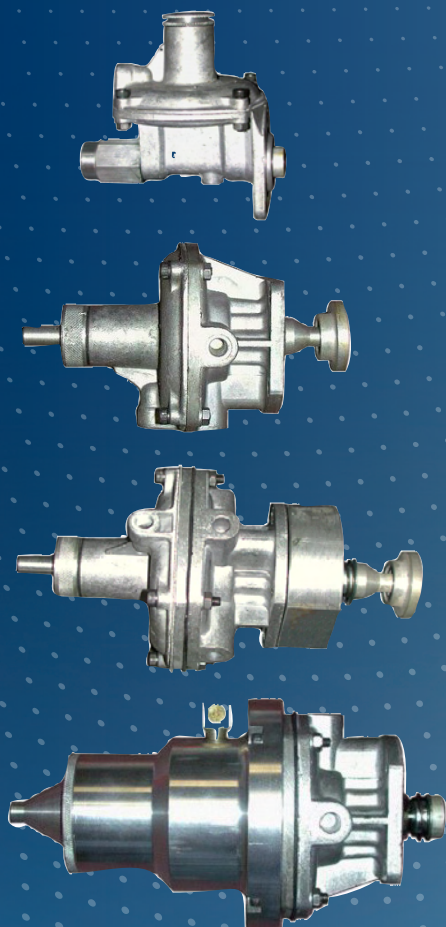


Technical Bulletin

SAFETY SLAM-SHUT VALVES - MODELS 290/309LP/309LP2/309LP4



MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

Introduction, Characteristics, Constructions, Technical Data

Introduction

- Specifically designed to protect the downstream system or equipment from either under and/or over pressure conditions
- Special models for protection against fire or high temperatures
- Use with confidence on natural and manufactured gases of non-aggressive nature, including nitrogen, carbon dioxide, propane, butane, etc.
- Versions available for special applications like indoor applications with no requirement for vent-line
- Can be incorporated with any of our pressure regulators for additional safety protection or can be fitted to an independent body

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Characteristics

- Specifically designed to measure downstream pressure and 100% completely shut-off the forward flow of gas if a pre-determined pressure limit is reached
- Wide inlet pressure range 0.5-275 psi (0.035-19.0 bar) if independent of regulator
- Maximum inlet pressure 150 psi (10.3 bar) with incorporated regulator
- Model 290 Safety Slam-Shut Valve is available in Over-Pressure Cut-Off (OPCO) feature only
- Under Pressure Cut-Off (UPCO) shut off range from 4" wc - 4.5 psi (10 - 315 mbar)
- Over Pressure Cut-Off (OPCO) shut off range from 14" wc - 72 psi (35 mbar - 5.0 bar)
- T-Type thermal protection version shuts the gas supply off if the assembly is engulfed in a fire or is subject to an ambient temperature of above 212°F (100°C)
- Available with or without incorporated body for mounting
- 1" or 2" flanged connections (180°) in ANSI150 RF/FF or PN16 RF/FF. Flanged body material available in cast iron, ductile iron or cast steel
- Available with internal (I.C.L.) or external (E.C.L.) impulse
- Ease of maintenance due to interchangeable diaphragm casing cartridge
- Custom designed and pre-fabricated regulator meter set assemblies available

Available Constructions

- 290-OPCO - over pressure slam-shut device
 - over pressure range 14" wc - 8 psi (35 - 560 mbar)
- 309LP OPCO - over-pressure slam-shut device
 - over pressure 4" - 60" wc (10 - 150 mbar)
- 309LP UPCO/OPCO - under and over-pressure slam-shut device
 - under pressure 4" - 60" wc (10 - 150 mbar)
 - over pressure 20" wc - 8 psi (50 - 560 mbar)
- 309LP2 OPCO - over-pressure slam-shut device
 - over pressure 6.0 - 22.0 psi (0.42 - 1.5 bar)
- 309LP2 UPCO/OPCO - under and over-pressure slam-shut device
 - under pressure 8" wc - 4.5 psi (20 - 315 mbar)
 - over pressure 6.0 - 22.0 psi (0.42 - 1.5 bar)
- 309LP4 OPCO - over-pressure slam-shut device
 - over pressure 15.0 - 72.0 psi (1.0 - 5.0 bar)
- 309LP4 UPCO/OPCO - under and over-pressure slam-shut device
 - under pressure 8" wc - 4.5 psi (20 - 315 mbar)
 - over pressure 15.0 - 72.0 psi (1.0 - 5.0 bar)
- T-TYPE Thermal Protection - safety slam-shut valve with safety diaphragms for indoor installation and no requirement for vent-line to atmosphere. Available with UPCO or UPCO/OPCO features. Shut down protection if assembly is engulfed in fire or ambient temperature reached pre-determined limit. Only available with over pressure protection up to 12 psi
- IMPULSE - available with I.C.L. (internal impulse) measuring pressure internally in the body or E.C.L. (external impulse) measuring pressure via a downstream sensing control line
- F VERSION - complete with inlet mess filter

MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

Approvals, Pressure Ratings, Weights, Materials of Construction

Agency Approvals

C.S.A. 6.18 - Service Regulators
 C.S.A. 6.22 - Line Pressure Regulators
 C E
 D.V.G.W.



PRESSURE RATINGS		
Maximum Inlet Pressure	no integral regulator	with integral regulator
Maximum Allowable Operating Pressure	275 psi	150 psi
	19.0 bar	10.3 bar

Temperature Rating (standard version)

-40° to 60° Celsius
 -40° to 120° Fahrenheit

Temperature Rating (CSA 6.22 Approved version)

0° to 60° Celsius
 32° to 120° Fahrenheit

Weights

- Model 290-OPCO Safety Slam-Shut Valve (no body) - 2.0 lb (0.9 kg)
- Model 309LP Safety Slam-Shut Valve (no body) - 2.2 lb (1.0 kg)
- Model 309LP2 Safety Slam-Shut Valve (no body) - 2.5 lb (1.3 kg)
- Model 309LP4 Safety Slam-Shut Valve (no body) - 8.0 lb (3.2 kg)
- T-Type Thermal Protection Feature - add 5.0 lb (2.3 kg)
- with screwed body (1/2", 3/4" or 1") - add 2.0 lb (0.9 kg)
- with screwed body (1 1/4", 1 1/2" or 2") - add 8.0 lb (3.6 kg)
- with cast iron flanged body (1") - add 7.0 lb (3.2 kg)
- with ductile iron flanged body (1") - add 8.0 lb (3.6 kg)
- with cast iron flanged body (2") - add 15.0 lb (6.8 kg)
- with ductile iron flanged body (2") - add 17.0 lb (7.7 kg)
- with cast steel flanged body (2") - add 23 lb (10.5 kg)

MATERIALS OF CONSTRUCTION	
Screwed Body Casting	Cast Iron
Flanged Body Casting	Cast Iron, Ductile Iron, Cast Steel
Diaphragm Casings	Die Cast Aluminum
Diaphragm Casings (T-TYPE)	Cast Steel
Main Diaphragm	Molded Nitrile Rubber with Nylon Reinforcing
Valve Head (Seat)	Polyurethane
Diaphragm Plates	Steel
Orifice	Brass or Stainless Steel (t-type)
Fasteners	Steel
Top Cap	Aluminum
Springs	Steel
O-Rings	Nitrile Rubber
Gaskets (T-TYPE)	Graphite

MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

Spring & Shut-Off Pressure Ranges, Correction Factors

SPRING SELECTION AND SHUT-OFF RANGES		
Range (imperial)	Range (metric)	Spring Number (Colour)
MODEL 290 SAFETY SLAM-SHUT VALVE		
14" - 28" wc	35 - 70 mbar	861 (brown)
27" - 67" wc	68 - 168 mbar	868 (green)
2.0 - 8.0 psi	140 - 560 mbar	1254 (red)
MODEL 309LP SAFETY SLAM-SHUT VALVE		
UPCO SPRING RANGES (under pressure cut-off)		
4" - 10" wc	10 - 25 mbar	1138 (blue/green)
10" - 60" wc	25 - 150 mbar	638 (blue)
OPCO SPRING RANGES (over pressure cut-off)		
20" - 50" wc	50 - 100 mbar	1175 (dark blue/black)
40" - 97" wc	100 - 243 mbar	1174 (dark blue/orange)
3.0 - 6.0 psi	210 - 420 mbar	1173 (dark blue/grey)
7.0 - 8.0 psi	490 - 560 mbar	1254 (red)
MODEL 309LP2 SAFETY SLAM-SHUT VALVE		
UPCO SPRING RANGES (under pressure cut-off)		
8" - 22" wc	20 - 55 mbar	1138 (blue/green)
0.8 - 2.5 psi	56 - 175 mbar	638 (blue)
2.5 - 4.5 psi	175 - 315 mbar	IA/006 (green)
OPCO SPRING RANGES (over pressure cut-off)		
6.0 - 12.0 psi	0.4 - 0.8 bar	1173 (dark blue/grey)
12.0 - 17.0 psi	0.8 - 1.2 bar	1254 (red)
17.0 - 22.0 psi	1.2 - 1.5 bar	1255 (green)
MODEL 309LP SAFETY SLAM-SHUT VALVE		
UPCO SPRING RANGES (under pressure cut-off)		
8" - 22" wc	20 - 55 mbar	1138 (blue/green)
0.8 - 2.5 psi	56 - 175 mbar	638 (blue)
2.5 - 4.5 psi	175 - 315 mbar	IA/006 (green)
OPCO SPRING RANGES (over pressure cut-off)		
15.0 - 30.0 psi	1.0 - 2.0 bar	1030 (grey)
30.0 - 45.0 psi	2.0 - 3.1 bar	1031 (green)
45.0 - 60.0 psi	3.1 - 4.2 bar	1032 (dark blue)
60.0 - 75.0 psi	4.2 - 5.0 bar	1033 (silver)

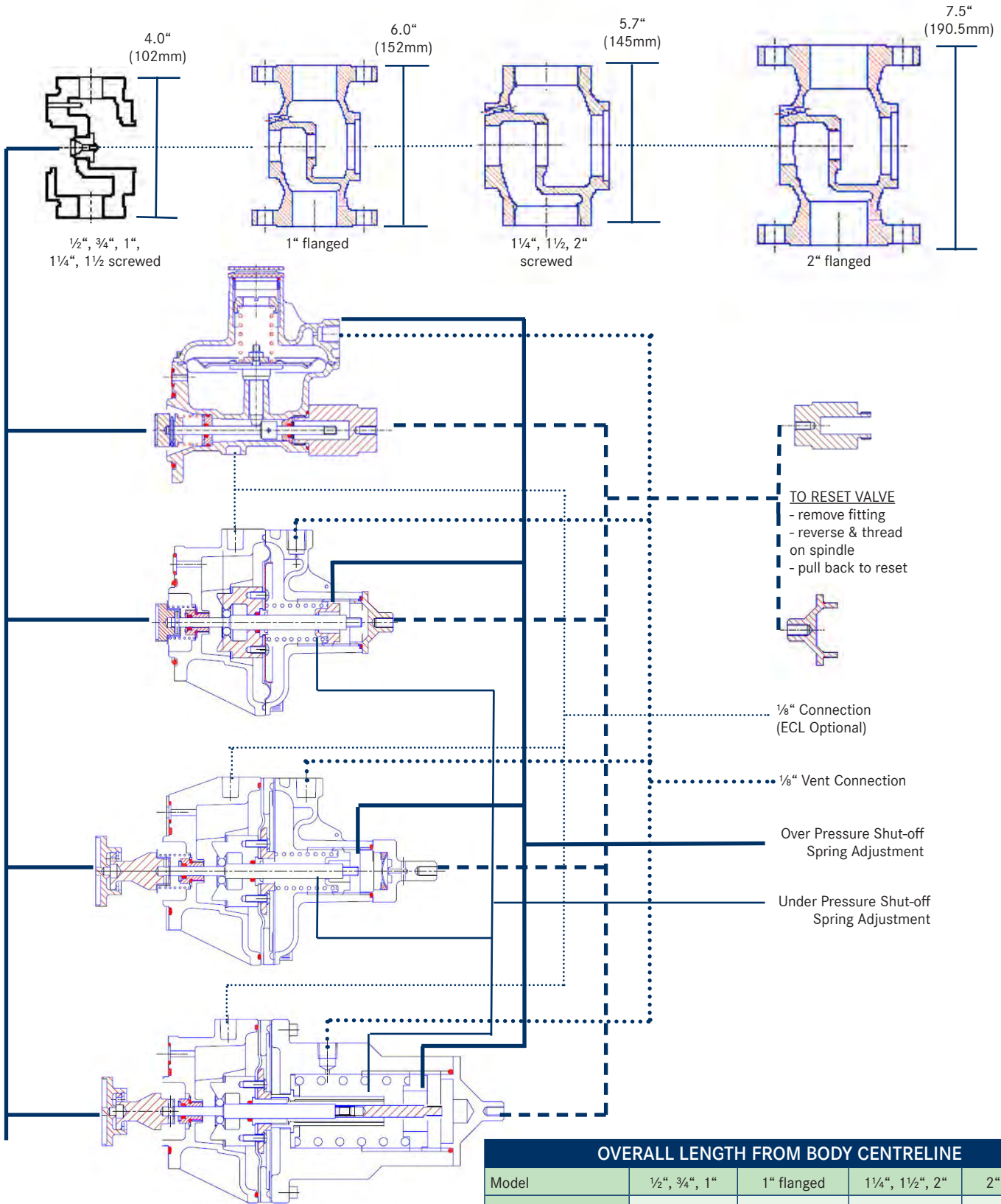
CORRECTION FACTORS FOR OTHER GASES		
Gas Type	Specific Gravity	Correction Factor (CF)
Air	1.00	0.77
Butane	2.01	0.55
Carbon Dioxide (Dry)	1.52	0.63
Carbon Monoxide (Dry)	0.97	0.79
Natural Gas	0.60	1.00
Nitrogen	0.97	0.79
Propane	1.53	0.63
Propane-Air Mix	1.20	0.71

For Other Conversion Factors

$$C_f = \sqrt{\frac{0.6}{\text{SG of Gas}}}$$

MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

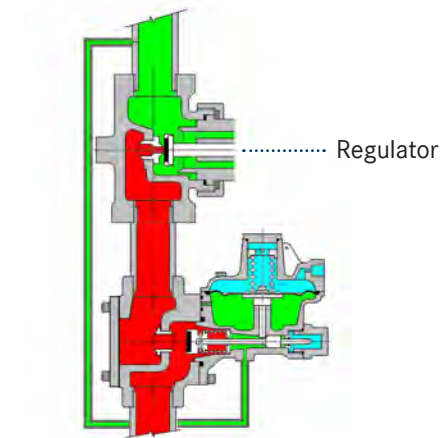
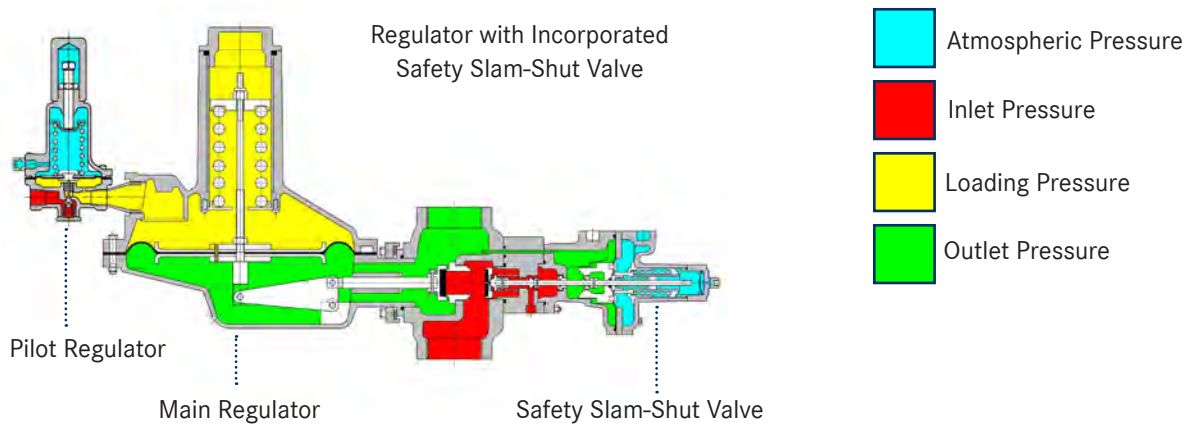
Dimensional Data, Sectional View, SSV Reset, ECL Connection, Spring Adjustment



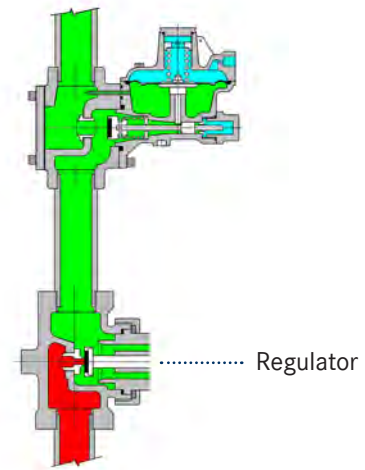
OVERALL LENGTH FROM BODY CENTRELINE				
Model	1/2", 3/4", 1"	1" flanged	1 1/4", 1 1/2", 2"	2" flanged
290 SSV	6.0" (152mm)	6.0" (152mm)	7.0" (178mm)	7.0" (178mm)
309LP SSV	6.5" (165mm)	6.5" (165mm)	7.5" (191mm)	7.5" (191mm)
309LP2 SSV	6.75" (171mm)	6.75" (171mm)	7.75" (197mm)	7.75" (197mm)
309LP4 SSV	9.5" (241mm)	9.5" (241mm)	10.5" (267mm)	10.5" (267mm)
**required distance for reset clearence	add 4.0" (102mm)	add 4.0" (102mm)	add 4.0" (102mm)	add 4.0" (102mm)

MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

Sectional Drawing, Impulse Configurations and Spares Kits



SSV with E.C.L. Arrangement
(External Control Line Required)



SSV with I.C.L. Arrangement
(Internally Impulsed)

SPARES KIT FOR VARIOUS SAFETY SLAM-SHUT VALVES

MODEL NUMBER	VALVE ASSEMBLY	SPARES KIT
Model 290 OPCO SSV	1/2", 3/4", 1", 1 1/4", 1 1/2"	CSK 1326
Model 290 OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1346
Model 290 OPCO SD SSV	1/2", 3/4", 1", 1 1/4", 1 1/2"	CSK 1336
Model 290 OPCO SD SSV	1 1/4", 1 1/2", 2" (274)	CSK 1376
Model 309LP OPCO SSV	1/2", 3/4", 1"	CSK 1026-A
Model 309LP OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1026-B
Model 309LP OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1026-C
Model 309LP UPCO/OPCO SSV	1/2", 3/4", 1"	CSK 1036-A
Model 309LP UPCO/OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1036-B
Model 309LP UPCO/OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1036-C
Model 309LP2 OPCO SSV	1/2", 3/4", 1"	CSK 1056-A
Model 309LP2 OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1056-B
Model 309LP2 OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1056-C
Model 309LP2 UPCO/OPCO SSV	1/2", 3/4", 1"	CSK 1046-A
Model 309LP2 UPCO/OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1046-B
Model 309LP2 UPCO/OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1046-C

SPARES KIT FOR VARIOUS SAFETY SLAM-SHUT VALVES

MODEL NUMBER	VALVE ASSEMBLY	SPARES KIT
Model 309LP4 OPCO SSV	1/2", 3/4", 1"	CSK 1066-A
Model 309LP4 OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1066-B
Model 309LP4 OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1066-C
Model 309LP4 UPCO/OPCO SSV	1/2", 3/4", 1"	CSK 1076-A
Model 309LP4 UPCO/OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1076-B
Model 309LP4 UPCO/OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1076-C
Model 290 „t“ OPCO SD SSV	1/2", 3/4", 1", 1 1/4", 1 1/2"	CSK 1306
Model 290 „t „ OPCO SD SSV	1 1/4", 1 1/2", 2" (274)	CSK 1366
Model 309LP „t“ OPCO SSV	1/2", 3/4", 1"	CSK 1006-A
Model 309LP „t“ OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1006-B
Model 309LP „t“ OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1006-C
Model 309LP „t“ UPCO/OPCO SSV	1/2", 3/4", 1"	CSK 1016-A
Model 309LP „t“ UPCO/OPCO SSV	1 1/4", 1 1/2" (240)	CSK 1016-B
Model 309LP „t“ UPCO/OPCO SSV	1 1/4", 1 1/2", 2" (274)	CSK 1016-C

MODEL 290-309LP-309LP2-309LP4 SAFETY SLAM-SHUT VALVES

Part Numbering System

RMG 290 X 1 H N C I X X B X K F

INTERNAL RELIEF	
X	n/a
S	Safety Diaphragm

OPCO TYPE	
1	290 OPCO
2	309LP OPCO
3	309LP UPCO/OPCO
4	309LP2 OPCO
5	309LP2 UPCO/OPCO
6	309LP4 OPCO
7	309LP4 UPCO/OPCO
A	309LP „t“ OPCO
B	309LP „t“ UPCO/OPCO
C	309LP2 „t“ OPCO
D	309LP2 „t“ UPCO/OPCO
E	290 „t“ OPCO

CONNECTIONS SIZE	
E	1/2" x 1/2"
F	3/4" x 3/4"
G	1" x 1"
H	1 1/4" x 1 1/4"
K	1 1/2" x 1 1/2"
M	2" x 2"

CONNECTION TYPE	
N	NPT
B	BSPT
P	BSPP
1	ANSI150RF
2	ANSI150FF
6	PN16RF
7	PN16FF
3	1/2", 3/4", 1" (260/240) valve seat
4	1 1/4", 1 1/2" (240) valve seat
5	1 1/4", 1 1/2", 2" (274) valve seat

MATERIAL	
C	Cast Iron
D	Ductile Iron
S	Cast Steel

IMPULSE	
I	Internal
E	External

OPTIONAL FEATURES	
I	Test Point on Inlet
O	Test Point on Outlet
E	Casting Engraving
B	Test Point on both Inlet & Outlet
F	Inlet Filter Strainer
Z	Blanking Plate

BODY/VENT ORIENTATION	
X	n/a

ORIFICE DIAMETER	
11.0mm	P
20.0mm	S
30.0mm	U

UPCO SPRING	
1138	A
638	B
IA/010	C
IA/006	D
IA/007	E
IA/013	F
n/a	X

OPCO SPRING	
861	A
868	B
1254	C
IA/012	D
1255	E
1171	F
1172	G
1173	H
1174	I
1175	J
1030	K
1031	L
1032	M
1033	N
n/a	X

REGULATOR SPRING	
X	n/a

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F

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WWW.RMG.COM

GERMANY

RMG REGEL + MESSTECHNIK GMBH
Osterholzstrasse 45
K-34123 Kassel
Tel +49 (0) 561.5007.0
Fax +49 (0) 561.5007.107

RMG MESSTECHNIK GMBH
Otto-Hahn-Strasse 5
D-35510 Butzbach
Tel +49 (0) 6033.897.0
Fax +49 (0) 6033.897.130
Works Ebersberg
- Software Development -
Anzinger Straße 14
D-85560 Ebersberg
Tel +49 (0) 8092.20.97.0
Fax +49 (0) 8092.20.97.10

ENGLAND

BRYAN DONKIN RMG GAS CONTROLS LIMITED
Enterprise Drive, Holmewood
Chesterfield S42 5UZ
England
Tel +44 (0) 1246.501.501
Fax +44 (0) 1246.501.500

POLAND

GAZOMET SP. Z O.O
ul. Sarnowska 2
63-900 Rawicz
Poland
Tel +48 (0) 65.546.2401
Fax +48 (0) 65.546.2408

WÄGA WÄRME-GASTECHNIK GMBH
Osterholzstrasse 45
D-34123 Kassel
Tel +49 (0) 561.50707.0
Fax +49 (0) 561.5007.207

RMG-GASELAN REGEL + MESSTECHNIK GMBH
Julius-Pintsch-Ring 3
D-15517 Fürstenwalde
Tel +49 (0) 3361.356.0
Fax +49 (0) 3361.356.836

CANADA

BRYAN DONKIN RMG CANADA LIMITED
50 Clarke Street South
Woodstock, Ontario
Canada N4S 0A8
Tel +1 (0) 519.539.8531
Fax +1 (0) 519.537.3339

UNITED STATES OF AMERICA

MERCURY INSTRUMENTS INC, USA
3940 Virginia Avenue
Cincinnati, Ohio
U.S.A. 45227
Tel +1 (0) 513.272.1111
Fax +1 (0) 513.272.0211