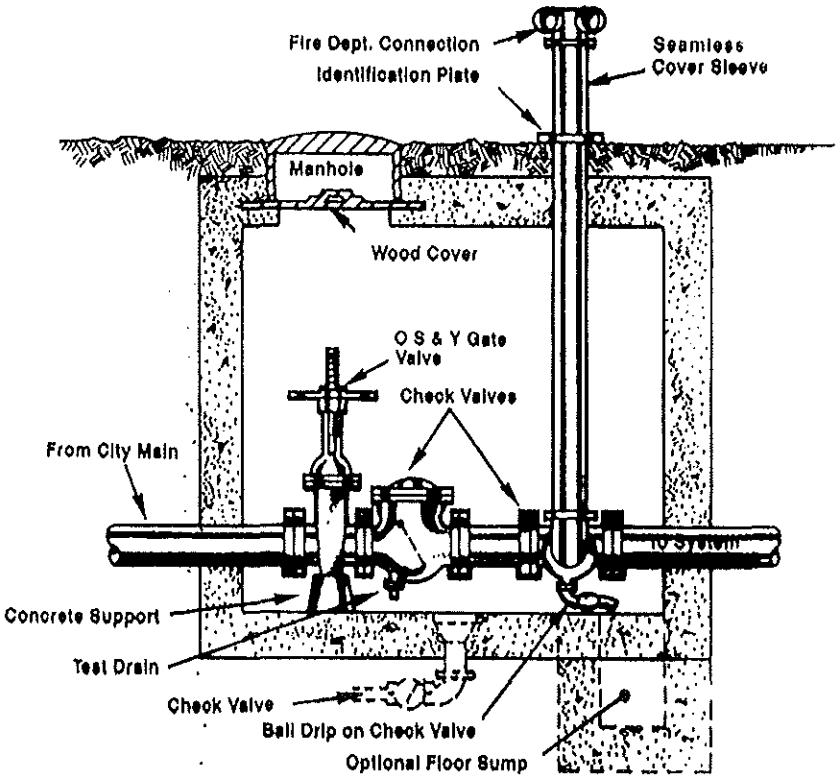
FUNCTION: Used as an auxiliary inlet connection to supplement the fire protection water supply. Free standing design is used on exterior fire lines piped vertically through grade.

REGULARLY FURNISHED: Cast brass angle body or red glossy polyester coated ductile iron angle body, size of outlet and number and type of inlets as selected by figure number. 18" long polished brass seamless cover sleeve; cast brass identification base plate, cast brass pin lug plugs and chains on each pin lug swivel.

LETTERING AVAILABLE:
AUTO. SPKR.
STANDPIPE
DRY STANDPIPE
AUTO. SPKR. STANDPIPE
Refer to page 5-6 for special lettering

VARIATION:
Additional length sleeve. Specify length

SPECIFY thread and lettering



TWO-WAY BRASS BODY WITH CLAPPERS

Fig.	Size	
5761	4" x 2½"	2-Way
5762	4" x 3"	2-Way
5763	6" x 2½"	2-Way
5764	6"x 3"	2-Way

Overall Height: 24"
Radius of Body Swing: 7¼"

OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated Body; Polished Chrome Plated Trim
-D Polished Chrome Plated

SPECIFY thread and lettering

5760 SERIES

THREE-WAY BRASS BODY WITH CLAPPERS

Fig.	Size	
5771	4" x 2½"	3-Way
5773	6" x 2½"	3-Way

Overall Height: 24"
Radius of Body Swing: 9"

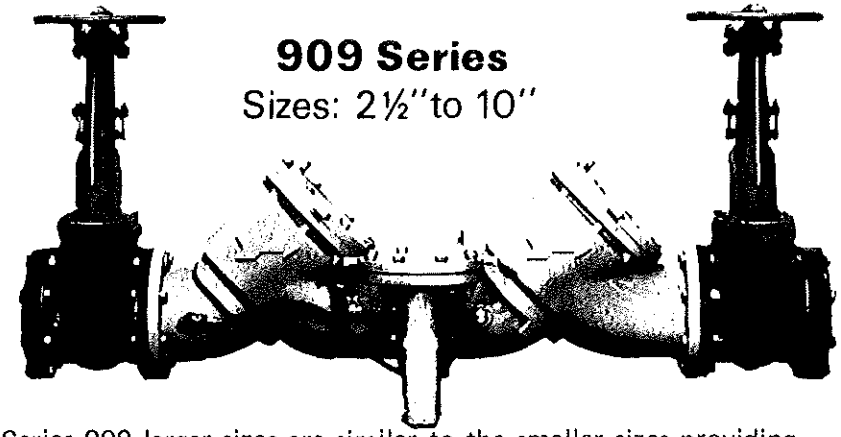
OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated Body; Polished Chrome Plated Trim
-D Polished Chrome Plated

SPECIFY thread and lettering

5770 SERIES

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS

BACKFLOW PREVENTERS



909 Series
Sizes: 2½"to 10"

Series 909 larger sizes are similar to the smaller sizes providing the same protection in cross connection control, with its unique patented design incorporating the "air-in/water-out" principle. Furnished with non-rising stem (NRS) gate valve shut-offs.

OPTIONS: (Options can be combined)

Suffix

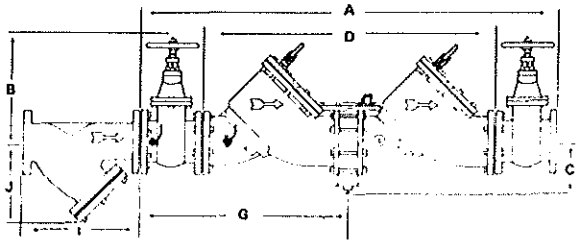
- S · with strainer, FDA approved epoxy coating.
- M2 · with epoxy coated (FDA approved) cast iron check valve bodies, Sizes: 2½",3".
- OSY · with OS&Y gate valve shut-offs.
- QT · with ¼ turn, full port, resilient seated, ball valve shut-offs 2½" - 6".
- RW · with resilient wedge shut-off valves.
- LF · without shut-off valves.

NOTE: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary and the direction of flow must be (down) for 2½" - 10".

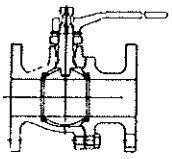
FEATURES

- Removeable bronze seats
- Stainless steel internal parts

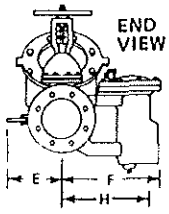
DIMENSIONS-WEIGHTS



QT



Watts G-4000 Series Ball Valves



Strainer (Size)	Dimensions I	Dimensions J	Weight (lbs.)
2½"	12	8½	40
3"	14	10	52
4"	16½	11½	77
6"	20¼	15	108
8"	23	19¾	275
10"	26¾	23	413

NOTE: Relief valve section is reversible, therefore, dimension "F" can be on either side and is furnished standardly as shown.

SIZE	DIMENSIONS (Inches) A	B NRS	B O.S.&Y.	C	D	E	F	G	H	Weight (Lbs.) NRS	Weight (Lbs.) O.S.&Y.*
2½"	41¼	11⅜	15⅞	5¼	26⅛	4	9	20⅝	7⅝	195	198
3"	42¼	12¾	18½	5¼	26⅛	5	9	21¼	7⅝	225	230
4"	55⅛	15⅜	23¾	6	37	6	13⅝	27⅝	11¾	455	470
6"	65½	19¾	32½	6	44½	11	13⅝	32¾	11¾	718	798
8"	78¾	24½	39¼	9¾	55¼	11¼	18½	39⅜	16⅜	1,350	1,456
10"	93⅝	29¼	48	9¾	67⅜	12½	18½	46⅞	16⅜	2,160	2,230

SIZE	A	QT	C	D	E	F	G	H	QT
2½"	41¼	6	5¼	26⅛	4	9	20⅝	7⅝	182
3"	42¼	7	5¼	26⅛	5	9	21¼	7⅝	190
4"	55⅛	9	6	37	6	13⅝	27⅝	11¾	362
6"	65½	10	6	44½	11	13⅝	32¾	11¾	762

* UL, FM approved backflow preventers must include FM approved OS&Y gate valves.

MATERIALS

No. 909 M2 sizes: 2½" & 3" and No. 909 sizes: 4" & 6", have epoxy coated (FDA approved) cast iron check valve bodies with bronze seats and bronze relief valve with stainless steel trim.

No. 909 sizes: 8" & 10" have epoxy coated cast iron check valve bodies with bronze seats, epoxy coated cast iron relief valve with stainless steel trim. All sizes furnished with bronze body ball valve test cocks.

No. 909 sizes: 2½", 3" have all bronze construction and stainless steel trim.

PRESSURE-TEMPERATURE

Suitable for supply pressure up to 175 PSI and water temperature to 110°F.

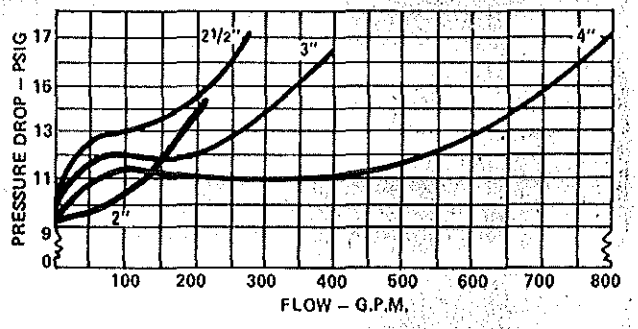
STANDARDS

Tested and certified under the following standards for reduced pressure backflow preventers; A.S.S.E. No. 1013; AWWA C506; CSA B64.4; FCCCHR of USC Manual Section 10; U.L. Classified File No. EX3185 (sizes 2½" thru 10"). Listed by IAPMO (UPC); SBCCI (Standard Plumbing Code). Consult your Watts representative or factory for other state, county or city acceptances.

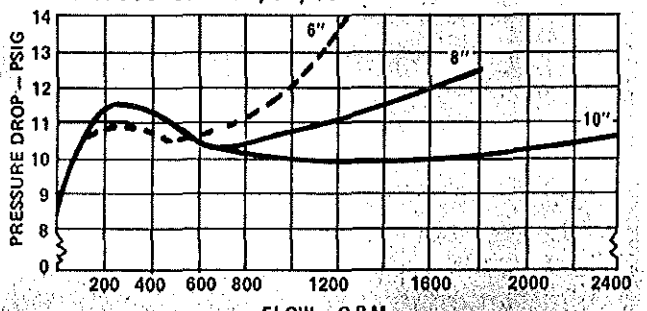
CAPACITY

Factory Mutual System WITH OS&Y GATE VALVES

No. 909 Sizes 2"-4"



No. 909 Sizes 6", 8", 10"



CHANDLER MED. CTR.
LEXINGTON, KY.

SUPPLIED BY BSC.

2974
8-4-89

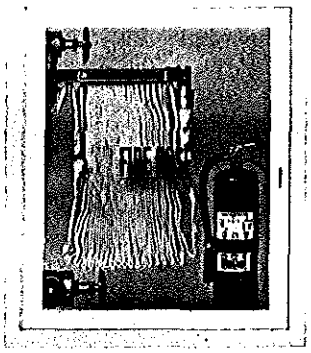
HOSE CABINETS PER FLOOR →

	STAIRWELL "A"	STAIRWELL "B"	STAIRWELL "D"	INTERIOR EAST	INTERIOR WEST
GROUND	RECESS	RECESS	SURFACE	RECESS	RECESS
FIRST	RECESS	RECESS	SURFACE	RECESS	RECESS
SECOND	RECESS	RECESS	SURFACE	RECESS	RECESS
THIRD	RECESS	RECESS	SURFACE	RECESS	RECESS
FOURTH	RECESS	RECESS	SURFACE	RECESS	RECESS
FIFTH	NONE	NONE	NONE	NONE	NONE
SIXTH	RECESS	RECESS	SURFACE	RECESS	RECESS
SEVENTH	RECESS	RECESS	SURFACE	NONE	NONE
EIGHTH	NONE	RECESS	NONE	NONE	NONE
MACHINE RM.	NONE	SURFACE	NONE	NONE	NONE
FAN RM.	NONE	SURFACE	NONE	NONE	NONE

POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co.

1500 SERIES
FIRE HOSE CABINETS



FOR USE WITH

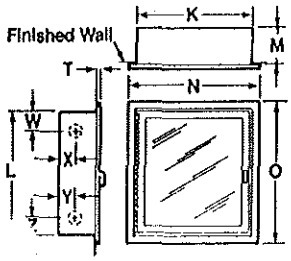
- 1½" FIRE HOSE RACK ASSEMBLY
- PORTABLE FIRE EXTINGUISHER
- 2½" FIRE DEPT. VALVE

FUNCTION: 1500 Series cabinets accommodate a single 1½" fire hose rack assembly with either Polyflex or PR-Superflex hose and a portable fire extinguisher and a 2½" fire dept. valve with cap and chain.

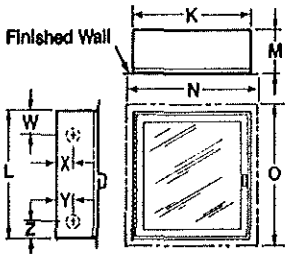
OPTIONAL MATERIALS:
Door and Frame available in aluminum or stainless steel. Refer to page **9**.

REGULARLY FURNISHED:
20 gauge white glossy polyester coated steel box, 20 gauge tubular steel door with 18 gauge frame with a continuous steel hinge (brass pin). Steel corner seams welded and ground smooth. Door and Frame finished with white prime polyester coating. Wall mounting and size of cabinet as selected by Figure Number.

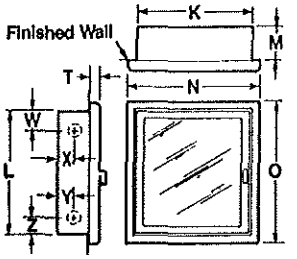
1500 SERIES



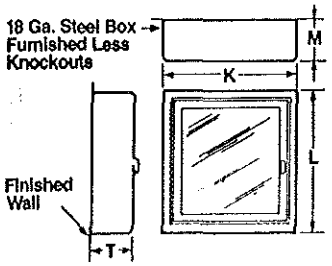
RECESSED



TRIMLESS



SEMI-RECESSED



SURFACE

ORDERING INFORMATION

- **Select cabinet figure number**
- **Select cabinet door style (Refer to page 10)**
- **Select type of hose rack assembly (Refer to 2000 Section)**
- **Select type and size of fire extinguisher (Maximum sizes are 2½ gallon water, 20 lb. dry chemical 20 lb. halon or 10 lb. carbon dioxide. Refer to 3000 Section)**
- **Select type of fire dept. valve with cap and chain (Refer to 4000 Section)**

SPECIFICATION: Provide and install where indicated on drawings Potter-Roemer Fig. No. _____ Fire Hose Cabinet with Door Style Suffix _____ containing Fig. No. _____ Fire Hose Rack Assembly and Fig. No. _____ Fire Extinguisher and Fig. No. _____ Fire Dept. Valve with Fig. No. _____ Cap and Chain.

Fig. No.	Wall Mounting	MAX. CAPACITY Poly-Flex	MAX. CAPACITY PR Super Flex	Box Dimensions K	Box Dimensions L	Box Dimensions M	Overall Frame* N	Overall Frame* O	Wall Opening Required WIDTH	Wall Opening Required HEIGHT	Wall Opening Required DEPTH	Trim T	Inlet Location W	Inlet Location X	Inlet Location Y	Inlet Location Z
1504	Recessed	75'	50'	30	36	8	33¾	39¾	31	37	8½	⅝	4	4	4	4
1506	Recessed	100'	75'	30	40	8	33¾	43¾	31	41	8½	⅝	4	4	4	4
1508	Recessed	—	100'	30	44	8	33¾	47¾	31	45	8½	⅝	4	4	4	4
1514	Trimless	75'	50'	30	36	8¾	33	39	31	37	9¼	—	4	4	4	4
1516	Trimless	100'	75'	30	40	8¾	33	43	31	41	9¼	—	4	4	4	4
1518	Trimless	—	100'	30	44	8¾	33	47	31	45	9¼	—	4	4	4	4
1534	Semi-Recessed	75'	50'	30	36	8	33½	39½	31	37	6¼	2¾	4	4	4	4
1536	Semi-Recessed	100'	75'	30	40	8	33½	43½	31	41	6¼	2¾	4	4	4	4
1538	Semi-Recessed	—	100'	30	44	8	33½	47½	31	45	6¼	2¾	4	4	4	4
1554	Surface	75'	50'	32	38	9¼	—	—	—	—	—	9¼	—	—	—	—
1556	Surface	100'	75'	32	42	9¼	—	—	—	—	—	9¼	—	—	—	—
1558	Surface	—	100'	32	46	9¼	—	—	—	—	—	9¼	—	—	—	—

ALL DIMENSIONS IN INCHES

*NOTE: FOR ALUMINUM CABINETS DEDUCT FROM OVERALL FRAME DIMENSIONS N & O, 1" FOR RECESSED AND ½" FOR SEMI-RECESSED.

POTTER-ROEMER, INC.

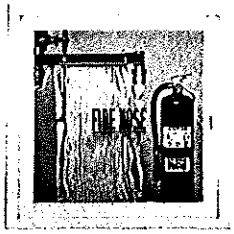
Subsidiary of Jay R. Smith Mfg. Co.

CABINET SELECTION

STEP 4

SELECT DOOR STYLE (Except Bubble Type)

ADD SUFFIX LETTER TO CABINET FIGURE NUMBER



FULL GLASS

FUNCTION: Used where maximum visibility of entire contents is desired.

REGULARLY FURNISHED:
Cam catch, double strength glass and identifying decal.

SUFFIX-A

DUO VERTICAL PANEL GLASS

FUNCTION: Used where visibility of extinguisher is desired.

REGULARLY FURNISHED:
Cam catch, double strength glass and identifying decal.

SUFFIX-DV

BREAK GLASS

FUNCTION: Used where security of contents is desired with visual identification.

REGULARLY FURNISHED:
Keyed alike cylinder lock with internal trip device, single strength glass with instructional decal.

SUFFIX-B

BREAK GLASS 25 SQ. IN.

FUNCTION: Used where security of contents is desired. Conforms to NFPA 14 recommendations.

REGULARLY FURNISHED:
Keyed alike cylinder lock with internal trip device, single strength glass with instructional decal.

SUFFIX-E

SOLID METAL
(Aluminum Only)

FUNCTION: Used where contents are to be concealed for esthetic purposes.

REGULARLY FURNISHED:
Cam catch and identifying decal.

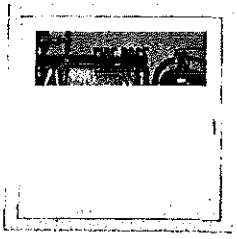
SUFFIX-C

FLUSH SOLID METAL

FUNCTION: Used where contents are to be concealed for esthetic purposes; blends with finished wall.

REGULARLY FURNISHED:
Cam catch and identifying decal.
18ga 304 SS #4 finish

SUFFIX-F

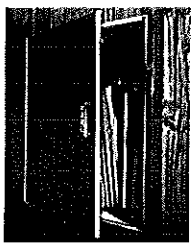


DUO PANEL GLASS

FUNCTION: Used where a combination of limited visibility and concealment of contents is desired.

REGULARLY FURNISHED:
Cam catch, double strength glass and identifying decal.

SUFFIX-D



INSET PANEL

FUNCTION: Used to allow insertion of finish material in door.

REGULARLY FURNISHED:
Cam catch and identifying decal.

SUFFIX-J

OPTIONAL INSERTS FOR GLASS STYLE DOORS

Specify by adding description to door style suffix:

- PLATE GLASS
- DOUBLE STRENGTH MIRROR GLASS
- TINTED GLASS
- COLORED ACRYLIC
- WIRE INSERTED GLASS
- CLEAR ACRYLIC

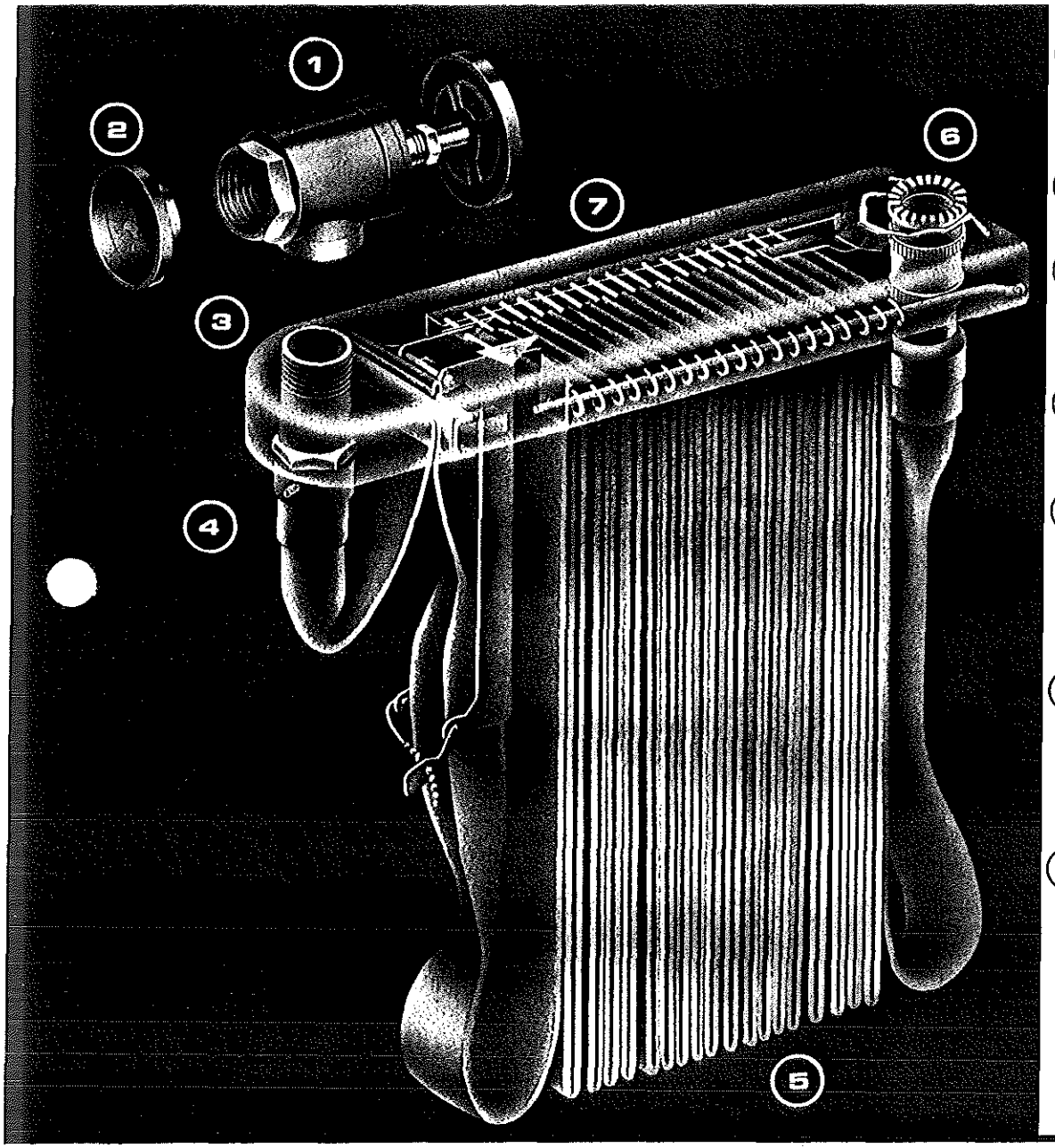
Door styles have continuous hinge on left side unless otherwise specified. Any above door style except suffix-D may be rotated if right hand hinge is desired.
See 1900 series cabinet accessories and identification options.

POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co.

SEMI-AUTOMATIC HOSE RACK ASSEMBLY

A readily available and immediate means of controlling and suppressing fire by one person. The assembly is capable of delivering the nationally recognized standard of 100 G.P.M. at 65 P.S.I. at the nozzle.



1 VALVE
Connection to standpipe. Controls water flow and pressure. Refer to 4000 Section.

2 ESCUTCHEON
To conceal pipe entry into cabinet.

3 RACK NIPPLE
Supports the hose rack and allows directional deployment of hose. Provide local fire department thread.

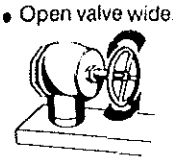
4 COUPLING
Allows watertight attachment of hose to nipple. Refer to page **2**-11.

5 HOSE
A lightweight durable, compact, and readily deployed hose that is testable and easily folded for rack storage. Refer to pages **2**-9 and 10.

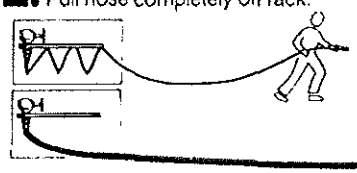
6 FOG NOZZLE
Directs water flow to extinguish fire. The nozzle pattern control permits fog, straight stream or shut off positions. Refer to pages **2**-13 and 14.

7 SEMI-AUTOMATIC HOSE RACK
Provides storage for folded hose and nozzle. The water retention device provides one person operation. Inspection seal indicates readiness of the assembly. Refer to page **2**-4.

1. Open valve wide.



2. Pull hose completely off rack.



3. Water will come on when hose is free.

1½" HOSE RACK ASSEMBLIES

POTTER-ROEMER, INC.

A Subsidiary of Jay R. Smith Mfg. Co.

FUNCTION: Used to provide an immediate and more efficient means of fire control. The assembly is capable of one man operation and delivering the nationally recognized standard of 100 G.P.M. at 65 P.S.I. at the nozzle. Class II service.

REGULARLY FURNISHED:

Fig. 4070 Rough Brass 300 lb. U/L-◀ FM ▶ Angle Valve
Fig. 2750 Escutcheon
Fig. 2755 Satin Brass Hose Rack Nipple
Fig. 2930 Satin Brass Pin Lug Coupling
Fig. 2915 ◀ FM ▶ Lined 500 lb. Polyflex Hose
Fig. 2962 Satin Brass Fog Nozzle
2792 Fig. ~~2872~~ Red Glossy Polyester Coated Steel U/L-◀ FM ▶ Hose Rack
Fig. 1985 Instructional Decal

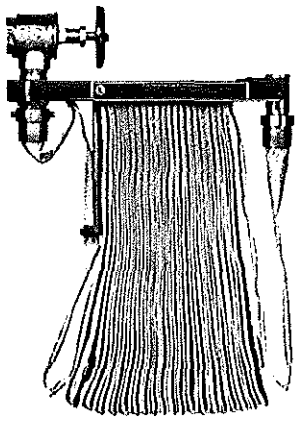
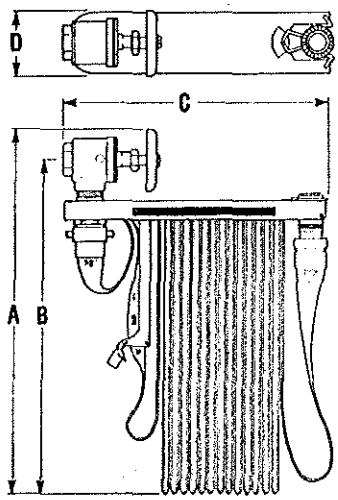


Fig. No.	Hose Length	Valve Size	Hose Dia.	Dimensions A	B	C	D
2505	50'	1½"	1½"	22"	23½"	18"	4"
2507	75'	1½"	1½"	24½"	26"	18"	4"
2510	100'	1½"	1½"	29½"	31"	18"	4"

Add 4" to hose rack assembly dimension "C" for Fig. 2926 PR-Superflex Hose

2500 SERIES



OPTIONAL FINISHES

	Rack	Valve	Trim
–A	Red Enamel	Rough Brass	Polished Brass
–B	Red Enamel	Polished Brass	Polished Brass
–C	Polished Chrome Plated	Rough Chrome Plated	Rough Chrome Plated
–D	Polished Chrome Plated	Polished Chrome Plated	Polished Chrome Plated

NFPA/FEMA CLASS OF SERVICE

CLASS I FIRE SERVICE ONLY
CLASS II OCCUPANT USE
CLASS III FIRE SERVICE OR OCCUPANT USE

OPTIONAL EQUIPMENT: TO SELECT ADD SUFFIX

1½" VALVES

–10 With Fig. 2760 Brass Automatic Drain Valve.
–11 With Fig. 2765 Brass Adjustable Pressure Restricting Device.
–12 With Fig. 2770 Brass Restricting Disc.
–14 With Fig. 4090 Double Female Adjustable Pressure Restricting Angle Valve.
–16 With Fig. 4010 Double Female Pressure Regulating Angle Valve.
–18 With Fig. 4042 Double Female Pressure Regulating Angle Valve.

1½" HOSE

–21 With Fig. 2915 Single Jacket Lined 300 lb. Test Polyflex Hose. ◀ FM ▶ and U/L
–23 With Fig. 2926 Single Jacket Lined 500 lb. Test PR-Superflex Hose. ◀ FM ▶
–24 With Fig. 2926 Single Jacket Lined 500 lb. Test PR-Superflex Hose. ◀ FM ▶ and U/L

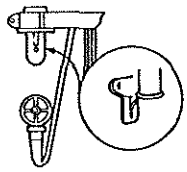
1½" COUPLING

–31 With Fig. 2930 –RL Rocker Lug Coupling.
–32 With Fig. 2941 Extruded Aluminum Coupling.

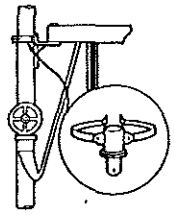
1½" NOZZLE

–42 With Fig. 2960 Red Polycarbonate Fog Nozzle.
–43 With Fig. 2972 Brass Fog Nozzle With Rubber Bumper.
–44 With Fig. 2980 Red Polycarbonate "All Fog" Nozzle.
–45 With Fig. 2985 Brass "All Fog" Nozzle With Rubber Bumper.
–46 With Fig. 2993 Brass Fixed-Flow Nozzle.

OPTIONAL TYPES OF MOUNTING



–E WALL BRACKET
FUNCTION: Used to support hose rack assembly independent of standpipe.



–G PIPE CLAMP
FUNCTION: Used for external attachment to standpipe riser.

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS

HOSE ASSEMBLY ACCESSORIES

POTTER-ROEMER, INC.
A Subsidiary of Jay R. Smith Mfg. Co.

CABINET ESCUTCHEONS

FUNCTION: Used to conceal pipe entry into cabinet.

Fig. 2750 ..... 1½" Size stamped steel, polished chrome plated.

Fig. 2751 ..... 2½" Size white polycarbonate.

BRASS RACK NIPPLE

FUNCTION: Used to support hose rack from valve and adapt pipe thread to hose thread.

REGULARLY FURNISHED:
Cast brass hexagon type hose rack nipple with male NPT x male hose thread.

Fig.
2755 ..... 1½" Size.
2756 ..... 2½" Size.

OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated

SPECIFY thread

BRASS AUTOMATIC DRAIN VALVE

FUNCTION: Used to prevent water damage to hose due to valve leakage.

REGULARLY FURNISHED:
Cast brass female pin lug swivel hose thread x male hose thread drain valve with pressure activated ball seal.

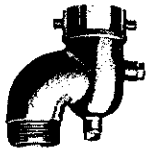
Fig.
2760 ..... 1½" Size.
2761 ..... 2½" Size.

OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated

SPECIFY thread

2750-2751

2755-2756



2760-2761

BRASS ADJUSTABLE PRESSURE RESTRICTING DEVICE

FUNCTION: Used to reduce water pressure at hose line by restricting flow. Removable breakable link allows restriction to be overridden.

REGULARLY FURNISHED:
Cast brass finish, female pin lug swivel hose thread x male hose thread adjustable pressure restricting device, furnished with field setting chart.

Fig.
2765 ..... 1½" Size.
2766 ..... 2½" Size.

OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated

SPECIFY thread

BRASS RESTRICTING DISC

FUNCTION: Use to reduce water pressure at hose line by restricting flow.

REGULARLY FURNISHED:
Brass disc with orifice size as ordered.

Fig. 2770 ..... 1½" Size

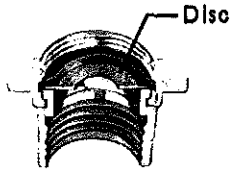
SIZING INFORMATION:

$$A = 0.0425 \frac{Q}{\sqrt{P_1 - P_2}}$$

A = Orifice Size in Inches
Q = Flow in GPM
P_1 = Inlet Pressure
P_2 = Required Outlet Pressure

.0425 x G.P.M. divided by square root of difference between inlet pressure and required outlet pressure results in orifice size.

2765-2766



2770

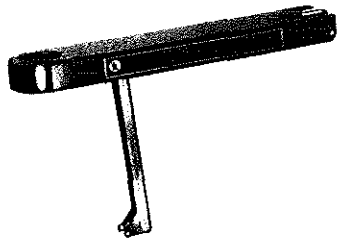
SEMI-AUTOMATIC HOSE RACK

FUNCTION: Use to store hose ready for one man operation of assembly. Water retention device stops water at first fold, after valve is open, until preceding folds are free of rack.

Fig.
2792.....For Use With 1½" Valve and 1½" Lined Hose.
2794.....For Use With 2½" Valve and 1½" Lined Hose.

REGULARLY FURNISHED:
U/L listed ◀FM▶ approved pin type hose rack with red polyester coating welded all steel cover with water retention device and combination nozzle clip. Type of rack as selected by figure number. Pins provided for maximum length hose allowed.

OPTIONAL FINISH:
-D Polished Chrome Plated



2790 SERIES

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS

POTTER-ROEMER, INC.

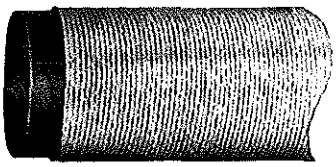
Subsidiary of Jay R. Smith Mfg. Co.

FIRE HOSE

NOTE: All Hoses Normally Supplied With Couplings Attached.

SINGLE JACKET HOSE

FUNCTION: Used with hump racks, reels, hangers, and exterior houses for emergency fire protection in most industrial applications.



300 lb. TEST

REGULARLY FURNISHED:
100% polyester jacket and synthetic rubber lining. ◀ FM ▶ label. Size as selected by Figure Number.

Fig. No.	Coupling Size	Hose I.D.	Hose O.D.	Coupling
2901	1½"	1½"	1¾"	2934
2902	2½"	2½"	2 13/16"	2936

600 lb. TEST

REGULARLY FURNISHED:
100% polyester jacket and synthetic rubber lining. Designed for more resistance to many acids, alkalines and other chemicals. Used where working pressures are higher than normal ◀ FM ▶ label. Size as selected by Figure Number.

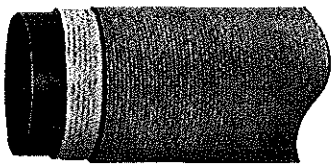
Fig. No.	Coupling Size	Hose I.D.	Hose O.D.	Coupling
2903	1½"	1½"	1¾"	2934
2904	1½"	1¾"	1 15/16"	2942
2905	1½"	2"	2 5/16"	2942-2 5/16
2906	2½"	2½"	2 13/16"	2936

AVAILABLE: 50', 75' and 100' lengths SPECIFY length and thread
OPTIONS: –U/L Label
Hypalon or Neoprene Impregnation
VARIATION: – N Neoprene lining

2901-2906

DOUBLE JACKET HOSE 600 lb. TEST

FUNCTION: Used with hump rack, reels, hangers and exterior houses. Double jacketed hose provides extra protection where abrasion and high pressure are a consideration.



REGULARLY FURNISHED: 100% polyester double jacket and synthetic rubber lining. ◀ FM ▶ label. Size as selected by Figure Number.

Fig. No.	Coupling Size	Hose I.D.	Hose O.D.	Coupling
2911	1½"	1½"	1 15/16"	2938
2912	1½"	1¾"	2⅛"	2942-2⅛
2913	1½"	2"	2 9/16"	2942-2 9/16"
2914	2½"	2½"	3"	2937

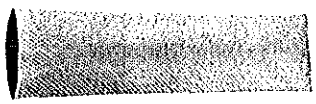
AVAILABLE: 50', 75' and 100' lengths
SPECIFY length and thread

OPTIONS: –U/L Label
Hypalon or Neoprene Impregnation
VARIATION: – N Neoprene lining

2911-2914

RACK AND REEL HOSE 500 lb. TEST POLYFLEX

FUNCTION: Used with hose rack and reel assemblies. The most compact lined hose available. Replaces unlined linen hose.



REGULARLY FURNISHED: 100% synthetic jacket and extruded 100% synthetic lining ◀ FM ▶ label. Size as selected by Figure Number.

Fig. No.	Coupling Size	Hose I.D.	Hose O.D.	Coupling
2915	1½"	1½"	1 11/16"	2930
2916	2½"	2½"	2 13/16"	2936

AVAILABLE: 50', 75' and 100' lengths
SPECIFY length and thread
OPTION: –U/L Label 300 lb. test

2915-2916

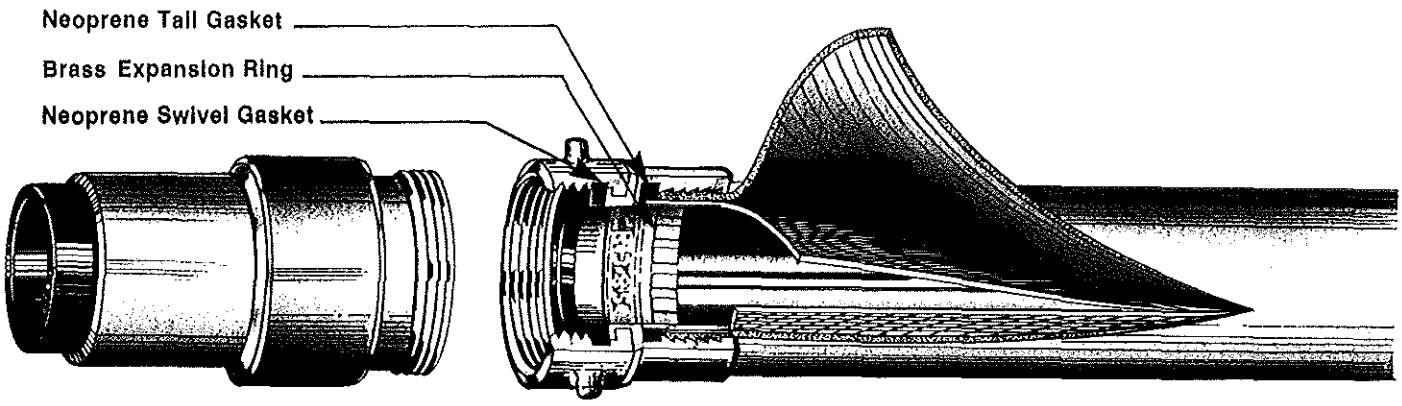
100% SYNTHETIC totally immune to mildew and rot, never needs drying.
100% POLYESTER — will not mildew or decay with age. Resistant to many acids.

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS

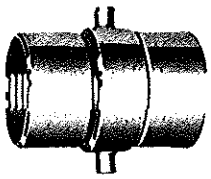
POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co.

FIRE HOSE COUPLINGS



1 ½" SINGLE LUG COUPLING



FUNCTION: Used with 2915 Polyflex hose.

REGULARLY FURNISHED: Cast brass finish. 1 1/16" bowl size. Single pin lug with two expansion rings, two tail and one swivel gasket.

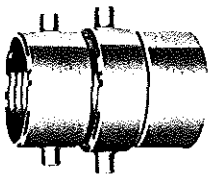
OPTIONAL FINISHES: –B Polished Brass
–C Rough Chrome Plated
–D Polished Chrome Plated.

VARIATION: With Rocker Lug (suffix –RL).

2930

SPECIFY thread

DOUBLE LUG COUPLINGS



FUNCTION: Used with lined fire hose as indicated by bowl size.

REGULARLY FURNISHED: Cast brass finish. Bowl size as selected by figure number. Double pin lug with two expansion rings, two tail and one swivel gasket.

1 ½" Size	
Fig.	Bowl Size
2934	1¾"
2935	1 13/16"
2938	1 15/16"

2 ½" Size	
Fig.	Bowl Size
2936	2 13/16"
2937	3"

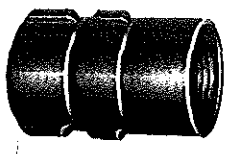
OPTIONAL FINISHES: –B Polished Brass
–C Rough Chrome Plated
–D Polished Chrome Plated.

VARIATION: With Rocker Lug (suffix –RL)

SPECIFY thread

2934-2938

EXTRUDED ALUMINUM COUPLINGS



FUNCTION: Used with single and double jacket lined hose, aluminum provides advantages of light weight with no loss of strength.

REGULARLY FURNISHED: Hard coated, lightweight aluminum rocker lug coupling. Two expansion rings, two tail and one swivel gasket.

1 ½" Size		
Fig.	Bowl Size	Optional Bowl Size: Specify
2941	1 1/16"	1¾" or 1 13/16"
2942	1 15/16"	2⅛" or 2 5/16" or 2 9/16"

2 ½" Size	
Fig.	Bowl Size
2943	2 13/16"
2944	3"

SPECIFY thread

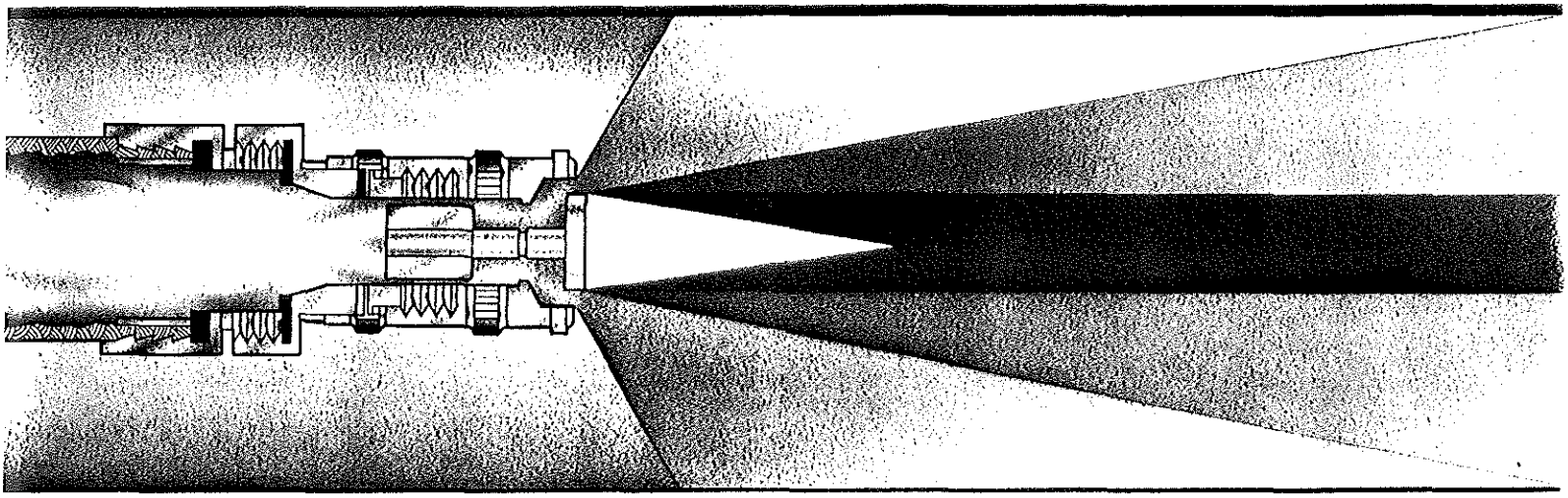
2940 SERIES

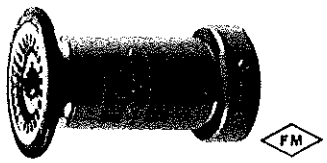
NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS.

POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co.

FOG NOZZLES





FM

2959-2961

YL

2962

ADJUSTABLE NOZZLES

FUNCTION: Used on class A and B fires in most industrial applications, including hose rack and reel assemblies. Adjustments from fog to straight stream to shutoff.

POLYCARBONATE WITH BUMPER

REGULARLY FURNISHED:
Red injection molded polycarbonate nozzle with rubber bumper. Size as selected by Figure Number.

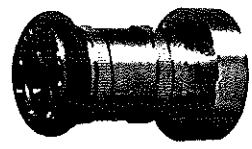
Fig.	Size	THREADS AVAILABLE
2959	1"	NST NPSH
2960	1½"	NYFD CFD
2961	2½"	SPECIFY thread

BRASS

REGULARLY FURNISHED:
Cast brass nozzle with satin finish.

Fig. 2962 ..... 1½" Size

OPTIONAL FINISHES:
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated
SPECIFY thread



YL

2971-2974

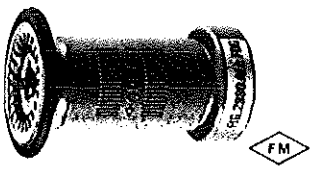
BRASS WITH BUMPER

REGULARLY FURNISHED: Cast brass nozzle with satin finish and rubber bumper. Size as selected by Figure Number.

Fig.	Size
2971	1"
2972	1½"
2973	2½"
2974 For playpipe use (threaded ULT only.)	

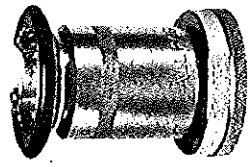
OPTIONAL FINISHED:
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated

SPECIFY thread



FM

2980



YL

2985

"ALL-FOG" ADJUSTABLE NOZZLES FOR ELECTRICAL APPLICATIONS

FUNCTION: Used on class A, B, and C fires. Adjustments from full fog to shutoff with no straight stream position. Suitable for use in electrical hazard areas at distances of 10 feet and greater with voltage levels below 250,000 volts.

POLYCARBONATE WITH BUMPER

REGULARLY FURNISHED: Red injection molded polycarbonate nozzle with rubber bumper.

Fig. 2980 ..... 1½" Size

THREADS AVAILABLE
NST NPSH
NYFD CFD
SPECIFY thread

BRASS WITH BUMPER

REGULARLY FURNISHED: Cast brass nozzle with satin finish and rubber bumper.

Fig. 2985 ..... 1½" Size

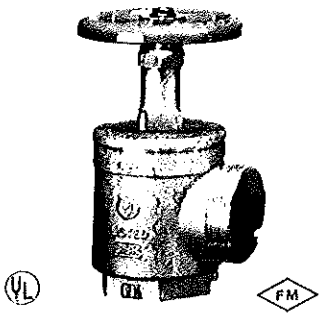
OPTIONAL FINISHES
-B Polished Brass
-C Rough Chrome Plated
-D Polished Chrome Plated

SPECIFY thread

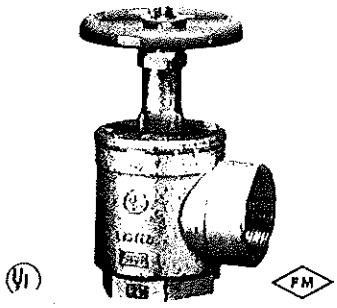
NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS.

HOSE VALVES

ANGLE



4060-4065



4070-4075

FEMALE X MALE

FUNCTION: Used with a fire hose rack assembly or as a fire dept. outlet connection.

REGULARLY FURNISHED:
Cast brass valve with red hand wheel. Female N.P.T. inlet X male hose thread outlet. 300 lb. rated

Fig.
4060 ..... 1½" Size
4065 ..... 2½" Size

SPECIFY thread

OPTIONAL FINISHES:
–B Polished Brass
–C Rough Chrome Plated
–D Polished Chrome Plated

VARIATIONS:
Extended stem up to 24", SPECIFY length
⅛" petcock SPECIFY location

Size	A	B	Closed C	Open C	D	E
1½	2¼	3½	6½	7½	2½	2
2½	3½	5	9½	11½	3½	2¾

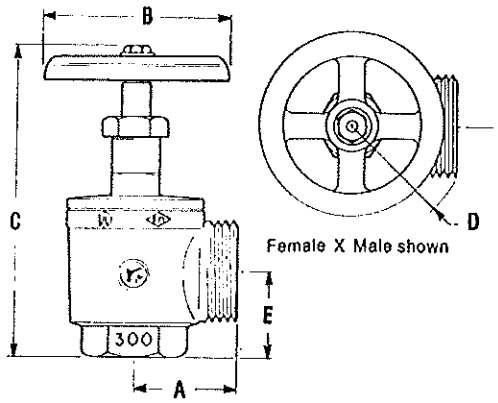
ALL DIMENSIONS IN INCHES

DOUBLE FEMALE

FUNCTION: Used with a fire hose rack assembly.

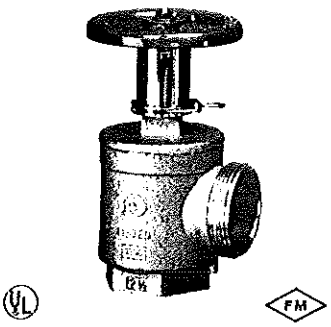
REGULARLY FURNISHED:
Cast brass valve with red hand wheel. Female N.P.T. inlet and outlet. 300 lb. rated

Fig.
4070 ..... 1½" Size
4075 ..... 2½" Size

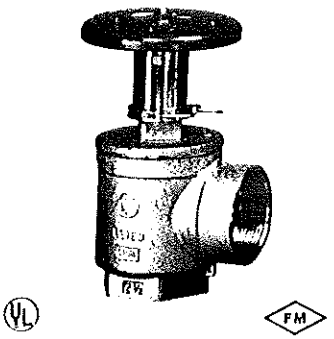


Female X Male shown

ADJUSTABLE PRESSURE RESTRICTING ANGLE VALVE



4080-4085



4090-4095

FEMALE X MALE

FUNCTION: Used with a fire hose rack assembly or as a fire dept. outlet connection. Water pressure is controlled by adjustable flow restriction. If full flow is required the restriction may be overridden.

REGULARLY FURNISHED:
Cast brass valve with red hand wheel with pressure restricting feature. Female N.P.T. inlet X male hose thread outlet. 300 lb. rated. Furnished with field setting chart.

Fig.
4080 ..... 1½" Size
4085 ..... 2½" Size

SPECIFY thread

OPTIONAL FINISHES:
–B Polished Brass
–C Rough Chrome Plated
–D Polished Chrome Plated

Size	A	B	Closed C	Open C	D	E
1½	2¼	3½	6½	7½	2½	2
2½	3½	5	9½	11½	3½	2¾

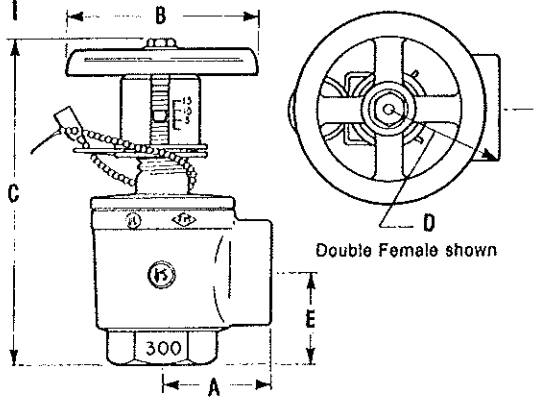
ALL DIMENSIONS IN INCHES

DOUBLE FEMALE

FUNCTION: Used with a fire hose rack assembly. Water pressure is controlled by adjustable flow restriction. If full flow is required the restriction may be overriden.

REGULARLY FURNISHED:
Cast brass valve with red hand wheel with pressure restricting feature. Female N.P.T. inlet and outlet. 300 lb. rated. Furnished with field setting chart.

Fig.
4090 ..... 1½" Size
4095 ..... 2½" Size



Double Female shown

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS.

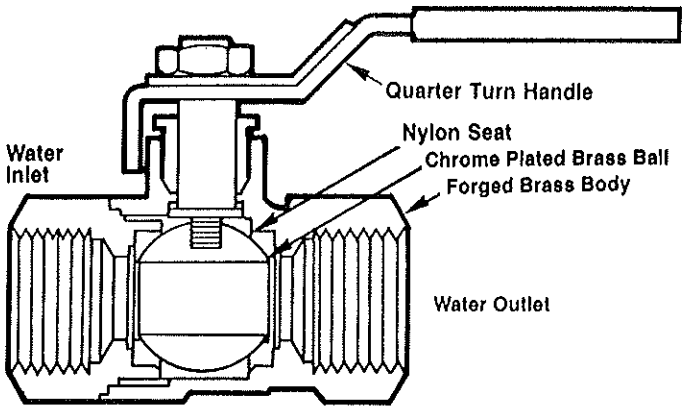
BALL VALVES, CAPS AND FLANGES

POTTER-ROEMER, INC.

A Subsidiary of Jay R. Smith Mfg. Co.

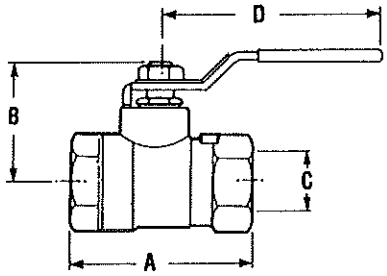
FEATURES OF BALL SHUT-OFF VALVES

- Large ports to minimize pressure drop and turbulence.
- Low torque operation.
- Speed of operation.
- Positive closure.
- Flow in either direction.
- Straight through flow.
- Forged strength up to 600 lb. pressure rating.
- Ease of installation.
- Conserves space.



- Visual indication of operating condition — open or closed.
- Tested hydrostatically in the open and closed position.
- Simplicity of maintenance.
- Durability.
- Reliability.
- Listed by Underwriters Laboratories, Inc.
- Approved by Factory Mutual Research Corporation.

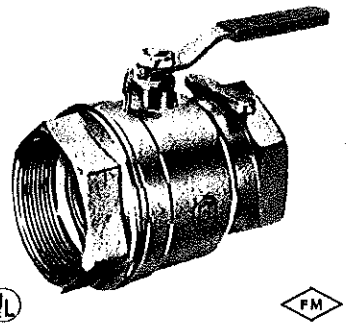
FUNCTION: Used in the trim assembly of alarm check, dry pipe and automatic water control valves. Used to control manually the flow of water to small open head extinguishing systems and as zone control valve.



REGULARLY FURNISHED:
Forged brass body. Cadmium plated vinyl insulated handle. Chrome plated brass ball with nylon seat. Female N.P.T. inlet and outlet. Size as selected by figure number.

Fig. No.	Size	A	B	C	D	Pressure Rating P.S.I.
4405	½	2 3/16	1 3/8	.472	3 1/16	600
4407	¾	2 1/2	1 3/4	.672	3 13/16	600
4410	1	3	1 7/8	.891	3 13/16	500
4412	1¼	3 7/16	2 1/16	1.109	3 13/16	500
4415	1½	3¾	2 3/8	1.378	4 13/16	500
4420	2	4 3/8	2 11/16	1.772	4 13/16	500
4425	2½	5¼	3¼	2.250	6	400
4430	3	6¼	3½	2.625	6	400

ALL DIMENSIONS IN INCHES



4400 SERIES

CAPS AND CHAINS

FUNCTION: Use to cover and protect male threads on valves and hydrants. Discourages entry of foreign matter.

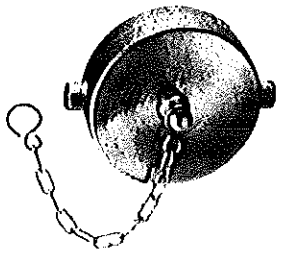
REGULARLY FURNISHED: Cast brass cap with female hose thread, pin lugs and chain.

Fig.	Size
4605	¾"
4610	1"
4615	1½"
4625	2½"
4630	3"
4640	4"

OPTIONAL FINISHES:
–B Polished Brass
–C Rough Chrome Plated
–D Polished Chrome Plated

VARIATIONS: with rocker lugs (suffix –RL)
2½" and 3" size available in plastic (suffix –P)

SPECIFY: Thread.



4600 SERIES

FLANGES

FUNCTION: Used to trim pipe entry.

BRASS WITH SET SCREW

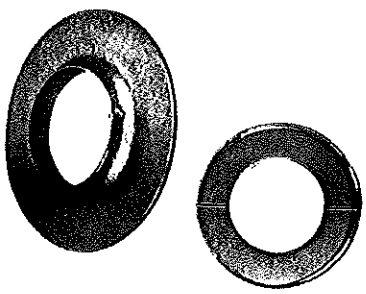
REGULARLY FURNISHED:
Cast brass flange with set screw.

Fig.	Size
4711	1½"
4712	2½"
4713	3"

STAMP STEEL SPLIT RING

REGULARLY FURNISHED:
Chrome plated stamped steel split ring flange.

Fig.	Size
4723	2½"
4733	3"



4711-4733

NOTE: ALWAYS INDICATE HOSE THREAD REQUIREMENTS.

POTTER-ROEMER, INC.

Subsidiary of Jay R. Smith Mfg. Co.

EQUIPMENT FOR EXTERIOR HOUSES

I.R.I. INDUSTRIAL RISK INSURANCE REQUIREMENTS

50'lengths Fig. 2902 hose with Fig. 2936 couplings.
(Quantity depends upon local authority having jurisdiction)

2 Fig. 2949 U/L Playpipes (with Brackets)
1 Fig. 6060 Axe (with Brackets)
1 Fig. 6062 Pry Bar (with Brackets)
1 Fig. 6055 Hydrant Wrench
4 Fig. 6051 Common Spanners
2 Fig. 6067 Hose and Ladder Straps
1 Fig. 6065 Playpipe Holder
2 Fig. 6098 Gaskets (Spare)

(Brackets integral part of houses)

MINIMUM FM REQUIREMENTS (Approval Guide)

4 Fig. 2902 50' lengths hose with Fig. 2936 couplings
2 Fig. 2901 50' lengths hose with Fig. 2934 couplings
1 Fig. 6095 Gated Connection
2 Fig. 2973 Fog Nozzles
1 Fig. 2960 Fog Nozzle
1 Fig. 2810 2½" x 1½" Adapter
2 Fig. 6055 Hydrant Wrenches
2 Fig. 6050 Common Spanners
4 Fig. 6051 Common Spanners

Note: Selection of equipment required is determined by the authority having jurisdiction.

COMMON SPANNER

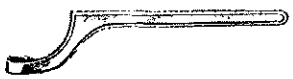


Fig. 6050 ..... 1½" Size
Fig. 6051 ..... 2½" Size
–BR for Brackets

Cast aluminum wrench for pin lug fittings.

TABOR SPANNER

Fig. 6052 ..... 1½" Size
Fig. 6053 ..... 2½" Size

Cadmium plated iron reversible wrench for pin lug fittings.

HYDRANT WRENCH

Fig. 6055

Cadmium plated ductile iron adjustable wrench for pentagon nuts or pin and rocker lug fittings.

UNIVERSAL SPANNER

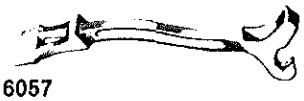


Fig. 6057

Heat treated aluminum universal wrench for pin and rocker lug fittings with gas cock slot and pry handle.

AXE

Fig. 6060
–BR for Brackets
Red painted axe with steel pick head.

PRY BAR

Fig. 6062
–BR for Brackets
54" long blue painted bar with pinch point.

PLAYPIPE HOLDER

Fig. 6065

Blue painted steel holder with leather strap and foot disc.

HOSE AND LADDER STRAP

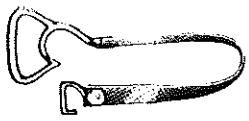


Fig. 6067

Polyester strap with cadmium plated malleable iron hook and handle.

PORTABLE LIGHT

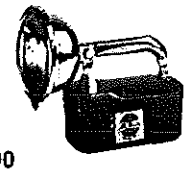


Fig. 6090

6-volt battery operated hand light. Furnished less battery.

BREAKABLE PADLOCK

Fig. 6092

Cadmium plated steel padlock with break away shackle.

GATED CONNECTION

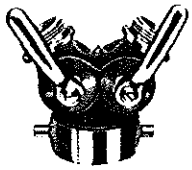


Fig. 6095

Cast brass with 2½" female swivel inlet and two 1½" male hose outlets with quarter turn shutoff. SPECIFY thread

GASKET

Fig. 6097 ..... 1½" Size
Fig. 6098 ..... 2½" Size

Spare Hose Gasket.

PORTABLE FIRE EXTINGUISHERS

POTTER-ROEMER, INC.

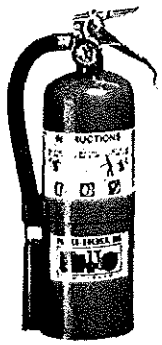
A Subsidiary of Jay R. Smith Mfg. Co.

ABC MULTI-PURPOSE DRY CHEMICAL

FUNCTION: Used to provide protection against class A, B, and C fires.

REGULARLY FURNISHED: Red glossy polyester coated steel cylinder with pressure gauge, wall mounting bracket and hose or nozzle as indicated. Contents stored under pressure at approximately 195 P.S.I.

Fig. No.	Size (lbs.)	U/L Rating	Height	Dia.	Range of Stream	Type Discharge
3002	2½	1A:10B:C	14"	3"	9'-15'	Nozzle
3005	5	2A:10B:C	14½"	4¼"	12'-18'	Hose
3006	6	3A:40B:C	16"	5"	12'-18'	Hose
3010	10	4A:60B:C	20"	5"	15'-21'	Hose
3020	20	20A:120B:C	24"	7"	15'-21'	Hose



3000 SERIES

ABC MULTI-PURPOSE CARTRIDGE OPERATED DRY CHEMICAL

FUNCTION: Used to provide protection against class A, B, and C fires. Outside cartridge offers ease of recharge where frequent usage is a consideration.

REGULARLY FURNISHED: Red glossy polyester coated steel cylinder with hose, squeeze grip control nozzle and wall mounting bracket. Carbon dioxide gas contained in outside cartridge at approximately 850 P.S.I. (70 degrees F.) provides cylinder pressurization and agent discharge upon activation.

Fig. No.	Size (lbs.)	U/L Rating	Height	Dia.	Overall Width	Range of Stream	Type Discharge
3052	10	4A:60B:C	18½"	5¼"	9"	18'-22'	Hose
3054	20	20A:80B:C	21½"	6¾"	10¾"	18'-22'	Hose
3056	25	20A:120B:C	26¼"	6¾"	10¾"	18'-22'	Hose

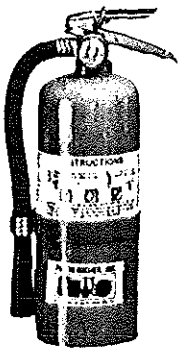
3050 SERIES

HALON 1211

FUNCTION: Used to provide protection against class A, B, and C fires.

REGULARLY FURNISHED: Red glossy polyester coated steel cylinder with pressure gauge, wall mounting bracket and hose or nozzle as indicated. Contents stored under pressure at approximately 195 P.S.I.

Fig. No.	Size (lbs.)	U/L Rating	Height	Dia.	Range of Stream	Type Discharge
3102	2½	5B:C	14"	3"	9'-15'	Nozzle
3105	5	10B:C	14½"	4¼"	9'-15'	Nozzle
3109	9	1A:10B:C	16"	5"	12'-18'	Hose
3113	13	2A:40B:C	20½"	5"	12'-18'	Hose
3117	17	3A:80B:C	24"	7"	12'-18'	Hose
3120	20	4A:80B:C	24"	7"	12'-18'	Hose



3100 SERIES

PRESSURIZED WATER

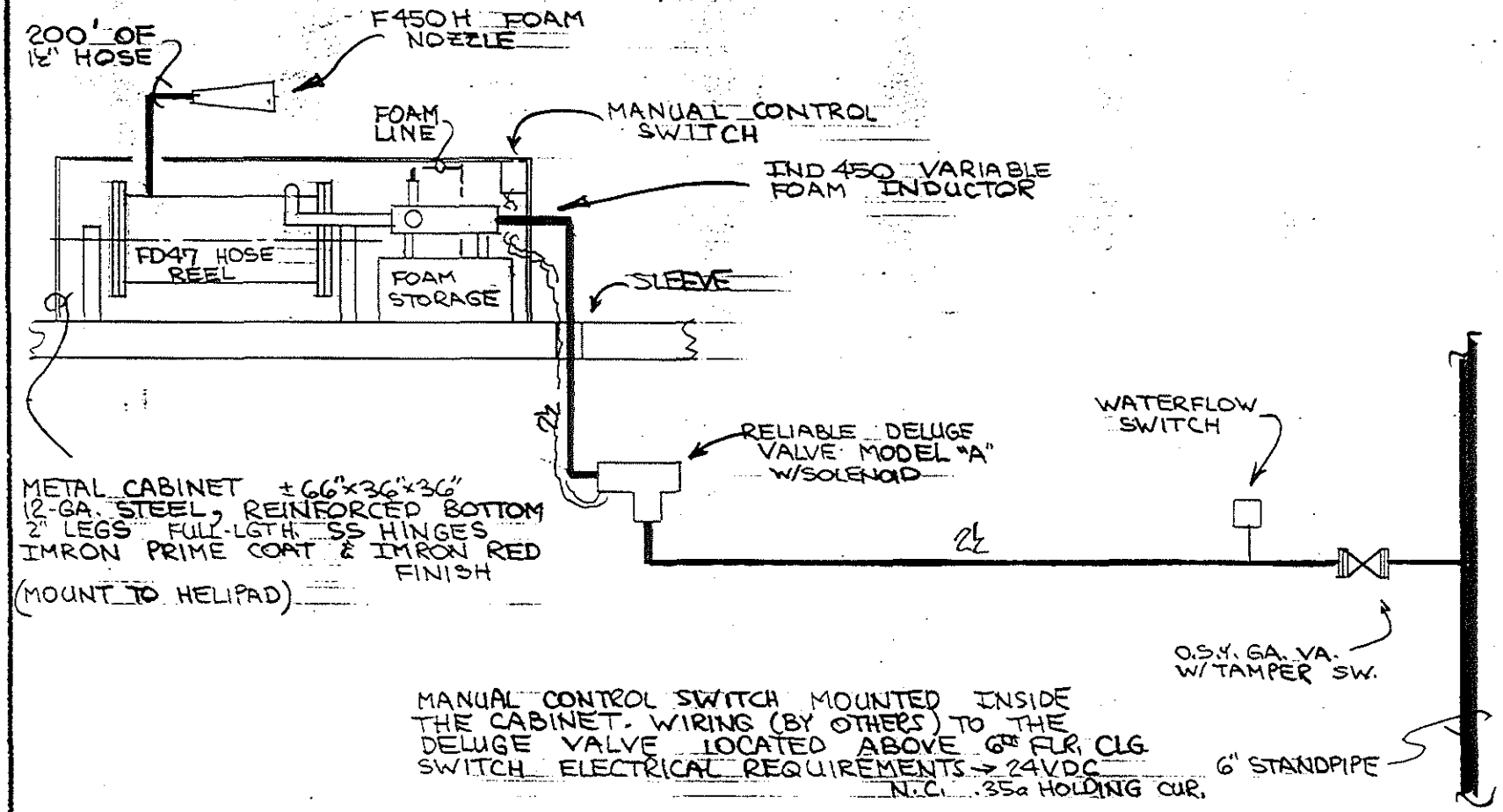
FUNCTION: Used to provide protection against class A fires.

REGULARLY FURNISHED: Stainless steel shell with pressure gauge and wall mounting bracket. Shipped empty, to be charged at destination by authorized personnel.

Fig. No.	Size (Gal.)	U/L Rating	Height	Dia.	Range of Stream	Type Discharge
3202	2½	2A	24½"	7"	30'-45'	Hose

3202

NOTE: FOR PROPER SELECTION OF CABINET, REFER TO SECTION 1000



COMMONWEALTH OF KENTUCKY
Fire Suppression
BROWN SPRINKLER CORP.
B-001S
Sprinkler
Contractor

COMMONWEALTH OF KENTUCKY
Fire Suppression
K.A. WESTPHAL
L-008N
Sprinkler
Layout Technician

HELIPAD FOAM UNITS

(REVISED 5-1-89)

Contract: 2974	BROWN SPRINKLER
Date: 11-88 By: KW	LEXINGTON, KENTUCKY
Scale: NONE	U.K. CHANDLER MED. CTR.
Sketch No: 2974-B	LEXINGTON KENTUCKY

ANSUL®

EXTINGUISHING AGENT DATA SHEET

ANSULITE® 3% (AFC-3A) AQUEOUS FILM-FORMING FOAM (AFFF) CONCENTRATE

Description

ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is formulated from specialty fluorochemical and hydrocarbon type surfactants along with solvents. It is transported and stored as a concentrate to provide ease of use and considerable savings in weight and volume.

It is intended for use as a 3% proportioned solution in fresh, salt or hard water. (Water hardness should not exceed 500 ppm expressed as calcium and magnesium.) It may also be used and stored as a 3% premixed solution in fresh or potable water only. The correct proportioning or mixture ratio is 3 parts of concentrate to 97 parts of water.

Three fire extinguishment mechanisms are in effect when using ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate. First, an aqueous film is formed which works to help prevent the release of fuel vapor. Second, the foam blanket from which the film-forming liquid drains effectively excludes oxygen from the fuel surface. Third, the water content of the foam provides a cooling effect.

Typical Physiochemical Properties at 77 °F (25 °C)

Appearance	Clear Pale Yellow Liquid
Density	1.024 gm/ml ± .003
pH	8.0 ± .2
Refractive Index	1.3610 ± .0025
Viscosity	3.0 ± .3 centistokes
Surface Tension	16.7 ± .7 dynes/cm
Chloride Content	Less than 75 ppm

Application

ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is intended for use on Class B hydrocarbon fuel fires having low water solubility such as various crude oils, gasolines, diesel fuels, aviation fuels, etc. It is not suitable for use on fuels having appreciable water solubility (polar solvents), i.e., methyl and ethyl alcohol, acetone, and methyl ethyl ketone. It can be used with both aspirating and non-aspirating discharge devices because of the low energy required to make it foam.

Its excellent wetting characteristics make it useful in combating Class A fires as well. It can be used with dry chemical extinguishing agents without regard to the order of application to provide even greater fire protection capability.

Performance

Fire Performance – The fire performance of ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is measured against specifications and standards such as U.S. Military Specification MIL-F-24385B (latest amendment) and Underwriters Laboratories Standard 162 – 5th Edition. Reports covering this fire performance are available on request since standards and specifications such as those cited are continuously being upgraded and changed.

Foaming Properties – When used with fresh or salt water or water of any hardness, at the correct dilution with most conventional foam making equipment, the expansion will vary depending on the performance characteristics of the equipment. Aspirating discharge devices produce expansion ratios of from 6:1 to 10:1 depending primarily on type of aspirating nozzle and flow rate. In general, the higher the flow rate the higher the expansion ratio. Thus monitors and foam chambers normally produce higher expansion ratios than foam water sprinkler heads and hand held type nozzles. Subsurface injection is a special case where generally expansion ratios of 2:1 to 3:1 are preferred but up to 4:1 is allowed. Non-aspirating devices such as handline water fog/stream nozzles or standard sprinkler heads give expansion ratios of 2:1 to 4:1.

Proportioning – ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate can be proportioned easily at the correct dilution using most conventional proportioning equipment such as:

1. Balanced pressure and in-line balanced pressure pumped proportioning equipment
2. Balanced pressure bladder tank type proportioners
3. Around the pump type proportioners
4. Fixed or portable (in-line) venturi type proportioners
5. Handline nozzles with fixed induction/pickup tubes

The minimum and maximum usable temperatures for ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate in this equipment is 35 °F (2 °C) to 120 °F (49 °C) respectively.

Storage/Shelf Life – When stored in the packaging supplied (polyethylene drums or pails) or in equipment recommended by the manufacturer as part of the foam system within the temperature limits specified, the shelf life of ANSULITE AFFF 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is about 20-25 years. The factors affecting shelf life and stability for ANSULITE AFFF Agents are discussed in detail in Ansul Technical Bulletin No. 54. If the product is frozen during storage or transportation, thawing will render the product completely usable.

Compatibility – Certain specifications such as U.S. Military Specification MIL-F-24385 (latest amendment) require that products placed on the Qualified Products List (QPL) for that specification demonstrate performance compatibility in all mixture proportions.

With regard to non-qualified (QPL) AFFF type concentrates, they should only be mixed in an emergency, or if the manufacturer has supporting test data to substantiate that the mixture meets the same requirements as the individual component concentrates. Refer to Ansul Technical Bulletin No. 48 for a more detailed discussion of compatibility.

Different types of foam concentrates, i.e., AFFF, protein base, etc., should not be mixed under any circumstances.

Inspection – As with any fire extinguishing agent, ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate, whether in the concentrate or pre-mixed form should be inspected periodically. Please refer to the Field Inspection Manual, Ansul Part No. 31274, for the detailed procedures to perform this inspection. An annual inspection is recommended unless unusual conditions of exposure occur, such as are described in Ansul Technical Bulletin No. 54. In such cases, Ansul's recommendation should be sought.

Approvals and Listing

ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is approved, qualified under, listed or meets the requirements of the following specifications and standards:

U.S. Military Specification – MIL-F-24385B with the latest amendment issued by U.S. Navy (NAVSEA).

Underwriters Laboratories Inc. – U.L. Standard 162 – EX 3125 (5th Ed.)

1. Foam Quality Tests
2. Class B Hydrocarbon Fuel Fire Tests
3. Foam Identification Tests
4. Tests of Shipping Containers
5. Class B Hydrocarbon Fuel Sprinkler Tests (Foam water and standard type both upright and pendent approvals)

It is impractical for Ansul to list its ANSULITE 3% agents with every piece of U.L. listed hardware. Moreover, there are numerous foam hardware components without U.L. listings that cannot be listed for use with any AFFF agent.

Many unlisted pieces of foam hardware should be similar to those listed. However, installations where ANSULITE 3% may be used with hardware components of significantly different types than those tested, contact Ansul for recommendations.

Ordering Information

ANSULITE 3% (AFC-3A) Aqueous Film-Forming Foam (AFFF) Concentrate is available in 5 gallon containers – Part No. 55800 and 55 gallon drums – Part No. 55809.

Shipping Weight:

5 gal. (19 L) pail – 45 lbs. (20.4 kg)

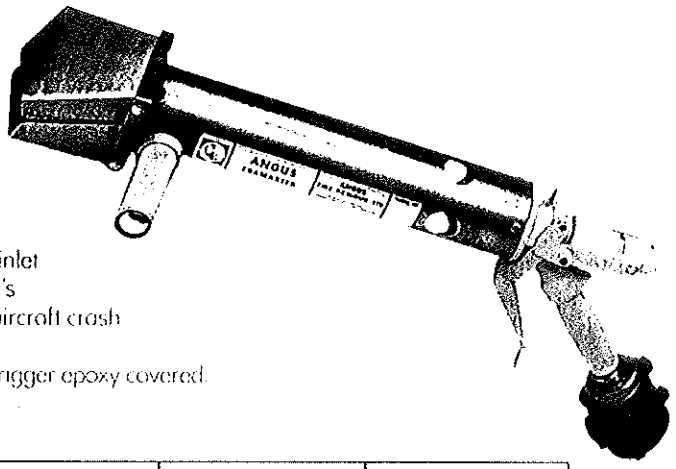
55 gal. (208.1 L) drum – 495 lbs. (224.5 kg)

Cube:

5 gal. (19 L) pail – 1.25 cu. ft. (.0353 m^3)

55 gal. (208.1 L) drum – 11.83 cu. ft. (.3350 m^3)

ANGUS FOAMASTERS



THE B225 APPLICATOR provides maximum fire performance using rapid knockdown AFFF concentrate such as Angus Tridol. Ease of handling, combined with simple controls for jet, spray, or shut off, give the most effective deployment of foam and minimize extinction times. The B225 is ideal for fast attack in emergency fire situations where quick response and top performance from foam and equipment is essential.

The applicator is rated at 60 USgals/min (225 litres/min) at 100 psi (7kg/cm²) inlet pressure and can be used with Angus IND 225 in line 60 gpm eductor. The unit's handleability makes it ideal for installation on Rapid Intervention Vehicles for aircraft crash protection or on Angus AF120 portable foam units for high risk areas.

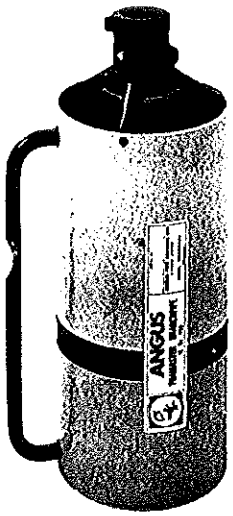
SPECIFICATION: Stainless steel barrel and spreader; aluminum handle and trigger epoxy covered.

Weight: 7½ lbs *Standard Connectors:* 1½" NST Female or 1½" IPT Female

Dimensions: 29" overall

PERFORMANCE: Results obtained using Tridol 6 (AFFF 6%) at 6% induction.

Pressure At Applicator Inlet		Approximate Solution Flow/Min.		Foam Properties		Effective Throw				With Foam Spreader (Blades Closed)			
				Expansion	Drainage	Foam		Water		Throw		Spread	
Lb/In²	kg/cm²	U.S. Gals	Litres			Ft.	M.	Ft.	M.	Ft.	M.	Ft.	M.
50	3.5	42	160	8-9	1'12"	30	9	35	11	19	6	11	3
75	5.3	52	195	8-9	1'12"	37	11	43	13	21	6.5	12	3.5
100	7	60	225	8-9	1'30"	42	13	50	15	24	7	13	4
125	8.8	66	250	8-9	1'36"	46	14	55	17	26	8	14	4.5



MEX225/450 Foam making nozzles 60/120 are designed to produce medium expansion foam using high expansion concentrate at 2-3% induction. They are particularly suitable where: stable foam is required; water damage must be kept to a minimum; water supplies are limited; hazards areas are remote or inaccessible; the fire can be spread by use of water stream.

SPECIFICATION:

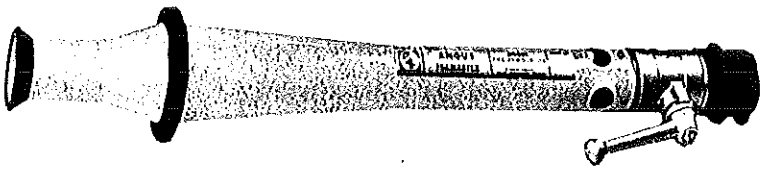
Construction: Yellow high impact PVC body. Light alloy coupling and chrome plated brass nozzle. Epoxy painted aluminum handle. Stainless steel gauze.

	MEX225	MEX450
Weight: Including coupling	5.5 lbs (2.5kg)	10.12 lbs (4.6kg)
Dimensions: Overall	17.7 ins. (450mm)	22.8 ins. (580mm)
Body Diameter:	6.7 ins. (170mm)	8.7 ins. (220mm)
Standard Connectors	1½ ins. NST or IPT female	

PERFORMANCE

	Pressure At Nozzle		Normal Flows		Range		Expansion	Color
	Lb/In²	kg/cm²	U.S. Gals	Litres	Ft	M		
MEX225	30	2	42.1	159	18	5.5	6:1	Yellow
	45	3	48	180	25	7.5		
	60	4	51	193	27	8.2		
MEX450	30	2	73	276	23	7	6:1	Red
	45	3	90	340	28	8		
	60	4	100	378	29	8.8		

LOW EXPANSION Foam making nozzles (UL) listed. These very light nozzles are designed for long range performance with negligible nozzle reaction. The H models produce noncoherent foam rope and longer reach than the basic models.



SPECIFICATION:

Construction:

Body: Light alloy yellow epoxy coated

Nozzle: Light alloy

Handle: Nylon coated light alloy (F450 and F900 only)

Protection rings: Oil resistant synthetic rubber

Standard connectors: 1½" NST female or 1½" IPT female

Weight including connector: F225-4 lbs; F450-5 lbs; F900-11 lbs. Add 6 lbs for shut off. Supplied as optional extra.

PERFORMANCE

Foam Nozzle	Pressure At Nozzle		Nominal Flow		Range				Color Code
					H Models		Basic Models		
	kg/cm²	p.s.i.	litre/min	gpm	Metre	Feet	Metre	Feet	
60 gpm F225H F225	3.5	50	160	42	14	45	9	30	Plain Yellow
	5.3	75	195	52	17	55	10	33	
	7.0	100	225	60	20	65	12	38	
120 gpm F450H Can be used with 95 gpm eductor	3.5	50	320	85	15	50	11	35	Red Band
	5.3	75	390	103	18	60	15	50	
	7.0	100	450	120	21	70	18	60	
240 gpm F900H F900	3.5	50	640	170	18	60	14	45	Blue Band
	5.3	75	780	206	21	70	18	60	
	7.0	100	900	240	24	80	21	70	

EXPANSION 10:1 EXPANSION 6:1

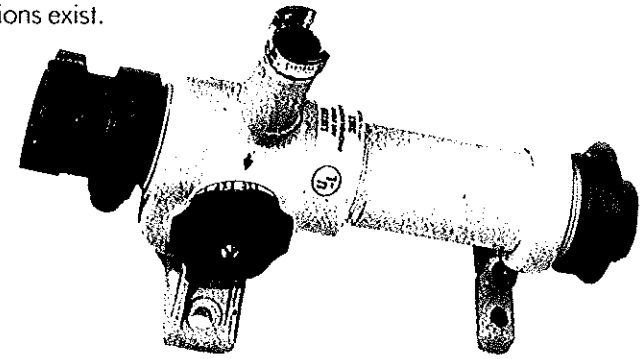
ANGUS LOW PRESSURE
Variable Foam Eductors

These low pressure (60-150 psi at inlet) eductors when matched with Angus Foam-making nozzles provide the simplest possible means of supplying the foam to the fire — where it is needed.

They can be placed at the pumper or any other convenient location thus giving the nozzle operator a considerable freedom of movement to concentrate on fighting the fire.

Light and corrosion resistant they have been designed for minimum pressure drop (only 22% for type 225, 28% for type 450 and 32% for type 900). This significantly lower pressure loss than other eductors of similar water flows are due to a very simple energy recovery system activated by a pressure balancing valve. The controlled water flow ensures constant, correct foam concentrate induction over the entire flow/pressure range (60-150 psi). Also due to these unique features the length of hose lay between the eductor and the foam nozzle can be at least twice the normal recommended length. Rate of induction can be varied at will within the range 3% to 6%. All Angus eductors are color coded to ensure the correct match with the Foam-making nozzle.

Angus eductors are also most suitable for inclusion in the industrial installation especially where high pressure fluctuations exist.



CONSTRUCTION:

The body, barrel and mounting feet are of corrosion resistant aluminum which will withstand the effect of sea water.

The internal parts of Venturi tube system and the pressure balancing valve (in the energy recovery system) are injection moulded from a high strength plastic material, selected for its outstanding dimensional stability in the presence of water and foam compounds of all kinds.

Pick up tube connection incorporates a non return valve which prevents accidental dilution of concentrate by water.

The filter and metering control pin are of stainless steel.

SPECIFICATION:

Body, barrel, feet — corrosion resistant aluminum
Venturi tube and valve — high strength plastic material
Filter, metering and control pin — stainless steel
Pick up tube connection — hermaphrodite coupling chrome plated brass
Connectors — see below
Color — yellow epoxy with color code to identify type

PERFORMANCE

Eductor	Flow At 100 psi gpm	Working Pressure Range psi	Induction %	Standard Connections	Hose Dia Eductor To Nozzle	Length Of Hose Line Eductor To Nozzle[x]	Color Code
IND225	60	60 - 150	1 - 6	NST 1" or IPT	1"	300 ft	Plain Yellow
IND450	120	60 - 150	3 - 6	1½" NST or 2" or 2½" IPT	1½" xx 2" 2½"	600 ft	Red Band
IND900	240	60 - 150	3 - 6	NST 2½" or IPT	2½"	1200 ft	Blue Band

x at 150 psi at inlet into eductor;
xx when using 1½" dia hose with 120 gpm eductor reduce hose lay to 150/200 ft. max.

Use eductor IND225 with **NOZZLES** B225, F225, F225H, MEX225 ; IND450 with **NOZZLES** F450, F450H, MEX450 ; IND900 with **NOZZLES** F900, F900H

WARNING

1) Most fog or automatic/constant flow nozzles may be used with Angus eductors but the user must verify efficiency of the matched pair.
2) Any eductor and foam nozzle must be matched, i.e. their flow should be similar otherwise the eductor may become inoperative.

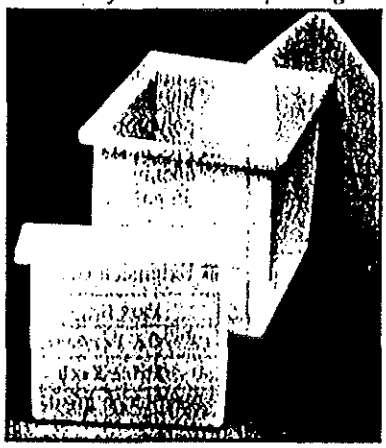
	Type 225 & 450	Type 900
Length With Connectors	14.75"	20.90"
Overall Height	7.50"	7.50"
Distance Base to Ctr of Connector	3.20"	3.40"
Width	5.90"	5.90"
Weight With Connectors	6.30 lbs	9.60 lbs

HIGH-DENSITY POLYETHYLENE RECTANGULAR TANKS WITH COVERS

HIGH-DENSITY POLYETHYLENE

IDEAL CHOICE FOR PROCESSING PRINTED CIRCUIT BOARDS OR SMALL PLATING OPERATIONS!

- Designed for strength and reliability under severe operating conditions
- Research, light manufacturing, material handling, storage applications
- High density polyethylene for excellent chemical, abrasion, and impact resistance
- Continuous operating service to 180°F.—intermittent to 212°F.
- Large tanks need additional support at room temperature



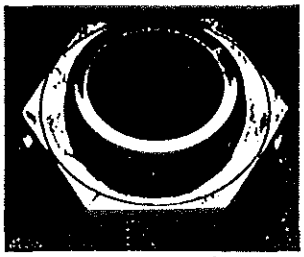
Cap., Gal.	Length x Width x Depth, in.	Approx. Wall Thickness, in.	Tank With Cover Part No.
2	8 x 8 x 8	3/32	19009HA
6	14 x 10 x 10	3/32	19013HA
7	12 x 12 x 12	3/32	19017HA
11	18 x 12 x 12	3/32	19020HA
15	24 x 12 x 12	3/32	19022HA
6	18 x 4 x 18	3/32	19024HA
11	12 x 12 x 18	3/32	19026HA
15	18 x 12 x 18	3/32	19028HA
25	18 x 18 x 18	3/32	19031HA
22	24 x 12 x 18	3/32	19033HA
30	24 x 18 x 18	3/32	19035HA
60	36 x 20 x 20	1/16	19037HA
22	18 x 12 x 24	3/32	19039HA
30	24 x 12 x 24	3/32	19041HA
45	24 x 18 x 24	3/32	19044HA
90	36 x 24 x 24	1/16	19046HA
12	24 x 4 x 30	3/32	19048HA
25	24 x 8 x 30	3/32	19050HA
90	24 x 24 x 36	1/16	19053HA

DISCOUNTS: (Tanks Only) 10% OFF: 2-4 15% OFF: 5-7 20% OFF: 8 or more

HAYWARD® BULKHEAD FITTING

PVC-CPVC-POLYPROPYLENE

- Ideal for plastic or metal tanks or on rubber or plastic-lined tanks
- NPT inside threads accommodate any standard threaded plastic pipe
- Thick, soft EPDM gaskets seal against irregular or curved surfaces

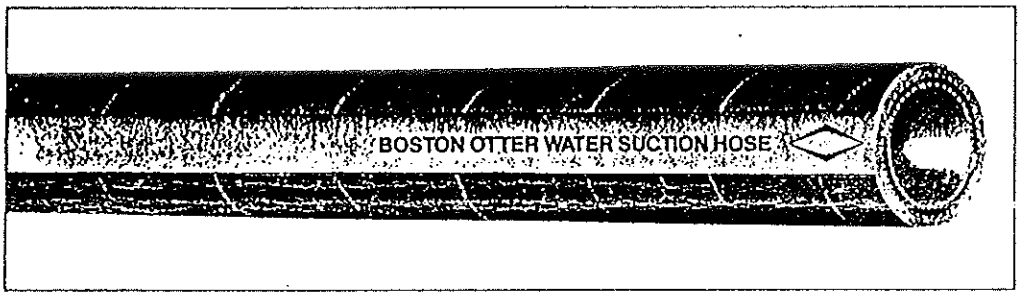


Inside Thread NPT	PVC Part No.
½	24701HA
¾	24703HA
1	24705HA
1¼	24707HA
1½	24709HA
2	24711HA
3	24713HA
4	24716HA

Setting a new standard in production and packaging for the industry, BOSTON 100's are backed by over 100 years of quality and dependability. Every BOSTON 100's hose is quality assured and job-rated to meet exacting industry standards.

BOSTON 100's

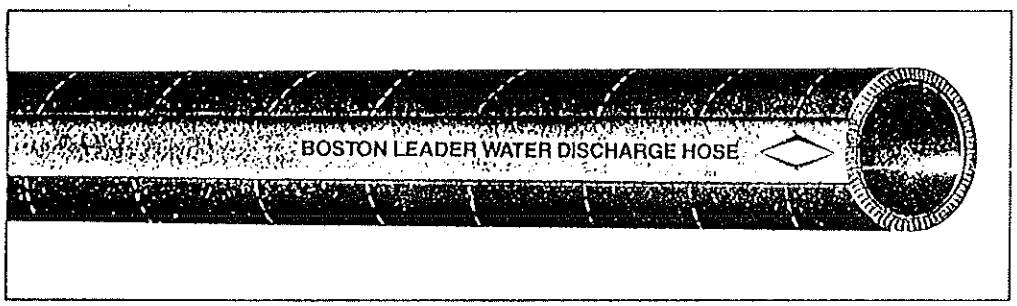
Water Suction & Discharge



BOSTON 100's OTTER WATER SUCTION AND DISCHARGE HOSE

- A lightweight yet high strength water suction and discharge hose for construction, industrial and agricultural service.
- Helical wire between four spirals of high strength synthetic cord gives full vacuum yet ease of handling and excellent flexibility.
- Tube and cover constructed of E.P.D.M. rubber for abrasion and weathering resistance.
- Suitable for agricultural service with most insecticides, pesticides and ag chemicals.
- Available in 100 ft. lengths for most economical cuts of 20 and 25 footers.

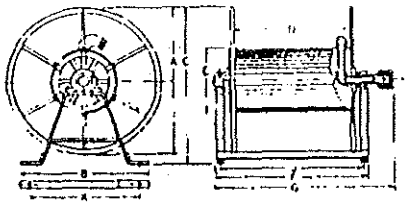
CODE	SIZE ID (IN.)	SIZE ID (MM)	SPIRALS	SIZE NOMINAL OD (IN.)	SIZE NOMINAL OD (MM)	APPROX. WT. POUNDS PER. 100 FT.	MAX. REC. WORKING PRESS. (PSI)	MINIMUM BEND RADIUS (IN.)	MINIMUM BEND RADIUS (MM)
43-0364-40	1-1/2	38.1	4	2	50.8	87	125	5	127.0
43-0364-42	2	50.8	4	2-1/2	63.5	112	125	6	152.4
43-0364-43	3	76.2	4	3-9/16	90.5	162	100	12	304.8
43-0364-44	4	101.6	4	4-9/16	115.9	228	75	14	355.6



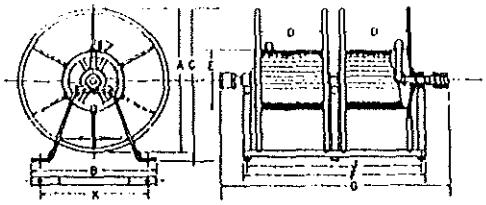
BOSTON 100's LEADER WATER DISCHARGE

- A heavy duty water discharge hose for the most demanding construction and industrial applications.
- Extra tough black rubber tube and cover for abrasion and weathering resistance. (S.B.R.)
- High strength synthetic cord reinforced for strength and pressure. Will not rot or mildew.
- Suitable for irrigation connection hose.
- Available in 100 ft. lengths for most economical cuts of 20 and 25 footers.

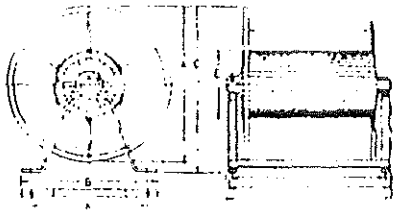
CODE	SIZE ID (IN.)	SIZE ID (MM)	SPIRALS	SIZE NOMINAL OD (IN.)	SIZE NOMINAL OD (MM)	APPROX. WT. POUNDS PER. 100 FT.	MAX. REC. WORKING PRESS. (PSI)
43-0307-12	1-1/2	38.1	2	1-13 16	46 0	47	100
43-0307-06	2	50.8	2	2-5 16	58 7	62	100
43-0307-08	3	76.2	2	3-5 16	84 1	89	100
43-0307-10	4	101.6	2	4-5 16	109.5	122	100



FD47



RO-384



FX STORAGE REELS

	Catalog No.	CAPACITY	DIMENSIONS—INCHES									Shipping Weight
		Water, Air, Foam or Wash-Up Hose	A	B	C	D	E	F	G	J	K	
CONTINUOUS FLOW STORAGE REELS	FD47-1 -100	150′ of ¾″ or 100′ of 1″	24	19	26	10	10	16	21	14¾	17	73
	FD47-1 -200	300′ of ¾″ or 200′ of 1″	24	19	26	20	10	26	31	24¾	17	83
	FD47-1½- 50	75′ of 1¼″ or 50′ of 1½″	24	19	26	10	10	16	21	14¾	17	80
	FD47-1½-100	150′ of 1¼″ or 100′ of 1½″	24	19	26	20	10	26	31	24¾	17	92
	FD47-1½-200	200′ of 1½″	29	24	31	20	10	26	31	24¾	22	104
	FD47-2½-250	250′ of 2½″ Double Jacket CRL	37	30	39½	28	14	34½	39½	33¼	28	

HOSE CONNECTION—FD47-1-100 and FD47-1-200 furnished with 1″ male IPT outlet, male Garden Hose Thread, male Chemical Hose Thread, ¼″ male IPT or 1″ male IPT optional at no extra cost if specified on order; other threads at additional cost. FD47-1-½-50 and FD47-1-½-100 furnished with 1½″ male IPT outlet; 1¼″ male IPT or 1½″ male NST outlet optional at no extra cost if specified on order; other threads at additional cost.

NOTE: When using flat hose (SJ or DJ) with this reel, the flow of water through the reel will be restricted unless all the hose is taken off the reel before use.

FRAME—Heavy bar steel. Designed for mounting on either vertical or horizontal surfaces.

RIMS & SPOKES—Rims are tubular steel and spokes are round steel bolt stock. Surfaces are round and will not cut the hose

SWIVEL JOINT—W & K design and manufacture. Easy running and trouble free in operation.

DRUM—10″ diameter to minimize kinking of hose. Heavy gauge sheet steel.

FINISH—Grey prime coat.
Also available in Hot Dipped Galvanized.

	Catalog No.	Water, Air, Spray Hose		DIMENSIONS—INCHES								
		Each Compartment	Total	A	B	C	D	E	F	G	J	K
2 COMPARTMENT CONT. FLOW REEL	RO-384	150′ of ¾″ or 100′ of 1″	300′ of ¾″ or 200′ of 1″	24	19	26	10	10	31¾	41¾	30½	17

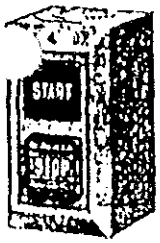
	Catalog No.	Single Jacket CRL			Double Jacket CRL			Water Hose			DIMENSIONS—INCHES									Shipping Weight
		1¼″	2″	2½″	1½″	2″	2½″	¾″	1″	1½″	A	B	C	D	E	F	G	J	K	
STORAGE REELS	FX299A	200	150	100	100	100	50	300	200	100	24	19	26	20	10	26	26	24¾	17	75
	FX301	500	350	250	300	200	150	750	500	250	37	30	39	20	10	26	26	24¾	28	122
	FX302	650	500	400	400	300	250	900	600	300	37	30	39	26	10	32	32	30¾	28	137
	FX303	800	600	500	500	400	300	1100	700	350	37	30	39	32	10	38	38	36¾	28	150

STANDARD DUTY CONTROL STATIONS

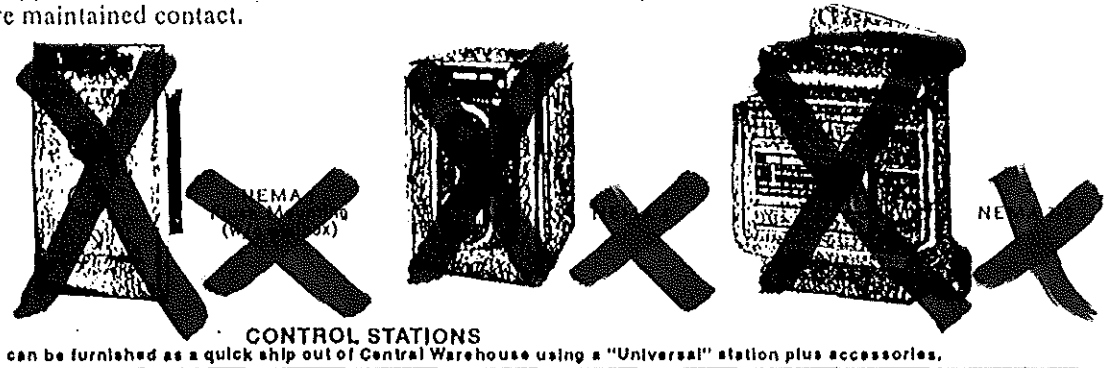
TYPE B

CLASS 9001

Standard duty control stations are designed for use with magnetic motor starters to govern the starting, stopping, or reversing of all types of electric motors. Push buttons are momentary contact unless otherwise indicated. Selector switches are maintained contact.



NEMA 1
Surface Mounting



CONTROL STATIONS

Many items are stock or can be furnished as a quick ship out of Central Warehouse using a "Universal" station plus accessories.

No. of Units	Nameplate Markings and Features	Contact Symbol See Page 295	Surface Mounting NEMA Type 1* Type	Stainless Steel Flush Plate (Pullbox* not included)* Type	Watertight and Dustlight NEMA Type 4* Type	For Hazardous* Locations Class I, Div. 1 Groups B, C and D Class II Div. 1 Groups E and G NEMA Types 7 & 9 Type
1	Start	1	BG101	BF101	BW146	BR101
	Stop	3	BG102	BF102	BW147	.....
	Stop (Mushroom Button)	3	BG103	.....	BW151	BR103
	Stop (Lockout)	3	BG104	.....	BW148	BR104
	Universal (w/o Legend Insert) ▲	18	BG107	BF107	BW159	BR107
	Off-on (Selector Switch)	19	BG111	BF111	.....	.....
	Hand-Off-Auto (Selector Switch)	17	BG112	BF112	.....	.....
	Universal Selector Switch (w/o Legend Insert) ▲	19 or 17	BG114	BF114	.....	.....
	Red Pilot Light: 120 V. AC or DC	121	BG121	BF121	.....	.....
	Green Pilot Light: 120 V. AC or DC	121	BG122	BF122	.....	.....
	Pilot Light (w/o Lens): 120 V. AC or DC▲	121	BG123	BF123	.....	.....
2	Start-Stop	145	BG201	BF201	BW240	BR204
	Start-Stop	146	BG202	BF202	BW252	BR202
	Start-Stop (Mushroom on Stop)	145	BG203	.....	BW250	BR203
	Start-Stop (Lockout on Stop)	145	BG204	.....	BW241	BR204
	Start-Stop (Mushroom on Start and Stop)	145	BG205	.....	BW246	BR205
	Forward-Reverse	146	BG206	BF206	BW242	BR206
	Open-Close	146	BG207	BF207	BW244	BR207
	Up-Down	146	BG208	BF208	BW243	BR208
	Raise-Lower	148	BG209	BF209	BW253	BR209
	On-Off	145	BG210	BF210	BW245	BR210
	On-Off	148	BG211	BF211	BW254	BR211
	Universal (w/o Legend Inserts) ▲	25	BG214	BF214	BW260	BR214
	Start-Stop (Maintained Contact)	10	BG215	BF215	BW255	BR215
	On-Off (Maintained Contact)	10	BG216	BF216	BW256	BR216
	Hand-Auto (Maintained Contact)	10	BG217	BF217	BW257	BR217
	Universal (Maintained Contact w/o Legend Inserts) ▲	147	BG218	BF218	BW258	BR218
	Off-On (Selector Switch), Red P.L.: 120 V. AC or DC	19 & 121	BG221	BF221		
	Hand-Off-Auto (Selector Switch), Red P.L.: 120 V. AC or DC	17 & 121	BG223	BF223		
	Universal Selector Switch & Pilot Light 120 V. AC or DC (w/o Legend Insert & w/o Lens) ▲	17 or 19 & 121	BG224	BF224		
	Hand-Off-Auto (Selector Switch) & Start (Push Button)	17 & 1	BG225	BF225		
	Universal Selector Switch & Push Button (w/o Legend Inserts) ▲	17 or 19 & 16	BG226	BF226		
3	Fast-Slow-Stop	109	BG301	BF301		
	Fwd.-Rev.-Stop	109	BG302	BF302		
	Open-Close-Stop	109	BG303	BF303		
	Raise-Lower-Stop	109	BG304	BF304		
	Up-Down-Stop	109	BG305	BF305		
	High-Low-Stop	109	BG306	BF306		
	Start-Jog-Stop	109	BG316	.....		
	Fwd.-Rev.-Stop (Lockout on Stop)	109	BG322	.....		
	Up-Down-Stop (Lockout on Stop)	109	BG325	.....		
	High-Low-Stop (Lockout on Stop)	109	BG326	.....		
	Universal (w/o Legend Inserts) ▲	8	BG307	BF307		
	Start-Stop, Red Pilot Light: 120 V. AC or DC	145 & 121	BG308	BF308		
	Universal Push Buttons (2) & Pilot Light: 120 V. AC or DC (w/o Legend Inserts & w/o Lens) ▲	25 & 121	BG309	BF309		
	Start-Stop (Maintained Contacts) & Red Pilot Light: 120 V. AC or DC	10 & 121	BG310	BF310		
	On-Off (Maintained Contact) & Red Pilot Light: 120 V. AC or DC	10 & 121	BG311	BF311		
	Hand-Auto (Maintained Contact), & Red Pilot Light: 120 V. AC or DC	10 & 121	BG312	BF312		
	Universal Push Buttons (Maintained Contact) & Pilot Light: 120 V. AC or DC (w/o Legend Inserts & w/o Lens) ▲	147 & 121	BG313	BF313		
	Hand-Off-Auto (Selector Switch), & Start-Stop (Push Buttons)	17 & 145	BG314	BF314		
	Universal Selector Switch & 2 Push Buttons (w/o Legend Inserts) ▲	17 or 19 & 25	BG315	BF315		

▲"Universal" designates control stations without legend inserts, lenses or accessory kits. Universal stations plus separate legend inserts and other accessories listed on page 295 allow the user to conveniently build up standard or custom stations.

*Use standard 2 1/8 inch deep wall boxes, single gang for Types BF1 — and BF2— and two gang for Type BF3—.

#For replacement interiors, see Control Products Catalog Class 9001 Section 2.

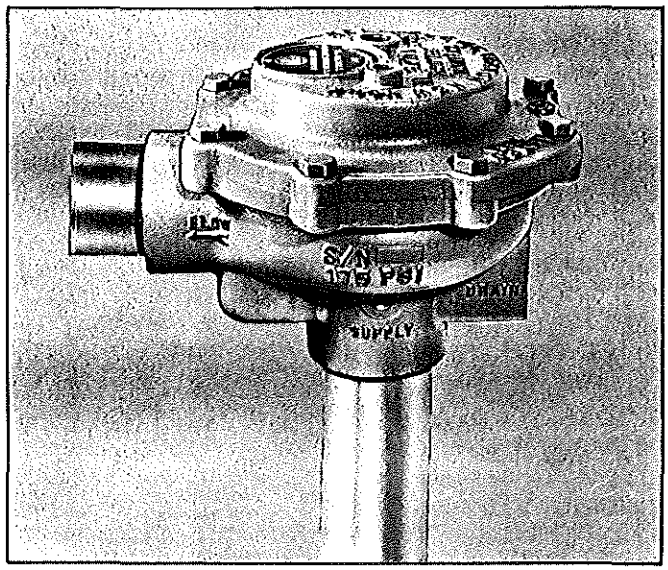
Reliable®

Model A Deluge Valve 2½"

Bulletin 502B

Features

1. Differential Diaphragm Type—Simple—Lightweight—Dependable Construction
2. Simply and Easily Trimmed for Actuation by:
   - Manual Devices
   - Wet Pilot Sprinklers
   - Dry Pilot Sprinklers
   - Solenoid Valves
3. Limited Compression Seat Seal
4. External Hydraulic Reset
5. Furnished in 2½" NPT, 2½" Grooved End, or 65 mm.
6. Separately Replaceable Diaphragm and Seat Seal
7. Listed by Underwriters Laboratories, Inc. & Underwriters' Laboratories of Canada. Approved by Factory Mutual Research Corporation & Fire Offices' Committee. NYC BS & A No. 587-75-SA



The Reliable Model A 2½" Deluge Valve is a hydraulically operated differential diaphragm type Deluge Valve used to control the water supply to a deluge or preaction system. Deluge systems use open sprinklers or nozzles as discharge outlets in the fire area while preaction systems use closed sprinklers or nozzles.

Both systems use separate detection devices to control the operation of the deluge valve. Two simple trim arrangements allow for actuation of the Reliable Model A Deluge Valve by manual, hydraulic, pneumatic or electric devices such as break glass stations, wet pilot or dry pilot sprinklers and thermal or smoke detectors.

The Reliable Automatic Sprinkler Co., Inc., 525 North MacQuesten Parkway, Mount Vernon, New York 10552

General

The Model A 2½" Deluge Valve is a direct diaphragm actuated valve. There are no moving linkages or mechanisms to wear or jam or internally reset. The direct diaphragm operation allows the valve to be reset by external hydraulic means. The valve has been ruggedly designed to provide many years of trouble free static and cyclic operation.

The design features a limited compression piston (clapper) rubber seal installed in the valve body. This feature prevents localized compression set of the rubber seal. Compression set of the clapper seal in other valves requires exact clapper to seat realignment when resetting and may cause reseating leakage. The limited compression is accomplished by a metal piston stop in the rubber seal to valve body retainer ring. The seal retainer ring metal stop allows the piston to squeeze the seal only a predetermined fixed amount regardless of inlet supply pressure. The piston cannot continue to compress the seal as the supply pressure increases causing higher piston closing forces.

The valve design also features a separately replaceable molded diaphragm which incorporates an O-ring end configuration on the inside and outside sealing diameters. The O-ring ends provide more positive retention, clamping and sealing of the diaphragm to piston and diaphragm to valve body and cover sealing surfaces.

The valve is externally hydraulically reset eliminating the lengthy process of removing cover plates. After the actuation device is reclosed or in the case of wet pilot sprinklers, replaced, pressure is resupplied to the upper portion of the diaphragm and piston. This causes the piston to close and reseat, resetting the deluge valve.

The design of Reliable's 2½" Deluge Valve provides for longer term trouble free positive operation without the need of internal linkage and clapper alignment for resetting.

Operation

Reliable's Model A 2½" Deluge Valve is a quick opening hydraulically operated, diaphragm actuated type valve. The Model A consists of three chambers, top (pressurized), outlet (normally dry) and inlet (pressurized). The three chambers are isolated from each other by the diaphragm and piston and compression limited seat seal. In the closed position (Figure 1) supply pressure in the top chamber acts across the diaphragm and piston holding the piston on the seat against inlet supply pressure. The diaphragm pressure area is greater than the seat pressure area providing a force imbalance of about 3 to 1.

When a fire is detected, the top chamber is vented to atmosphere through the outlet port via opened actuation devices. The top chamber pressure cannot be replenished from the restricted inlet port as rapidly as it is vented from the outlet port, and the chamber pressure falls instantaneously. When the top chamber pressure reaches about ⅓ the supply pressure, the upward force of the supply pressure acting on the piston face is greater than the downward force of the diaphragm and the piston moves up to the open position (Figure 2).

Once the piston has opened water flows from the supply through the Deluge Valve into the piping system and alarm outlet to the alarm devices. The valve maintains the open position until the open releasing device(s) is closed. Caution—The Releasing Device Must Be Maintained Open To Prevent Closing Of The Model A Deluge Valve.

Detection and Actuation

In general the Reliable Model A 2½" Deluge Valve can be actuated by any listed or approved device which opens sufficiently to vent the top chamber in response to a fire. The actuation device is simply connected to the top chamber outlet port. When the actuation device operates and vents the top chamber, the deluge valve opens.

Typical actuation devices include hydraulic break glass stations, wet or dry pilot sprinklers and solenoid valves. Devices such as wet or dry pilot sprinklers perform both the deluge valve actuation and the detection functions. No additional detectors are required when these devices are used.

The use of a solenoid valve for deluge valve actuation enables the numerous types of electrical fire detection

Model A Deluge Valve

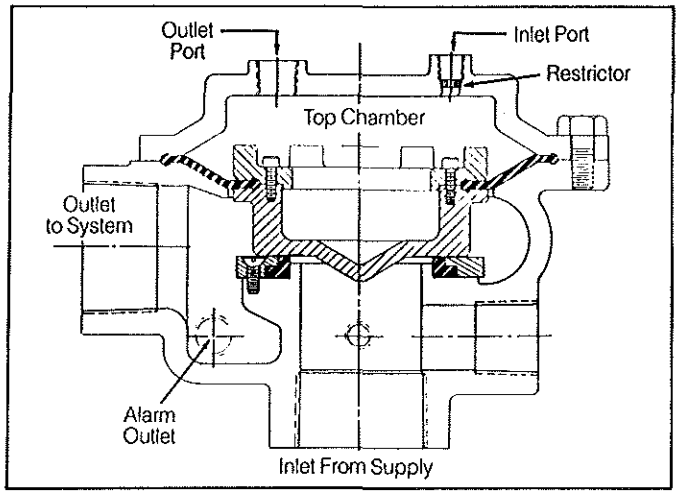


Figure 1
Closed Position

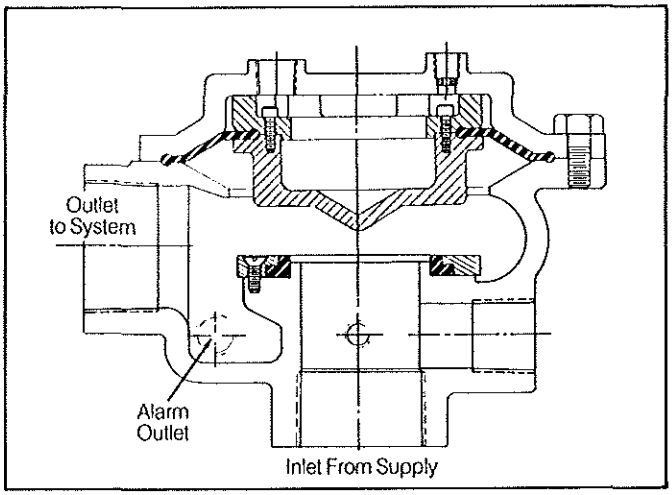


Figure 2
Open Position

devices to be used. Typical detection devices include electrical break glass stations, thermal detectors and ionization or photoelectric smoke detectors. The electric detection and actuation equipment is the Model 2000 Supertrol System which is described in Bulletins 703 and 704.

Valve Description

1. Rated working pressure 175 psi (12, 1 bar)
2. Factory hydrostatic test pressure 350 psi (24, 1 bar)
3. End and trim connections—Three valve connection styles are available.
   a. 2½" American Standard taper pipe threads inlet and outlet per ANSI B2.1.
      - Threaded opening per ANSI B2.1.
      - Reliable's standard trim sets are compatible with American Standard taper pipe threads.
      - Color—Light Gray
   b. 2½" Grooved Inlet and Outlet
      - Threaded openings per ANSI B2.1.
      - Reliable's standard trim sets are compatible with Grooved Valves
      - Color—Light Gray

U.S. Groove Dimensions In Inches			
Outlet Dia.	Groove Dia.	Groove Width	Outlet Face to Groove
2.875	2.720	5/16	5/8

   c. 2½" (65 mm) British Standard pipe threads inlet and outlet per BS21—1973
      - Threaded Openings per BS21—1973
      - Reliable's standard trim sets may be used with Metric Valves providing trim is assembled carefully and extra thread sealant is applied to connections between valves and trim.
      - Color—Light Blue
4. Shipping Weight—49 lbs. (22 kg)
5. Friction Loss—Expressed in Equivalent Length of Pipe, Based on Hazen & Williams formula with C = 120. Equiv. Length = 17.1 ft.
6. Installation position—Vertical.

Trim Description

The trimmings for the Reliable Model A Deluge Valve are arranged for rapid, easy compact attachment and serve as connection points to Reliable Alarm and other devices.

The Model A Deluge Valve trim sets are:
a. Basic trim set.
b. Wet pilot line trim set.
c. Dry pilot line trim set.

All valves are listed and approved by Underwriters Laboratories, Inc. and Factory Mutual Research Corp. only when used with the valve manufacturers trim sets.

The basic trim set (Figure 3) is used with every Model A Deluge Valve. This trim set provides the 1¼" main drain connection, the alarm connection, the alarm test connection and the top chamber supply connection and supply pressure gauge.

The wet pilot line trim set (Figure 3) is connected to the top chamber outlet. This trim set is used when wet pilot sprinklers, hydraulic manual emergency pull boxes or solenoid valves are used for actuation. The wet pilot line trim set includes a gauge to read top chamber pressure, a Globe valve for manual operation of the deluge valve and a connection for the actuation device.

The following table specifies the maximum wet pilot line height for use with the Reliable Model A Deluge Valve. Refer to the Reliable Hydraulic Data Book for combination height and distance limitations.

Table 1

Average Service Pressure At Valve		Maximum Height of Wet Pilot Line Above Valve	
PSI	bar	Ft.	Metres
20	1.38	6.2	(1.9)
40	2.76	15.4	(4.7)
60	4.14	26.1	(7.9)
80	5.52	35.3	(10.7)
100	6.89	46.2	(14.2)
120	8.27	56.9	(17.3)
140	9.65	67.7	(20.6)
160	11.03	80.0	(24.4)
175	12.07	83.1	(25.3)

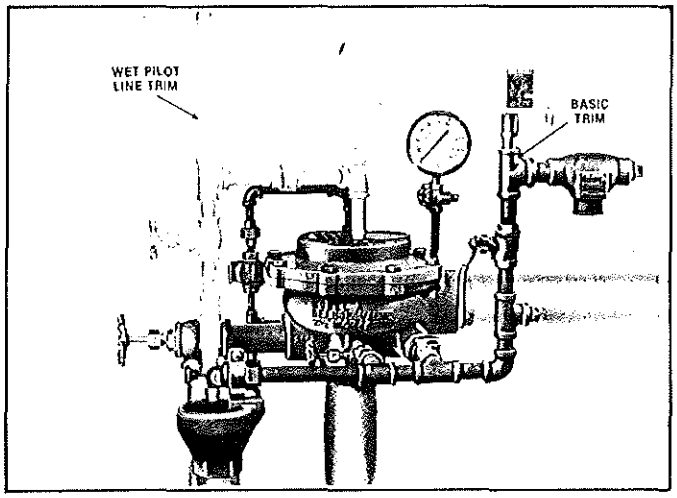


Figure 3—2½" Model A Deluge Valve with Basic Trim and Wet Pilot Line Trim

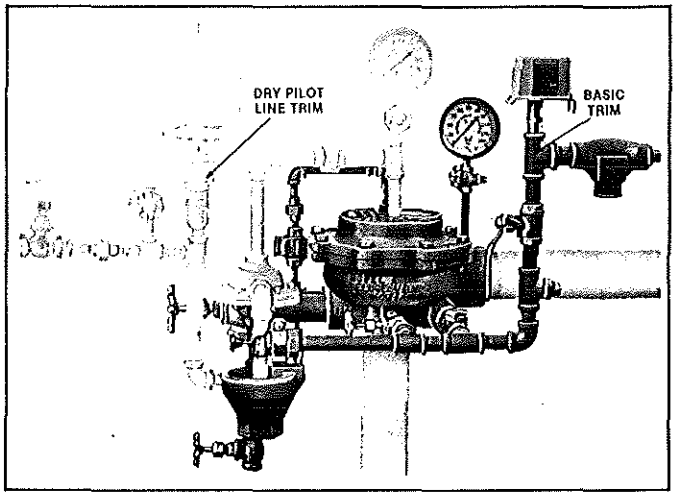


Figure 4—2½" Model A Deluge Valve with Basic Trim and Dry Pilot Line Trim

The dry pilot line trim set (Figure 4) is used when dry pilot line sprinklers or devices are used as the actuation means. The dry pilot line trim set includes the dry pilot line actuator, air and water pressure gauges, low air pressure warning switch, air relief valve and the connection for the actuation device. The dry pilot line actuator is fully described in Bulletin 504.

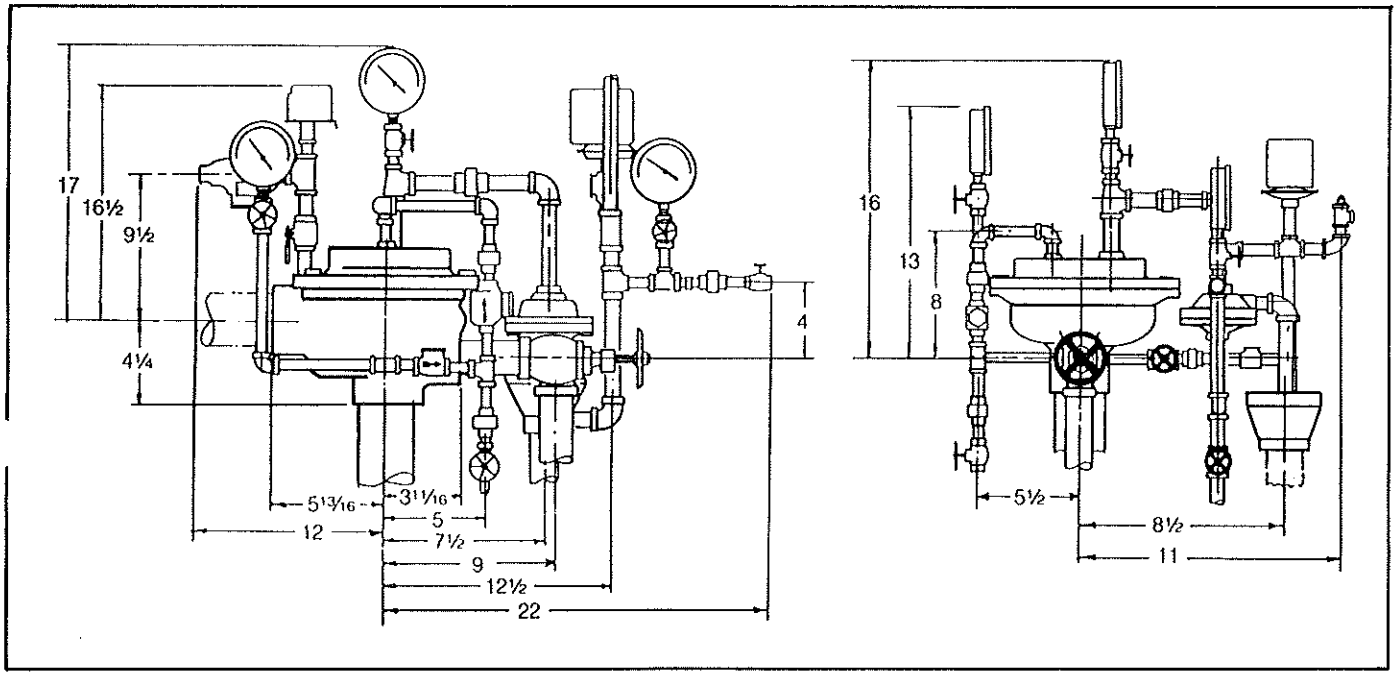
Table 2 provides the recommended air pressure when the dry pilot line trim set is used as the actuation means.

The Model A Hydraulic Manual Emergency Pull Box is described in Bulletin 506. This device may be used for manual emergency deluge valve operation with either the wet or dry pilot trim sets.

Table 2

Water Pressure (PSI)	Air Pressure to be Pumped into Dry Pilot Line (PSI)	
Maximum	Not Less Than	Not More Than
20	10	20
50	15	25
75	20	30
100	25	35
125	30	40
150	35	45
175	40	50

Installation Measurements in Inches



Ordering Information

Specify

- Valve Size—Either 2½" or 65 mm. When size is specified in mm, a metric valve per Valve Description Section 3.c will be supplied.
- Inlet and Outlet Connection—American Standard Taper Pipe Threads, Grooved End or British Standard Pipe Threads.
- Trim—The basic trim set must be used with every Model A Deluge Valve. Order either the Wet or Dry Pilot Line trim set depending on actuation method.
- Additional equipment—Air Maintenance Devices, Air Compressors, Supertrol Electric Detection and Actuation Equipment and Mechanical Sprinkler Alarms must be separately ordered. These devices are fully described in other bulletins.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Reliable Sprinkler Devices, protecting life and property for over 60 years, are approved by all fire insurance and government agencies, and are installed and serviced by Reliable's chain of representatives.
Reliable representatives, located throughout the United States, Canada and foreign countries, have a life-time of experience and are as near as your telephone.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
525 North MacQuesten Parkway
Mount Vernon, New York 10552
(914) 668-3470

FOAM UNIT CABINET

CABINETS ARE TO BE CUSTOM MADE BY FIRELINE. NO DRAWINGS ARE AVAILABLE FOR SUBMITTAL. SPECIFICATIONS ARE AS FOLLOWS:

Cabinet walls and doors of 12-ga. steel

IMRON prime coat and IMRON red finish

+/- dimensions to be 60" x 36" x 36"

bottom panel is reinforced, 2" high legs

full-length stainless steel door hinges

color of cabinet to be determined by architect

GUARDIAN FIRE EQUIPMENT, INC.
3430 N.W. 38th STREET
MIAMI, FLORIDA 33142
(305) 633-0361

SUBMITTAL

September 2, 1988

Brown Sprinkler Corp.
4705 Pinewood Rd.
Louisville, KY. 40218

Subject: UNIVERSITY OF KENTUCKY
HOSPITAL EXPANSION

Gentlemen:

We propose to furnish the following fire equipment for subject project:

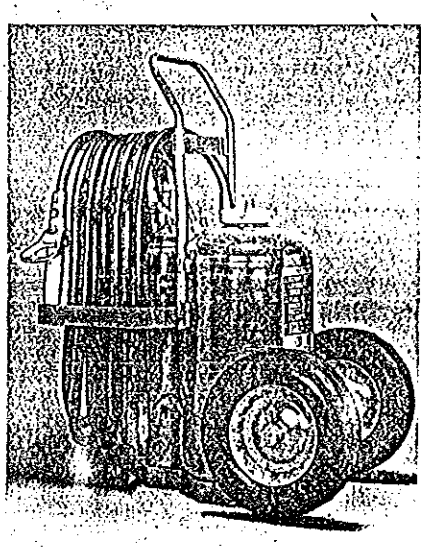
(2) #451 150 lb. Wheeled regular dry chemical extinguisher with 23 cubit ft. nitrogen cylinder. Unit shipped with initial charge plus 3-50 lb. pails extra powder.

Please return an approved copy for our files.

Enclosures

Represented by: Allen Equipment

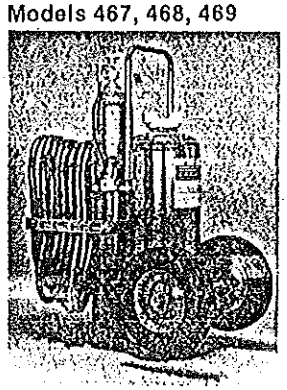
NITROGEN CYLINDER OPERATED
DRY CHEMICAL — ABC, REGULAR, PURPLE K
FOAM — ALCOHOL RESISTANT FFFP
(FILM FORMING FLUOROPROTEIN)



Models 450, 451, 452

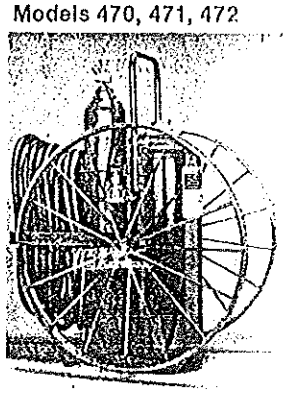
SPECIFICATIONS			
Model Number	450	451	452
Agent	ABC	REGULAR	PURPLE K
U/L Rating	40A:240B:C	240B:C	320B:C
Capacity (lb/kg)	125/56.7	150/68.0	125/56.7
Shipping Weight (lb/kg)	337/152.86	363/164.65	337/152.86
Discharge Time (sec.)	52	[illegible]	53
Discharge Range (ft./m)	30 - 40 / 9.1 - 12.2		
Nitrogen Cylinder (cu. ft./litre)	23 / 651.29		
Operating Temp. Range (Degrees F./C.)	-65 to +120 / -54 to +49		
Safety Disc Burst Range (psi/kPa)	400 - 500 / 2760 - 3450		
Hose Length (ft./m)	50 / 15.2		
Hose Diameter (in./cm)	.75 / 1.90		
Wheels (Semi-Pneumatic) (in./cm)	16 x 4 / 40.64 x 10.16		
Height (in./cm)	45 / 114.3		
Width (in./cm)	24 / 60.96		
Depth (in./cm)	36 / 91.44		
Coast Guard Approved	YES		

Models 467, 468, 469

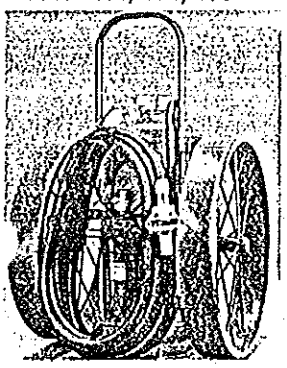


SPECIFICATIONS						
Model Number	467	468	469	470	471	472
Agent	ABC	REGULAR	PURPLE K	ABC	REGULAR	PURPLE K
U/L Rating	40A:240B:C	240B:C	320B:C	40A:240B:C	240B:C	320B:C
Capacity (lb/kg)	125/56.7	150/68.0	125/56.7	125/56.7	150/68.0	125/56.7
Shipping Weight (lb/kg)	406/184.15	431/195.49	406/184.15	455/206.38	480/217.72	455/206.38
Discharge Time (sec.)	48	53	52	48	53	52
Discharge Range (ft./m)	30 - 40 / 9.1 - 12.2			30 - 40 / 9.1 - 12.2		
Nitrogen Cylinder (cu. ft./litre)	110 / 3114.67			110 / 3114.67		
Operating Temp Range (Degrees F./C.)	-65 to +120 / -54 to +49			-65 to +120 / -54 to +49		
Hose Length (ft./m)	50 / 15.2			50 / 15.2		
Hose Diameter (in./cm)	.75 / 1.90			.75 / 1.90		
Wheels (Steel) (in./cm)	16 x 4 / 40.64 x 10.16			36 x 2.5 / 91.44 x 15.24		
Height (in./cm)	52 / 132.08			52 / 132.08		
Width (in./cm)	26 / 66.04			28 / 71.12		
Depth (in./cm)	38 / 96.52			45 / 114.3		
Coast Guard Approved	YES			YES		

Models 470, 471, 472

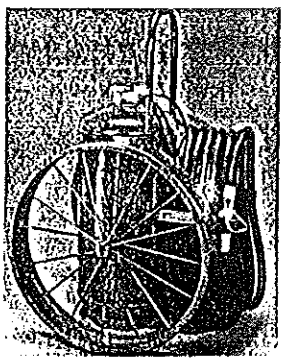


Models 491, 492, 493



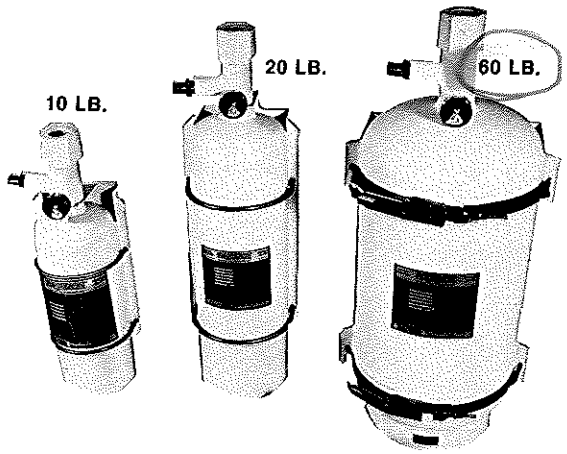
SPECIFICATIONS				
Model Number	491	492	493	630
Agent	ABC	REGULAR	PURPLE K	Alcohol Resistant FFFP Foam
U/L Rating	40A:320B:C	320B:C	320B:C	20A:160B
Capacity (lb/kg)	300/136.07	350/158.75	300/136.07	33 / 124.91
Shipping Weight (lb/kg)	763/346.09	816/370.13	763/346.09	390 / 176.88
Discharge Time (sec.)	60	70	67	60
Discharge Range (ft./m)	30 - 40 / 9.1 - 12.2			30 - 40 / 9.1 - 12.2
Nitrogen Cylinder (cu. ft./litre)	55 / 1557.43			23 / 651.29
Operating Temp Range (Degrees F./C.)	-65 to +120 / -54 to +49			+35 to +120 / +2 to +49
Safety Disc Burst Range (psi/kPa)	400 - 500 / 2760 - 3450			400 - 500 / 2760 - 3450
Hose Length (ft./m)	50 / 15.2			50 / 15.2
Hose Diameter (in./cm)	1 / 2.54			1 / 2.54
Wheels (Steel) (in./cm)	36 x 6 / 91.44 x 15.24			36 x 6 / 91.44 x 15.24
Height (in./cm)	57 / 144.78			57 / 144.78
Width (in./cm)	34 / 86.36			34 / 86.36
Depth (in./cm)	39 / 99.06			39 / 99.06
Coast Guard Approved	YES			PENDING

Model 630



Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications



DESCRIPTION

The function of a Fike Container in a fire extinguishing system is to store Halon 1301, the fire extinguishing agent, until a fire develops and the agent must be released. Release of the Halon 1301 from the container is accomplished through two methods: 1) By either an automatic or manually controlled electric signal activating a pyrotechnic initiator to burst a fast acting rupture membrane; 2) When the contained Halon 1301 itself reaches a temperature of approximately 160°F. it will create sufficient pressure to burst the rupture membrane, thus releasing itself. The valve which contains the rupture membrane and initiator is field reloadable by simply replacing three components.

The Fike 10, 20, and 60 Pound Containers have passed extensive testing by Underwriters Laboratories and Factory Mutual and are used in installations where from 6 to 64 pounds of Halon 1301 are required. To eliminate the need of multiple containers or using more Halon 1301 than necessary, these containers can be filled in 1 pound increments up to their maximum capacity. The Halon 1301 used in these containers has a natural vapor pressure of 204.0 psig. at 72°F. and has been superpressurized to 360 psig. with dry nitrogen to accomplish a quick and effective discharge.

Each of these containers is supplied with a pressure gauge that permits a quick visual inspection of container pressure. Also, if desired, a low pressure switch can be provided. This switch allows the container's pressure condition to be checked from a remote location by connecting the switch to an electrical panel which can monitor the pressure switch's normally closed circuit.

These containers may be supplied for installation in the upright, horizontal or inverted positions, depending upon the user's particular needs. The mounting location of these containers is quite flexible. They may be mounted at the exact point of discharge or at a remote location by adding piping to the nozzle system (reference Fike Specifications and Installation Instructions). The operating temperature must not fall below −40°F. or exceed +130°F. in any installation.

The 10, 20 and 60 Pound Containers may be used in either a pre-engineered or engineered system utilizing balanced or unbalanced piping configurations. For additional guidance, consult your local authorized Fike Distributor or Fike Fire Suppression Systems.

RELIABILITY

These Fike Halon 1301 Containers are manufactured in strict accordance with the Department of Transportation (D.O.T.) regulations. These 70 Series Containers have successfully passed testing by Factory Mutual and Underwriters Laboratories, Inc. Before leaving the factory, each container must pass extensive leakage testing and pressure testing to 1000 psig. These containers are primarily constructed from carbon steel alloys and painted with a durable baked enamel paint.

INSTALLATION

Each Fike Container is supplied with a one-piece mounting bracket that is designed to provide the most effective and versatile installation for that particular container. The 10 and 20 pound container brackets employ two U-bolts for securing the Container to the bracket. The 60 Pound Container is secured using two quick connecting, over-center handle clamps. No special tools or equipment are required for installing these containers.

Approximate container assembly weights when filled with Halon 1301 are:

10 lb. Container	27 lb.
20 lb. Container	46 lb.
60 lb. Container	131 lb.

ARCHITECT SPECIFICATIONS

The Halon 1301 shall be stored in Fike 70 Series Agent Storage Containers that have passed extensive testing at Underwriters Laboratories, Inc. and Factory Mutual. These containers shall be capable of being filled in one pound increments up to their listed maximum capacity. These Halon 1301 containers shall be activated by a signal from the control panel which is processed by the agent release module. This module stores the power to activate the actual pyrotechnic releasing device. The valve shall contain a scored, non-fragmenting rupture disc to provide an immediate, total discharge of all the agent. Halon 1301 is stored in the container as a liquid, having a natural vapor pressure of 204.0 psig. @ 72°F. To aid in distribution, the container shall be superpressurized to 360 psig. with dry nitrogen.

All agent storage containers shall be actuated by either a manual pull station, an automatic device (or devices) or an increase in internal pressure due to heating the Halon 1301 to approximately 140°F. At this temperature, internal pressure will be adequate to

ARCHITECT SPECIFICATIONS CONT.

burst the rupture disc. Normal operating temperature shall not fall below −40°F. or exceed +130°F.

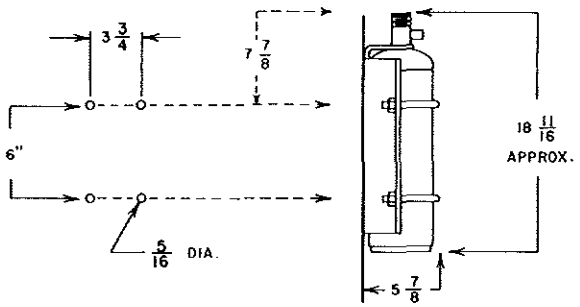
These Halon 1301 containers shall be equipped with a pressure gauge to display internal pressures. This gauge shall be an integral part of the container and color coded for fast referencing of pressure readings. A low pressure switch shall be made available, as an option. A decrease in pressure from 360 psig. to 272 psig. shall cause the normally closed contacts to open, indicating a trouble condition.

The Halon 1301 containers shall be securely mounted using a one-piece mounting bracket that is designed for the most effective and versatile installation of each container. No special tools or equipment shall be required to mount the bracket.

MOUNTING DATA

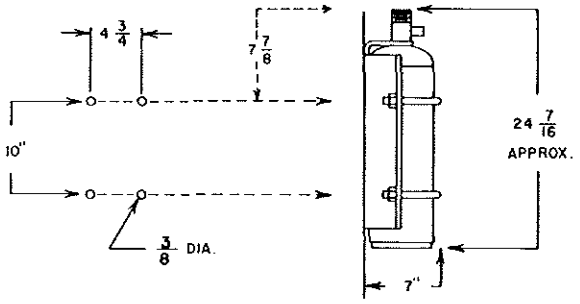
10# CONTAINER ASSEMBLY

70-030 for Horizontal or Vertical Installation
70-029 for Inverted Installation



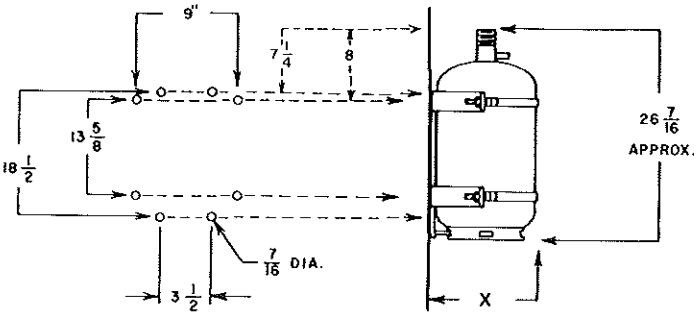
20# CONTAINER ASSEMBLY

70-032 for Horizontal or Vertical Installation
70-031 for Inverted Installation



60# CONTAINER ASSEMBLY

70-022 for Horizontal or Vertical Installation
70-021 for Inverted Installation



NOTE: ALL DIMENSIONS ARE APPROXIMATE AND ARE SUBJECT TO CHANGE WITHOUT NOTICE

x = 10¾ with "U" Bolt Clamp
x = 11½ with Voss Over Center Clamp

HALON 1301 FILL CAPACITIES

Nominal Container Size	Actual Fill Capacity
10 pound	6 to 10 pounds
20 pound	13 to 21 pounds
60 pound	37 to 64 pounds

Fike Fire Suppression Systems

PRE-ENGINEERED NOZZLES

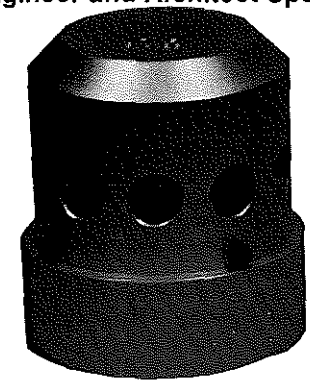
CATALOG NUMBER 1008

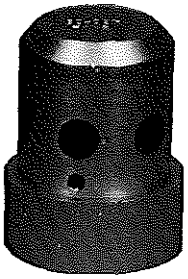
80-024 THRU -029

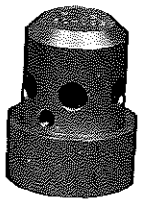
U.L. LISTED
F.M. APPROVED

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications



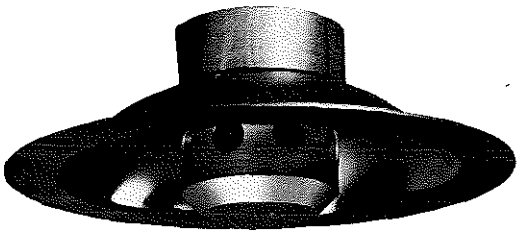




ENGINEER AND ARCHITECT SPECIFICATIONS

The function of the Fike Nozzle in a fire extinguishing system is to distribute Halon 1301 in a uniform, pre-determined pattern and concentration. These nozzles are designed to accommodate the discharge of Halon 1301 in less than ten seconds when used within the design limitations of Fike Specification RD 1082, Installation Instructions.

Fike Nozzles are available in three sizes: ½", 1" and 1½". Each size comes in two configurations: 180° and 360° distribution patterns. As an option, deflector plates are available where sensitive ceiling tiles must be protected.



Nozzle with Deflector Plate

ARCHITECT SPECIFICATIONS

The Nozzle used to disperse the Halon 1301 shall be a Fike Model 80 Series Nozzle. The nozzle shall be available in ½", 1", and 1½" sizes. Each size shall come in two styles: 180° and 360° dispersion patterns. The nozzle used shall be provided with pipe threads that correspond to the nozzle size. Deflector plates shall be made available, as an option, where sensitive ceiling tiles must be protected.

The nozzle used shall be F.M. (Factory Mutual) approved and U.L. (Underwriters Laboratories) listed.

(See back of this sheet for nozzle size/area coverage.)

RELIABILITY

The Fike Nozzle has been tested and approved by F.M. (Factory Mutual) and listed by U.L. (Underwriters Laboratories). Nozzles are made of grey anodized aluminum while deflector plates are made of stainless steel, to prevent corrosion and provide a durable and attractive finish.

INSTALLATION

The Fike Nozzle is provided with pipe threads that correspond to the nozzle size. With this arrangement, the Fike Nozzle can be installed directly at the Halon 1301 container or at the end of a piping system with relative ease.

Fike Fire Suppression Systems
Division Fike Corporation
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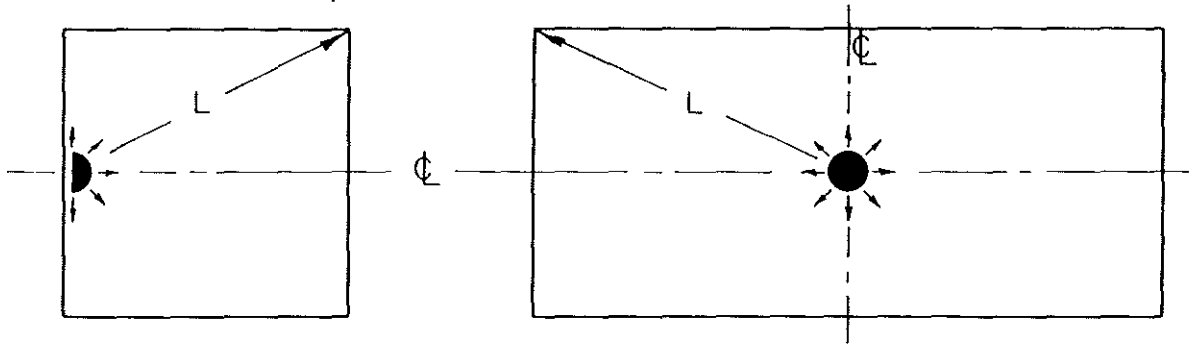
September, 1987
Revised Issue

MAXIMUM HAZARD AREA COVERAGE (UL)

(REFERENCE FIKE SPECIFICATION RD 1082-6)



180° NOZZLE 360° NOZZLE

HAZARD AREA DIMENSIONS

NOZZLE SIZE	"L" DIMENSION	CEILING HEIGHT RANGE
1/2 IN.	31 FT.	8 IN. TO 20 FT.
1 IN.	44FT.	8 IN. TO 20 FT.
1-1/2 IN.	48 FT.	8 IN. TO 20 FT.

NOTES:

a. An allowable area coverage includes any area where the maximum coverage distance from the nozzle (L dimension) is not exceeded.

b. Nozzles should be located on center line of hazard area.

c. When working with ceiling heights exceeding the values tabulated above, the hazard volume must be broken down into vertically stacked hazard volumes with heights less than the maximums shown in the table.
It is imperative that unusual applications of this nature be handled by experienced people in the field, and in most cases, operational tests should be performed before the system is put into service.

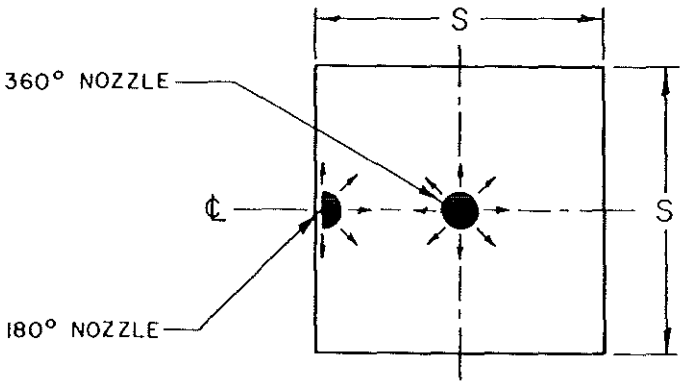
d. Dimensions and nozzle data shown are taken from the Installation Instructions that are approved by Underwriters Laboratories for FIKE Pre-Engineered Halon 1301 Systems.

MAXIMUM HAZARD AREA COVERAGE (FM)

(REFERENCE FIKE SPECIFICATION RD 1082-5)

NOZZLE SIZE	"S" DIM.
1/2 INCH	30 FT.
1 INCH	50 FT.
1-1/2 INCH	50 FT.

HAZARD AREA & NOZZLE ORIENTATION



NOTES

a. An allowable area coverage includes any area that falls within the square area described.

b. Nozzles should be located on center line of hazard areas.

c. Dimensions and nozzle data shown are taken from the Installation Instructions that are approved by Factory Mutual for FIKE Pre-Engineered Halon 1301 Systems.

Fike Fire Suppression Systems

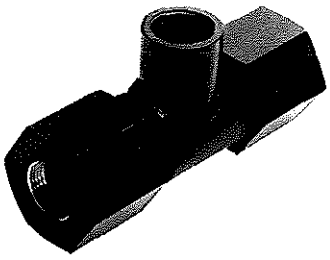
CONTAINER ACCESSORIES

CATALOG NUMBER 1009

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

MAIN-RESERVE SHUTTLE VALVE **80-1038** — 1″ PIPING
80-1063 — 1½″ PIPING



DESCRIPTION

The Shuttle Valve is designed for use in Fike Halon 1301 Systems that employ main-reserve containers. The shuttle valve's function is to direct the Halon 1301 flow from either container through common piping and nozzle by sliding a ball that will block the appropriate path. Shuttle valves are available for 1″ and 1½″ piping systems.

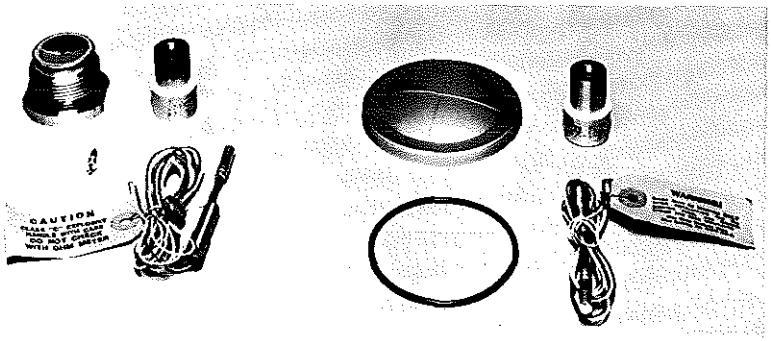
PRESSURE SWITCH **70-1121** — 10, 20, 60, 100, 125, 215, 375, 650 & 1000 POUND CONTAINERS

DESCRIPTION

This device monitors the pressure within the Halon 1301 Container. Should loss of Halon 1301 or Nitrogen occur, the Pressure Switch's normally closed contacts would open indicating a problem that could occur between routine maintenance or inspection periods.

Pressure—320 psig. normally closed to 272 psig. normally open.
Temperature— +275°F. to −65°F.
Contacts—2 amp silver contacts
18″ gauge wire 600V 105°C. wire
⅛″ male NPT with snubber

RELOAD KIT **85-004** — 1″ VALVE
85-006 — 2½″ VALVE



DESCRIPTION

The 85 series Reload Kits are designed to facilitate field reloading of the complete line of Fike Halon 1301 containers. The 1″ Reload Kit will service the 10, 20, 60 and 100 Pound Fike Containers. The 2½″ kit will service the Fike 125 and 215 Pound Containers. Generally, each kit consists of a rupture disc, a detonator, a detonator housing, a replacement core for the fill valve, O-ring, and a teflon ring. The detonator is a Class "C" explosive and should be handled with extreme caution.

Fike Fire Suppression Systems
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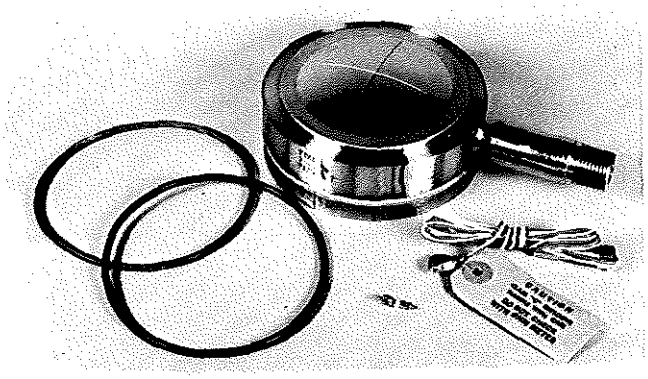
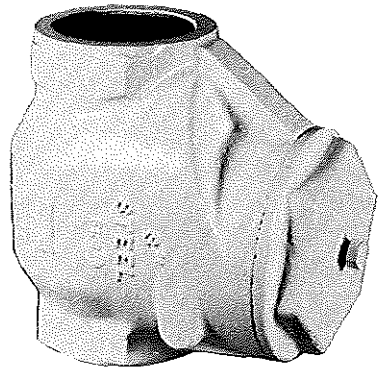
February, 1987
Revised Issue



RELOAD KIT 85-014 — 3″ VALVE

DESCRIPTION

The 3″ Reload Kit provides field reloading of the 70-083, 70-086, 70-087, and 70-090 series Containers. Each kit consists of a rupture disc, 3″ valve assembly, detonator assembly, "O"-ring and replacement core for the fill valve. The detonator is a Class "C" explosive and should be handled with extreme caution.



3" CHECK VALVE 21-001

DESCRIPTION

The Fike Check Valve prevents agent loss from the manifold and/or system piping in the event that one or more containers are removed for servicing and the system is operated.

Constructed of carbon steel, the Check Valve has a working pressure of 720 PSI and is fitted with 2″ or 3″ female NPT threads at both ends.

Friction loss for the 3″ Check Valve is rated at 3 feet equivalent length of 3″ pipe, the 2″ Check Valve is rated at 3 feet equivalent length of 2″ pipe.

3" VICTAULIC NIPPLE & COUPLING 02-2106 02-1987

DESCRIPTION

Coupling the 3″ check valve and/or system piping to the 3″ cylinder valve is the sole purpose of the 3″ Victaulic Nipple & Coupling. The coupling is rated at 500 PSI working pressure and contains a Buna "N" type gasket. The nipped is schedule 40 pipe, has 3″ male thread NPT at one end and a 3″ Victaulic groove on the opposite end.

Fike Fire Suppression Systems

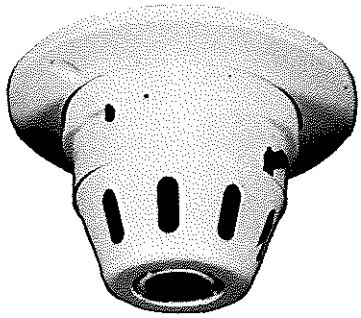
DETECTOR

CATALOG NUMBER 1022

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

63-011 PHOTOELECTRIC TYPE PRODUCTS OF COMBUSTION DETECTOR



HIGHLIGHTS
- UL LISTED
- PULSED, INFRARED, L.E.D. LIGHT SOURCE
- SILICON PHOTO DIODE RECEIVING ELEMENT
- TWO WIRE
- ALARM L.E.D.
- LOCKING SCREW—TAMPER PROOF
- STANDARD BASE FOR INTERCHANGEABILITY
- ANNUNCIATOR OUTPUT
- ADJUSTABLE SENSITIVITY

DESCRIPTION
The Fike 63-011 is a Photoelectric Type Smoke Detector used for early detection of a fire condition. The 63-011 is a two wire unit and features solid state circuitry, a pulsed infrared L.E.D. light source, silicon photo diode receiving element, alarm L.E.D. on its head and the capability of powering an annunciator light. The Fike 63-011 (Hochiki SLG-24F with HS-220 Base) is FM approved and U.L. listed under U.L. Standard 268.

OPERATION
The Fike 63-011 Photoelectric Detector is comprised of a pulsed, infrared, L.E.D. light source and a silicon photo diode receiving element. Normally, the receiving element receives no light from the pulsating light source. In the event of a fire, smoke enters the detector and light is reflected from the smoke particles to the receiving element, where it is converted into an electronic signal. Signals are received by the comparator and when two signals exceeding the basic level are received in series within a specified period of time, the circuit triggers a S.C.R. switch to activate the alarm.

FEATURES
The Fike 63-011 Photoelectric Detector is composed of two separate components. The detector mounting "base" and the detector "head" which houses the photo cell with its infrared light source of receiving element. The detector head twists into this standard base and a locking screw is provided to securely lock the head in place thereby eliminating the possibility of tampering. The standard base also allows for interchanging of photoelectric, ionization, thermal and other Fike Detectors for uniformity and greater flexibility in detection system design. The detector head houses an alarm L.E.D. which blinks while the detector is in normal standby and lights steadily upon the detector sensing an alarm condition. Each detector head is also equipped to provide a remote annunciator output which will duplicate the alarm L.E.D. during an alarm condition. All connections are made to the terminal strip located on the base.

The Fike 63-011 Photoelectric Detector has incorporated state of the art circuitry to assure stable operation with maximum sensitivity. By using a pulsed, infrared light source power consumption is only 35 to 40 microamps. The dectector head incorporates a stainless steel mesh wraparound to protect the sensing chamber from penetration by lint, dust or insects. In addition, all circuits in the head are shielded for efficiency and RF rejection.

Its rugged construction is also dew proof, dust proof and completely uninfluenced by high air velocities.

Calibration may be tested or adjusted in the field to suit the desired detection characteristics. Testing can be performed either in place or in the sensitivity monitor. This monitor uses a calibrated smoke source for accurate comparisons. The monitor also can check the calibration of ionization units.

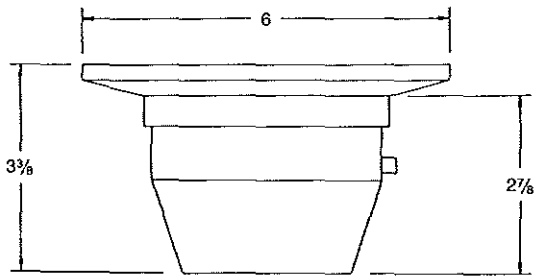
ARCHITECT SPECIFICATIONS
The Products of Combustion Detectors, Photoelectric Type, shall be Fike 63-011. The detector shall utilize solid state circuitry, a pulsed, infrared, L.E.D. light source and a silicon photo diode receiving element. The receiving element will not sense any light from the L.E.D. source. When smoke particles enter the sensing chamber the light source shall be reflected to the sensing element. Comparator circuitry shall be incorporated so as to discriminate between a valid "fire" signal and an intermittent "non-fire" source. The entrance to the sensing chamber shall be surrounded by a fine stainless steel mesh so as to prevent ready entry by insects, lint or dust. Unit shall be dew-proof and uninfluenced by high air velocity.

The Photoelectric type detector shall utilize a standard base so that it may readily be interchanged, without any modifications, with ionization, thermal, or other type detectors. The detector head shall be equipped with a L.E.D. which blinks while the detector is in normal standby and lights steadily upon the detector sensing an alarm condition. The detector will have the ability to power a remote annunciator which will duplicate the alarm L.E.D. during an alarm condition. The detector head shall be equipped with a means of securing the head to the base in such a fashion that the head may not be tampered with.

The detector head shall be removable from its base for cleaning, service or replacement. The detector shall be capable of having its calibration checked or adjusted in the field via the standard detector sensitivity monitor. This same monitor shall be capable of checking ionization and photoelectric type detectors. The detector may have its sensitivity tested either in place as its exposed to the environment or in a calibrated smoke chamber to give a reading of sensitivity which can be referenced against other like detectors under known conditions. The detectors shall be Factory Mutual approved, and UL listed to UL Standard 268.

SPECIFICATIONS
Operating Voltage — 17.6 to 27.7 VDC
Current Draw — Normal 40 microamps @ 24 VDC
Alarm 85 milliamps @ 24 VDC
Operating Temperature +32°F to +120°F
Mounting — 4" octagonal outlet box
Weight — 6.5 oz. without base
6.11 oz. with base
Humidity — MAX 96% relative humidity
RF Immune — 1 kHz thru 1000 mHz
Light Source — Pulsed, infrared L.E.D.

DIMENSIONS



Fike Fire Suppression Systems
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FORM NO. D1022-4

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Fike Fire Suppression Systems

DETECTOR

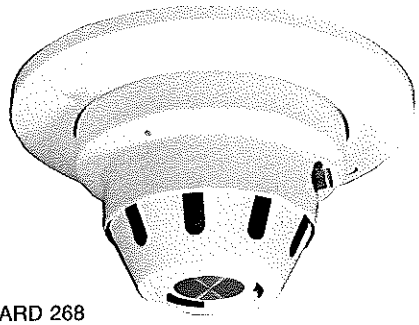
67-015

CATALOG NUMBER 1021

U.L. & U.L.C. LISTED
F.M. APPROVED

Engineer and Architect Specifications

IONIZATION TYPE PRODUCTS OF COMBUSTION DETECTOR



HIGHLIGHTS

- UL LISTED—STANDARD 268
- DUAL CHAMBER
- TWO WIRE
- ALARM L.E.D.
- LOCKING SCREW—TAMPER PROOF
- STANDARD BASE FOR INTERCHANGEABILITY
- ANNUNCIATOR OUTPUT
- ADJUSTABLE SENSITIVITY

DESCRIPTION

The Fike 67-015 is an Ionization Type Smoke Detector used for early detection of a fire condition. The 67-015 is a two wire unit and features solid state circuitry, dual chamber configuration, alarm L.E.D. on its head, and the capability of powering an annunciator light. The Fike 67-015 (Hochiki SIF-24F with HS-220 Base) is FM approved and U.L. listed under U.L. Standard 268.

OPERATION

The Fike 67-015 Ionization Detector has two chambers, an outer sample chamber and an inner balance chamber. Smoke or invisible products of combustion can freely penetrate the outer chamber, but the inner chamber is closed. A stainless steel screen prevents bugs or lint from entering the chambers. With both chambers ionized by a single Americium 241 source, a very small current flows in the circuit. The presence of visible smoke or invisible products of combustion have a great influence upon the current flow in the outer chamber and will cause a change in the voltage ratio between the chambers. This difference is then amplified inside the detector and provides an output recognizable to the control panel as an alarm signal.

FEATURES

The Fike 67-015 Ionization Detector is composed of two separate components. The detector mounting "base" and the detector "head" which houses the chambers and contains a circuit board with the necessary electronics. The detector head twists into this standard base and a locking screw is provided to securely lock the head in place thereby eliminating the possibility of tampering. The standard base also allows for interchanging of photoelectric, ionization, thermal and other Fike Detectors for uniformity and greater flexibility in detection system design. The detector head houses an alarm L.E.D. which pulsates while the detector is in normal standby and lights steadily upon the detector sensing an alarm condition. Each detector head is also equipped to provide a remote annunciator output which will duplicate the alarm L.E.D. during an alarm condition. All connections are made to the terminal strip located on the base.

The Fike 67-015 Ionization Detector has incorporated new compensating circuits for improving stability under conditions of extremes in temperature, humidity, and atmospheric changes. The detector is also relatively insensitive to aerosols such as Halon 1301, 1211 and 122. The detector circuitry has been computer designed for RF immunity (1 Khz thru 100 Mhz) air flow has little impact on sensitivity, thereby making it very suitable for data processing sub-floors or other such applications with high air velocities.

Calibration may be tested or adjusted in the field to suit the desired detection characteristics. Testing can be performed either in place or in the sensitivity monitor. The monitor also can test the calibration of photoelectric units.

ARCHITECT SPECIFICATIONS

The Products of Combustion Detectors, Ionization Type, shall be Fike 67-015. The detector shall utilize solid state circuitry and be of the dual chamber configuration. One chamber shall be open to sense particles of combustion while the other will be used as a reference chamber for stability. The unit shall be designed so as to be unaffected by RF energy from 1 Khz thru 100 Mhz. The detectors shall also be unaffected by air velocities up to 1200 feet per minute.

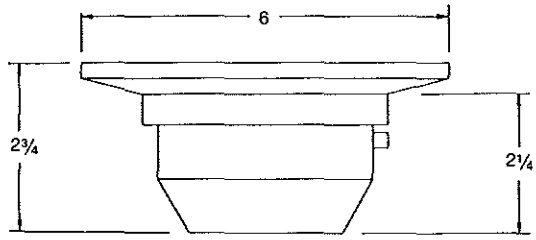
The ionization type detector shall utilize a standard base so that it may readily be interchanged, without any modifications, with photoelectric, thermal, or other type detectors. The detector head shall be equipped with a L.E.D. which pulsates while the detector is in normal standby and lights steadily upon the detector sensing an alarm condition. The detector will have the ability to power a remote annunciator which will duplicate the alarm L.E.D. during an alarm condition. The detector head shall be equipped with a means of securing the head to the base in such a fashion that the head may not readily be tampered with or removed.

The detector head shall be removable from its base for cleaning, service or replacement. The detector shall be capable of having its calibration checked or adjusted in the field via the standard detector sensitivity monitor. This same monitor shall be capable of checking ionization and photoelectric detectors. The detector may have its sensitivity tested either in place as its exposed to the environment or in a calibrated sensitivity monitor to give a reading of sensitivity which can be referenced against other like detectors under known conditions. The detectors shall be Factory Mutual approved, ULC listed and UL listed to UL Standard 268.

TECHNICAL SPECIFICATIONS

Operating Voltage — 18.8 to 27.7 VDC
Current Draw — Normal 40 microamps @ 24 VDC
Alarm 85 milliamps @ 24 VDC
Operating Temperature +32°F to +120°F
Mounting — 4" octagonal outlet box
Weight — 5.5 oz. without base
5.11 oz. with base
Humidity — 95% relative humidity max
Air Velocity — Stable 0 to 3000 FPM
(less than 4% smoke obscuration difference)
RF Immune — 1 kHz thru 1000 mHz
Ionization Source — 1.0 microcuries Americium 241

DIMENSIONS



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Fike Fire Suppression Systems

CONTROL ACCESSORIES

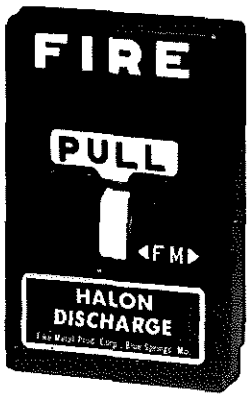
U.L. & U.L.C. LISTED
F.M. APPROVED

CATALOG NUMBER 1025

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

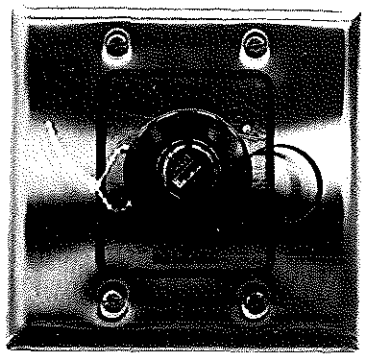
MANUAL PULL STATION 20-007



DESCRIPTION

The Manual Pull Station provides a means of manually discharging the automatic fire extinguishing system when used in conjunction with the FIKE Control Panel.

The Manual Pull Station's front housing and pull-lever are red and white high impact plastic with raised lettering, tipped white and red respectively. The 16 gauge steel backplate is primed and finished in red enamel. The dimensions of the station are approximately 5-1/4" high, 3-1/2" wide with an overall depth of 3/4" (semi-flush). The semi-flush stations mount on a standard single gang switch box. The switch ratings are listed 6 amp 125VAC. The Manual Pull Station is provided with one 4 position terminal strip for field wiring connections.



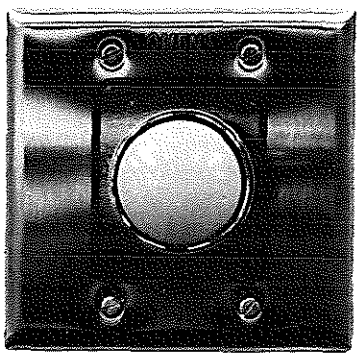
MANUAL RELEASE SWITCH 10-1638

DESCRIPTION

The Manual Release Switch is a dual actuation device which provides a means of manually discharging the automatic fire extinguishing system when used in conjunction with the FIKE Control Panel.

To operate the Manual Release Switch pull the spring clip safety pin (breaking the seal) and depress the button. The switch will remain engaged until released by unlocking the button with a key. A single normally open contact block is provided.

The front housing of the Release Switch is constructed of stainless steel with the keyed red plastic release button centered and bordered in black trim. The dimensions of this component are 4-1/2" wide, 4-9/16" high and 2-3/8" deep, and it may be mounted to a standard 4" electrical box or others (reference Data Sheet 1031). Electrical connections may be made through the knock-outs on the side of the box using 1/2" conduit fittings.



SYSTEM ABORT SWITCH 10-1639

DESCRIPTION

The System Abort Switch is designed to be used in conjunction with other system equipment. It provides a temporary manual means by which the Halon 1301 Container actuation circuit may be interrupted before automatic actuation occurs. The unit employs a momentary contact push button switch. While depressed, the switch causes the Halon release circuit to be manually delayed. Upon release of the Abort Switch, with the exception of optional time delays, the system will discharge the containers if the required detection circuits are in alarm.

The Abort Switch may be mounted to a standard 4" electrical box or others (reference Data Sheet 1031). Electrical connections to the box can be made through the provided knock-outs using 1/2" conduit fittings.

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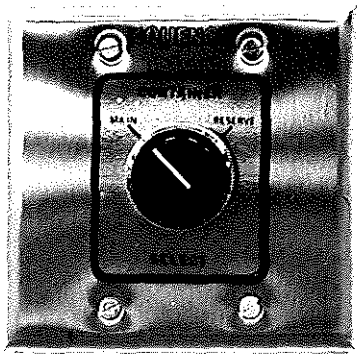


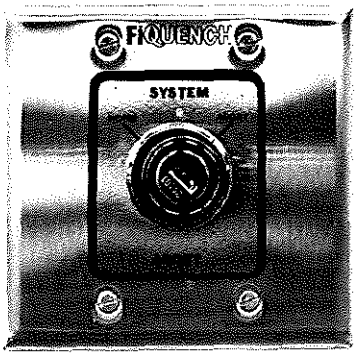
MAIN-RESERVE SWITCH 10-1640

DESCRIPTION

The "Main" to "Reserve" switch is used with systems that incorporate main and reserve (back-up) Halon 1301 containers. The switch may utilize 1 or 2 Form "C" Contact blocks which will provide an electrical path to either the "Main" or "Reserve" Halon 1301 containers.

In the event of an actual system discharge, and the control panel and detectors have been reset the switch may be moved to the "Reserve" position. The Control Panel may then be placed in a normal mode for uninterrupted FIKE protection. After the containers in the "Main" system have been recharged and all the wiring circuits have been thoroughly checked out, the switch may be returned to the "Main" position.

The switch may be mounted to a standard 4" electrical box or others (reference Data Sheet 1031). Electrical connections may be made through the knock-outs on the side of the box using 1/2" conduit fittings.

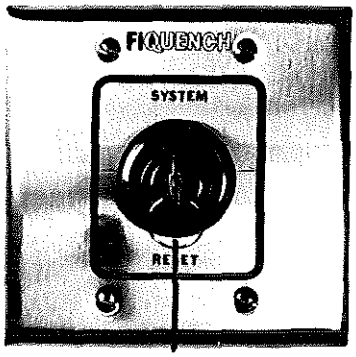


KEYED ABORT SWITCH 10-1642

DESCRIPTION

The System Abort Switch is designed to be used in conjunction with other system equipment. It provides a temporary manual means by which the Halon 1301 container actuation circuit may be interrupted before automatic actuation occurs. The unit employs a keyed contact switch with two positions, normal and abort. While in the extreme left hand position the Abort Switch is in the "normal" mode. In the extreme right hand position the Halon release circuit is manually delayed.

The Keyed Abort Switch may be mounted to a standard 4" electrical box or others (reference Data Sheet 1031). Electrical connections to the box can be made through the provided knock-outs using 1/2" conduit fittings.



KEYED REMOTE RESET 10-1641

DESCRIPTION

The Keyed Remote Reset Switch provides a method for resetting the Control Panel from a remote location. To reset the Control Panel simply insert the key and turn in a clockwise direction. Upon release of the key the spring loaded switch will return to its original position.

The front housing of the Keyed Remote Reset Switch is constructed of stainless steel and is 4-1/2" wide, 4-9/16" high and 2-3/8" deep. It may be mounted to a standard 4" electrical box or others (reference Data Sheet 1031). Electrical connections to the box can be made through the knockouts provided on the side of the box using 1/2" conduit fittings.

NOTE: All numbers in this section reference switches only, stainless steel face plates are provided with back box assemblies.

Fike Fire Suppression Systems

INSTRUCTIONAL SIGNS

CATALOG NUMBER 1026

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

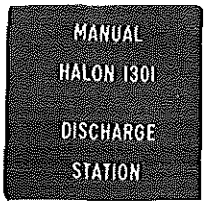
Instructional signs should be supplied in order to provide for a system in which the function of all devices is easy to understand. Fike offers several different "standard" signs to comply with N.F.P.A. and other industry requirements. All signs are durable plastic and backed with a strong adhesive for easy installation. Signs are typically installed at all entrances (CAUTION - Room Protected By HALON 1301) and near any device for which the extra explanation is helpful. Custom signs are available upon special request.

CAUTION SIGN 02-1673

DESCRIPTION

The purpose of the Caution Sign is to alert personnel that the room is protected by Halon 1301 and that all doors should be kept closed in the event of fire. The sign is 10" x 14" x 1/16" and constructed of black plastic with a yellow face. The Caution Sign should be conspicuously located in any room where Halon 1301 protection is being provided.

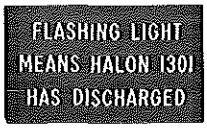
MANUAL DISCHARGE STATION SIGN 02-1674



DESCRIPTION

The purpose of the Manual Discharge Station Sign is to identify the manual pull station as the place where the Halon 1301 can be manually discharged. It also minimizes the possibility of the manual pull station being mistaken for a fire alarm device. The sign is a 4"×4"×1/16" square constructed of plastic with white lettering on a red background. The Manual Discharge Station Sign should be located in the proximity of the manual pull station for quick positive identification.

FLASHING LIGHT SIGN 02-1675



DESCRIPTION

The purpose of the Flashing Light Sign is to explain the presence of flashing lights in the event of a Halon 1301 discharge. The sign is 7" x 4¼" x 1/16" and is constructed of plastic with white lettering on a red background. The Flashing Light Sign should be located in the proximity of the Flashing Light unit. This will alert personnel when Halon 1301 has been discharged and allow them to take appropriate actions.

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Fike Fire Suppression Systems

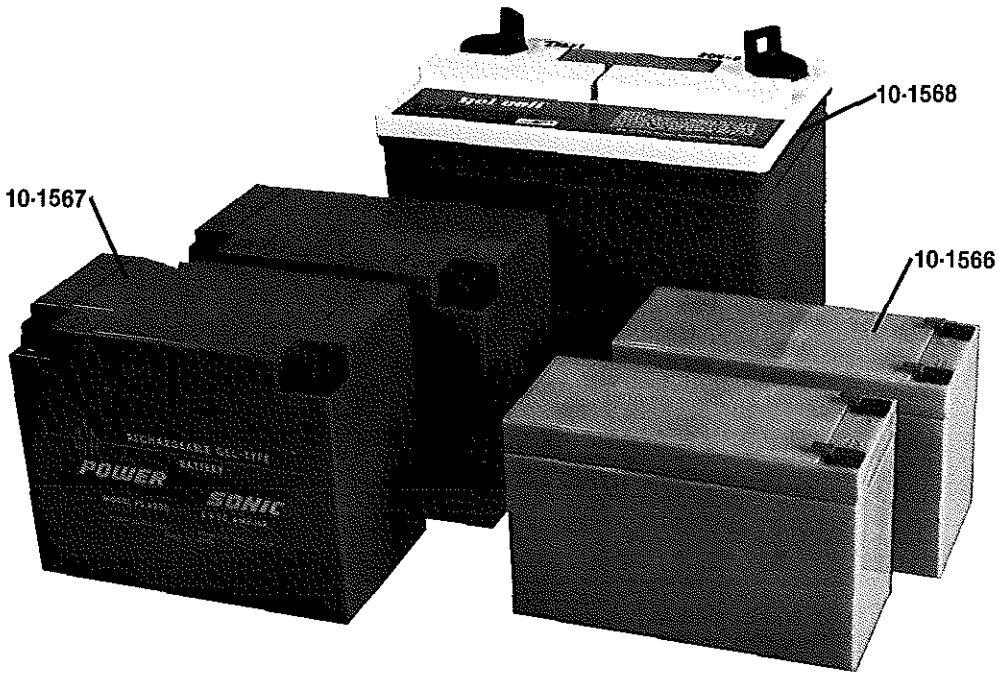
BATTERIES

CATALOG NUMBER 1036

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

10-1566
10-1567
10-1568



DESCRIPTION

Fike 10-1566, -1567 and -1568 Batteries are standby power supplies for use with Fike System Control Panels. Upon the loss of AC power, the system central control module will transfer from AC power to its standby battery supply. The system central control module is provided with a charger to maintain batteries at a full charge and to bring discharged batteries back to par.

Batteries are sized to provide a minimum of 24 hours standby power and still have enough power left to energize all alarm devices for 10 minutes and then discharge all system containers, Fike personnel will determine the appropriate sized batteries for each system.

Fike Systems utilize the maintenance free, gelled electrolyte type batteries, and require 24 VDC. Two or more batteries may be combined to meet this requirement.

Table 1 lists the Fike control enclosures and indicates which batteries are contained within them.

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Table 1

CONTROL ENCLOSURES	BATTERY P.N.	AH CAPACITY
10-101-1 ("A" Size)	-10-1566	6.5 AH
10-101-2 ("B" Size)	-10-1567 -10-1568	20 AH 28 AH*
10-101-3 ("C" Size)	-10-1567 -10-1568	20 AH 28 AH*

*Separate Battery Box Required

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Fike Fire Suppression Systems

CONTROL PANEL

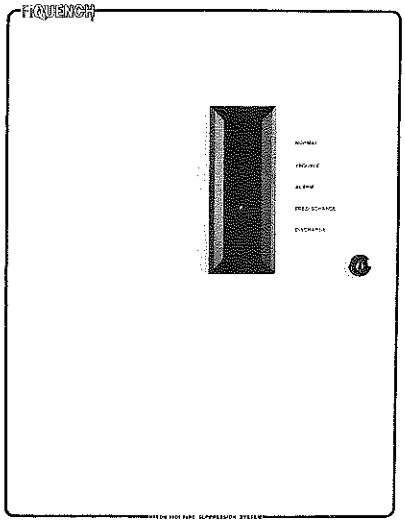
CATALOG NUMBER 1038

10-038

U.L. & U.L.C. LISTED
F.M. APPROVED

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications



FEATURES

- VERIFIED DETECTION CONCEPT — AN IMPROVEMENT OVER CROSS-ZONING
- PARALLEL WIRING OF INITIATORS
- CLASS "A" WIRING CAPABILITIES FOR DETECTION AND AGENT RELEASE CIRCUITS
- 3 AUDIBLE CIRCUITS — EACH INDIVIDUALLY SILENCEABLE
- 7 SETS OF 10 AMP RATED AUXILIARY CONTACTS
- MAINTENANCE FREE, BATTERY POWER STANDARD

SPECIAL FEATURES

The FIKE 10-038 Single Hazard Halon 1301 Releasing Control Panel continues the Fike tradition of innovative releasing equipment. In addition to the concepts pioneered by the FIKE 10-038's predecessor, the 10-014 Omni Control Panel, many new and important advancements have been added.

Perhaps one of the most significant advances in Halon 1301 control equipment over the past several years has been the development of the "Verified Detection" concept. The Verified Detection concept eliminates the need for two zones of detection (cross-zoning). When you use the cross-zoning method, it is possible for two or more detectors on a single zone to "alarm" but not release the extinguishing agent. With the Verified Detection concept, any single detector will generate an alarm signal and any two or more active detectors will generate a discharge signal — regardless of the proximity of their locations.

The Verified Detection concept also offers advantages in installation costs. With a typical cross-zoned system using two-wire detectors (a "best case" situation — 4 wire detectors make an even worse case for cross-zoning), two wires would be required for each zone and then two wires for the Manual Halon Release Stations. Cross-zoning, under best circumstances, requires six wires. However, with the Verified Detection concept all detectors and manual releases are installed on a basic, supervised, two-wire circuit. The final savings is more than just four wires! This may allow for smaller conduit sizes thereby creating another savings. Also, the simple two-wire circuit is easier to install as opposed to cross-zoning where the electrician must constantly be on the alert to alternate zones for detectors. This problem compounds with sub-floor detectors where a cross-zoned system must now alternate horizontally and vertically!

The benefits of the Verified Detection concept are many. Reliability with reference to discharge, better detector coverages and the installation edge are just two of the major points. The Verified Detection concept has been U.L. listed and Factory Mutual approved. The Industrial Risk Insurers Interpretive Guide points out that systems such as FIKE's Verified Detection are indeed acceptable and equal where cross-zoning had been specified in the past. Installations using the Verified Detection concept are now operational at many governmental facilities such as the Departments of Labor, Treasury, Energy, and more. The Russell Senate Office Building, C.I.A., and installations with the Army, Navy and Air Force have also found the benefits of the FIKE 10-038 very desirable.

Another industry advancement pioneered by FIKE control equipment is the use of electrical initiators wired in a parallel fashion. This too improves system reliability as a broken or disconnected wire in the initiator circuit will not totally incapacitate the entire system. With parallel-wired initiators, a break in the wiring would only cause a loss of that container or possibly any containers electrically "downstream" from the control panel. This feature is possible through the use of FIKE's patented Agent Release Modules which maintains circuitry to fully supervise all lines and to contain the necessary energy to operate the initiator.

Reliability has been a premier concern in all FIKE control equipment. The 10-038 control continues our policy of offering both Class "A" wiring and Class "B" wiring for all detection and Halon release circuits. By utilizing Class "A" wiring, a customer is assured that a break or disconnect in any single conductor will generate a trouble indication, however, the system will remain totally operational! Com-

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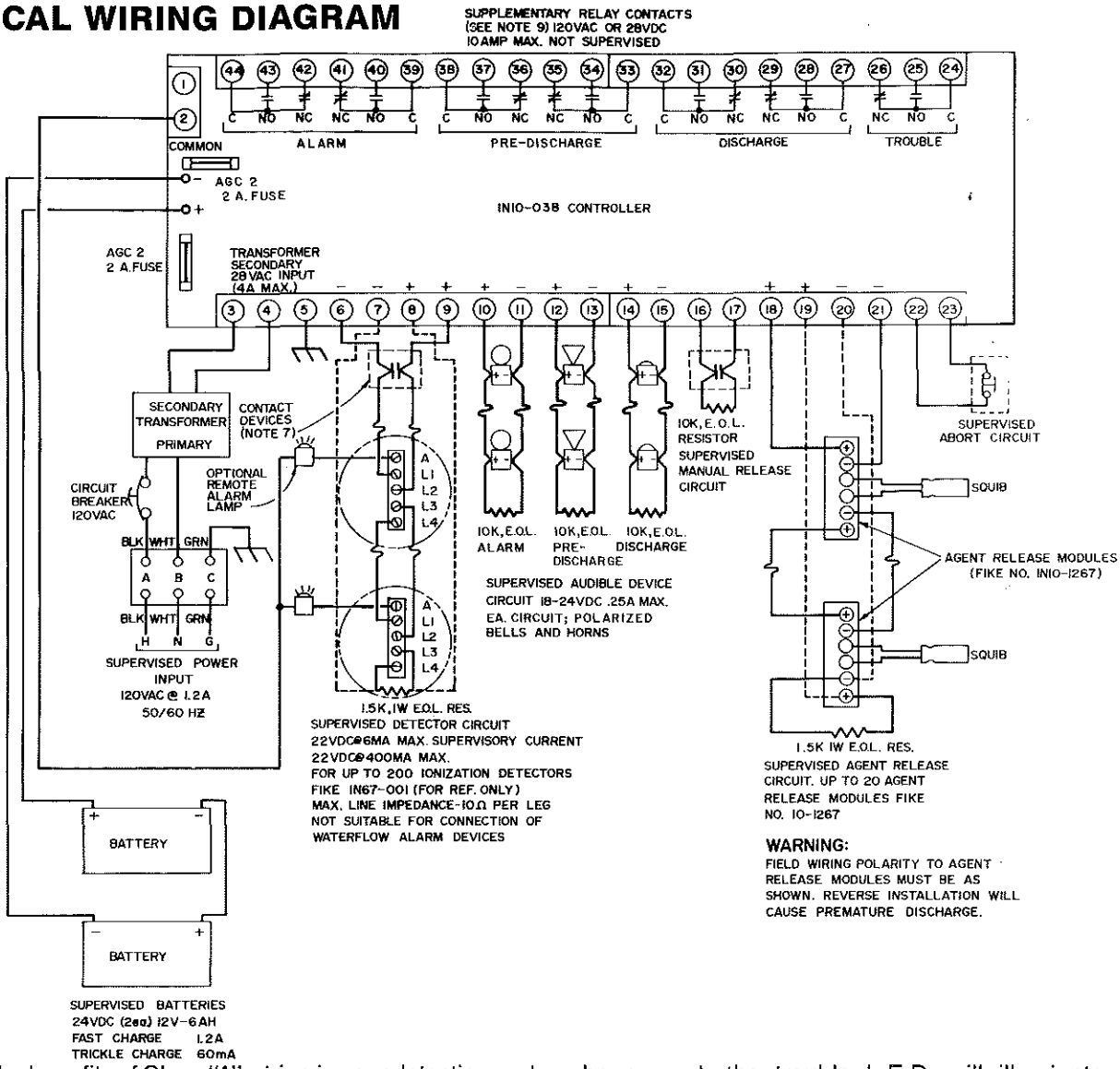
TYPICAL WIRING DIAGRAM



WARNING:
FIELD WIRING POLARITY TO AGENT RELEASE MODULES MUST BE AS SHOWN. REVERSE INSTALLATION WILL CAUSE PREMATURE DISCHARGE.

bining the benefits of Class "A" wiring in your detection and release circuits along with FIKE's Verified Detection concept and paralleled Agent Release circuit results in the most reliable system available today for Halon 1301 Suppression Systems!

OPERATION SEQUENCE

The FIKE 10-038 Control Panel is designed for non-coded, Automatic Fire Detection and Halon 1301 Fire Suppression Systems using low-voltage, two-wire detectors (ionization, photoelectric, thermal and others) and FIKE 70 Series Halon 1301 containers. The 10-038 Control Panel will, when properly installed and maintained, automatically detect and suppress fires while providing audible and visual indications of trouble, alarm, pre-discharge and discharge conditions.

Located behind a smoked plexiglas bezel are five L.E.D.'s which indicate general system status. They are:

Normal - Green L.E.D.
Trouble - Amber L.E.D.
Alarm - Red L.E.D.
Pre-Discharge - Red L.E.D.
Discharge - Red L.E.D.

A normal indication verifies that the system is operational. All circuits are supervised. Should an abnormal condition be sensed, the trouble L.E.D. will illuminate, a self-contained audible signal will operate and a set of SPDT, 10 amp rated contacts will transfer. These actions provide general indication of a trouble condition. By opening the control panel door, 10 L.E.D.'s located about the control circuit board come into view. These 10 diagnostic L.E.D.'s further identify the exact circuit within which the "trouble" exists. These 10 L.E.D.'s indicate "trouble" within the following circuits:

AC Power Loss or "Brown-Out"/DC Power—battery open or shorted cell, low voltage
Ground Fault
Pre-Discharge Audible Circuit
Alarm Audible Circuit
Discharge Audible Circuit
Detection Circuit
Initiator Defective
Initiator Circuit Wiring Defective
Manual Halon Release
Abort Switch Circuit

In the event a detector senses a fire condition, the system enters the "Alarm" mode. Activation of the red alarm L.E.D. visible through the cover takes place in addition to the activation of the Alarm Audible Circuit. At the same instant, a set of DPDT, 10 amp rated contacts will transfer. These contacts can be used for air shut-down, door closures, etc.

Should any second detector sense a fire condition, the system enters the "Pre-Discharge" mode. The Pre-Discharge Audible Circuit is activated and an additional set of DPDT, 10 amp rated contacts will transfer. At this time an integral solid state, field adjustable time delay circuit will activate and begin timing down to discharge. Should the time delay not be desired, it is simply set at zero seconds and the release of the Halon 1301 is simultaneous with the second detector activating.

Upon a second detector activating and/or the time delay expiring, the red discharge L.E.D. becomes visible through the cover. The Halon is immediately discharged and the discharge audible device is activated. Another set of DPDT, 10 amp rated contacts transfer.

Should an Abort Switch be connected to the panel, it is possible to manually delay the system from discharging. Four abort circuit configurations are available:

#1 Abort sequence which complies with the I.R.I. requirements. I.R.I. requires that the abort only be active after the first detector activates and before a second detector can activate.
#2 Abort may operate any time after 1st detector and prior to discharge. Operation of abort has **no effect** on any time delays.
#3 Abort operational at any time during alarm or pre-discharge modes. Operation of the abort switch immediately causes the time delay to become "0".
#4 Operation of the abort switch automatically recycles the time delay to original setting and starts countdown again.

A manual Halon release device may be installed within the detection circuit, in which case its operation automatically places the system in the "Pre-Discharge" mode. If a time delay is programmed, the manual release would not effect the time delay. If the manual releases are connected to the separate manual release circuit, their operation will automatically place the system in the Discharge mode, overriding any time delay or abort function.

OTHER ACCESSORIES

Each FIKE 10-038 Control Panel is equipped with a supervised, container disable switch. In its "normal" position, the system will function as previously described. When moved to the "disabled" position, the Agent Release Modules are electrically prevented from receiving a discharge signal. At the same time, a trouble signal is generated to alert personnel that this "abnormal" condition exists. This feature is beneficial when testing the system or when activities in the area may cause detectors to activate when you do not wish to operate the system. Service of air handling units, data processing equipment or other such equipment would be such an example. Note that the detection portion of the system would still be active and could detect a fire condition and activate an audible circuit.

The FIKE 10-038 comes with 6½ Amp Hour, maintenance free, rechargeable battery power. These 6½AH batteries are capable of powering a system loaded to maximum capacity for an excess of 24 hours in the standby mode and still have ample power to operate all functions. These batteries, which are in the same enclosure, are supervised and a trouble indication is generated when an abnormally low voltage or an open or shorted cell is sensed by the control circuitry.

ADDITIONAL FEATURES

a) 3 audible circuits—each rated @ 24 VDC, 0.25 A
b) 3 audible silence switches
c) Auxiliary contacts: 1 SPDT on Trouble, 1 DPDT on Alarm, Pre-Discharge and Discharge
d) 10 diagnostic L.E.D.'s for easy trouble-shooting
e) Solid-State, Field Programmable Time Delay — 0-60 seconds
f) 4 abort options including I.R.I. method
g) All components, including batteries, are located in single enclosure
h) Unit may be flush or surface mounted
i) Protective covers over all auxiliary relay terminals where high voltage lines may be routed (i.e., Equipment shutdowns, etc.)
j) Connections to power a remote annunciator
k) AC input protected by circuit breaker — not a fuse
l) Container Disable Switch — isolates the Halon container(s) so testing can be performed. Operation causes a trouble signal.

ARCHITECT SPECIFICATIONS

The Control Panel to be used for the Automatic Fire Detection and Halon 1301 Suppression System shall be a FIKE 10-038 releasing control. The Control Panel shall be U.L. and U.L.C. listed and bear Factory Mutual approval. The control panel shall include:

- Verified Detection (cross-zoning will **not be** considered equal)
- Parallel wired Agent Release Modules using electrical initiators
- Class "A" wiring of the detection and Halon release circuits
- Minimum of 24 hours of battery standby power — housed in same cabinet
- 3 Supervised audible circuits — each individually silenceable
- 7 Sets of 10 Amp auxiliary contacts

The control panel shall operate on the "Verified Detection" concept. Cross-zoning will not be considered as equal. With the Verified Detection concept, any single activated detector will be processed by the control panel and be indicated as an "Alarm" condition. This shall cause the alarm audible device circuit and the red alarm L.E.D. on the cover to activate. The activation of any second detector, regardless of its location, shall cause the system to enter the pre-discharge audible device circuit and start the programmed, solid state, time delay circuit. If no time delay is programmed, the system shall immediately discharge upon activation of the second detector. As the agent discharges, the discharge audible device circuit shall be energized and the red discharge L.E.D. on the panel will illuminate. Each audible circuit shall be capable of being individually silenced.

The control panel shall utilize parallel wired initiators as the method of discharging the extinguishing agent. The electrical initiator at each container shall be connected to the Agent Release Module, also at each container, which shall be a solid state circuit which provides the firing voltage. When a discharge signal is generated at the control panel, all agent release modules shall operate instantly, discharging the containers. All agent release modules shall be wired in a Class "A" configuration. Any system utilizing series-wired initiators, solenoids or mechanically operated valves

shall not be acceptable. All initiator wiring shall be fully supervised.

The control panel shall be equipped with a supervised "Container Disable" switch. Operation of this switch shall generate a trouble signal and shall electrically isolate the Agent Release Modules from receiving a discharge signal.

The control panel shall be equipped with auxiliary relays for shut-down operations. As a minimum, panel shall have one (1) SPDT relay for trouble, one (1) DPDT relay for alarm, one (1) DPDT relay for pre-discharge and (1) DPDT relay for discharge. All relays shall be rated at 10 Amps (resistive).

The control panel, in addition to its yellow system trouble L.E.D., shall further indicate a trouble condition by individual circuits. These ten (10) diagnostic L.E.D.'s shall indicate the exact circuit which is in trouble. These LED's shall indicate trouble in:

AC Power Loss or "Brown-Out"/DC Power—Battery Circuit
Ground Fault
Pre-Discharge Audible Circuit
Alarm Audible Circuit
Discharge Audible Circuit
Detection Circuit
Initiator Defective
Discharge Wiring Defective
Manual Release Circuit
Abort Circuit

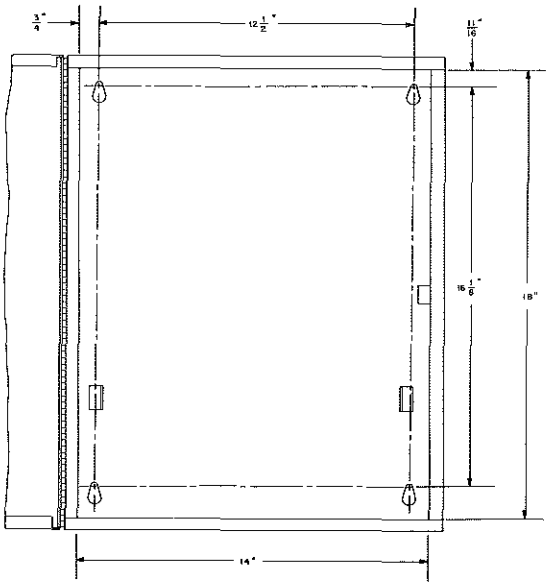
The control panel shall house its own standby battery power. The batteries shall be sized to provide a minimum of 24 hours of standby power but in no case shall be less than 6½AH capacity. Batteries shall be supervised and a trouble signal shall be provided when low battery voltage or an open or shorted cell is sensed by the control circuitry.

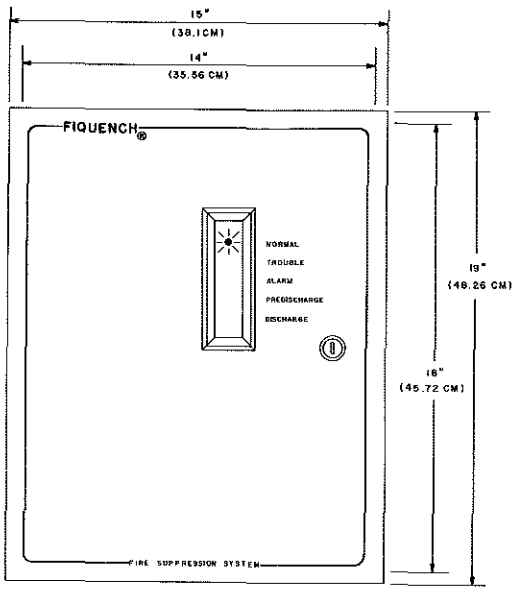
The control panel shall, without the addition of any additional parts, be able to accommodate supervised abort switches. By programming the control panel, the abort circuitry shall operate per I.R.I. standards or any of the industry's other methods.

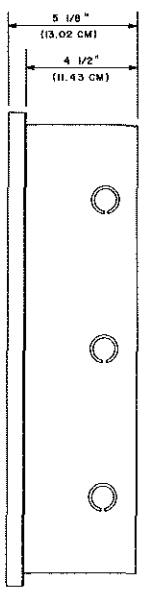
The control panel shall be furnished with a solid-state, field adjustable time delay. The time delay shall be adjustable in one second increments with a maximum setting of 60 seconds.

The control panel shall be constructed of 18 gauge steel finished with an attractive almond paint. Only the audio/visual signals activated shall be visible. Cabinet shall be sized so that the batteries may be located in the same enclosure. All terminal strips which may have more than 24 VDC, such as power input and auxiliary relays, shall have protective covers to prevent anyone from coming into accidental contact with a live terminal. Cabinet shall be capable of being flush mounted without the need of accessories. The control panel shall operate off of 115 VAC, 50/60 cycle. The system shall also be able to operate off 220 VAC if required. All power shall originate from a circuit breaker dedicated for this panel only. Within the panel the AC inputs shall be protected by a circuit breaker rather than fuses.

DIMENSIONS & MOUNTING DATA:







Fike Fire Suppression Systems

AUDIO-VISUAL ALARM DEVICES

CATALOG NUMBER 1010

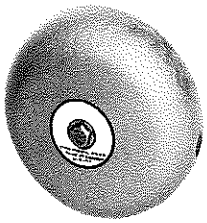
20-049 THRU 20-057

U.L. LISTED
F.M. APPROVED
B.S.A.

Halon 1301 Fire Extinguishing Systems

Engineer and Architect Specifications

ALARM BELL 20-053



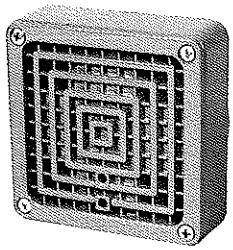
DESCRIPTION

The Fike Alarm Bell is a U.L. listed, low power consuming audible device. It consumes .030 amp at 24 VDC and is polarized for use on the supervised circuits available on the Fike Control Panel. The Alarm Bell is constructed from a high quality die casting and provided with a baked red finish. It mounts to a standard 4" square outlet box. Special mounting boxes are available upon request. Typical output of the Fike Alarm Bell is 84dBA at 24VDC.

ARCHITECT SPECIFICATIONS

Upon entering the Pre-Discharge (ALARM) Mode, audible indication shall be supplied by a Fike Series 20-053 Alarm Bell. This unit shall be polarized for full supervision and U.L. listed. It shall consume only .030 amp at 24VDC and have an output of 84dBA at 24VDC. The Alarm Bell shall be ruggedly constructed and provided with a baked red finish.

ALARM HORN 20-051



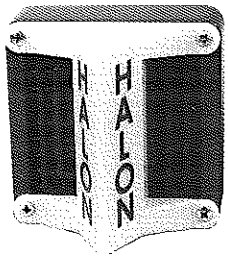
DESCRIPTION

The Fike Alarm Horn is a U.L. listed, low power consuming audible device. It consumes .035 amp at 24VDC and is polarized for use on the supervised circuits available on the Fike Control Panel. The Alarm Horn is constructed from a high quality die casting and provided with a baked red finish. It mounts to a standard 4" square outlet box. Special mounting boxes are available upon request. Typical output of the Fike Alarm Horn is 97dBA at 24VDC.

ARCHITECT SPECIFICATIONS

Upon entering the Discharge (FIRED) Mode, audible indication shall be provided by a Fike Series 20-051 Alarm Horn. This unit shall be polarized for full supervision and U.L. listed. It shall consume .035 amp at 24VDC and have an output of 97dBA at 24VDC. The Alarm Horn shall be ruggedly constructed and provided with a baked red finish.

STROBE HORN 20-049



DESCRIPTION

The Fike Strobe Horn combines a low power DC horn with a high intensity flashing light to provide both audible and visual signaling. It consumes .068 amp at 24VDC and is polarized for use on the supervised circuits available on the Fike Control Panel. The low power consumption and U.L. listing make the Strobe Horn ideal for use with Detection and Suppression Systems.

The light source is a Xenon flash tube. This eliminates problems inherent with incandescent light sources. The effective light intensity of each flash is approximately 1 Candela. At 24VDC the typical flash rate is 50 flashes per minute minimum, and horn output is 97dBA.

The Horn assembly is housed in a rugged die cast enclosure that has been painted fire alarm gloss red. The light source is sealed in silicone and protected by a sturdy Lexan lens with the word "HALON" imprinted on it.

The Strobe Horn mounts to a standard 4" square outlet box. Special mounting boxes are available upon request.

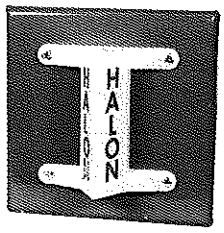
ARCHITECT SPECIFICATIONS

Upon entering either the Pre-Discharge (ALARM) mode or Discharge (FIRED) Mode, whichever the unit is chosen to indicate, audible and visual indication shall be supplied by the Fike Series 20-049 Strobe Horns. These devices shall be supplied with 24VDC power by the Control Panel and shall be supervised against faults. The Horn shall be rated for 97dBA at 24VDC. The Strobe shall develop an effective light intensity of approximately 1 Candela peak light intensity. The Strobe lens shall be of white translucent construction with the word "HALON" imprinted upon it. Total current draw of the Strobe Horn shall not exceed .070 amp at 24VDC.

Fike Fire Suppression Systems
Division Fike Corporation
704 South 10th Street • P.O. Box 610 • Blue Springs, Missouri 64015 U.S.A. • (816) 229-3405 • Telex 42263 • Telefax (816) 229-4615

April, 1988
Revised Issue

REMOTE STROBE LIGHT 20-056



DESCRIPTION

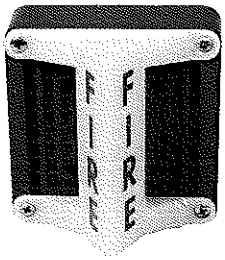
The Fike Remote Strobe Light provides a high intensity flashing light for indication of a Halon 1301 discharge. This low power device consumes .033 amp at 24VDC and is polarized for use on the supervised circuits available on the Fike Control Panel. The Fike Remote Strobe Light is U.L. listed for indoor applications. The flash rate is 50 flashes per minute minimum, at 24VDC.

The Xenon flash tube is sealed in silicone and housed in a sturdy Lexan lens, which is attached to a fire alarm gloss red back plate. The white translucent lens has the word "HALON" imprinted on two sides. The Remote Strobe Light mounts to a standard 4" outlet box.

ARCHITECT SPECIFICATIONS

Visual indication of a Halon 1301 discharge shall be supplied by a Fike Series 20-047 Remote Strobe Light. This device shall be polarized for supervision and shall receive its 24VDC power from the Control Panel. It shall be U.L. listed for indoor applications. Effective light intensity of each flash shall be approximately 1 Candela. Total current draw, per device, shall be .033 amp at 24VDC. The Xenon flash tube shall be sealed in a sturdy Lexan lens. The translucent white lens shall have the word "HALON" imprinted on three sides.

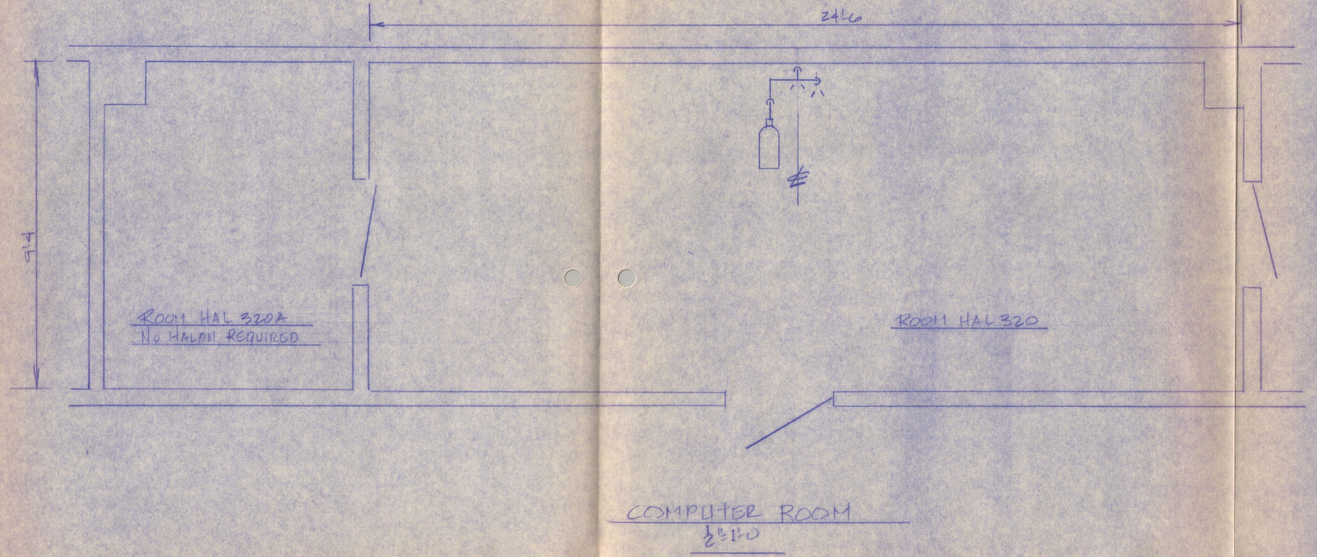
STROBE HORN 20-050



This strobe horn is identical to the Fike 20-049 strobe horn, except that its lens is imprinted with the word "FIRE." All other characteristics are identical.

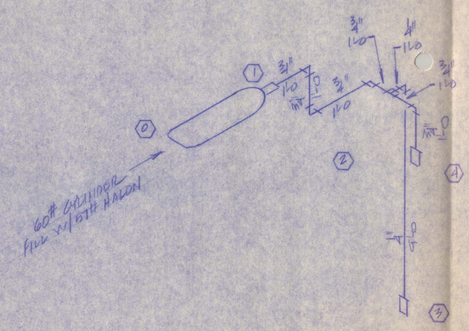
REMOTE STROBE LIGHT 20-057

This remote strobe light is identical to the Fike 20-056, except that its lens is imprinted with the word "FIRE." All other characteristics are identical.



HALON CALCULATION CHART

SYSTEM	AREA IDENTIFICATION	AREA (SQ. FT.)	HEIGHT	VOLUME (CU. FT.)	DESIGN TEMP.	DESIGN CONC.	#/FT. ON HALON	HALON LBS.
1	COMPUTER RM	228.8	8.5	1942	70°	6%	.0214	49
1	SUB FLOOR	297.6	1'-0	297.6	70°	6%	.0294	8



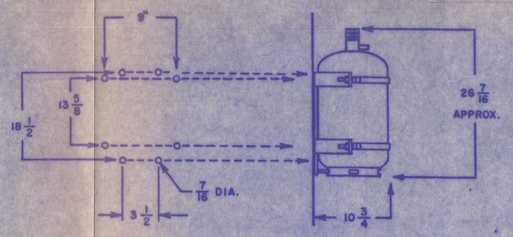
Piping shall be black and galvanized steel pipe (ASTM A 53 or A 106) Schedule 40. Pipe fittings shall be Malleable Iron 300# class (ASTMA 197) or ductile Iron 300# class (ASTM A 395). For 3/4" or smaller, 150# class fittings are acceptable. Ordinary cast iron pipe, steel pipe conforming to ASTM A 120, non-metallic pipe, or cast iron fittings shall not be used. Threaded pipe should be reamed and blown clear and swabbed with solvent to remove mill varnish and cutting oils before assembly. Some effective solvents are trichlorethylene, percholorethylene, etc. Use teflon tape only to seal threaded pipe joints. All piping must be rigidly supported by UL approved pipe hangers. When installing containers up to 60#, use pipe unions as close as possible to the valve to permit container removal for service and recharge. Prior to nozzle installation, blow out the piping with compressed air to remove chips or other debris. The extinguishing system cylinders shall not be relied upon for support of piping. All pipings shall be rigidly secured by means of UL listed pipe hangers. All piping shall be supported directly by the building structure, except as otherwise specified herein, Section 3500 NFPA pamphlet NO. 13 (Sprinkler System) shall apply

These Installation Specifications are not meant to supersede the current edition of NFPA 12-A.

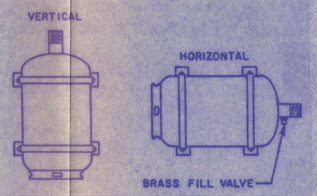
There shall be a support on the horizontal run within 6" or less of any vertical drop. Lateral bracing shall be provided at nozzles and where required to absorb forces developed during discharge. Design basis for pipe supports shall be actual weight plus 250# live load on each span. There shall be at least 1/2" clearance around pipe fittings where they pierce floors or ceilings. A one-piece escutcheon shall be provided to dress the opening.

60# CONTAINER ASSEMBLY

THE 60# CONTAINER BRACKET MAY BE SECURED TO THE MOUNTING SURFACE USING A MINIMUM OF FOUR 3/8" BOLTS. SELECT THE MOST SUITABLE BOLTING PATTERN, LOCATING AT LEAST ONE BOLT IN EACH CORNER SET OF HOLES.



60# CONTAINER ASSEMBLY MAY BE INSTALLED IN THE VERTICAL OR HORIZONTAL POSITION. WHEN INSTALLED IN THE HORIZONTAL POSITION THE BRASS FILL VALVE MUST POINT DOWN.



VFSD02.10 — Fike Fire Suppression Systems — Page 1
** OPTIMIZED **
Halon 1301 Flow Calculations

Filename: 469-A
Date: 08-10-989
Time: 13:04:26

Job: 469-A

Customer: U. Of K. Medical Center
University Of Kentucky
Lexington, Kentucky

Application: Halon System For Computer Room

Prepared by: Vulcan Fire Systems, Inc.
10482 Bluegrass Parkway
Louisville, KY 40299
(502) 499-1520

***** HAZARD SUMMARY *****

Area 1		Area 2	
Name:	Computer Room	Name:	Sub Floor
Volume:	1942 cuft	Volume:	297.6 cuft
Concentration:	6.06 %	Concentration:	6.43 %
Temperature:	70 deg F.	Temperature:	70 deg F.
Elevation:	0 ft.	Elevation:	0 ft.
Agent Weight:	49 lbs	Agent Weight:	8 lbs

***** CYLINDER DATA *****

Nominal Tank Size	Fill Wt. (lbs)	Fill Density (lb/cuft)	NUMBER of Tanks	TOTAL AGENT WT. (lbs)	% IN Pipe
60	57	61.50	1	57	6.4

***** PIPE DATA *****

From	To	Total Flow (lb)	Pipe Size (in)	Pipe Lgth (ft)	Elev Chng (ft)	90 EL	45 EL	TT	ST	UC	NZ SC	NZ	Xeq Lgth (ft)	Eq Lgth (ft)	Pipe Sched
0	1	57.00	0.75	0.00	+6.00	0	0	0	0	0	0	0	0.0	4.5	40
1	2	57.00	0.75	4.00	-2.00	2	0	0	0	0	0	0	0.0	8.4	40
2	3	8.00	0.25	10.00	-9.00	1	0	0	1	0	0	2	0.0	15.5	40
2	4	49.00	0.75	4.00	-2.00	1	0	1	0	0	0	2	0.0	7.6	40

***** DESIGN DATA *****

Design Discharge Time: 10 seconds
Average Container Pressure: 273 psi
Piping Volume: .03 cuft
Liquid Weight of Agent: 51.9 lbs
Weight of Agent in Pipe: 3.3 lbs
Type of Manifold: None

From	To	Start Press (psi)	Final Press (psi)	Flow Rate (lb/sec)	Terminal Density (lb/cuft)
0	1	273	265	5.2	96.55
1	2	265	260	5.2	92.19
2	3	260	245	0.7	71.60
2	4	263	260	4.4	89.79

***** NOZZLE DATA *****

Jct No.	Noz. Size (in)	Noz. Area (sqin)	Hole Dia. (in)	Nozzle Part Number	Noz. Type (deg.)
3	0.250	0.0269	0.0700	80-043-0700	180 *
4	0.750	0.1355	0.1570	80-046-1570	180 *

***** NOZZLE DISCHARGE SUMMARY *****

Noz'l Number	Liquid Time (Sec)	Vapor Time (Sec)
3	10.29	0.19
4	9.94	0.07

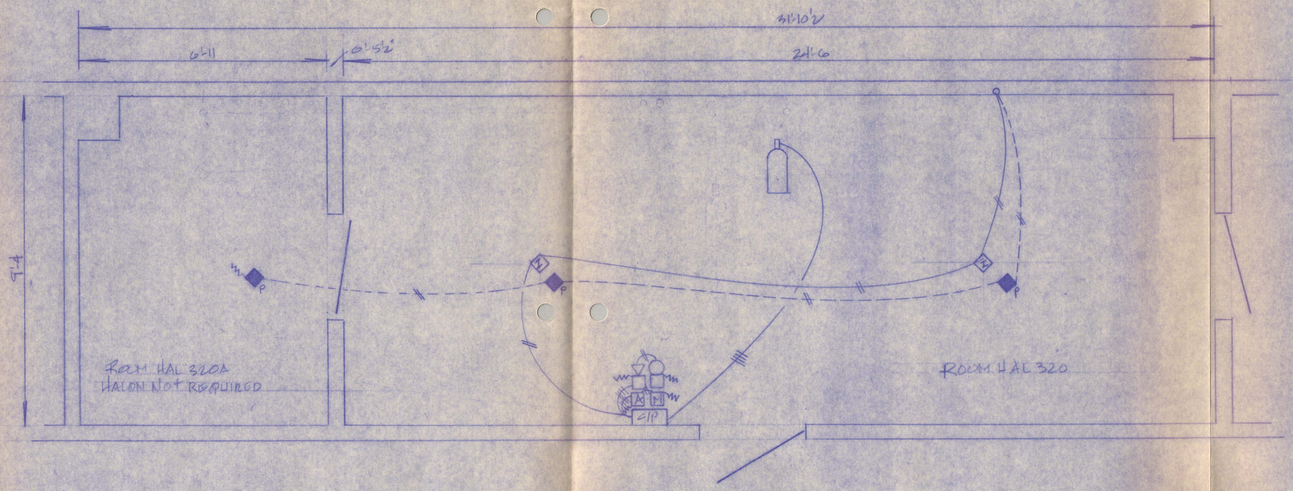
COMMONWEALTH OF KENTUCKY — Fire Suppression — R. POTTITZER COSG — Layout Technician

COMMONWEALTH OF KENTUCKY — Fire Suppression — Vulcan Fire Systems, Inc. F-0040 — Certificate

VULCAN FIRE SYSTEMS, INC.
10482 BLUEGRASS PARKWAY
LOUISVILLE, KENTUCKY 40299

U OF K MEDICAL CENTER
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

JOB NO: 469 | SCALE: As Noted | DRAWN BY: DSH
DATE: 8/21/89 | DRAWING NO: 2 OF 2



COMPUTER ROOM
½"=1'-0

1- HALON SYSTEM DESIGN BASED ON SECURE INTEGRITY OF THE PROTECTED AREA.
2- ALL WALLS, WINDOWS AND DOORS MUST BE TIGHTLY SEALED TO PREVENT LOSS OF HALON. (BY OTHERS)
3- ALL DOORS, OPENINGS OR OTHER POTENTIAL POINTS OF AIR LOSS MUST BE CLOSED. AUTOMATIC DOOR CLOSERS OR DAMPERS TO BE PROVIDED BY OTHERS, IF REQUIRED.
4- IF REQUIRED, DRY CONTRACTS ARE AVAILABLE ON THE CONTROL PANEL FOR WIRING TO CLOSE DAMPERS OR SHUT DOWN AIR MOVING EQUIPMENT.

	ITEM	DESCRIPTION
C/P	1	Control Panel
I	2	Ionization Detector
P	3	Photo Electric Detect
M	4	Manual Release
A	5	System Abort
	6	360° Nozzle
	7	180° Nozzle
K	8	Key Abort Switch
	9	Alarm Bell
	10	Discharge Horn/Light
	11	Halon Tank
	12	Check Valve
	13	Low Pressure Switch
	14	SUB FLOOR DETECTOR

120 VAC, 60 HZ, POWER INPUT TO BE SUPPLIED FROM SEPARATE CIRCUIT. THIS CIRCUIT SHALL NOT BE DE-ENERGIZED UPON SYSTEM ALARM.

WIRE RANGE FOR TERMANALS IS 14 AWG TO 18 ANG. TWO WIRES ON THE SAME TERMINAL MUST NOT DIFFER BY MORE THAN TWO GAUGES. COMPLIANCE WITH ALL LOCAL WIRING CODES IS REQUIRED.

ALL CIRCUITS ARE SUPERVISED AND MUST BE CONNECTED AS SHOWN. DO NOT PARALLEL BRANCH.

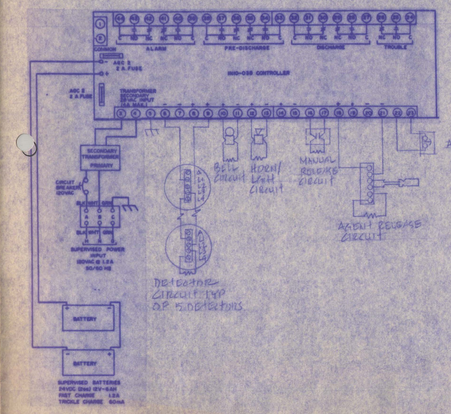
ALL SYSTEM WIRING FOR EACH ZONE MUST BE SHIELDED FROM ALL OTHER WIRING.

ALL WIRING SHALL BE IN CONDUIT USING 18 AWG MINIMUM 600 VOLT 105°C U.L. LISTED WIRE, UNLESS APPROVED FOR OPEN WIRING.

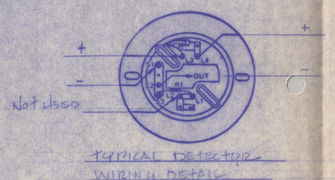
ALL SUPPLEMENTARY RELAY CONTACTS ARE RATED 120 VAC, 24 VDC, 10 AMP MAX. NOT SUPERVISED, NON-POWERED, DRY CONTACT.

DO NOT ENERGIZE CONTROL UNIT UNTIL SERVICED BY FACTORY TRAINED PERSONNEL.

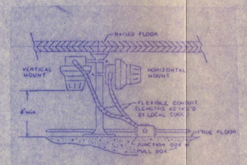
MAKE WIRE RUNS CONTINUOUS, UNLESS UNUSUALLY LONG RUNS ARE USED. KEEP SPLICES TO MINIMUM.



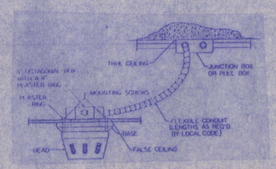
FIRE 032 CONTROL PANEL



TYPICAL DETECTOR WIRING DETAIL



SUBFLOOR DETECTOR MOUNTING DETAIL



CEILING DETECTOR MOUNTING DETAIL

COMMONWEALTH OF KENTUCKY — Fire Suppression — R. POTTITZER 0066 — Chemical — Layout Technician

COMMONWEALTH OF KENTUCKY — Fire Suppression — Vulcan Fire Systems, Inc. F-004C — Chemical Contractor

VULCAN FIRE SYSTEMS, INC.
10482 BLUEGRASS PARKWAY
LOUISVILLE, KENTUCKY 40299

U OF K MEDICAL CENTER
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

JOB NO: 469	SCALE: AS NOTED	DRAWN BY: DSW
DATE: 5/17/89		DRAWING NO: 1 OF 2

UNIT UL Approved OUR ORDER NO.

JOB UK Hospital CUSTOMER ORDER NO.
Expansion

PUMP 8x6MABS CAPACITY 1500 G.P.M. AT 289 FT. HEAD

MOTOR ODP MAKE FC FRAME 444TS

150 HP 3 PHASE 60 CYCLE 208 VOLT 1800 R.P.M.

CONTROLLER Metron

CERTIFIED BY E. Moore DATE 8/16/88

CONTROLLER	AA	BB	CC
FIRETROL FTA 1000A	14"	67 5/8"	16 1/2"

NOTE : 5" GROUT HOLES ARE PROVIDED.

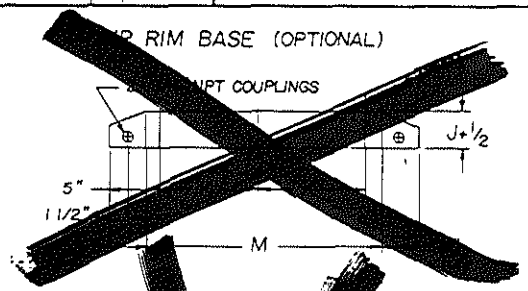
PATTERSON PUMP COMPANY

OUTLINE DIMENSIONS
8 x 6 MABS

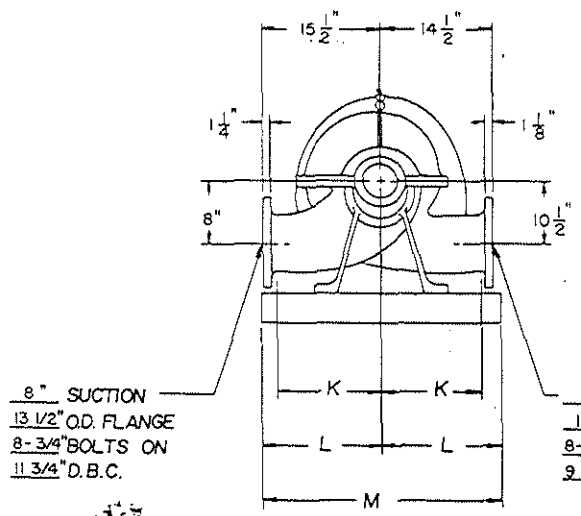
DWN	DATE	DWG NO.
SAP	3/12/81	AC-9574-1
SCALE NONE	APPRVD	

MOTOR FRAME	BASE	COUPLING	COUPLING GUARD	A	B	C	D	E	F	G	H	J	K	L	M
405TS	B-18926	9HS	B-18803	72 7/32	17 3/4	13 3/32	17 5/8	12	33	70	3/8	3	10	12	24
444TS	B-18927	↓	↓	75 1/8	19 1/2	14 1/4	↓	↓	36	76	↓	↓	↓	↓	↓
445TS	↓	10HS	B-18804	77 1/8	20 1/2	15 1/4	↓	↓	↓	↓	↓	↓	↓	↓	↓

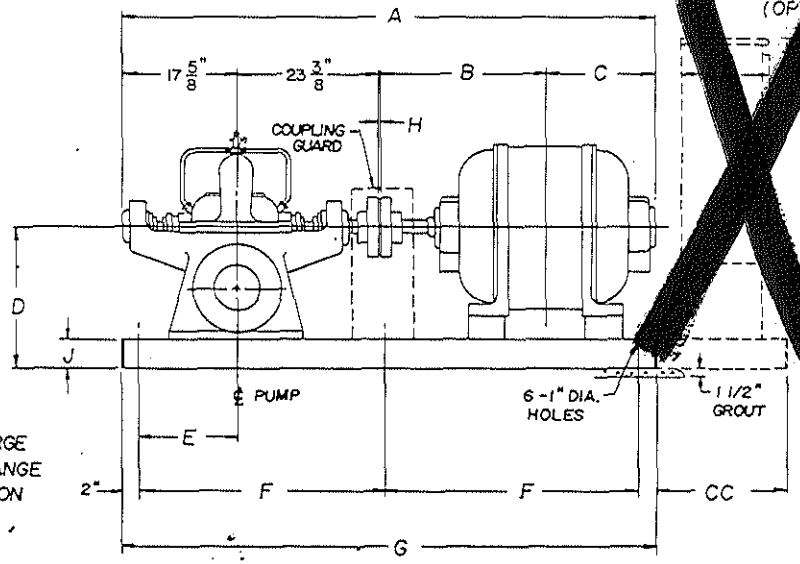
This symbol on the product's nameplate means it is Listed by UNDERWRITERS' LABORATORIES, INC.



PACKAGE [illegible]TED CONTROLLER (OPT[illegible]L)



D.B.C. STRADDLING ℄'S

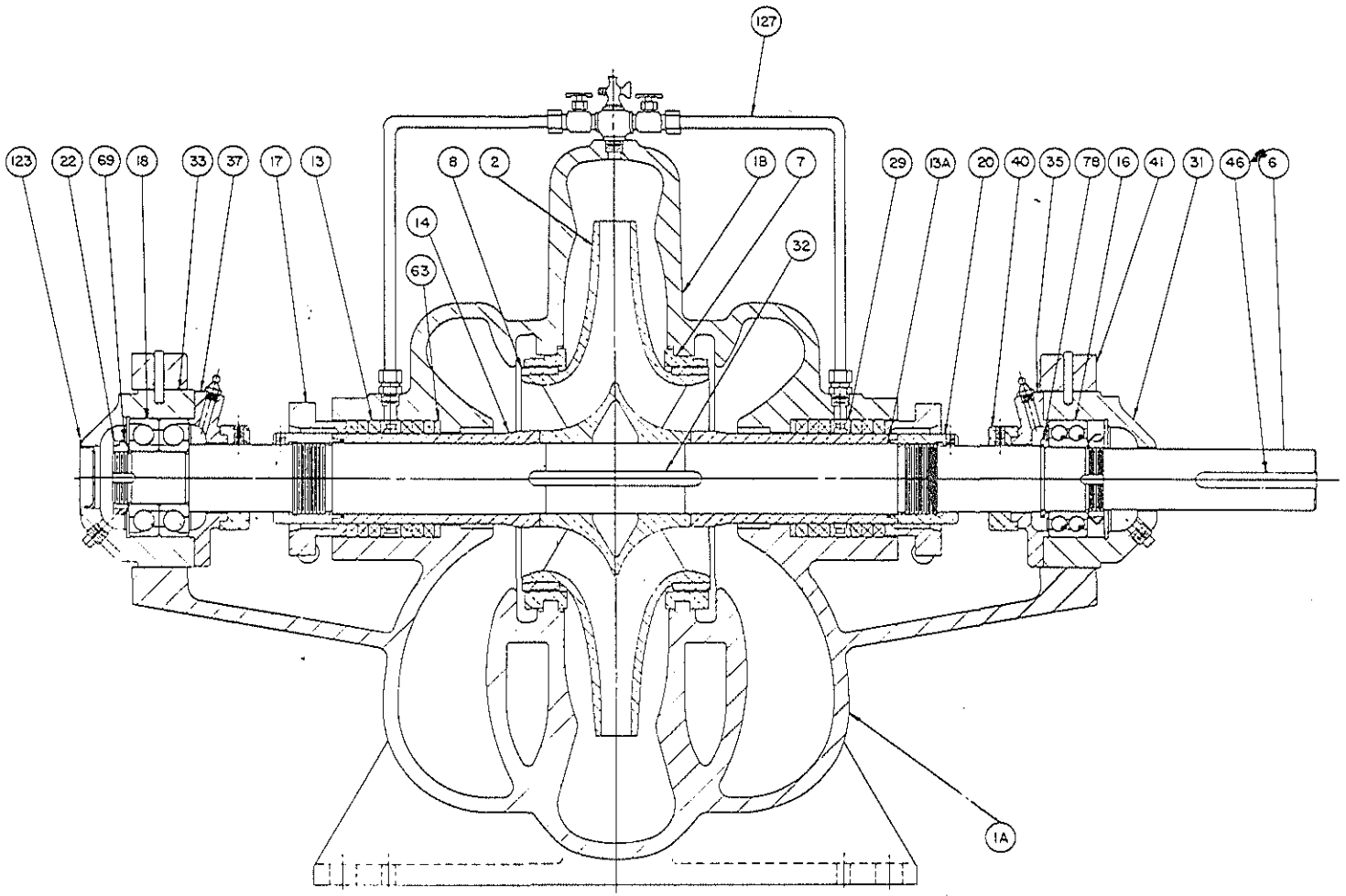


NOTE: FOR CW ROT. SUCT. ON RIGHT, DISCH. ON LEFT
FOR CCW ROT. SUCT. ON LEFT, DISCH. ON RIGHT
WHEN VIEWED FROM DRIVER END

PATTERSON PUMP COMPANY

ASSEMBLY SECTION
8 x 6 MABS

DWN	DATE	DWG NO.
PURCELL	10-23-84	AD-5481
SCALE	APPRVD	
NONE		



ITEM	DESCRIPTION
1A	CASING, LOWER HALF
1B	CASING, UPPER HALF
2	IMPELLER
6	SHAFT
7	CASING RING
8	IMPELLER WEAR RING
13	PACKING
13A	SHAFT SLEEVE O-RING
14	SHAFT SLEEVE
16	INBOARD BEARING
17	GLAND
18	OUTBOARD BEARING
20	SHAFT SLEEVE NUT
22	BEARING LOCKNUT
29	LANTERN RING
31	INBOARD BEARING HOUSING
32	IMPELLER KEY
33	OUTBOARD BEARING HOUSING
35	INBOARD BEARING COVER
37	OUTBOARD BEARING COVER
40	FLINGER
41	BEARING CAP
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PATTERSON PUMP COMPANY

OPERATION & MAINTENANCE MANUAL

for

DOUBLE SUCTION SPLIT CASE PUMPS

MEMBER

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A SUBSIDIARY OF BANNER INDUSTRIES, INC.
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Toccoa, Georgia 30577

SAFETY PRECAUTIONS

WARNING

Do not operate this equipment neither in excess of its rated speed nor other than in accordance with the instructions contained in this manual.

The equipment has been found satisfactory for the conditions for which it was sold, but its operation in excess of these conditions may subject it to stresses and strains which it was not designed to withstand.

For equipment covered by this instruction book, it is important to observe safety precautions to protect personnel from possible injury. Among the many considerations, personnel should be instructed to:

- —avoid contact with rotating parts,
- —avoid by-passing or rendering inoperative any safeguards or protective devices,
- —avoid extended exposure in close proximity to machinery with high noise levels,
- —use proper care and procedures in handling, lifting, installing, operating and maintaining the equipment,
- —do not modify this equipment - consult factory if modification is deemed necessary,
- —do not substitute for repair parts which can be provided by the equipment manufacturer.

Safe maintenance practices with qualified personnel are imperative.

Failure to heed this warning may result in an accident causing personal injury.

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SECTION I

GENERAL INFORMATION

This manual covers the installation, operation and maintenance of Patterson Pump horizontal split case pumps. The pump is a centrifugal, single stage, double suction type. When properly installed and when given reasonable care and maintenance, centrifugal pumps should operate satisfactorily for a long period of time. Centrifugal pumps use the centrifugal force principal of accelerating the liquid within a rotating impeller, and then collecting it and converting it to pressure head in a stationary volute.

The pump consists of two assemblies:

1) Casing assembly or stationary part;
2) Rotating element or moving parts.

This casing is split along the horizontal centerline of the pump shaft, suction and discharge nozzles both being located in the lower half. With this arrangement, it is not necessary to disconnect suction or discharge piping to make repairs to, or replacement of the rotating element. Upper and lower half casings are bolted together and doweled to maintain a smooth volute contour inside the pump. Supporting feet are integrally cast in the lower half casing and are drilled for bolting and doweling to base plate. Bearing brackets form a drip pocket for collecting stuffing box leakage and are provided with drilled and tapped connections for draining. The brackets also contain an overflow hole to release the water before it reaches the shaft, in case drain piping should become clogged. Suction and discharge flanges are drilled and tapped for gauge connections. Pump suction and discharge nozzles are drilled and tapped on the underneath side for complete pump drain. Wear rings are provided to minimize internal by-passing of the liquid being pumped, and to better efficiency, as well as to reduce the replacement of major components (such as casing and impeller).

SECTION II

STORAGE & PROTECTION

All pumps are shop serviced and ready for operation when delivered, but there are occasions when considerable time elapses between the delivery date and the time pump is put into operation. Equipment which is not in service should be kept in a clean, dry area. If equipment is to be stored for long periods of time (6 months or more), the following precautions should be taken to insure that the equipment remains in good condition.

1) Be sure that bearings are fully lubricated.

2) Unpainted machined surfaces which are subject to corrosion should be protected by some corrosive resistant coating.

3) The shaft should be rotated 10 to 15 revolutions by hand periodically in order to spread the lubricant over all the bearing surfaces. Suitable intervals are from one to three months, depending on atmospheric conditions, etc. In order to insure that the pump shaft does not begin to sag, do not leave the shaft in the same position each time.

4) Space heaters on motors and controllers should be connected and fully operable if atmospheric conditions approach those experienced in operation. Consult instruction manuals for other precautions concerning storage of individual components of pumping unit.

5) Fresh lubricant must be applied to bearings upon removal of equipment from storage.

SECTION III

INSTALLATION

3 - 1 Location:

Several factors should be considered when selecting a location for the pumping unit (pump, base, drive, and coupling). The unit should be accessible for both inspection and maintenance. Head room should be provided for the use of crane, hoist or other necessary lifting devices. The pump should be located as close as possible to the liquid supply so that the suction line is short and direct. Location should require a minimum of elbows and fittings in the discharge line to minimize friction losses. The unit should be protected against flooding.

3 - 2 Foundation:

The foundation should be sufficiently substantial to absorb vibration and to form a permanent rigid support for the base plate. Concrete is most widely used for foundation. Before pouring foundation, locate anchor bolts per outline drawing. Allow for 3/4 in. to 1 1/2 in. of grout between foundation and baseplate. The top surface of the foundation should be roughened to provide a good bond for the grout.

3 - 3 Mounting:

> **WARNING ! !** Do not attempt to lift entire unit using lugs provided on either pump or motor only. Such action may lead to failure of the lugs and possible damage to the unit or injury to personnel. Lift unit with slings around the baseplate, or by attaching cables to the lifting lugs on **both** pump **and** motor.

Coupling halves should be disconnected when mounting pumping unit on foundation. Wedges should be used to support the unit at time of grouting. Wedges should be located adjacent to anchor bolts (one on each side of bolt) and midway between bolts. Adjust the wedges to raise or lower the unit as required to align suction and discharge flanges to piping and to level the baseplate. Leveling bolts made of cap screws and nuts are useful when leveling large baseplate, but should not replace shims or blocks for supporting the load. After unit has been in operation for about a week, check alignment. After making any required adjustments, dowel pump and motor to base.

3 -4 Alignment:

Complete pump units are aligned at the factory, but all baseplates are flexible to some degree; and therefore, cannot be relied upon to maintain alignment. Reliable trouble-free and efficient operation of a unit depends upon correct alignment. Misalignment may be the cause of noisy pump operation, vibration, premature bearing failure, or excessive coupling wear. Factors that may change the alignment of the pumping unit are settling of the foundation, springing of the baseplate, piping strains, settling of the building, bearing wear, loose nuts or bolts on the pump or drive assembly, and a shift of pump or drive on the foundation. When checking coupling alignment, remember, flexible couplings are not intended to be used as universal joints. The purpose of a flexible coupling is to compensate for temperature changes and to permit end movement of the shafts without interference with each other.

Two types of misalignment may exist: parallel misalignment and angular misalignment. Limits of misalignments are stated in coupling manufacturer's instructions, but should be kept to a minimum for maximum life of equipment components.

To check coupling alignment, the following procedure should be followed:

1) Set the coupling gap to the dimension shown on the outline drawing.

2) Check for parallel misalignment by placing straight edge across both coupling halves at four points 90° apart. Correct alignment occurs when straight edge is level across the coupling halves at all points.

3) Check angular misalignment with a feeler gauge at four points 90° apart. Correct alignment occurs when the same gauge just enters between the halves at all four points.

Angular and parallel misalignment are corrected by shifting the motor and adding or removing shims from under the motor feet. After each change, it is necessary to recheck the alignment of the coupling halves. Adjustment in one direction may disturb adjustment already made in another direction.

An alternative method for checking coupling alignment is by use of a dial indicator. Proceed as follows:

1) Scribe index lines on coupling halves or mark where the indicator point rests.

2) Set indicator dial to zero.

3) Slowly turn both coupling halves so that index lines match, or indicator point is always on the mark.

4) Observe dial reading to determine whether adjustments are needed. Acceptable alignment occurs when total indicator reading does not exceed 0.004 in. for both parallel and angular alignment.

The importance of correct alignment cannot be overemphasized. Alignment should be checked and corrected as required after:

a) Mounting
b) Grouting has hardened
c) Foundation bolts are tightened
d) Piping is connected
e) Pump, driver, or baseplate is moved for any reason.

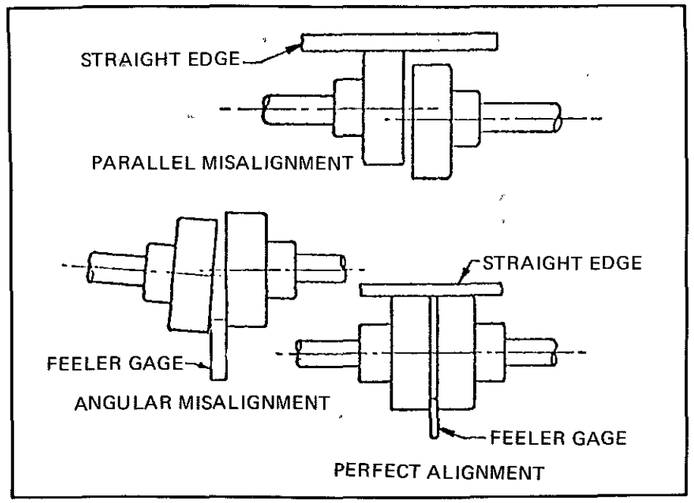


FIG. 1 TESTING ALIGNMENT, STRAIGHTEDGE

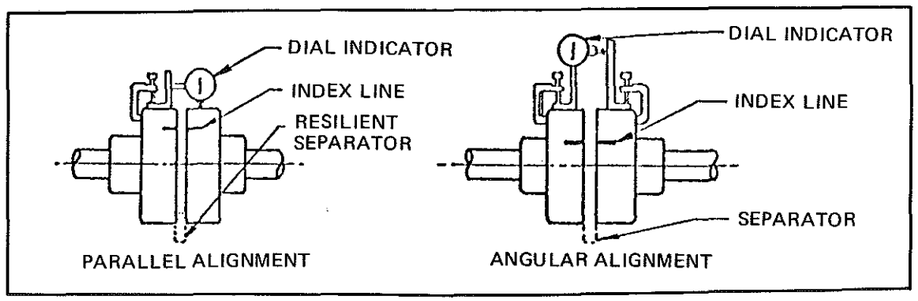


FIG. 2 TESTING ALIGNMENT, DIAL INDICATOR

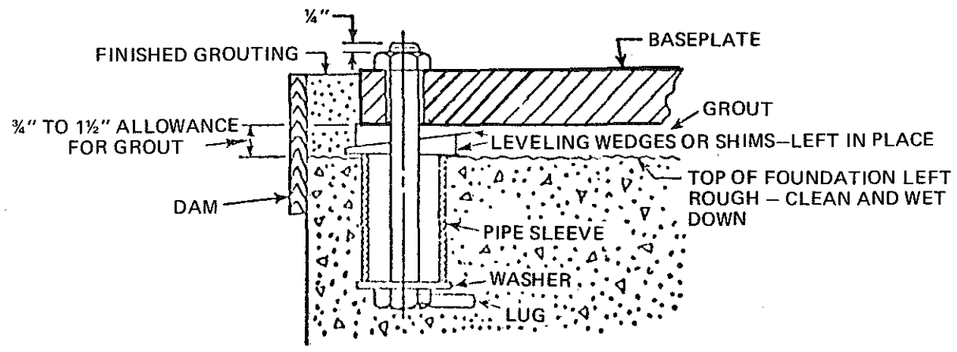


FIG. 3 TYPICAL FOUNDATION BOLT DESIGN

3 - 5 Grouting:

Grout compensates for uneveness in the foundation and distributes the weight of the unit uniformly on the foundation. It also prevents lateral shifting of the baseplate and reduces vibration. Use a non-shrinking grout. Foundation bolts should be tightened evenly but not too firmly. Grout the unit as follows:

1) Build a strong form around the baseplate to contain the grout.

2) Soak the foundation top thoroughly, then remove surface water.

3) Pour grout. Tamp liberally while pouring in order to fill all cavities and prevent air pockets. The space between the foundation and baseplate should be completely filled with grout. In order to prevent the baseplate from shifting, fill under the baseplate at least 4 inches in from all four edges. Wedges may be left in place.

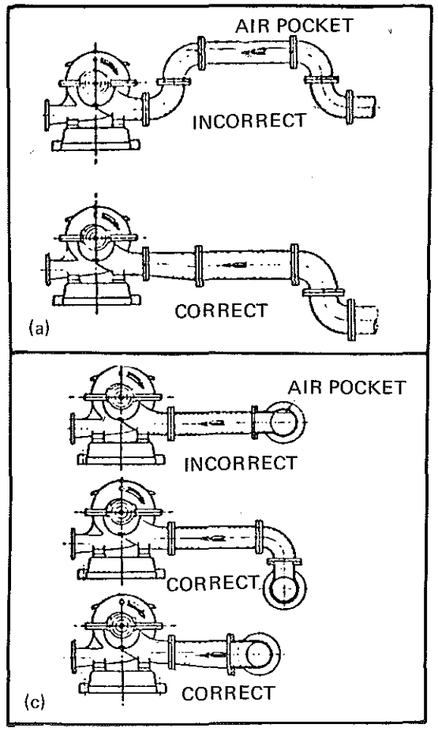
4) After grout has hardened (usually about 48 hours), thoroughly tighten foundation bolts and check alignment.

5) Approximately 14 days after the grout has been poured or when it is thoroughly dry, apply an oil base paint to exposed edges of the grout to prevent air and moisture from coming in contact with the grout.

3 - 6 Piping:

Connect pipe lines after the grout has thoroughly hardened. The suction and discharge piping should be installed with the shortest and most direct runs. Elbows should preferrably be of the long radius type. Pipes must line up naturally. The piping must never be pulled into position by the flange bolts. Such action may draw the pump out of alignment. Pipes should be supported independently of pump so as not to put any strain on pump casing. Suction piping, if not properly installed, is a potential source of faulty operation. Suction lines should be free of air leaks, and arranged so there are no loops or high spots in which air can be trapped. Generally, the suction line is larger than the pump suction nozzle, and eccentric reducers should be used. Eccentric reducers are not necessary for bottom suction pumps. If the liquid supply is located below the pump centerline, the reducer should be installed with the straight side up.

Most often air enters the suction pipe entrained in the liquid. Installations with a static suction lift preferably should have the inlet of the vertical suction piping submerged in the liquid to 4 times the piping diameter. A large suction pipe will usually prevent the formation of vortexes or whirlpools, especially if the entrance is flared. (See Fig. 5). A floating vortex breaker (raft) around the suction piping may be provided if a tendency appears for a vortex to form at the liquid surface. A stream of liquid falling into the sump near the intake pipe will churn air into the liquid (Fig. 6). The supply line should extend down into the sump. Liquid supply entering a well perpendicular to the intake line tends to rotate the liquid which interferes with the flow into the suction line (Fig. 7). A baffle placed in front of the supply pipe will remedy this situation. A short elbow should never be bolted directly to the pump suction nozzle. The disturbance in the flow caused by the sharp bend so near the pump inlet may result in noisy operation, loss in efficiency, and capacity, and heavy end thrust. A long



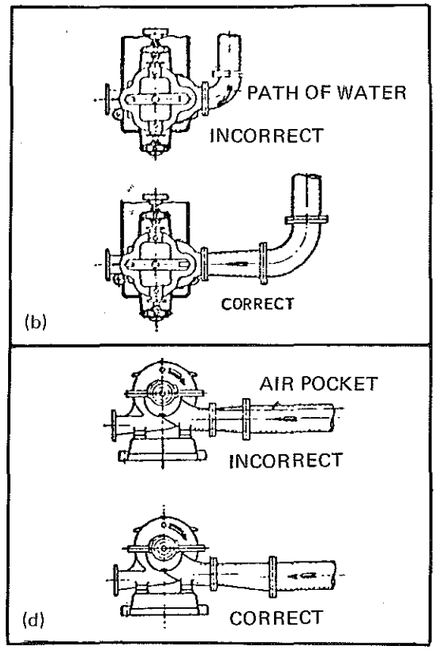


FIG. 4. SUCTION PIPING ARRANGEMENTS

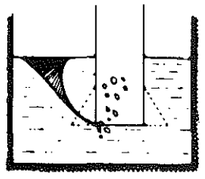


Fig. 5 Enlarging the suction pipe usually prevents whirlpools and the resultant entrance of air into the pipes.

Fig. 5

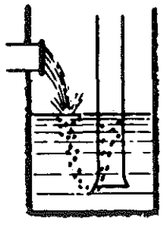


Fig. 6(a) Water falling into sump churns air into the sump-liquid and causes trouble in the suction line.

Fig. 6(a)

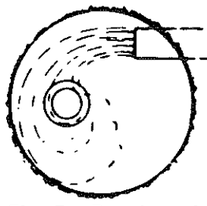


Fig. 7

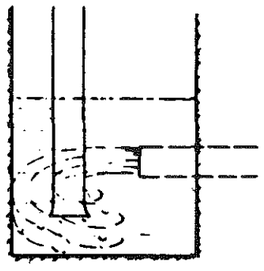


Fig. 7 Rotation of water in the well, as illustrated, can be prevented with a baffle.

Fig. 6(b) Supply line should extend down into the sump to prevent the churning of air into the water.

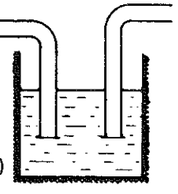


Fig. 6(b)

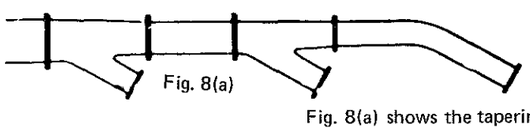


Fig. 8(a)

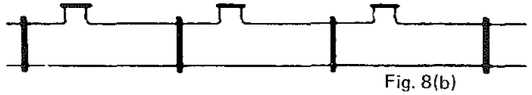


Fig. 8(b)

Fig. 8(a) shows the tapering header which should be used if two or more pumps are served with one intake line. The pipe shown in Fig 8(b) should never be used.

sweep or long radius elbow placed as far away from the pump as practicable should be used if a bend is necessary in the suction line. If separate suction lines cannot be used for each pump, then a tapering header with Y-branches should be used (Fig. 8A). A straight branch header should never be used. Prior to installing the pump, suction piping and pump should be inspected internally, cleaned and flushed. If a strainer is installed in the suction line, the openings in the screen must be checked and cleaned periodically. The openings must be smaller than the sphere size allowed by the impeller.

Discharge piping should be installed with check valve and gate valve, with the check valve being between pump and gate valve. The check valve prevents reverse flow and protects the pump from excessive back pressure. The gate valve is used to isolate the pump for maintenance, priming and starting. If a diffuser is used, it should be placed between pump and check valve.

Stuffing box seal connections are usually made from the top of the pump casing. If the liquid being pumped is unsuitable for sealing, then it is preferable to bring fresh, cool water to seal connections from an outside source. Centrifugal separators or other filters may be used to remove abrasive particles from the liquid being pumped if an outside source is not available. After all piping connections have been made, the alignment should be checked again.

SECTION IV

OPERATION

Before bolting coupling halves together, check drive rotation to see that it matches pump rotation. Pump rotation is indicated by an arrow attached to casing assembly. For a three phase motor, rotation may be reversed, if necessary, by interchanging any two of the three power leads. Rotation of single phase motors is fixed by internal wiring.

WARNING ! ! Prior to startup, check coupling alignment as covered in Installation. Operation of pump with unit misaligned will cause damage to shaft, bearings, and coupling.

4 - 1 Starting:

When possible, turn pump shaft by hand to insure that parts do not bind.

Check bearing lubricant.

Open valve in pump suction line, if fitted.

Close discharge valve.

Prime the pump in one of the following ways:

a) If pump operates under positive pressure, open vent valve on top of pump casing. After all entrained air has escaped, close vent valves. Rotate the shaft, if possible, to allow any air trapped in impeller passages to escape.

b) If pump operates on a suction lift and a foot valve is included in the system, fill the pump and suction line with liquid from an outside source. Trapped air should be allowed to escape through the vent valve while filling.

c) If the pump operates on a suction lift and no foot valve is provided, use a vacuum pump or ejector operated by air, steam, water, etc. to evacuate air from the pump case and suction line by connecting the ejector to the priming connection on top of the pump case.

Open valves in stuffing box seal lines, if fitted. Start driver. Open discharge valve slowly when pump is up to speed.

CAUTION: Overheating and/or loss of prime will result if pump is operated against a closed valve for more than a few minutes.

WARNING ! ! Coupling guard should be in place when unit is started. Stay clear of any exposed rotating parts while pump is operating. Contact with rotating parts may result in injury to personnel.

Adjust packing gland until there is a slight leakage from the stuffing box. (See Maintenance on Adjustment of Packing). Mechanical seals need no adjustment. There should be no leakage.

Note: Should pump fail to build up pressure or discharge water when discharge valve is opened, stop pump and read section, Locating Operating Difficulties.

4 - 2 Shut Down

The pump may be stopped with the discharge valve open without causing damage. However, in order to prevent water hammer effects, the discharge valve should be closed first.

A. Close discharge valve.

B. Stop driver.

C. Close water seal valves.

D. Close valve in pump suction line, if fitted. If danger of freezing exists, drain pump completely.

4 - 3 Minimum Flow Limitation

All centrifugal pumps have limitations on the minimum flow at which they should be operated. The most common limitation is to avoid excessive temperature build up in the pump because of absorption of the input power into the pumped fluid. Other less understood reasons for restrictions are:

1. Increased radial reaction at low flows in single volute casings.

2. Increased NPSHR at low flows.

3. Noisy, rough operation and possible physical damage due to internal recirculation.

4. Increased suction and discharge pulsation levels.

The size of the pump, the energy absorbed, and the liquid pumped are among the considerations in determining these minimum flow limitations. For example, most small pumps such as domestic home circulators, service water pumps, and chemical pumps have no limitations, except for temperature build up considerations while many large, high horsepower pumps have limitations as high as 40-50% of the best efficiency point capacity. The minimum safe flow for this pump is given under Pump Specifications.

SECTION V

MAINTENANCE

5 - 1 Lubrication:

Couplings: couplings with rubber drive elements do not require lubrication. Most other couplings require some form of lubrication. Consult manufacturer's instructions for recommendations.

Bearings: Frequency of lubrication depends upon operating conditions and environment; therefore, lubrication intervals must be determined by experience. Table I may be used as a general guide for grease relubrication. Lubricants need replacing only because of contamination by dirt or dust, metal particles, moisture or high temperature breakdown. A small amount of grease may be added about every 400 hours of operation. The bearing housing should be about 1/3 full of grease. Oil lubricated units are provided with constant level oilers. Bottles should be kept filled at all times so that there is a visible supply of oil. All lubricants have a tendency to deteriorate in the course of time; therefore, sooner or later it will be necessary to replace the old lubricant with new. Bearings which are dismantled are, of course, much more easily cleaned than bearings which stay in assembled equipment. Solvents may be used more freely and effectively. For cleaning bearings without dismounting, hot light oil at 180° - 200° F may be flushed through the housing while the shaft is slowly rotated. Light transformer oils, spindle oils, or automotive flushing oils are suitable for cleaning bearings, but anything heavier than light motor oil (SAE 10) is not recommended. The use of chlorinated solvents of any kind is not recommended in bearing cleaning.

Grease Relubrication: (Pumps are shipped with grease in bearing housings).

1) Thoroughly clean grease fitting and outside of bearing housing.

2) Remove drain plug.

3) Inject clean, new grease forcing out the old.

4) Start and run pump for a short time to eject any excess grease.

5) Wipe off all excess grease and replace drain plug.

Oil Relubrication: (Pumps are shipped without oil in bearing housing).

1) Remove drain plug and allow any residue oil to completely drain.

2) Remove constant level oiler bottle and clean thoroughly.

3) Replace drain plug.

4) Fill bottle, screw it to the lower reservoir of oiler and allow oil to flow into bearing housing reservoir. Repeat this procedure until a supply of oil remains in the bottle.

For ball bearings, the oil level should be at about the middle of the lower most ball. For ring oiled sleeve bearings, the oil level should be about 1/8 in. over the lowest point of the oil ring.

WARNING ! ! Proper lubrication is essential to pump operation. Do not operate pump if sufficient lubricant is not present in bearing housing or if lubricant is contaminated with excessive dirt or moisture. Operation of the unit under these conditions will lead to impaired pump performance, and possible bearing failure. Do not operate pump with excessive amount of lubricant. Such action will cause bearings to overheat.

5 - 2 Stuffing Box:

The purpose of a stuffing box is to limit or eliminate leakage of the pump fluid and to prevent air from entering the suction spaces along the pump shaft. Pumps are equipped with packing (limited leakage) or mechanical seals (no leakage). Normally, the pumped liquid is used to lubricate the stuffing box seal. If the liquid is dirty, gritty, or contains material that would gum or jam the seal, use a sealing liquid from an external source. If suction pressure is above atmospheric pressure, seal piping may not be required. For pumps equipped with packing, there must always be a slight leakage from the glands. The amount of leakage is hard to define but we recommend a steady dripping of liquid through the gland. Stuffing box glands should be adjusted after the pump is started. When leakage is excessive, tighten gland bolts evenly a little at a time. Allow an interval for packing to adjust to new position. Never tighten gland to be leakproof as this will cause overheating and undue wear on shaft sleeves.

Replace stuffing box packing as follows:

1. Shut down pump.
2. Take precautions to prevent driver from being inadvertently started.
3. Remove gland bolt nuts and gland.
4. Remove and discard old packing rings — note location of lantern ring. When repacking stuffing box, lantern ring must be positioned such that the water seal connection is opposite lantern ring.
5. Clean out stuffing box.

6. Inspect shaft sleeve for wear — if it is scored or grooved, it should be replaced.
7. Make sure stuffing box bushing (if furnished) is set at bottom of box.
8. Insert rings of packing and tap lightly to seat against bushing. Be sure rings are of the proper size and length and installed with cuts staggered. Lantern ring **must** be installed opposite sealing water connection.
9. Install gland and tighten, finger tight. With pump running, adjust gland as described previously. Care should be taken during the first hour of operation to take up on the packing gradually just enough to maintain the required amount of leakage.

If pump is operated daily, the stuffing box packing should be renewed about every two to three months before it gets hard and scores the shaft sleeves.

Mechanical seals should be removed, assembled, and/or adjusted according to the seal manufacturers' instructions. There should be no leakage from the gland if mechanical seals are used, except for a brief run in period.

5 - 3 Wear Ring Clearance:

Running fits between wear rings is given under pump specifications. When these clearances are doubled, or the capacity of the pump is reduced by 5 to 10%, the rings should be renewed. The purpose of these rings is to keep internal by-passing of the liquid being pumped to a minimum. Clearances should be checked periodically and whenever pump casing is opened. Check with feeler gauge or by direct measurement. Measure ID of case ring and OD of impeller ring, then compute clearance (ID minus OD).

TABLE 1
SUGGESTED RE-LUBRICATION INTERVALS FOR VARIOUS ENVIRONMENTAL, OPERATING AND TEMPERATURE CONDITIONS (GREASE LUBRICATED BEARINGS)

AMBIENT CONDITIONS		OPERATING CONDITIONS		BEARING OPERATING TEMPERATURE		SUGGESTED GREASING INTERVALS**	USE THESE GREASES
Dirt	Moisture	Load	Speed	Low	High		
Clean	Dry	Light to medium	Slow to medium	0°F (-18°C)	120°F (49°C)	2 to 6 months	High quality NGLI No. 1 or 2 multi-purpose bearing greases are generally satis-factory. Consul-tation with a reputable lubricant supplier is recommended
				120°F (49°C)	200°F (93°C)	1 to 2 months	
Moderate to Dirty	Dry	Light to medium	Slow to medium	0°F (-18°C)	120°F (49°C)	1 to 4 weeks	
				120°F (49°C)	200°F (93°C)	1 to 7 days	
Extreme Dirt	Dry	Light to medium	Slow to medium	0°F (-18°C)	200°F (93°C)	Daily flushing out dirt	
	High humidity Direct water Splash	Light to heavy	Slow to medium	32°F (0°C)	200°F (93°C)	1 to 4 weeks grease at shutdowns	Lithium or other corrosion control grease
		Heavy to very heavy	Slow	0°F (-18°C)	200°F (93°C)	1 to 8 weeks	High viscosity lubricant
				-20°F (-29°C)	120°F (49°C)	1 to 8 weeks	
		Light	High speed	100°F (38°C)	200°F (93°C)	1 to 8 weeks	Channeling (high speed) type greases
	Possible frost	Light to Heavy	Slow to medium	-65°F (-54°C)	+250°F (121°C)	1 to 4 weeks grease at shutdown	Wide temperature range Diester-type greases (Silicone-Diester-Polyester lubricants)
Clean to moderate	Dry	Light to medium	Slow to medium	80°F (27°C)	250°F (121°C)	1 to 8 weeks	Good quality high-temperature type greases
Clean to dirty	Dry	Light	Slow	80°F (27°C)	300°F (149°C)	1 to 4 weeks	Synthetic type greases

**Suggested starting interval for maintenance program. Check grease conditions for oiliness and dirt and adjust greasing frequency accordingly. Watch operating temperatures as sudden rises may show need for grease or indicate over-lubrication on higher speed applications.

Table II
RECOMMENDED GREASES

COMPANY	GREASE
Texaco	Premium RB No. 2
Shell	Alvania No. 2
Gulf	Gulfcrown No. 2
Texaco	Multifak No. 2
Standard	Amolith No. 2
Sinclair	Litholine Industrial No. 2
Cities Service	H - 2
Fina	Lithium 2 - R

WARNING ! ! Use of lubricants other than those listed or their equivalent will cause reduced pump performance and reduce bearing life.

TABLE III

RECOMMENDED OILS

	SPEED RANGE (RPM)	
	1800 and Over	1500 and Below
	VISCOSITY RANGE	
MANUFACTURER	145 SSU TO 175 SSU @ 100°	270 SSU TO 375 SSU @ 100°
MOBILE OIL CO.	MOBILE DTE 797	DET OIL HEAVY MEDIUM
SHELL OIL CO.	TELLUS 927	TELLUS 933
TEXACO, INC.	REGAL A (R & O)	REGAL PC (R & 0)
STANDARD OIL CO	CHEVRON OC TURBINE 9	CHEVRON OC TURBINE 15
HUMBLE OIL & REFINING CO.	TERESSTIC OR TERESSO 43	TERESSTIC OR TERESSO 52
GULF OIL CORP.	HARMONY 44	HARMONY 53
UNION OIL OF CALIF.	RED LINE TURBINE 150	RED LINE TURBINE 300
RICHFIELD DIV.	EAGLE R & O No. 10	EAGLE R & O LIGHT
ATLANTIC DIV. ATL. RICH.	HYTHERM C	HYTHERM F
AMERICAN OIL CO.	AMER INDUSTRIAL OIL No. 15	AMER INDUSTRIAL OIL No. 31
CITIES SERVICE OIL CO	CITGO PACEMAKER T-15	CITGO PACEMAKER T-30
CONTINENTAL OIL CO.	CONOCO DECTOL No. 15 R & O	
E. F. HOUGHTON & CO.	HYDRO-DRIVE MIH LIGHT	HYDRO-DRIVE MIH-20
KEYSTONE LUBRICATING CO.	KLC-6	KLC-4A
PENNZOIL CO.	PENNBELL No. 1	PENNBELL No. 3
PHILLIPS PETROLEUM CO.	MAGNUS OIL 150	
PURE OIL CO.		PUROPALE RX HEAVY MEDIUM
SINCLAIR REFINING CO.	DURO 150	DURO 300
SUN OIL CO.	SUNVIS 916	SUNVIS 931

WARNING ! **Use of lubricants other than those listed or their equivalent will cause reduced pump performance and reduce bearing life.**

SECTION VI

REPAIRS AND REPLACEMENT

WARNING ! ! Whenever any disassembly work is to be done on pump, disconnect power source to driver to eliminiate any possibility of starting unit.

6 - 1 To Remove Rotor:

Ref. Pump Assembly Section

1. Remove coupling guard and disconnect coupling halves.
2. Disconnect any piping from upper half casing (1B) that will interfere with its removal.
3. Remove bolting from casing flanges and bearing caps (41). Note: Some units are not provided with bearing caps. Remove bolting from bearing bracket (31 & 33) and lower case (1A).
4. Drain oil from reservoirs. (Oil lubricated ball bearing units only).
5. Remove bolting through oil reservoirs. (Oil lubricated ball bearing units only). Note: On some units the oil reservoir is independent of bearing housing. Remove outboard oil reservoir with bolting. (Check Assembly Section).
6. Screw jack screws down to separate upper and lower case. Turn jack screws back after separation to prevent interference at reassembly.
7. Lift upper casing (1B) straight up until clear of impeller.
8. Remove bearing caps (41).
9. Remove glands (17) and gland bolts (170).
10. Place slings around the shaft near the bearing housings and lift rotating element from lower casing (1A).
11. Place rotating element in a clean, dry work area for necessary disassembly. Case wear rings (7) will be loose on assembly.

6 - 2 Disassembly of Rotating Element:

If bearing assemblies do not require attention, but just the impeller or rings, then work just one side of unit (impeller may be removed from either end.)

1. Remove pump half coupling.
2. Loosen set screws in deflectors (40) and slide toward center of pump.
3. Remove cap screws from brg. covers (35 & 37) and separate covers from bearing housings (31 & 33).
4. Remove bearing housings (31 & 33).

5. Straighten locking tip on lockwashers (69) and remove locknuts (22) and washers.

6. Remove oil flingers (172) and oil rings (60); (oil lubricated ball bearings only).

7. Remove bearings (16 & 18). Remove with bearing puller pressing on the inside race. **Never** pull a bearing on the outside race unless bearing is to be discarded.

NOTE: Items 8-10 refer to sleeve bearing units only.

8. Remove thrust bearing cartridge (74), if applicable.

9. Remove oil rings (60).

10. Remove bolting from sleeve bearing halves (135 & 137) and remove bearings.

11. Remove bearing covers (35) and deflectors (40).

12. Remove packing (13), lantern ring (29), and stuffing box bushing (63), if applicable. Note the number of packing rings on either side of lantern ring. Lantern ring (29) must be installed opposite seal water inlet. Note: Follow seal manufacturers' instructions for repair and removal of mechanical seals.

13. Loosen set screws in sleeve nut (20) and unscrew nut from shaft.

14. Remove o-ring packing (13A) and shaft sleeves (14).

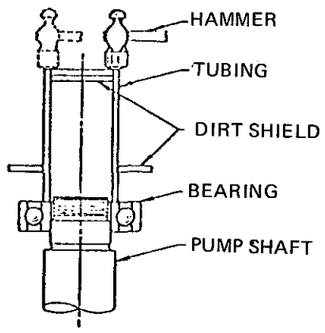
15. Remove casing wear rings (7). On most pumps, casing rings may be removed before disassembling rotating element.

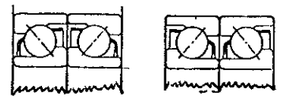
16. Impeller (2) with impeller rings (8) can now be removed from either end of shaft.

CAUTION: When removing impeller, note direction of vanes. Impeller must be installed with vanes in same direction.

6 - 3 To Remove Impeller Rings:

It is not necessary to remove impeller from shaft to replace impeller rings. First remove rotating element. Remove locking set screws from rings. Rings may now be pulled from impeller, cut off with a chisel, or turned off if a suitable lathe is available, using original shaft centers. **DO NOT CUT INTO BODY OF IMPELLER!** When new rings are installed, drill and tap new holes for locking set screws – do not attempt to use old half holes in impeller hub.



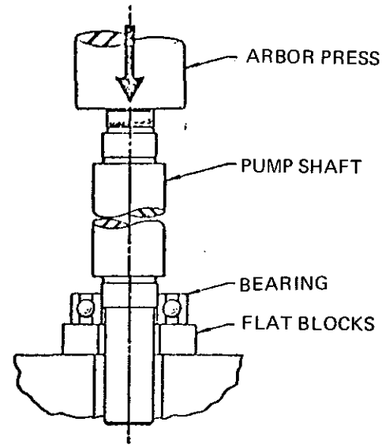


USING AN ARBOR PRESS

1. PLACE THE BEARING ON TWO FLAT BLOCKS SO THAT THEY CONTACT THE INNER RING OR BOTH RINGS OF THE BEARING.
2. HOLD SHAFT STRAIGHT – FORCE THE SHAFT BY A STEADY PRESSURE, UNTIL THE BEARING IS SEATED AGAINST THE SHAFT SHOULDER.

USING TUBING

1. PLACE THE BEARING ON SHAFT.
2. PLACE TUBING OVER SHAFT IN CONTACT WITH THE INNER RING OF THE BEARING.
3. APPLY HAMMER ALTERNATELY AT OPPOSITE POINTS – AVOID COCKING.



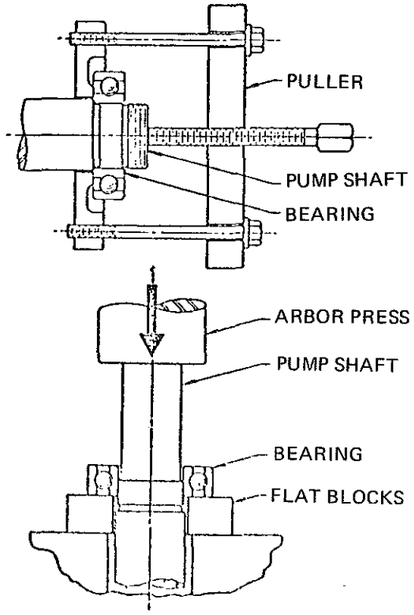
BEARING MOUNTING

USING A BEARING PULLER

1. PLACE BEARING PULLER BEHIND BEARING INNER RING. SET PULLER JAWS SO THAT THEY WILL NOT SLIP OVER THE INNER RING AND DAMAGE SEPARATOR OR SHIELD WHEN PRESSURE IS APPLIED.
2. FORCE BEARING OFF SHAFT BY A STRAIGHT PULL. DO NOT COCK BEARINGS.

USING AN ARBOR PRESS

1. REST THE BEARING INNER RING OR BOTH RINGS (NEVER THE OUTER RING ONLY) AGAINST A PAIR OF FLAT BLOCKS.
2. FORCE THE SHAFT OUT BY A STEADY PRESSURE–KEEP SHAFT STRAIGHT–DO NOT ALLOW SHAFT TO COCK OR DROP.



BEARING REMOVAL

FIGURE 9. BEARING REMOVAL AND MOUNTING

TABLE IV

BEARING DEFECTS

(Failures – Replace if found.)

DEFECT (Failure)	APPEARANCE	PROBABLE CAUSE
Flaking and cracking	In the early stages the surface of the inner and outer races develop small cracks, which flake. The cracks and flaking ultimately spread over the entire race surface.	1. Normal fatigue failure. 2. Bearing loads in excess of bearing capacity caused by misalignment.
Indentations	Indentations or cavities in the inner and outer races.	1. Dirt in the bearings. 2. Excessive impact loading of the bearings such as improper mounting or removal.
Broken separator (cage)	Cracked separator or separator in pieces.	1. Poor lubrication. 2. Misalignment of shaft. 3. Excessive shaft deflection.
Wear	Bore and OD of outer ring of bearing galled or braided.	1. Fit on shaft or in housing too loose. 2. Bearing locked by dirt and turning on shaft or in housing.
Fractured ring	Hairline cracks or complete ring fracture.	1. Forcing a cocked bearing on or off a shaft. 2. Too heavy a press fit.
Discoloration	Balls and races darker than normal appearances of bearing metal. (Moderate discoloration of balls and races not a reason for discard.)	1. Inadequate lubrication.
Corrosion	Balls and raceways rusted.	1. Water entering the housing. 2. Condensation inside the housing. 3. Lubricant breaks down into acid. (Wrong lubricant).

6 - 4 Inspection

Visually inspect parts for damage affecting serviceability. Check o-rings and gaskets for cracks, nicks, or tears; packing rings for excessive compression, fraying or shredding, and embedded particles. Replace if defective in any way. Mount the shaft between lathe centers and check eccentricity throughout the entire length. Eccentricity should not exceed .002 in. Bearing surfaces should be smooth and shoulders square and free of nicks.

Measure OD of impeller hub or impeller wear rings and ID of casing wear ring. Compute diametral clearance (ID minus OD) and compare with clearance given under pump specifications. Surfaces must be smooth and concentric. Examine impeller passages for cracks, dents or embedded material. Examine shaft sleeves for wear.

6 - 5 Assembly

Assembly is the reverse of the disassembly procedure. The following should prove helpful in reassembling pump:

1) All parts, inside and out, should be clean. Dirt and grit will cause excessive wear, plus needless shutdown.

2) Make certain that keys are in their proper position.

3) Reinstall impeller with vanes in right direction. Pump rotation is defined by viewing from the driver end. Impeller vanes slope must be opposite the pump rotation.

4) Do not lock sleeve nut (20) to shaft until impeller has been positioned in center of volute. This may be accomplished by loosening or tightening sleeve nuts against sleeves (14) as required, thereby working impeller into position.

5) Make certain that case rings (7) are in proper position. The half raised ring should be on the outside and completely in the lower half casing (1A). Be sure ring is fully seated.

6) Insure that packing does not block seal water inlet.

7) Rotate by hand to insure that parts do not bind before replacing upper half case (1B).

8) Bearing mounting is simplified by heating the whole bearing, thereby expanding it enough to be slipped on the shaft. This heating is best done by submerging the bearing in a bath consisting of 10-15% soluble oil in water and heated to boiling. This mixture cannot be overheated, is non-flammable, drains off easily permitting convenient handling, yet leaves an oil film sufficient for rust protection of the bearing surfaces.

LOCATING OPERATING DIFFICULTIES

In the majority of cases, operating difficulties are external to the pump and the following causes should be carefully investigated before undertaking repairs:

No Water Delivered

a. Pump not primed — indicated by no pressure on discharge.

b. Speed too low — indicated by low pressure on discharge.

c. Valve closed — indicated by high discharge head.

d. Impeller completely plugged up — indicated by low discharge pressure.

Abnormally Small Quantities Delivered

a. Air leaks in suction pipe or stuffing boxes.

b. Speed too low.

c. Discharge head higher than anticipated.

d. Impeller partially plugged up

e. Obstruction in suction line.

f. Mechanical defects: casing rings worn; impeller damaged; casing or seal defective.

Insufficient Pressure

a. Speed too low. Might be caused by low voltage or current characteristics different from name plate reading on motor.

b. Air in water will cause pump to make a cracking noise.

c. Mechanical defects: worn casing rings; damaged impeller; defective casing or seal.

Intermittent Operation

a. Leaky suction line.

b. Water seal plugged (Hence, leaky stuffing box).

c. Suction lift too high.

d. Air, gas or vapor in liquid.

Pump Overloads Driver

a. Speed too high.

b. Head lower than rated, hence, pumping too much water. (This is valid for low specific speed pumps).

c. Mechanical defects: stuffing boxes too tight; shaft bent; rotating element binds.

d. Rubbing due to foreign matter in pump between case rings & Impeller.

Pump Vibrates

a. Misalignment.

b. Foundation not sufficiently rigid.

c. Impeller partially clogged.

d. Mechanical defects: bent shaft; rotating element binds; bearings worn; coupling defective.

e. Suction and Discharge pipes not anchored.

f. Pump cavitating from too high a suction lift.

g. Air entrainment in the pump suction due to low submergence.

RECOMMENDED SPARE PARTS FOR DOUBLE SUCTION PUMPS

Ref.: Assembly Section

INTERMITTENT DUTY

No.	Description
7	Casing Ring
8	*Impeller Ring
13	*Packing (Stuffing Box)
13A	Packing O-Ring (Shaft Sleeve)
14	*Shaft Sleeve
65	+*Mechanical Seal (Stationary Element)
80	+*Mechanical Seal (Rotating Element)
	Coupling and its accessories (not shown)
	Gasket (not shown)
	Gland Bolts (not shown)

CONTINUOUS DUTY

No.	Description
2	Impeller
6	*Shaft
7	Casing Ring
8	*Impeller Ring
13	*Packing (Stuffing Box)
13A	Packing O-Ring (Shaft Sleeve)
14	*Shaft Sleeve
16	Bearing (Inboard)
18	Bearing (Outboard)
20	*Shaft Sleeve Nut
20A	*Impeller Locknut
22	Bearing Locknut
32	Impeller Key
40	Deflector
46	Coupling Key
65	+*Mechanical Seal - Stationary Element
68	Shaft Collar
80	+*Mechanical Seal - Rotating Element
	Coupling and its accessories (not shown)
	All Hardware (not shown)
	Gasket (not shown)
	Gland Bolts (not shown)

*Determined by Pump Construction
+Complete Consists of 65 & 80

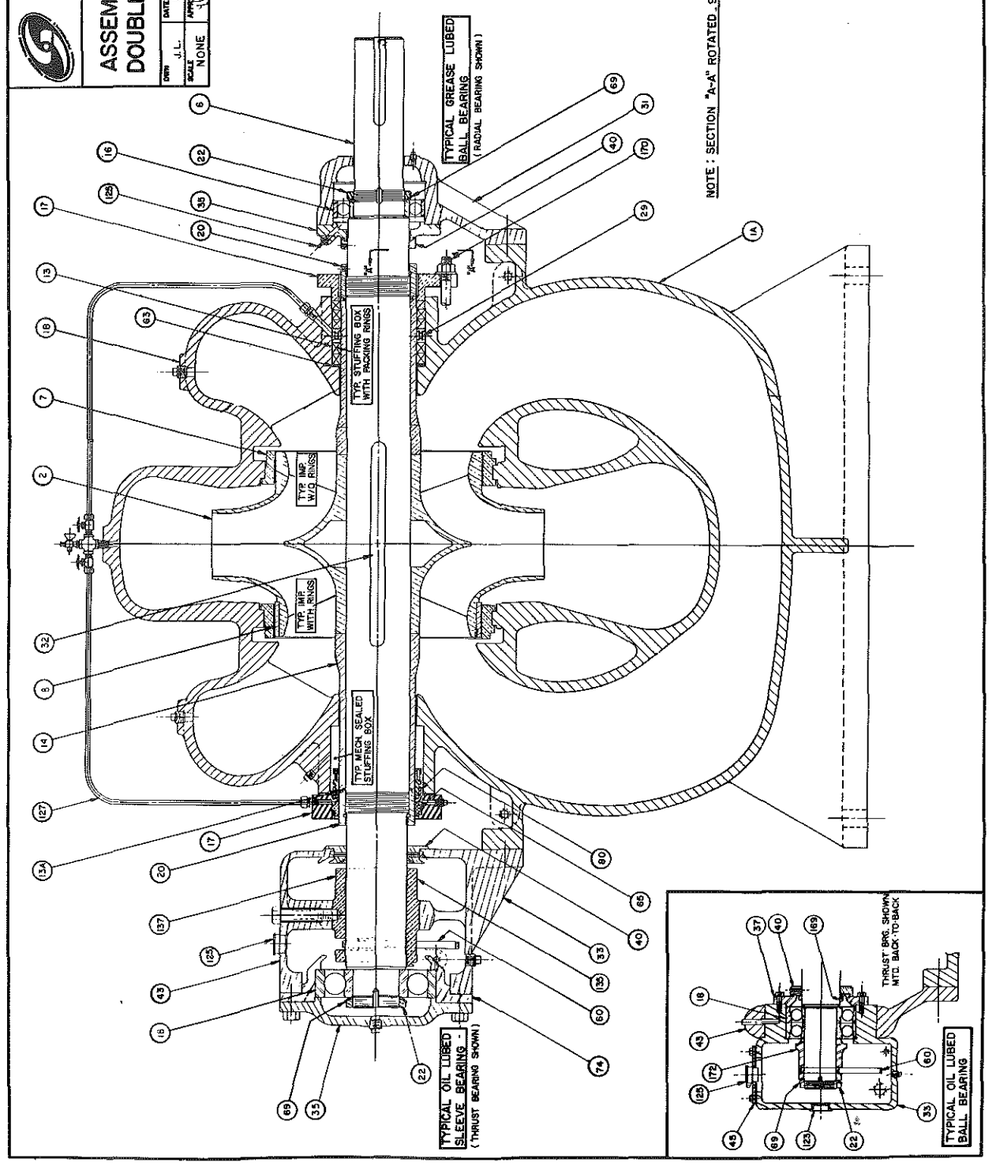
PATTERSON PUMP DIVISION

ASSEMBLY SECTION FOR DOUBLE SUCTION PUMPS

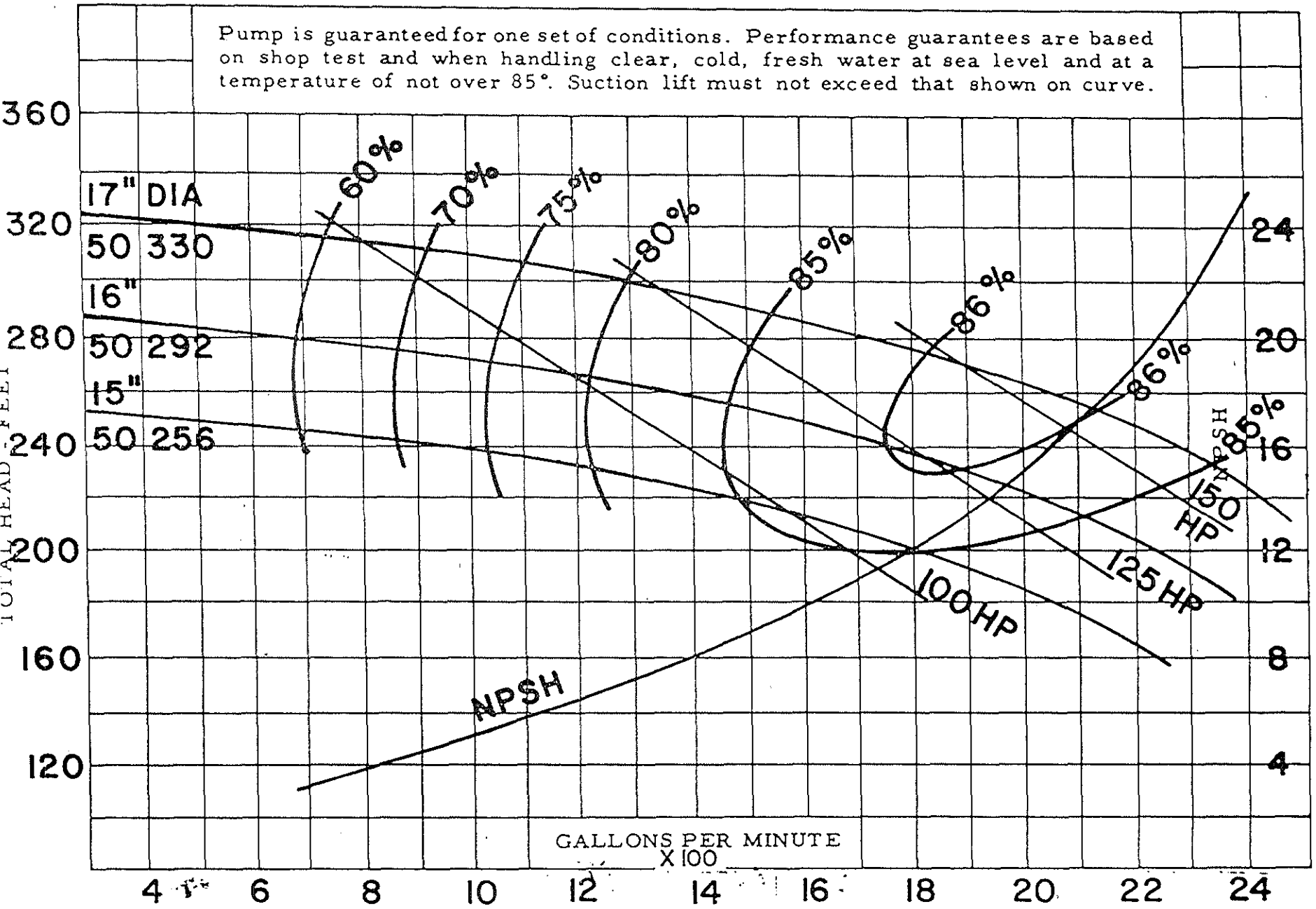
DWN J.L. | DATE 11-16-79 | DWG NO. AD-4712 | SCALE NONE | APPROVED

ITEM	DESCRIPTION
1A	CASING (LOWER HALF)
1B	CASING (UPPER HALF)
2	IMPELLER
6	SHAFT
7	CASING RING
8	IMPELLER RING
13	PACKING (STUFFING BOX)
13A	PACKING (SHAFT SLEEVE)
14	SHAFT SLEEVE
16	BEARING (INBOARD)
17	GLAND
18	BEARING (OUTBOARD)
20	NUT (SHAFT SLEEVE)
22	LOCKNUT
29	LANTERN RING
31	BEARING HOUSING (INBOARD)
32	IMPELLER KEY
33	BEARING HOUSING (OUTBOARD)
35	BEARING COVER (INBOARD)
37	BEARING COVER (OUTBOARD)
40	DEFLECTOR
41	BEARING CAP (INBOARD)
43	BEARING CAP (OUTBOARD)
45	OIL RESERVOIR COVER
60	OIL RING
63	STUFFING BOX BUSHING
65	MECH. SEAL (STATIONARY ELEMENT)
69	LOCKWASHER
74	JOURNAL (THRUST BEARING)
80	MECH. SEAL (ROTATING ELEMENT)
123	BEARING END COVER
125	OIL VENT (GREASE FITTING)
127	SEAL PIPING
135	BEARING SHELL (LOWER HALF)
137	BEARING SHELL (UPPER HALF)
169	BEARING HOUSING SEAL
170	GLAND SWING BOLT
172	OIL SLINGER

AD-4712



Pump is guaranteed for one set of conditions. Performance guarantees are based on shop test and when handling clear, cold, fresh water at sea level and at a temperature of not over 85°. Suction lift must not exceed that shown on curve.



SIZE & TYPE 8X6 MABS	R.P.M. 1760	EYE AREA 44.8
CURVE NO. 6 MABS-DF	IMPELLER B-15396	MAX. SPHERE 7/8"

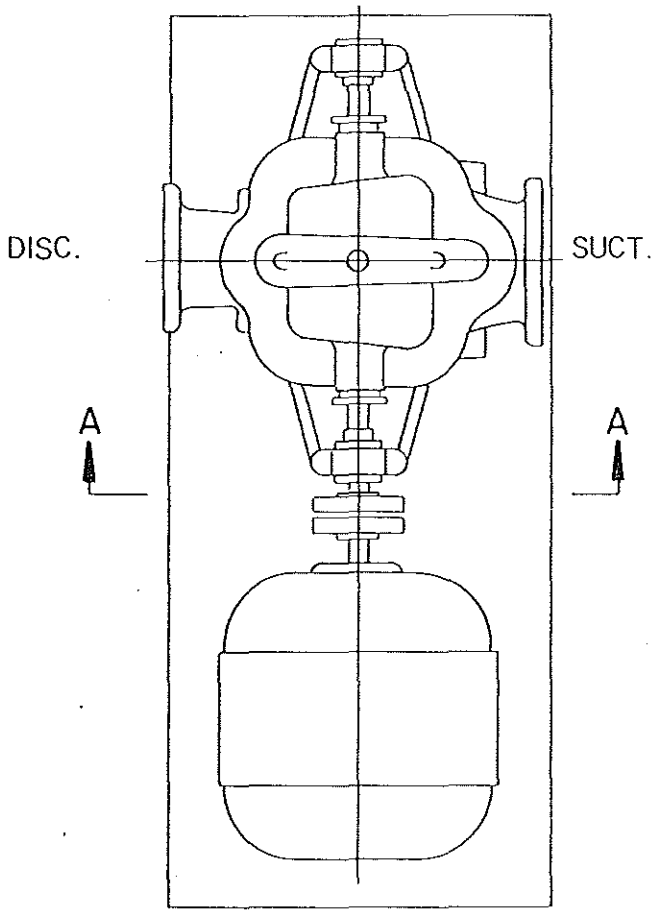
Form 777053

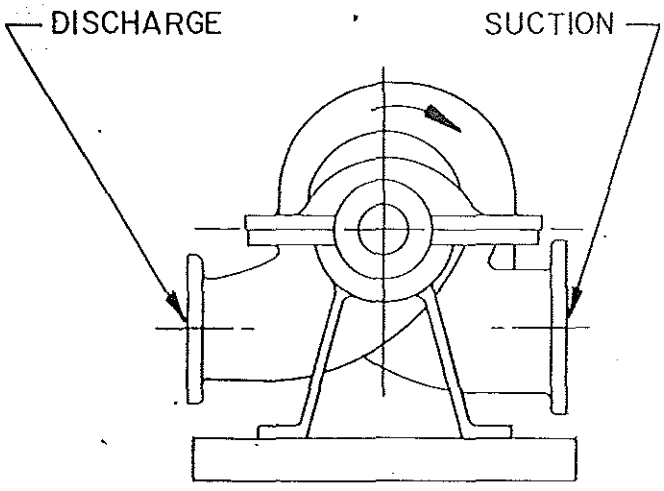
PATTERSON PUMP COMPANY
A SUBSIDIARY OF BANNER INDUSTRIES, INC.
P.O. BOX 790 • TOCCOA, GEORGIA 30577

Section A

ROTATIONAL VIEWS FOR PATTERSON PUMPS

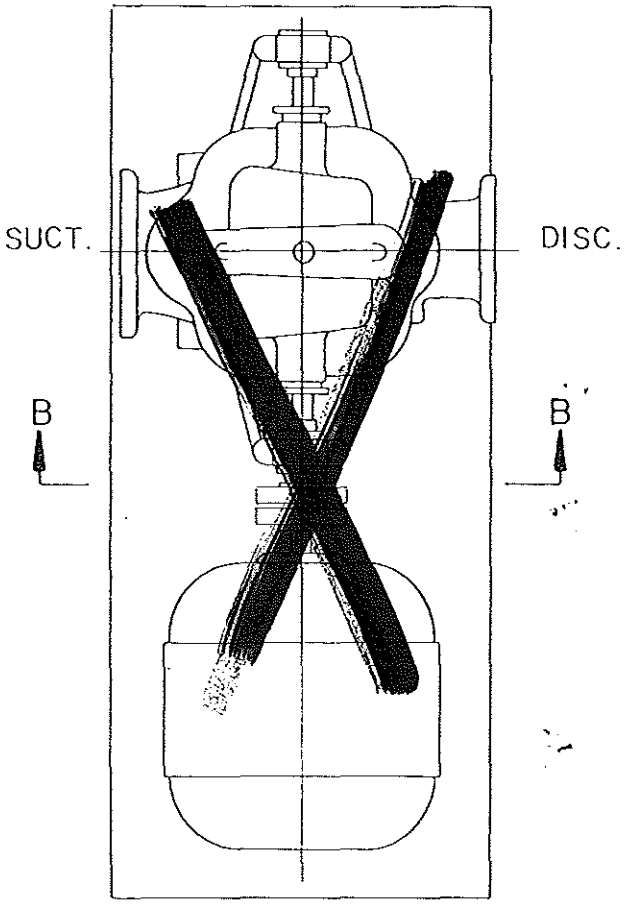
CLOCKWISE ROTATION

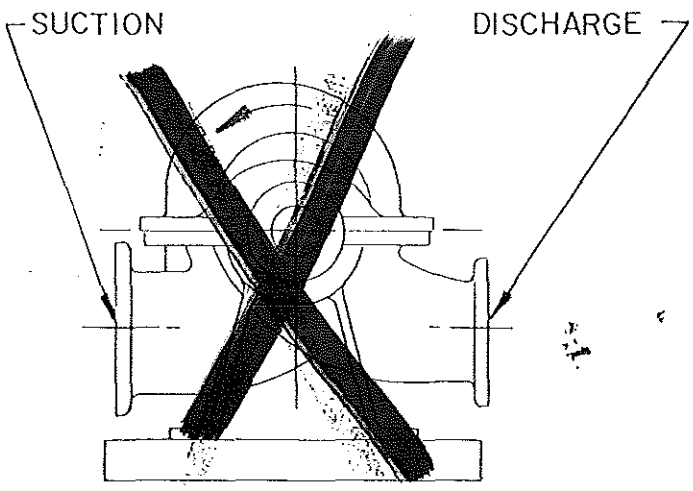




VIEW A-A

COUNTERCLOCKWISE ROTATION





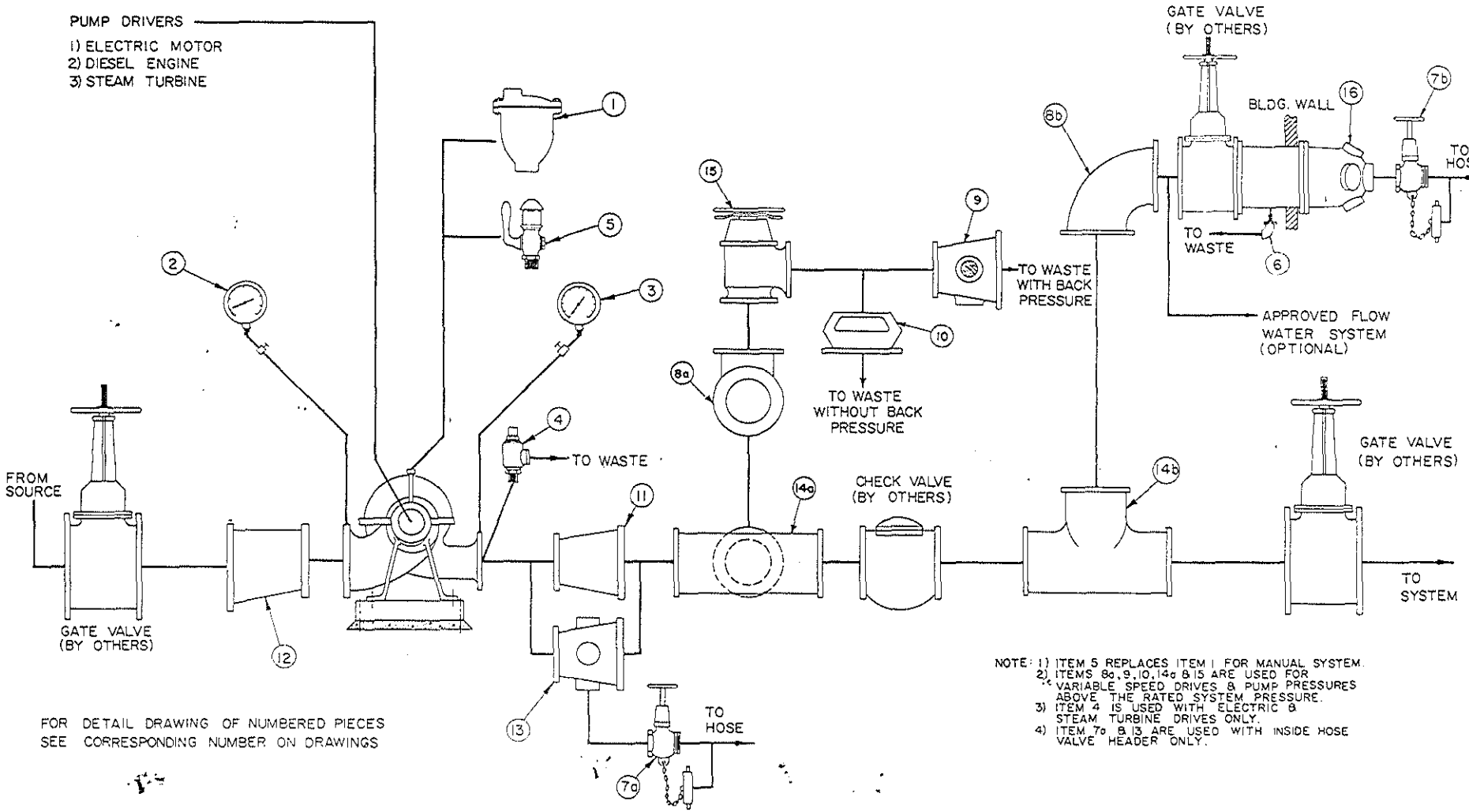
VIEW B-B

PART LIST | ORDER NO. | REF. L2, L3, & L4

SCALE: NONE	CHKD.	PATTERSON PUMP DIVISION (DURIT-CLARK COMPANY)	DWG. NO. L1 -1
DATE: 12/21/79	APPRVD.	GENERAL FIRE PUMP OPERATING LAYOUT	PATT. NO. / PART
DRAWN: SAP	MAT.		

1 AUTOMATIC AIR RELEASE VALVE
2 SUCTION GAUGE
3 DISCHARGE GAUGE
4 CASING RELIEF VALVE
5 UMBRELLA COCK
6 BALL DRIP VALVE
7 HOSE VALVE
8 90° ELBOW
9 ENCLOSED WASTE CONE
10 OPEN WASTE CONE
11 CONCENTRIC DISCHARGE INCREASER
12 ECCENTRIC SUCTION REDUCER
13 INSIDE HOSE VALVE HEADER
14 TEE
15 MAIN RELIEF VALVE
16 OUTSIDE HOSE VALVE HEADER

PUMP DRIVERS
1) ELECTRIC MOTOR
2) DIESEL ENGINE
3) STEAM TURBINE

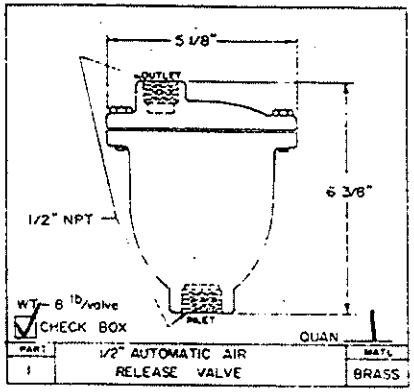


FOR DETAIL DRAWING OF NUMBERED PIECES SEE CORRESPONDING NUMBER ON DRAWINGS

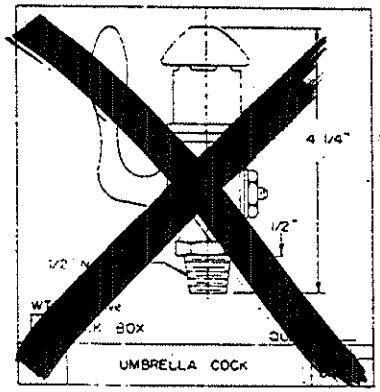
NOTE: 1) ITEM 5 REPLACES ITEM 1 FOR MANUAL SYSTEM.
2) ITEMS 8a, 9, 10, 14a & 15 ARE USED FOR VARIABLE SPEED DRIVES & PUMP PRESSURES ABOVE THE RATED SYSTEM PRESSURE.
3) ITEM 4 IS USED WITH ELECTRIC & STEAM TURBINE DRIVES ONLY.
4) ITEM 7a & 13 ARE USED WITH INSIDE HOSE VALVE HEADER ONLY.

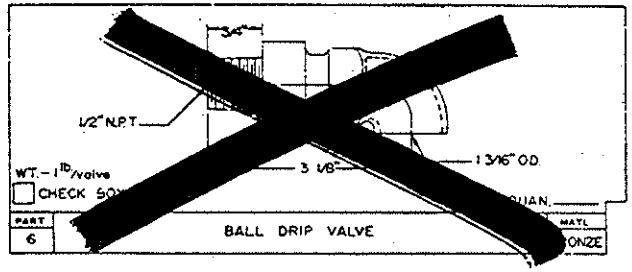
PATTERSON FIRE PUMP ACCESSORIES

DWN. SAP | DATE 6-22-79 | DWG. NO. L2
SCALE NONE | APPROVED

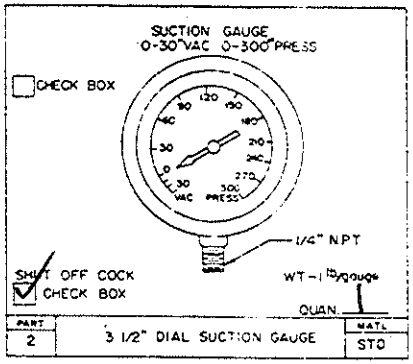


PART		MATL
1	1/2" AUTOMATIC AIR RELEASE VALVE	BRASS

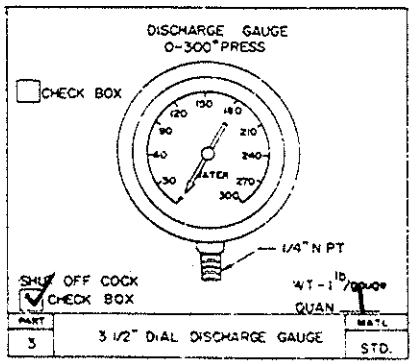




PART		MATL
6	BALL DRIP VALVE	BRONZE

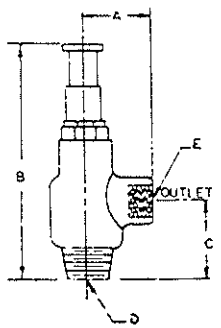


PART		MATL
2	3 1/2" DIAL SUCTION GAUGE	STD

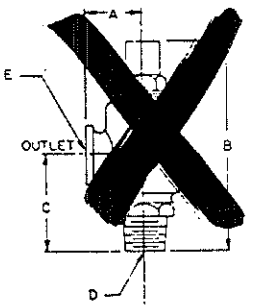


PART		MATL
3	3 1/2" DIAL DISCHARGE GAUGE	STD.

STYLE	PSIG RANGE	A	B	C	D	E	WT	CHECK BOX	QTY
1	25 - 175	1 7/16"	4 1/8"	1 1/2"	3/4"	3/4"	3.4 lb	✓	
2	175 - 300	1 7/16"	6 3/16"	2 5/8"	3/4"	3/4"	3 lb		



STYLE 1

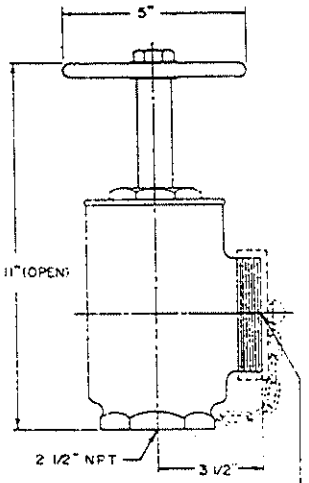


STYLE 2

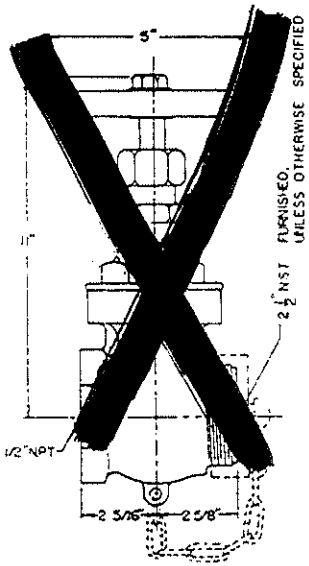
PART		MATL
4	CASING RELIEF VALVE	BRONZE

GPM	NO. OF HOSE VALVES	CHECK BOX	TYPE THREAD
SPECIAL SERVICE	1		
500	2		
750	3		
1,000	4		
1,500	6	✓	N.S.T.
2,000	6		
2,500	8		

✓ WITH CAP & CHAIN
— WITHOUT CAP & CHAIN



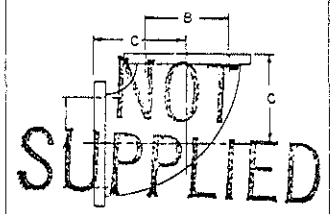
WT - 14 lb/valve



WT - 18 lb/valve

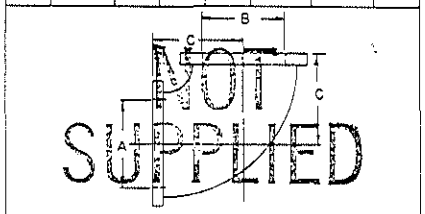
PART		MATL
5	HOSE VALVE	BRASS

ITEM	SIZE A x B	C	WT/FIT.	CHECK BOX	QUAN
A	6" x 6"	8"	70 lb.		
B	8" x 8"	9"	120 lb.		
C	10" x 10"	11"	185 lb.		
D	12" x 12"	12"	260 lb.		



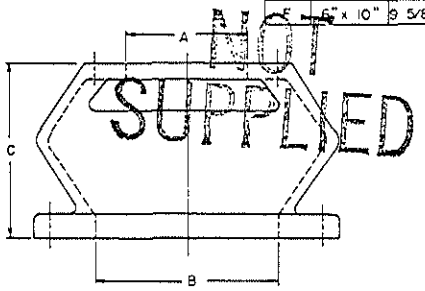
PART		MATL.
8	90° ELBOW	C.I.

ITEM	SIZE A x B	C			WT/FIT	CHECK BOX	QUAN
A	5" x 3"	7 1/2"			40 lb		
B	6" x 3"	8"			47 lb.		
C	6" x 4"	8"			56 lb.		
D	8" x 6"	9"			90 lb		
E	10" x 6"	11"			125 lb		



PART		MATL.
8	90° REDUCING ELBOW	C.I.

ITEM	SIZE A x B	C	WT/FIT	CHECK BOX	QUAN
A	3" x 5"	8 5/8"	37 lb		
B	3" x 6"	9 5/8"	37 lb		
C	4" x 6"	9 5/8"	73 lb.		
D	4" x 8"	9 5/8"	73 lb.		
E	6" x 8"	9 5/8"	80 lb.		
F	6" x 10"	9 5/8"	85 lb		



PART		MATL.
10	OPEN WASTE CONE	C.I.

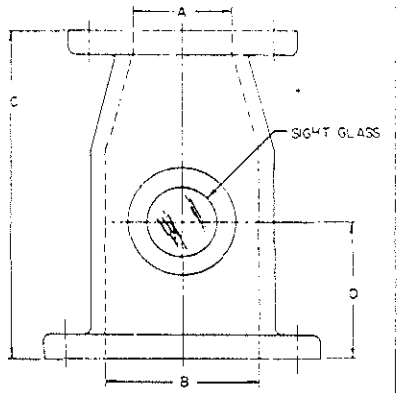
Patterson

PATTERSON FIRE PUMP ACCESSORIES

DWN	DATE	DWG NO.
SAP	6-19-79	L3
SCALE NONE	APPRVD	

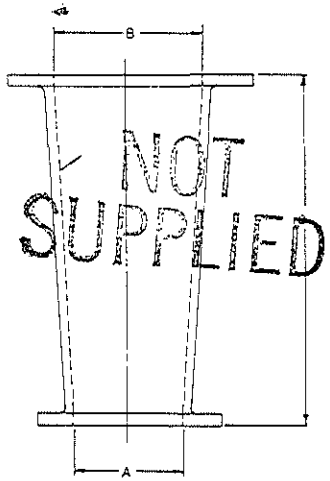
ALL FLANGES AND FLANGE DRILLING ARE IN CONFORMANCE WITH ASA B-16-1, 125 lb C I FLANGE STANDARDS, UNLESS OTHERWISE SPECIFIED

ITEM	SIZE A x B	C	D	WT/FIT	CHECK BOX	QUAN
A	3" x 6"	10"	4 1/8"	46 lb		
B	4" x 6"	10"	4 1/8"	46 lb		
C	4" x 8"	10"	4 1/8"	46 lb		
D	6" x 8"	11"	4 1/2"	76 lb		
E	6" x 10"	13"	5"	90 lb		
F	3" x 5"	10"	4 1/8"	46 lb		



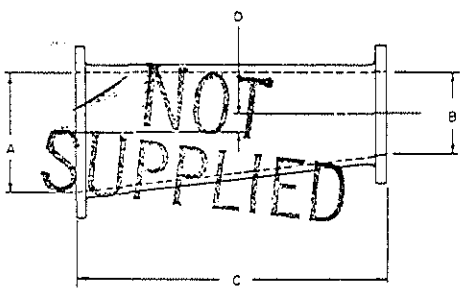
PART		MATL.
9	ENCLOSED WASTE CONE	C.I.

ITEM	SIZE A x B	C	WT/F.I.T.	CHECK BOX	QUAN
A	2" x 3"	6"	16 lb.		
B	3" x 6"	9"	47 lb.		
C	4" x 6"	9"	50 lb		
D	4" x 8"	11"	71 lb		
E	5" x 6"	9"	51 lb.		
F	5" x 8"	11"	76 lb.		
G	6" x 8"	11"	77 lb.		
H	6" x 10"	12"	107 lb.		
J	8" x 10"	12"	120 lb.		
K	8" x 12"	14"	150 lb		
L	10" x 12"	14"	180 lb		
M	10" x 14"	16"	200 lb		



PART		MATL.
11	CONCENTRIC DISCHARGE INCREASER	C.I.

ITEM	SIZE A x B	C	D	WT/FIT	CHECK BOX	QUAN
A	4" x 3"	7"	1/2"	28 lb		
B	6" x 4"	9"	1"	50 lb		
C	6" x 5"	9"	1/2"	51 lb		
D	8" x 5"	11"	1 1/2"	76 lb		
E	8" x 6"	11"	1"	77 lb		
F	10" x 6"	12"	2"	98 lb		
G	10" x 8"	12"	1"	120 lb		
H	12" x 8"	14"	2"	155 lb		
J	12" x 10"	14"	1"	180 lb		



PART		MATL.
12	ECCENTRIC SUCTION REDUCER	C.I.

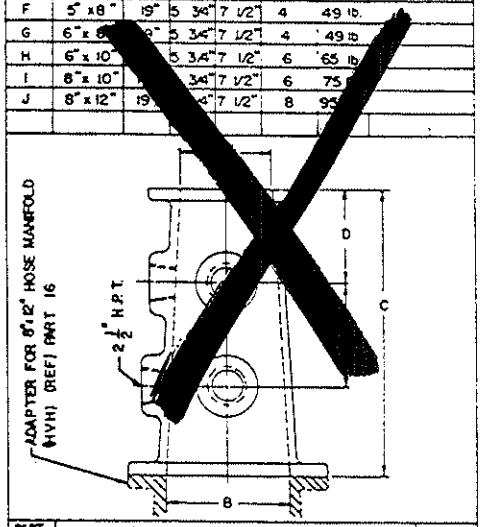
PATTERSON PUMP COMPANY
A SUBSIDIARY OF BANNER INDUSTRIES INC.
TOCCOA GEORGIA

PATTERSON FIRE PUMP ENGINE ACCESSORIES

DRWN	DATE	DWG NO.
SAP	6-15-79	L4-2
SCALE NONE	APPROVED	

ALL FLANGES AND FLANGE DRILLING ARE IN CONFORMANCE WITH A.S.A. B-16-1, 125 lb. C.I. FLANGE STANDARDS UNLESS OTHERWISE SPECIFIED.

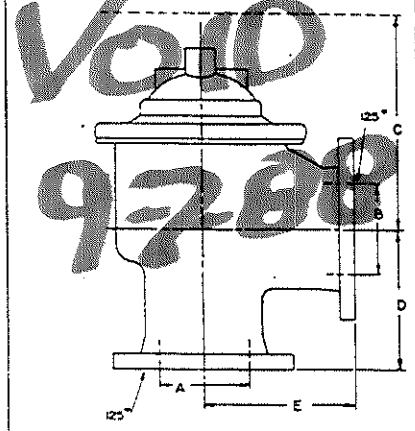
ITEM	SIZE A x B	C	D	E	NO OF PORTALS	WT/FIT.	CHECK BOX	QUAN
A	2" x 4"	10"	5"	—	1	30 lb		
B	4" x 4"	12"	6"	—	1	40 lb		
C	3" x 6"	11 1/2"	5 3/4"	—	3	47 lb		
D	5" x 6"	11 1/2"	5 3/4"	—	3	47 lb		
E	4" x 8"	19"	5 3/4"	7 1/2"	4	49 lb		
F	5" x 8"	19"	5 3/4"	7 1/2"	4	49 lb		
G	6" x 8"	19"	5 3/4"	7 1/2"	4	49 lb		
H	6" x 10"		5 3/4"	7 1/2"	6	65 lb		
I	8" x 10"		5 3/4"	7 1/2"	6	75		
J	8" x 12"	19"	5 3/4"	7 1/2"	8	95		



PART 13 — INSIDE HOSE VALVE HEADER — MATL C.I.

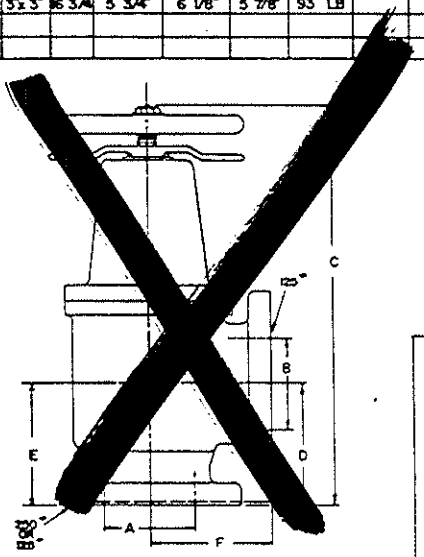
ITEM	SIZE A x B	C	D	E	WT/FIT	CHECK BOX	QUAN
A	4" x 4"	8 3/8"	6 3/4"	6 3/4"	150		
B	6" x 6"	12 3/8"	8 1/2"	8 1/2"	230	✓	1
C	8" x 8"	16 1/4"	11"	11"	300		

VOID 92-80



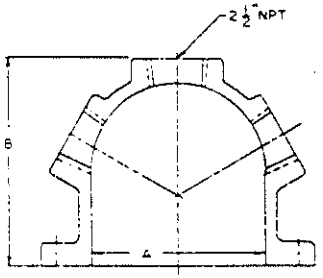
PART 15 — BAKER MAIN RELIEF VALVE — MATL C.I.

ITEM	SIZE A x B	C	D (125)	E (250)	F	WT./FIT.	CHECK BOX	QUAN.
A	4"x4"	22"	6 5/16"	6 3/8"	6 1/2"	160 LB.		
B	3"x 3"	16 3/4	5 3/4"	6 1/8"	5 7/8"	93 LB		



PART 15 — KUNKLE MAIN RELIEF VALVE — MATL C.I.

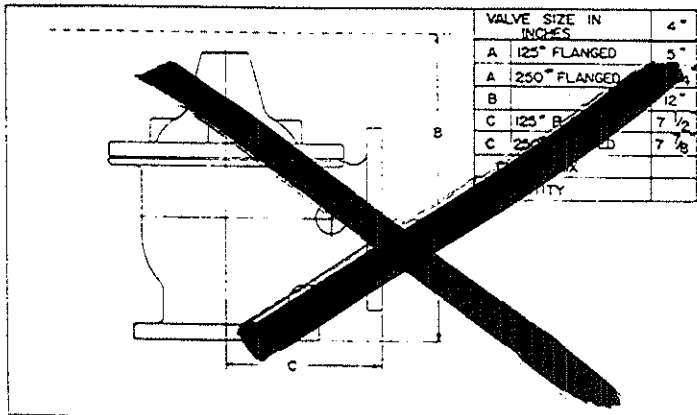
ITEM	A	B	NO OF PORTALS	WT./FIT.	CHECK BOX	QUAN
A	4"	8"	2	40 lb		
B	6"	8 3/16"	3,4	60 lb		
C	8"	9 3/4"	6	90 lb	✓	1
D	10"	20"	8-12	180 lb		



NO PORTALS	FLOW
2	500
3	750
4	1000
6	1500
8	2500
12	3000

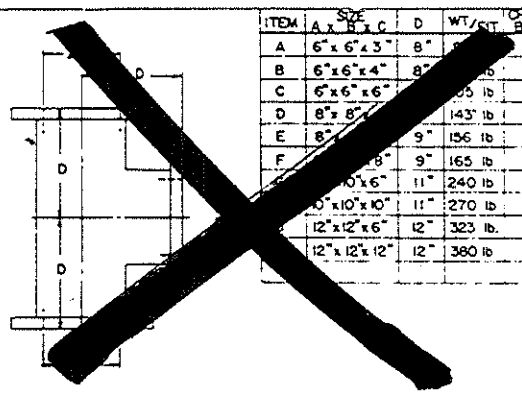
ALSO AVAILABLE IN 250 PSI

PART 16 — OUTSIDE HOSE VALVE HEADER — MATL C.I.



VALVE SIZE IN INCHES		4"	6"	8"
A	125" FLANGED	5"	6"	8"
A	250" FLANGED	4 1/16"	6 1/2"	8 1/2"
B		12"	12 1/2"	15 3/4"
C	125" FLANGED	7 1/2"	10"	12 3/4"
C	250" FLANGED	7 1/8"	10 1/2"	13 1/4"

PART 15 — CLAYTON MAIN RELIEF VALVE — MATL C.I.



ITEM	SIZE A x B x C	D	WT./FT	CHECK BOX	QUAN
A	6"x 6"x 3"	8"			
B	6"x6"x4"	8"			
C	6"x6"x6"				
D	8"x 8"		143 lb		
E	8"	9"	156 lb		
F	8"	9"	165 lb		
	10"x6"	11"	240 lb		
	10"x10"x10"	11"	270 lb		
	12"x12"x6"	12"	323 lb.		
	12"x12"x12"	12"	380 lb		

PART 14 — STRAIGHT TEE — MATL C.I.

GERAND ENGINEERING CO.

4903 S. CEDAR LAKE RD.
MINNEAPOLIS, MN 55416

TLX: 298125 GERAND ENG MPS
Telephone: (612) 374-1320

DETAILS OF PARTS AND INSTALLATION OF THE GERAND FIRE PUMP TEST METERS

MATERIALS SHIPPED WILL BE AS FOLLOWS:

(1) ONE FACTORY CALIBRATED DIRECT READING GPM METER WITH VENT VALVES AND CLEAR HOSES ASSEMBLED AND ATTACHED TO THE METER. THE LENS OF THE METER HAS AN "FM APPROVED" STICKER ADHERED TO IT AS WELL AS A METAL TAG WITH THE GERAND MODEL NUMBER, MAXIMUM RATED PSI AND SERIAL NUMBER.

(1) ONE CALIBRATED GERAND VENTURI WITH ATTACHED METAL TAG LISTING THE VENTURI SIZE, THE PUMP GPM, THE METER RANGE AND THE MAXIMUM RATED PSI. ADHERED TO THE VENTURI IS A "FLOW STICKER" WITH AN ARROW SHOWING THE DIRECTION OF THE FLOW AND THE CORRECT STRAIGHT PIPE DIAMETERS REQUIRED UPSTREAM AND DOWNSTREAM FROM THE VENTURI.

(1) ONE SET OF 500 PSI RATED HOSES ASSEMBLED WITH COLOR CODED FITTINGS TO BE ATTACHED TO THE METER AND VENTURI.

INSTALLATION INSTRUCTIONS ARE AS FOLLOWS:

THE VENTURI MUST BE INSTALLED IN THE LINE WITH THE FLOW IN THE SYSTEM GOING IN THE SAME DIRECTION AS THE ARROW SHOWN ON THE VENTURI STICKER AND WITH THE CORRECT STRAIGHT PIPE DIAMETERS UPSTREAM AND DOWNSTREAM OF THE VENTURI.

THE METER IS THEN ATTACHED TO THE BRACKET WELDED ON THE VENTURI.

ONCE THE METER HAS BEEN SECURED TO THE VENTURI, SCREW THE VALVELESS END OF THE HOSES INTO THE METER (RED TO RED AND GREEN TO GREEN) AND THE VALVE FITTED ENDS INTO THE VENTURI (RED TO RED AND GREEN TO GREEN).

OPERATING INSTRUCTIONS:

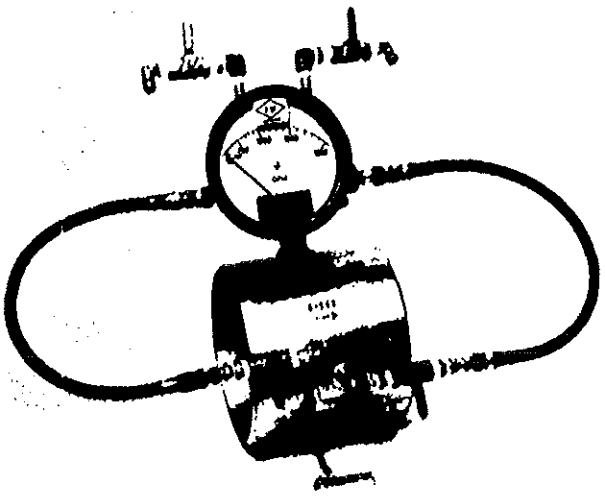
ATTACHED TO THE METER WITH A BRASS CHAIN IS AN OBLONG METAL TAG WITH THE SUGGESTED PIPING DIAGRAM OF THE SYSTEM ON ONE SIDE AND THE FOLLOWING OPERATING INSTRUCTIONS ON THE REVERSE SIDE:

1. CLOSE SYSTEM OYS VALVE "A".
2. OPEN OSY BY-PASS VALVE AND "B" BUTTERFLY THROTTLE VALVE.
3. PURGE METER LOCATED ON VENTURI AS FOLLOWS:
   OPEN STATION SHUT-OFF VALVES (BELOW METER) AND VENT VALVES (ABOVE METER). WHEN A STEADY STREAM OF WATER IS PASSING THROUGH EACH PLASTIC HOSE, METER IS PURGED OF AIR. CLOSE VENT VALVES AFTER AIR PURGING.
4. START FIRE PUMP AND READ METER IN GPM.
5. REFER TO PUMP GPM REQUIREMENT AND ADJUST THROTTLE VALVE FOR THE REQUIREMENT.

MODEL-K FIRE PUMP TEST METER

726—8-8-8B

FM APPROVED



– RATING 500 PSI –
(BUTT WELD, GROOVED ENDS & 300 # FLANGED)

– RATING 275 PSI –
(FOR 150 # FLANGED UNITS ONLY)

A CALIBRATED VENTURI AND ATTACHED GPM METER INSTALLED ON THE DISCHARGE OF A FIRE PUMP TO ACCURATELY DETERMINE PUMP PERFORMANCE.

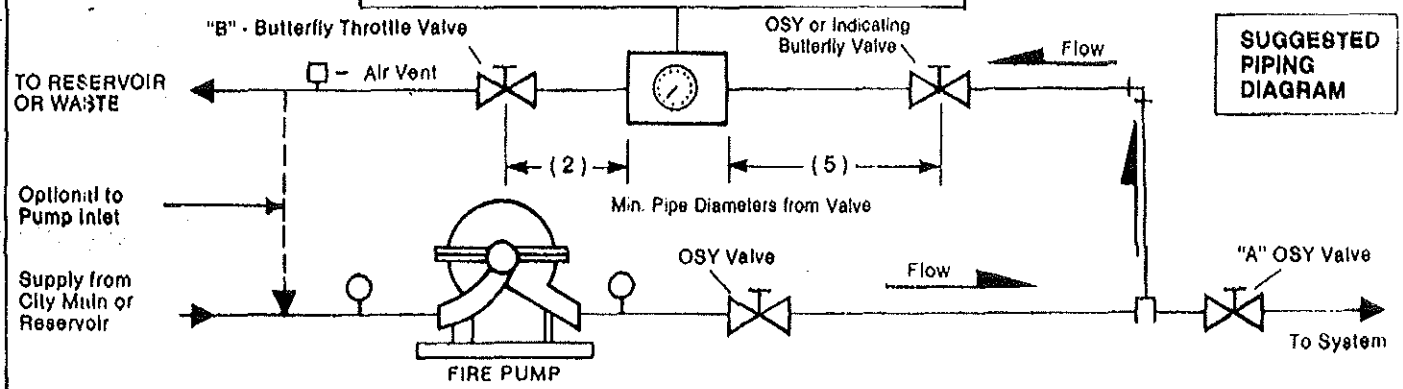
4½" DIAL METER IS SHIPPED FOR MOUNTING ON VENTURI BRACKET. IF METER IS TO BE REMOTE MOUNTED, CONSULT FACTORY ON SPECIAL HOSE LENGTHS.

CONSULT FACTORY FOR FM APPROVED SYSTEM COMBINATIONS OTHER THAN BELOW.

PUMP GPM	VENTURI SYSTEM MODEL NO.	PIPE SIZE	METER RANGE MIN. & MAX. GPM	WELDED OR GROOVED VENTURI LENGTH	*FLANGED VENTURI LENGTH 150 # (RF)	300 # (RF)
25	K-25-1¼ (616)	1¼"	12.5-50	Threaded only 3¾"	---	---
50	K-50-2 (685)	2"	25-100	Threaded only 4¼"	---	---
100	K-100-2½ (746)	2½"	50-200	3" (WELD) 4"	8½"	9½"
150	K-150-3 (746)	3"	75-300	3½" (WELD) 4⅜"	9"	10¼"
200	K-200-3 (766)	3"	100-400	3½" (WELD) 4⅜"	9"	10½"
250	K-250-4 (744)	4"	125-500	3½" (WELD) 3¾"	9½"	10¾"
300	K-300-4 (744)	4"	150-600	3½" (WELD) 3¾"	9½"	10¾"
450	K-450-4 (744)	4"	225-900	3½" (WELD) 3¾"	9½"	10¾"
500	K-500-5 (716)	5"	250-1000	5"	12"	13¼"
750	K-750-6 (743)	6"	375-1500	6"	13"	14¼"
1000	K-1000-6 (743)	6"	500-2000	6"	13"	14¼"
1250	K-1250-6 (743)	6"	625-2500	6"	13"	14¼"
1500	K-1500-8 (750)	8"	750-3000	7"	15"	16¼"
2000	K-2000-8 (750)	8"	1000-4000	7"	15"	16¼"
2500	K-2500-8 (750)	8"	1250-5000	7"	15"	16¼"
3000	K-3000-8 (750)	8"	1500-6000	7"	15"	16¼"
3500	K-3500-10 (755)	10"	1750-7000	8"	16"	17¾"
4000	K-4000-10 (755)	10"	2000-8000	8"	16"	17¾"
4500	K-4500-10 (755)	10"	2250-9000	8"	16"	17¾"
5000	K-5000-12 (750)	12"	2500-10000	12"	21"	22¾"

*SPECIFY RAISED OR FLAT FACE

GERAND GPM METER - VENTURI PACKAGE



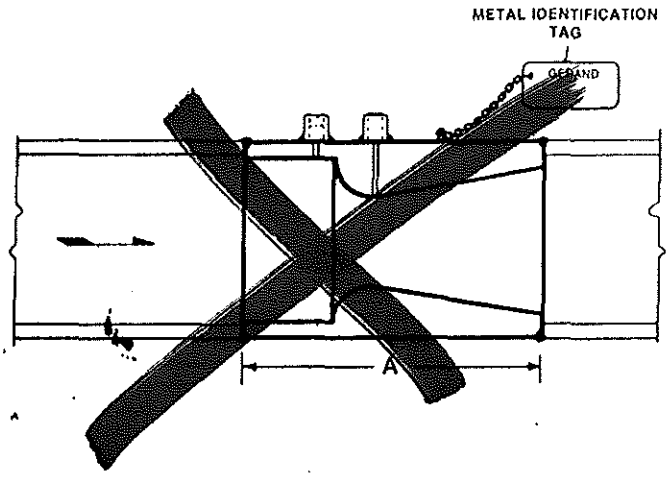
OPERATING INSTRUCTIONS FOR GERAND FIRE PUMP TEST METER

1. CLOSE SYSTEM OSY VALVE "A".
2. OPEN BY-PASS VALVE AND "B" BUTTERFLY THROTTLE VALVE.
3. PURGE METER LOCATED ON VENTURI AS FOLLOWS:
   OPEN STATION SHUT-OFF VALVES (BELOW METER) AND VENT VALVES (ABOVE METER). WHEN A STEADY STREAM OF WATER IS PASSING THROUGH EACH PLASTIC HOSE, METER IS PURGED OF AIR. CLOSE VENT VALVES AFTER AIR PURGING.
4. START FIRE PUMP AND READ METER IN GPM.
5. REFER TO PUMP GPM REQUIREMENT AND ADJUST THROTTLE VALVE FOR THIS REQUIREMENT.

GERAND ENGINEERING CO.
4903 SOUTH CEDAR LAKE ROAD • MINNEAPOLIS, MN 55416 • PHONE: (612) 374-1320 • FAX: (612)374-1758

AVAILABLE VENTURI STYLES

FM APPROVED

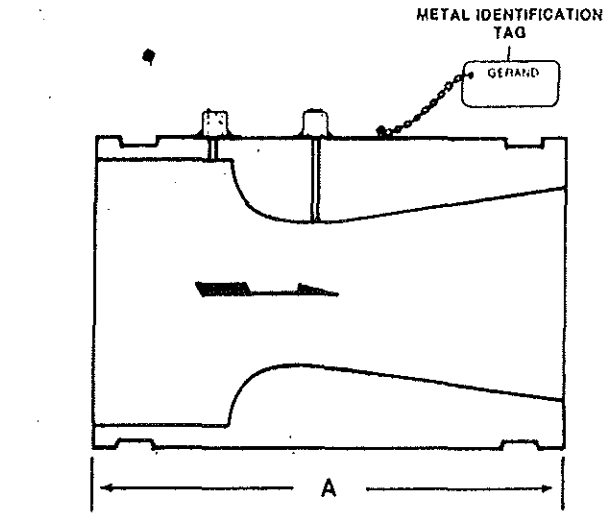


BUTT WELD ENDS
Steel (2½" – 10" Zinc Plated)
Accuracy – ±1%

SIZE	A
2½" - 746	3"
3" - 766	[illegible]
4" - 744	[illegible]
5" - 715	5"
6" - [illegible]	6"
8" - [illegible]	[illegible]
10" - 755	[illegible]
12" - 750	12"

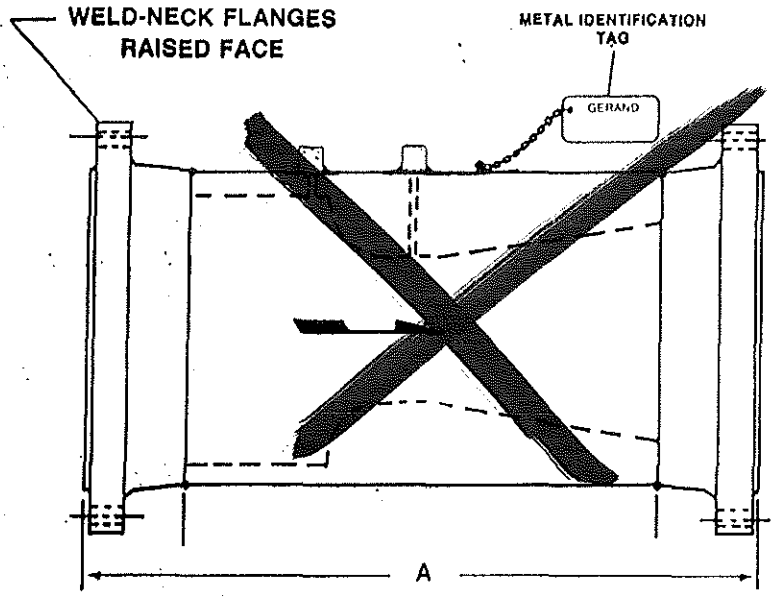
BRASS THREADED ONLY
Accuracy – ±1%

1¼" - 616	3¾"
2" - 685	4¼"



GROOVED ENDS
Steel (2½" – 10" Zinc Plated)
Accuracy – ±1%

SIZE	A
2½" - 746	4"
3" - 766	4⅜"
4" - 744	3¾"
5" - 715	5"
6" - 743	6"
8" - 750	7"
10" - 755	8"
12" - 750	12"



FLANGED ENDS (RF)
Steel (2½" – 10" Zinc Plated)
Accuracy – ±1%

SIZE	150 #	300 #
2½" - 746	[illegible]	9½"
3" - [illegible]	9"	10¼"
4" - 744	9½"	10¾"
5" - 715	12"	13¼"
6" - 743	13"	[illegible]¼"
8" - 750	15"	[illegible]¼"
10" - 755	16"	17¾"
12" - 750	21"	22¾"

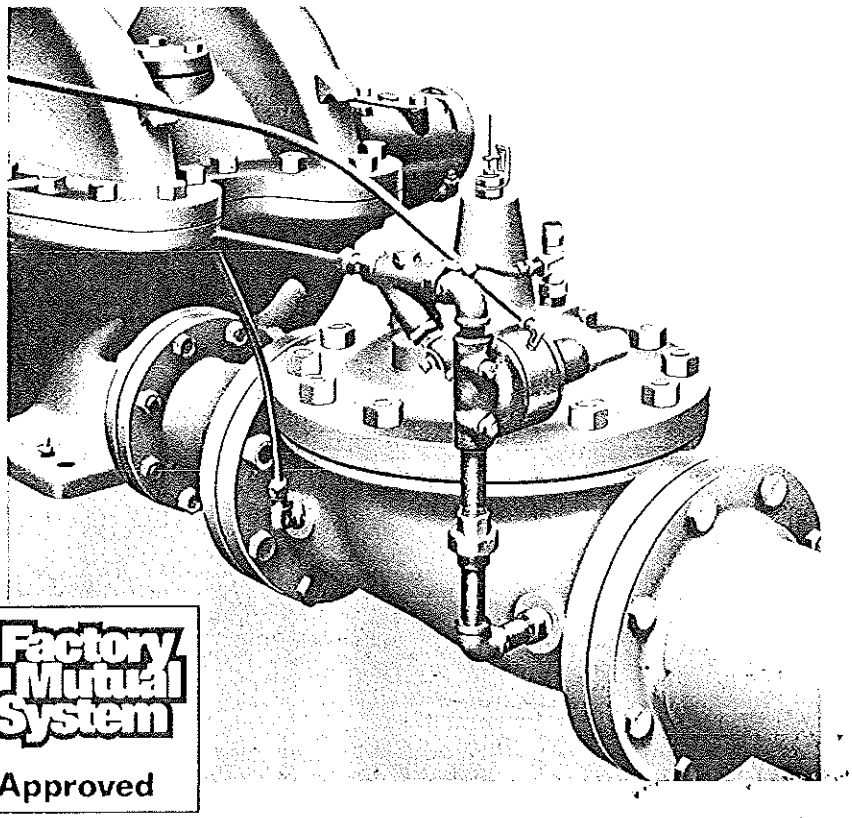
CLAYTON® *automatic* VALVES

for

FIRE PROTECTION SYSTEMS

The Clayton **50B-5KG**

PUMP SUCTION CONTROL VALVE

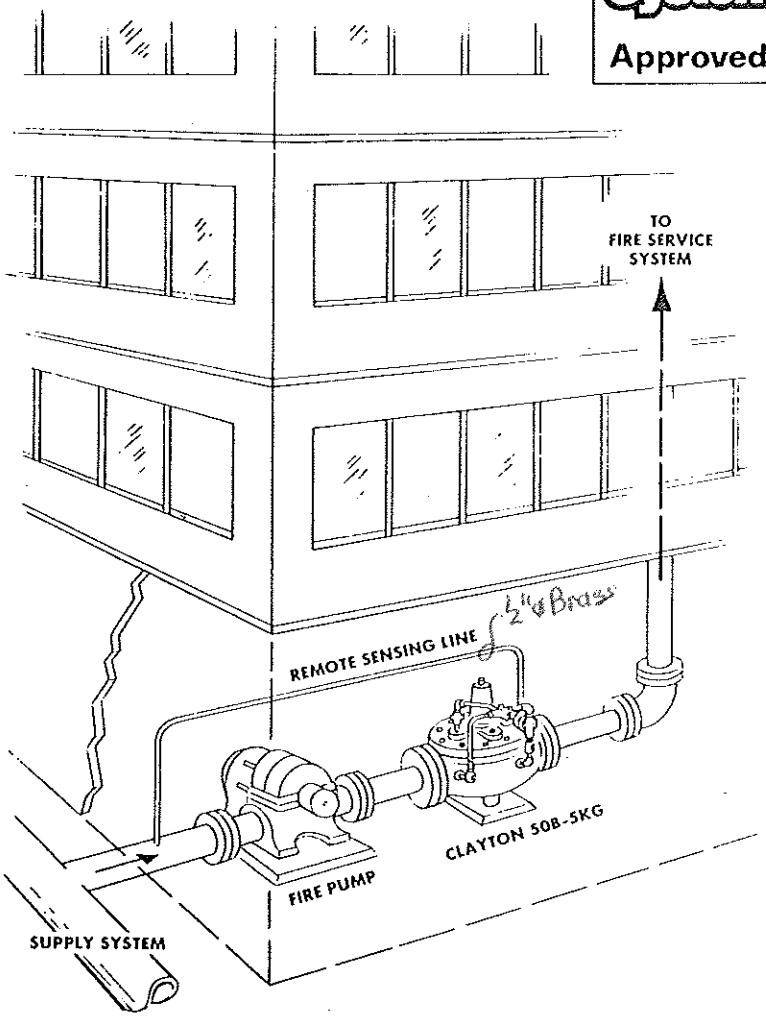


The Clayton 50B-5KG Pump Suction Control Valve is designed specifically for Fire Pump Suction Control Service. It modulates to maintain the pump discharge in relation to the suction head available, thus assuring that the suction head pressure does not fall below the pre-set minimum.

The Clayton 50B-5KG is a diaphragm-type valve, hydraulically operated, pilot-controlled for modulating service. The Valve is actuated by line pressure through a pilot control system affording fast response to changing pressure conditions to maintain the desired minimum pressure at the pump suction. Operation is completely automatic. Pressure setting is adjustable.

Factory Mutual System Approved

TYPICAL INSTALLATION



FEATURES

- Adjustable opening speed for pump suction protection.
- Pilot control provides wide flow range with minimal pressure variations.
- Controlled closing for system protection.
- Modulates within 5% of setting for accurate pressure control.
- Pressure settings adjustable.
- No external packing glands.
- Pressure setting not affected by pressure at valve discharge.

The diagram illustrates the application of the Clayton 50B-5KG Pump Suction Control Valve.

When there is a demand in the Fire System, the pump is started, delivering water from the supply source to the area of demand. To assure the fire pump draw does not exceed the available water supply, the Clayton 50B-5KG, sensing the pump suction, modulates to prevent suction pressure from dropping below a pre-set minimum.

By maintaining minimum pressure requirements in the supply main, the main is protected from possible damage or backflow conditions. Also a minimum supply pressure is provided for local fire apparatus.

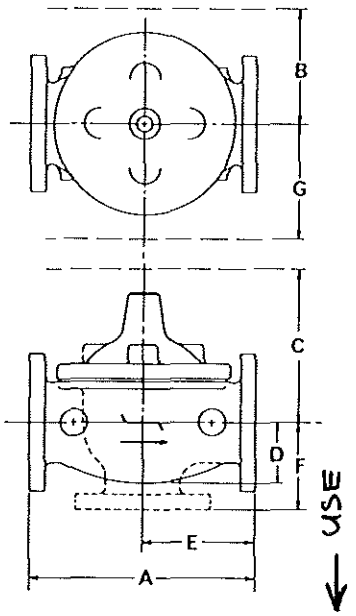
Factory Mutual System
Approved

Clayton 50B-5KG
PUMP SUCTION CONTROL VALVE

SPECIFICATIONS

SIZES	*Globe:* 3" - 8" flanged *Angle:* 3" - 8" flanged
END DETAILS	125 and 250 ANSI B16.1
PRESSURE RATINGS	125 class - 175 psi Max. 250 class - 300 psi Max.
TEMPERATURE RANGE	Water, to +180°F. Max.
MATERIALS	*Main valve body & cover:* Cast Iron ASTM A48 *Main valve trim:* Brass QQ-B-626 Bronze Seat ASTM B61 Teflon Coated Stainless Steel Stem 303 Delrin Sleeved *Pilot Control System:* Cast Bronze ASTM B62 with 303 Stainless Steel Trim
ADJUSTMENT RANGES	*Available in the following pressure range:* 5 to 25 psi Set at 10 psi

DIMENSIONS



DIMENSIONS IN INCHES

VALVE SIZES IN INCHES		3	4	6	8
A	SCREWED ENDS	12½	—	—	—
	125 FLANGED	12	15	20	25⅜
	250 FLANGED	13¼	15⅝	21	26⅜
B		4⅝	5¾	7⅞	10
C		19¼	19¼	19¼	22¾
D		3⅛	4¼	6	7⅝
E	SCREWED ENDS	6¼	—	—	—
	125 FLANGED	6	7½	10	12¾
	250 FLANGED	6⅜	7⅞	10½	13¼
F	SCREWED ENDS	4½	—	—	—
	125 FLANGED	4	5	6	8
	250 FLANGED	4⅜	5¼	6½	8½
G		8	8½	9	11

PURCHASE SPECIFICATIONS

The Fire Pump Suction Control Valve shall modulate to maintain a minimum pressure at the Pump Suction regardless of system demand. It shall control the pump discharge in relation to the suction head available, and shall not allow suction head pressure to fall below a pre-set minimum.

It shall be actuated by line pressure thru a pilot control system which allows rapid response to changing pressure conditions without line surges. The pilot control shall be remote sensed to the pump suction head pressure.

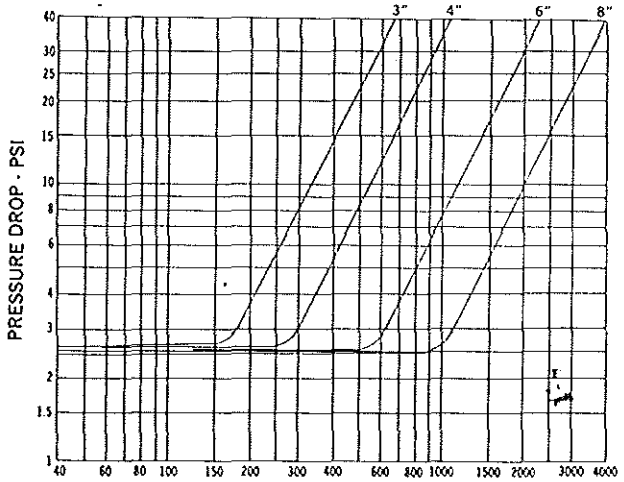
The main valve shall be of the hydraulically-operated, pilot-controlled, diaphragm-type, globe or angle valve. It shall have a single, removable seat, a delrin-sleeved guided stem and a renewable resilient disc with rectangular cross section. No external packing glands shall be permitted and the diaphragm shall not be used as a seating surface. The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm-type valve designed for modulating service to permit flow when controlling pressure exceeds spring setting.

A device indicating the percent at which the valve is open or closed shall be supplied on the assembly, together with a sediment evacuator and dampening device.

The valve shall be designed to allow for repair and servicing without removing the valve body from the line.

This valve shall be FACTORY MUTUAL APPROVED. It shall be similar in all respects to the CLAYTON 50B-5KG 3" PUMP SUCTION CONTROL VALVE as manufactured by Cla-Val Co., Newport Beach, California.

FLOW CHART



FLOW - GALLONS PER MINUTE

LITHO IN U.S.A.

CLA-VAL CO. *Newport Beach, California*

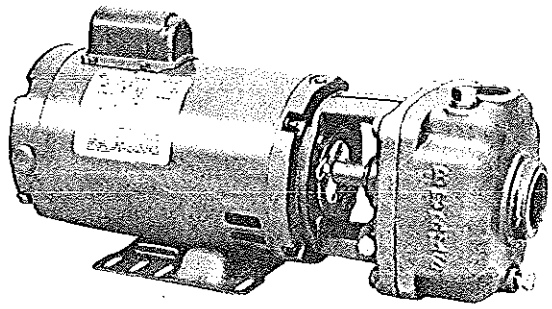
SERIES CS

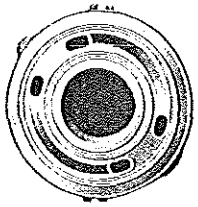
FORM No. 700
Rev. 3/84

burks pumps®

P.O. Box 431 Decatur, IL 62526-0431
Phone: 217/429-2591

Close Coupled Turbine Pumps





BURKS exclusive, unique regenerative type turbine pumps are designed to handle clear water and many other non-abrasive, lower viscosity liquids on high pressure, low capacity applications with the greatest possible efficiency.

BURKS is the only turbine pump with Life-Lok® External Impeller Adjustment feature that allows readjustment of impeller without disturbing piping, disassembling pump or replacing parts. Gives up to 40% longer service life than turbine pumps of other designs.

QUALITY FEATURES

- Self-Priming
- Compact, space-saving size
- No coupling – eliminates misalignment problems
- Dependable carbon/ceramic mechanical shaft seal for temperatures to 225°F.
- Bronze impeller with Monel blades – the only moving part
- Bronze raceway with cast-in vortex pockets – will not vapor lock
- #303 Stainless Steel pump shaft
- Easy to service
- Every pump factory tested

PERFORMANCE AND SELECTION

*Catalog No.		H.P.	Tappings			TOTAL HEAD												
					PSI	8.6	17.2	26	43.3	54.1	64.9	75.8	86.6	97.4	108.3	119.1	130	140.1	151.6
					Feet	20	40	60	100	125	150	175	200	225	250	275	300	325	350
1-Phase	3-Phase		Suct.	Disch.		CAPACITY IN G.P.M.													
1725 RPM																			
34CS5M	334CS5M	1/3	1¼"	1"		5.8	4.9	4.3	3.3	2.8	2.4	2.1	1.8	1.6					
34CS6M	334CS6M	1/3	1¼"	1"		7.8	6.9	6.3	5.2	4.6	4.1	3.7	3.3						
54CS6M	354CS6M	½	1¼"	1"		7.8	6.9	6.3	5.2	4.6	4.1	3.7	3.3	2.9	2.6	2.3			
34CS7M	334CS7M	1/3	1¼"	1"		10.4	9.4	8.5	7.2	6.5									
54CS7M	354CS7M	½	1¼"	1"		10.4	9.4	8.5	7.2	6.5	5.9	5.4							
54CS8M	354CS8M	½	1¼"	1"		12.2	11.3	10.4	9.0	8.2									
3450 RPM																			
10CS5M	310CS5M	1	1¼"	1"		11	10.6	10.1	9.3	9	8.5	8.2	8	7.7					
15CS5M	315CS5M	1½	1¼"	1"		11	10.6	10.1	9.3	9	8.5	8.2	8	7.7	7.5	7.4	7.2	7.1	
10CS6M	310CS6M	1	1¼"	1"		16	15.2	14.5	13.5	12.8									
15CS6M	315CS6M	1½	1¼"	1"		16	15.2	14.5	13.5	12.8	12.4	12	11.5	11	10.7				
20CS6M	320CS6M	2	1¼"	1"		16	15.2	14.5	13.5	12.8	12.4	12	11.5	11	10.7	10.5	10.1	9.7	9.5
15CS7M	315CS7M	1½	1¼"	1"		20.5	19.6	19.5	17.3										
20CS7M	320CS7M	2	1¼"	1"		20.5	19.6	19.5	17.3	16.5	16	15.3	14.7						
——	330CS7M	3	1¼"	1"		20.5	19.6	19.5	17.3	16.5	16	15.3	14.7	14.2	13.7	13.3	12.8	12.5	12
20CS8M	320CS8M	2	1¼"	1"		26.5	25.5	24.6	23	22									
——	330CS8M	3	1¼"	1"		26.5	25.5	24.6	23	22	21.3	20.5	19.8	19.2					
——	350CS8M	5	1¼"	1"		26.5	25.5	24.6	23	22	21.3	20.5	19.8	19.2	18.5	18	17.4	16.8	16.3
——	330CS9M	3	1¼"	1"		32.5	31.5	30.5	28.6	27.5	26.5								
——	350CS9M	5	1¼"	1"		32.5	31.5	30.5	28.6	27.5	26.5	25.6	24.7	23.8	23	22.2	21.5	20.7	20

NOTE: When pumping hot water over 180°F., check the NPSH available in the pumping system against the required pump NPSH shown on pump performance curves. Available NPSH must be greater than required NPSH.

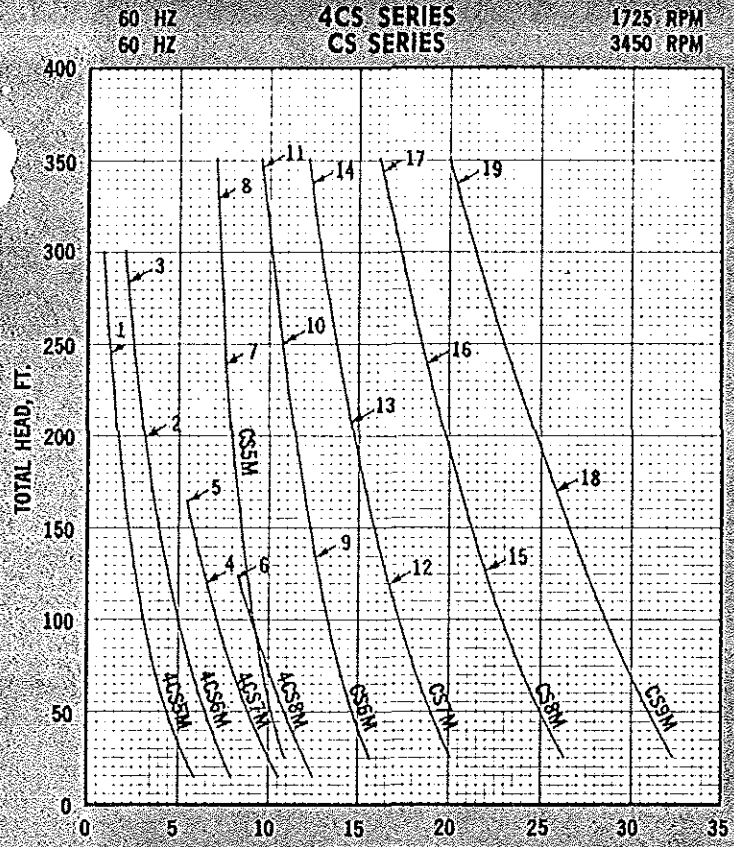
Standard pump motors have open drip-proof construction and are rated with jet pump service factors for continuous duty operation at all ratings shown. Single phase motors are capacitor start induction run with built-in overload protection. Three phase motors require a magnetic starter which provides full 3-leg overload protection. Failure to use the correct starter and overloads will void the warranty.

TEMPERATURES TO 500°F
Series CS pumps are available in a patented Jacketed Seal Cavity design for pumping hot oil, hot water and heat transfer fluids in common use in high temperature heating or cooling applications. Add suffix "J" to Catalog Number. Example: 15CS6MJ.

4CS Series:
Single Phase motors are 115/208-230 Volt, 60 HZ, 1725 RPM.
Three Phase motors are 208-230/460 Volt, 60/50 HZ, 1725/1425 RPM.

CS Series:
Single Phase motors are 115/208-230 Volt, 60 HZ, 3450 RPM.
Three Phase 1, 1½ & 2 H.P.–208-230/460 Volt, 60/50 HZ, 3450/2850 RPM
Three Phase 3 & 5 H.P.–208-230/460 Volt, 60 HZ, 3450 RPM

PERFORMANCE AND SPECIFICATIONS



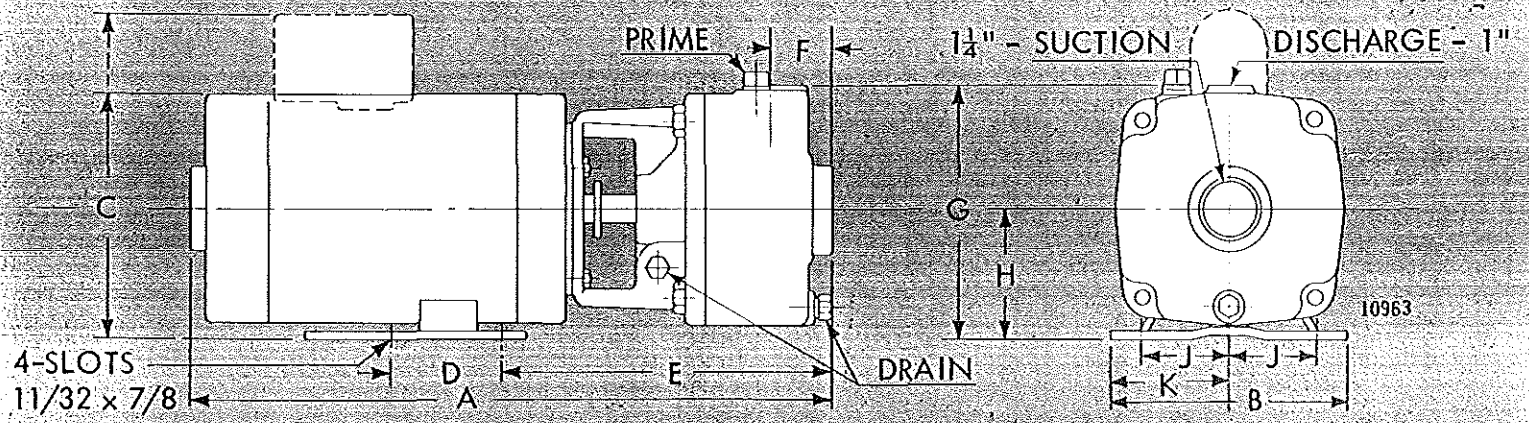
MAXIMUM HEAD*			
Symbol Number	H.P.	Catalog Number	
		1-Phase	3-Phase
1	⅓	34CS5M	334CS5M
2	⅓	34CS6M	334CS6M
3	½	54CS6M	354CS6M
4	⅓	34CS7M	334CS7M
5	½	54CS7M	354CS7M
6	½	54CS8M	354CS8M
7	1	10CS5M	310CS5M
8	1½	15CS5M	315CS5M
9	1	10CS6M	310CS6M
10	1½	15CS6M	315CS6M
11	2	20CS6M	320CS6M
12	1½	15CS7M	315CS7M
13	2	20CS7M	320CS7M
14	3	—	330CS7M
15	2	20CS8M	320CS8M
16	3	—	330CS8M
17	5	—	350CS8M
18	3	—	330CS9M
19	5	—	350CS9M

*For Standard Pumps with ODP Motors
MAXIMUM INLET PRESSURE–100 PSI
MAXIMUM WORKING PRESSURE–250 PSI

MATERIALS OF CONSTRUCTION

Part	Bronze Fitted	All Bronze
Frame	Cast Iron	Bronze
Case	Cast Iron	Bronze
Impeller	Bronze (Monel Blades)	Bronze (Monel Blades)
Raceway	Bronze	Bronze
Shaft	#303 Stainless Steel	#303 Stainless Steel
Shaft Seal	Carbon-Ceramic S.S.-Buna N	Carbon-Ceramic S.S.-Buna N

A strainer, approximately 20 mesh, should be installed on the suction side of the pump to prevent chips, scale or hard foreign particles from entering the pump and damaging the raceway and impeller.

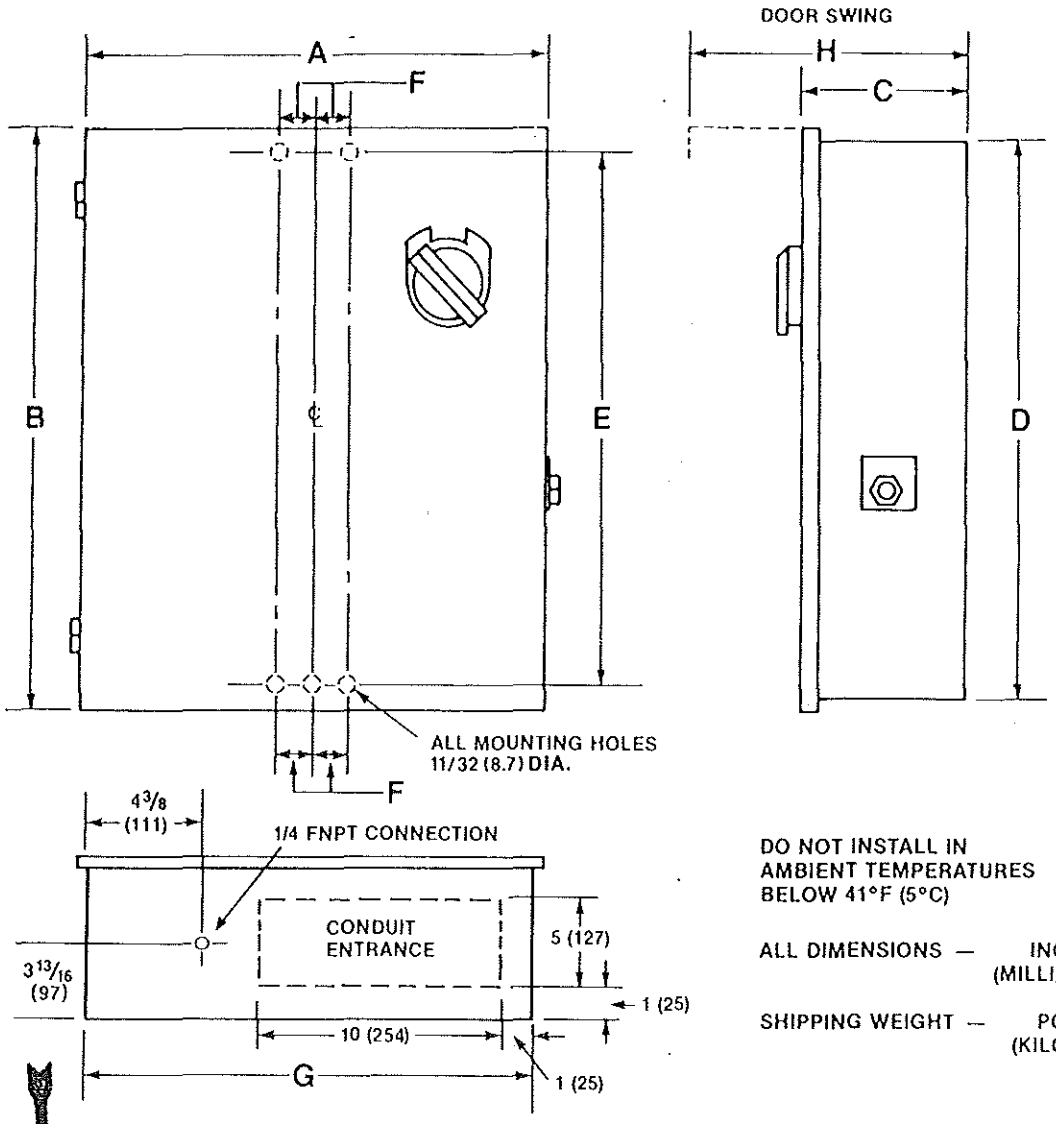


DIMENSIONS

SERIES	HP	TAPPING		1 PH.	3 PH.		1 PH.	3 PH.						
		SUCT.	DISCH.	A	A	B	C	C	D	E	F	G	H	J	K
4CS	⅓	1¼	1	17⅝	16⅜	6½	6⅝	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
	½	1¼	1	17⅝	16⅝	6½	6⅝	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
CS	1	1¼	1	18 5/16	18 5/16	6½	6⅝	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
	1½	1¼	1	19 1/16	19 1/16	6½	8 13/16	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
	2	1¼	1	19 5/16	19 1/16	6½	8 13/16	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
	3	1¼	1	—	19 5/16	6½	—	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼
	5	1¼	1	—	20 15/16	6½	—	6⅝	3	9	1¾	6¾	3½	2 7/16	3¼

Dimensions and Shipping Weights
Patterson Jockey Pump Controllers

FTA 500T



DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

ALL DIMENSIONS — INCHES (MILLIMETERS)

SHIPPING WEIGHT — POUNDS (KILOGRAMS)

MAXIMUM HORSEPOWER				DIMENSIONS • INCHES (MILLIMETERS)								APPROX SHIPPING WEIGHT LBS. (Kg)
200-208 VOLTS	220-240 VOLTS	380-415 VOLTS	440-600 VOLTS	A WIDE	B HIGH	C DEEP	D	E	F	G	H	
15	20	30	40	18 (457)	22 (559)	7 (178)	20 3/4 (527)	18 (457)	1 1/2 [1] (38)	17 (432)	25 (635)	40 (18)
30	30	40	50	20 (508)	30 1/2 (775)	7 1/2 (191)	30 (762)	27 (686)	2 1/2 (64)	20 (508)	28 1/2 (724)	65 (29)

[1] This enclosure has only one mounting hole at the bottom, located on the center line.

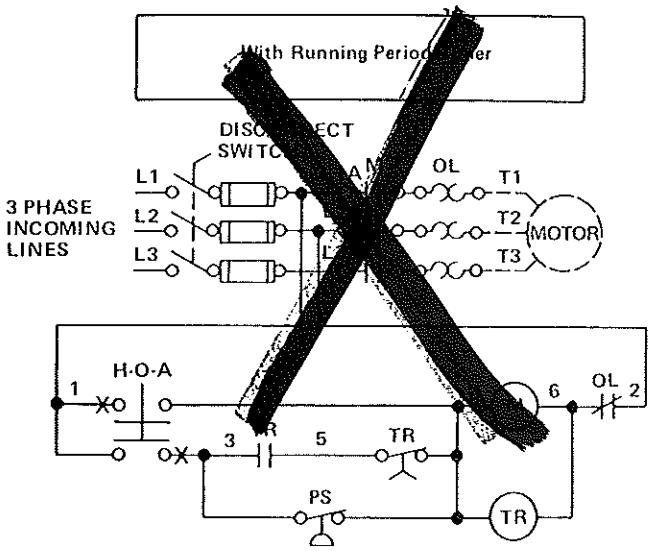
PATTERSON PUMP COMPANY

DRAWING NO.	
DD500T-01	
DATE	REV.
September 1, 1985	B

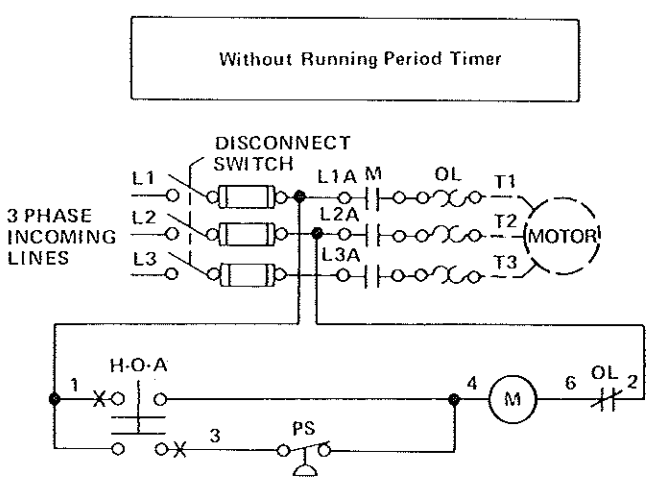
Wiring Schematic
Patterson Jockey Pump Controllers

FTA 500T

STANDARD CONTROLLER



OPTION B



This schematic diagram covers the standard controller and includes Option B. For wiring of additional options and modifications, see other side.

WIRE CAPACITY – LINE TERMINALS [1]

MOTOR HP	200-240V	440-480V
1/4 - 10	#14AWG-#8AWG	#14AWG-#8AWG
15	#14AWG-#4AWG	#14AWG-#8AWG
20	#14AWG-#4AWG	#14AWG-#8AWG
25-30	#8AWG-#1/0AWG	#14AWG-#4AWG
40	—	#14AWG-#4AWG
50	—	#8AWG-#1/0AWG

WIRE CAPACITY–MOTOR TERMINALS [1]

MOTOR HP	200-208V	220-240V	440-480V
1/4 - 5	#14-#12AWG	#14-#12AWG	#14-#12AWG
7½	#14-#8AWG	#14-#12AWG	#14-#12AWG
10	#14-#8AWG	#14-#8AWG	#14-#12AWG
15	#14-#2AWG	#14-#2AWG	#14-#12AWG
20	#14-#2/0AWG	#14-#2AWG	#14-#8AWG
25	#14-#2/0AWG	#14-#2/0AWG	#14-#2AWG
30	#14-#2/0AWG	#14-#2/0AWG	#14-#2AWG
40	—	—	#14-#2AWG
50	—	—	#14-#2/0AWG

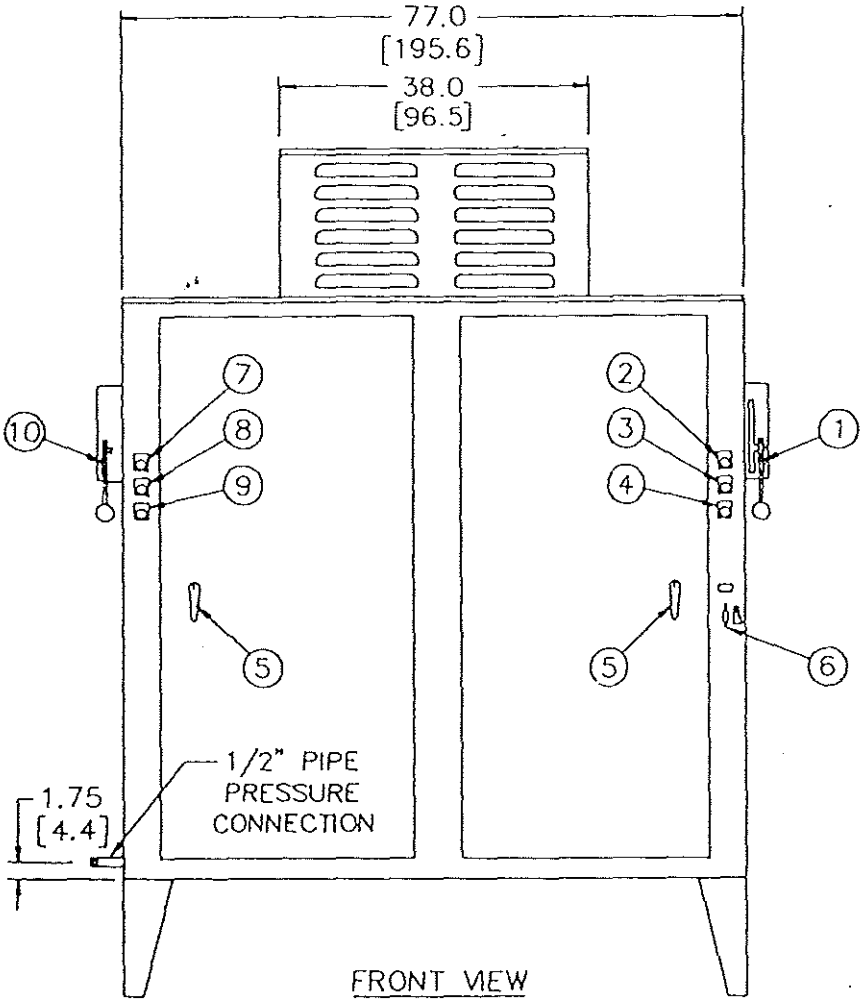
PRESSURE SYSTEM CONNECTION 1/4" FNPT

[1] For proper wire sizing, refer to the National Electrical Code, NFPA 70.

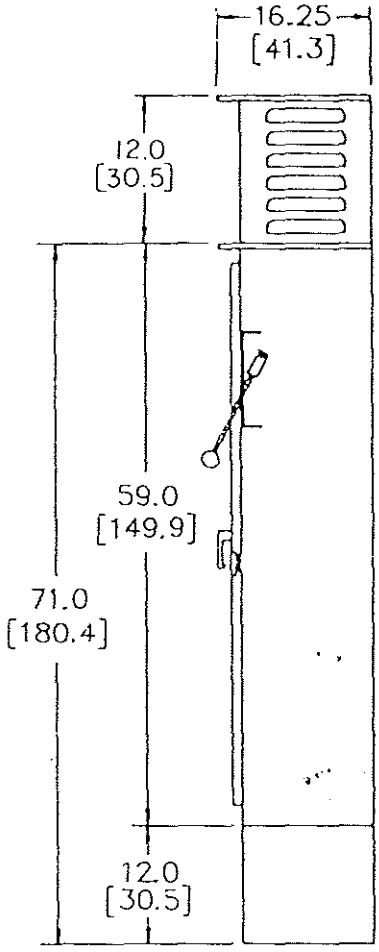
PATTERSON PUMP COMPANY

DRAWING NO.	
WS500T-01	
DATE: September 1, 1985	REV.: C

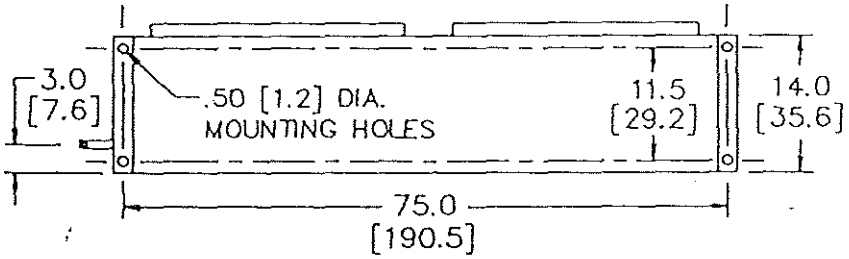
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED



FRONT VIEW



SIDE VIEW



BOTTOM VIEW

LEGEND

1. CIRCUIT BREAKER/ ISOLATION SWITCH OPERATOR
2. POWER ON LIGHT
3. START PUSH BUTTON
4. STOP PUSH BUTTON
5. LOCKING DOOR HANDLE
6. EMERGENCY START OPERATOR
7. NORMAL POWER ON LIGHT
8. EMERGENCY POWER ON LIGHT
9. PUSH TO TEST BUTTON
10. EMERGENCY ISOLATION SWITCH OPERATOR

NOTES

ALL DIMENSIONS IN INCHES AND CENTIMETERS ([])

DRAWN	SR	3-24-87
CHECK	RAD	3-24-87
APPD	DJL	3-25-87

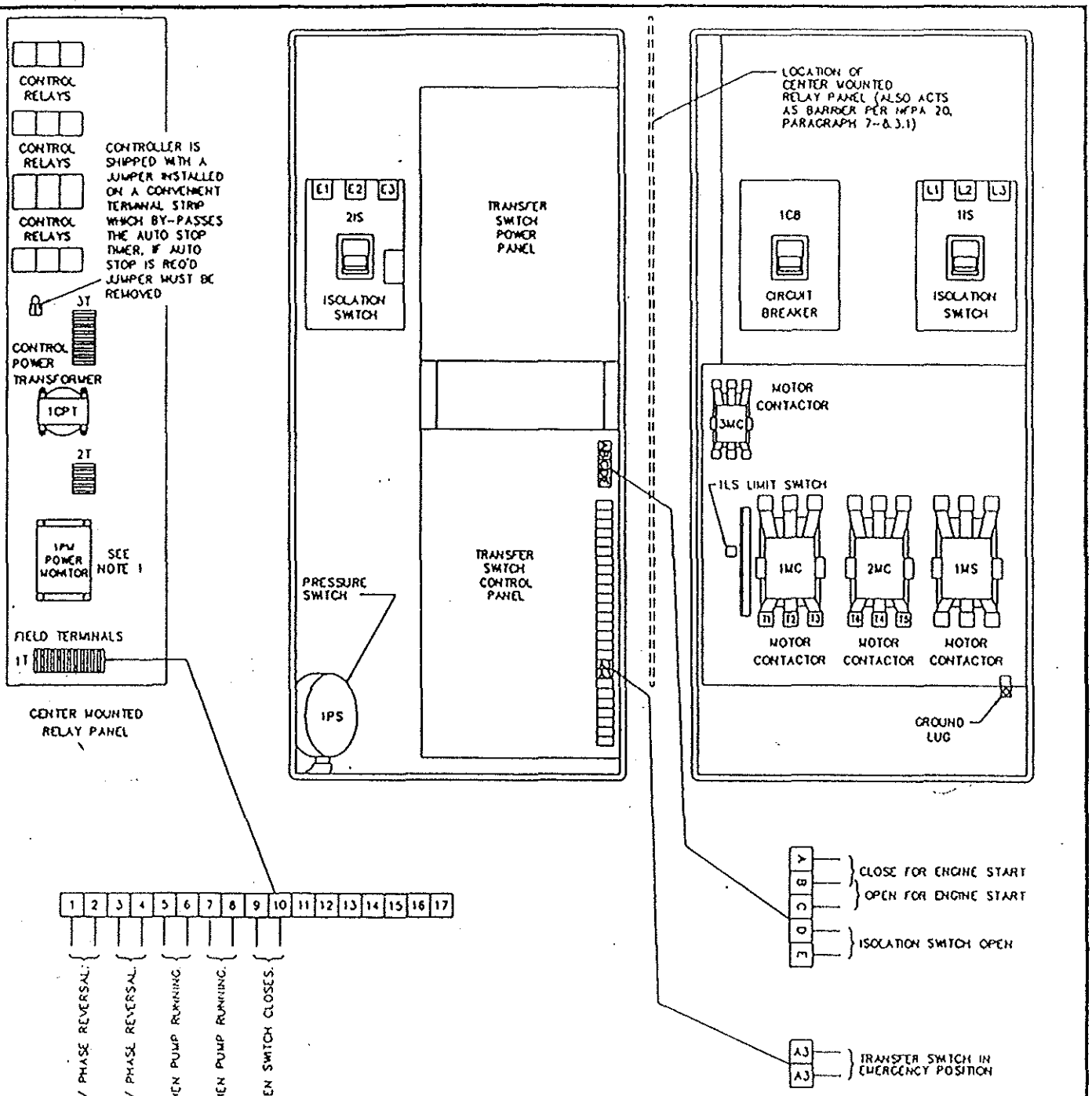
METRON, INC.

ENCLOSURE DIMENSIONS, FLOOR MOUNT MODEL M435 W/TRANSFER SWITCH ELECTRIC FIRE PUMP CONTROLLER

OPTIONS: NONE

AD10976A-SK081188

SCALE 1/20 | SHEET 1 OF 1



Per Steve Dickson of Patterson,
10-4-88 (404) 886-2101;

Metron supplies only (1) type of circuit breaker, which is capable of interupting at 100,000 amps maximum.

42,000 amps will be no problem.
100,000 Withstand Rating

NOTES:

1. POWER MONITOR SIGNALS ANY OF THE FOLLOWING FAILURES.
   - LOSS OF ANY PHASE
   - LOW VOLTAGE
   - PHASE REVERSAL

DRAWN	1-28-88	METRON, INC. DENVER, CO
CHECK	1-29-88	
APPD	2-1-88	
INTERNAL LAYOUT & EXTERNAL HOOKUP MODEL M455 WYE-DELTA CLOSED TRANSITION ELECTRIC FIRE PUMP CONTROLLER with Russell Transfer switch	OPTIONS NONE	
	CH31631 - 3K081188	
	XAJ 1/4	SHEET 1 OF 1

LOAD CONNECTIONS
L1 L2 L3

SOLID NEUTRAL IF REQUIRED
LN
NN — EN

NORMAL SOURCE CONNECTIONS
N1
N2
N3

EMERGENCY SOURCE CONNECTIONS
E1
E2
E3

PHASE RELAY 1
14
PHASE RELAY 2
14
PHASE RELAY 3
14

EXERCISER
44

VR 480/120 — 100 VA
VR 480/120 — 100 VA

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

1A
1A

ACC. PWR
ACC. PWR

VOLTAGE FREQUENCY SENSING NETWORK

EMERGENCY RELAY
12, 18, 34

B1B2B3

28 (ACC.3A)

TIME DELAY ON RETRANSFER TO NORMAL WITH TIME DELAY FOR UNLOADED ENGINE OPERATION
21, 31

TRANSFER RELAY
14, 31, 33, 38

TD1

ENGINE START RELAY
14, 18, 29, 27, 44, 44

MOTOR OPERATOR
(FOR COMPLETE MOTOR OPERATOR WIRING DETAILS REFER TO SH. #4)

TS — CONTACT ON NORMAL SHAFT
N

TS — CONTACT ON EMERGENCY SHAFT
E

○ INDICATES TERMINAL STRIP ON MCB

□ INDICATES ALL OTHER TERMINAL STRIPS

ACC.7
ENGINE START

(ACC.8)

(ACC.14A TYPICAL)

(ACC.14B TYPICAL)

DWG. SHOWN WITH NORMAL AND EMERGENCY POWER DE-ENERGIZED.

277/480VOLT 3PHASE 4WIRE

SCHEMATIC DIAGRAM

TITLE

RUSSELECTRIC INC.

NO. BRONZ INDUSTRIAL PARK INDUSTRIAL PARK RD., HINGHAM, MA.

DRTN.	PFA	2-28-03
CHKD.		
APPD.		

DWG. NO. 10632-1 REV. C

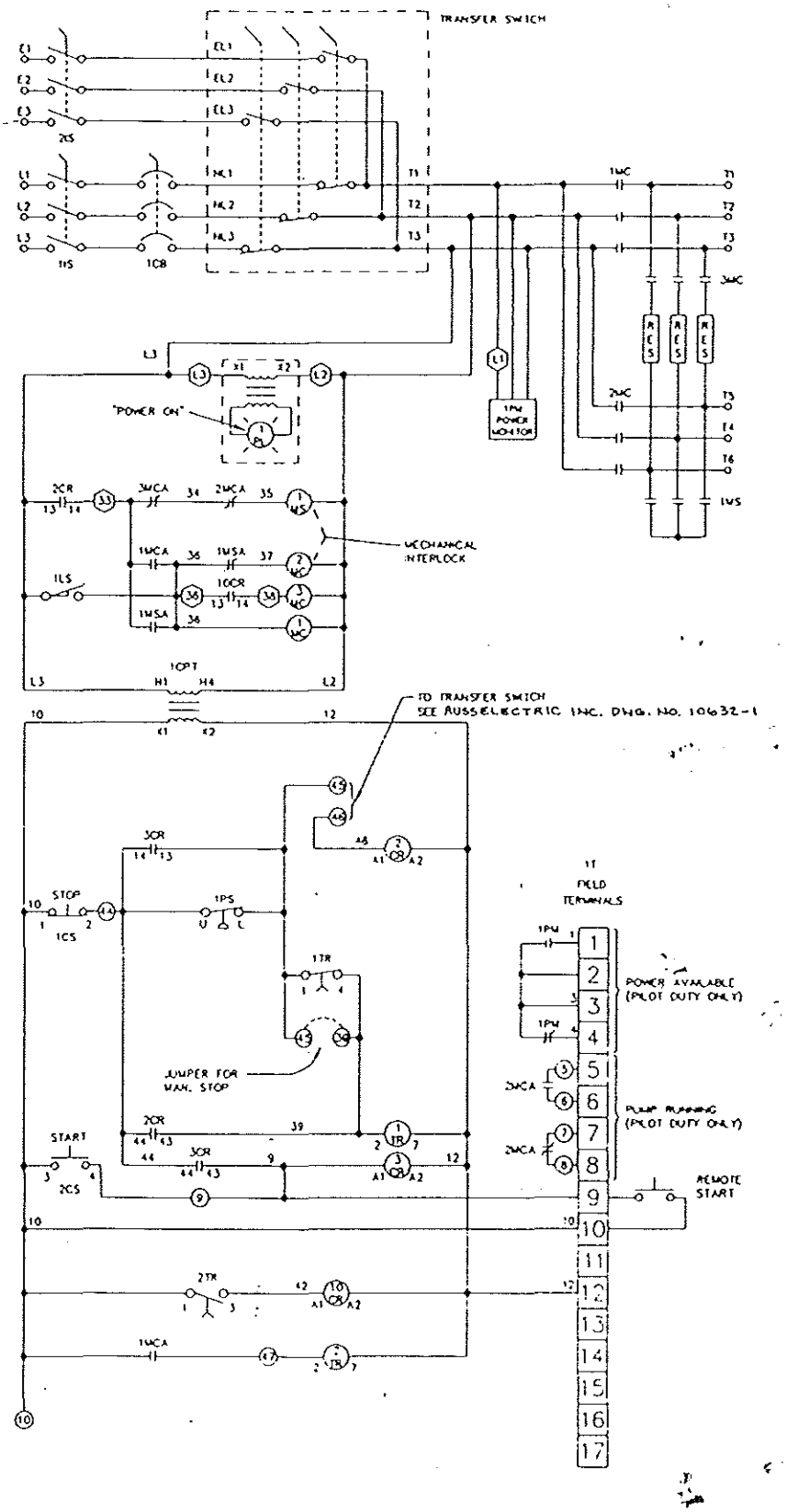
SHEET 2 CONT'D ON SHEET 3 (REF.)

REVISIONS	SYM	DESCRIPTION	DATE	APPROVED
	B	REVISED TRANSFER SWITCH REF. No. ECO 1758	3-28-88	

COMPONENTS	FUNCTION	LOCATION	CONTACTS
2CR	CONTROL RELAY	28	15,35
3CR	MANUAL START RELAY	36	26,36
10CR	1MS DELAY RELAY	40	18
1TR	RUN PERICO TIMER	35	30
2TR	TRANSITION DELAY TIMER	42	40
1MS	SHORTING CONTACTOR	15	15,15,15
1MC	RUN CONTACTOR 1	19	5,6,7
2MC	RUN CONTACTOR 2	17	12,13,14
3MC	TRANSITION CONTACTOR	18	8,8,8
1MSA	1MS AUXILARY CONTACT		17,19
1MCA	1MC AUXILARY CONTACT		17,42,44
2MCA	2MC AUXILARY CONTACT		15,33,35
3MCA	3MC AUXILARY CONTACT		15
1CS	CONTROL SWITCH	28	
2CS	CONTROL SWITCH	36	
1IS	NORMAL POWER ISO. SWITCH	5,6,7	
2IS	EMERGENCY POWER ISO. SWITCH	1,2,3	
1CB	CIRCUIT BREAKER	5,6,7	
1PS	PRESSURE SWITCH	28	
1PL	PILOT LIGHT	13	
1CPT	CONTROL POWER TRANSFORMER	21	
1PM	POWER MONITOR	12	29,32
1LS	EMERGENCY START LIMIT SWITCH		18

NOTE FOR FIELD WIRING

1. USE COPPER WIRING ONLY EXCEPT AT TERMINALS MARKED CU-AL
2. (1) DENOTES TERMINALS ON 2T
3. (1) DENOTES TERMINALS ON 3T



DRAWN		7-14-87
CHECK		8-25-87
APPD		8-25-87

METRON, INC.
DENVER, CO

SCHEMATIC, MODEL M435
COMBINED MANUAL - AUTOMATIC
WYE-DELTA, CLOSED TRANSITION
ELECTRIC FIRE PUMP CONTROLLER
W/ZENITH TRANSFER SWITCH

OPTIONS NONE

CS314958-8K081188

SCALE

SHEET 1 OF 1

116FM
1116FM

MUESCO™

Factory Mutual System Approved

UL LISTED
40-H-1

ULC

CEx757

Automatic Pressure Relief Valves for Fire Protection Systems

The MUESCO Automatic Pressure Relief Valves for Fire Protection Systems Features:

Responsive

MUESCO's automatic, diaphragm type pressure relief valve responds quickly and accurately.

Top Quality

The highest quality components used in manufacturing. MUESCO valves assure excellent on-the-job performance and long life.

Dependable

You can depend on our valve pilot control system to signal the valve to open and close at just the right time.

Excess pressure is released into the atmosphere or to pump suction with no worry of surge problems.

A constant level of pressure in your fire pump protection system.

Factory Mutual approved, and UL. listed.

Selection

MUESCO has the valve to fit your fire protection system's particular requirements. Our Globe 116FM and Angle 1116FM pressure relief valves are available in 4", 6" and 8" sizes.

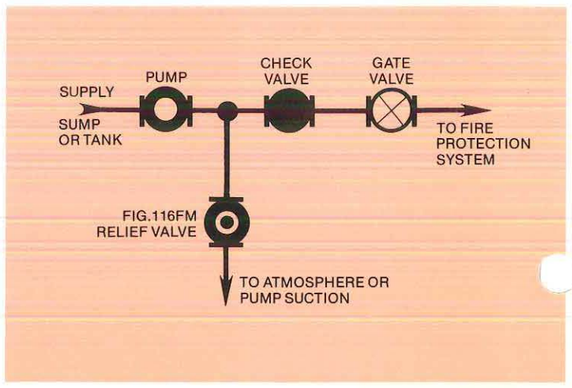
Ease of Operation And Maintenance

Valves are automatic.

Simple turning of adjusting screw permits easy adjustment of pressure settings.

Self-cleaning strainer offers removability feature for periodic checking in extremely high algae or lime environments.

Typical Installation



Characteristics

Ranges:

Adjustment—20 to 200 psi.
Temperature—Maximum water temperature, to +180°F (82°C)

Pressure Ratings:

125 Class—175 psi.
250 Class—300 psi.

End Details:

125 and 250 ANSI B16.1
250 × 125 ANGLE, ANSI B16.1

Materials:

Cast iron main valve body and cover.
Stainless steel with nylon coated bearing surfaces.
Nylon coated bronze seat.

Cross Section of Pressure Relief Valve

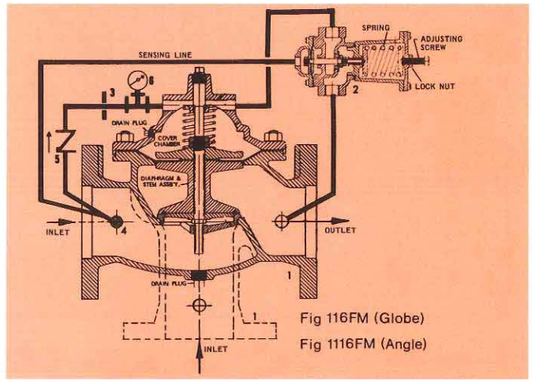


Fig 116FM (Globe)
Fig 1116FM (Angle)

Sizes:

Globe—3, 4, 6 & 8" Flanged (UL Approved)
Angle—3, 4, 6 & 8" Flanged (UL Approved)
Globe—4, 6, & 8" Flanged (FM Approved)
Angle—4, 6 & 8" Flanged (FM Approved)

Item No.	Description
1.	Fig. 100 (Globe) or 1100 (Angle) Diaphragm Valve
2.	Fig. 16 Pressure Relief Control
3.	Orifice
4.	Strainer
5.	Check Pilot
6.	Gauge

This valve is Factory Mutual approved.
Serial No. 1A2A3.AH

UL LISTED
40-H-1

ULC
CEx757

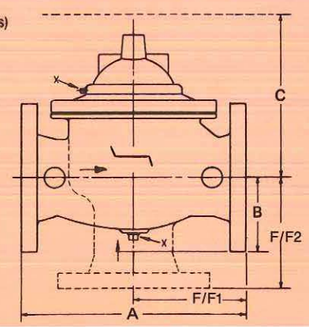
Flow Capacities:

3" (80 mm) size—1000 GPM (63LPS)
4" (100mm) size—1800GPM (113LPS)
6" (150mm) size—4000GPM (252LPS)
8" (200mm) size—7000GPM (442LPS)
Recommended max flow in Gallons Per Minute, or Liter Per Second of water. Intermittent surge relief.

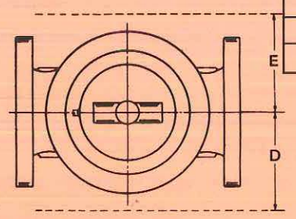
Dimensions:

Valve Size	A		B		C	D	E	F**	
	Class 125	Class 250	Class 125	Class 250				Class 125	Class 250
3" (80mm)	12	12-3/4	3-1/4	4-1/8	6-5/8	7	4	5-3/4	6-1/8
4" (100mm)	13-1/2	14-1/8	4-1/2	5	8-5/8	7-7/8	4-7/8	6-3/4	7-1/8
6" (150mm)	17	17-7/8	5-1/2	6-1/4	12-3/8	9-5/8	6-5/8	8-1/2	8-7/8
8" (200mm)	22	23	6-3/4	7-1/2	16-1/4	11-1/2	8-1/2	11	11-1/2

Dimensions in inches
(Dimensions in millimeters)



**Applies to Angle Valves.



Class 250 × 125		
Valve Size	F1	F2
4"	6¾	7
6"	8½	8 15/16

Specifications

_____Fire Pump Pressure Relief Valves shall be furnished. Valves to be furnished shall have the following specifications:

- ☐ Modulate to keep the system line pressure at a constant level despite changes in fire pump demand
- ☐ Respond accurately to pressure excesses beyond a given pressure set point
- ☐ Release excess pressure to a suction pump or into the surrounding atmosphere
- ☐ Pressure settings shall not be disturbed by back pressure
- ☐ Be equipped with a pilot control system which signals the valve's opening and closing
- ☐ Valve shall respond to fluctuations in demand by opening quickly and closing slowly to prevent any sudden surges
- ☐ Valve shall re-position itself drip-tight and within 5% of its pressure set point
- ☐ The Main Valve shall be of a diaphragm type, Globe or Angle pattern and shall work hydraulically
- ☐ The stem ends and the single removable bronze seat shall be Nylon coated, and the O-Ring disc shall be of standard commercial size
- ☐ The valve diaphragm shall not serve as the seating surface
- ☐ The pilot control shall be direct acting, spring loaded and fully adjustable
- ☐ Be Factory Mutual approved

MUESCO™

MUESCO, Inc.

SALES OFFICE—P.O. BOX 14239, HOUSTON, TEXAS 77221-4239
PHONE—(713) 923-9111 USA TLX: 790-738 INT. TLX: 6868373

MUESCO CANADA, INC.
3006 OSLER STREET, LONDON, ONTARIO N5V 1V3 CANADA
PHONE—(519) 451-7650

MUESCO OCEAN EUROPE B.V.
KOLLERGANG 14, P. O. BOX 85, 6960 AB EERBEEK, THE NETHERLANDS
TELEPHONE NO. 08338-59134, TELEX NO. 37247

MUESCO PATEL VALVES & CONTROL PVT. LTD.
PLOT: 5/1/1-A, G.I.D.C., VATWA, POST BOX NO. 45, VATWA, AHMEDABAD 382 445, INDIA
TELEPHONE NO. 876605, TELEX C/O 121 373, CABLE: MUESCO, VATWA

PRINTED IN U.S.A.

IRON GATE VALVES

Underwriters' / Factory Mutual

Working pressures:
2½"-12" Cold Water, Non-Shock 175 lbs.
14" — Cold Water, Non-Shock 150 lbs.

- Outside-Screw-and-Yoke
- **Bronze Mounted**
- **Parallel Seats**
- **Double Disc**
- 2½" through 14"

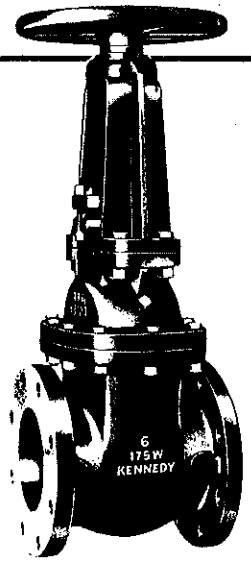


FIG. 68
Flanged Ends

HYDROSTATIC TEST PRESSURE: 2½" — 12" Seat & Shell — 350 psi.
14" Seat & Shell — 300 psi.

Part No.	DESCRIPTION	MATERIAL	A.S.T.M. SPEC.
1	Lock Nut	Bronze	B-62
2	Handwheel	Cast Iron	A-126 Class B
3	Washer	Bronze	B-62
4	Yoke Nut	Bronze	B-62
5	Stem	Bronze Rod	B-16
6	Yoke	Cast Iron	A-126 Class B
7	Hex Nuts	Bronze	B-16
8	Gland Follower	Cast Iron	A-126 Class B
9	Gland	Bronze	B-62
10	T-Head Bolts	Steel (Rust Proof)	A-307 Grade B
11	Packing	Graph. Asbestos	
12	Bonnet Bushing	Bronze	B-135 Alloy 2
13	Yoke to Bonnet Bolts & Nuts	Steel	A-307 Grade B
14	Bonnet	Cast Iron	A-126 Class B
15	Gasket	Asbestos Sheet	
16	Bonnet Bolts & Nuts	Steel	A-307 Grade B
17	Stem Head	Mang. Bronze	B-132 Alloy A
18	Disc Rings	Bronze	B-62
19	Discs	Cast Iron	A-126 Class B
20	Seat Rings	Bronze	B-62
21	Wedge Pins	Bronze	B-62
22	Body	Cast Iron	A-126 Class B

SIZE	A	B	C	D	E	F	G	H	J	K
2½	7½	7	1¾	12⅞	15⅞	8	7	6	⅜	¾
3	8	7½	1¾	15⅞	19¼	10	10½	6	½	13/16
3½	8½	8½	1⅞	16⅛	20⅛	8	10¼	8	7/16	⅞
4	9	9	1¾	18¼	22¾	10	14	8	½	1
5	10	10	2½	20¾	26⅜	10	11¼	8	½	1⅛
6	10½	11	2¼	24⅜	30⅞	12	20	10	½	1¼
8	11½	13½	2½	31½	40¼	14	26½	12	⅝	1⅜
10	13	16	2¼	36¼	47 1/16	16	32½	14	⅝	1½
12	14	19	2½	42½	55 5/16	18	38	16	⅝	1⅝
14	15	21	2½	50⅜	65½	18	45	16	¾	1¾

WEIGHTS — POUNDS

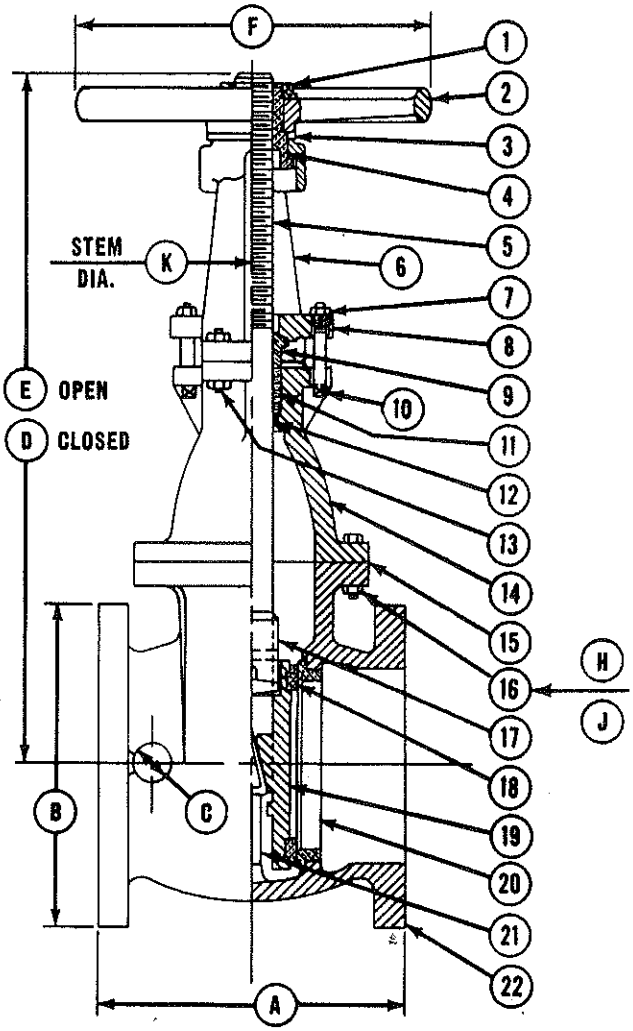
SIZE	2½	3	3½	4	5	6	8	10	12	14
FIG. 68	51	70	77	109	126	180	314	447	610	890

F = DIA. OF HANDWHEEL WHEN SPECIFIED
G = NUMBER OF TURNS TO OPEN
H = NO. OF BOLTS
J = DIA. OF BOLT

BODY MARKING
SIZE
175W
KENNEDY

BONNET MARKING
UA YEAR
◀FM▶

YOKES ARE BOLTED ON IN SIZES LARGER THAN 4 INCH; 4 INCH AND BELOW — THE YOKES ARE CAST INTEGRAL WITH BONNET.
125 LB. AMERICAN STANDARD END FLANGE DRILLING.



IRON SWING CHECK VALVES

Underwriters' / Factory Mutual

- c mounted with
- Rubber Faced Disc or Bronze Faced Disc
- 2½" through 12"

Working pressures:
2½"-12" Cold Water, Non-Shock 175 lbs.

HYDROSTATIC TEST PRESSURE: 2½" — 12" Seat and Shell — 350 psi.

FIG. 126 BRONZE DISC ASSEMBLY SIZES 2½" and 3"

Part No.	DESCRIPTION	MATERIAL	A.S.T.M. SPEC.
1	Cap Bolts	Steel	A-307 Grade B
2	Cap	Cast Iron	A-126 Class B
3	Gasket	Asb. Sheet	
4	Hex Nuts	Steel	A-307 Grade B
5	Body	Cast Iron	A-126 Class B
6	Hinge Pin	Stainless Steel	A-276 (304)
7	Hinge Bushings	Sint. Bronze	
8	Hinge	Mang. Bronze	B-132 Alloy A
9	Disc Nut Pin	Brass	
10	Disc Nut	Bronze Rod	B-16
11	Disc	Bronze	B-62
12	Seat Ring	Bronze	B-62
13	Drain Plug	Cast Iron	A-126 Class B

FIG. 126 BRONZE FACED DISC ASSEMBLY SIZES 4" through 12"

14	"O" Rings	Buna "N"	
15	Disc Bolt	Bronze Rod	B-16
16	Disc Nut Pin	Brass	
17	Hinge	Malleable Iron	A-47
18	Disc	Malleable Iron	A-47
19	Disc Ring	Bronze	B-62

FIG. 126A RUBBER FACED DISC SIZES 2½" — 3" ARE SAME CONSTRUCTION AS FIG. 125A, page 42

FIG. 126A RUBBER FACED DISC SIZES 4" — 12"

20	Disc Holder	Malleable Iron	A-47
21	Disc	Rubber	
22	Disc Plate	Bronze	B-62
23	Disc Bolt	Bronze Rod	B-16
24	Disc Nut	Bronze Rod	B-16
25	"O" Rings	Buna "N"	
26	Disc Nut Pin	Brass	
27	Disc Bolt Bushing	Sint. Bronze	
28	Side Plugs	Bronze Rod	B-16

SIZE	A	B	C	D	E	F	G
2½	10	11/16	7	6 7/16	7	13/32	¾
3	10¼	¾	7½	6⅝	7½	7/16	¾
4	13	15/16	9	8 7/16	9	½	¾
5	15	1	10	9 3/16	10	½	¾
6	16	1	11	10⅛	11	⅝	¾
8	19	1⅛	13½	11⅞	13½	¾	¾
10	22	1 3/16	16	13 5/16	16¾	13/16	¾
12	26	1¼	19	15 5/16	19	⅞	¾

WEIGHT — POUNDS

SIZE	2½"	3"	4"	5"	6"	8"	10"	12"
FIG. 126	52	62	114	145	193	319	475	680
FIG. 126-A	53	62	117	145	196	322	480	685

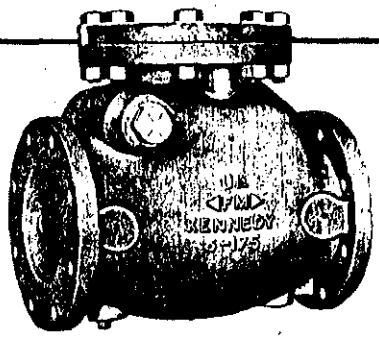


FIG. 126 — FIG. 126A
Flanged Ends

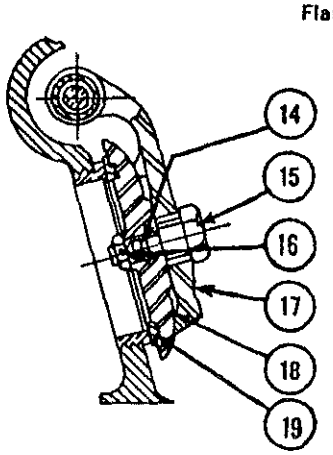


FIG. 126
Bronze Faced Disc
4" through 12"

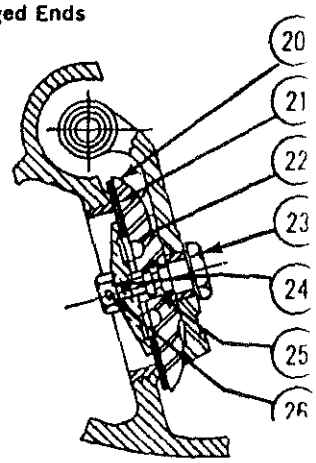
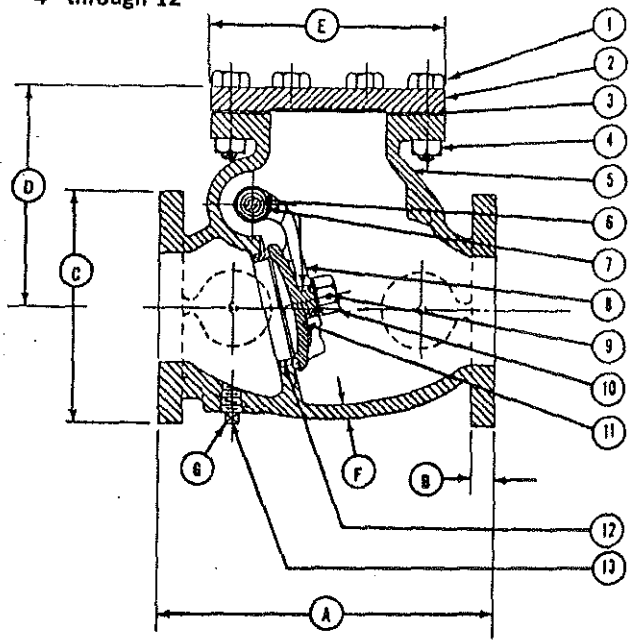


FIG. 126A
Rubber Faced Disc

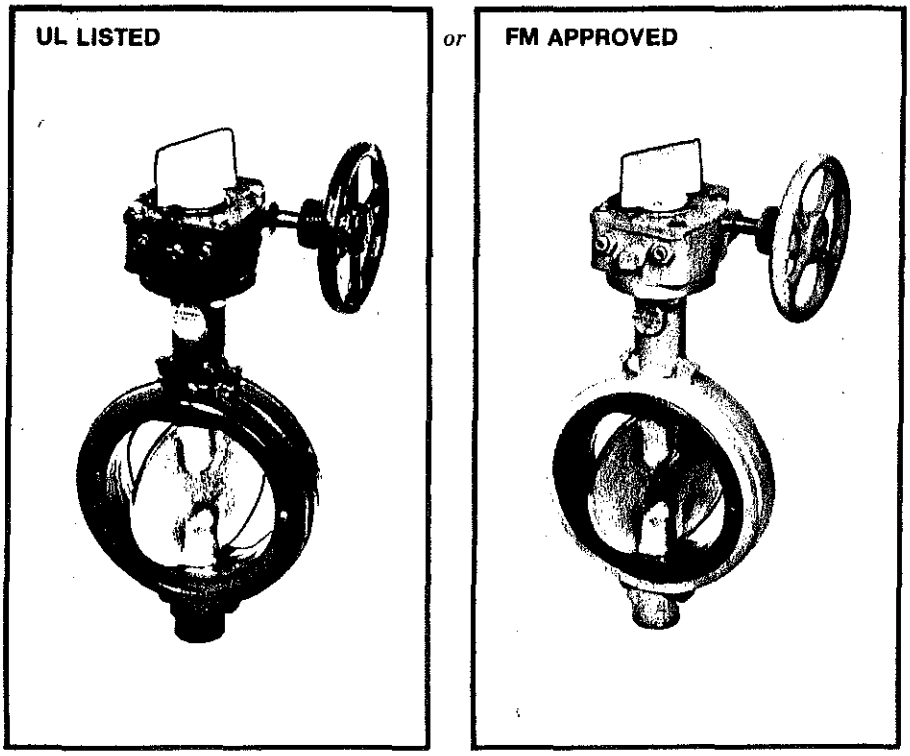


BODY MARKING
UL ◀ FM ▶
KENNEDY
SIZE — 175

OPPOSITE SIDE
YEAR
FIG. 126

END FLANGE DRILLING
125 LB. AMERICAN STANDARD
G = SIZE OF BODY DRAIN PLUG

KENNEDY VALVE BUTTERFLY VALVES



Specifically Designed For Use On Fire Protection Systems and Rated At 175 PSI Working Pressure

Sizes 4, 5, 6, 8, 10 and 12 inch
UL Listed *or* FM Approved

Wafer or Lug Body
Lightweight
Easy to Install: Suitable for installation between ANSI 125 lb. flanges. No gaskets required.
Permanently sealed stems
Resilient seating for bubbletight shut-off.
Corrosion resistant construction.
Gear type actuators, factory installed, have sequential shearing protection, easy-to-read flag type position indicators, and are fitted with a 1/2" NPT connection for the addition of a monitor switch, if required.

HOW TO ORDER

Valve Size
Figure Number — 911 UL or 911 FM
Body Style — Wafer or Lug
Accessories — (if required)
Remote Indicator (Available on Indicating Butterfly Valve)
Post Indicator Valve Assembly (Fig. 911 UL only)
Lock-Out Option (Chain)
Monitor Switches
Chainwheel
Chain Length

KENNEDY VALVE
Division of ITT Grinnell Valve Co., Inc.

STAR®

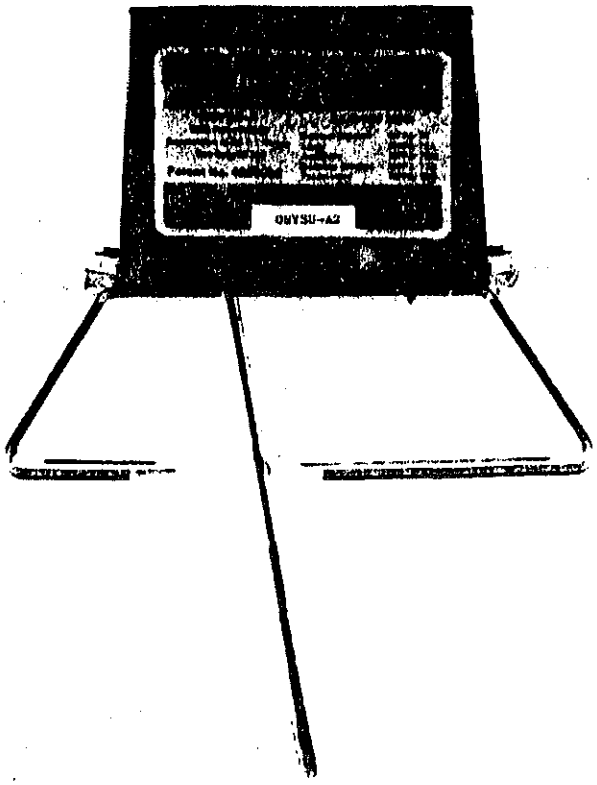
Model 20–6″, 8″ and 10″ Check Valves

The Star Model 20—6″, 8″, and 10″ check valves are designed for reliability and easy maintenance with replaceable clapper facings and non-stick coated clappers. The valves are approved for installation in the vertical position. When the piping is installed horizontally, the hinge pin should be in the vertical position.

POTTER ELECTRIC SIGNAL CO.
2081 Craig Road • P.O. Box 28480
St. Louis, Mo. 63146 • (314)878-4321
Toll-Free (800)325-3936
TWX: 9107640909

OSYSU-A

OUTSIDE SCREW AND YO VALVE SWITCH



OSYSU-A1 Stk. No. 1010102
OSYSU-A2 Stk. No. 1010202

CHARACTERISTICS

U.L. LISTED & F.M. APPROVED

CONTACT RATINGS:
OSYSU-A1 — One set of S.P.D.T. (Form C)
OSYSU-A2 — Two sets of S.P.D.T. (Form C)
15 A @ 125/250 WAC
0.50 A @ 125 VDC
0.25 A @ 250 VDC

DIMENSIONS: 6.1"L x 2.3"W x 8.3"H
See Fig. 2 15.5cm.L x 5.7cm.W x 21.0cm.H

WEIGHT: 2 lb.
.9kg

ENCLOSURE: Cover: Die-cast Aluminum
Finished -- Red Spatter Enamel
Base: Formed Steel
All parts plated to resist corrosion.

COVER TAMPER: Mechanically Activated by cover removal.

ENVIRONMENTAL LIMITATIONS: -40°F/+140°F

The OSYSU-A is used to monitor the open position of an OS&Y (outside screw & yoke) type gate valve. This device is available in two models; the OSYSU-A1, containing one set of S.P.D.T. (Form C) contacts and OSYSU-A2, containing two sets of S.P.D.T. (Form C) contacts. These switches mount conveniently to most OS&Y valves ranging in size from ½" to 12". (For explosion proof requirements see model OSYS-U-EX, Bulletin 705)

TAMPER RESISTANT

Removing the cover causes the switches to operate. Either switch on the OSYSU-A2 may be disconnected from the tamper action by removing the tamper action tab or screw associated with that particular switch. (SEE PAGE 2)

WARNING

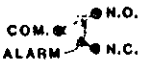
DISABLING THE TAMPER ACTION OF THE SWITCH ON THE OSYSU-A1 OR BOTH SWITCHES ON THE OSYSU-A2 WILL VOID UNDERWRITERS LABORATORIES' LISTING AND F.M. APPROVAL.

SERVICE USE:

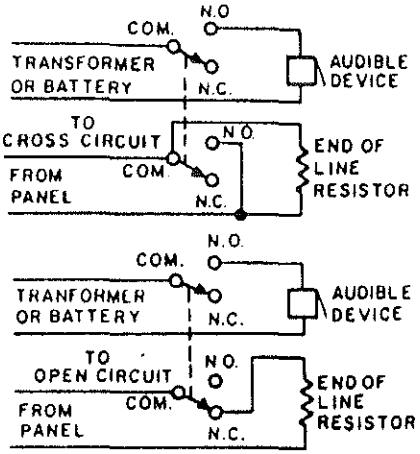
Central Station	NFPA-71
Local	NFPA-72A
Auxiliary	NFPA-72B
Remote Station	NFPA-72C
Proprietary	NFPA-72D

TYPICAL ELECTRICAL CONNECTIONS

TYP. SWITCH ACTION



LOCAL AUDIBLE / CONTROL PANEL



LOCAL AUDIBLE / REMOTE TRANSMITTER

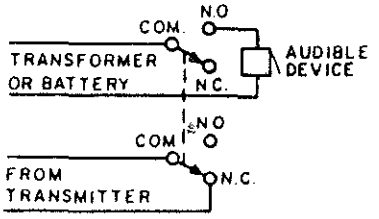
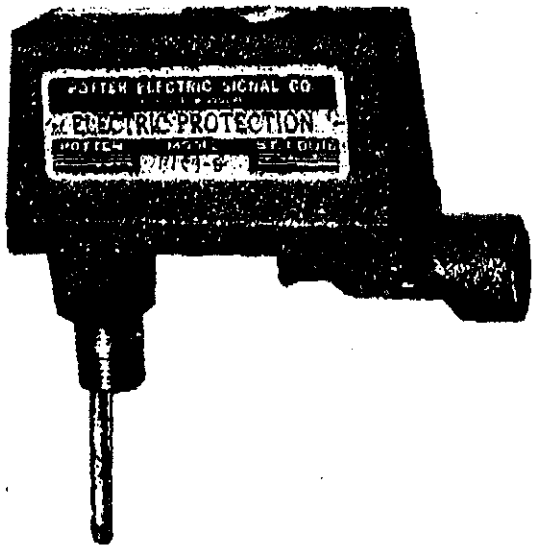


FIGURE 1 DWG. 5400655-15A

POTTER
ELECTRIC SIGNAL CO.
2081 Craig Road • P.O. Box 28460 • St. Louis, Mo. 63146
Toll-Free (800) 325-3936 • (314) 878-4321 • TWX: 9107640909

PIVS-B
POST INDICATOR VALVE SWITCH



CHARACTERISTICS

U.L. LISTED & F.M. APPROVED

DIMENSIONS: PIVS-B 5.75" L x 1.6875" W x 4.25" D

WEIGHT: PIVS-B 1.25 lb. .56 Kg.

ENCLOSURE: Cast Aluminum
Finish - Red Spatter Enamel
All parts are plated to resist corrosion.

TAMPER: Mechanically Activated by Cover Removal

CONTACT RATINGS: One set of S.P.D.T.
15 Amp. @ 125/250 VAC
0.50 Amp. @ 125 VDC
0.25 Amp. @ 250 VDC

ENVIRONMENTAL LIMITATIONS: Temp. -40°F/+140°F

USAGE OPTIONS: DEMCO, GRINNELL, MUELLER, PRATT, TRW MISSION, DRESSER, CLOW, ELKHART (Not all installations are U.L. Listed and F.M. approved.)

INSTALLATION KITS: Pratt Post Indicator Valve Kit
PVK 1000060
Pratt Butterfly Valve Kit
PBK-S 1000061
PBK-L 1000062

The Model PIVS-B is a weather and tamper proof switch that can be mounted on post indicator valves or butterfly valves to monitor the open valve positions. This device provides a S.P.D.T. switch that will operate when the valve is intentionally or accidentally closed and is compatible with any type of circuit. (See Fig. 1)

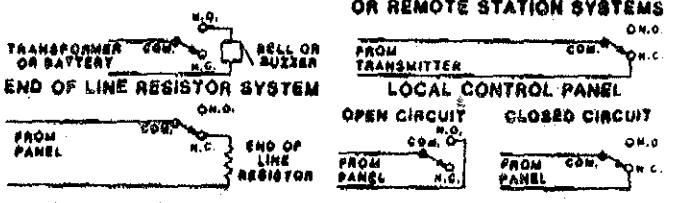
Horizontal or vertical adjustments are provided for contact adjustments, however the adjustments are factory set and should not normally require readjustment.

The Model PIVS-B is designed to mount in 1/2" NPT tapped hole in the post indicator or butterfly valve housing. It should be located so that the trip rod of the switch has pressure applied to it by the indicator assembly when the valve is fully open and in a location on the valve where it is accessible for service.

TAMPERPROOF COVER: Tamper action is provided by a cover operated spring, which actuates the same switch used for the valve signal. This is a special switch designed for this device.

NOTE: Disabling The Tamper Will Void Underwriters Laboratories' Listing and FM Approval.

TYPICAL ELECTRICAL CONNECTIONS



DWG. 5400517-15 FIG. 1