A New Dimension in Deluge Valve Technology

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UL LISTED
DELUGE VALVE
EX16301

FLOW-TEK VALVES & CONTROLS INC.

an ISO 9001 : 2008 Certified Company

Deluge Valve

Typical Applications

- Petroleum & Refineries
- Foam Application
- Power Plants & Transformers
- Gas/LNG Storage Tanks
- Marine/Ships
- Offshore Platforms

Deluge Valve Skid

Optional Features

Pneumatic Trim
Water Motor Alarm - Gong
Pressure Switch
Test Trim
Ex-Proof Enclosure For Hazardous Areas
Electric Release Trim
Skid Mounted With Isolation Valves
Siamese Connection
Local Control Panel

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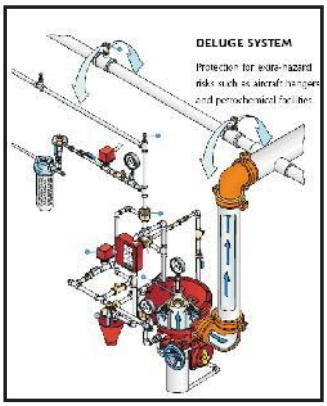
DELUGE VALVES
FT100D-STRAIGHT PATTERN / FT1100D – ANGLE PATTERN

Description

FLOW-AGE Deluge valves is hydraulically actuated, pilot operated diaphragm control valve.

Two basic designs are available FT100-straight pattern & FT 1100-angle pattern. All internal parts and cover are 100% identical in both the designs.

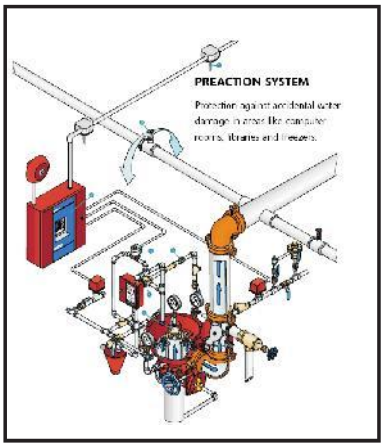
The FT100/1100-series Deluge valve is held closed by system water pressure trapped in the top cover chamber. When the releasing system operates, pressure is released from the top cover chamber and the diaphragm assembly moves upward allowing the water to flow into the system.



Operation

Deluge valves are required to operate independently, regardless of failure in other systems or sources of energy. In emergency deluge valves should be operated by line water pressure.

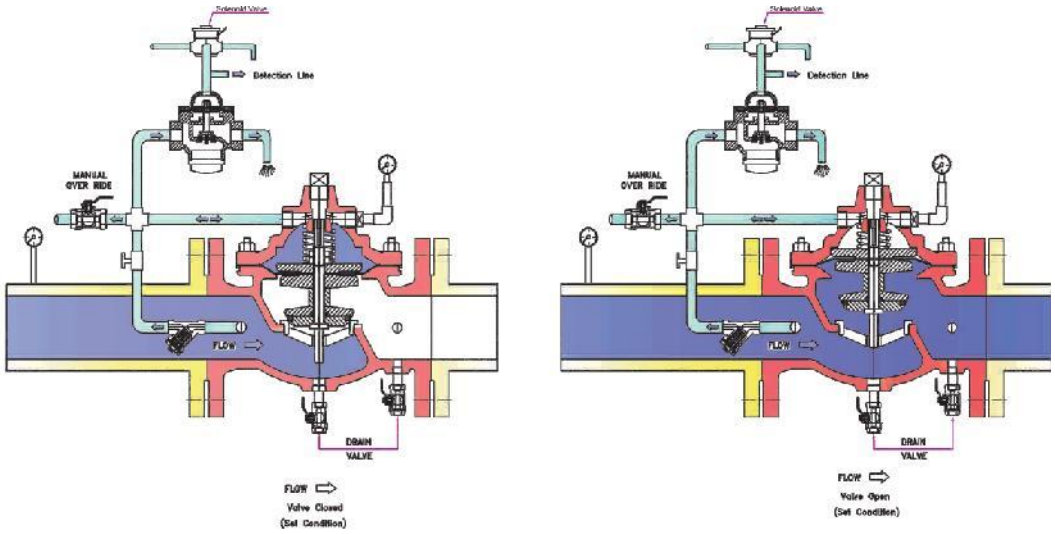
There are three chambers in the valve, inlet, outlet and cover chamber. The cover chamber & inlet/outlet are separated by an Elastomer Diaphragm. The valve consists of three main parts , Body, cover and diaphragm assembly. When diaphragm assembly, moves upward, valve opens and when it moves downward, it seals on the seat and valves closes bubble tight. The valve is of packless design-having no gland packing.



In the closed set condition, FLOW-AGE FT100/FT1100 Deluge valve is held closed by line pressure applied and trapped in the cover chamber

Refer Drawing. This water pressure multiplied by the effective surface area of the diaphragm Creates a differential closing force, resulting the valves remaining bubble tight closed

Until a control devices activates. The closed valves prevents the water or foam from entering the system. During FIRE or TEST condition, the water pressure is released from the cover chamber. This enables the line water pressure, without any help from any outside sources, to force the diaphragm plug assembly upward and the valve fully opens for clear unrestricted reintroduced into the cover chamber which closes the valve fully.



Advantages

- Steel body for longer life
- All sizes are with stainless steel pilots for very quick opening
- Valve size upto 8" will open within 2 seconds.
- Unique quad ring seal from parker / Equivalent for drip tight shut off.
- Diaphragm of even thickness, flexible and strong rated upto 375 psig pressure.
- Deluge valve is completely pre-piped with wet trim/pneumatic trim from factory –
- Saving high labour cost to do trim fitting at site.

BASIC DELUGE VALVE CONTROLS

Hydraulically Controlled Deluge Valve

This type of system is suitable for wet pilot lines with closed fusible plugs. Provided with boosted local opening, it is recommended for systems with elevated fusible plugs. The Deluge valves latches open in response to hydraulic pressure drop in the wet pilot line.

Electro – hydraulically controlled Deluge valve

This type of Deluge valve is solenoid (electrically) operated with hydraulic (line fluid) actuated. The Deluge valve opens in response to an electric signal which drains the cover chamber of pilot and main valve, which allows the to fully open.

Pneumatically Controlled Deluge Valve

This type of Deluge valve opens up in response to pneumatic pressure drop in the dry pilot line. This system is suitable for dry pilot lines with closed pneumatic pressure drop in the dry pilot line.

Electro-Pneumatically controlled Deluge Valve

This type of Deluge valve has electric and Electro Pneumatic device for detection. The Deluge valve opens in response to an electric signal and/or pneumatic pressure drop in the dry pilot line.

TRIM OPTIONS

Basic Trim

Deluge valve trims consist of diaphragm, retainer, retainer plate, stem and spring. The whole trim assembly moves together to open/close the valve based on signal received from the controller device. For drip tightness there is soft seat retainer plate in closed position.

Dry Pilot Trim

Dry pilot operation uses a pilot line of closed sprinkler containing air under pressure, located in the protected area. It requires regulated dry air supply with main supply point with restricted orifice. The air pressure to be maintained as specifies. The pilot line is connected to air inlet side. The top chamber of the Deluge valve is connected to water inlet side.

When there is an air pressure drop due to release of any device on detection of fire, the diaphragm of pilot is lifted and allows the water to drain. This release the water pressure in the top cover chamber of the Deluge valve, allowing the Deluge valve tom open and water to flow into the system's piping and alarm devices.

Recommended air supply pressure for dry pilot trim system is 3-4 kg/cm2.

Wet Pilot Trim

Wet pilot operation uses a pilot line of closed sprinklers containing pressurized water, supplied through the upstream side of the Deluge valve, through a restricted orifice. All the release line. Due to release of any one of the release device, the water pressure in the top chamber of the pilot valve drops which opens the pilots and the Deluge valve opens.

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Electric Release Trim

To actuate deluge valve electrically, a solenoid valve is provided to drain the water from the top chamber of the Deluge valve. A pressure switch is provided to activated an electric alarm and signal to shut down the desired equipment or to give tripped indication to Deluge valve in addition to this pressure switch can also monitor "low air pressure" and "fire condition" when used in dry pilot air line.

Test and Alarm Trim with Sprinkler Alarm

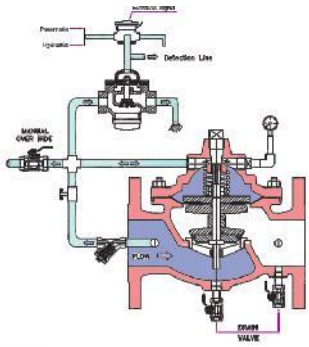
This trim is supplied with the sprinkler alarm bell, which rings on actuation of Deluge valve. A test valve is provided to test the normal operation of the sprinkler alarm bell.(water motor gong)

Accessories

- Pressure Gauge
- Water Alarm Gong
- Pressure switch
- Drain valve
- Air filter regulator

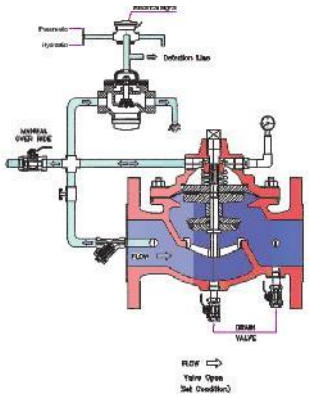
Test and Alarm Trim with Sprinkler Alarm

This trim is supplied with the sprinkler alarm bell, which rings on actuation of deluge valve. A test valve is provided to test the normal operation of the sprinkler alarm bell.(water motor gong)



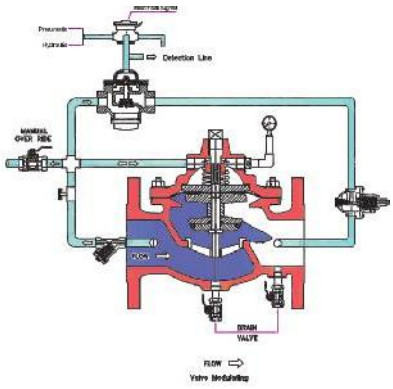
Valve Close

Line pressure applied to the cover chamber, which creates higher force due to large area above the seat, which moves valve to the closed position and provides drop tight shut off. Diaphragm area is always 1.5 times larger than seat area in all sizes of valve



Valve Open

Discharging the pressure out of the cover chamber to atmosphere or other lower pressure to act below seat area to move valve upward to the open position.



Valve Modulating

The pressure reducing pilot valve (FT15) senses the pressure, changes and opens or closed the valve and modulates the main valve and accordingly controls/reduces the outlet pressure

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Tender Specifications :

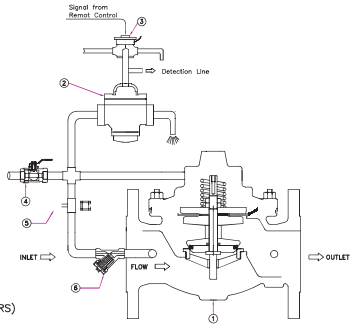
- The Deluge valve shall be pilot operated, diaphragm and line fluid actuated
- Pilot can be operated by electric (solenoid valve), pneumatic or hydraulic (lined fluid) sources, without any other gadgets.
- The Diaphragm assembly shall be only moving part
- The valve cover shall be removable for online servicing and inspection without removing the entire valve from the pipelines
- The controls trim shall be factory pre-assembled and integrated part of the Deluge valve

FT100 D – B/ FT1100 D – B
Solenoid Operated Deluge Valve for Freshwater & Seawater

- Model FT100 D
- Fast Acting Solenoid Control
- Drip Tight-Shutoff
- Simple Design-Pressure Reliability
- Easy Installation and Maintenance without
- Removing valve from the line
- All Deluge Valve trims are pre-piped at factory

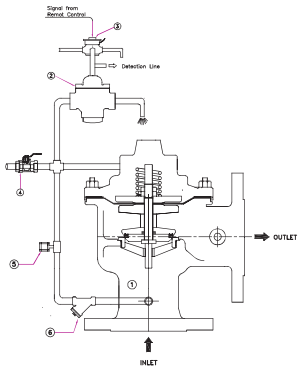
The FLOW-AGE FT100D-B Solenoid Control Valve in an ON/OFF control valve which either opens or closes upon receiving an Electrical Signal to the Solenoid Pilot Control. This valve consist of FT100 Main Valve, A 3/2 way Solenoid Valve, an Auxiliary Pilot-100M and Manual Release station (MRS).

The Pilot Control System applies water pressure to or relieves water pressure from the Diaphragm Chamber of the main valve to close or open the Deluge Valve. It is supplied either normally Closed (Energize Solenoid to open) or normally Open (De-energize Solenoid Valve to open)



(1) Main Deluge Valve – F100
(2) Pilot Valve (100M)
(3) Solenoid Valve
(4) Manual Release Station (MRS)
(5) Flow Control Device
(6) Flow Clean strainer

SCHEMATIC DIAGRAM FOR F100 D–B



(1) Main Deluge Valve – F100
(2) Pilot Valve (100M)
(3) Solenoid Valve
(4) Manual Release Station (MRS)
(5) Flow Control Device
(6) Flow Clean strainer

SCHEMATIC DIAGRAM FOR F1100 D–B

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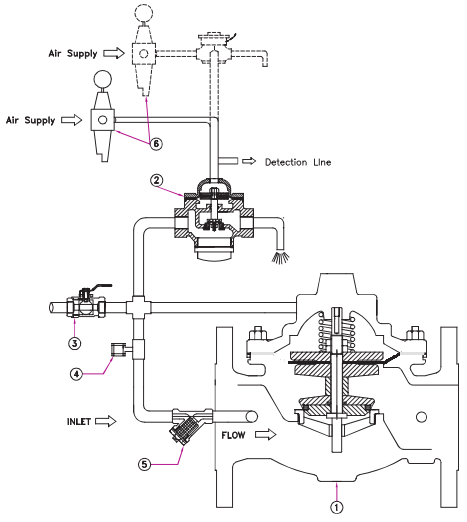
FT100 D – A /FT1100 D –A
Pneumatically /Hydraulically Controlled Deluge Valve for Freshwater & Seawater

- Model FT100 D
- Quick response to air supply to pilot
- No gland packing
- Dry pilot trim when air is used for sprinkler system

The FLOW-AGE FT100D-A Deluge valve is used for dry pilot trim-air operated Deluge system. The valve can be used with direct air supply to the pilot (100m) in which case, the Deluge valve will open in case of air pressure loss. The valve can also be used with solenoid valve, where air is supplied to pilot valve through 3/2 way solenoid valve which keeps Deluge valve in closed condition.

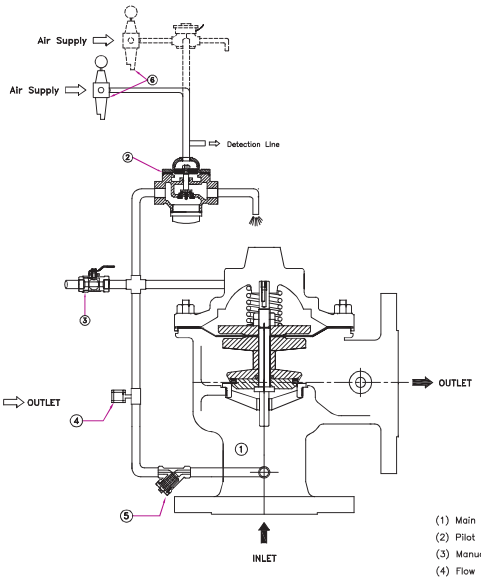
In case of FIRE or TEST, the 3/2 way solenoid valve is energized, which removes air from the pilot valve (100m). This open the pilot valve and releases water from the cover chamber of main valve which opens main valve – Deluge valve.

This eliminates separate types of trim for hydraulically operated & pneumatically operated Deluge valve and makes it very simple to use operate and maintain.



(1) Main Deluge Valve – F100
(2) Pilot Valve (100M)
(3) Manual Release Station (MRS)
(4) Flow Control Device
(5) Flow Clean strainer
(6) Air Filter Regulator

SCHEMATIC DIAGRAM FOR F100 D–B



(1) Main Deluge Valve – F100
(2) Pilot Valve (100M)
(3) Manual Release Station (MRS)
(4) Flow Control Device
(5) Flow Clean strainer
(6) Air Filter Regulator

SCHEMATIC DIAGRAM FOR F1100 D–B

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Specifications

FT100 – Globe – 2''-16''-Flanged to ANSI B16.5 class 150 & 300

FT1100 – Angle – 2''- 8''-Flanged to ANSI B16.5 class 150 & 300

Pressure Rating – 150 class, Max 285 PSIG (20 Brag)
300 class, Max 375 PSIG (26 Brag)

Temperature Range – Water up to 70 C / 160° F Max.

Material Main Valve Body & Cover

- Cast Steel ASTM A216 Gr.WCB
- Naval Bronze: ASTM B61
- Nickel Al-Bronze-ASTM B148/BS1400 Gr.AB2
- Stainless Steel-ASTM A351 Gr.CF8/8M

Valves Seat	–	SS 304/SS 316
All Other Internal Parts	–	SS 304/SS 316
Stem	–	SS 316/SS 316
	–	Monel for SEAWATER
Pilot 100m	–	Stainless Steel
Tubing & fitting	–	All Stainless Steel
Elastomers	–	NBR/Buna-N-Nylon Reinforced

Pilot Valve Specifications – 100M

Body & Trim Material - Complete Stainless Steel

Max. Pressure – 375 Psig (26 Barg)

Max. Temperature – 70 °c / 160°F

Fluid – Air / Water / Light Oil

Elastomers – Buna–N–Nylon Reinforced

Solenoid Control Specifications

Type –	3/2 way – Normally Open Energize to Open Deluge Valve – 3/2 way–Normally Close De-Energize To Open Deluge Valve
Body	–Brass ASTM B283 Stainless Steel
Enclosure	– Weatherproof to NEMA type 1, 2,3,4,5 NEMA type -6,7,9- Watertight IP 65, Ex-Proof PESO/CMRI certified for Gr.IIA/IIB at extra cost. UL-approved Ex-Proof/ATEX at extra cost
Voltage	– 110V/220V – AC – 60Hz/50Hz 24V/48V DC
Coil	– Class F
Current	– AC Coil – 6 Watts
Current	– DC Coil – 10.6 Watts
Inrush Amp.	– 30 VAC
Holding Amp.	– 16 VAC

Manual Operated – Available On Request at Extra Cost

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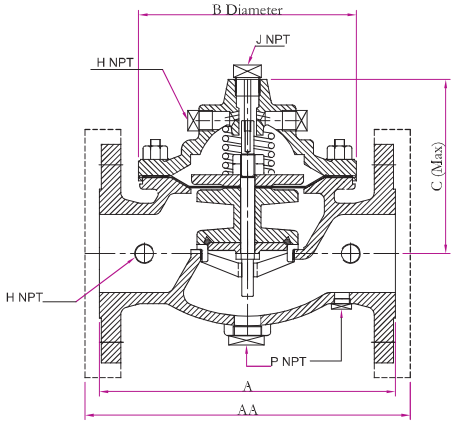
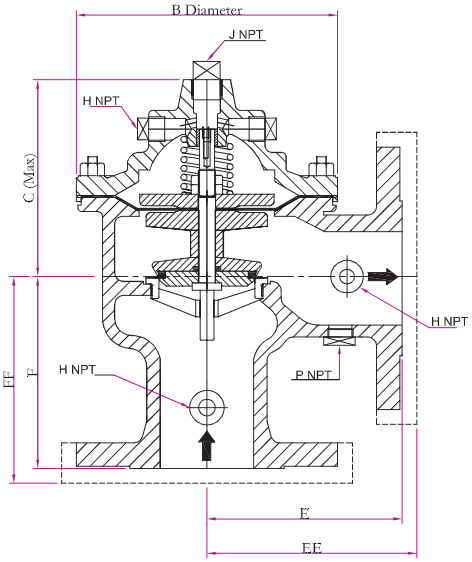
Flow Data - ACV FT 100 (Globe)/FT1100(Angle)

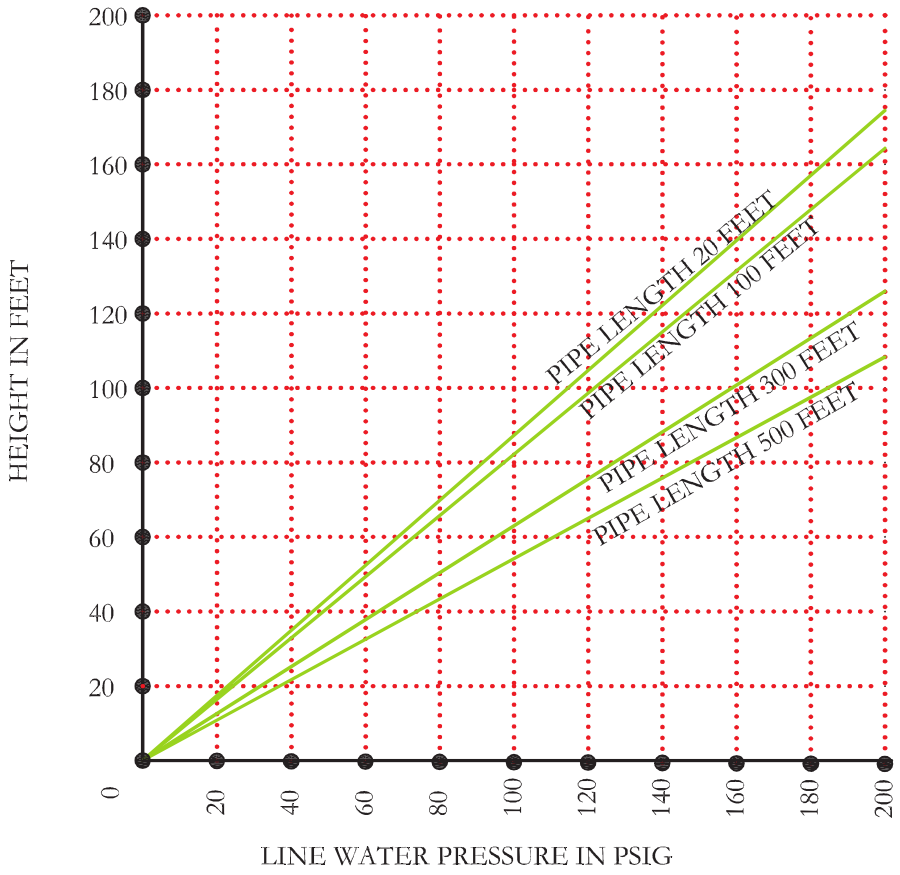
Valve Size - Inch	2"	3"	4"	6"	8"	10"	12"	14"	16"
Valve Size - mm	50	80	100	150	200	250	300	350	400
Valve Cover Chamber Capacity(liters)	0.112	.28	.616	1.96	4.73	9.46	15.14	24.6	35.9
CV Valve (Globe) FT-100 (G.P.M.@ 1 PSI P)	55	125	220	460	840	1400	1730	2300	2950
CV Valve (Angle) FT-100 (G.P.M.@ 1 PSI P)	66	150	260	570	990	1600	2500	3060	4210
Maximum Continuos Flow Rate GPM (Water)	208	460	800	1800	3100	4900	7000	8500	11000
Maximum Inermittent Flow Rate GPM (Water)	260	570	1000	2300	3900	6000	8600	10500	14000
Approx. Weight (Kgs)	20	28	55	115	182	375	500	728	1025





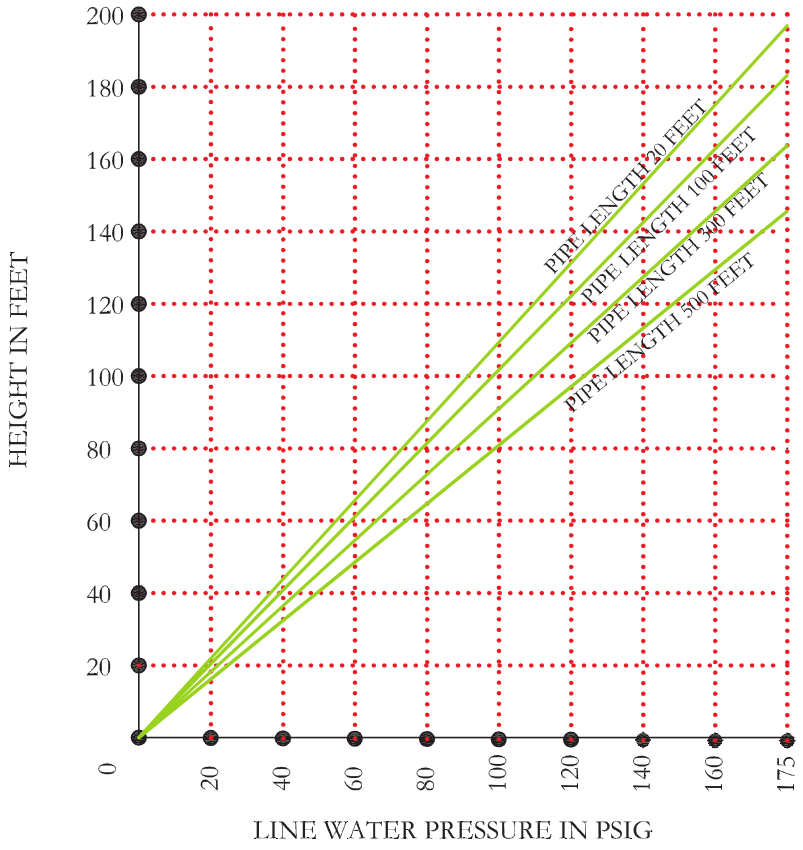
Valve Size - Inch	2"	3"	4"	6"	8"	10"	12"	14"	16"
Valve Size - mm	50	80	100	150	200	250	300	350	400
A 150 ANSI	238	305	381	508	645	756	864	991	1051
AA 300 ANSI	254	337	397	533	670	790	902	1029	1105
B Dia	143	200	253	337	445	594	710	819	902
C Max. -F100	140	175	220	305	400	480	530	570	665
E 150 ANSI	150	195	225	275	350				
EE 300 ANSI	156	205	233	286	362				
F 150 ANSI	127	146	173	216	280				
C Max. -F1100	140	175	220	305	350				
P NPT	1/2"	1"	1"	1-1/2"	2"	2"	2"	2"	2"
H NPT	3/8"	3/8"	3/8"	3/8"	1/2"	3/4"	3/4"	1"	1-1/2"
J NPT	1/2"	3/4"	3/4"	1"	1"	1"	1"	1"	1"

Wet Pilot Sprinkle Height Limitation FT100 D - A, FT 100D-B 4 Inch (100mm)



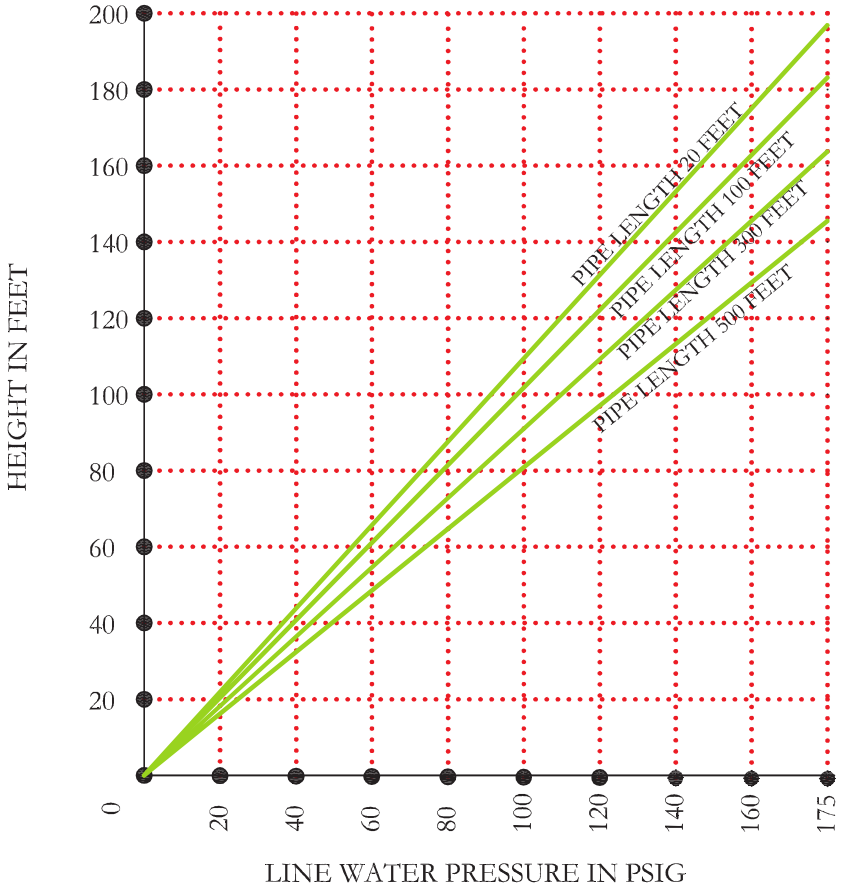
MAX. PIPE LENGTH		MAX. SPRINKLE HEIGHT IN FEET			
		20	100	300	500
LINE WATER PRESSURE IN PSIG	20	21	20	17	14
	40	40	38	33	28
	60	52	49	41	33
	80	75	71	61	51
	100	98	93	81	69
	120	121	115	101	87
	140	144	137	121	105
	160	151	143	124	104
	175	174	166	145	125

Wet Pilot Sprinkle Height Limitation FT100 D - A, FT 100D-B 6 Inch (150mm)



MAX. PIPE LENGTH		MAX. SPRINKLE HEIGHT IN FEET			
		20	100	300	500
LINE WATER PRESSURE IN PSIG	20	21	20	17	14
	40	42	40	35	30
	60	60	57	50	42
	80	83	79	70	60
	100	98	93	81	69
	120	129	115	110	96
	140	144	137	121	105
	160	174	167	150	132
	175	190	182	163	144

Wet Pilot Sprinkle Height Limitation FT100 D - A, FT 100D-B 8 Inch (200mm)



MAX. PIPE LENGTH		MAX. SPRINKLE HEIGHT IN FEET			
		20	100	300	500
LINE WATER PRESSURE IN PSIG	20	22	21	19	16
	40	42	40	35	30
	60	60	57	50	42
	80	99	95	87	79
	100	106	101	90	78
	120	129	123	110	96
	140	144	137	121	105
	160	159	151	133	114
	175	197	190	172	153

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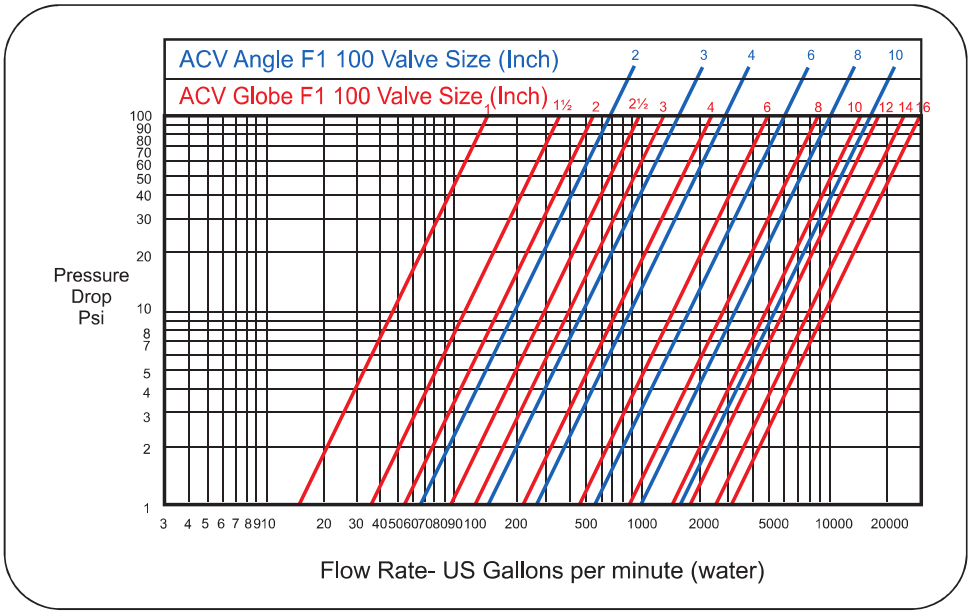
Pressure Drop Chart



BSCIC ISO 9001 REGISTERED
NABCB GM 638

IBR Approved

CE

D&B

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