

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.fisherregulators.com. For further information refer to: T205 Series Tank Blanketing Regulators Instruction Manual, D103748X012.

P.E.D. Categories

This product may be used as a safety accessory with pressure equipment in the following Pressure Equipment Directive 97/23/EC categories. It may also be used outside of the Pressure Equipment Directive using sound engineering practice (SEP) per table below.

PRODUCT SIZE	CATEGORIES	FLUID TYPE
DN 20 and 25 / 3/4 and 1 inch	SEP	1

Specifications

Available Configurations

Type T205: Tank blanketing regulator with outlet pressure range of 2.5 mbar to 0.48 bar / 1 inch w.c. to 7 psig in seven different spring ranges and has internal pressure registration requiring no downstream control line.

Type T205M: Similar to Type T205 but has a blocked throat and a downstream control line connection for external pressure registration.

Body Sizes and End Connection Styles

See Table 1

Maximum Allowable and Operating Inlet Pressure⁽¹⁾

See Tables 1 and 4

Maximum Outlet (Casing) Pressure⁽¹⁾

See Table 1

Maximum Emergency Outlet Pressure to Avoid Internal Parts Damage⁽¹⁾

With Nitrile (NBR) or Fluorocarbon (FKM)

diaphragm: 2.4 bar / 35 psig

With Fluorinated Ethylene Propylene (FEP)

diaphragm: 1.4 bar / 20 psig

Outlet (Control) Pressure Ranges⁽¹⁾

See Table 3

Shutoff Classification per ANSI/FCI 70-3-2004

Class VI (Soft Seat)

Pressure Registration

Type T205: Internal

Type T205M: External

Material Temperature Capabilities⁽¹⁾⁽²⁾

Nitrile (NBR): -29 to 82°C / -20 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

Ethylene Propylene Diene (EPDM):

-29 to 107°C / -20 to 225°F

Perfluoroelastomer (FFKM):

-18 to 149°C / 0 to 300°F

Installation



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. (Regulator Technologies) 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.

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⁽³⁾, 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.

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

2. See Table 2 for operating temperature ranges for available trim combinations.

3. 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.



T205 Series

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

BODY SIZE		BODY MATERIAL	END CONNECTION STYLES ⁽¹⁾	MAXIMUM ALLOWABLE AND OPERATING INLET PRESSURE		MAXIMUM OUTLET (CASING) PRESSURE	
DN	Inch			bar	psig	bar	psig
20 or 25	3/4 or 1	Gray Cast Iron	NPT	10.3	150	2.4	35
		WCC Carbon Steel	NPT, CL150 RF, CL300 RF, or PN 16/25/40 RF	13.8	200	5.2	75
		CF8M/CF3M Stainless Steel ⁽²⁾					

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. 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)	-29 to 82°C / -20 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 ⁽¹⁾	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

1. Includes 316 Stainless steel trim parts.

Overpressure Protection

T205 Series regulators have an outlet pressure rating lower than the inlet pressure rating. The recommended pressure limitations are stamped on the regulator nameplate. Some type of overpressure protection is needed if the actual inlet pressure can exceed the maximum operating outlet pressure rating. Common methods of external overpressure protection include relief valves, monitoring regulators, shut-off devices, and series regulation. Overpressuring any portion of the regulators beyond the limits in the Specifications section may cause leakage, damage to regulator parts, or personal injury due to bursting of pressure-containing parts.

Regulator operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line. The regulator should be inspected for damage after any overpressure condition.

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 outlet 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 outlet pressure or counterclockwise to decrease outlet pressure. The regulator will go into immediate operation. To ensure correct operation, always use a pressure gauge to monitor the tank blanketing 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 outlet pressure or counterclockwise to decrease outlet pressure. Always use pressure gauge to monitor the tank blanketing gas pressure when making adjustments.
3. After making the adjustment, tighten the locknut (key 20).

Taking Out of Service (Shutdown)



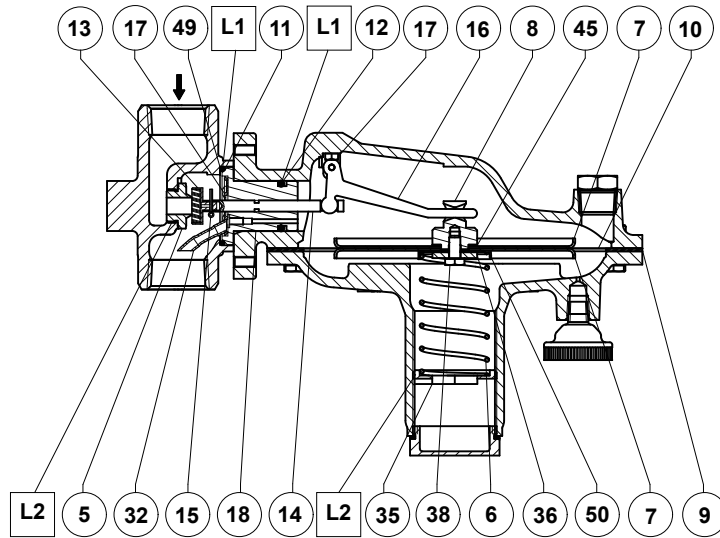
To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.

Parts List

Key	Description	Key	Description
1	Body	23	Hex Nut (8 required)
2	Cap Screw (2 required)	24	Spring Case Cap Screw (8 required)
3	Spring Case	25*	Closing Cap Gasket
4	Lower Casing	26	Vent Assembly
5*	Orifice	27	Pipe Plug (Type T205 only)
6	Spring	30*	Stem Seal O-ring (Type T205M only)
7	Diaphragm Head (2 required)	31*	Throat Seal O-ring (Type T205M only)
8	Pusher Post	32	Pitot Tube (Type T205)
9*	Diaphragm Gasket	34	Machine Screw (Type T205M only)
10*	Diaphragm	35	Adjusting Screw
11*	Body Seal O-Ring	36	Washer
12*	Insert Seal O-ring	38	Diaphragm Cap Screw
13*	Disk Assembly	45*	Diaphragm Head Gasket
14	Stem	46	Nameplate
15*	Cotter Pin	47	Drive Screw (2 required)
16	Lever Assembly	48	Flow arrow
17	Machine Screw Type T205 (6 required) Type T205M (2 required)	49	Backup Ring
18	Guide Insert	50	Lower Spring Seat
19	Upper Spring Seat ⁽¹⁾	51	NACE Tag (not shown)
20	Lock Nut ⁽¹⁾	52	Tag Wire (not shown)
22	Closing Cap		

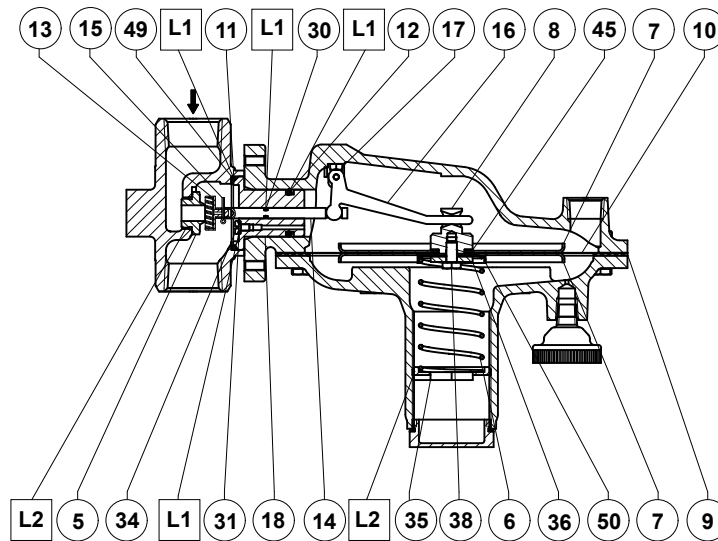
* Recommended spare part

1. Use for optional external square head adjusting screw assembly recommended for 83 to 172 mbar / 1.2 to 2.5 psig, 0.17 to 0.31 bar / 2.5 to 4.5 psig, and 0.31 to 0.48 bar / 4.5 to 7 psig spring ranges only.



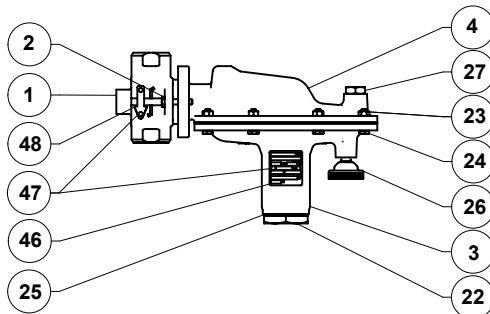
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TYPE T205 ASSEMBLY WITH INTERNAL PRESSURE REGISTRATION

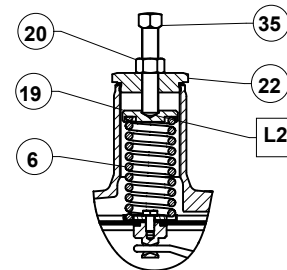


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TYPE T205M ASSEMBLY WITH EXTERNAL PRESSURE REGISTRATION



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ERSA02736

EXTERNAL SQUARE HEAD ADJUSTING SCREW ASSEMBLY OPTION⁽²⁾

□ **APPLY LUBRICANT⁽¹⁾:**
L1 = SILICONE GREASE
L2 = ANTI-SEIZE COMPOUND

1. Lubricants must be selected such that they meet the temperature requirements.
2. For 83 to 172 mbar / 1.2 to 2.5 psig, 0.17 to 0.31 bar / 2.5 to 4.5 psig, and 0.31 to 0.48 bar / 4.5 to 7 psig spring ranges only.

Figure 1. T205 Series Assembly

T205 Series

Table 3. Outlet (Control) Pressure Ranges and Spring Information

OUTLET (CONTROL) PRESSURE RANGE		SPRING PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
mbar	Inches w.c.			mm	Inch	mm	Inch
2.5 to 6.2	1 to 2.5	1B558527052 ⁽¹⁾⁽²⁾	Orange	1.8	0.072	82.6	3.25
6.2 to 17	2.5 to 7	1B653827052 ⁽¹⁾	Red	2.2	0.085	92.2	3.63
17 to 40	7 to 16	1B653927022	Unpainted	2.7	0.105	95.2	3.75
34 to 83	0.5 to 1.2 psig	1B537027052	Yellow	2.9	0.114	109	4.31
83 to 172	1.2 to 2.5 psig	1B537127022	Green	4.0	0.156	103	4.06
0.17 to 0.31 bar	2.5 to 4.5 psig	1B537227022	Light Blue	4.8	0.187	100	3.94
0.31 to 0.48 bar	4.5 to 7 psig	1B537327052	Black	5.5	0.218	101	3.98

1. To achieve the published outlet 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 4. Maximum Operating Inlet Pressures

ORIFICE SIZE		MAXIMUM OPERATING INLET PRESSURE													
		2.5 to 6.2 mbar / 1 to 2.5 inches w.c. Outlet (Control) Pressure Setting		6.2 to 17 mbar / 2.5 to 7 inches w.c. Outlet (Control) Pressure Setting		17 to 40 mbar / 7 to 16 inches w.c. Outlet (Control) Pressure Setting		34 to 83 mbar / 0.5 to 1.2 psig Outlet (Control) Pressure Setting		83 to 172 mbar / 1.2 to 2.5 psig Outlet (Control) Pressure Setting		0.17 to 0.31 bar / 2.5 to 4.5 psig Outlet (Control) Pressure Setting		0.31 to 0.48 bar / 4.5 to 7 psig Outlet (Control) Pressure Setting	
mm	Inch	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig	bar	psig
3.2	1/8	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾
6.4	1/4	4.1	60	6.9	100	6.9	100	6.9	100	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾	13.8 ⁽¹⁾	200 ⁽¹⁾
9.5	3/8	2.1	30	2.8	40	6.9	100	4.1	60	8.6	125	8.6	125	8.6	125
13	1/2	1.0	15	1.0	15	0.55	8	2.1	30	2.1	30	2.1	30	2.1	30
14	9/16	0.69	10	0.69	10	1.4	20	0.69	10	2.1	30	2.1	30	2.1	30

1. Inlet pressure is limited to 10.3 bar / 150 psig for gray cast iron bodies.

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