February 2008

F180 Series Excess Flow Valves for Compressed Air Service

TYPE F186

TYPE F187

TYPE F188

Figure 1. *F180 Series Excess Flow Valves*

WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in property damage and personal injury or death.

Fisher® equipment must be installed, operated, and maintained in accordance with federal, state, and local codes and Fisher instructions.

Only personnel trained in the proper procedures, codes, standards, and regulations of the applicable industries should install and service this equipment.

WARNING

A break or leak downstream of an excess flow valve that does not allow a flow equal to the valve flow rating will not actuate the excess flow valve and could result in property damage or personal injury from a whipping hose or high volume discharge of air. For this reason the operator must be familiar with the system shutoff valves and close the system if an emergency occurs.

Introduction

Scope of Manual

This instruction manual covers installation and maintenance for F180 Series excess flow valves used on compressed air service.

D450016T012

Specifications

TYPE	INLET CONNECTION, INCHES	OUTLET CONNECTION, INCHES	MATERIAL	CLOSING FLOW, AIR SCFM (meters³/min) AT 100 PSIG (6,9 bar) INLET PRESSURE	CLOSING FLOW DIFFERENTIAL PRESSURE, PSIG (bar)	BODY LENGTH, INCHES (cm)	WRENCH HEX, INCHES (cm)
F186-06-1	3/4 MNPT	3/4 FNPT	Brass	171 (4,8)	11 (0,76)	1.85 (4,7)	1.31 (3,3)
F187-08-1	1 FNPT	1 FNPT	Brass	189 (5,4)	3.3 (0,23)	3.47 (8,8)	1.75 (4,4)
F187-12-1	1-1/2 FNPT	1-1/2 FNPT	Brass	416 (11,8)	4.7 (0,32)	4 (10,2)	2.25 (5,7)
F187-16-1	2 FNPT	2 FNPT	Brass	879 (24,9)	4.2 (0,29)	4.56 (11,6)	3 (7,6)
F188-24-1	3 FNPT	3 MNPT x 2 FNPT	Steel	1729 (49,0)	7.1 (0,49)	6.22 (15,8)	3.75 (9,5)

Maximum Operating Pressure: 250 psig (17,2 bar)

Maximum Differential Pressure: 15 psig (1,03 bar)

Closing Flow Tolerance: +10% to -20% of rated flow

Description

Excess flow check valves close when the flow rate of air exceeds the valve's rated flow capacity. They are used to protect against the dangers of a whipping hose. The valves are available in a variety of sizes and body configurations.

When flow exceeds the valve's setting, the valve closes and remains closed until the system equalizes. A built-in equalizing passage automatically opens the valve once pressures on both sides of the poppet are equal.

Specifications

CAUTION

If the valve is to be used in service other than compressed air, contact the factory to determine if the valve materials are suitable for the particular service.

Valves with brass materials must not be used on anhydrous ammonia (NH_3) service.

Installation

CAUTION

Do not install the valve in any hose or piping which tends to restrict the valve inlet. This may prevent the excess flow valve from closing.

Flow through the excess flow valve must be in the same direction as the flow arrow stamped on the valve.

1. A rule of thumb for sizing excess flow valves is to choose a valve with a closing flow 1.5 times the maximum operating flow. For surge conditions, 2 times maximum flow may be required.

However, the excess flow valve's closing flow rate must be **less** than the capacity of the compressed air system in which the valve is being used. The flow rating of the piping, fittings, pump, valves, and hose on both the inlet and outlet of the excess flow valve must be **greater** than the flow rating of the excess flow valve. If branching, piping length, additional valves, reduction in pipe size, elbows, or other necessary

components in the piping system create restrictions which reduce the flow rating to less than that of the excess flow valve rating, the valve will not give excess flow protection, and additional excess flow valves must be installed at these points.

2. Brass valves are not suitable for anhydrous ammonia (NH_3) applications.

3. Manually operate the excess flow valve's poppet before installation to assure parts were not damaged in shipment or blocked with dirt or foreign material.

4. Use pipe dope on the male threads of the valve or the pipeline. Polytetrafluoroethylene (PTFE) tape or PTFE pipe dope compound is recommended for the male threads of the larger valves such as the 2 and 3-inch sizes.

5. After the excess flow valve is installed, the system should be tested for excess flow valve operation by simulating a break downstream in the system at the furthermost point being protected. To test the unit, pressure the system and then open a shutoff valve quickly at the farthest point in the piping that the excess flow valve is intended to protect. There should be a sudden decrease in flow, indicating that the valve has closed and is working properly. Because of the bleed that permits the valve to equalize itself, a small amount of leakage will continue after the excess flow check closes.

6. To reopen a closed excess flow valve, close a shutoff valve on either the upstream or downstream piping. When pressure is equal on both sides of the valve, it will "click" open and flow can be resumed by opening the shutoff valve.

WARNING

Trained personnel should test the excess flow valve in a safe location.

Excess flow closure should be checked annually or on a regularly scheduled basis to insure that the valve is still functional.

Maintenance

Excess flow valves are non-repairable. Replace non-functioning valves.

Troubleshooting

If the excess flow valve fails to close – check the following:

1. Flow direction is the same direction as arrow stamped on the valve.

2. Shut off valves on the inlet and outlet of the piping are fully open.

3. Restrictions on the inlet or outlet of the excess flow valve are restricting flow into or out of the valve.

4. Flow capacity at point of test is not great enough to close the excess flow valve.

5. Pipe scale, welding slag, or other debris is holding the valve open.

Premature closing or valve chattering – check the following:

1. Surge conditions – Increase flow slowly to prevent surge. A larger excess closing flow may be required.

2. Chattering – Normal flow conditions may be too near to the closing flow rate, or flow direction is wrong or back flowing is occuring.

3. Restriction on inlet of valve.

WARNING

Back flowing or flowing too near to the excess flow valve closing rate may cause chattering which may result in excessive wear on parts and valve failure.

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