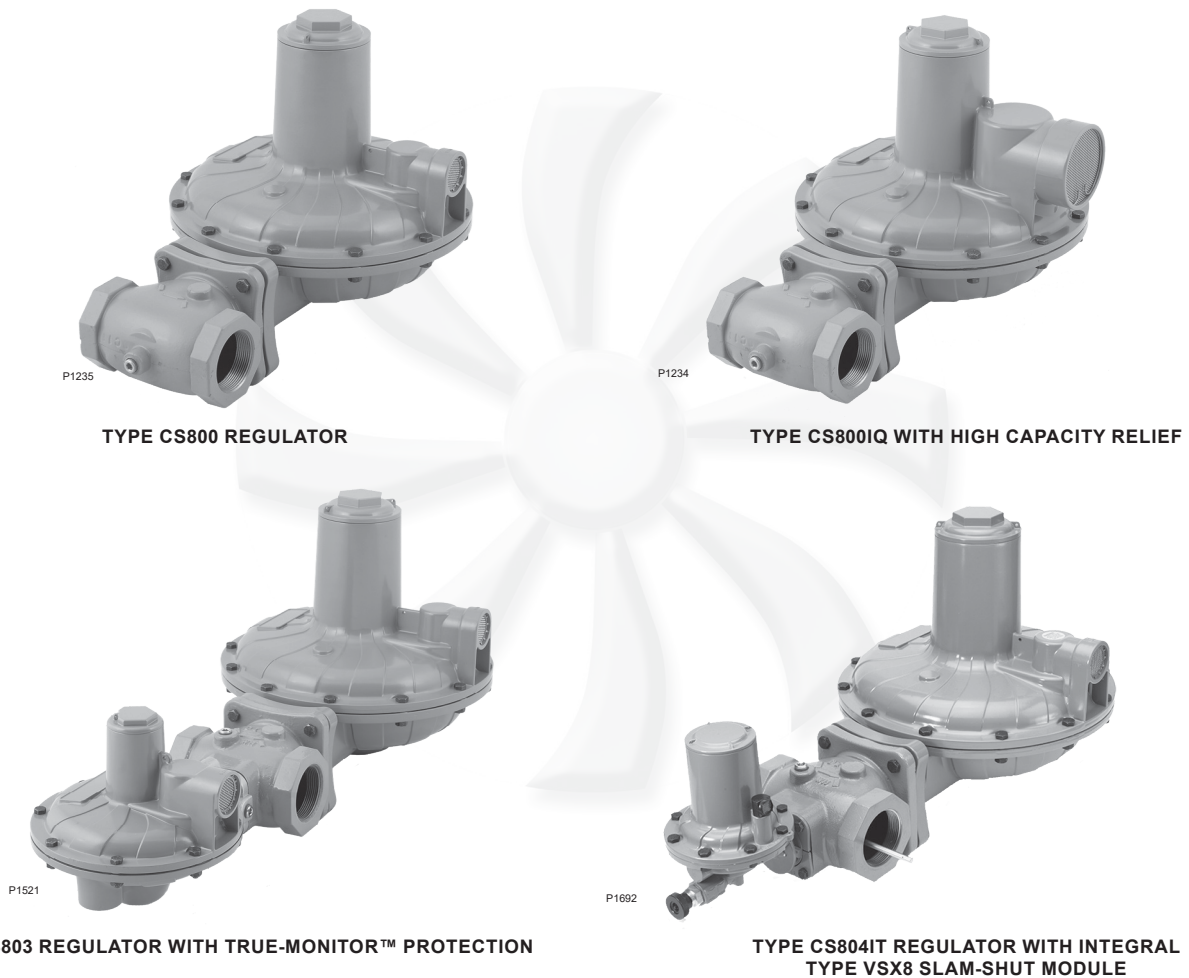


September 2023

# CS800 Series Commercial/Industrial Pressure Reducing Regulators per EN334



Outside North America Only

Figure 1. Typical CS800 Series Pressure Reducing Regulator

## Features and Benefits

- Flow-optimized disks provide the maximum flow for your application
- Largest number of overpressure protection offerings in the industry
- Wide variety of body sizes and end connections
- Body materials available in gray cast iron, ductile iron and steel
- Fixed Factor/Pressure Factor Measurement (PFM) accuracy capabilities
- Only standard tools required for pressure adjustment and orifice removal
- Simplified maintenance
- Optional stabilizer cartridge

# CS800 Series

## Specifications

The Specifications section lists the specifications for the CS800 Series Regulators. The following information is stamped on the nameplate of CS800 Series: Type Number, Maximum Outlet Pressure and Spring Range.

### Available Configurations

See Table 1

### Body Sizes, Material, End Connection and Pressure Rating<sup>(1)</sup>

See Table 2

### Maximum Inlet Pressures<sup>(1)</sup>, $P_{umax}$

**Emergency:** 12.1 bar / 175 psig

**Operating:** See Table 3

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

**Emergency (Casing):** 1.0 bar / 15 psig

**To avoid internal parts damage:** 0.21 bar / 3 psig differential above outlet pressure setting

### Outlet Pressure Ranges<sup>(1)</sup>, $W_d$

**Regulator:** 9 mbar to 0.69 bar / 3.5 in. w.c. to 10 psig

See Table 4

### Flow Capacities

See Tables 14 and 15

### Orifice Sizes, Flow Coefficients and IEC Sizing Coefficients

See Table 3

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

-29 to 66°C / -20 to 150°F

**PED:** -20 to 66°C / -4 to 150°F

### Spring Case Vent Connection

**Internal Relief:** 1 NPT

**High Capacity Relief:** 2-1/2 NPT

### External Registration Connection

3/4 NPT

### Spring Case Vent and Body Orientation

See Figures 9 and 10

### Secondary Seat Approximate Lockup Values and Associated Internal Relief Start-to-Discharge:

See Table 6

### Standards

PED, EN334, EN14382

### TM600 Series True-Monitor Performance<sup>(1)</sup>

#### Inlet Pressure Ratings

*Maximum Operating:* Up to 8.6 bar / 125 psig

*Maximum Emergency:* 12.1 bar / 175 psig

**Outlet Pressure Range:** 30 mbar to 0.52 bar / 12 in. w.c. to 7.5 psig

### Type VSX8 Slam-Shut Device<sup>(1)</sup>

**Maximum Inlet Pressure:** 12.1 bar / 175 psig

**Maximum Operating Inlet Pressure:**

12.1 bar / 175 psig

**Accuracy Class, AG:** +/-5%

**Response Time,  $t_a$ :** <1 second

### Construction Materials

#### CS800 Series Main Valve and Actuator

*Body:* Gray Cast Iron, Ductile Iron or Steel

*Body O-ring:* Nitrile (NBR)

*Closing Cap:* Aluminum

*Adjusting Screw:* Aluminum, Brass or Zinc-plated steel

*Upper and Lower Case:* Aluminum

*Valve Stem:* Aluminum or Zinc-plated steel

*Diaphragm Head:* Zinc-plated steel

*Orifice:*

*Standard:* Aluminum

*Secondary Seat:* Brass

*Pusher Post or Internal Relief Valve Seat:*

Aluminum or Zinc-plated steel

*Diaphragm and Disk:* Nitrile (NBR)

*Control Spring:* Stainless steel or Steel

*Relief Valve Spring:* Stainless steel

*Relief Valve Spring Retainer:* Aluminum or

Zinc-plated steel

*Vent Screen:* Stainless steel

*Retaining Ring:* Stainless steel or

Zinc-plated steel

*Lever Pin:* Stainless steel or hardened steel

*Spring Seat:* Aluminum

*Lever:* Steel

*Diaphragm Case, Spring Case and Balanced*

*Port Assembly Housing:* Aluminum

*Diaphragm Retainer and Diaphragm Head:*

Zinc-plated Steel

*Valve Stem:* Aluminum

*Diaphragm:* Nitrile (NBR)

### Type TM600 True-Monitor™ Actuator

*Disk Holder and Disk Retainer:* Brass

*Disk/Seat Contact:* Nitrile (NBR)

*Monitor Stem:* Stainless steel

*Middle Diaphragm Retainer:* Zinc-plated steel

*Control Spring:* Stainless steel

*Vent Screen:* Stainless steel

*Vent Retaining Ring:* Zinc-plated steel

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

2. Product has passed Emerson Process Management Regulator Technologies, Inc. testing for lockup, relief start-to-discharge and reseal down to -40 degrees.

3. Applies to Capacities with Low Inlet Option, which offers Enhanced Flow Performance at Low Inlet pressures for the DN 50 / 2 in. body with 13 to 21 mbar / 5.5 to 8.5 in. w.c. spring range.

- continued -

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## Specifications (continued)

### Construction Materials (continued)

#### Type TM600 True-Monitor™

#### Actuator (continued)

Closing Cap: Aluminum

Adjusting Screw: Aluminum

O-rings: Nitrile (NBR)

#### Type VSX8 Slam-Shut Device

Diaphragm Case, Spring Case, Diaphragm Plate and Valve Stem: Aluminum

Diaphragm and Disk: Nitrile (NBR)

Control Spring: Music Wire or Stainless steel

Vent Screen: Stainless steel

Vent Screen Retainer: Zinc-plated steel

Closing Cap: Aluminum

Adjusting Screw: Aluminum

### Designed, Tested and Evaluated Consistent with:

ASME B16, ASME Section VIII DIV I and ASTM B117 (Corrosion Resistance)

### Approximate Weights

#### With Threaded Body

Type CS800/CS820: 11 kg / 25 lbs

Type CS803/CS823: 15 kg / 34 lbs

Type CS804/CS824: 14 kg / 31 lbs

Type CS805/CS825: 12 kg / 26 lbs

Type CS806/CS826: 12 kg / 26 lbs

**High-Pressure Types:** For Type CS85x add 0.9 kg / 2 lbs to types listed above

#### With Flanged Body

Add 5.0 kg / 11 lbs to weights listed above

**Table 1. Available Configurations**

TYPE NUMBER				OPTIONS			
C	S	8					
							<b>OUTLET PRESSURE CONSTRUCTION</b>
			0				Low Pressure Applications (Outlet Pressure: 9 to 75 mbar / 3.5 to 30 in. w.c.)
			2				Medium Pressure Applications (Outlet Pressure: 69 mbar to 0.38 bar / 1 to 5.5 psig)
			5				High Pressure Applications (Outlet Pressure: 0.34 to 0.69 bar / 5 to 10 psig) <sup>(1)</sup>
							<b>OVERPRESSURE PROTECTION MODULE</b>
			0				Without Overpressure Protection Module
			3				With Integral True-Monitor Module <sup>(4)</sup>
			4				With Slam-shut Module <sup>(4)</sup>
			5				With Secondary Seat™ Protection
			6				With Secondary Seat Protection with controlled bleed to indicate Secondary Seat is functioning <sup>(2)</sup>
							<b>PRESSURE REGISTRATION</b>
				I			Internal Registration
				E			External Registration <sup>(3)</sup>
							<b>RELIEF</b>
				N			Non-Relieving
				R			Internal Relief
				Q			High-Capacity Relief
				T			Token Relief
				L			Low Flow Token Relief
				SC			Stabilizer Cartridge
<p>Example: Type Number CS800IR: Type CS800 regulator without Overpressure Protection Module with Internal Pressure Registration and with Internal Relief.</p> <p>1. High-pressure Construction is not available with True-Monitor Protection, Secondary Seat Protection or Relief.</p> <p>2. Available only with Internal Relief or High-Capacity Relief Constructions.</p> <p>3. Available only with Non-Relieving or Token Relief Constructions.</p> <p>4. Reference Instruction Manual D103126X012 for information regarding the Type TM600 Integral True-Monitor™ or Instruction Manual D103127X012 for Type VSX8 safety Slam-shut module.</p>							

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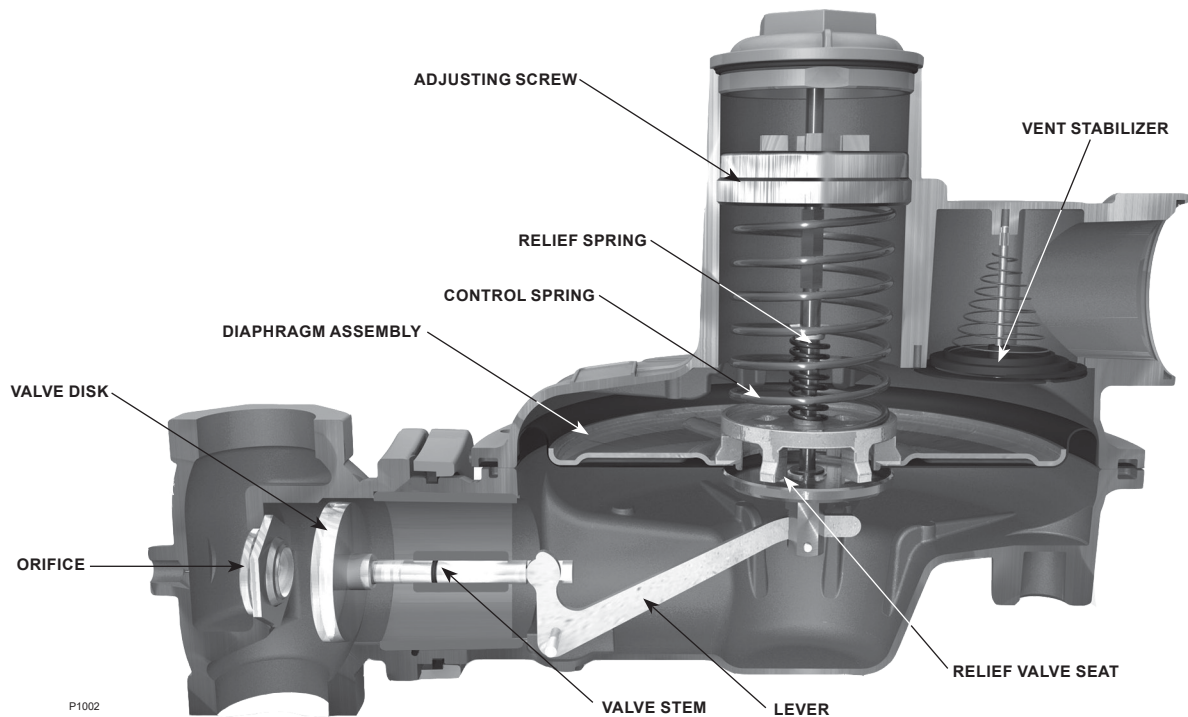


Figure 2. Internal View of CS800 Series with High Capacity Relief

## Introduction

The CS800 Series direct-operated, spring-loaded regulators have been engineered to fit a multitude of commercial and industrial pressure-reducing applications. This flexibility is provided by the numerous body sizes and end connections, outlet pressure settings, orifice sizes, as well as the option for internal or external pressure registration.

## Features

### Stabilizer Cartridge Option

The stabilizer cartridge is designed to eliminate harmonic instability in such applications where there can be humming/buzzing, meter feedback or high efficiency boiler feedback.

### Overpressure Protection Options Available

- **Internal Relief**—Provides overpressure protection to the downstream system by relieving gas through the diaphragm assembly to atmosphere in the event of an overpressure situation.
- **High-Capacity Internal Relief**—Provides an increase in relief performance over internal relief thereby offering a significant improvement in the level of overpressure protection to the downstream system in the event of an overpressure occurrence.

- **True-Monitor™ Protection**—Combines the operation of a conventional two-regulator wideopen monitor set into one body. Provides a second monitoring regulator to control downstream pressure. In event of loss of downstream pressure control by the primary regulator due to damage to the lever, downstream sense line, orifice, disk, diaphragm, etc., the monitoring regulator will assume control of the downstream pressure and regulator flow.
- **Secondary Seat™ Protection**—Provides a solution to the most common cause of regulators failing to shut off by employing a secondary seating surface to provide shutoff in the event the primary orifice seating surface becomes damaged or blocked. See page 15 for additional information.
- **Slam-Shut Protection**—Discontinues gas service by shutting the gas off if there is an overpressure or underpressure condition.

### Overpressure Relief

- **Token Relief**—Provides overpressure relief via a small capacity or token relief that relieves minor overpressure caused by thermal expansion or minor nicks in the orifice or disk.

**Table 2. Body Sizes, Materials, End Connections and Maximum Cold Working Pressure Ratings<sup>(5)</sup>**

TYPE	BODY MATERIAL	END CONNECTION	BODY SIZE		FACE-TO-FACE DIMENSION		BODY INLET PRESSURE RATING, P <sub>s</sub>	
			DN	In.	mm	In.	bar	psig
CS800, CS805, CS806, CS820, CS825, CS826 and CS850	Gray Cast Iron	NPT	----	1-1/4	155	6.12	12.1	175
			----	1-1/2	155	6.12		
			----	2 <sup>(1)</sup>	155	6.12		
			----	2	155	6.12		
		CL125 FF	50	2	191	7.5	12.1	175
			50	2	254	10		
CS800 <sup>(3)</sup> , CS820 <sup>(3)</sup> , CS850 <sup>(3)</sup> , CS803, CS823, CS804, CS824 and CS854	Gray Cast Iron	NPT	----	2 <sup>(2)</sup>	155	6.12	12.1	175
	Ductile Iron	NPT	----	1-1/4 <sup>(4)</sup>	155	6.12	17.2	250
			----	1-1/2	155	6.12		
			----	2	155	6.12		
		Rp	----	2	155	6.12	17.2	250
		CL125 FF / CL150 FF	50	2	191 <sup>(4)</sup>	7.5 <sup>(4)</sup>	17.2	250
			50	2	254	10		
			50	2	267	10.5		
		PN 10/16	50	2	191 <sup>(4)</sup>	7.5 <sup>(4)</sup>	16	232
	50		2	254	10			
	WCC Steel	NPT	----	1-1/4 <sup>(4)</sup>	155	6.12	20	290
			----	1-1/2	155	6.12		
			----	2	155	6.12		
		Rp	----	2	155	6.12	20	290
CL150 RF		50	2	254	10	20	290	
PN 10/16		50	2	254	10	16	232	

1. Standard on Types CS800, CS820 and CS850.
2. Standard on Types CS803, CS804, CS823, CS824 and CS854.
3. If a ductile iron or steel body material is selected without an Integral True-Monitor™ or Slam-shut Overpressure Protection (OPP) device, the port located at the bottom of the body will receive an aluminum plug.
4. Not available on Types CS804, CS824 and CS854.
5. The pressure/temperature limits in this Bulletin or any applicable standard or code limitation should not be exceeded.

**Table 3. Inlet Pressure Ratings and Flow and Sizing Coefficients**

ORIFICE SIZE		MAXIMUM OPERATING INLET PRESSURE TO OBTAIN OPTIMUM PERFORMANCE, BP <sub>u</sub>				MAXIMUM EMERGENCY INLET PRESSURE, P <sub>umax</sub>		WIDE-OPEN FLOW COEFFICIENTS			IEC SIZING COEFFICIENTS		
		psig Setpoints		In. w.c. Setpoints									
mm	In.	bar	psig	bar	psig	bar	psig	C <sub>g</sub>	C <sub>v</sub>	C <sub>1</sub>	X <sub>T</sub>	F <sub>L</sub>	F <sub>D</sub>
6.4 <sup>(1)</sup>	1/4 <sup>(1)</sup>	8.6	125	8.6	125	12.1	175	50	2.1	24.6	0.38	0.89	0.99
9.5	3/8	8.6	125	8.6	125	12.1	175	110	3.8	29.5	0.55	0.89	0.90
13	1/2	6.9	100	6.9	100	12.1	175	210	7.2	29.5	0.55	0.89	0.93
16	5/8	6.5	80	4.1	60	12.1	175	320	10.1	31.8	0.64	0.89	0.88
19	3/4	6.5	80	4.1	60	12.1	175	450	13.3	34	0.73	0.89	0.84
22	7/8	4.1	60	3.4	50	12.1	175	600	16.7	36	0.82	0.89	0.81
25 <sup>(1)</sup>	1 <sup>(1)</sup>	2.1	30	1.7	25	12.1	175	765	20.1	38.1	0.92	0.89	0.77
35 <sup>(1)(2)</sup>	1-3/8 <sup>(1)(2)</sup>	1.0	15	1.0	15	12.1	175	1125	29.8	37.7	0.90	0.89	0.76

1. Not available on the Types CS805, CS806, CS825 and CS826.
2. Not available on the Types CS803 and CS823.

Outside North America Only

# CS800 Series

**Table 4. Outlet Pressure Ranges**

TYPE	OUTLET PRESSURE RANGE		COLOR CODE	PART NUMBER	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
	mbar	In. w.c.			mm	In.	mm	In.
CS800, CS803, CS804, CS805 and CS806	9 to 15 <sup>(1)</sup>	3.5 to 6 <sup>(1)</sup>	Red	GE30337X012	3.8	0.15	173	6.8
	13 to 21	5.5 to 8.5	Black	GE30338X012	4.3	0.17	173	6.8
	13 to 21	5.5 to 8.5	Brown [Use with Low Inlet (LIN) Option]	GE49043X012	4.1	0.16	211	8.3
	20 to 30	8 to 12	Purple	GE30339X012	4.3	0.17	188	7.4
	25 to 40	10 to 16	White	GE30340X012	4.6	0.18	188	7.4
	35 to 75	14 to 30	Dark Green	GE30341X012	5.2	0.20	191	7.5
CS820, CS823, CS824, CS825 and CS826	69 to 170	1 to 2.5 psig	Dark Blue	GE30342X012	6.4	0.25	191	7.5
	100 to 241	1.5 to 3.5 psig	Orange	GE46922X012	6.6	0.26	180	7.1
	170 to 380	2.5 to 5.5 psig	Yellow	GE30343X012	7.5	0.29	170	6.7
CS850 and CS854	345 to 690	5 to 10 psig	Green with White Stripe	GE30344X012	9.9	0.39	192	7.6

1. In order to achieve the complete spring range listed, in some applications it may be required to re-orient the actuator/spring case to point downward to utilize the weight of the internal components.

**Table 5. Approximate Internal Relief Valve Start-to-Discharge Pressure Above Setpoint**

CONTROL SPRING	SETPOINT		SET RANGE		INTERNAL RELIEF AND HIGH CAPACITY RELIEF				TOKEN RELIEF	
					Start-to-Discharge Pressure Range above Setpoint		Low Start-to-Discharge Option <sup>(1)</sup>		Start-to-Discharge Pressure Range above Setpoint	
	mbar	In. w.c.	mbar	In. w.c.			mbar	In. w.c.		
GE30337X012	10	4	9 to 15	3.5 to 6	27 to 42	11 to 18	17 to 35	7 to 14	15 to 35	6 to 14
GE30338X012	17	7	13 to 21	5.5 to 8.5	27 to 42	11 to 18	17 to 35	7 to 14	15 to 35	6 to 14
GE49043X012 (LIN)	17	7	13 to 21	5.5 to 8.5	27 to 42	11 to 18	17 to 35	7 to 14	15 to 35	6 to 14
GE30339X012	27	11	20 to 30	8 to 12	27 to 42	11 to 18	17 to 35	7 to 14	15 to 35	6 to 14
GE30340X012	35	14	25 to 40	10 to 16	27 to 42	11 to 18	17 to 35	7 to 14	15 to 35	6 to 14
GE30341X012	69	1 psig	35 to 75	14 to 30	17 to 69	7 in. w.c. to 1 psig	----	----	20 to 40	8 to 16
GE30342X012	138	2 psig	70 to 170	1 to 2.5 psig	17 to 138	7 in. w.c. to 2 psig	----	----	17 to 69	7 in. w.c. to 1 psig
GE46922X012	207	3 psig	100 to 240	1.5 to 3.5 psig	17 to 138	7 in. w.c. to 2 psig	----	----	35 to 100	0.5 to 1.5 psig
GE30343X012	345	5 psig	170 to 380	2.5 to 5.5 psig	17 to 170	7 in. w.c. to 2.5 psig	----	----	69 to 138	1 to 2 psig

1. Low start-to-discharge option is only available on the main control spring ranges up to 25 to 40 mbar / 10 to 16 in. w.c.

Outside North America Only

**Table 6. Secondary Seat™ Outlet Pressures**

CONTROL SPRING	SPRING RANGE		SETPOINT		SECONDARY SEAT SHUTOFF PRESSURE <sup>(2)</sup> (TYPES CS805 AND CS825)				DOWNSTREAM BUILD-UP PRESSURE <sup>(1)(2)(3)</sup> (TYPES CS806 AND CS826)			
					Up to 13 mm / 1/2 in. Orifice Size		Up to 22 mm / 7/8 in. Orifice Size		Up to 13 mm / 1/2 in. Orifice Size		Up to 22 mm / 7/8 in. Orifice Size	
Color	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.
Black	13 to 21	5.5 to 8.5	17	7	27	11	30	12	62	25	57	23
Brown (LIN)	13 to 21	5.5 to 8.5	17	7	27	11	30	12	62	25	57	23
White Stripe	25 to 40	10 to 16	35	14	47	19	50	20	89	36	81	33
Dark Green	35 to 75	14 to 30	69	1 psig	83	1.2 psig	90	1.3 psig	145	2.1 psig	138	2 psig
Dark Blue	69 to 170	1 to 2.5 psig	140	2 psig	179	2.6 psig	179	2.6 psig	262	3.8 psig	255	3.7 psig
Yellow	170 to 380	2.5 to 5.5 psig	345	5 psig	434	6.3 psig	434	6.3 psig	510	7.4 psig	565	8.2 psig

1. Downstream pressure buildup with Secondary Seat fixed bleed in operation and regulator relief valve relieving to atmosphere.
2. Outlet pressure values listed are at maximum operating inlet pressure rating per orifice.
3. If the outlet pressure rises above setpoint exceeding the pressure rating of the regulator, the internal parts must be inspected and replaced if damaged.

**Table 7. Types CS803 and CS823 Regulator and Integral True-Monitor™ Outlet Pressure Ranges without Token Relief**

Type	PRIMARY REGULATOR					INTEGRAL TRUE-MONITOR				
	Setpoint		Spring Range		Spring Color	Setpoint		Spring Range		Spring Color
	mbar	In. w.c.	mbar	In. w.c.		mbar	In. w.c.	mbar	In. w.c.	
CS803IN and CS803EN	10	4	9 to 15	3.5 to 6	Red	35	14	30 to 52	12 to 21	Blue
						52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	17	7	13 to 21	5.5 to 8.5	Black	35	14	30 to 52	12 to 21	Blue
						52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	17	7	13 to 21	5.5 to 8.5	Brown (LIN)	35	14	30 to 52	12 to 21	Blue
						52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	27	11	20 to 30	8 to 12	Purple	52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
						103	1.5 psig	97 to 200	1.4 to 2.9 psig	Black
	35	14	25 to 40	10 to 16	White	52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
						103	1.5 psig	97 to 200	1.4 to 2.9 psig	Black
69	1 psig	35 to 75	14 to 30	Dark Green	103	1.5 psig	97 to 200	1.4 to 2.9 psig	Black	
					138	2 psig	97 to 200	1.4 to 2.9 psig	Black	
					241	3.5 psig	179 to 255	2.6 to 3.7 psig	Purple	
CS823IN and CS823EN	138	2 psig	69 to 170	1 to 2.5 psig	Dark Blue	172	2.5 psig	97 to 200	1.4 to 2.9 psig	Black
						207	3 psig	179 to 255	2.6 to 3.7 psig	Purple
						345	5 psig	248 to 414	3.6 to 6 psig	Dark Blue
	207	3 psig	100 to 241	1.5 to 3.5 psig	Orange	241	3.5 psig	179 to 255	2.6 to 3.7 psig	Purple
						276	4 psig	248 to 414	3.6 to 6 psig	Dark Blue
						414	6 psig	352 to 517	5.1 to 7.5 psig	Red
345	5 psig	170 to 380	2.5 to 5.5 psig	Yellow	414	6 psig	352 to 517	5.1 to 7.5 psig	Red	
					483	7 psig	352 to 517	5.1 to 7.5 psig	Red	
					517	7.5 psig	352 to 517	5.1 to 7.5 psig	Red	

Outside North America Only

# CS800 Series

**Table 8. Primary Regulator and Integral True-Monitor™ Outlet Pressure Ranges with Token Relief**

Type	PRIMARY REGULATOR					INTEGRAL TRUE-MONITOR				
	Setpoint		Spring Pressure Range		Spring Color	Setpoint		Spring Pressure Range		Spring Color
	mbar	In. w.c.	mbar	In. w.c.		mbar	In. w.c.	mbar	In. w.c.	
CS803IT, CS803IL, CS803ET and CS803EL	10	4	9 to 15	3.5 to 6	Red	52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	17	7	13 to 21	5.5 to 8.5	Black	52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	17	7	13 to 21	5.5 to 8.5	Brown (LIN)	52	21	45 to 75	18 to 30	Green
						69	1 psig	65 to 99	26 to 40	Orange
	27	11	20 to 30	8 to 12	Purple	69	1 psig	65 to 99	26 to 40	Orange
						103	1.5 psig	97 to 200	1.4 to 2.9 psig	Black
	35	14	25 to 40	10 to 16	White	69	1 psig	65 to 99	26 to 40	Orange
						103	1.5 psig	97 to 200	1.4 to 2.9 psig	Black
	69	1 psig	35 to 75	14 to 30	Dark Green	138	2 psig	97 to 200	1.4 to 2.9 psig	Black
						207	3 psig	179 to 255	2.6 to 3.7 psig	Purple
CS823IT, CS823IL, CS823ET and CS823EL	138	2 psig	69 to 170	1 to 2.5 psig	Dark Blue	207	3 psig	179 to 255	2.6 to 3.7 psig	Purple
						276	4 psig	248 to 414	3.6 to 6 psig	Dark Blue
	207	3 psig	100 to 241	1.5 to 3.5 psig	Orange	345	5 psig	248 to 414	3.6 to 6 psig	Dark Blue
						414	6 psig	352 to 517	5.1 to 7.5 psig	Red
	345	5 psig	170 to 380	2.5 to 5.5 psig	Yellow	483	7 psig	352 to 517	5.1 to 7.5 psig	Red
						517	7.5 psig	352 to 517	5.1 to 7.5 psig	Red

**Table 9. CS800 Series Disk Color Selection**

PRESSURE REGISTRATION	TYPE	BODY SIZE		SPRING RANGE <sup>(1)</sup>		BODY MATERIAL	END CONNECTION	DISK COLOR	DISK ASSEMBLY PART NUMBER	REPAIR KIT <sup>(2)</sup>
		DN	In.	mbar	In. w.c.					
Internal	CS800	32 and 40	1-1/4 and 1-1/2	9 to 75	3.5 to 30	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2
				9 to 15	3.5 to 6	All Materials	All Connections	Green	GE29773X042	RCS800XGRN2
		50	2	13 to 21 and 20 to 30	5.5 to 8.5 and 8 to 12	Gray Cast Iron	All Connections	Blue	GE29773X032	RCS800XBLU2
						Ductile Iron or WCC Steel	Flanged	Blue	GE29773X032	RCS800XBLU2
							Threaded	Dark Gray	GE29773X082	RCS800XGRY2
			25 to 40 and 35 to 75	10 to 16 and 14 to 30	All Materials	All Connections	Green	GE29773X042	RCS800XGRN2	
	CS820 and CS850	All Sizes	69 to 690	1 to 10 psig	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2	
External	All	All Sizes	All	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2		

1. The 9 to 75 mbar / 3.5 to 30 in. w.c. spring range indicates that all of the springs within this range are applicable.  
2. Repair kit includes O-ring (key 19), disk assembly (key 36) and O-ring (key 62).

Outside North America Only



**Table 10. CS803 and CS804 Series Disk Color Selection**

PRESSURE REGISTRATION	TYPE	BODY SIZE		SPRING RANGE <sup>(1)</sup>		BODY MATERIAL	END CONNECTION	DISK COLOR	DISK ASSEMBLY PART NUMBER	REPAIR KIT <sup>(2)</sup>
		DN	In.	mbar	In. w.c.					
Internal	CS803 and CS804	40	1-1/2	9 to 75	3.5 to 30	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2
		50	2	9 to 15	3.5 to 6	All Materials	All Connections	Green	GE29773X042	RCS800XGRN2
				13 to 21 and 20 to 30	5.5 to 8.5 and 8 to 12	Ductile Iron or WCC Steel	Flanged	Blue	GE29773X032	RCS800XBLU2
						Gray Cast Iron	Threaded	Dark Gray	GE29773X082	RCS800XGRY2
				25 to 40 and 35 to 75	10 to 16 and 14 to 30	All Materials	All Connections	Blue	GE29773X032	RCS800XBLU2
	25 to 40 and 35 to 75	10 to 16 and 14 to 30	All Materials	All Connections	Green	GE29773X042	RCS800XGRN2			
CS823, CS824 and CS854	All Sizes	69 to 690	1 to 10 psig	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2		
External	All	All Sizes	All	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2		

1. The 9 to 75 mbar / 3.5 to 30 in. w.c. spring range indicates that all of the springs within this range are applicable.  
 2. Repair kit includes O-ring (key 19), disk assembly (key 36) and O-ring (key 62).

**Table 11. CS805 and CS806 Series Disk Color Selection**

PRESSURE REGISTRATION	TYPE	BODY SIZE		SPRING RANGE <sup>(1)</sup>		BODY MATERIAL	END CONNECTION	DISK COLOR	DISK ASSEMBLY PART NUMBER	REPAIR KIT <sup>(3)</sup>
		DN	In.	mbar	In. w.c.					
Internal	CS805 and CS806	32	1-1/4	9 to 75	3.5 to 30	Gray Cast Iron	All Connections	Yellow/White Dot	GE29773X062	RCS800XYEL2
		40	1-1/2					Green/White Dot	GE29773X092	RCS800XGR22
		50	2					White/White Dot <sup>(2)</sup>	GE29773X052	RCS800XWHT2
	CS825 and CS826	All Sizes	69 to 380	1 to 5.5 psig	Gray Cast Iron	All Connections	Yellow/White Dot	GE29773X062	RCS800XYEL2	
External	All	All Sizes	All	All Materials	All Connections	Black	GE29773X022	RCS800XBLK2		

1. The 9 to 75 mbar / 3.5 to 30 in. w.c. spring range indicates that all of the springs within this range are applicable.  
 2. White/White Dot disk requires the open end to be directed downstream with the direction of flow.  
 3. Repair kit includes O-ring (key 19), disk assembly (key 36) and O-ring (key 62).

**Table 12. Regulator and Slam-Shut Overpressure Shutoff (OPSO) Pressure Ranges**

REGULATOR					SLAM-SHUT DEVICE				
Type	Factory Setpoint		Spring Range		Factory Setpoint <sup>(1)</sup>		Spring Range <sup>(2)</sup>		Spring Part Number and Color
	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.	mbar	In. w.c.	
	Over Pressure Shut-off (OPSO)								
CS804	10	4	9 to 15	3.5 to 6	47	19	30 to 60	12 to 25	GF02168X012 / Brown
	17	7	14 to 21	5.5 to 8.5	55	22			
	17 (optional)	7 (optional)	14 to 21	5.5 to 8.5	62	25	40 to 110	16 to 44	GF02169X012 / Red
	27	11	20 to 30	8 to 12					
	35	14	25 to 40	10 to 16	75	30	60 to 190	24 to 78	GF02170X012 / Orange
	35 (optional)	14 (optional)	25 to 40	10 to 16	138	2 psig	97 to 283	1.4 to 4.1 psig	GF02171X012 / Pink
69	1 psig	35 to 75	14 to 30	138	2 psig				
CS824	138	2 psig	69 to 170	1 to 2.5 psig	241	3.5 psig	138 to 503	2 to 7.3 psig	GF02172X012 / Green
	207	3 psig	100 to 241	1.5 to 3.5 psig	345	5 psig			
	345	5 psig	170 to 380	2.5 to 5.5 psig	483	7 psig			
CS854	483	7 psig	345 to 690	5 to 10 psig	621	9 psig	400 to 896	5.8 to 13 psig	GF04353X012 / Yellow

1. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.  
 2. If Non-Factory OPSO setpoints are specified, the allowable OPSO setpoint cannot exceed the maximum of 3 psig / 207 mbar above the regulator setpoint in order to ensure no internal parts damage from overpressure.

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**Table 13. Regulator and Slam-Shut Underpressure Shutoff (UPSO) Pressure and Overpressure Shutoff (OPSO) Ranges**

REGULATOR					SLAM-SHUT DEVICE									
Type	Factory Setpoint		Spring Range		Under Pressure Shut-off (UPSO)				Over Pressure Shut-off (OPSO)					
	mbar	In. w.c.	mbar	In. w.c.	Factory Setpoint <sup>(1)</sup>		Spring Range		Spring Part Number and Color	Factory Setpoint <sup>(2)</sup>		Spring Range Over UPSO Setpoint <sup>(3)</sup>		Spring Part Number and Color
					mbar	In. w.c.	mbar	In. w.c.		mbar	In. w.c.	mbar	In. w.c.	
CS804	17	7	14 to 21	5.5 to 8.5	7	3	5 to 30	2 to 12	T14168T0012 / White	55	22	42 to 69	17 to 28	GF02168X012 / Brown
	27	11	20 to 30	8 to 12	15	6								
	35	14	25 to 40	10 to 16	22	9								
	69	1 psig	35 to 75	14 to 30	35	0.5 psig	25 to 160	0.36 to 2.3 psig	T14170T0012 / Silver	138	2 psig	90 to 214	1.3 to 3.1 psig	GF02170X012 / Orange
CS824	138	2 psig	69 to 170	1 to 2.5 psig	69	1 psig	25 to 160	0.36 to 2.3 psig	T14170T0012 / Silver	241	3.5 psig	90 to 214	1.3 to 3.1 psig	GF02170X012 / Orange
	207	3 psig	100 to 241	1.5 to 3.5 psig	121	1.75 psig	100 to 500	1.5 to 7.3 psig	FA142869X12 / Orange Stripe	345	5 psig	186 to 379	2.7 to 5.5 psig	GF02171X012 / Pink
	345	5 psig	170 to 380	2.5 to 5.5 psig	207	3 psig				483	7 psig			
CS854	483	7 psig	345 to 690	5 to 10 psig	241	3.5 psig	100 to 500	1.5 to 7.3 psig	FA142869X12 / Orange Stripe	621	9 psig	186 to 379	2.7 to 5.5 psig	GF02171X012 / Pink

1. If Non-Factory UPSO setpoints are specified, a minimum differential of 10 mbar / 4 in. w.c. between UPSO setpoint and regulator setpoint must be maintained in order to ensure a secure latch of the Slam-Shut.  
2. For units equipped with Token Relief, if Non-Factory Slam-shut OPSO setpoints are specified, they must be higher than the Token Relief Start-to-Discharge values provided in Table 5.  
3. If Non-Factory OPSO setpoints are specified, the allowable OPSO setpoint cannot exceed the maximum of 207 mbar / 3 psig above the regulator setpoint in order to ensure no internal parts damage from overpressure.

## Principle of Operation and Overpressure Protection

### Types CS800, CS820 and CS850 Base Regulator Operation

Refer to Figures 3 and 4. When downstream demand decreases, the pressure under the diaphragm increases. This pressure overcomes the regulator setting (which is set by the regulator control spring). Through the action of the pusher post assembly, lever and valve stem, the valve disk moves closer to the orifice and reduces gas flow. If demand downstream increases, pressure under the diaphragm decreases. Spring force pushes the pusher post assembly downward, the valve disk moves away from the orifice and the gas flow increases downstream as the regulator opens in response to the decreased pressure underneath the diaphragm.

### Stability Cartridge

In certain commercial and industrial applications, regulators may exhibit excessive noise, even in situations with small pressure reductions. This noise is often caused by a harmonic instability condition in the system which manifests itself in the regulator.

The stabilizer cartridge can be installed to eliminate harmonic instability in such applications. This device is a compact assembly that is installed in the throat of a Type CS800 regulator. See Installation Sheet D104125X012.

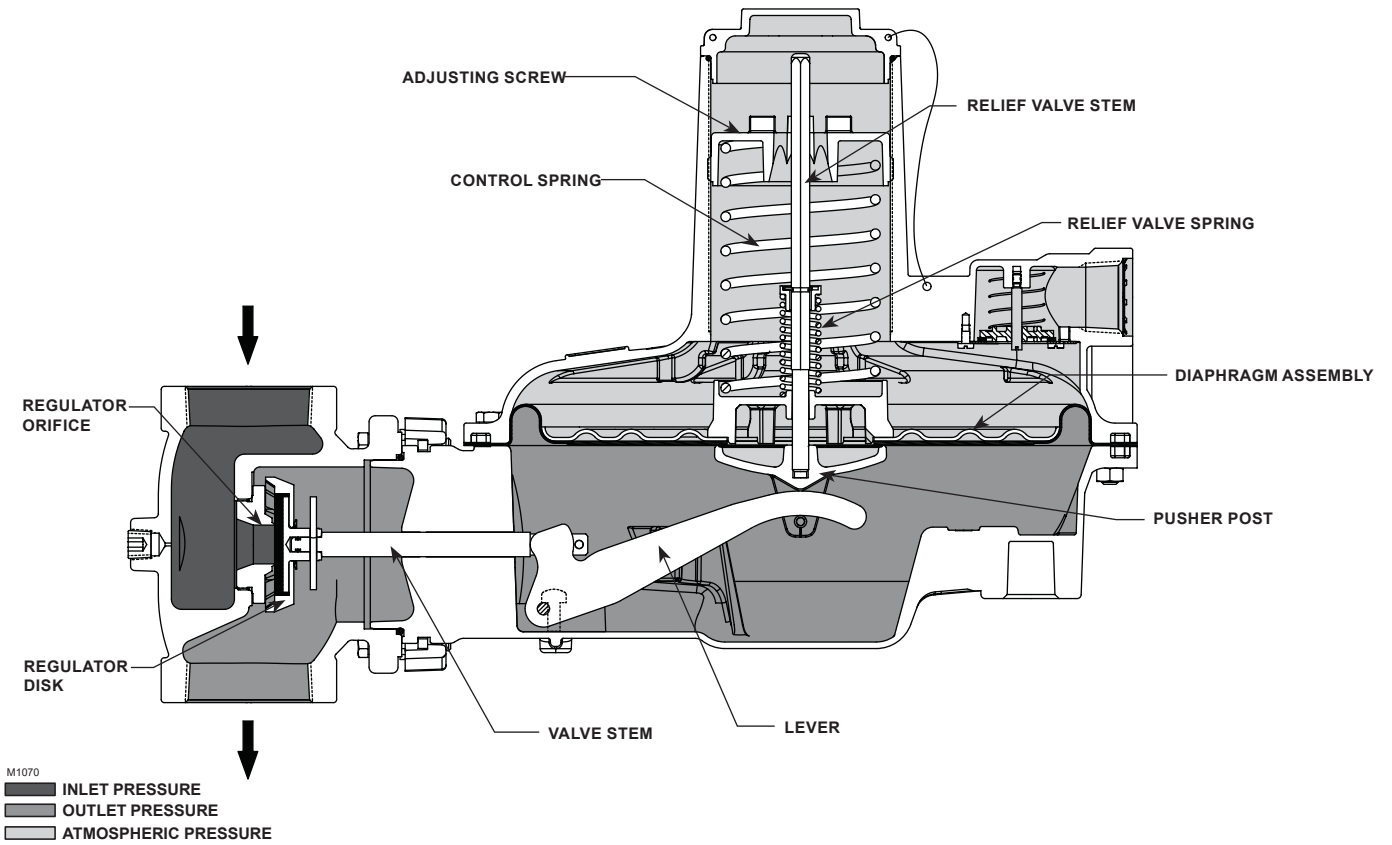


Figure 3. Type CS800IR Internally Registered Regulator with Internal Relief Operational Schematic

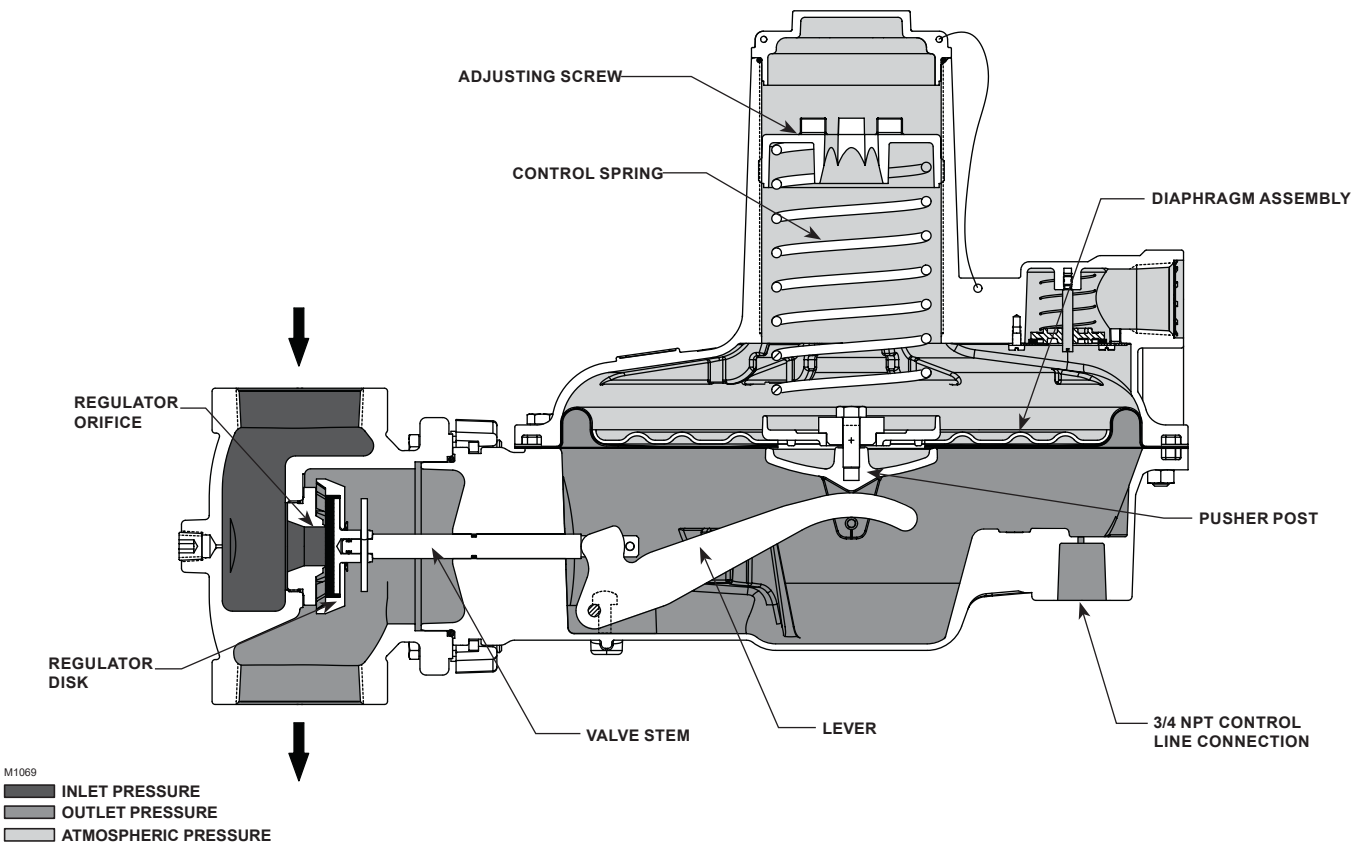
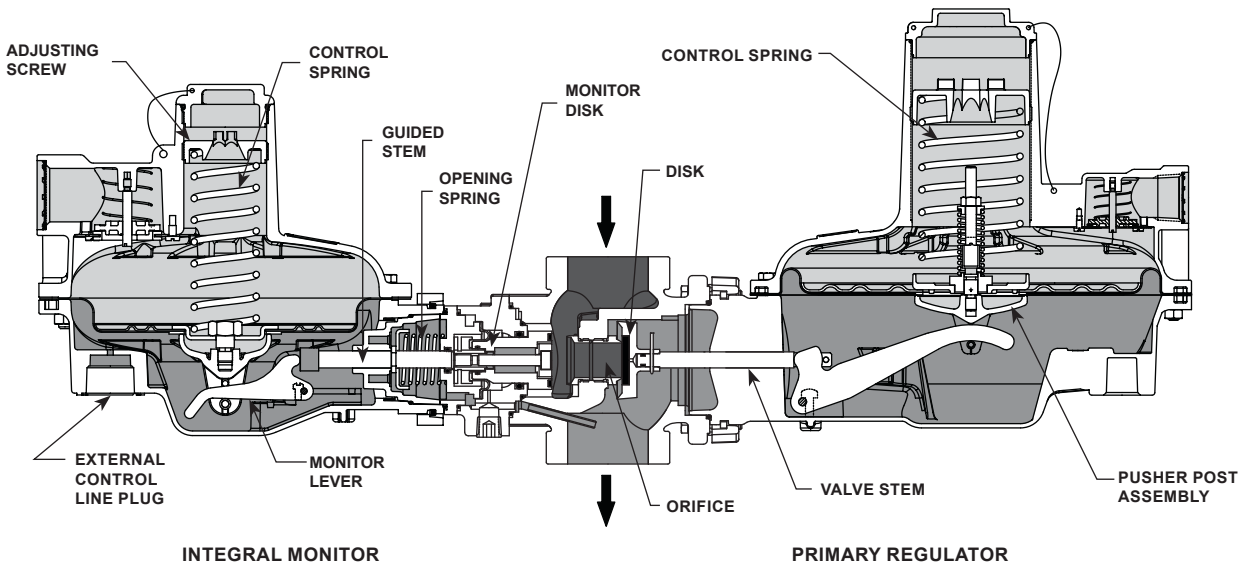


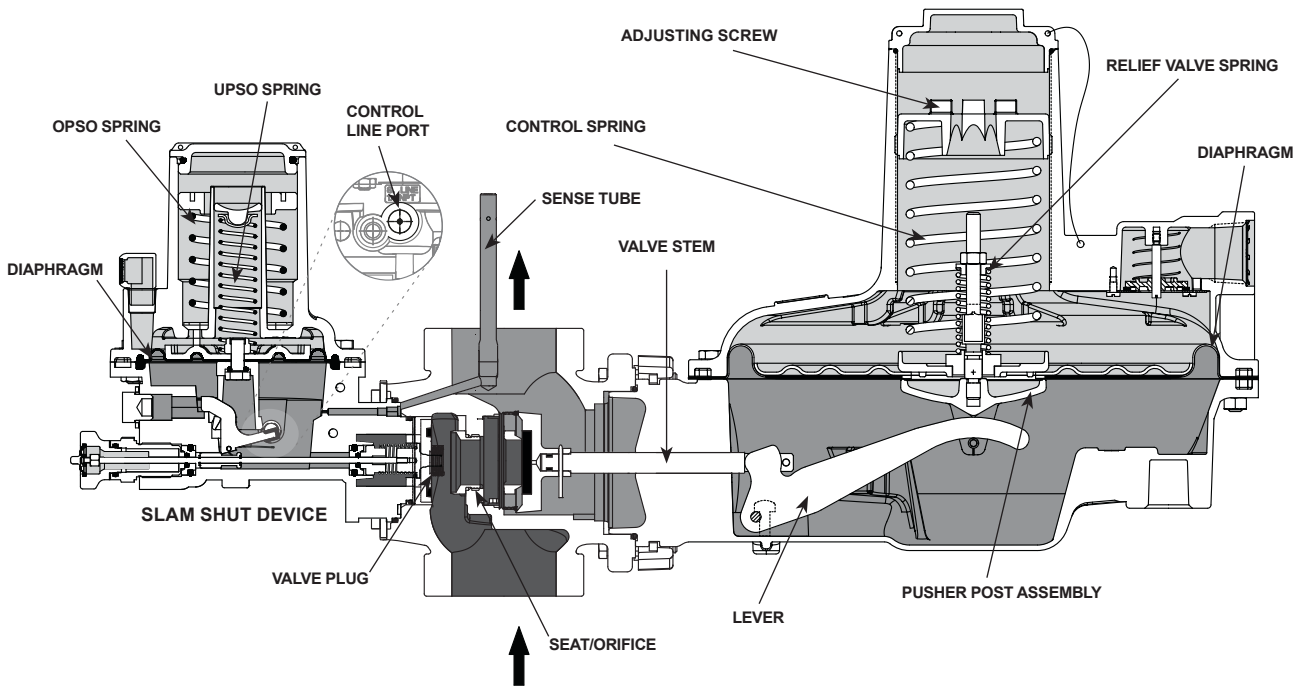
Figure 4. Type CS800EN Externally Registered Regulator Operational Schematic

# CS800 Series



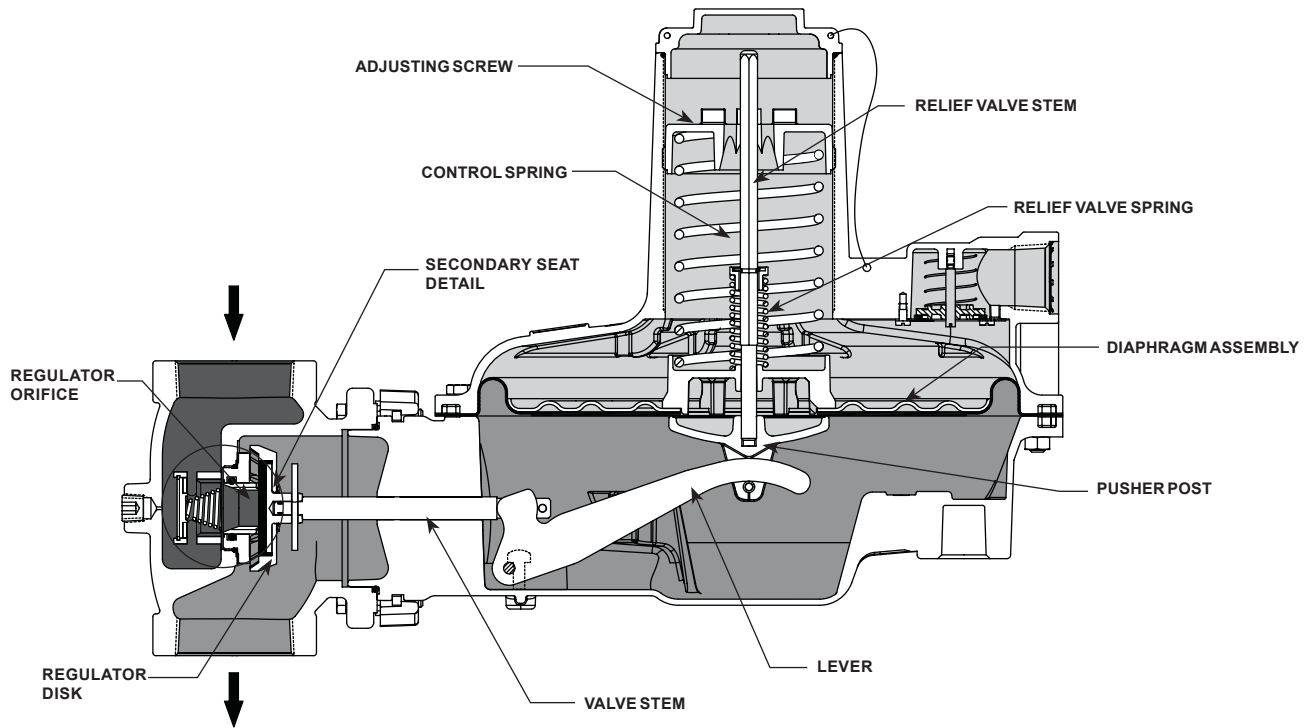
M1074  
 ■ INLET PRESSURE  
 ■ OUTLET PRESSURE  
 ■ ATMOSPHERIC PRESSURE

Figure 5. Type CS803IT Internally Registered Primary Regulator with Internally Registered Integral Monitor Operational Schematic

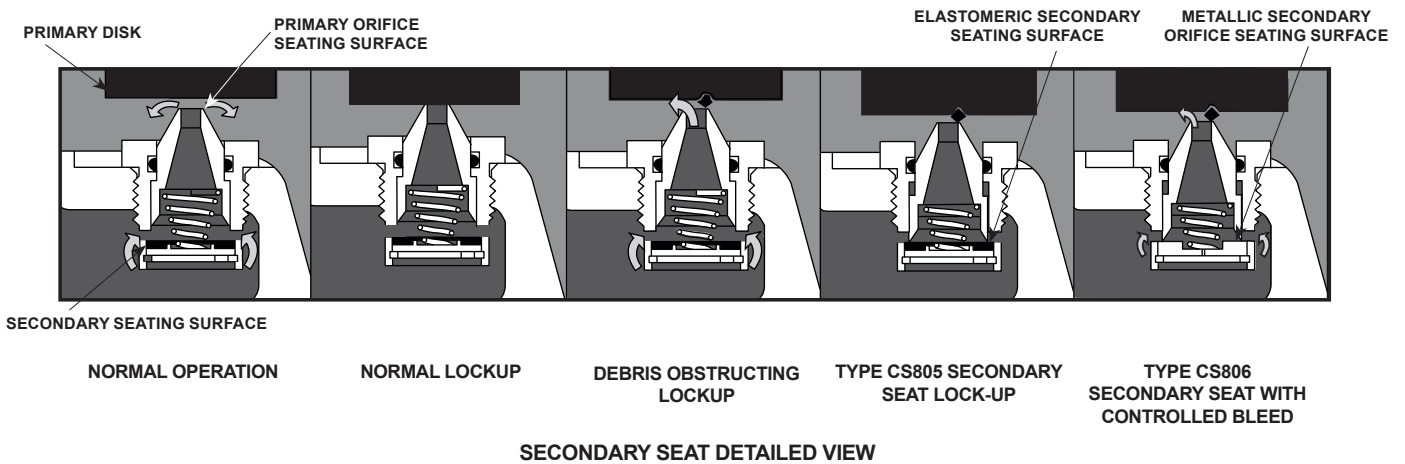


M1075  
 ■ INLET PRESSURE  
 ■ OUTLET PRESSURE  
 ■ ATMOSPHERIC PRESSURE

Figure 6. Type CS804IT Internally Registered Regulator with Slam-Shut Module Operational Schematic



M1072  
 ■ INLET PRESSURE  
 ■ OUTLET PRESSURE  
 ■ ATMOSPHERIC PRESSURE



M1072  
 ■ INLET PRESSURE  
 ■ OUTLET PRESSURE  
 ■ ATMOSPHERIC PRESSURE

Figure 7. CS805 Series with Secondary Seat™ Protection

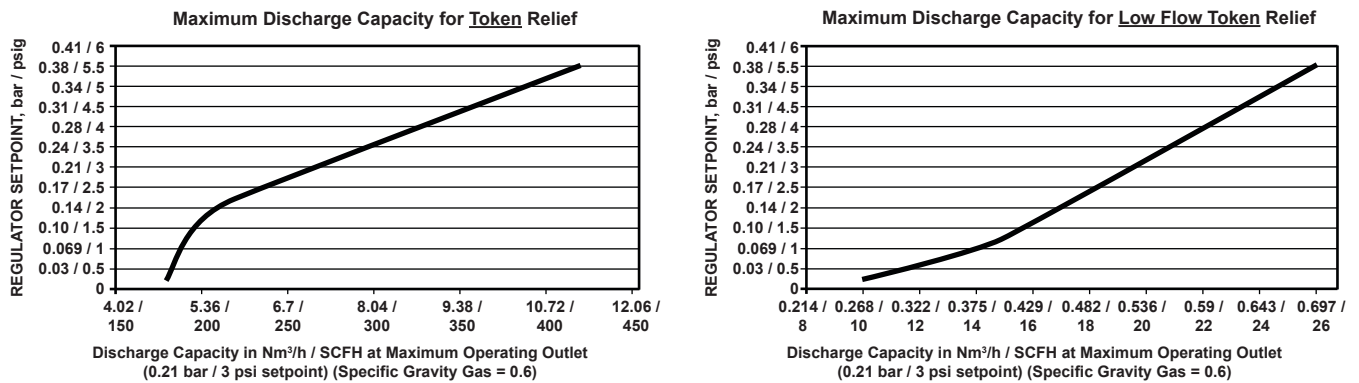


Figure 8. Maximum Discharge Capacity for Token and Low Flow Token Relief

## Relief Operation

### Internal Relief “R”

Type numbers with the “R” suffix, e.g., Type CS800IR, provide internal relief discharge through the diaphragm assembly (see Figure 3) to minimize overpressure. Any outlet pressure above the start-to-discharge point of the non-adjustable relief spring (see Table 5) moves the diaphragm off the relief seat, allowing excess pressure to discharge through the vent. If conditions should exist that prevent normal operation of the regulator or internal relief valve, the relief valve stem acts as a secondary travel stop contacting the underside of the closing cap and stopping the upward travel of the relief seat. Since the diaphragm continues to rise as downstream pressure builds, the diaphragm lifts off of the relief seat to provide relief operation. This secondary travel stop for internal relief is not available on token relieving units. Units with internal relief valve have 1 NPT vent size.

### High-Capacity Internal Relief “Q”

Type numbers with the “Q” suffix, e.g., Type CS800IQ, provide high capacity relief discharge across the diaphragm assembly to minimize overpressure. Any outlet pressure above the start-to-discharge point of the non-adjustable relief spring (see Table 5) moves the diaphragm off the relief seat, allowing excess pressure to discharge through the vent. If emergency conditions should exist that prevent normal operation of the regulator or internal relief valve, the relief valve stem acts as a secondary travel stop contacting the underside of the closing cap and stopping the upward travel of the relief seat. Since the diaphragm continues

to rise as downstream pressure builds, the diaphragm lifts off of the relief seat to provide relief operation. The secondary travel stop for internal relief is not available on token relieving units. Units with high capacity internal relief valve have 2-1/2 NPT vent size. Contact Factory if using stabilizer cartridge for data.

### Token Relief “T” and Low Flow Token Relief “L”

Type numbers with the “T” or “L” suffix, e.g., Types CS800IT and CS800IL provide a low capacity/token relief. Token relief provides relief from minor overpressure caused by nicks or dents on the orifice or by thermal expansion of gas in the downstream line. Token relief also provides a token or signal, in the form of odor, that an overpressure situation is occurring. Start-to-discharge values for Token reliefs are found in Table 5. Maximum discharge capacities for Token reliefs are found in Figure 8.

### Types CS803 and CS823 Integral True-Monitor™ Operation

Types CS803 and CS823 combine the operation of a conventional two-regulator wide-open monitor set into one body, see Figure 5. The Integral True-Monitor is installed on the inlet side of the body and serves to control downstream pressure in the situation where the Primary regulator can no longer regulate downstream pressure. During normal operation the True-Monitor is in a wide-open state as its setpoint is set higher than the primary regulator. See Tables 7 and 8 for guidance regarding the setpoints of the regulator and associated Integral Monitor sets. If the downstream pressure should rise to the setpoint of the True-Monitor due to loss of pressure control by the primary regulator,

the monitor will assume control and regulate flow to the downstream system. Internal and external downstream pressure registration are available. External pressure registration requires a downstream sensing line. See the Type TM600 Instruction Manual for additional details of operation.

If a Token relief is present, the token relief will relieve a small amount of gas to the atmosphere as an indication that the Integral Monitor is controlling the downstream pressure.

## Types CS804, CS824 and CS854 Slam-Shut Operation

The Type VSX8 Slam-shut module on the CS804 Series regulators is a fast acting shutoff device that provides overpressure (OPSO) or overpressure and underpressure (OPSO/UPSO) protection by completely shutting off the flow of gas to the downstream system. See Tables 12 and 13 for guidance regarding the typical setpoint of the regulator and associated OPSO and UPSO sets. The Type VSX8's actions are independent of the CS804 Series regulator and of variations to the inlet pressure. The Type VSX8 provides the option of internal or external downstream pressure registration. External registration requires a downstream sensing line.

The Type VSX8 shutoff disk is normally in the open (reset) position, see Figure 6. If the downstream pressure below the slam-shut diaphragm increases (or decreases) until it reaches the slam-shut setpoint, this diaphragm moves upward (or downward) to release the trip mechanism which allows the spring force on the stem to push the disk against the seat, shutting off all gas flow. To reset the slam-shut after gas has been shutoff, refer to Type VSX8 Instruction Manual, D103127X012, for additional details.

### Note

**In order for the Underpressure Shutoff (UPSO) of any slam-shut to be triggered, the downstream pipe pressure must drop below the UPSO setpoint. In the case of a downstream line break, numerous factors can prevent the downstream pipe pressure from decreasing below the slam-shut UPSO setpoint. These factors include the distance of pipe to the break, the diameter of the pipe, size of the break**

**and the number of restrictions, such as valves, elbows and bends, downstream of the regulator and/or slam-shut device. Due to these factors additional protections should be installed to stop flow in the event of a line break.**

## Types CS805 and CS825 with Secondary Seat™ Protection

### Note

**Types CS805 and CS825 regulators do not have any means to alert when the Secondary Seat operates at lockup. Therefore, it is recommended that Internal relief or high-capacity relief are also selected or the addition of some other method of overpressure protection be added in the downstream system as discussed in the Overpressure Protection section.**

Refer to Figure 7. The Type CS805 provides Secondary Seat Protection. As downstream demand decreases and downstream pressure rises to the regulator pressure lockup value, the regulator will lockup. If, however, damage has occurred to the primary disk, to the primary orifice seating surface or debris has become lodged between the primary disk and primary orifice, the outlet pressure will continue to rise. This additional pressure causes the primary disk to apply additional force to the orifice seating surface, which causes the Secondary seating surface to move toward the Secondary disk or sealing surface. If downstream demand decreases to zero, then the secondary seating surface will contact the sealing surface to provide lockup. See Table 6 for Secondary Seat shutoff above setpoint.

## Types CS806 and CS826 Secondary Seat Protection with Bleed

The Types CS806 and CS826 provides small bleed to the downstream system as an indication that the Secondary Seat is providing lock-up. In the event that the primary orifice and disk cannot provide lockup, the secondary seating surface will move into contact with a metal disk. This metal to metal interface, combined with a small drilled bleed hole, will allow a small amount of gas to bleed downstream thereby

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increasing outlet pressure until the internal relief valve begins to discharge gas to the atmosphere. The odor of this discharged gas provides an indication that the regulator is relying on the Secondary Seat for overpressure protection. See Table 6 for Secondary Seat maximum downstream buildup.

## Secondary Seat Protection Limitations

### Note

**Overpressure conditions can occur in the downstream piping when the Secondary Seat Protection is installed. The Secondary Seat Protection serves only as a backup to the primary seat for lockup. Refer to the sections on Overpressure Protection and Maintenance.**

Secondary Seat Protection does not provide additional overpressure protection in the event the secondary seat or disk is damaged by debris or contamination in the pipeline or from conditions that would cause the regulator to go wide-open.

## Installation

The CS800 Series regulators may be installed in any position. However, the spring case vent should be pointed downward. If gas escaping through the CS800 Series internal relief valve could constitute a hazard, the spring case vent must be piped to a location where escaping gas will not be hazardous. If the vented gas will be piped to another location, use obstruction-free tubing or piping at least equal in size to the vent; protect the end of the vent pipe from anything that might clog it. Regulators with External Registration require the use of an external control line.

## Non-Relieving “N”

Type numbers with the “N” suffix, e.g., Type CS800IN, do not provide internal relief discharge through the diaphragm assembly.

The CS800 Series regulators have outlet pressure ratings that are lower than their inlet pressure ratings. A pressure relieving or pressure limiting device is needed if the application inlet pressure can exceed the outlet pressure rating and the regulator is not equipped with internal relief, high capacity relief, Integral True-Monitor™ Protection or Secondary Seat™ Protection.

### Note

**Overpressuring any portion of a regulator or associated equipment may cause personal injury, leakage or property damage due to bursting of pressure-containing parts or explosion of accumulated gas. Provide appropriate pressure relieving or pressure limiting devices to ensure that the limits in the specifications section are not exceeded. Regulator operation within ratings does not prevent the possibility of damage from external sources or from debris in the pipeline.**

## Downstream Control Line Connection

A CS800 Series regulator with an EN, ET or ER in the type number has a blocked throat, an O-ring stem seal and a 3/4 NPT control line tapping in the lower diaphragm casing, see Figure 4. A regulator with a downstream control line is used for monitoring installations or other applications where there is other equipment installed between the regulator and the pressure control point. The O-ring stem seal helps separate body pressure from diaphragm case pressure on monitor installations where leakage cannot be tolerated.

## Capacity Information

Tables 14 and 15 provide natural gas regulating capacities at selected inlet pressures, outlet pressure settings and body outlet sizes. Flows are in Nm<sup>3</sup>/h (0°C and 1.01,325 bar) and SCFH (60°F and 14.7 psia) and of 0.6 specific gravity natural gas. To determine equivalent capacities for air, propane, butane or nitrogen, multiply the capacity number in the tables by the following appropriate conversion factor: 0.775 for air, 0.628 for propane, 0.548 for butane or 0.789 for nitrogen. For gases of other specific gravities, multiply the given capacity by 0.775 and divide by the square root of the appropriate specific gravity.



**Table 14.** Types CS800, CS803, CS804 Series Internal Registration Flow Capacities in Sm<sup>3</sup>/hr per EN334 for 2 in. / DN 50 Body Size, AC5

SEAT DIAMETER		OUTLET PRESSURE, mbar	INLET PRESSURE, bar										
mm	IN.		0.03	0.07	0.3	0.5	1	1.5	2	3	4	8	
9.5	3/8	10	9	19	45	49	81	114	146	192	165	218	
12.7	1/2		11	28	79	94	180	210	218	229	269	201	
15.8	5/8		16	38	118	137	181	200	212	137	251		
19.5	3/4		25	42	167	210	194	220	242	288	297		
25.4	1		34	58	185	241	301	337	240				
35.0	1-3/8		43	82	228	240	282						
9.5	3/8	20	14	17	44	60	93	119	142	187	218	297	
12.7	1/2		18	40	90	118	171	201	237	264	262	439	
15.8	5/8		24	41	113	162	213	248	302	312	523		
19.5	3/4		34	55	159	218	261	307	408	555	488		
25.4	1		46	79	224	298	434	487	476				
35.0	1-3/8		66	110	223	274	361						
9.5	3/8	50		16	44	60	93	144	175	234	262	349	
12.7	1/2			28	80	113	178	273	332	331	328	439	
15.8	5/8			32	110	163	262	334	346	348	372		
19.5	3/4			46	130	197	323	436	383	393	404		
25.4	1			62	174	261	394	523	557				
35.0	1-3/8			89	232	300	406						
9.5	3/8	100			43	60	93	140	168	234	298	496	
12.7	1/2				74	108	173	255	316	424	466	714	
15.8	5/8				100	149	247	352	425	497	579		
19.5	3/4				119	178	306	440	524	591	616		
25.4	1				173	261	410	489	552				
35.0	1-3/8				216	308	441						
9.5	3/8	200			50	62	90	123	151	217	283	528	
12.7	1/2				65	98	162	203	263	395	510	705	
15.8	5/8				80	128	214	267	355	491	572		
19.5	3/4				106	159	278	319	396	530	582		
25.4	1				151	228	372	414	503				
35.0	1-3/8				191	305	445						
9.5	3/8	300				48	108	115	143	192	243	532	
12.7	1/2					56	154	206	257	355	448	755	
15.8	5/8					98	193	270	349	493	615		
19.5	3/4					128	265	359	453	587	695		
25.4	1					159	356	394	516				
35.0	1-3/8					228	433						
9.5	3/8	500					92	99	126	179	232	390	
12.7	1/2							100	148	194	283	381	510
15.8	5/8							134	201	258	373	483	
19.5	3/4							160	241	309	446	577	
25.4	1							239	332	445			
35.0	1-3/8							319					

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**Table 15. Types CS800, CS803, CS804 Series Internal Registration Flow Capacities in Sm<sup>3</sup>/hr per EN334 for 2 in. / DN 50 Body Size, AC10**

SEAT DIAMETER		OUTLET PRESSURE, mbar	INLET PRESSURE, bar									
mm	IN.		0.03	0.07	0.3	0.5	1	1.5	2	3	4	8
9.5	3/8	10	11	24	56	61	101	143	183	239	207	273
12.7	1/2		13	35	99	117	225	263	272	286	337	251
15.8	5/8		20	47	148	171	227	250	265	171	314	
19.5	3/4		31	52	209	262	242	275	303	361	371	
25.4	1		43	73	231	301	376	422	300			
35.0	1-3/8		53	102	285	300	353					
9.5	3/8	20	18	22	55	75	116	148	177	233	272	371
12.7	1/2		23	50	112	148	214	251	296	330	328	548
15.8	5/8		30	52	141	203	267	310	378	390	654	
19.5	3/4		42	69	199	272	326	383	510	694	610	
25.4	1		57	98	280	373	542	609	595			
35.0	1-3/8		82	138	278	342	451					
9.5	3/8	50		20	55	75	116	148	181	238	303	490
12.7	1/2			35	98	142	223	278	338	425	464	804
15.8	5/8			41	138	204	328	418	488	525	648	
19.5	3/4			58	162	247	404	543	638	701	707	
25.4	1			78	217	326	493	569	595			
35.0	1-3/8			111	289	375	507					
9.5	3/8	100			54	75	116	148	178	239	301	540
12.7	1/2				93	135	216	280	337	452	562	886
15.8	5/8				125	186	309	398	488	653	815	
19.5	3/4				149	222	382	525	630	742	790	
25.4	1				216	326	513	619	683			
35.0	1-3/8				270	384	551					
9.5	3/8	200			65	90	113	146	176	239	302	542
12.7	1/2				81	123	203	268	326	448	565	885
15.8	5/8				100	160	268	365	460	628	782	
19.5	3/4				132	199	348	474	581	725	816	
25.4	1				188	286	465	591	686			
35.0	1-3/8				239	382	556					
9.5	3/8	300				60	135	143	179	239	304	547
12.7	1/2					70	192	257	321	444	560	893
15.8	5/8					123	241	337	436	616	769	
19.5	3/4					160	331	449	566	734	869	
25.4	1					199	445	590	689			
35.0	1-3/8					286	541					
9.5	3/8	500					115	123	157	223	290	531
12.7	1/2						125	185	243	354	476	774
15.8	5/8						168	252	323	467	603	
19.5	3/4						200	301	386	558	721	
25.4	1						299	415	556			
35.0	1-3/8						398					

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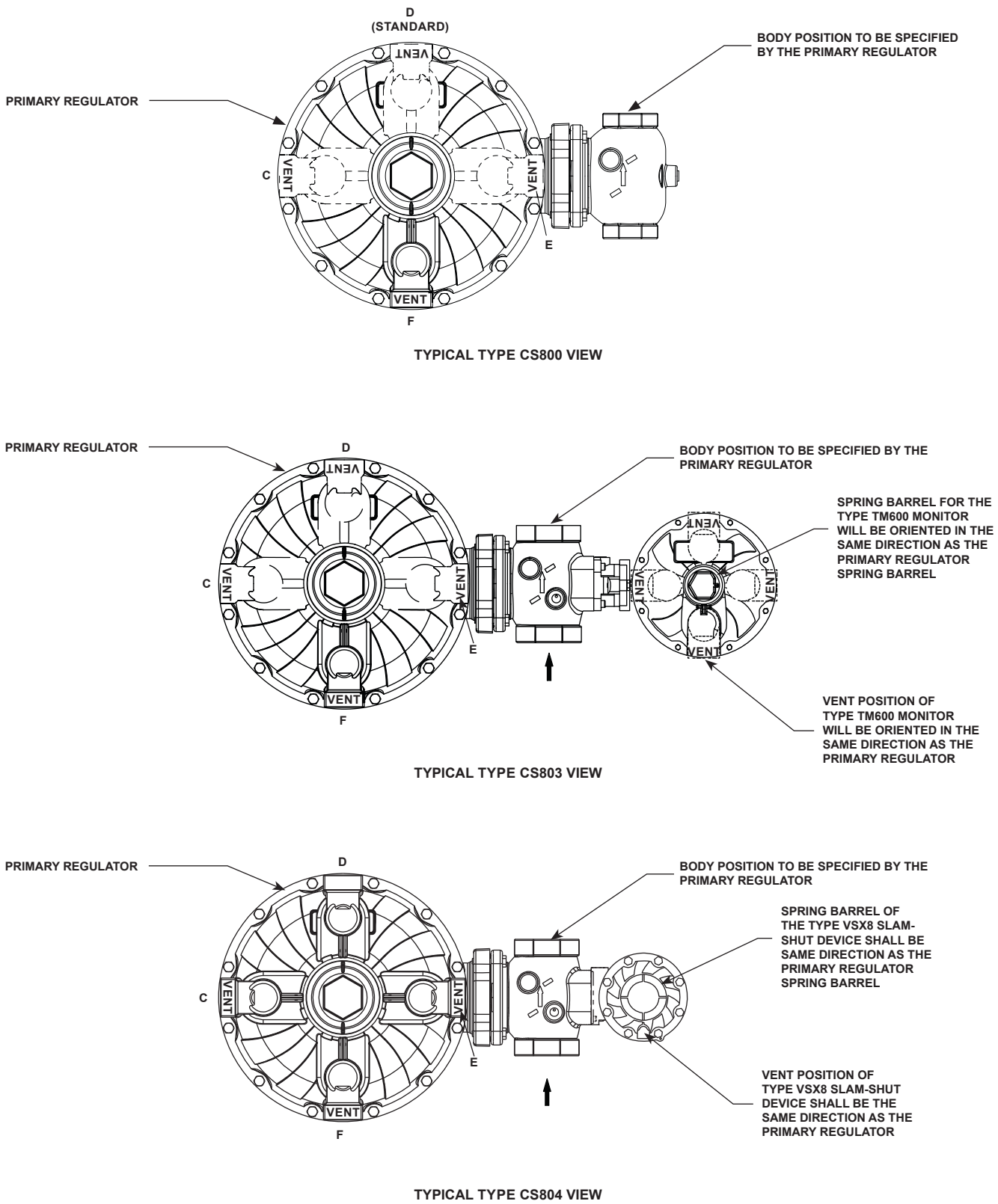


Figure 9. Spring Case Vent and Body Orientation

# CS800 Series

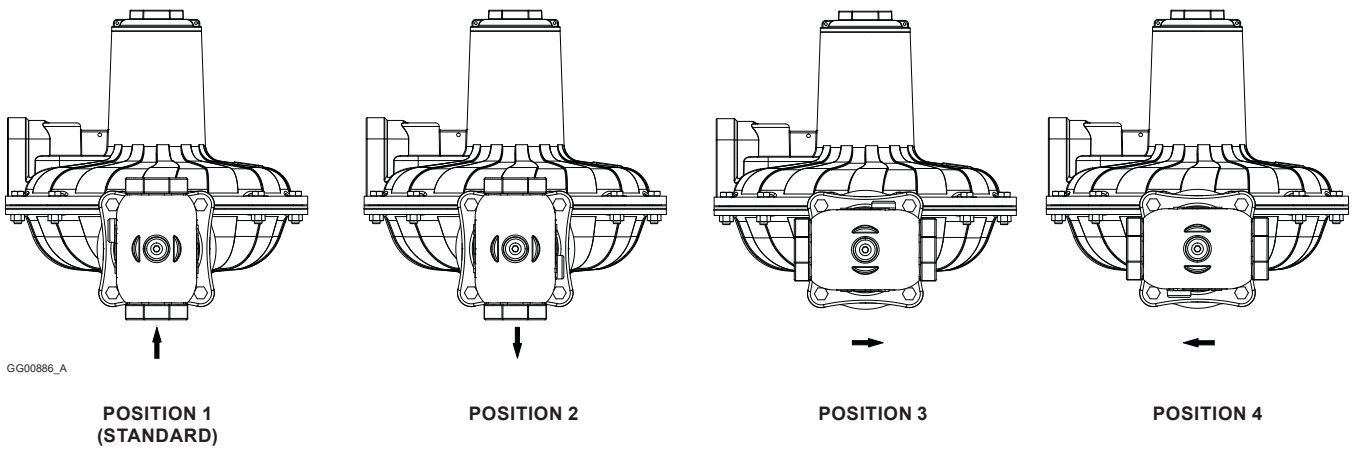
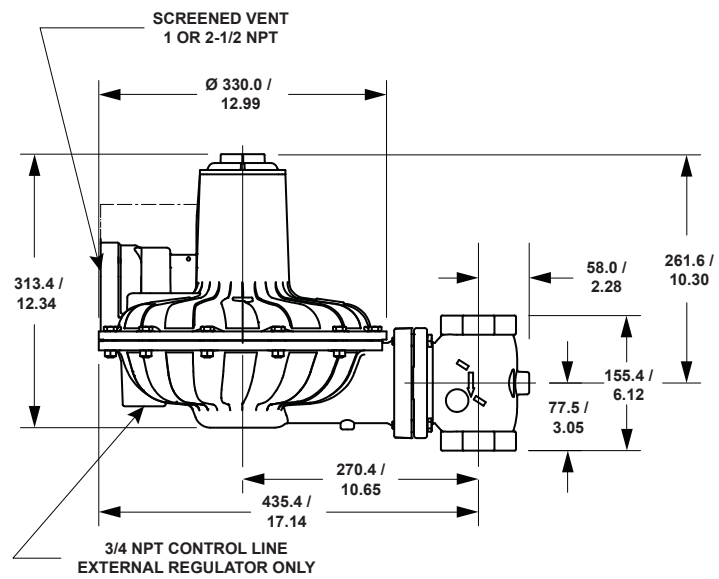


Figure 9. Spring Case Vent and Body Orientation (continued)



**TYPE CS800 REGULATOR MAIN VALVE**

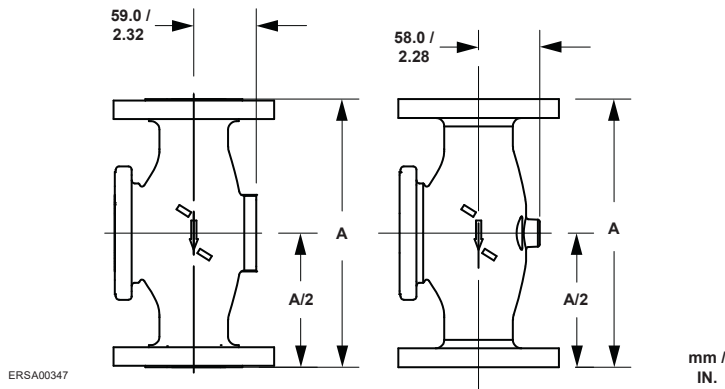
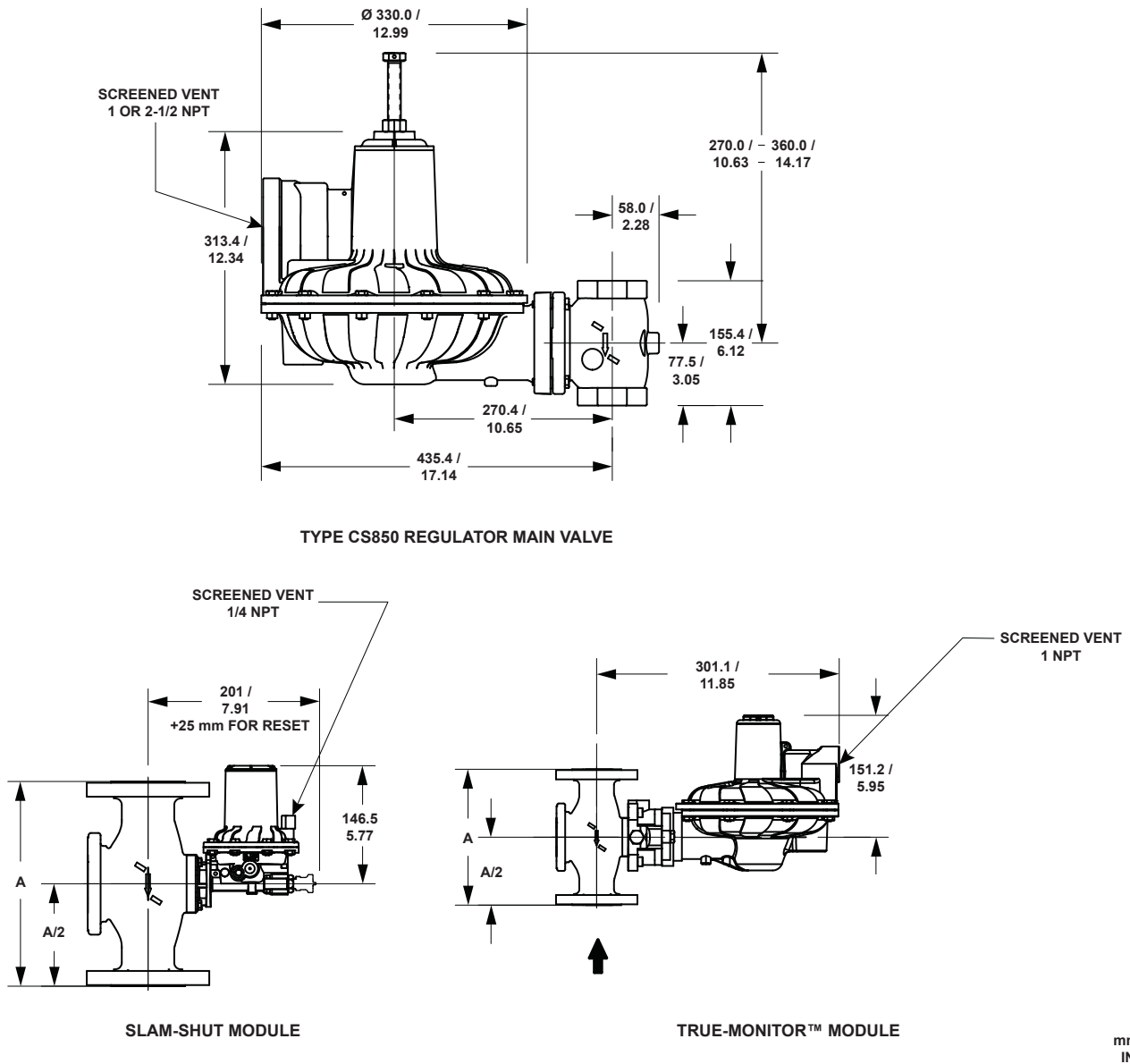


Figure 10. Dimensions

Outside North America Only



mm /  
IN.

Outside North America Only

ERSA00347

Figure 10. Dimensions (continued)

Table 16. Dimensions

BODY SIZE		END CONNECTION STYLE	DIMENSION A			
DN	In.		mm		In.	
----	1-1/4 to 2	NPT or Rp	155		6.12	
50 <sup>(1)</sup>	2 <sup>(1)</sup>	CL125 FF Flange	191	254	7.5	10
50 <sup>(2)</sup>	2 <sup>(2)</sup>	CL125 FF, CL150 FF or PN 10/16 Flange				
50 <sup>(2)</sup>	2 <sup>(2)</sup>	CL125 FF or CL150 FF Flange	267		10.5	
50 <sup>(3)</sup>	2 <sup>(3)</sup>	CL150 RF or PN 16 Flange	254		10	

1. For Cast Iron.  
2. For Ductile Iron.  
3. For Steel.

# CS800 Series

## 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

**Type** (See Table 1 for Construction Features)  
(Select One)

### Stand-Alone Regulator

- CS800IN
- CS800IR
- CS800IT
- CS800IQ
- CS800IL
- CS800EN
- CS800ET
- CS800EL
- CS820IN
- CS820IR
- CS820IT
- CS820IQ
- CS820IL
- CS820EN
- CS820ET
- CS820EL
- CS850IN
- CS850EN

### With Integral True-Monitor™ Module

- CS803IN
- CS803IT
- CS803IL
- CS803EN
- CS803ET
- CS803EL
- CS823IN
- CS823IT
- CS823IL
- CS823EN
- CS823ET
- CS823EL

### With Type Secondary Seat™ Protection Without Vent

- CS805IN
- CS805IR
- CS805IT
- CS805IQ
- CS825IN
- CS825IR
- CS825IT
- CS825IQ

### With Type Secondary Seat Protection with Vent

- CS806IR
- CS806IQ
- CS826IR
- CS826IQ

### With Slam Shut

- CS804IN
- CS804IT
- CS804IL
- CS804EN
- CS804ET
- CS804EL
- CS824IN
- CS824IT
- CS824IL
- CS824EN
- CS824ET
- CS824EL
- CS854IN
- CS854EN

### Body Material, Body Size and End Connection (Select One)

#### Gray Cast Iron (Types CS800, CS805, CS806, CS820, CS825, CS826 and CS850)

- 1-1/4 NPT\*\*\*
- 1-1/2 NPT\*\*\*
- 2 NPT\*\*\*
- DN 50 / NPS 2, CL125 FF\*\*\*

*Face-to-face dimension:*

- 191 mm / 7.5 in.
- 254 mm / 10 in.

#### Gray Cast Iron (Types CS803, CS823, CS804, CS824 and CS854)

- 2 NPT\*\*\*

#### Ductile Iron (Types CS800, CS803, CS820, CS823 and CS850)

- 1-1/4 NPT\*\*\*
- 1-1/2 NPT\*\*\*
- 2 NPT\*\*\*
- Rp 1-1/4\*\*\*
- Rp 1-1/2\*\*\*
- Rp 2\*\*\*
- NPS 2 / DN 50, CL125 FF / CL150 FF\*\*\*

*Face-to-face dimension:*

- 191 mm / 7.5 in.
- 254 mm / 10 in.
- 267 mm / 10.5 in.

- DN 50 / NPS 2, PN 10/16\*\*\*

*Face-to-face dimension:*

- 191 mm / 7.5 in.
- 254 mm / 10 in.

- continued -

## Ordering Guide (continued)

### Ductile Iron (Types CS804, CS824 and CS854)

- 1-1/2 NPT\*\*\*
- 2 NPT\*\*\*
- Rp 2\*\*\*
- DN 50 / NPS 2, CL125 FF / CL150 FF\*\*\*
- Face-to-face dimension:*
  - 254 mm / 10 in.
  - 267 mm / 10.5 in.
- DN 50 / NPS 2, PN 10/16\*\*\*<sup>(1)</sup>

### WCC Steel (Types CS800, CS803, CS820, CS823 and CS850)

- 1-1/4 NPT\*\*\*
- 1-1/2 NPT\*\*\*
- 2 NPT\*\*\*
- Rp 1-1/4\*\*\*
- Rp 1-1/2\*\*\*
- Rp 2\*\*\*
- DN 50 / NPS 2, CL150 RF\*\*\*<sup>(1)</sup>
- DN 50 / NPS 2, PN 10/16\*\*\*<sup>(1)</sup>

### WCC Steel (Types CS804, CS824 and CS854)

- 1-1/2 NPT\*\*\*
- 2 NPT\*\*\*
- Rp 2\*\*\*
- DN 50 / NPS 2, CL150 RF\*\*\*<sup>(1)</sup>
- DN 50 / NPS 2, PN 10/16\*\*\*<sup>(1)</sup>

### Outlet Pressure Range

(See Table 4) (Select One)

- 9 to 15 mbar / 3.5 to 6 in. w.c., Red
- 13 to 21 mbar / 5.5 to 8.5 in. w.c., Black
- 13 to 21 mbar / 5.5 to 8.5 in. w.c., Brown
- 20 to 30 mbar / 8 to 12 in. w.c., Purple
- 25 to 40 mbar / 10 to 16 in. w.c., White
- 35 to 75 mbar / 14 to 30 in. w.c., Dark Green
- 69 to 170 mbar / 1 to 2.5 psig, Dark Blue
- 100 to 241 mbar / 1.5 to 3.5 psig, Orange
- 170 to 380 mbar / 2.5 to 5.5 psig, Yellow
- 345 to 690 mbar / 5 to 10 psig, Green with White Stripe

### Orifice Size (Select One)

#### Types CS800, CS804, CS820, CS824, CS850 and CS854

- 6.4 mm / 1/4 in.
- 9.5 mm / 3/8 in.
- 13 mm / 1/2 in.
- 16 mm / 5/8 in.
- 19 mm / 3/4 in.
- 22 mm / 7/8 in.
- 25 mm / 1 in.
- 34.9 mm / 1-3/8 in.

#### Types CS803 and CS823

- 6.4 mm / 1/4 in.
- 9.5 mm / 3/8 in.
- 13 mm / 1/2 in.
- 16 mm / 5/8 in.
- 19 mm / 3/4 in.
- 22 mm / 7/8 in.
- 25 mm / 1 in.

### Types CS805, CS825, CS855, CS806, CS826 and CS856

- 9.5 mm / 3/8 in.
- 13 mm / 1/2 in.
- 16 mm / 5/8 in.
- 19 mm / 3/4 in.
- 22 mm / 7/8 in.

### Body Orientation (Select one, see Figure 9)

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

### Vent Orientation (Select one)

- Position C\*\*\*
- Position D (standard)\*\*\*
- Position E\*\*\*
- Position F\*\*\*

### True-Monitor™ Control Pressure Range (For CS803 and CS823 Series)

(See Tables 7 and 8, select one if applicable)

- 30 to 52 mbar / 12 to 21 in. w.c., Blue
- 45 to 75 mbar / 18 to 30 in. w.c., Green
- 65 to 99 mbar / 26 to 40 in. w.c., Orange
- 97 to 200 mbar / 1.4 to 2.9 psig, Black
- 179 to 255 mbar / 2.6 to 3.7 psig, Purple
- 248 to 414 mbar / 3.6 to 6 psig, Dark Blue
- 352 to 517 mbar / 5.1 to 7.5 psig, Red

### Slam-Shut Trip Pressure Setting

(For CS804, CS824 and CS854 Series)

(Select one if applicable and specify setpoint/s)

- Overpressure Protection Only (OPSO)**  
Supply setpoint required \_\_\_\_\_

- Overpressure and Underpressure Protection (OPSO/UPSO)**  
Supply overpressure setpoint required \_\_\_\_\_

Supply underpressure setpoint required \_\_\_\_\_

### Options (Select all that apply)

- Enhanced Low Inlet Pressure Flow Performance  
Choose this option for enhanced flow performance for low inlet pressure systems, up to 1.7 bar / 25 psig. This option applies to the 13 to 21 mbar 5.5 to 8.5 in. w.c. spring range when combined with 2 in. threaded or flanged bodies only.
- Low Relief Start-to-Discharge (STD) Spring  
This option provides a relief start-to-discharge range of 17 to 35 mbar / 7 to 14 in. w.c. above setpoint for the Type CS800IR or CS800IQ with a spring range of up to 25 to 40 mbar / 10 to 16 in. w.c.
- Closing Cap and Setpoint Seal Wire
- Stabilizer Cartridge

- continued -

1. 254 mm / 10 in. face-to-face dimension

# CS800 Series

## Ordering Guide (continued)

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:**  
 Specific Use \_\_\_\_\_  
 Line Size \_\_\_\_\_  
 Gas Type and Specific Gravity \_\_\_\_\_  
 Gas 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 ( $P_{1max}$ ) \_\_\_\_\_  
 Minimum Inlet Pressure ( $P_{1min}$ ) \_\_\_\_\_  
 Downstream Pressure Setting(s) ( $P_2$ ) \_\_\_\_\_  
 Maximum Flow ( $Q_{max}$ ) \_\_\_\_\_

**Performance Required:**  
 Accuracy Requirements? \_\_\_\_\_  
 Need for Extremely Fast Response? \_\_\_\_\_

**Other Requirements:** \_\_\_\_\_

Outside North America Only

-  [Webadmin.Regulators@emerson.com](mailto:Webadmin.Regulators@emerson.com)
-  [Facebook.com/EmersonAutomationSolutions](https://Facebook.com/EmersonAutomationSolutions)
-  [Fisher.com](http://Fisher.com)
-  [LinkedIn.com/company/emerson-automation-solutions](https://LinkedIn.com/company/emerson-automation-solutions)
-  [Twitter.com/emr\\_automation](https://Twitter.com/emr_automation)

### 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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