

English – September 2022

## Introduction

This installation guide provides instructions for installation, startup and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at [www.fisher.com](http://www.fisher.com). For further information refer to: T208 Series Tank Blanketing Vapor Recovery Regulators Instruction Manual, D103752X012.

## PED/PE(S)R Categories

This product may be used as a safety accessory with pressure equipment in the following categories. It may also be used outside of these Directives using Sound Engineering Practice (SEP) per table below. For information on the current PED/PE(S)R revision, see Bulletin: [D103053X012](#).

PRODUCT SIZE	CATEGORY	FLUID TYPE
DN 20 and 25 / NPS 3/4 and 1	SEP	1

## Specifications

### Available Configurations

**Type T208:** Tank blanketing vapor recovery regulator with control pressure range of 5 mbar to 0.48 bar / 2 in. w.c. to 7 psig in six different spring ranges and has internal pressure registration requiring no control line.

**Type T208M:** Similar to Type T208 but has a blocked throat and a control line connection for external pressure registration.

### Body Sizes and End Connection Styles

See Table 1

### Maximum Allowable Inlet (Casing) Pressure<sup>(1)</sup>

See Table 1

### Maximum Outlet Pressure<sup>(1)</sup>

2.4 bar / 35 psig

### Maximum Emergency Inlet Pressure to Avoid Internal Parts Damage<sup>(1)</sup>

**With Nitrile (NBR), Ethylene Propylene Diene (EPDM) or Fluorocarbon (FKM) diaphragm:**  
2.4 bar / 35 psig

**With Fluorinated Ethylene Propylene (FEP) diaphragm:** 0.69 bar / 10 psig

### Control Pressure Ranges<sup>(1)</sup>

See Table 2

### Shutoff Classification per ANSI/FCI 70-3-2004

Class VI (Soft Seat)

## Pressure Registration

**Type T208:** Internal

**Type T208M:** External

## Material Temperature Capabilities<sup>(1)(2)</sup>

### Elastomer Parts

*Nitrile (NBR):* -40 to 82°C / -40 to 180°F

*Fluorinated Ethylene Propylene (FEP):*  
-29 to 82°C / -20 to 180°F

*Fluorocarbon (FKM):* 4 to 149°C / 40 to 300°F

*EPDM:* -29 to 107°C / -20 to 225°F

*Perfluoroelastomer (FFKM):* -18 to 149°C / 0 to 300°F

### Body Materials

*Gray Cast Iron:* -29 to 149°C / -20 to 300°F

*WCC Carbon Steel:* -29 to 149°C / -20 to 300°F

*LCC Carbon Steel:* -40 to 149°C / -40 to 300°F

*CF8M/CF3M Stainless Steel:* -40 to 149°C / -40 to 300°F

## Installation



## WARNING

**Only qualified personnel shall install or service a regulator. Regulators should be installed, operated and maintained in accordance with international and applicable codes and regulations, and Emerson Process Management Regulator Technologies, Inc. instructions.**

**If the regulator vents fluid or a leak develops in the system, it indicates that service is required. Failure to take the regulator out of service immediately may create a hazardous condition.**

**Personal injury, equipment damage, or leakage due to escaping fluid or bursting of pressure containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the Specifications section, or where conditions exceed any ratings of the adjacent piping or piping connections.**

**To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation or standard) to prevent service conditions from exceeding limits.**

1. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.  
2. See Table 3 for operating temperature ranges for available trim combinations.

# T208 Series

**Additionally, physical damage to the regulator could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the regulator in a safe location.**

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has collected foreign material during shipping. For NPT bodies, apply pipe compound to the external pipe threads. For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired<sup>(1)</sup>, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

## Note

**It is important that the regulator be installed so that the vent hole in the spring case is unobstructed at all times. For outdoor installations, the regulator should be located away from vehicular traffic and positioned so that water, ice and other foreign materials cannot enter the spring case through the vent. Avoid placing the regulator beneath eaves or downspouts, and be sure it is above the probable snow level.**

## Overpressure Protection

Recommended pressure limitations are stamped on the regulator nameplate. Vapor recovery regulators are used to maintain a constant inlet (blanket) pressure with the outlet flowing to a system whose pressure is lower than that at the inlet. The recovery regulators are not intended to be used as an ASME certified relief device for overpressure protection on a tank. They are to be used as part of a gas blanketing system to control outflow of blanketing gas under normal conditions and collect tank vapors for the vapor disposal reclamation system. Provide alternate methods of emergency overpressure protection.

## Startup

The regulator is factory set at approximately the midpoint of the spring range or the pressure requested, so an initial adjustment may be required to give the desired results. With proper installation completed and relief valves properly adjusted, slowly open the upstream and downstream shutoff valves.

## Adjustment

To change the control pressure, perform the following procedure.

### For internal flat circular adjusting screw:

1. Remove the closing cap (key 22).
2. Use a 25 mm / 1-inch hex rod or flat screwdriver to turn the adjusting screw (key 35) either clockwise to increase control pressure or counterclockwise to decrease control pressure. The regulator will go into immediate operation. To ensure correct operation, always use a pressure gauge to monitor the vapor recovery pressure when making adjustments.
3. After making the adjustment, replace the closing cap gasket (key 25) and install the closing cap (key 22).

### For external square head adjusting screw:

1. Loosen the locknut (key 20).
2. Turn the adjusting screw (key 35) either clockwise to increase control pressure or counterclockwise to decrease control pressure. Always use pressure gauge to monitor the vapor recovery pressure when making adjustments.
3. After making the adjustment, tighten the locknut (key 20).

## Taking Out of Service (Shutdown)



## WARNING

**To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.**

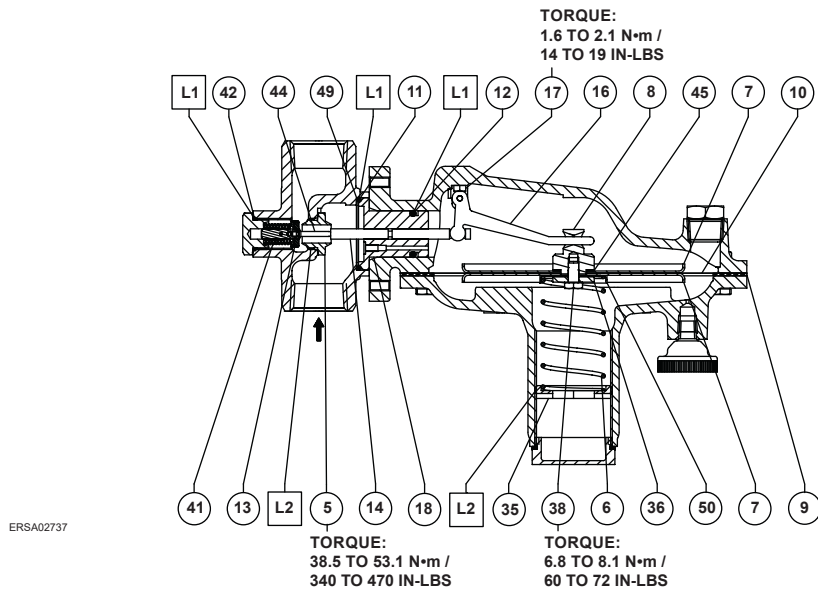
## Parts List

Key	Description	Key	Description
1	Body	26	Vent Assembly
2	Cap Screw	27	Pipe Plug
3	Spring Case		(Type T208 only)
4	Lower Casing	30*	Stem Seal O-ring
5*	Orifice		(Type T208M only)
6	Spring	31*	Throat Seal O-ring
7	Diaphragm Head		(Type T208M only)
8	Pusher Post	34	Machine Screw
9	Diaphragm Gasket		(Type T208M only)
10*	Diaphragm	35	Adjusting Screw
11*	Body Seal O-ring	36	Washer
12*	Insert Seal O-ring	38	Cap Screw
13*	Disk Assembly	41	Back Disk Spring
14	Stem	42*	Back Body Seal O-ring
16	Lever Assembly	43	Back Body Cap
17	Machine Screw	44	Disk Spacer
18	Guide Insert	45*	Diaphragm Head Gasket
19	Upper spring seat <sup>(2)</sup>	46	Nameplate
20	Lock Nut <sup>(2)</sup>	47	Drive screw
22	Closing Cap	48	Flow arrow
23	Hex Nut	49	Backup Ring
24	Cap Screw	50	Lower Spring Seat
25*	Closing Cap Gasket	51	NACE Tag (not shown)
		52	Tag Wire (not shown)

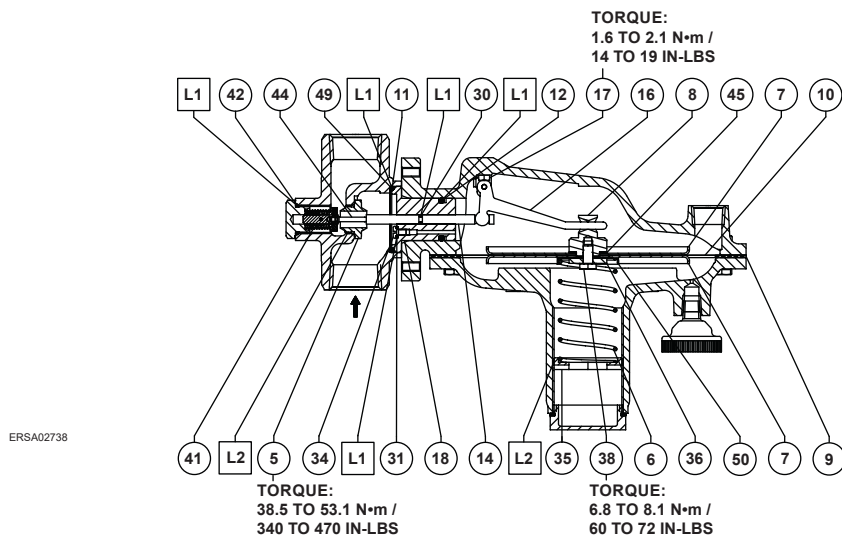
\*Recommended Spare Part

1. For proper operation to achieve the published capacities at low setpoint, the spring case barrel should be installed pointed down as shown in Figure 1.

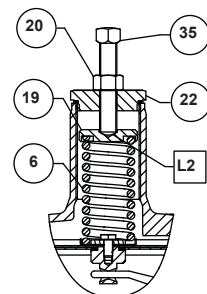
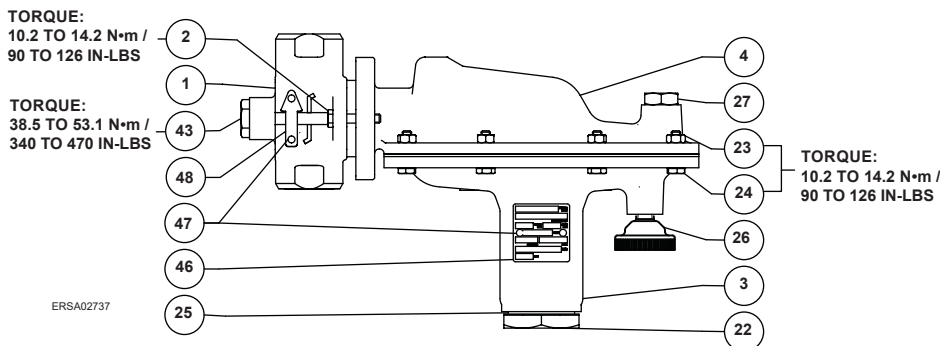
2. Use for optional external square head adjusting screw assembly recommended for 62 to 172 mbar / 0.9 to 2.5 psig, 90 to 310 mbar / 1.3 to 4.5 psig and 0.26 to 0.48 bar / 3.8 to 7 psig spring ranges only.



TYPE T208 ASSEMBLY WITH INTERNAL PRESSURE REGISTRATION



TYPE T208M ASSEMBLY WITH EXTERNAL PRESSURE REGISTRATION



EXTERNAL SQUARE HEAD  
ADJUSTING SCREW ASSEMBLY OPTION<sup>(2)</sup>

□ APPLY LUBRICANT<sup>(1)</sup>:  
L1 = SILICONE GREASE  
L2 = ANTI-SEIZE COMPOUND

1. Lubricants must be selected such that they meet the temperature requirements.
2. For 62 to 172 mbar / 0.9 to 2.5 psig, 90 to 310 mbar / 1.3 to 4.5 psig and 0.26 to 0.48 bar / 3.8 to 7 psig spring ranges only.

Figure 1. T208 Series Assembly

# T208 Series

**Table 1. Body Sizes, End Connection Styles and Maximum Allowable Inlet (Casing) Pressures**

BODY SIZE		BODY MATERIAL	END CONNECTION STYLES <sup>(1)</sup>	MAXIMUM ALLOWABLE INLET (CASING) PRESSURE	
DN	In.			bar	psig
20 or 25	3/4 or 1	Gray cast iron	NPT	2.4	35
		WCC Carbon steel	NPT, CL150 RF, CL300 RF or PN 16/25/40 RF	5.2	75
		LCC Carbon steel			
		CF8M/CF3M Stainless steel <sup>(2)</sup>			

1. All flanges are welded. Weld-on flange dimension is 356 mm / 14 inches face-to-face.  
2. Pipe nipples and flanges are 316 Stainless steel for flanged body assemblies.

**Table 2. Control Pressure Ranges and Spring Information**

CONTROL PRESSURE RANGE		SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
mbar	In. w.c.			mm	In.	mm	In.
5 to 17 <sup>(1)(2)</sup>	2 to 7 <sup>(1)(2)</sup>	1B653827052	Red	2.2	0.085	92.2	3.63
7 to 32 <sup>(1)(2)</sup>	3 to 13 <sup>(1)(2)</sup>	1B653927022	Unpainted	2.7	0.105	95.3	3.75
25 to 65	10 to 26	1B537027052	Yellow	2.9	0.114	109	4.31
62 to 172	0.9 to 2.5 psig	1B537127022	Green	4.0	0.156	103	4.06
90 to 310	1.3 to 4.5 psig	1B537227022	Light blue	4.8	0.187	100	3.94
0.26 to 0.48 bar	3.8 to 7 psig	1B537327052	Black	5.5	0.218	101	3.98

1. To achieve the published control pressure range, the spring case must be installed pointing down.  
2. Do not use Fluorocarbon (FKM) diaphragm with this spring at diaphragm temperatures lower than 16°C / 60°F.

**Table 3. Operating Temperature Ranges for Available Trim Combination**

TRIM OPTION CODE	DIAPHRAGM MATERIAL	DISK AND O-RING MATERIAL	OPERATING TEMPERATURE RANGES
Standard	Nitrile (NBR)	Nitrile (NBR)	-40 to 82°C / -40 to 180°F
VV	Fluorocarbon (FKM)	Fluorocarbon (FKM)	4 to 149°C / 40 to 300°F
TN	Fluorinated Ethylene Propylene (FEP)	Nitrile (NBR)	-29 to 82°C / -20 to 180°F
TV	Fluorinated Ethylene Propylene (FEP)	Fluorocarbon (FKM)	4 to 82°C / 40 to 180°F
TK	Fluorinated Ethylene Propylene (FEP)	Perfluoroelastomer (FFKM)	-18 to 82°C / 0 to 180°F
TE	Fluorinated Ethylene Propylene (FEP)	Ethylene Propylene Diene (EPDM)	-29 to 82°C / -20 to 180°F
EE	EPDM	EPDM	-29 to 107°C / -20 to 225°F
FDA <sup>(1)</sup>	EPDM	EPDM	-29 to 107°C / -20 to 225°F

1. EPDM option available with FDA/USP Class VI approved/ADI-free elastomers (wetted components only).

✉ Webadmin.Regulators@emerson.com

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## Emerson Automation Solutions

### Americas

McKinney, Texas 75070 USA  
T +1 800 558 5853  
+1 972 548 3574

### Asia Pacific

Singapore 128461, Singapore  
T +65 6777 8211

### Europe

Bologna 40013, Italy  
T +39 051 419 0611

### Middle East and Africa

Dubai, United Arab Emirates  
T +971 4 811 8100

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For further information on the current PED/PE(S)R revision see Bulletin: [D103053X012](#) or scan the QR code.

