

July 2017

# 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 Type 112 Restrictors are mainly used in natural gas, air or other non-corrosive gas applications. They are typically used with a 161 Series pilot for Pressure Regulators Type EZR.

### 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.

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## Specifications

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

<p><b>Maximum Inlet Pressure and Pressure Drops<sup>(1)</sup></b> Restrictor: 1500 psig / 103 bar</p> <p><b>Flow Coefficients</b> Restrictor: See Table 1</p>	<p><b>Construction Materials</b>  <b>Body:</b> CB7Cu-2 Stainless steel  <b>Groove Valve:</b> 416 Stainless steel  <b>Retainer:</b> 416 Stainless steel  <b>Pipe Plug:</b> 316 Stainless steel  <b>O-rings:</b> Fluorocarbon (FKM)</p>
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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 <sub>i</sub>
C <sub>g</sub>	C <sub>v</sub>	C <sub>g</sub>	C <sub>v</sub>	
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	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

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.

- Push on the retainer (key 23) to push the groove valve (key 22) out of the body (key 21), then complete disassembly.
- 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).
- 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.
- 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.

## Parts List

### Type 112 Restrictor (Figure 2)

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

\*Recommended spare part

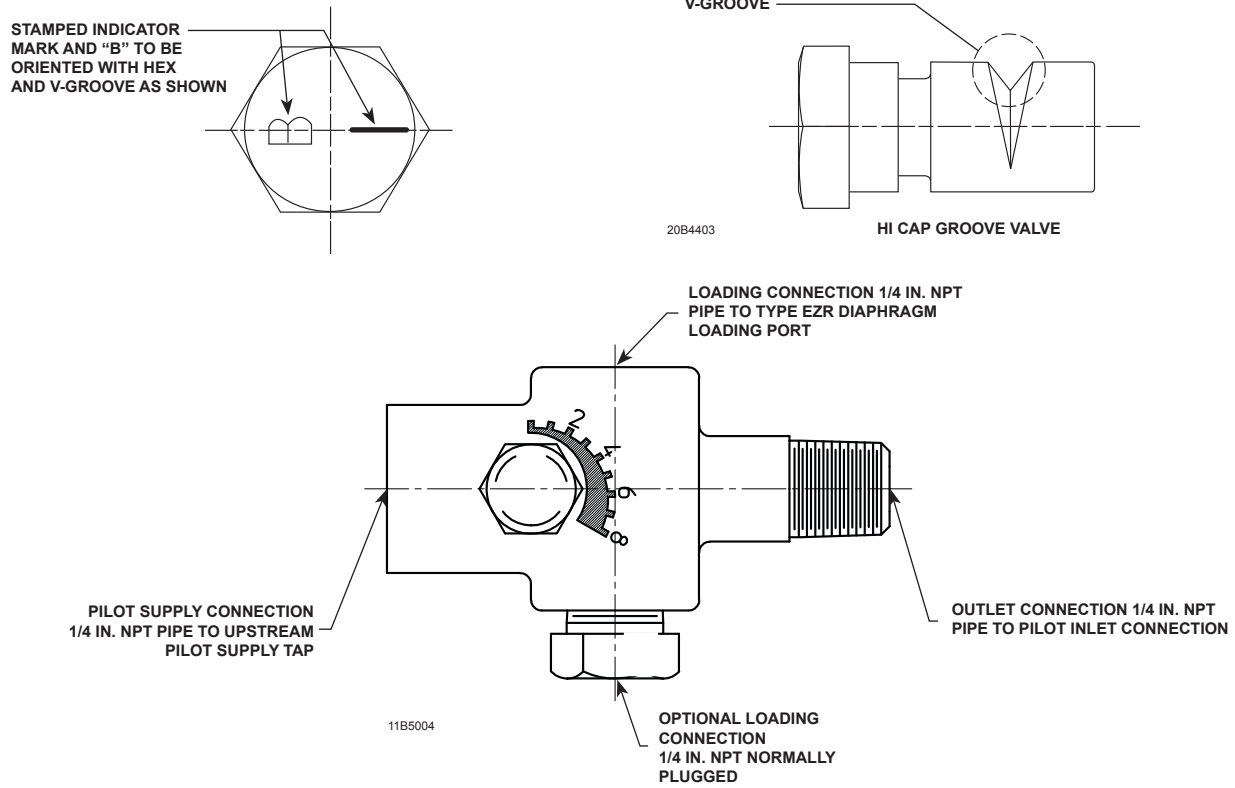
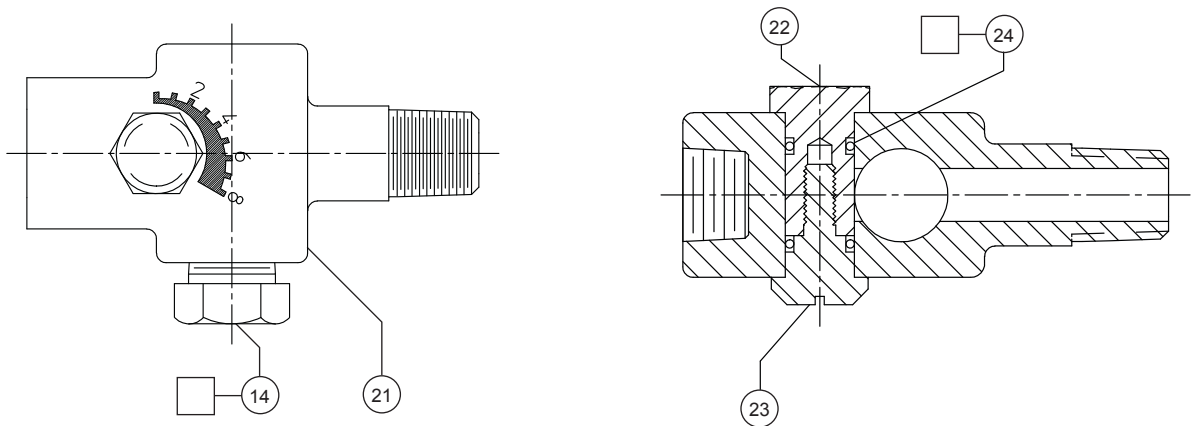


Figure 1. Type 112 Restrictor Port Function and Connection Sizes



20B4393-D

APPLY LUBRICANT

Figure 2. Type 112 Restrictor Assembly

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