T205 Series

English – March 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. For further information refer to: T205 Series Tank Blanketing Regulators Instruction Manual, D103748X012.

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

Product Configurations

Type T205: Tank blanketing regulator with control pressure range of 2.5 mbar to 0.48 bar / 1 in. 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.
Type T205H: Similar to Type T205, except outlet (casing) pressure rating equals the inlet rating (both 10.3 bar / 150 psig) and low temperature to -29°C / -20°F.
Type T205HM: Similar to Type T205M, except outlet (casing) pressure rating equals the inlet rating (both 10.3 bar / 150 psig) and low temperature to -29°C / -20°F.

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)

Types T205 and T205M
Gray Cast iron: 2.4 bar / 35 psig
WCC Carbon steel, LCC Carbon steel or CF8M/CF3M Stainless steel: 5.2 bar / 75 psig
Types T205H and T205HM
WCC Carbon steel or CF8M/CF3M Stainless steel: 10.3 bar / 150 psig

Outlet (Control) Pressure Ranges(1)

See Table 3

Shutoff Classification per ANSI/FCI 70-3-2004

Class VI (Soft Seat)

Pressure Registration

Types T205 and T205H: Internal
Types T205M and T205HM: External

Material Temperature Capabilities(1)(2)

Elastomer Parts
Nitrile (NBR):
Types T205 and T205M: -40 to 82°C / -40 to 180°F
Types T205H and T205HM: -29 to 82°C / -20 to 180°F
Fluorinated Ethylene Propylene (FEP)(3):
-29 to 82°C / -20 to 180°F
Fluorocarbon (FKM)(3): 4 to 149°C / 40 to 300°F
Ethylene Propylene Diene (EPDM)(3):
-29 to 107°C / -20 to 225°F
Perfluoroelastomer (FFKM)(3): -18 to 149°C / 0 to 300°F

Body Materials
Gray Cast iron(3): -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.

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.

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. Not available for Types T205H and T205HM.

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

BODY SIZE		BODY MATERIAL	END CONNECTION STYLE(1)	MAXIMUM ALLOWABLE AND OPERATING INLET PRESSURE	
DN	In.			bar	psig
20 or 25	3/4 or 1	Gray Cast iron(2)	NPT	10.3	150
		WCC Carbon steel, LCC Carbon steel or CF8M/CF3M Stainless steel(4)		13.8(3)	200(3)
20 or 20 x 25	3/4 or 3/4 x 1(5)	WCC Carbon steel, LCC Carbon steel or CF8M/CF3M Stainless steel(4)	CL150 RF, CL300 RF or PN 16/25/40 RF	13.8(3)	200(3)

1. All flanges are welded. Weld-on flange dimension is 356 mm / 14 in. face-to-face.
2. Not available for Types T205H and T205HM.
3. Inlet pressure is limited to 10.3 bar / 150 psig for Types T205H and T205HM.
4. Pipe nipples and flanges are 316 Stainless steel for flanged body assemblies.
5. 3/4 x 1 in. / DN 20 x 25 flanged construction uses 3/4 in. / DN 20 body.

For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired(2), 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

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 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 in. 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 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 control pressure or counterclockwise to decrease control 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)

WARNING

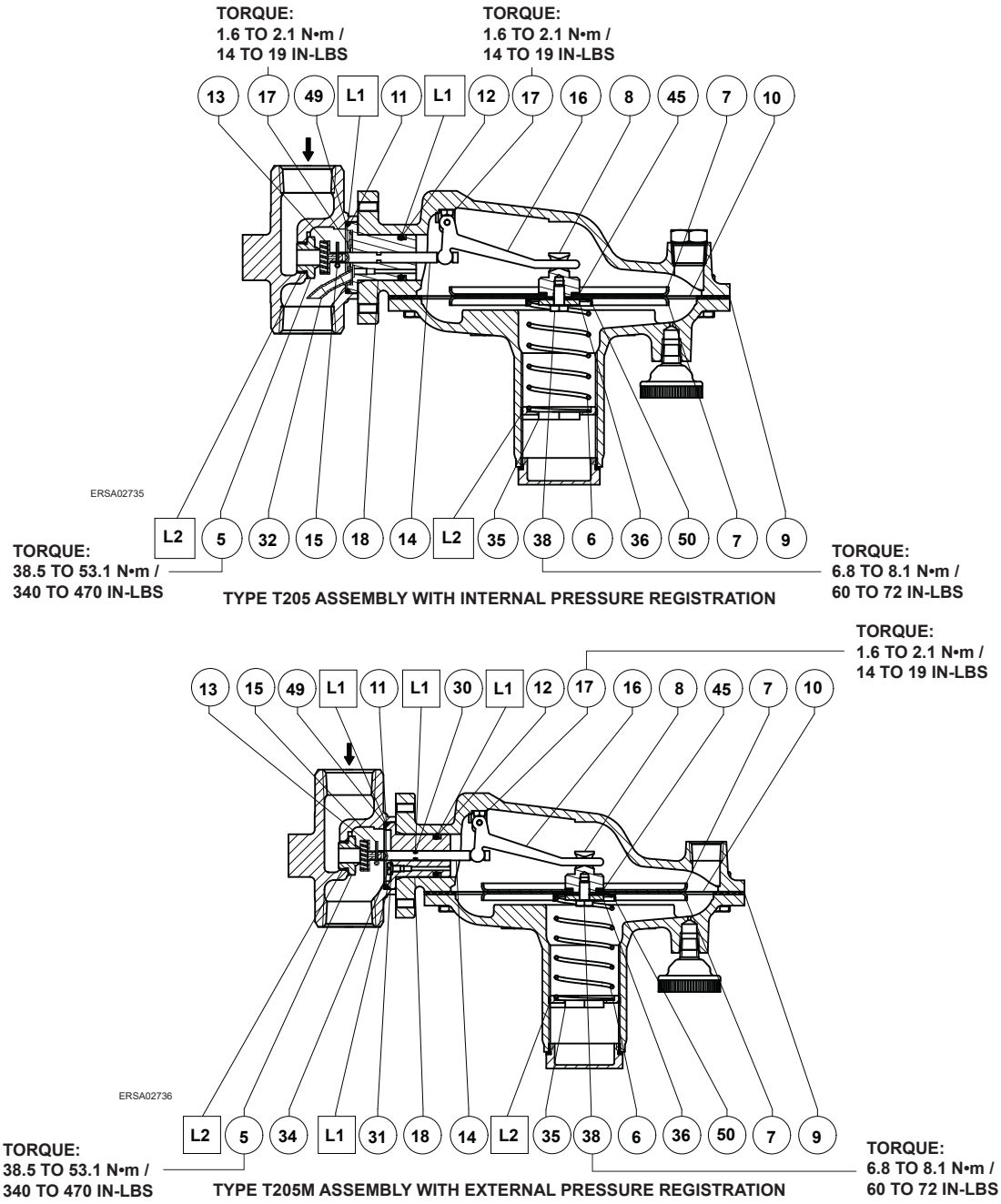
To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.

Parts List

Key	Description
1	Body
2	Cap Screw
3	Spring Case
4	Lower Casing
5*	Orifice
6	Spring
7	Diaphragm Head
8	Pusher Post
9*	Diaphragm Gasket
10*	Diaphragm
11*	Body Seal O-ring
12*	Insert Seal O-ring
13*	Disk Assembly
14	Stem
15*	Cotter Pin
16	Lever Assembly
17	Machine Screw
18	Guide Insert
19	Upper Spring Seat(1)
20	Lock Nut(1)
22	Closing Cap
23	Hex Nut
24	Spring Case Cap Screw
25*	Closing Cap Gasket
26	Vent Assembly
27	Pipe Plug (Types T205 and T205H only)
30*	Stem Seal O-ring (Types T205M and T205HM only)
31*	Throat Seal O-ring (Types T205M and T205HM only)
32	Pitot Tube (Types T205 and T205H)
34	Machine Screw (Types T205M and T205HM only)
35	Adjusting Screw
36	Washer
38	Diaphragm Cap Screw
45*	Diaphragm Head Gasket
46	Nameplate
47	Drive Screw
48	Flow arrow (not shown)
49	Backup Ring
50	Lower Spring Seat
51	NACE Tag (not shown)
52	Tag Wire (not shown)
54	Diaphragm Head (not shown)

* 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.
2. Not available for Types T205H and T205HM.



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*

Table 2. *T205 Series Trim Option Code*

TRIM OPTION CODE	DIAPHRAGM MATERIAL	DISK AND O-RING MATERIAL	OPERATING TEMPERATURE RANGE[3]
Standard	Nitrile (NBR)[2]	Nitrile (NBR)	Types T205 and T205M: -40 to 82°C / -40 to 180°F Types T205H and T205HM: -29 to 82°C / -20 to 180°F
EE	EPDM	EPDM	-29 to 107°C to -20 to 225°F
FDA[4]			
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)	EPDM	-29 to 82°C / -20 to 180°F

1. Includes 316 Stainless steel trim parts.
2. Types T205 and T205HM are only available with Nitrile (NBR) diaphragm.
3. Gray Cast iron and WCC Carbon steel bodies are limited to -29 to 149°C / -20 to 300°F.
4. EPDM option available with FDA/USP Class VI approved/ADI-free elastomers (wetted components only).

Table 3. *Outlet (Control) Pressure Ranges*

OUTLET (CONTROL) PRESSURE RANGE	
mbar	**In. w.c.**
2.5 to 6.2[1][2]	1 to 2.5[1][2]
6.2 to 17[1]	2.5 to 7[1]
17 to 40	7 to 16
34 to 83	0.5 to 1.2 psig
83 to 172	1.2 to 2.5 psig
0.17 to 0.31 bar	2.5 to 4.5 psig
0.31 to 0.48 bar	4.5 to 7 psig

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 4. *T205 Series Maximum Operating Inlet Pressure*

ORIFICE SIZE		MAXIMUM OPERATING INLET PRESSURE[1]													
		2.5 to 6.2 mbar / 1 to 2.5 In. w.c. Outlet (Control) Pressure Setting		6.2 to 17 mbar / 2.5 to 7 In. w.c. Outlet (Control) Pressure Setting		17 to 40 mbar / 7 to 16 In. 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	**In.**	**bar**	**psig**	**bar**	**psig**	**bar**	**psig**	**bar**	**psig**	**bar**	**psig**	**bar**	**psig**	**bar**	**psig**
DN 20 / 3/4 In. Body Size															
3.2	1/8	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
6.4	1/4	8.62	125	12.1[2]	175[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
9.5	3/8	4.14	60	5.52	80	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
13	1/2	2.07	30	2.76	40	8.62	125	10.3	150	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
14	9/16	1.38	20	2.07	30	6.89	100	8.62	125	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
DN 25 / 1 In. Body Size															
3.2	1/8	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
6.4	1/4	6.89	100	10.3	150	10.3	150	10.3	150	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
9.5	3/8	2.76	40	5.52	80	10.3	150	10.3	150	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
13	1/2	2.07	30	2.76	40	8.62	125	10.3	150	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]
14	9/16	1.38	20	1.03	15	6.89	100	8.62	125	13.8[2]	200[2]	13.8[2]	200[2]	13.8[2]	200[2]

1. At maximum inlet pressure, minimum achievable setpoints may vary based on process conditions.
2. Inlet pressure is limited to 10.3 bar / 150 psig for Gray Cast iron bodies and for Types T205H and T205HM.

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

The distinctive diamond shape cast into every spring case uniquely identifies the regulator as part of the Fisher™ brand and assures you of the highest-quality engineering, durability, performance, and support.

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