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: CSB700 Series Commercial / Industrial Pressure Reducing Regulators Instruction Manual, D103483X012.

P.E.D. Categories

This product may be used as a pressure accessory with pressure equipment in the following Pressure Equipment Directive. For information on the current PED revision see Bulletin: *D103053X012*. Pressure regulator does not require any supplementary upstream safety accessory for protection against overpressure compared with its design pressure PS, when upstream reducing station is sized for a maximum downstream incidental MIPd <= 1.1 PS.

TYPE	DESCRIPTION	PED CATEGORY	FLUID GROUP
CSB700, CSB700F, CSB720, CSB720F and CSB750	Base regulator	I	Groups 1 and 2 according to PED 2014/68/EU, 1st and 2nd family gas according to EN 437 or other gases (compressed air, nitrogen). The gas must be non-corrosive, clean (filtration on inlet side necessary) and dry.
CSB704, CSB704F, CSB724F CSB724 and CSB754	Regulator with Slam-shut Module	IV	
European EN Reference Standards		EN334 and EN14382	

Specifications

Available Configurations
See Table 1

Regulator Type
Differential Strength (DS)

Accuracy Class
Up to AC5 (depending on Outlet Pressure)

Lockup Class
Up to SG10 (depending on Outlet Pressure)

Failure Mode per EN334
Fail Open (FO)

Integral Strength (IS) Pressure Ratings(1)
See Table 2

Differential Strength (DS) Pressure Ratings(1)
See Table 3

Body Sizes, Materials, End Connections and Pressure Ratings(1)
See Table 4

Operating Pressure Range(1)
Regulator: See Table 5
Slam-Shut Module: See Tables 7a, 7b, 7c and 7d

Maximum Outlet Pressure(1)
Emergency Casing:
Type CSB700/CSB700F/CSB720/CSB720F: 4.0 bar / 58.0 psig
Type CSB750: 5.0 bar / 72.5 psig
To Avoid Internal Metallic Parts Damage:
Type CSB700/CSB700F/CSB720/CSB720F: 0.34 bar / 5.0 psig over set pressure
Type CSB750: 1.5 bar / 21.8 psig over set pressure — not to exceed maximum emergency outlet
Operating Casing:
Type CSB700/CSB720: 1.1 bar / 16.2 psig
Type CSB750: 5.0 bar / 72.5 psig

Outlet Pressure Ranges(1)
9.0 mbar to 4.0 bar / 0.13 to 58.0 psig
See Table 5

Orifice Size:
35 mm / 1-3/8 in.

Pressure Registration
External

Temperature Capabilities(1)(2)(3)
According to PED Standards:
-20 to 66°C / -4 to 151°F
Non-PED:
-30 to 66°C / -22 to 151°F

Spring Case Vent Connection
1 NPT: Types CSB700 and CSB720
1/2 NPT: Type CSB750

Type VSX8 Slam-Shut Device Maximum Inlet Pressure (P_{umax})(1):
Differential Strength (DS): 16 bar / 232 psig
Integral Strength (IS): 6.0 bar / 87 psig

Approximate Weights
with Threaded body
Type CSB700/CSB720: 13 kg / 29 lbs
Type CSB750 : 14 kg / 31 lbs
Type CSB704/CSB724: 14 kg / 31 lbs
Type CSB754 : 15 kg / 33 lbs
with Flanged body
Add 5.2 kg / 11 lbs to weights listed

Designed, Tested and Evaluated Consistent With:
ANSI B16, ASME BPVC Sec. VIII Div. I, ASTM B117 (Corrosion Resistance), EN334 and EN14382

Directive ATEX Information
See Table 6
For information about ATEX, refer to CSB700 Series (D103483X012) and VSX4/VSX8 Series (D103127X012) Instruction Manuals.

1. The pressure/temperature limits in this Installation Guide or any applicable standard limitation should not be exceeded.
2. Standard token relief set values listed in Table 6 are based on -20 to 60°C / -4 to 140°F.
3. Product has passed Emerson Process Management Regulator Technologies, Inc. (Emerson) testing for lockup, relief start-to-discharge and reseal down to -40°.

Table 1. *Available Configurations*

TYPE NUMBER								OPTION
C	S	B	7					
								PRESSURE CONSTRUCTION
				0				Low Pressure Applications *(Outlet Pressure: 9 to 110 mbar / 3.6 in. w.c. to 1.60 psig)*[2]
				2				Medium Pressure Applications *(Outlet Pressure: 61 to 780 mbar / 0.9 to 11.3 psig)*[2]
				5				High Pressure Applications *(Outlet Pressure: 0.7 to 4 bar / 10.2 to 58 psig)*[2]
								OVERPRESSURE PROTECTION
					0			Without Overpressure Protection Module
					0F			Without Overpressure Protection Module *(Outlet Pressure: 9 to 110 mbar / 3.6 in. w.c. to 1.60 psig and 270 to 325 mbar / 3.9 to 4.7 psig only)*[2]
					4			With Type VSX8 Slam-shut Module[1]
					4F			With Type VSX8 Slam-shut Module[1] *(Outlet Pressure: 9 to 110 mbar / 3.6 in. w.c. to 1.60 psig and 270 to 325 mbar / 3.9 to 4.7 psig only)*[2]
								PRESSURE REGISTRATION
						E		External
								RELIEF
							N	None
							T	Token Internal Relief[3]

Example: Type number CSB724ET: Type CSB700 regulator constructed for medium pressure applications, with Type VSX8 Slam-shut Module, with External pressure registration and with Token relief.

1. Reference Instruction Manual D103127X012 for information regarding the Type VSX8 Slam-shut Module.
2. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.
3. Token relief not available for outlet pressure above 500 mbar / 8 psig.

Table 2. *Integral Strength (IS) Pressure Ratings*[1]

TYPE	MAXIMUM ALLOWABLE PRESSURE / MAXIMUM EMERGENCY INLET PRESSURE		MAXIMUM OPERATING INLET PRESSURE[2]	
	P_S		P_{UMAX}	
	bar	psig	bar	psig
CSB700 and CSB704	4.0	58.0	4.0	58.0
CSB700F and CSB704F				
CSB720 and CSB724				
CSB720F and CSB724F				
CSB750 and CSB754	5.0	72.5	5.0	72.5

1. Applicable only to applications where the inlet rating cannot exceed the outlet rating.
2. For the Integral Strength (IS version), the maximum value of P_s and P_{umax} should be similar to the PSD used for the Differential Strength (DS) version.

Table 3. *Differential Strength (DS) Pressure Ratings and Flow and Sizing Coefficients*

TYPE	SPECIFIC MAXIMUM ALLOWABLE PRESSURE / MAXIMUM EMERGENCY OUTLET PRESSURE		MAXIMUM ALLOWABLE PRESSURE / MAXIMUM EMERGENCY INLET PRESSURE		MAXIMUM OPERATING INLET PRESSURE		ORIFICE SIZE		WIDE-OPEN FLOW COEFFICIENT			IEC SIZING COEFFICIENT		
	P_{SD}		P_S		P_{UMAX}									
	bar	psig	bar	psig	bar	psig	mm	In.	C_g	C_v	C_1	X_T	F_D	F_L
CSB700 and CSB704	4.0	58.0	12.0	174	10	145	35	1-3/8	1080	27.7	39	0.96	0.89	0.66
CSB700F and CSB704F					6	87								
CSB720F and CSB724F														
CSB720 and CSB724			20.0	290	16	232								
CSB750 and CSB754	5.0	72.5	20.0	290	16	232								

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

Table 4. *Body Sizes, Material, End Connections and Cold Working Pressure Ratings*

BODY MATERIAL	BODY SIZE		END CONNECTION	FACE-TO-FACE DIMENSION		BODY PRESSURE RATING	
	DN	NPS		mm	In.	bar	psig
Ductile Iron	40	1-1/2	NPT	155	6.10	17.2	250
	50	2					
	40	1-1/2	Rp				
	50	2					
	50	2	CL125 FF/CL150 FF	191	7.52		
	50	2		254	10.0		
	50	2		267	10.5		
	50	2	PN 10/16	191	7.52	16.0	232
	50	2		200	7.87		
	50	2		254	10.0		
	40	1-1/2	PN 16 Slip-On	222	8.74		
WCC Steel	40	1-1/2	NPT	155	6.10	20.0	290
	50	2					
	40	1-1/2	Rp				
	50	2					
	50	2	CL150 RF	254	20.0		
	50	2	PN 10/16			16.0	232
	50	2	PN 10/16	191	7.52		

Table 5. *CSB700 Series Primary Regulator Outlet Pressure Ranges*

TYPE	OPERATING PRESSURE RANGES, W_d		PART NUMBER	SPRING COLOR	SPRING WIRE DIAMETER		SPRING FREE LENGTH	
	mbar	psig			mm	In.	mm	In.
CSB700, CSB704, CSB700F and CSB704F	9 to 14	3.6 to 5.6 in. w.c.	GE30336X012	Silver	3.00	0.118	224	8.82
	13 to 24	5.2 to 9.6 in. w.c.	ERSA01138A0	Red	3.50	0.138	264	10.4
	22 to 39	8.8 to 15.7 in. w.c.	GE30338X012	Black Stripe	4.32	0.170	172	6.78
	32 to 50	12.8 to 20.1 in. w.c.	GE30339X012	Purple	4.34	0.171	187	7.35
	42 to 70	16.9 to 28.1 in. w.c.	GE30340X012	White Stripe	4.62	0.182	188	7.40
	61 to 110	0.9 to 1.6	ERSA03656A0	Dark Green	4.88	0.192	224	8.82
CSB720 and CSB724	61 to 110	0.9 to 1.6	ERSA03656A0	Dark Green	4.88	0.192	224	8.82
	105 to 220	1.5 to 3.2	ERSA03657A0	Blue	5.94	0.234	217	8.53
	210 to 380	3.1 to 5.5	GG06247X012	Black	8.00	0.315	206	8.13
	320 to 570	4.6 to 8.3	ERSA01582A0	Red with White Stripe	8.71	0.343	177	6.97
	510 to 780	7.4 to 11.3	ERSA05055A0	Blue with White Stripe	10	0.394	181	7.13
CSB720F and CSB724F	270 to 325	3.9 to 4.7	ERAA11747A0	Black with White Stripe	6.5	0.256	235	9.25
CSB750 and CSB754	0.7 to 1.19 bar	10.2 to 17.3	GE30345X012	Purple Stripe	9.00	0.354	225	8.87
	1.05 to 2.7 bar	15.2 to 39.2	GE30346X012	Brown	11.0	0.433	226	8.88
	2.3 to 3.25 bar	33.4 to 47.1	ERSA01125A0	Grey with Red Stripe	12.6	0.496	225	8.87
	3.1 to 4 bar	45 to 58	ERSA01126A0	Grey with Orange Stripe	13.7	0.539	226	8.89

Table 6. *Directive ATEX Information*

TYPE	CLASSIFICATION	ATEX ASSEMBLIES	ATEX LABELLING
CSB704, CSB704F,CSB724, CSB724, CSB724F, CSB754 version with VSX8	Non-electrical equipment	Not falling under the ATEX Directive 2014/34/EU	No
CSB704, CSB704F, CSB724, CSB724, CSB724F and CSB754 with limit switch	Non-electric equipment equipped with an electrical device falling under the scope of the ATEX Directive 2014/34/EU	Constitutes an assembly according to the ATEX Directive 2014/34/EU	CE Ex II 2 G T☐

Table 7a. *North American Overpressure Shut-off OPSO Only Ranges*

REGULATOR			SLAM SHUT DEVICE						
Type	Typical Setpoint	Spring Range	Type (Maximum Operating Inlet)	Token Relief Set	Relief Range Shown as a % of Regulator Setpoint		Required Difference Between Token Relief and OPSO	Over Pressure Shut-off (OPSO) Set Range	Factory Set OPSO
	psig	psig		psig	min	max	psig	psig	psig
CSB704F	7 in. w.c.	5.2 to 9.6 in. w.c.	VSX8L (125 psi)	12 in. w.c.	170	215	3.2 in. w.c.	12 to 24 in. w.c.	22 in. w.c.
	11 in. w.c.	8.8 to 15.7 in. w.c.		17 in. w.c.	150	160	4 in. w.c.	16 in. w.c. to 1.6 psig	25 in. w.c.
	14 in. w.c.	12.8 to 20.0 in. w.c.		21 in. w.c.	150	160	4 in. w.c.	24 in. w.c. to 2.8 psig	1.1
	1	24 in. w.c. to 1.6 psig		1.4	140	150	6.4 in. w.c.	1.4 to 4.1	2
CSB724F	2	1.5 to 3.2		2.6	130	140	0.6	2.0 to 7.3	3.5
	3			3.8	125	140	0.6		5
	5	3.1 to 5.5		6.2	125	140	0.7	3.2 to 11.0	7
	10	7.4 to 11.3						5.8 to 13.3[1]	12
CSB704	7 in. w.c.	5.2 to 9.6 in. w.c.	VSX8L (232 psi)	12 in. w.c.	170	215	3.2 in. w.c.	12 to 24 in. w.c.	22 in. w.c.
	11 in. w.c.	8.8 to 15.7 in. w.c.		17 in. w.c.	150	160	4 in. w.c.	16 in. w.c. to 1.6 psig	25 in. w.c.
	14 in. w.c.	12.8 to 20.0 in. w.c.		21 in. w.c.	150	160	4 in. w.c.	24 in. w.c. to 2.8 psig	1.1
	1	24 in. w.c. to 1.6 psig		1.4	140	150	6.4 in. w.c.	1.4 to 4.1	2
CSB724	2	1.5 to 3.2		2.6	130	140	0.6	2.0 to 7.3	3.5
	3			3.8	125	140	0.6		5
	5	3.1 to 5.5		6.2	125	140	0.7	3.2 to 11.0	7
	10	7.4 to 11.3						5.8 to 13.3[1]	12
CSB754	15	10.2 to 17.3	VSX8H (232 psi)					13.1 to 39.1[1]	19
	20	15.2 to 39.2						13.1 to 43.5	25
	30								35
	40	33.4 to 47.1						23.2 to 72.5[1]	45

- Gray areas indicate that token relief is not available above 8 psig setpoint.
1. Max OPSO setpoint truncated to reflect maximum outlet pressure for spring range.

Table 7b. *European Overpressure Shut-off OPSO Only Ranges*

REGULATOR			SLAM SHUT DEVICE						
Type	Typical Setpoint	Spring Range	Type (Maximum Operating Inlet)	Token Relief Set	Relief Range Shown as a % of Regulator Setpoint		Required Difference Between Token Relief and OPSO	Over Pressure Shut-off (OPSO) Set Range	Factory Set OPSO
	mbar	mbar		mbar	min	max	mbar	mbar	mbar
CSB704F	10	9 to 14	VSX8L (8.6 bar)	17	170	215	8	30 to 60	32
	15	13 to 24		26	170	215	6		
	20	13 to 24		34	170	215	6	30 to 60	40
	21			36	170	215	4		
	27	22 to 39		41	150	160	5	30 to 60	46
	30			45	150	160	10		60
	35	22 to 39		53	150	160	10	40 to 110	70
	50	42 to 70		70	140	158	16	60 to 193	90
	60			84	140	158	16		105
	75	61 to 110		98	130	140	20	60 to 193	130
CSB704	10	9 to 14	VSX8L (16 bar)	17	170	215	8	30 to 60	40
	15	13 to 24		26	170	215	10		50
	20	13 to 24		34	170	215	10	30 to 60	55
	21			36	170	215	10		55
	27	22 to 39		41	150	160	10	30 to 60	55
	30			45	150	160	10		60
	35	22 to 39		53	150	160	10	40 to 110	70
	50	42 to 70		70	140	158	16	60 to 193	90
	60			84	140	158	16		105
	75	61 to 110		98	130	140	20	60 to 193	130
CSB724	100	61 to 110	VSX8L (16 bar)	130	130	140	20	60 to 193	170
	120	105 to 220		156	130	140	40	95 to 280	205
	150			195	130	140	40		250
	160	105 to 220		208	130	140	40	95 to 280	265
	200	105 to 220		250	125	140	50	138 to 500	330
	300	210 to 380		375	125	140	50	138 to 500	450
	500	320 to 570		625	125	140	60	221 to 760	700
	600	510 to 780						400 to 915[1]	840
	750							400 to 1100[1]	1050
CSB724F	300	270 to 325	VSX8L (8.6 bar)					138 to 500	450
CSB754	1000	700 to 1190	VSX8H (16 bar)					400 to 1450	1320
	1200	1050 to 2700						900 to 3000	1600
	1500								1900
	2000	1050 to 2700						1600 to 4000[1]	2400
	3000	2300 to 3250						1600 to 5000[1]	3400
	4000	3100 to 4000							4400

- Gray areas indicate that token relief is not available above 500 mbar setpoint.
1. Max OPSO setpoint truncated to reflect maximum outlet pressure for spring range.

Table 7c. *North American Overpressure and Underpressure Shut-off UPSO/OPSO Ranges*

REGULATOR			SLAM SHUT DEVICE								
Type	Typical Setpoint	Spring Range	Type (Maximum Operating Inlet)	Token Relief Set	Relief Range Shown as a % of Regulator Setpoint		Required Difference Between Token Relief and OPSO	UPSO	OPSO	Factory Set		
								Set Range	Shut-off (OPSO) Set Range Over UPSO Setpoint	UPSO	Adjusted OPSO Range	OPSO
	psig	psig		psig	min	max	psig	psig	psig	psig	psig	psig
CSB704F	7 in. w.c.	5.2 to 9.6 in. w.c.	VSX8L (125 psi)	12 in. w.c.	170	215	3.2 in. w.c.	3 to 12 in. w.c.	16 to 29 in. w.c.	3 in. w.c.	19 in. w.c. to 1.2 psig	22 in. w.c.
	11 in. w.c.	8.8 to 15.7 in. w.c.		17 in. w.c.	150	160	4 in. w.c.			6 in. w.c.	22 in. w.c. to 1.3 psig	25 in. w.c.
	14 in. w.c.	12.8 to 20.0 in. w.c.		21 in. wc	150	160	4 in. w.c.	4 in. w.c. to 1.1 psig	20 in. w.c. to 1.8 psig	9 in. w.c.	1 to 2.1 psig	1.1
	1	24.0 in. w.c. to 1.6 psig		1.4	140	150	6.4 in. w.c.	10 in. w.c. to 2.3 psig	1.2 to 3.2	14 in. w.c.	1.7 to 3.7	2
CSB724	2	1.5 to 3.2		2.6	130	140	0.6			1	2.2 to 4.2	3.5
	3			3.8	125	140	0.6	1.5 to 7.3	2.6 to 5.6	2	4.6 to 7.6	5
	5	3.1 to 5.5		6.2	125	140	0.7	1.5 to 7.3	3.5 to 8.2	3	5.6 to 8.6	7
	10	7.4 to 11.3						1.5 to 7.3	3.5 to 8.2	5	8.5 to 13.2	12
CSB704	7 in. w.c.	5.2 to 9.6 in. w.c.	VSX8L (232 psi)	12 in. w.c.	170	215	3.2 in. w.c.	3 to 12 in. w.c.	18 to 30 in. w.c.	3 in. w.c.	21 in. w.c. to 1.2 psig	22 in. w.c.
	11 in. w.c.	8.8 to 15.7 in. w.c.		17 in. w.c.	150	160	4 in. w.c.			6 in. w.c.	24 in. w.c. to 1.3 psig	25 in. w.c.
	14 in. w.c.	12.8 to 20.0 in. w.c.		21 in. w.c.	150	160	4 in. w.c.	4 in. w.c. to 1.1 psig	25 in. w.c. to 1.9 psig	9 in. w.c.	1.2 to 2.2	1.1
	1	24.0 in. w.c. to 1.6 psig		1.4	140	150	6.4 in. w.c.	10 in. w.c. to 2.3 psig	1.2 to 3.2	14 in. w.c.	1.7 to 3.7	2
CSB724	2	1.5 to 3.2		2.6	130	140	0.6			1	2.2 to 4.2	3.5
	3			3.8	125	140	0.6	1.5 to 7.3	2.6 to 5.6	2	4.6 to 7.6	5
	5	3.1 to 5.5		6.2	125	140	0.7			3	5.6 to 8.6	7
	10	7.4 to 11.3							3.5 to 8.2	5	8.5 to 13.2	12
CSB754	15	10.2 to 17.3						1.5 to 10.9	6.7 to 13.5	7	13.7 to 20.5	19
	20	15.2 to 39.2	VSX8H (232 psi)					7.3 to 29.0	15.2 to 22.8	10	25.2 to 32.8	25
	30								18.1 to 33.4	15	33.1 to 48.4	35
	40	33.4 to 55.1								20	38.1 to 53.4	45

▭ - Gray areas indicate that token relief is not available above 8 psig setpoint.

Table 7d. *European Overpressure and Underpressure Shut-off UPSO/OPSO Ranges*

REGULATOR			SLAM SHUT DEVICE									
Type	Typical Setpoint	Spring Range	Type (Maximum Operating Inlet)	Token Relief Set	Relief Range Shown as a % of Regulator Setpoint		Required Difference Between Token Relief and OPSO	UPSO	OPSO	Factory Set		
								Set Range	Shut-off (OPSO) Set Range Over UPSO Setpoint	UPSO	Adjusted OPSO Range	OPSO
	mbar	mbar		mbar	min	max	mbar	mbar	mbar	mbar	mbar	mbar
CSB704F	15	13 to 24	VSX8L (8.6 bar)	26	170	215	6	7 to 11	30 to 44	8	38 to 52	40
	20	13 to 24		34	170	215	6	7 to 11	30 to 44	10	40 to 54	40
	21	13 to 24		36	170	215	4	7 to 11	30 to 44	10	40 to 54	40
	27	22 to 39		41	150	160	5	7 to 15	32 to 44	14	46 to 58	46
	30	22 to 39		45	150	160	10	7 to 30	40 to 72	15	55 to 87	60
	35	22 to 39		53	150	160	10	7 to 30	40 to 72	18	58 to 90	70
	50	42 to 70		70	140	158	16	10 to 75	48 to 74	25	73 to 99	90
	60			84	140	158	16		48 to 74	30	78 to 104	100
	75	61 to 110		98	130	140	20	25 to 160	83 to 221	38	121 to 259	130
CSB704	15	13 to 24	VSX8L (16 bar)	26	170	215	6	7 to 30	40 to 55	8	48 to 63	50
	20	13 to 24		34	170	215	6	7 to 30	40 to 55	10	50 to 65	55
	21	13 to 24		36	170	215	4	7 to 30	40 to 55	10	50 to 65	55
	27	22 to 39		41	150	160	5	7 to 30	40 to 55	14	54 to 69	55
	30			45	150	160	10	7 to 30	45 to 76	15	60 to 91	60
	35			53	150	160	10	7 to 30	45 to 76	18	63 to 94	70
	50	42 to 70		70	140	158	16	10 to 75	50 to 80	25	75 to 105	90
	60			84	140	158	16		50 to 80	30	80 to 110	100
	75	61 to 110		98	130	140	20	25 to 160	83 to 221	38	121 to 259	130
CSB724	100	105 to 220		130	130	140	20			50	133 to 271	170
	120			156	130	140	40			60	143 to 281	205
	150			195	130	140	40			75	158 to 296	250
	160			208	130	140	40	25 to 160	83 to 221	80	163 to 301	265
	200			250	125	140	50	100 to 500	114 to 261	100	214 to 361	330
	300	210 to 380		375	125	140	50		179 to 386	150	329 to 536	450
	500	320 to 570		625	125	140	60		241 to 565	250	491 to 815	700
	600	510 to 780						100 to 500	241 to 565	300	541 to 865	840
	750							100 to 750	460 to 932	375	835 to 1120[1]	1050
CSB724F	300	270 to 325	VSX8L (8.6 bar)					100 to 500	179 to 386	200	379 to 586	400
CSB754 GrDF	1 bar	0.7 to 1.19 bar	VSX8L (16 bar)					100 to 500	460 to 932	750	1210 to 1682	1210
CSB754	1 bar	0.7 to 1.19 bar						100 to 500	460 to 932	500	960 to 1432	1320
	1.2 bar	1.05 to 2.7 bar	VSX8H (16 bar)					500 to 2000	1050 to 1570	600	1650 to 2170	1650
	1.5 bar									750	1800 to 2320	1900
	2 bar								1250 to 2300	1000	2250 to 3300	2400
	3 bar	2.3 to 3.25 bar								1500	2750 to 3800	3400
	4 bar	3.1 to 4 bar						500 to 2800	2100 to 3750	2000	4100 to 5000[1]	4400

▭ - Gray areas indicate that token relief is not available above 500 mbar setpoint.
1. Max OPSO setpoint truncated to reflect maximum outlet pressure for spring range.

Example: *If a non-standard setpoint is needed, see the following example for the proper use of Tables 7a, 7b, 7c and 7d. In this example, the non-standard regulator setpoint is 140 mbar / 2.0 psig. The minimum factory token relief set pressure is 130% of the non-standard setpoint. The resulting token relief set pressure is 183 mbar / 2.6 psig. The minimum factory OPSO and UPSO set pressures are 165% and 50% of the non-standard setpoint, respectively. The resulting minimum settings are: OPSO = 231 mbar / 3.4 psig and UPSO = 70 mbar / 1.0 psig.*

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 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 gas or bursting of pressure containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the Specifications section or where conditions exceed any ratings of the adjacent piping or piping connections.

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

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

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has collected foreign material during shipping. For NPT bodies, apply pipe compound to the external pipe threads. For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired, 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.

Downstream Control Line Installation

WARNING

Failure to install a downstream control line could result in a hazardous condition. Install downstream control line(s) to the slam-shut device when construction uses external pressure registration. The regulator and slam-shut device will not control pressure or shut off if a downstream control line is not installed on those constructions where external pressure registration is required.

CSB700 Series regulators with an “ET” or “EN” in the type number use external pressure registration. To communicate the downstream pressure to the regulator, connect a downstream control line tubing to the 3/4 NPT control line tapping in the lower diaphragm casing and connect the other end of the tubing downstream of the regulator outlet with a minimum distance of 6 times the outlet pipe diameter.

For all types with external control lines, use tubing with an inner diameter of 16 mm / 0.63 in. or larger.

Downstream Control Line Installation with Slam-Shut Device

Refer to Figure 1. When installing the Types CSB704ET, CSB704FET, CSB704FEN CSB704EN, CSB724ET, CSB724EN, CSB724FEN and CSB754EN regulators, connect downstream control line tubing to the lower casing of the regulator and run the tubing downstream of the regulator outlet with a minimum distance of 6 times the outlet pipe diameter. Connect a second, separate downstream control line tubing to the lower casing of the slam-shut and run the tubing downstream of the regulator outlet a minimum distance of 6 times the outlet pipe diameter.

For all types with external control lines, use tubing with an inner diameter of 16 mm / 0.63 in. or larger for the primary regulator and 6.4 mm / 0.25 in. or larger for the slam-shut.

Installation with External Overpressure Protection

If the regulator is used in conjunction with a Type 289H relief valve, it should be installed as shown in Figure 6. The outside end of the vent line should be protected with a rainproof assembly. The Type 289H is typically set 25 mbar / 10 in. w.c. higher than the outlet pressure setting of the regulator, up to 75 mbar / 30 in. w.c. outlet pressure. For pressure greater than this, set the Type 289H 0.05 bar / 0.73 psi higher than the outlet pressure setting of the regulator. Refer to the 289 Series Instruction Manual (D100280X012) for more information.

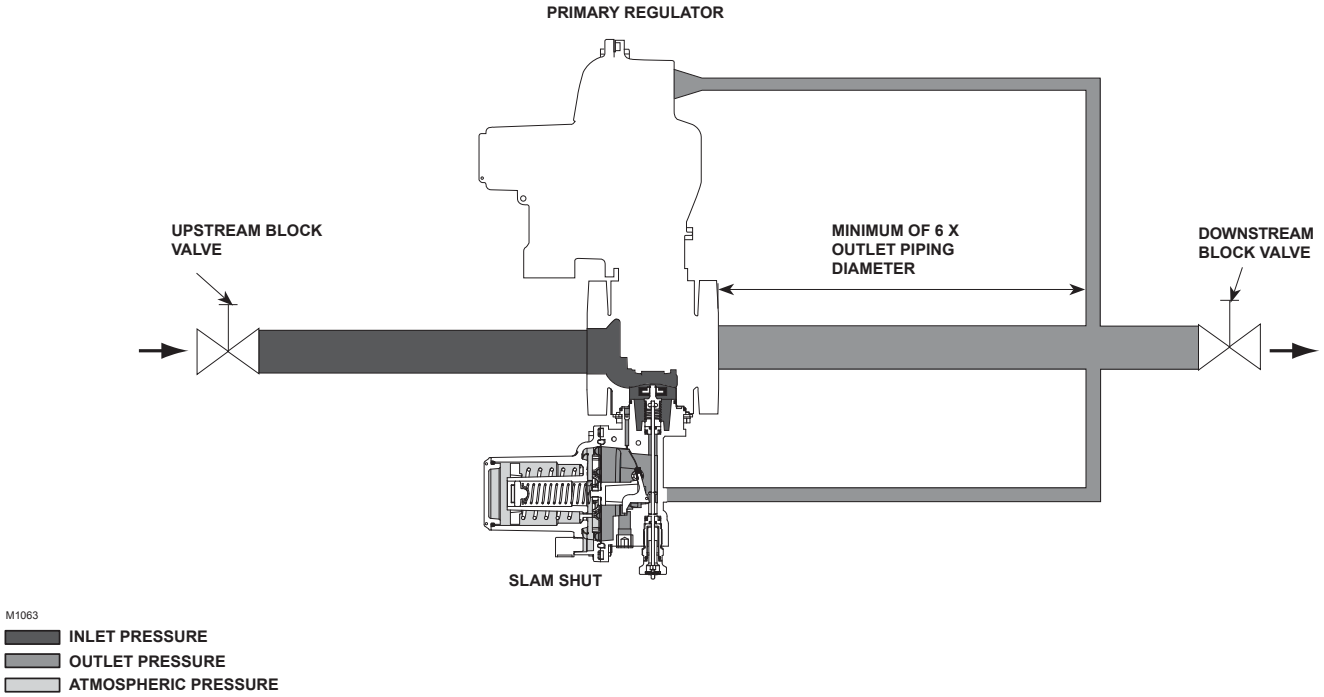

Figure 1. *Type CSB704 Downstream Control Line Installation*

Vent Line Installation

CSB700 Series regulators have a 1 NPT screened vent opening in the spring case. If necessary to vent escaping gas away from the regulator, install a remote vent line in the spring case tapping. Vent piping should be as short and direct as possible with a minimum number of bends and elbows. The remote vent line should have the largest practical diameter. Vent piping on regulators with token relief must be large enough to vent all relief valve discharge to atmosphere without excessive backpressure and resulting excessive pressure in the regulator.

For types with optional token relief, this low capacity relief is located in the spring case of the primary regulator. If necessary to vent escaping gas away, install a remote vent line in the spring case tapping of the primary regulator as described above. Periodically check all vent openings to be sure that they are not plugged or obstructed.

For Types CSB700/CSB700F/CSB720/CSB720F, outlet pressure higher than 0.34 bar / 5.0 psig above the setpoint may damage internal metallic parts. For Type CSB750, outlet pressure higher than 1.5 bar / 21.8 psig above the setpoint may damage internal metallic parts.

Overpressure Protection

The recommended pressure limitations are stamped on the regulator nameplate. Some type of overpressure protection is needed if the actual inlet pressure exceeds the maximum operating outlet pressure rating. Overpressure protection should also be provided if the regulator inlet pressure is greater than the safe working pressure of the downstream equipment.

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

Note

For types that include the slam-shut module, refer to the instruction manual for Type VSX8 slam-shut for adjustment and maintenance of the slam-shut.

To change the outlet pressure, loosen the hex nut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease it. Monitor the outlet pressure with a test gauge during the adjustment. Tighten the hex nut to maintain the desired setting.

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	Spring Case, Aluminum
4	Stabilizer Guide, Stainless steel
5	Stabilizer, Lustran® 648
6	Spring, Stainless steel
7	Retainer Ring, Zinc-plated Carbon steel
8	Stabilizer Screw, Zinc-plated steel (3 required)
9	Lower Casing, Aluminum
10	Lever, BP steel
11	Stem, BP, Aluminum
13	Lever Pin, Carbon steel
14	Lever Screw, Plated-Carbon steel (2 required)
15	Bolt, Steel (8 required)
16	Nut, Steel (6 required for low and medium pressure, 8 required for high pressure)
17	Union Ring, Aluminum
18	Snap Ring, Zinc-plated steel
19*	O-ring, Nitrile (NBR)
20	Stem Guide, Aluminum
21*	O-ring, Nitrile (NBR)
22	Pipe plug (not shown), 3/4 NPT, Carbon steel
25	Orifice, Aluminum
26	Orifice, Aluminum (with slam-shut module)
27*	O-ring, Nitrile (NBR) (with slam-shut module)
36*	Balanced Port Assembly
36A	Stem, Stainless steel
36B	Spring Retainer, Zinc-plated steel
36C	Spring, Stainless steel
36D	Screw, Steel
36E	Diaphragm, Nitrile (NBR) and Polyester Fabric
36F	Housing
36G	Cap, Brass
36H	Diaphragm Retainer, Zinc-plated steel
36J	Disk, Nitrile (NBR)
36K	Disk Retainer
36L*	O-ring, Nitrile (NBR)
36M*	O-ring, Nitrile (NBR)
36N*	O-ring, Nitrile (NBR)
36P*	O-ring, Nitrile (NBR)
36Q*	O-ring, Nitrile (NBR)
36R	Screw, Zinc-plated steel (4 required)
36S	Retainer Plate
36V	Stabilizer
36W	Retaining Ring
36X	Connector
36Z	Stabilizer Spring
38	Spring, Music Wire
40	Relief Valve Seat Nut, Zinc-plated steel
41	Token Relief Spring, Music Wire
42	Spring Retainer, Zinc-plated steel (with token relief)
43	Spring Seat, Zinc-plated steel
44	Stem, Zinc-plated steel (with token relief)
45	Screw, Zinc-plated steel (without token relief)
46	Token Relief Nut, Steel
50	Pusher Post, Aluminum
51	Relief Valve Seat, Aluminum
52*	Pusher Post O-ring, Nitrile (NBR)
53	Pin, Stainless steel
54	Roller Pin, Brass
55*	Diaphragm Assembly
60*	Closing Cap, Aluminum
61	Bonnet, Zinc-plated steel
62*	O-ring, Nitrile (NBR)
63	Upper Spring Seat, Zinc-plated Carbon steel
64	Adjusting Bolt, Steel
65*	Adjusting Screw, Aluminum
66	Ball, Stainless Steel
67	Hex Nut, Stainless steel
68	Retainer Ring, Steel
70	Body
71	Cap Screw, Steel (4 required)
72	Pipe Plug, 1/4 NPT
74*	Blanking Plug, Aluminum (without slam-shut module)
75*	O-ring, Nitrile (NBR)
76	Snap Ring Flange (2 required)
77*	O-ring, Nitrile (NBR)
80	Screw, Steel (4 required)
82*	O-ring, Nitrile (NBR)
90	Nameplate
91	Warning Label
93	Label
94	Overlay Label
95	Grommet, Nitrile (NBR)
96	Rubber Washer, Nitrile (NBR)
100	Lockwire
101	Hub, Zinc-Plated Steel (2 required)
102	Sip-On Flange (2 required)
103	O-ring, Nitrile (NBR) (2 required)
104	Spacer
105	Restriction Plate, Stainless steel
106	Diaphragm Stem O-ring, Nitrile (NBR)
111	Damper Assembly
111A	Connector
111B	Retainer Ring
111C	Spring, Stainless steel
111D	Spring Retainer, Zinc-plated steel
111E	Plastics Ball
111F	Knob, Acrylonitrile Butadiene Styrene (ABS)
112	Stem Cap
113*	Sealing Washer
114	Elbow
115	Thrust Washer

*Recommended spare part.
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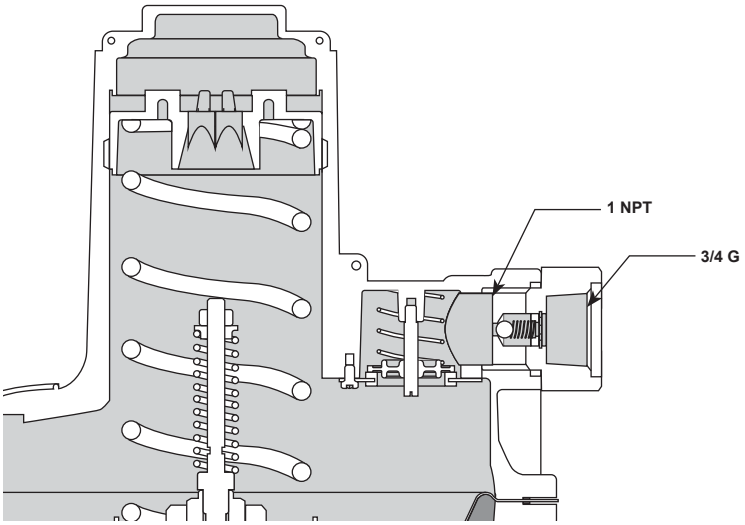
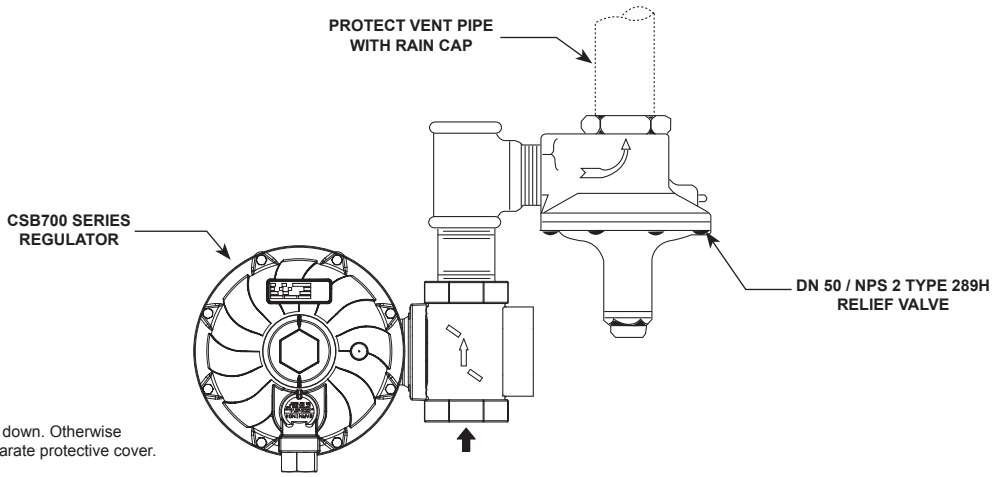
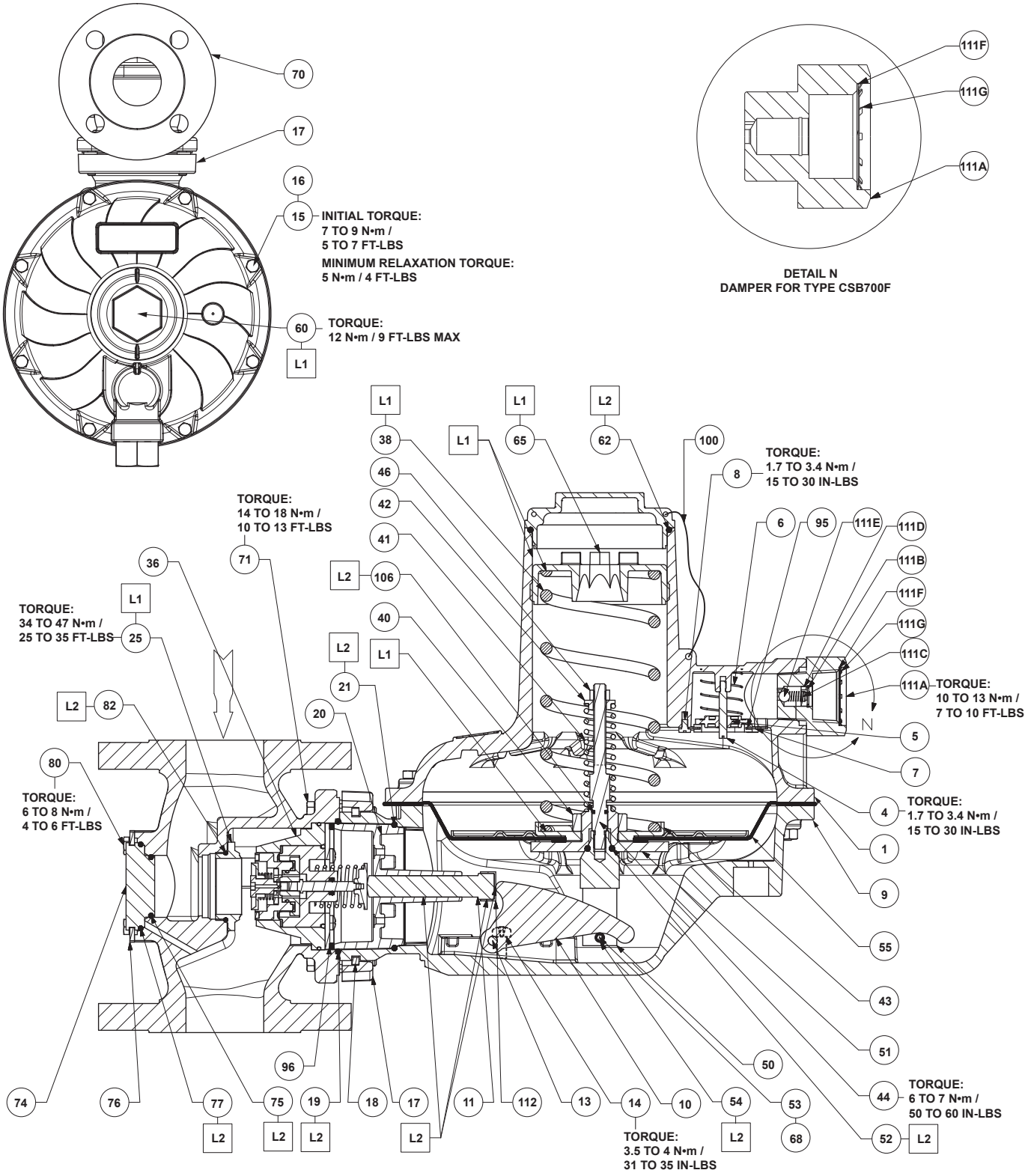


Figure 2. *CSB700 Series Regulator Vent Line Installation*



Note: Install with vent pointed vertically down. Otherwise regulator must be installed under a separate protective cover.

Figure 3. *CSB700 Series Regulator Installed with the Vent Pointed Downward and with a Type 289H Relief Valve for High Capacity Relief*

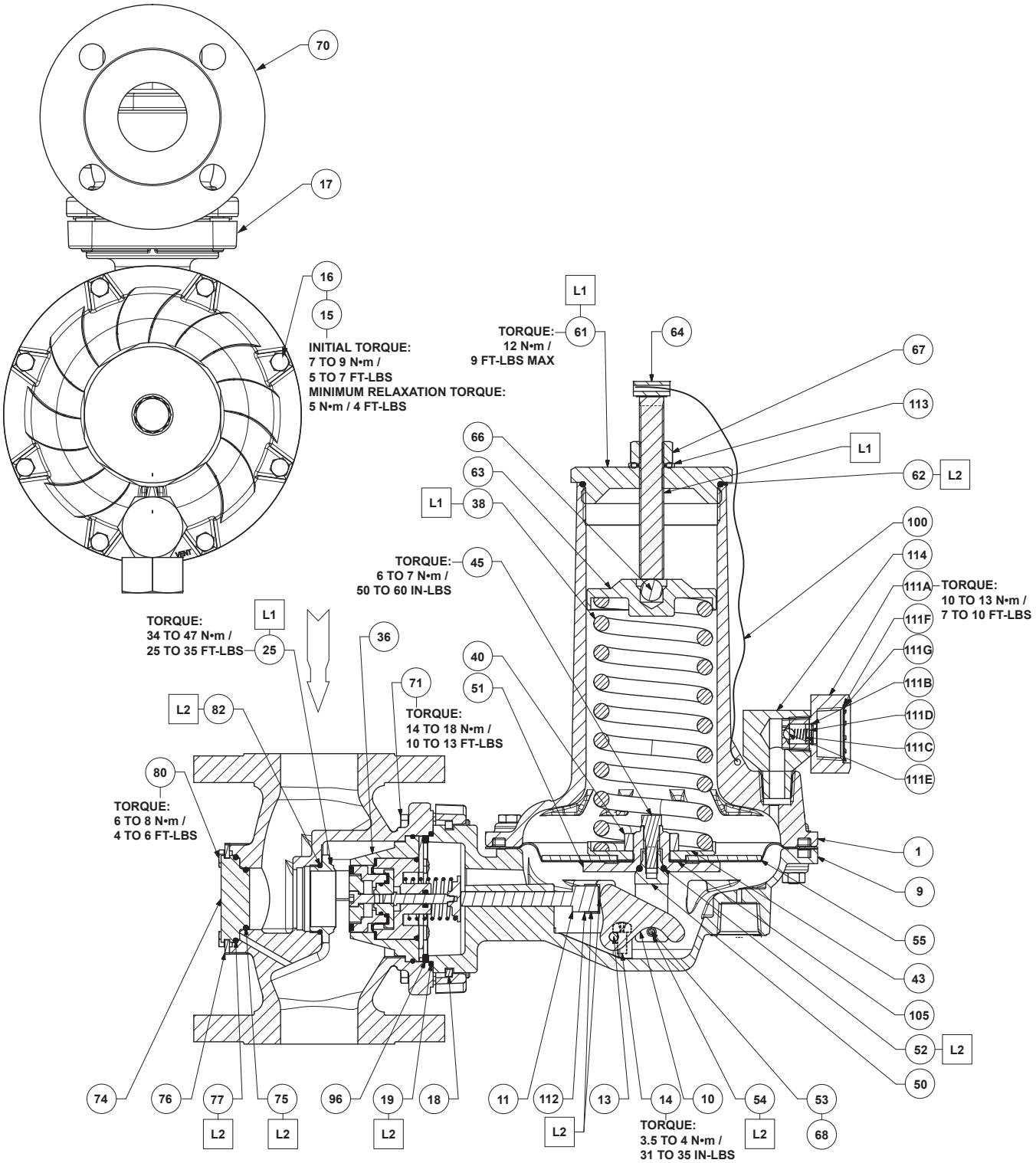


GE2791_DM

☐ **APPLY LUBRICANT(1)**
L1 = ANTI-SEIZE LUBRICANT
L2 = EXTREME LOW-TEMPERATURE BEARING GREASE

1. Lubricants must be selected such that they meet the temperature requirements.

Figure 4. *CSB700 Series Regulator Assembly*



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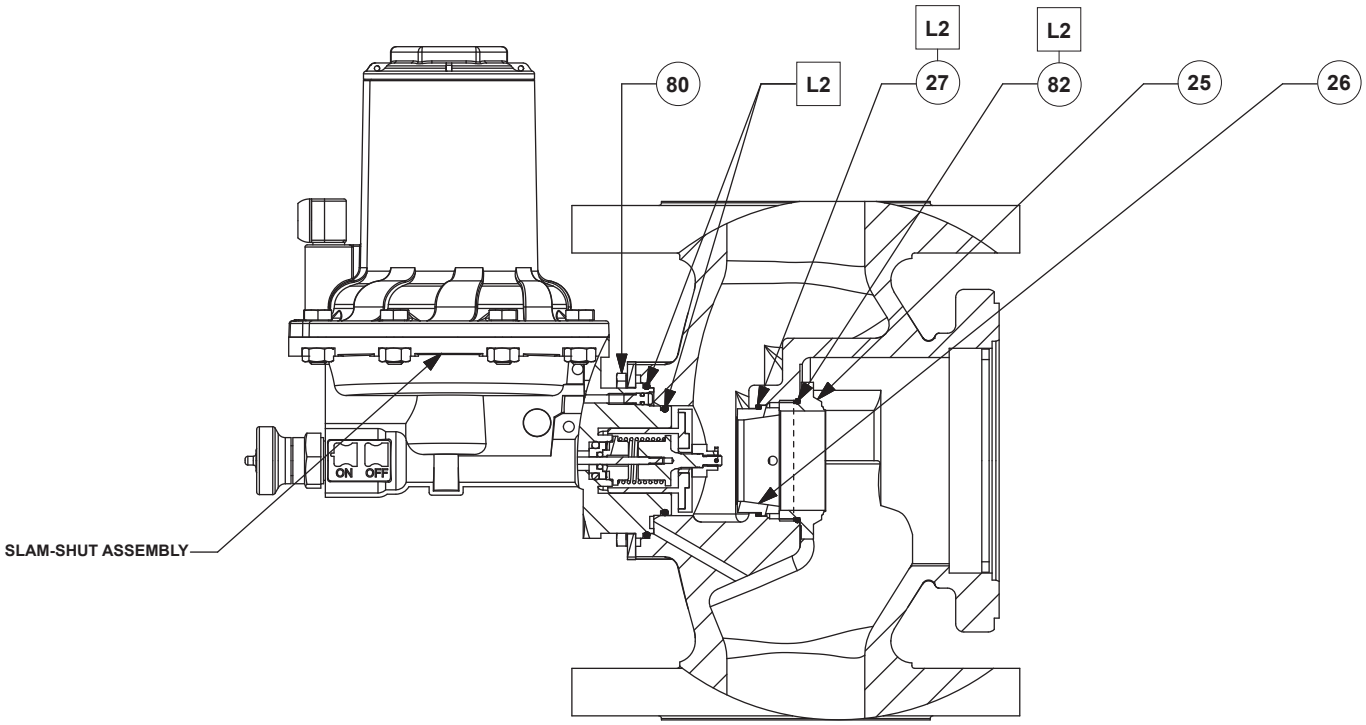
☐ **APPLY LUBRICANT(1)**
L1 = ANTI-SEIZE LUBRICANT
L2 = EXTREME LOW-TEMPERATURE BEARING GREASE

1. Lubricants must be selected such that they meet the temperature requirements.

Figure 5. *CSB750 Series Regulator Assembly*



ORIFICE AND SLAM-SHUT ASSEMBLY

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☐ **APPLY LUBRICANT(1)**
L2 = EXTREME LOW-TEMPERATURE BEARING GREASE
1. Lubricants must be selected such that they meet the temperature requirements.

Figure 6. *CSB700 Series Slam-Shut Module*

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For further information on the current PED revision see Bulletin: *D103053X012* or scan the QR code.

The distinctive swirl pattern cast into every actuator casing uniquely identifies the regulator as part of the Fisher™ brand Commercial Service Regulator family and assures you of the highest-quality engineering, performance, and support traditionally associated with Fisher™ and Tartarini™ regulators. Visit www.fishercommercialservice.com to access interactive applications.

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