

September 2008

Type 112 Restrictor

Introduction

Scope of Manual

This instruction manual provides technical specifications, installation, startup, adjustment, and parts ordering information for the Type 112 restrictor.

Product Description

The 112 Restrictors are mainly used in natural gas, air, or other non-corrosive gas applications. Their installation is foreseen together with a Type 161 pilot for Pressure Regulators Type EZR.

Specifications

The Specification section lists pressure limitations and other specifications for Type 112 Restrictor.

Principle of Operation

The Type 112 restrictor controls the regulator's proportional band (droop) and speed of response. The restrictor can be used to fine tune the regulator for maximum performance by decreasing the restrictor setting for tighter control (increased opening speed, decreased closing speed); or increasing the restrictor setting for maximum stability (decreased opening speed, increased closing speed). A lower setting also provides a narrower proportional band for better accuracy. The "8" position has the largest flow, is most stable, and easiest for startup, however, using the "8" position is not necessary. The "0" setting has the smallest (minimum) flow passage; at no point of rotation will the Type 112 restrictor be completely shutoff. After initial adjustment, the restrictor does not need to be adjusted for maintenance or startup.

Startup and Adjustment

Startup for Both Single-Regulator and Monitoring Installations

1. Make sure all block and vent valves are closed.
2. Back out the pilot adjusting screw(s).
3. For easy initial startup, set the restrictor to the "8" position. For future startups, the restrictor can be left in the desired run position.
4. **SLOWLY OPEN** the valves in the following order:
 - a. Pilot supply and control line valve(s), if used
 - b. Inlet block valve
 - c. Outlet block valve
5. For a 161 Series pilot with Type 112 restrictor, turn the restrictor(s) to position "2" or to desired run position. Set then the pilot to the desired outlet (control) pressure according to the pilot adjustment procedure. Refer to Tables 2 and 3 for recommended settings.

Maintenance

Type 112 Restrictor

Perform this procedure only if O-rings are leaking. Key numbers are referenced in Figure 2.

1. Unscrew the groove valve (key 22) and retainer (key 23) just enough to loosen them, but do not completely separate.
2. Push on the retainer (key 23) to push the groove valve (key 22) out of the body (key 21), then complete disassembly.
3. Replace the groove valve O-rings (key 24) if necessary, being sure to lightly apply lubricant to the replacement O-rings before installing them in the groove valve (key 22) and retainer (key 23).



Type 112

Specifications

Maximum Inlet Pressure and Pressure Drops⁽¹⁾
Restrictor: 1500 psig (103 bar)

Flow Coefficients
Restrictor: See Table 1

Construction Materials

Body: CB7Cu-2 Stainless steel
Groove Valve: 416 Stainless steel
Retainer: 416 Stainless steel
Pipe Plug: 316 Stainless steel
O-rings: Fluorocarbon (FKM)

1. The pressure/temperature limits in this Instruction Manual and any applicable standard or code limitation should not be exceeded.

Table 1. Restrictor Flow Coefficients

SET ON START		SET ON RUN		C _i
C _g	C _v	C _g	C _v	
6	0.17	1	0.03	35

Table 2. Adjustment Recommendations with 161 and 161EB Series Pilot

SERIES	RECOMMENDED TYPE 112 RESTRICTOR SETTINGS FOR LOW FLOW OPERATION	TYPE 112 RESTRICTOR SETTINGS TO AVOID LOW FLOW OPERATION
161 / 161H Pilots	Restrictor Setting of "5" or Greater	Restrictor Setting of "2" or less if continuous flows are expected to be less than 5% of maximum capacity
161EB Pilots		
Note: Higher Type 112 restrictor setting will increase proportional band. Adjustment of the Type 112 restrictor will also cause a shift in setpoint. Setpoint should be checked and adjusted following restrictor setting adjustment.		

Table 3. Adjustment Recommendations with 161AY / 161AYM Series Pilot

SERIES	RECOMMENDED TYPE 112 RESTRICTOR SETTINGS FOR LOW FLOW OPERATION	RECOMMENDED ORIFICE SIZE(S) FOR LOW FLOW OPERATION	TYPE 112 RESTRICTOR SETTINGS AND ORIFICE SIZES TO AVOID LOW FLOW OPERATION
161AY Pilots	Restrictor Setting of "5" or greater	3/32 or 1/8-inch (2,38 or 3,18 mm) (3/32-inch (2,38 mm) is standard)	Restrictor Setting of "2" or less if continuous flows are expected to be less than 5% of maximum capacity
Note: Higher Type 112 restrictor setting will increase proportional band. Adjustment of the Type 112 restrictor will also cause a shift in setpoint. Setpoint should be checked and adjusted following restrictor setting adjustment.			

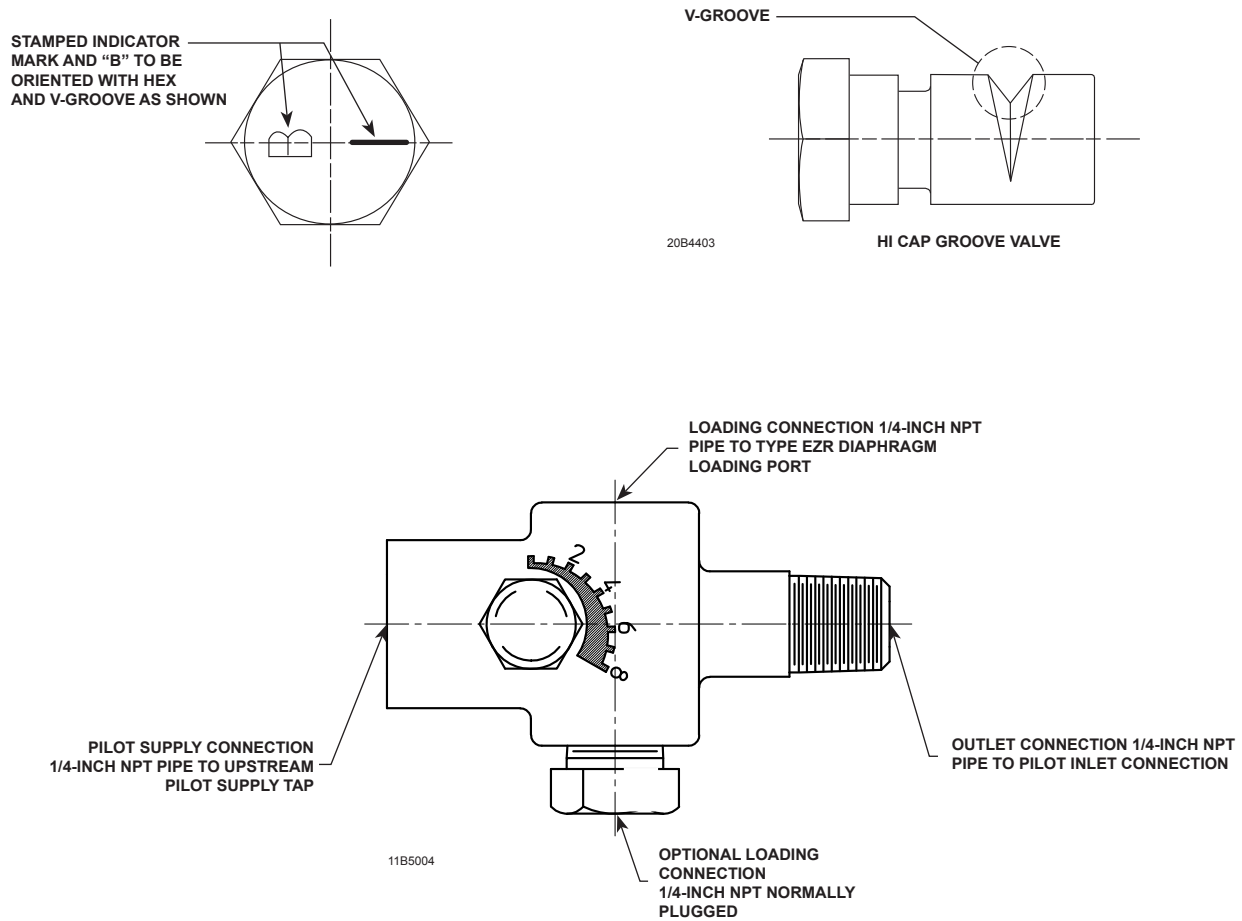


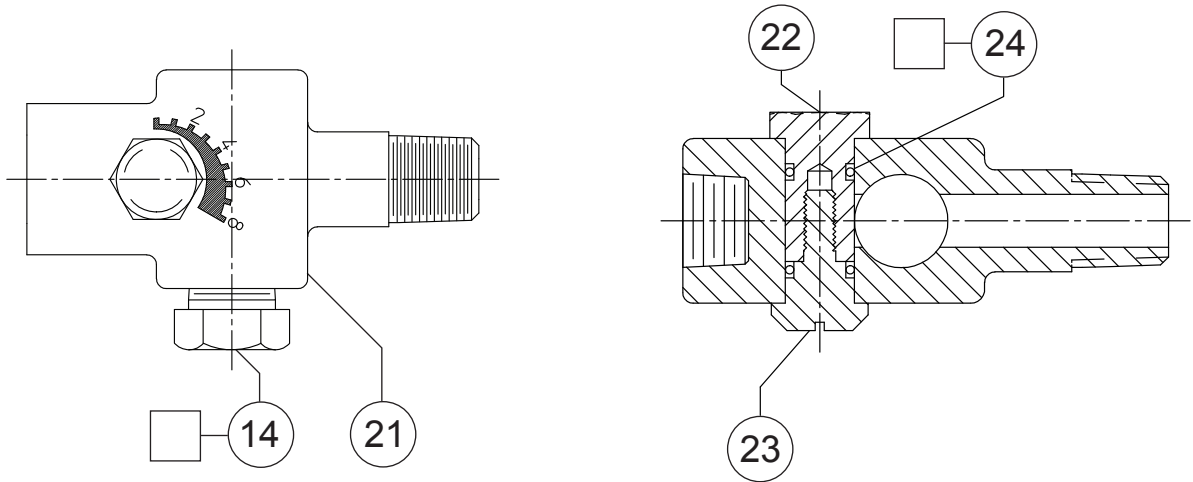
Figure 1. Type 112 Restrictor Port Function and Connection Sizes

4. Install the groove valve (key 22) into the same side of the body where the scale appears. Install the retainer (key 23) into the opposite side of the body, and tighten until both are secure.
5. When all maintenance is complete, refer to the Startup and Adjustment section to put the regulator back into operation.

Parts Ordering

When corresponding with your local Sales Office about this equipment, always reference the equipment serial number or FS number found on a nameplate attached to the bonnet. When ordering replacement parts, reference the complete 11-character part number of each needed part as found in the following parts list.

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20B4393-D

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Figure 2. Type 112 Restrictor Assembly

Parts List

Type 112 Restrictor (Figure 2)

Key	Description	Part Number	Key	Description	Part Number
14	Pipe Plug, 316 Stainless steel	1A767535072	23	Retainer, 416 Stainless steel	10B4402X012
21	Body, CB7Cu-2 Stainless steel	20B4429X012	24*	Groove Valve O-ring (2 required), Fluorocarbon (FKM)	1C8538X0052
22	Groove Valve, 416 Stainless steel	20B4403X012			

* Recommended spare part

Industrial Regulators Regulator Division Emerson Process Management

USA - Headquarters
McKinney, Texas 75070 USA
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Shanghai, China 201206
Tel: +86 21 2892 9000

Europe
Bologna, Italy 40013
Tel: +39 051 4190611

Natural Gas Technologies Regulator Division Emerson Process Management

USA - Headquarters
McKinney, Texas 75070
Tel: 1-800-558-5853
Outside U.S. 1-972-548-3574

Asia-Pacific
Singapore, Singapore 128461
Tel: +65 6777 8211

Europe
Bologna, Italy 40013
Tel: +39 051 4190611
Gallardon, France 28320
Tel: +33 (0)2 37 33 47 00

TESCOM Regulator Division Emerson Process Management

USA - Headquarters
Elk River, Minnesota 55330 USA
Tel: 1-763-241-3238

Europe
Selmsdorf, Germany 23923
Tel: +49 (0) 38823 31 0

For further information visit www.emersonprocess.com/regulators

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