

Fisher Controls**FISHER®**

Instruction Manual

**912 Series
Pressure Regulators**

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Form 5124

WARNING

To avoid injury or equipment damage, these regulators should be installed, operated, and maintained in accordance with federal, state and local codes, rules and regulations, and Fisher instructions. Only a qualified person must install or service a regulator. Be certain the control spring range label is updated to accurately indicate any field changes in equipment, materials, service conditions, or pressure settings.

Immediately call a qualified technician in case of trouble. If venting occurs, or a leak develops in the system, it indicates that service is required. Failure to correct the situation immediately may create a hazardous condition.

INTRODUCTION**Scope of Manual**

This manual provides installation, maintenance, and parts information for the 912 Series pressure regulators (figure 1) as used in industrial/natural gas applications.

Description

The 912 Series pressure regulators are self-operated, spring-loaded devices built to provide accurate, sensitive control suited to a variety of applications.

As outlet pressure begins to exceed the set pressure, the diaphragm inside the regulator lifts, operating a lever to

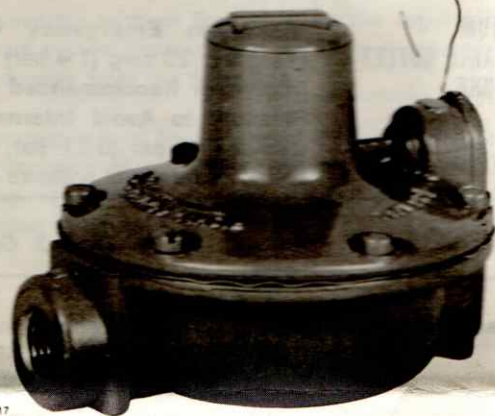


Figure 1. Type 912 Regulator

close the inlet. Pressure in excess of the relief valve spring force opens the relief valve, allowing excess pressure to bleed through the screened vent in the spring case.

Specifications

Specifications for the 912 Series pressure regulators are listed in table 1.

INSTALLATION**WARNING**

Personal injury or equipment damage may result if the regulator is installed where service conditions could exceed the pressure or temperature specifications in table 1. The regulator must not be used for hazardous gas service in a closed area unless the vent is piped to a safe



Table 1. Specifications

AVAILABLE CONFIGURATIONS	See table 2	INTERNAL RELIEF PERFORMANCE	Approximate Internal Relief Valve Start-to-Discharge Point: See table 2 Capacity: Adequate only for relieving minor buildup situations such as are caused by chips or dirt blocking the seat partly open; for major malfunctions, external relief is required according to the "Installation" section
BODY SIZES AND END CONNECTION STYLES	Inlet: 1/4-inch NPT screwed Outlet: ■ 1/4 or ■ 3/8-inch NPT screwed	MATERIAL TEMPERATURE CAPABILITIES	-20 to 160°F (-29 to 71°C)
MAXIMUM ALLOWABLE INLET PRESSURE	250 psig (17 bar)	PRESSURE REGISTRATION	Internal
OUTLET PRESSURE RANGES	See table 2	APPROXIMATE WEIGHT	1.3 pounds (0.6 kg)
MAXIMUM ALLOWABLE OUTLET PRESSURE	Maximum Emergency Outlet Pressure: 20 psig (1.4 bar) Maximum Recommended Outlet Pressure to Avoid Internal Part Damage: 3 psi (0.21 bar, differential) above outlet pressure setting		

Table 2. Outlet Pressure Range Data

AVAILABLE CONFIGURATION	OUTLET PRESSURE RANGE	APPROXIMATE POINT ABOVE OUTLET PRESSURE SETTING AT WHICH INTERNAL RELIEF STARTS TO DISCHARGE	CONTROL SPRING SELECTION	
			Part Number	Color Code
Type 912 without handwheel	3 to 7 inches w.c. (7 to 17 mbar)	5 to 21 inches w.c. (12 to 52 mbar)	1B7843 27222	Red
	5 to 10 inches w.c. (12 to 25 mbar)	8 to 30 inches w.c. (20 to 75 mbar)	1B7844 27222	Orange
	9.25 to 13 inches w.c. (23 to 32 mbar)	16 to 39 inches w.c. (40 to 97 mbar)	1L5079 37022	Cadmium
	12 to 24 inches w.c. (30 to 60 mbar)	17 inches w.c. to 3 psig (42 to 210 mbar)	1B7845 27222	Blue
Type 912H without handwheel	1 to 2.5 psig (69 to 172 mbar)	0.7 to 6.8 psig (0.05 to 0.47 bar)	1B7846 27222	Yellow
	2.7 to 5 psig (186 to 340 mbar)	3.8 to 12.5 psig (0.26 to 0.86 bar)	1B7847 27222	Green
912 Series with handwheel	0 to 1 psig (0 to 69 mbar)	0 to 3 psig (0 to 210 mbar)	1C5804 27222	Black
	0 to 5 psig (0 to 340 mbar)	0 to 12.5 psig (0 to 0.86 bar)	1C5805 27012	Brown

area. The vent opening on the regulator or the opening on the remote vent pipe (if one is used) should be pointed down to minimize clogging from collected moisture, corrosive chemicals, or other foreign material. Overpressuring the downstream system (and risk of explosion) could result from a clogged vent.

Overpressuring any portion of a regulator or associated equipment may cause leakage, part damage, or personal injury due to bursting of pressure-containing parts or explosion of accumulated gas.

Like most regulators, the 912 Series regulators have an outlet pressure rating lower than the inlet pressure rating. Downstream protection is required if the actual inlet pressure can exceed the regulator outlet pressure rating or the pressure rating of any downstream equipment.

Regulator operation within ratings does not preclude the possibility of damage from external sources or from debris

in the lines. A regulator should be inspected for damage periodically and after any overpressure condition.

Ensure that the regulator is undamaged and contains no foreign material. Install the regulator so that flow through it leaves the outlet port (marked on the body). The regulator may be installed in any position, however, the spring case vent should be pointed down. Spring case/vent orientation can be changed by rotating the spring case with respect to the body.

For an indoor installation, if the regulator controls a gas that is flammable or otherwise hazardous, a spring case with the optional tapped vent should be used so that the exhaust can be piped away. Provide protection on a remote vent by installing a screened vent cap into the remote end of the vent pipe. The vent should be pointed down.

Apply a good grade of pipe compound to the pipe threads before making the connections. Install piping into the 1/4-inch NPT inlet connection and the 1/4-inch or 3/8-inch NPT outlet connection.

Each regulator is factory-set for the pressure setting specified on the order. If no setting was specified, the outlet pressure is factory-set at the mid-range of the control spring. The procedure for adjusting the output pressure is given in the "Startup" section.

STARTUP

Key numbers are referenced in figure 2.

With installation completed and downstream equipment properly adjusted, slowly open the upstream and downstream shutoff valves while monitoring the regulator output pressure.

WARNING

For the 912 Series constructions with no drive screw in the spring case, never adjust the control spring to produce an outlet pressure higher than the outlet pressure range for that particular spring. Doing so could overpressure the system and cause personal injury or equipment damage. If the desired outlet pressure is not within the range of the control spring, install a spring of the proper range according to the "Maintenance" section.

If outlet pressure adjustment is necessary, monitor the outlet pressure with a gauge while performing the following procedure:

1. For units without a handwheel, unscrew the closing cap (key 3) and insert a screwdriver blade into the adjusting screw (key 4).
2. Slowly turn the adjusting screw or handwheel clockwise to increase or counter-clockwise to decrease the output pressure setting.
3. With the output pressure adjusted to the desired value, replace the closing cap on units without a handwheel.

SHUTDOWN

Close the nearest upstream shutoff valve, then close the nearest downstream shutoff valve, and vent pressure from the outlet of the regulator.

MAINTENANCE

Regulator parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement of parts depends on the severity of service conditions or the requirements of local, state, and federal rules and regulations.

WARNING

To avoid personal injury or equipment damage, do not attempt any maintenance or disassembly without first isolating the regulator from system pressure and relieving all internal pressure from the regulator.

This procedure is to be performed if changing the control spring for one of a different range, or for inspecting, cleaning, or replacing any other parts. Key numbers are referenced in figure 2.

Note

If sufficient clearance exists, the regulator body (key 1) can remain in the line during spring replacement or other maintenance procedures.

Control Spring Replacement

On units without the handwheel, unscrew the closing cap (key 3) and turn the adjusting screw out of the spring case. Lift out the control spring (key 5).

On units with a handwheel, turn the handwheel counter-clockwise until the tension is relieved from the control spring. Unscrew the nut at the base of the handwheel and lift the handwheel off the spring case. Lift out the adjusting screw and the control spring.

Replace the control spring and complete the assembly by replacing the adjusting screw and the closing cap or handwheel. Adjust the spring tension as described in the "Startup" section.

Diaphragm and Relief Valve Replacement

Remove cap screws (key 14) and separate the spring case from the valve body. Remove the control spring (key 5) and the diaphragm (key 15) along with the diaphragm head (key 10), the relief valve seat (key 9) and the relief valve spring (key 6). Separate these parts by removing the pin (key 8) and the spring seat (key 7). Remove the disc holder assembly (key 11) by removing two screws (key 13).

To re-assemble the regulator, first assemble the relief valve spring assembly, then replace the relief valve spring assembly, the disc holder assembly, the diaphragm, the diaphragm head, and fit the spring case to the body. Install and tighten cap screws (key 14) in a criss-cross manner. Adjust the control spring tension as described in the "Startup" section.

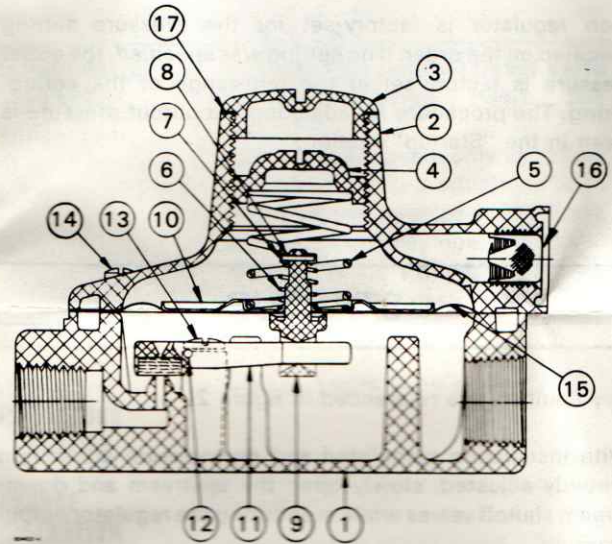


Figure 2. 912 Series Pressure Regulator Assembly

PARTS ORDERING

When corresponding with the Fisher representative about this regulator, include the type number, date of manufacture, and all other pertinent information from the labels. Specify the eleven-character part number when ordering new parts from the following parts list.

PARTS LIST

Key	Description	Part Number	Key	Description	Part Number
1	Body, zinc 1/4" x 1/4" NPT 0.073" (1.8 mm) port dia	3D3771 44042	5	Regulator Spring, steel pl. 9.25 to 13" w.c. (23 to 32 mbar), cad.	1L5079 37022
2	Spring Case, zinc For use with control springs 1B7847 27222 (complete with drive screw)	3B7824 44042	6	Relief Valve Spring, steel pl	1B7848 27012
	Untapped	1B7840 T00012	7	Spring Seat, steel pl	1B7834 25072
	1/8-inch NPT tapped	T10895 T00012	8	Pin, SST	1B7835 35032
	vent	T10895 T00012	9	Relief Valve Ass'y, brass/zinc	1C3650 X0012
	For all other constructions		10	Diaphragm Plate, steel Zn pl	1B7838 24132
	Untapped	3E2944 44042	11	Disc Holder Ass'y, zinc/nitrile	1E3003 000A2
	1/8-inch NPT tapped	1E2955 44042	12	Fulcrum Rod, SST	0U0914 35032
	vent	1E2955 44042	13	Machine Screw, steel pl (2 req'd)	1A3461 28982
3	Closing Cap 912 Series w/handwheel, brass	1C2344 14012	14	Machine Screw, steel pl (6 req'd)	1B7839 28982
	All others, plastic	T10276 06992	15	Diaphragm, rubber	1B7837 02012
4	Adjusting Screw 912 Series w/handwheel, zinc & steel	1B7992 000A2	16	Vent Screen, Monel†	0W0863 43062
	All others, plastic	T10277 06992	17*	Closing Cap Gasket, asbestos (use with tapped vent only)	1E7652 04022
			18	Closing Spring, SST, 912 Series w/handwheel, only	1E3020 37022
			19	Spacer Ring, brass, 912 Series w/handwheel, only	1C5807 14012
			20	Lockwheel, brass, 912 Series w/handwheel, only	1C2346 14012
			22	Warning Label (not shown)	1P4879 06032
			23	Spring Range Label (not shown)	
				1 to 2.5 psig (69 to 172 mbar)	T10800 06992
				2.7 to 5 psi (186 to 340 mbar)	T10801 06992
				0 to 1 psi (0 to 69 mbar)	T10802 06992
				0 to 5 psi (0 to 340 mbar)	T10803 06992
			25	Spring Seat, brass, 912 Series w/handwheel	1C2345 14012

*Recommended spare part.

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