

Type T205B Balanced Tank Blanketing Regulator

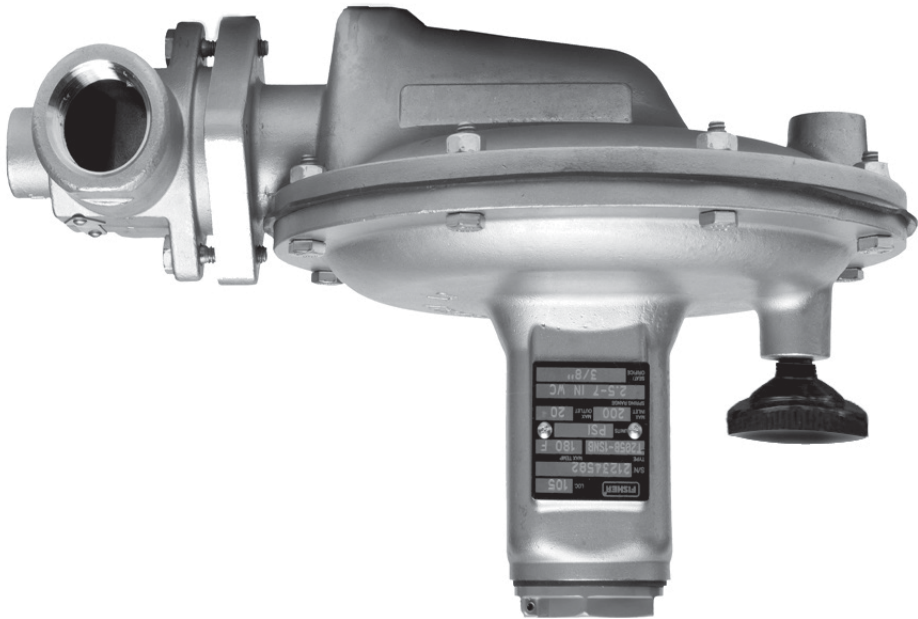


Figure 1. Type T205B Balanced Tank Blanketing Regulator

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Features

- Fully Balanced Plug Design
- Large Diaphragm
- Low-Pressure Setting and Fast Speed of Response
- Accurate Control and Small Lockup Pressure
- Sour Gas Service Capability



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Specifications

This section lists the specifications of the Type T205B Balanced Tank Blanketing Regulator. Factory specification, such as maximum temperature, maximum inlet and outlet pressures, spring range and seat or orifice size are stamped on the nameplate fastened on the regulator at the factory.

Body Sizes and End Connection Styles

See Table 1

Maximum Allowable Inlet Pressure⁽¹⁾

See Table 1

Maximum Operating Inlet Pressure⁽¹⁾

Gray cast iron: 150 psig / 10.3 bar

WCC Carbon steel or CF8M/CF3M Stainless steel: 200 psig / 13.8 bar

Maximum Outlet (Casing) Pressure⁽¹⁾

Gray cast iron: 35 psig / 2.4 bar

WCC Carbon steel or CF8M/CF3M Stainless steel: 75 psig / 5.2 bar

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

With Nitrile (NBR) or Fluorocarbon (FKM) diaphragm: 35 psig / 2.4 bar

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

Outlet (Control) Pressure Range⁽¹⁾

See Table 2

Shutoff Classification per ANSI/FCI 70-3-2004

Class VI (Soft Seat)

Pressure Registration

External

Orifice Size

3/8 inch / 9.5 mm

Flow and Sizing Coefficients

See Table 4

C_v Coefficients

See Table 8

Flow Capacities

See Table 9

Material Temperature Capabilities⁽¹⁾⁽²⁾

Elastomer Parts

Nitrile (NBR):

-40 to 180°F / -40 to 82°C

Fluorinated Ethylene Propylene (FEP):

-20 to 180°F / -29 to 82°C

Fluorocarbon (FKM):

40 to 300°F / 4 to 149°C

Ethylene Propylene Diene (EPDM):

-20 to 225°F / -29 to 107°C

Perfluoroelastomer (FFKM):

0 to 300°F / -18 to 149°C

Body Materials

Gray cast iron: -20 to 300°F / -29 to 149°C

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

CF8M/CF3M Stainless steel:

-40 to 300°F / -40 to 149°C

Body and Casing Materials

Gray cast iron, WCC Carbon steel and CF8M/CF3M Stainless steel⁽³⁾

Trim Materials

See Table 3

Spring Case Vent Connection

1/4 NPT

Diaphragm Case Control Line Connection

1/2 NPT

Approximate Weight

17.7 pounds / 8 kg

1. The pressure/temperature limits in this Bulletin or any applicable standard limitation should not be exceeded.

2. See Table 3 for operating temperature ranges for available trim combinations.

3. Pipe nipples and flanges are 316 Stainless steel for flanged body assemblies.

Introduction

Tank blanketing is the process of covering the surface of a liquid stored in a vessel with a gas, usually nitrogen and of maintaining a slightly positive pressure in an enclosed storage tank. Tank blanketing prevents a stored liquid from vaporizing into the atmosphere, reduces liquid combustibility and prevents oxidation or contamination of the liquid by reducing its exposure to air. This process is used in various products, such as adhesives, pharmaceuticals, pesticides, fertilizers, fuels, inks and food additives.

Type T205B balanced tank blanketing regulator (Figure 1) is a direct-operated regulator with fully balanced plug design to reduce inlet pressure sensitivity and with a large diaphragm to accurately control tank pressure at low pressure settings on tank blanketing systems. It uses a control line to sense the pressure in an enclosed storage tank. Type T205B maintains a slightly positive pressure and thereby reduces the possibility of tank wall collapse during pump out operation.

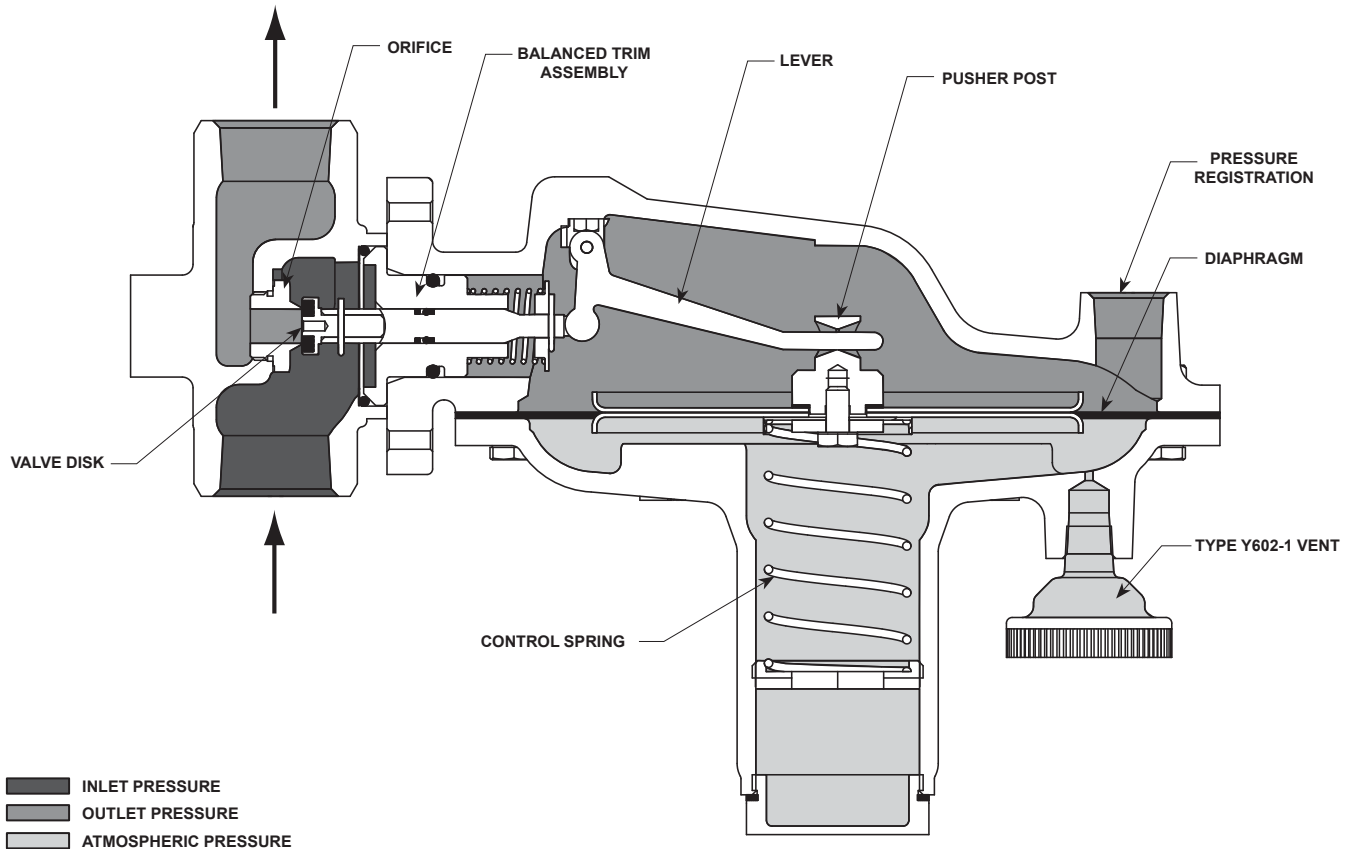


Figure 2. Type T205B Operational Schematic

Features

Fully Balanced Plug Design — Eliminates setpoint changes caused by varying inlet pressure. This design provides smooth opening of the plug for stable flow and greater regulating flow capacity.

Large Diaphragm — Highly sensitive to changes in tank pressure. Available in various materials to suit different applications.

Low-Pressure Setting and Fast Speed of Response — Applicable for low pressure setting as low as 1 inch water column / 2.5 mbar. Type T205B reacts quickly in changing tank vapor pressure due to direct-operated construction.

Accurate Control and Small Lockup Pressure — Type T205B has a large effective diaphragm area that detects small pressure change and provides accurate control at low pressure setting. Type T205B is a lever style regulator; this regulator style increases force for lockup, thus, shut off can be attained with small lockup pressure.

Sour Gas Service Capability — Available construction to meet NACE MR0175-2002.

Principle of Operation

Refer to Figure 2. Type T205B tank blanketing regulator controls the vapor space pressure over a stored liquid. When liquid is pumped out of the tank or vapors in the tank condense, the pressure in the tank decreases. Tank pressure is sensed by the actuator diaphragm. Spring force pushes the pusher post assembly, the valve disk moves away from the orifice, allowing the blanketing gas flow to increase.

When pressure in the tank increases, the actuator diaphragm is pushed. Through the action of the pusher post assembly, lever and valve stem, the valve disk moves closer to the orifice reducing blanketing gas flow.

The regulator plug is balanced (inlet pressure creates equal upward and downward forces on these components), therefore, the outlet (control) pressure of the unit is not affected by inlet pressure variation.

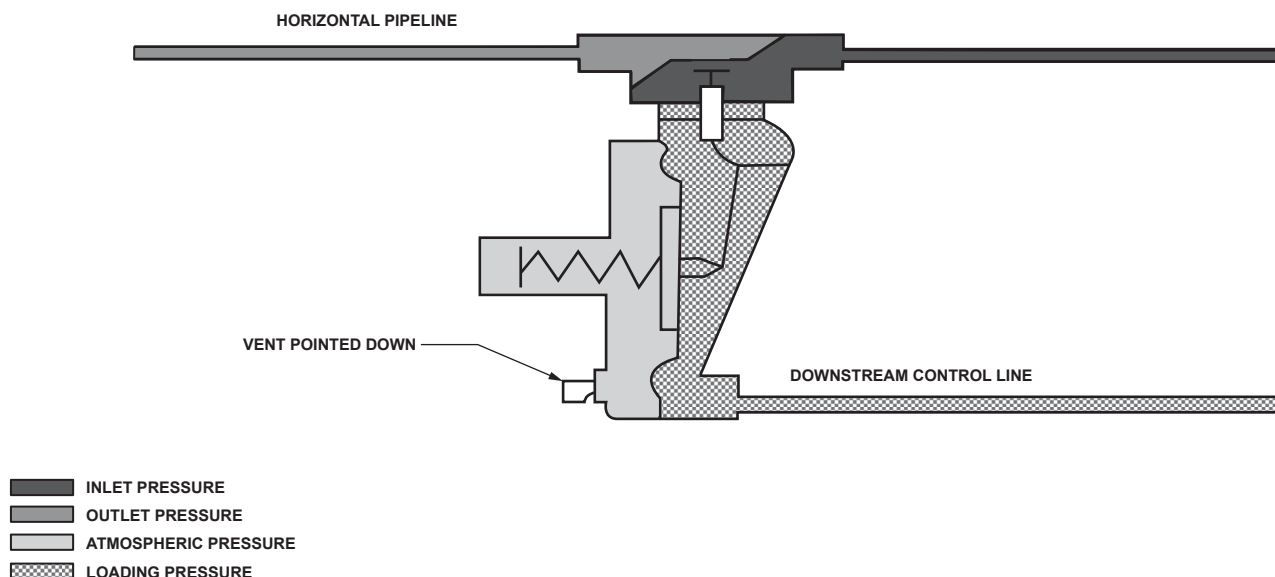


Figure 3. Type T205B Actuator Casing Drainage

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

BODY SIZE		BODY MATERIAL	END CONNECTION STYLES ⁽¹⁾	MAXIMUM ALLOWABLE INLET PRESSURE	
Inch	DN			psig	bar
3/4 or 1	20 or 25	Gray cast iron	NPT	150	10.3
		WCC Carbon steel	NPT, CL150 RF, CL300 RF or PN 16/25/40 RF	200	13.8
		CF8M/CF3M Stainless steel ⁽²⁾			

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

Installation

Type T205B regulator may be installed in any orientation as long as the flow through the body matches the direction indicated by the arrow on the body. To achieve the published capacities at low setpoint, the spring case barrel should be installed pointed down as shown in Figure 2. For complete actuator casing drainage, regulator should be installed as shown in Figure 3. To keep the vent assembly from being plugged or the spring case from collecting moisture, corrosive chemicals or other foreign material, point the vent down or otherwise protect it. If an indoor installation is required and if hazardous gas service is used, the vent should be piped outside. External dimensions and connections are shown in Figure 5.

Emerson Process Management Regulator Technologies, Inc. provides an instruction manual with every regulator shipped. Refer to this for complete installation, operation and maintenance instructions. Included is a complete listing of individual parts and recommended spare parts.

Overpressure Protection

Type T205B regulator has an outlet pressure ratings that are lower than its inlet pressure ratings. Install downstream overpressure protection if the inlet pressure can exceed the outlet pressure rating.

Refer to the Capacity Information section and the relief sizing coefficients in the Specification sections to determine the required relief valve capacity.

Universal NACE Compliance

Optional materials are available for applications handling sour gases. These constructions comply with the recommendations of National Association of Corrosion Engineers (NACE) sour service standards.

The manufacturing processes and materials used by Emerson assure that all products specified for sour gas service comply with the chemical, physical and metallurgical requirements of NACE MR0175-2002. Customers have the responsibility to specify correct materials. Environmental limitations may apply and shall be determined by the user.

Table 2. Outlet (Control) Pressure Ranges and Spring Information

OUTLET (CONTROL) PRESSURE RANGE		SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
Inch w.c.	mbar		Inch	mm	Inch	mm
1.0 to 2.5 ⁽¹⁾⁽²⁾	2.5 to 6.2 ⁽¹⁾⁽²⁾	Orange	0.072	1.8	3.25	82.6
2.5 to 7.0 ⁽²⁾	6.2 to 17 ⁽²⁾	Red	0.085	2.2	3.63	92.2
7.0 to 16.0	17 to 40	Unpainted	0.105	2.7	3.75	95.2
0.5 to 1.2 psig	34 to 83	Yellow	0.114	2.9	4.31	109
1.2 to 2.5 psig	83 to 172	Green	0.156	4.0	4.06	103
2.5 to 4.5 psig	0.17 to 0.31 bar	Light Blue	0.187	4.8	3.94	100
4.5 to 7 psig	0.31 to 0.48 bar	Black	0.218	5.5	3.98	101

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

Table 3. Available Construction and Trim Materials

AVAILABLE CONSTRUCTION MATERIALS					AVAILABLE TRIM OPTIONS			
Body and Casing	Guide Insert	Diaphragm Head	Lever Assembly and Bias Spring	Stem	Trim Option Code	Diaphragm Material	Disk and O-ring Material	Operating Temperature Ranges
Gray cast iron, WCC Carbon Steel, or CF8M/CF3M Stainless steel ⁽¹⁾	316 Stainless steel	304 Stainless steel	302 Stainless steel	Nitronic® 60	Standard	Fluorinated Ethylene Propylene (FEP)	Nitrile (NBR)	-20 to 180°F / -29 to 82°C
					NN	Nitrile (NBR)	Nitrile (NBR)	-40 to 180°F / -40 to 82°C
					VV	Fluorocarbon (FKM)	Fluorocarbon (FKM)	40 to 300°F / 4 to 149°C
					TV	Fluorinated Ethylene Propylene (FEP)	Fluorocarbon (FKM)	40 to 180°F / 4 to 82°C
					TK	Fluorinated Ethylene Propylene (FEP)	Perfluoroelastomer (FFKM)	0 to 180°F / -18 to 82°C
					TE	Fluorinated Ethylene Propylene (FEP)	Ethylene Propylene Diene (EPDM)	-20 to 180°F / -29 to 82°C

1. Pipe nipples and flanges are 316 Stainless steel for flanged body assemblies. Nitronic® is a registered trademark of AK Steel Corporation.

Table 4. Type T205B Flow and Sizing Coefficients

ORIFICE SIZE		REGULATING			WIDE-OPEN		
Inch	mm	C _g	C _v	C _i	C _g	C _v	C _i
3/8	9.5	98	2.8	34.6	101	2.9	34.6

Table 5. Flow Rate Conversion

MULTIPLY MAXIMUM PUMP RATE IN	BY	TO OBTAIN
U.S. GPM	8.021	SCFH air required ⁽¹⁾
U.S. GPH	0.1337	
Barrels/hour	5.615	
Barrels/day	0.2340	

1. To convert to Nm³/h multiply SCFH by 0.0268.

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Table 6. Flow Rate Required due to Thermal Cooling

VESSEL CAPACITY			AIR FLOW RATE REQUIRED ⁽¹⁾	
Barrels	Gallons	Liters	SCFH	Nm³/h
60	2500	9500	60	1.6
100	4200	16,000	100	2.7
500	21,000	79,500	500	13.4
1000	42,000	159,000	1000	26.8
2000	84,000	318,000	2000	53.6
3000	126,000	477,000	3000	80.4
4000	168,000	636,000	4000	107
5000	210,000	795,000	5000	134
10,000	420,000	1,590,000	10,000	268
15,000	630,000	2,385,000	15,000	402
20,000	840,000	3,180,000	20,000	536
25,000	1,050,000	3,975,000	24,000	643
30,000	1,260,000	4,769,000	28,000	750
35,000	1,470,000	5,564,000	31,000	831
40,000	1,680,000	6,359,000	34,000	911
45,000	1,890,000	7,154,000	37,000	992
50,000	2,100,000	7,949,999	40,000	1072
60,000	2,520,000	9,539,000	44,000	1179
70,000	2,940,000	11,129,000	48,000	1286
80,000	3,360,000	12,718,000	52,000	1394
90,000	3,780,000	14,308,000	56,000	1501
100,000	4,200,000	15,898,000	60,000	1608
120,000	5,040,000	19,078,000	68,000	1822
140,000	5,880,000	22,257,000	75,000	2010
160,000	6,720,000	25,347,000	82,000	2198
180,000	7,560,000	28,616,000	90,000	2412

1. Flash point is below 100°F / 38°C or normal boiling point is below 300°F / 149°C.

Table 7. Correction Factors (For Converting Air Flow Rates to Other Gas Flow Rates)⁽¹⁾

BLANKET GAS	SPECIFIC GRAVITY	CORRECTION FACTOR
Natural Gas	0.60	1.291
Nitrogen	0.97	1.015
Dry CO ₂	1.52	0.811

1. For gases of other specific gravities, use equation below.

$$\text{Correction Factor} = \frac{1.00}{\sqrt{SG}}$$

Sizing Blanketing Systems

When sizing a gas blanketing regulator system for a low-pressure blanketing application, consider the replacement of blanketing gas required for the liquid loss during pump out of the vessel plus the condensation/contraction of vessel vapors during atmospheric thermal cooling. Using the established procedures from American Petroleum Institute Standard 2000 (API 2000), determine the flow rate of blanketing gas required.

$$Q_{\text{total}} = Q_{\text{pump}} + Q_{\text{thermal}}$$

Where,

Q_{total} : Required Flow Rate.

Q_{pump} : Required Flow Rate to replace pumped out liquid.

Q_{thermal} : Required Flow Rate due to thermal cooling. (See Table 6)

Capacity Information

Capacity tables are based on 1.0 specific gravity air. If other blanketing gas is used, convert the tabular values as follows. For blanketing (pad) gases other than air, multiply the given air flow rate by

the correction factors in Table 6. For gases of other specific gravities, divide the given air flow rate by the square root of the appropriate specific gravity.

Table 8. Type T205B C_v Coefficient

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C_v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
1.0 to 2.5 inches w.c. / 2.5 to 6.2 mbar Orange	1 inch w.c. / 2.5 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	1.9	2.7
			2	0.14	2.2	2.7
			4	0.28	2.3	2.6
			6	0.41	2.3	2.8
			8	0.55	2.3	2.8
			10	0.69	2.4	2.8
			15	1.0	2.4	2.8
			20	1.4	2.4	2.7
			40	2.8	2.5	2.7
			60	4.1	2.5	2.6
			80	5.5	2.4	2.2
			100	6.9	1.8	1.6
			125	8.6	1.3	1.3
			150	10.3	1.0	1.2
			175	12.1	0.9	1.1
			200	13.8	0.8	0.8
	2.5 inches w.c. / 6.2 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	2.1	2.6
			2	0.14	2.3	2.7
			4	0.28	2.5	2.6
			6	0.41	2.5	2.6
			8	0.55	2.5	2.7
			10	0.69	2.5	2.8
			15	1.0	2.5	2.7
			20	1.4	2.5	2.7
			40	2.8	2.6	2.6
			60	4.1	2.5	2.6
			80	5.5	2.5	2.6
			100	6.9	2.5	1.9
			125	8.6	1.5	1.4
			150	10.3	1.0	1.2
			175	12.1	0.9	1.1
			200	13.8	0.8	0.9

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
2.5 to 7.0 inches w.c. / 6.2 to 17 mbar Red	2.5 inches w.c. / 6.2 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	1.8	1.8
			2	0.14	1.9	1.8
			4	0.28	2.0	1.9
			6	0.41	2.1	1.9
			8	0.55	2.1	1.9
			10	0.69	2.1	1.9
			15	1.0	2.3	2.0
			20	1.4	2.3	2.0
			40	2.8	2.5	2.5
			60	4.1	2.5	2.6
			80	5.5	2.5	2.6
			100	6.9	2.5	2.6
			125	8.6	1.7	1.7
			150	10.3	1.3	1.3
			175	12.1	1.1	1.1
			200	13.8	1.0	0.9
	4 inches w.c. / 10 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	1.4	1.6
			2	0.14	1.5	1.5
			4	0.28	1.6	1.5
			6	0.41	1.6	1.6
			8	0.55	1.8	1.5
			10	0.69	1.9	1.6
			15	1.0	2.0	1.6
			20	1.4	2.1	1.8
			40	2.8	2.4	2.3
			60	4.1	2.5	2.6
			80	5.5	2.5	2.6
			100	6.9	2.5	2.6
			125	8.6	2.5	2.0
			150	10.3	1.4	1.4
			175	12.1	1.2	1.0
			200	13.8	1.0	0.9
	7 inches w.c. / 17 mbar	-2 to +2 inches w.c. / -5 to +5.0 mbar	1	0.07	2.1	2.1
			2	0.14	2.2	2.1
			4	0.28	2.1	2.0
			6	0.41	2.2	2.1
			8	0.55	2.1	2.2
			10	0.69	2.2	2.2
			15	1.0	2.4	2.2
			20	1.4	2.2	2.3
			40	2.8	2.5	2.5
			60	4.1	2.5	2.5
			80	5.5	2.5	2.6
			100	6.9	2.5	2.6
			125	8.6	2.5	2.6
			150	10.3	1.7	1.9
			175	12.1	1.4	1.5
			200	13.8	1.1	1.3

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
7.0 to 16.0 inches w.c. / 17 to 40 mbar Unpainted	11 inches w.c. / 27 mbar	20% droop	1	0.07	1.5	1.9
			2	0.14	1.6	1.6
			4	0.28	1.5	1.6
			6	0.41	1.6	1.7
			8	0.55	1.7	1.6
			10	0.69	1.7	1.7
			15	1.0	1.8	1.7
			20	1.4	1.8	1.7
			40	2.8	2.1	1.9
			60	4.1	2.3	2.2
			80	5.5	2.4	2.3
			100	6.9	2.4	2.4
			125	8.6	2.5	2.6
			150	10.3	2.4	2.4
			175	12.1	2.5	2.1
			200	13.8	1.9	1.9
	15 inches w.c. / 37 mbar	20% droop	2	0.14	1.9	1.9
			4	0.28	1.7	1.8
			6	0.41	1.8	1.9
			8	0.55	1.9	1.8
			10	0.69	1.8	1.9
			15	1.0	1.9	1.9
			20	1.4	2.0	1.9
			40	2.8	2.2	2.1
			60	4.1	2.3	2.3
			80	5.5	2.4	2.4
			100	6.9	2.4	2.5
			125	8.6	2.5	2.5
			150	10.3	2.5	2.4
			175	12.1	2.5	2.5
			200	13.8	2.5	2.5

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
0.5 to 1.2 psig / 34 to 83 mbar Yellow	0.5 psig / 34 mbar	20% droop	2	0.14	1.5	1.6
			4	0.28	1.5	1.6
			6	0.41	1.5	1.5
			8	0.55	1.5	1.5
			10	0.69	1.5	1.4
			15	1.0	1.5	1.5
			20	1.4	1.5	1.5
			40	2.8	1.7	1.5
			60	4.1	1.9	1.8
			80	5.5	2.1	2.0
			100	6.9	2.3	2.2
			125	8.6	2.3	2.3
			150	10.3	2.4	2.3
			175	12.1	2.4	2.4
			200	13.8	2.4	2.4
	1.2 psig / 83 mbar	20% droop	2	0.14	2.0	2.2
			4	0.28	1.8	1.9
			6	0.41	2.0	2.0
			8	0.55	1.9	2.1
			10	0.69	1.9	2.0
			15	1.0	1.9	2.0
			20	1.4	2.0	2.0
			40	2.8	2.2	2.1
			60	4.1	2.2	2.2
			80	5.5	2.2	2.2
			100	6.9	2.3	2.3
			125	8.6	2.4	2.4
			150	10.3	2.3	2.0
			175	12.1	2.4	2.2
			200	13.8	2.4	2.2

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
1.2 psig to 2.5 psig / 83 to 172 mbar Green	1.2 psig / 83 mbar	20% droop	2	0.14	1.4	1.5
			4	0.28	1.2	1.3
			6	0.41	1.2	1.2
			8	0.55	1.2	1.2
			10	0.69	1.2	1.1
			15	1.0	1.1	1.1
			20	1.4	1.2	1.1
			40	2.8	1.1	1.1
			60	4.1	1.1	1.1
			80	5.5	1.2	1.1
			100	6.9	1.2	1.2
			125	8.6	1.3	1.2
			150	10.3	1.4	1.4
			175	12.1	1.4	1.3
			200	13.8	1.4	1.2
	2.5 psig / 172 mbar	20% droop	4	0.28	1.9	1.9
			6	0.41	1.5	1.8
			8	0.55	1.6	1.7
			10	0.69	1.8	1.7
			15	1.0	1.7	1.8
			20	1.4	1.7	1.8
			40	2.8	1.8	1.7
			60	4.1	1.8	1.8
			80	5.5	1.9	1.8
			100	6.9	1.9	1.8
			125	8.6	1.9	1.9
			150	10.3	2.0	1.6
			175	12.1	1.9	1.8
			200	13.8	2.0	1.9

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
2.5 to 4.5 psig / 0.17 to 0.31 bar Light Blue	2.5 psig / 0.17 bar	20% droop	4	0.28	1.4	1.4
			6	0.41	1.2	1.2
			8	0.55	1.1	1.2
			10	0.69	1.2	1.2
			15	1.0	1.1	1.1
			20	1.4	1.1	1.2
			40	2.8	1.1	1.1
			60	4.1	1.1	1.0
			80	5.5	1.1	1.1
			100	6.9	1.1	1.1
			125	8.6	1.1	1.1
			150	10.3	1.1	1.0
			175	12.1	1.2	1.0
			200	13.8	1.2	1.0
	4.5 psig / 0.31 bar	20% droop	8	0.55	1.7	1.7
			10	0.69	1.5	1.7
			15	1.0	1.6	1.6
			20	1.4	1.6	1.6
			40	2.8	1.7	1.6
			60	4.1	1.7	1.5
			80	5.5	1.7	1.6
			100	6.9	1.7	1.6
			125	8.6	1.7	1.6
			150	10.3	1.7	1.4
			175	12.1	1.7	1.5
			200	13.8	1.7	1.5

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Table 8. Type T205B C_v Coefficient (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		C _v COEFFICIENT	
			psig	bar	3/4 Inch / DN 20 Body Size	1 Inch / DN 25 Body Size
4.5 to 7 psig / 0.31 to 0.48 bar Black	4.5 psig / 0.31 bar	20% droop	10	0.69	1.1	1.2
			15	1.0	1.1	1.1
			20	1.4	1.1	1.1
			40	2.8	1.1	1.1
			60	4.1	1.1	1.0
			80	5.5	1.1	1.1
			100	6.9	1.1	1.1
			125	8.6	1.1	1.1
			150	10.3	1.1	0.9
			175	12.1	1.1	1.1
			200	13.8	1.0	1.0
	7 psig / 0.48 bar	20% droop	10	0.69	1.7	1.7
			15	1.0	1.6	1.6
			20	1.4	1.5	1.5
			40	2.8	1.5	1.5
			60	4.1	1.5	1.5
			80	5.5	1.5	1.4
			100	6.9	1.5	1.5
			125	8.6	1.5	1.5
			150	10.3	1.5	1.3
			175	12.1	1.5	1.4
			200	13.8	1.5	1.3

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Table 9. Type T205B Flow Capacities

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm³h OF AIR			
			psig	bar	3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
					SCFH	Nm³h	SCFH	Nm³h
1.0 to 2.5 inches w.c. / 2.5 to 6.2 mbar Orange	1 inch w.c. / 2.5 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	434	11.6	603	16.2
			2	0.14	708	19.0	852	22.8
			4	0.28	1056	28.3	1204	32.3
			6	0.41	1328	35.6	1595	42.7
			8	0.55	1563	41.9	1876	50.3
			10	0.69	1840	49.3	2094	56.1
			15	1.0	2304	61.7	2698	72.3
			20	1.4	2729	73.1	3149	84.4
			40	2.8	4678	125	5002	134.1
			60	4.1	6353	170	6748	181
			80	5.5	7957	213	8614	231
			100	6.9	9801	263	10,473	281
			125	8.6	9955	267	9463	254
			150	10.3	8852	237	7015	188
			175	12.1	8554	229	7675	206
			200	13.8	9118	244	6628	178
	2.5 inches w.c. / 6.2 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	455	12.2	563	15.1
			2	0.14	711	19.1	838	22.5
			4	0.28	1122	30.1	1201	32.2
			6	0.41	1429	38.3	1485	39.8
			8	0.55	1681	45.1	1820	48.8
			10	0.69	1886	50.5	2086	55.9
			15	1.0	2418	64.8	2638	70.7
			20	1.4	2834	76.0	3081	82.6
			40	2.8	4838	130	4958	133
			60	4.1	6456	173	6729	180
			80	5.5	8271	222	8531	229
			100	6.9	10,044	269	10,396	279
			125	8.6	11,997	322	12,662	339
			150	10.3	9273	249	8001	214
			175	12.1	9248	248	8034	215
			200	13.8	9010	241	7029	188

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Table 9. Type T205B Flow Capacities (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm ³ h OF AIR			
					3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
			psig	bar	SCFH	Nm ³ h	SCFH	Nm ³ h
2.5 to 7.0 inches w.c. / 6.2 to 17 mbar Red	2.5 inches w.c. / 6.2 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	391	10.5	402	10.8
			2	0.14	594	15.9	580	15.5
			4	0.28	923	24.7	850	22.8
			6	0.41	1216	32.6	1058	28.4
			8	0.55	1411	37.8	1249	33.5
			10	0.69	1563	41.9	1463	39.2
			15	1.0	2194	58.8	1922	51.5
			20	1.4	2650	71.0	2340	62.7
			40	2.8	4758	128	4730	127
			60	4.1	6421	172	6676	179
			80	5.5	8180	219	8534	229
			100	6.9	10,000	268	10,340	277
			125	8.6	12,193	327	12,658	339
			150	10.3	14,498	389	11,300	303
			175	12.1	11,208	300	10,474	281
			200	13.8	11,341	304	9858	264
	4 inches w.c. / 10 mbar	-1 to +2 inches w.c. / -2.5 to +5.0 mbar	1	0.07	298	8.0	340	9.1
			2	0.14	470	12.6	472	12.6
			4	0.28	735	19.7	686	18.4
			6	0.41	904	24.2	878	23.5
			8	0.55	1183	31.7	983	26.3
			10	0.69	1396	37.4	1212	32.5
			15	1.0	1913	51.3	1520	40.7
			20	1.4	2416	64.7	2036	54.6
			40	2.8	4505	121	4390	118
			60	4.1	6388	171	6598	177
			80	5.5	8191	220	8385	225
			100	6.9	10,032	269	10,222	274
			125	8.6	12,171	326	12,576	337
			150	10.3	14,540	390	14,402	386
			175	12.1	13,210	354	12,087	324
			200	13.8	11,877	318	10,424	279
	7 inches w.c. / 17 mbar	-2 to +2 inches w.c. / -5 to +5.0 mbar	1	0.07	417	11.2	417	11.2
			2	0.14	673	18.0	626	16.8
			4	0.28	963	25.8	916	24.5
			6	0.41	1219	32.7	1199	32.1
			8	0.55	1410	37.8	1468	39.3
			10	0.69	1676	44.9	1666	44.6
			15	1.0	2276	61.0	2100	56.3
			20	1.4	2571	68.9	2639	70.7
			40	2.8	4625	124.0	4641	124
			60	4.1	6302	169	6535	175
			80	5.5	8179	219	8412	225
			100	6.9	9897	265	10,225	274
			125	8.6	12,129	325	12,497	335
			150	10.3	14,390	386	14,165	380
			175	12.1	16,671	447	16,734	448
			200	13.8	13,907	373	19,101	512

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Table 9. Type T205B Flow Capacities (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm³h OF AIR			
			psig	bar	3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
					SCFH	Nm³h	SCFH	Nm³h
7.0 to 16.0 inches w.c. / 17 to 40 mbar Unpainted	11 inches w.c. / 27 mbar	20% droop	1	0.07	272	7.3	340	9.1
			2	0.14	453	12.1	458	12.3
			4	0.28	679	18.2	696	18.7
			6	0.41	879	23.6	920	24.7
			8	0.55	1087	29.1	1080	28.9
			10	0.69	1258	33.7	1266	33.9
			15	1.0	1673	44.8	1639	43.9
			20	1.4	2054	55.0	1938	51.9
			40	2.8	3868	104	3595	96.3
			60	4.1	5801	156	5764	154
			80	5.5	7695	206	7616	204
			100	6.9	9559	256	9636	258
			125	8.6	11,986	321	12,258	329
			150	10.3	13,813	370	13,781	369
			175	12.1	16,389	439	15,565	417
			200	13.8	18,695	501	18,494	496
	15 inches w.c. / 37 mbar	20% droop	2	0.14	537	14.4	534	14.3
			4	0.28	752	20.2	776	20.8
			6	0.41	994	26.6	1028	27.6
			8	0.55	1224	32.8	1157	31.0
			10	0.69	1336	35.8	1391	37.3
			15	1.0	1831	49.1	1770	47.4
			20	1.4	2248	60.2	2205	59.1
			40	2.8	4063	109	3846	103
			60	4.1	5892	158	5865	157
			80	5.5	7718	207	7699	206
			100	6.9	9562	256	9738	261
			125	8.6	11,899	319	12,035	323
			150	10.3	13,895	372	13,352	358
			175	12.1	15,977	428	16,046	430
			200	13.8	18,568	498	18,554	497

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Table 9. Type T205B Flow Capacities (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm ³ h OF AIR			
			psig	bar	3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
					SCFH	Nm ³ h	SCFH	Nm ³ h
0.5 to 1.2 psig / 34 to 83 mbar Yellow	0.5 psig / 34 mbar	20% droop	2	0.14	412	11.0	449	12.0
			4	0.28	660	17.7	674	18.1
			6	0.41	834	22.4	844	22.6
			8	0.55	1007	27.0	950	25.5
			10	0.69	1148	30.8	1067	28.6
			15	1.0	1474	39.5	1386	37.1
			20	1.4	1773	47.5	1719	46.1
			40	2.8	3208	86.0	2886	77.3
			60	4.1	5005	134	4731	127
			80	5.5	6967	187	6590	177
			100	6.9	8906	239	8858	237
			125	8.6	11,231	301	11,100	298
			150	10.3	13,636	365	12,946	347
			175	12.1	15,861	425	15,565	417
			200	13.8	17,949	481	17,585	471
	1.2 psig / 83 mbar	20% droop	2	0.14	422	11.3	466	12.5
			4	0.28	725	19.4	769	20.6
			6	0.41	1030	27.6	1074	28.8
			8	0.55	1207	32.3	1311	35.1
			10	0.69	1388	37.2	1489	39.9
			15	1.0	1779	47.7	1912	51.2
			20	1.4	2321	62.2	2330	62.4
			40	2.8	4052	109	3858	103
			60	4.1	5536	148	5711	153
			80	5.5	7322	196	7228	194
			100	6.9	9006	241	9023	242
			125	8.6	11,329	304	11,471	307
			150	10.3	13,188	353	11,316	303
			175	12.1	15,494	415	14,402	386
			200	13.8	17,694	474	16,532	443

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Table 9. Type T205B Flow Capacities (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm³h OF AIR			
			psig	bar	3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
					SCFH	Nm³h	SCFH	Nm³h
1.2 psig to 2.5 psig / 83 to 172 mbar Green	1.2 psig / 83 mbar	20% droop	2	0.14	296	7.9	313	8.4
			4	0.28	474	12.7	497	13.3
			6	0.41	619	16.6	621	16.6
			8	0.55	748	20.0	730	19.6
			10	0.69	893	23.9	831	22.3
			15	1.0	1070	28.7	1073	28.8
			20	1.4	1318	35.3	1266	33.9
			40	2.8	2063	55.3	2004	53.7
			60	4.1	2879	77.2	2864	76.8
			80	5.5	3791	102	3526	94.5
			100	6.9	4683	126	4843	130
			125	8.6	6054	162	5956	160
			150	10.3	7699	206	7844	210
			175	12.1	9024	242	8195	220
			200	13.8	10,650	285	8982	241
	2.5 psig / 172 mbar	20% droop	4	0.28	560	15.0	581	15.6
			6	0.41	698	18.7	834	22.4
			8	0.55	923	24.7	1023	27.4
			10	0.69	1246	33.4	1192	31.9
			15	1.0	1552	41.6	1638	43.9
			20	1.4	1908	51.1	1996	53.5
			40	2.8	3337	89.4	3217	86.2
			60	4.1	4676	125	4564	122
			80	5.5	6060	162	5922	159
			100	6.9	7405	199	7209	193
			125	8.6	9223	247	8995	241
			150	10.3	11,164	299	9333	250
			175	12.1	12,347	331	11,432	306
			200	13.8	15,029	403	13,640	366

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Table 9. Type T205B Flow Capacities (continued)

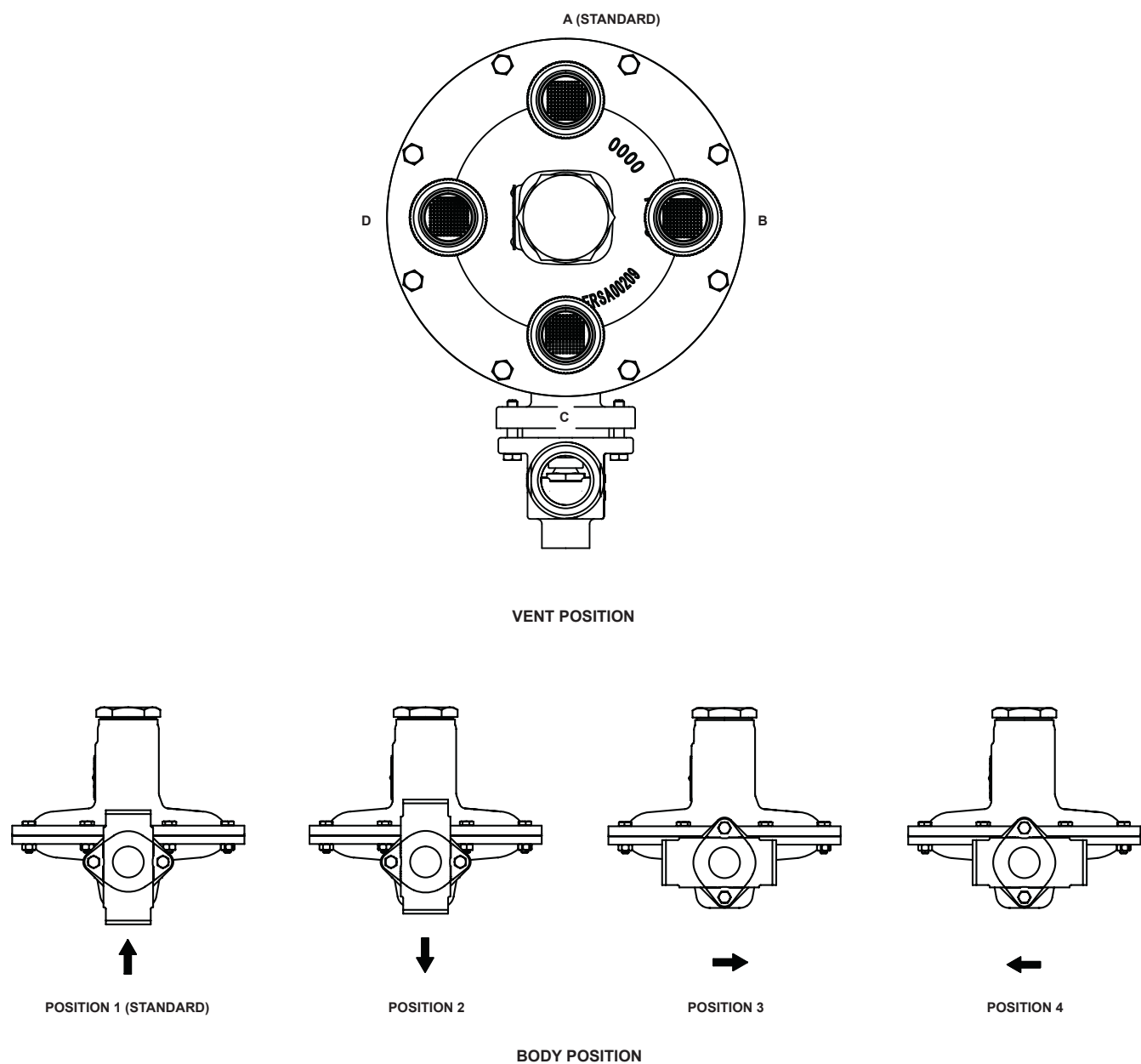
SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm ³ h OF AIR			
			psig	bar	3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
					SCFH	Nm ³ h	SCFH	Nm ³ h
2.5 to 4.5 psig / 0.17 to 0.31 bar Light Blue	2.5 psig / 0.17 bar	20% droop	4	0.28	407	10.9	418	11.2
			6	0.41	555	14.9	557	14.9
			8	0.55	645	17.3	679	18.2
			10	0.69	800	21.4	804	21.5
			15	1.0	1009	27.0	1039	27.8
			20	1.4	1220	32.7	1291	34.6
			40	2.8	2064	55.3	1964	52.6
			60	4.1	2876	77.1	2674	71.7
			80	5.5	3683	98.7	3545	95.0
			100	6.9	4525	121	4319	116
			125	8.6	5485	147	5293	142
			150	10.3	6237	167	5739	154
			175	12.1	7547	202	6810	183
			200	13.8	8673	232	7427	199
	4.5 psig / 0.31 bar	20% droop	8	0.55	823	22.1	854	22.9
			10	0.69	949	25.4	1075	28.8
			15	1.0	1412	37.8	1411	37.8
			20	1.4	1723	46.2	1729	46.3
			40	2.8	3067	82.2	2880	77.2
			60	4.1	4252	114	3836	103
			80	5.5	5513	148	5200	139
			100	6.9	6682	179	6236	167
			125	8.6	8249	221	7916	212
			150	10.3	9787	262	8032	215
			175	12.1	11,084	297	9703	260
			200	13.8	12,748	342	11,264	302

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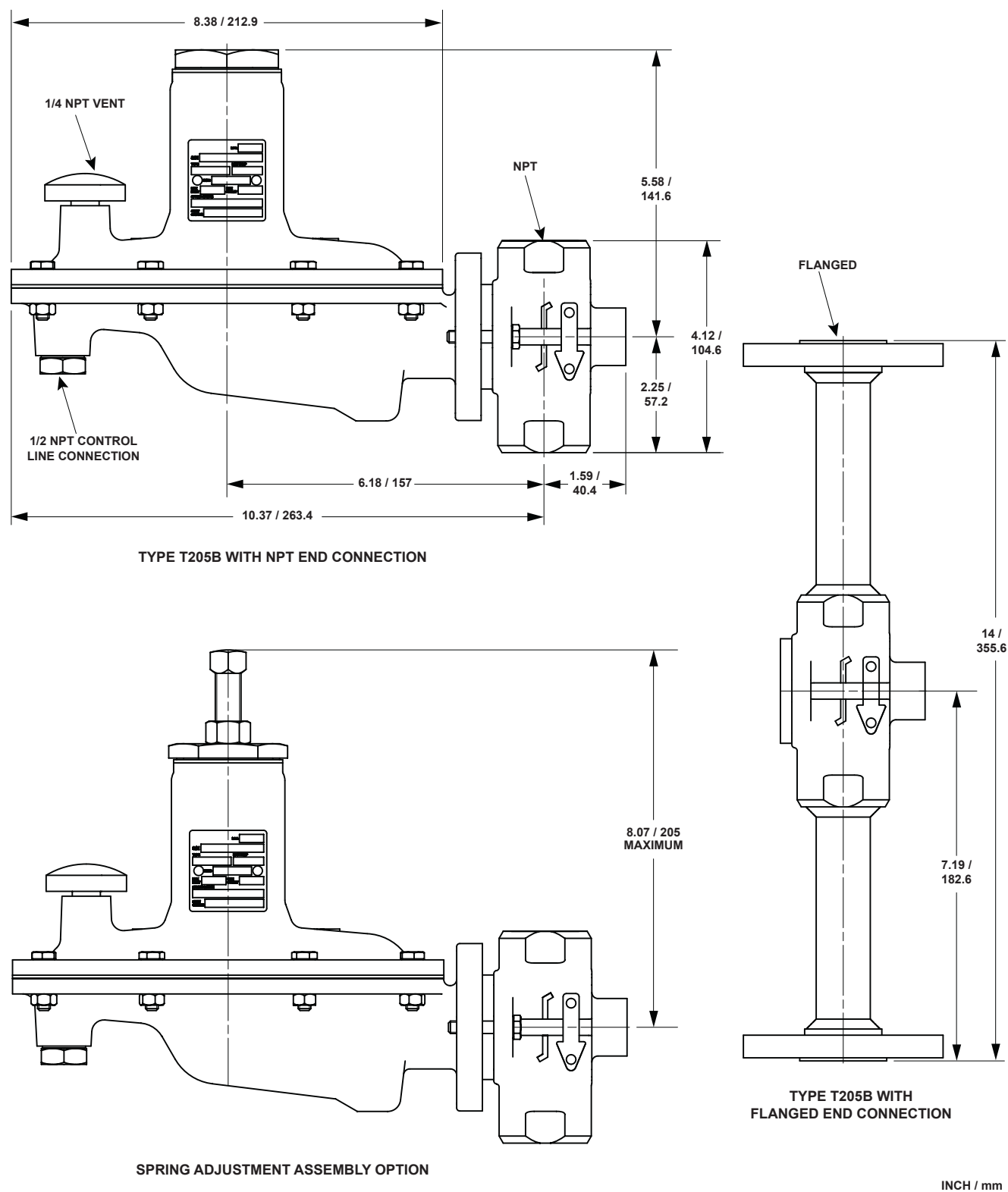
Table 9. Type T205B Flow Capacities (continued)

SPRING RANGE AND COLOR	OUTLET PRESSURE SETTING	OFFSET FROM SETPOINT	INLET PRESSURE		CAPACITIES IN SCFH / Nm³h OF AIR			
					3/4 Inch / DN 20 Body Size		1 Inch / DN 25 Body Size	
			psig	bar	SCFH	Nm³h	SCFH	Nm³h
4.5 to 7 psig / 0.31 to 0.48 bar Black	4.5 psig / 0.31 bar	20% droop	10	0.69	706	18.9	741	19.9
			15	1.0	978	26.2	1003	26.9
			20	1.4	1161	31.1	1237	33.2
			40	2.8	1993	53.4	2012	53.9
			60	4.1	2776	74.4	2661	71.3
			80	5.5	3477	93.2	3426	91.8
			100	6.9	4265	114	4163	112
			125	8.6	5233	140	5161	138
			150	10.3	6206	166	5200	139
			175	12.1	7053	189	7007	188
			200	13.8	7705	207	7620	204
	7 psig / 0.48 bar	20% droop	10	0.69	810	21.7	821	22.0
			15	1.0	1289	34.5	1282	34.4
			20	1.4	1576	42.2	1596	42.8
			40	2.8	2836	76.0	2737	73.4
			60	4.1	3870	104	3734	100
			80	5.5	4923	132	4716	126
			100	6.9	6001	161	5737	154
			125	8.6	7307	196	7058	189
			150	10.3	8380	225	7324	196
			175	12.1	9560	256	9388	252
			200	13.8	11,332	304	9637	258



ERSA00746

Figure 4. Body and Vent Position



ERSA02735

Figure 5. Dimensions

Ordering Information

When ordering, complete the ordering guide on this page. Refer to the Specifications section on page 2. Review the description to the right of each

specification and the information in each referenced table or figure. Specify your choice whenever a selection is offered.

Ordering Guide

Body Size (Select One)

- ☐ 3/4 inch / DN 20***
- ☐ 1 inch / DN 25***

Body Material and End Connection Style (Select One)

Gray Cast Iron

- ☐ NPT***

WCC Carbon Steel

- ☐ NPT***
- ☐ CL150 RF***
- ☐ CL300 RF***
- ☐ PN 16/25/40 RF*** specify rating _____

CF8M/CF3M Stainless steel⁽¹⁾

- ☐ NPT***
- ☐ CL150 RF***
- ☐ CL300 RF***
- ☐ PN 16/25/40 RF*** specify rating _____

Outlet (Control) Pressure Range (Select One)

- ☐ 1 to 2.5 inches w.c. / 2.5 to 6.2 mbar, Orange***
- ☐ 2.5 to 7 inches w.c. / 6.2 to 17 mbar, Red***
- ☐ 7 to 16 inches w.c. / 17 to 40 mbar, Unpainted***
- ☐ 0.5 to 1.2 psig / 34 to 83 mbar, Yellow***
- ☐ 1.2 to 2.5 psig / 83 to 172 mbar, Green***
- ☐ 2.5 to 4.5 psig / 0.17 to 0.31 bar, Light Blue***
- ☐ 4.5 to 7 psig / 0.31 to 0.48 bar, Black

Trim Material (See Table 3, Select One)

- ☐ Standard***
- ☐ NN***
- ☐ VV***
- ☐ TV***
- ☐ TK***
- ☐ TE***

Adjusting Screw (Select One)

- ☐ Internal Flat Circular (**standard**)***
- ☐ External Square Head (Available for Green, Light blue and Black springs only. Steel closing cap is automatically supplied in this option)***

Closing Cap Material (Select One)

- ☐ Plastic (**standard**) (not available for Green, Light blue and Black springs)***
- ☐ Steel (**standard** for Green, Light blue and Black springs)***
- ☐ Stainless steel***

Body Position (See Figure 4, Select One)

- ☐ Position 1 (**standard**)***
- ☐ Position 2***
- ☐ Position 3***
- ☐ Position 4***

Spring Case Orientation/Vent Type (Select One)

- ☐ Spring Case Side (Type Y602-12) (**standard**)***
- ☐ Spring Case Down (Type Y602-1)***
- ☐ Spring Case Up (Type Y602-11)***

Vent Position (See Figure 4, Select One)

- ☐ Position A (**standard**)***
- ☐ Position B***
- ☐ Position C***
- ☐ Position D***

316 Stainless steel Trim Parts (Select One)

- ☐ Yes
- ☐ No

Replacement Parts Kit (Optional)

- ☐ Yes, send one replacement parts kit to match this order.

1. Pipe nipples and flanges are 316 Stainless steel for flanged body assemblies.

Regulators Quick Order Guide	
***	Readily Available for Shipment
**	Allow Additional Time for Shipment
*	Special Order, Constructed from Non-Stocked Parts. Consult your local Sales Office for Availability.
Availability of the product being ordered is determined by the component with the longest shipping time for the requested construction.	

Specification Worksheet	
Application (Please designate units):	
Specific Use	_____
Line Size	_____
Fluid Type and Specific Gravity	_____
Fluid Temperature	_____
Does the Application Require Overpressure Protection?	
☐ Yes ☐ No If yes, which is preferred:	
☐ Relief Valve ☐ Monitor Regulator ☐ Shutoff Device	
Is overpressure protection equipment selection assistance desired? _____	
Pressure:	
Maximum Inlet Pressure	_____
Minimum Inlet Pressure	_____
Differential Pressure	_____
Set Pressure	_____
Maximum Flow (Q _{max})	_____
Performance Required:	
Accuracy Requirements?	
Less than or Equal to:	
☐ 5% ☐ 10% ☐ 20% ☐ Wide Open	
Other Requirements:	

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