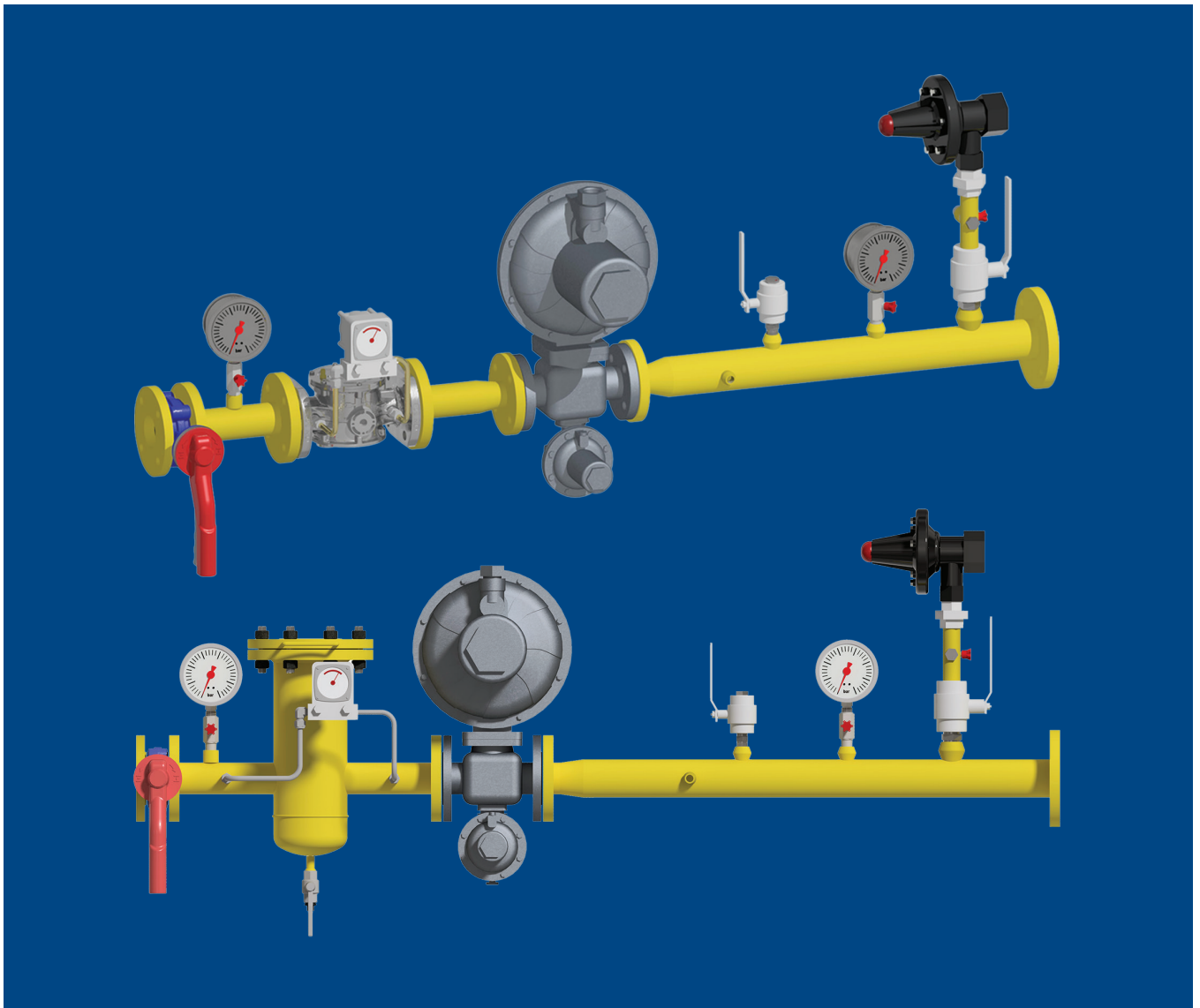


PRESSURE REGULATING LINES

LR Series



LR Series Regulating Lines

Description

LR Series pressure regulating lines are assembled systems designed to reduce the pressure of natural gas or nitrogen, keeping it at a constant value, and to supply the downstream user with the required flow rate.

The pressure reduction is carried out by spring loaded regulators with counterbalanced shutter and integrated slam shut.

The counterbalanced shutter design compensates for possible variations of inlet pressure keeping at constant value the downstream pressure.

For those applications where inlet pressure is constant, a non-balanced pressure regulator can be used.

The slam shut valves are safety devices which automatically cut the flow to prevent the pressure in the downstream system from exceeding the permissible values in the event of regulator failure.

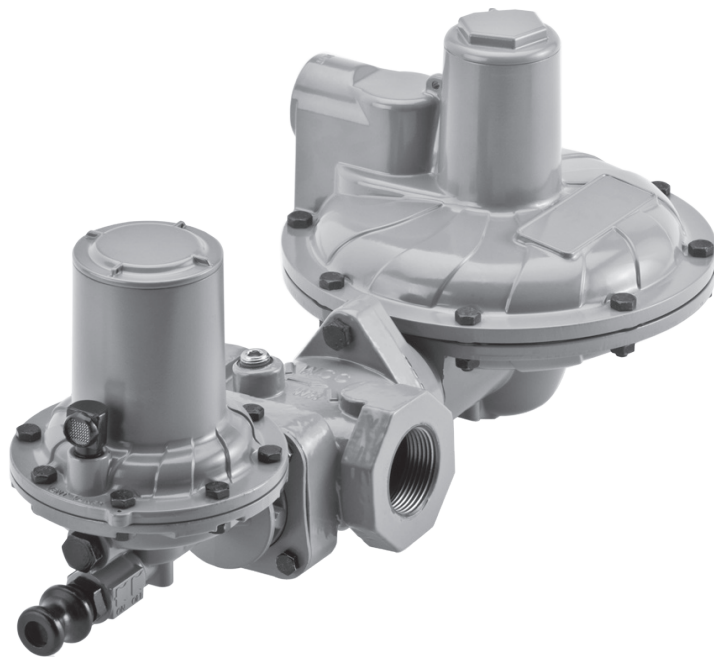
When there is a shutoff due to the maximum pressure being reached, the valve remains in closed position and has to be reset manually.

This type of regulator is ideal for applications requiring sudden changes in capacity or where gas shutoff is solenoid controlled as with industrial burners or furnaces.

The lines are equipped with a spring loaded relief valve, installed downstream of the pressure regulator.

Benefits

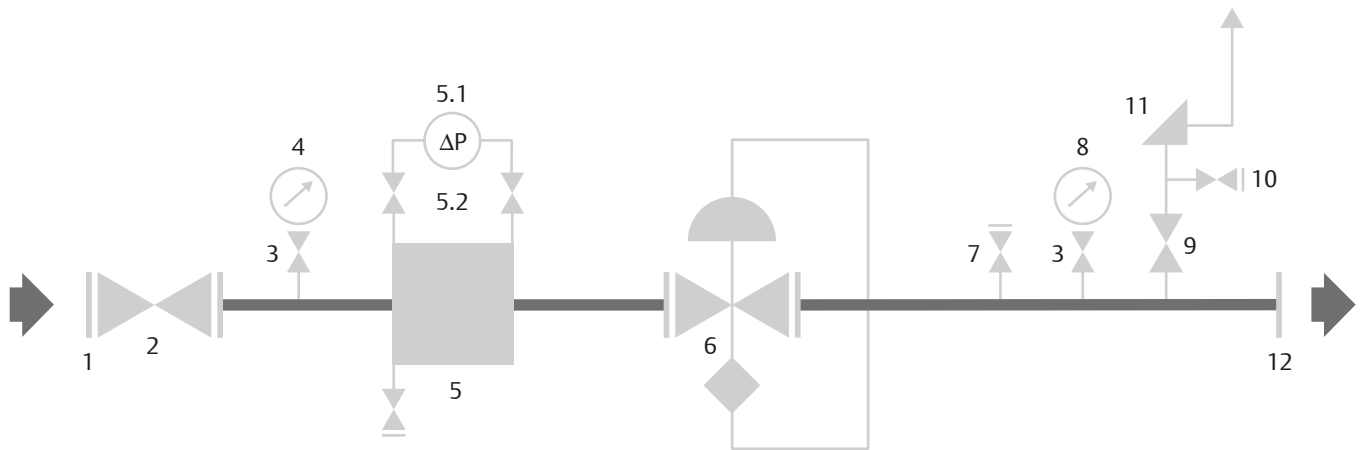
- ***Compact installation***
- ***Stable regulation***
- ***Standardized components and parts***
- ***Plug and play solution***



Type CSB404 Pressure Regulator

LR Series Regulating Lines

Flow Diagram



Components

1		Inlet plate flange PN 16 EN 1092-1
2		<p>Steel wafer ball valve DN 25 to 40 PN 16 lever operated</p> <p>Cast-iron butterfly valve lever operated for diameters greater than or equal to DN 50</p>
3		Needle valve for pressure-gauge 1/2 in.

LR Series Regulating Lines

Components

4



Pressure gauge Ø 100 mm
Radial process connection 1/2 in. GAS-M
Range: 0 to 6 bar / 0 to 87 psi

5



Cartridge filter - FAG-A Series
Maximum working pressure: 6 barg / 87 psig
Steel body
Flanged axial connections PN 16
Complete with drain valve 1/2 in. GAS-FF
Felt cartridge with 5 µm filtering capacity
Operating temperature (TS): -10 to +60°C / 14 to 140°F

5



Aluminum filter
Flanged axial connections PN 16
Maximum working pressure 6 bar / 87 psi
Cartridge with 50 µm filtering capacity

5.1



Clogging indicator Type PG/150
Range: 0 to 150 mbar / 0 to 2.18 psi
Body: Aluminum
Connections: 1/4 NPT
With clogging indicator slave pointer

5.2



Three way manifold for clogging indicator

6



Spring loaded pressure regulator with integrated slam shut
Type CSB404/424
Body: Cast iron
Body O-ring: Nitrile (NBR)
Covers: Aluminum
Diaphragm and Pad: Nitrile (NBR)
Operating Temperature (TS): -20 to +66°C / -4 to 150°F

LR Series Regulating Lines

6



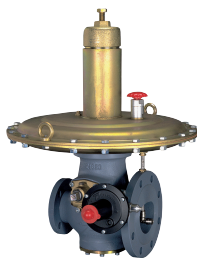
Spring loaded pressure regulator with integrated slam shut
Type CSB624
Body: Iron
Body O-ring: Nitrile (NBR)
Covers: Aluminum
Diaphragm and Pad: Nitrile (NBR)
Operating Temperature (TS): -20 to +66°C / -4 to 150°F

6



Spring loaded pressure regulator with integrated slam shut
Type CSB724
Body: Iron
Body O-ring: Nitrile (NBR)
Covers: Aluminum
Diaphragm and Pad: Nitrile (NBR)
Operating temperature (TS): -20 to +66°C / -4 to 150°F

6



Spring loaded pressure regulator with integrated slam shut
Type MBN
Flanges and Covers: Steel
Diaphragm: Fabric NBR+PVC or Nitrile (NBR)
Pads: Nitrile (NBR)
Operating Temperature (TS): -10 to +60°C / 14 to 140°F

6



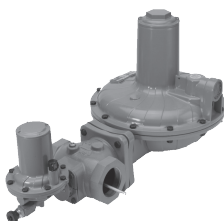
Spring loaded pressure regulator with integrated slam shut
Type LS204
Body: Ductile iron
Pads: Nitrile (NBR)
Operating Temperature (TS): -20 to +66°C / -4 to 150°F

6



Spring loaded pressure regulator with integrated slam shut
Unbalanced plug
Type CS404
Body: Ductile iron
Pads: Nitrile (NBR)
Operating Temperature (TS): -20 to +66°C / -4 to 150°F

6



Spring loaded pressure regulator with integrated slam shut
Unbalanced plug
Type CS824
Body: Ductile iron
Pads: Nitrile (NBR)
Operating Temperature (TS): -20 to +60°C / -4 to 140°F

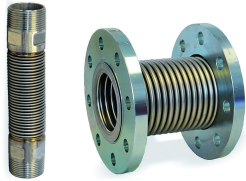
LR Series Regulating Lines

Components

7		Brass ball valves 1/2 in. GAS-FF for pressure setting
8		Pressure gauge Ø 100 mm Radial process connection 1/2 in. GAS-M Range: 0 to 600 mbar / 0 to 8.7 psi
9		Brass ball valves 1 in. GAS-FF
10		Needle valve 1/2 in. for relief valve setting
11		Spring loaded relief valve Type V/51 or V/52 Body/Cover: Aluminum Diaphragm: Nitrile (NBR) Threaded connections 1 x 1-1/2 in. GAS-FF Operating temperature (TS): -10 to +60°C / 14 to 140°F
12		Outlet spool with plate flange PN 16 EN 1092-1

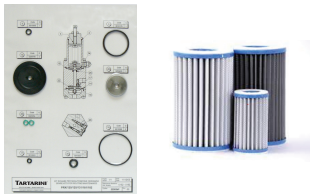
Options Available on Request

1



Anti-vibration joints with stainless steel bellows (supplied loose)
Threaded version MM - 1 and 1 1/2 in.
Version with flanges in carbon steel from DN 50 to DN 200

2



Set of spare parts for preventive maintenance consisting of:

- Cartridge with 5 µm filtering capacity in felt
- Spare parts kit in vacuum blister pack (pressure regulator; slam shut and relief valve)

3



Motorized Safety Shut-Off Valve and Pressure Stabilizer in one unit
ASCO™ Series 158 and 159
EN161 certified
Position switches and visual indication available

4



Solenoid Safety Shut-Off Valve
ASCO™ Series 215
EN161 certified

5



Angle Body Pneumatically Operated Safety Shut-Off Valve
ASCO™ Series 290D
EN161 and EN16678 certified
Signaling box (switches) and visual indication available

LR Series Regulating Lines

Technical Features

Working Conditions

Maximum upstream pressure P1 max (barg)	Minimum upstream pressure P1 min (barg)	Downstream pressure P2 (mbarg)
5	0.5	100 150 300
	1	
	1.5	
	2	
	3	
	4	

The maximum flow rate of natural gas of LR Series with steel filter 5 μ is given in the tables from page 12 to page 17.

Flow rate tables of LR Series with aluminum filter 50 μ is given in tables from page 18 to 23.

For other gases having different densities, the flow rate indicated in the tables needs to be multiplied by the correction factor F.

Gas	Relative Density, d	Factor, F
Air	1	0.78
Butane	2.01	0.55
Propane	1.53	0.63
Nitrogen	0.97	0.79

Technical Features

Sizing Criteria

- Maximum gas velocity in the line upstream of the regulators: 30 m/sec (for LR Series with steel filter 5 μ)
- Maximum gas velocity in the line upstream of the regulators: 20 m/sec (for LR Series with aluminum filter 50 μ)
- Maximum gas velocity in the line downstream of the regulators: 20 m/sec
- Maximum head loss of the filter: 5% of P1min at Qmax
- Pressure regulator accuracy class (AC): 10

UNI 10619-1 - "Gas pressure control systems and/or gas measurement installations for inlet pressure up to 12 bar for industrial and domestic use. Part 1: Design, construction and testing - General."

UNI 10619-2 - "Gas pressure control systems and/or gas measurement installations for inlet pressure up to 12 bar for industrial and domestic use. Part 2 - Equipment for gas control."

EN12186 - "Gas infrastructure. Gas pressure regulating stations for transmission and distribution. Functional requirements."



Type LS204 Pressure Regulator

LR Series Regulating Lines

Technical Features

Piping

- Seamless steel pipe according to ANSI B36.10, material API 5L Gr.B (Sch. Std)
- Cleaned of dirt, refuse, welds spatters by sandblasting SA 2.5

Impulse Lines and Fittings

- Stainless steel (copper only for Type MBN regulators) / carbon steel fittings

Flanges

- Plate flange in steel PN 16 EN 1092-1 (where applicable)

Welding Fittings

- According to ANSI B16.9 standard, material ASTM A234 WPB or equivalent

Threaded Accessories

- According to API standard with NPT or GAS threads In ASTM A105 or equivalent

Welding Procedures

- According to EN 15609 or ASME Sect. IX

Welder Qualifications

- According to UNI EN ISO 9606-1 (2013) or ASME Sect. IX

Stud bolts and nuts

- According to UNI 5737/5739 / hot-dip galvanized to UNI 5587 standard

Gaskets / Threaded Connections Seal

- Centellen® (Aramid fiber and NBR) with Teflon tape

Technical Features

Tests

- Hydrostatic test of pipe spool
- Tightness test of assembled unit

Painting (only for filter and line downstream)

- Sandblasting grade SA 2.5
- First layer: epoxy primer, min. thickness 50 μm
- Second layer: polyurethane paint, min. thickness 30 μm - Yellow RAL 1016

Other components painted according to the manufacturer's standard.

Documentation Included in the Supply (in Italian or English)

- PED declaration of conformity for the equipment (where applicable)
- Declaration of compliance with Italian Ministerial Decree D.M. April 16, 2008
- Drawing in pdf format
- Bill of materials and P&ID
- Equipment instruction manuals

Materials and Services on Request

- Support skid
- Relief valve vent pipe and its support
- Line grounding
- Cabinet
- Start up

LR Series Regulating Lines

Flow Rate Tables - Steel Filter

Table No. 1 - P1 max/min = 5/0.5 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-1	80	25	FAG-A/0.5	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	40
LR-2	350	50	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	80
LR-3	500	65	FAG-A/2	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-4	640	80	FAG-A/2	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	100
LR-5	820	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	150

Table No. 2 - P1 max/min = 5/0.5 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-6	110	40	FAG-A/0.5	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	50
LR-7	280	50	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	65
LR-8	445	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	80
LR-9	600	65	FAG-A/2	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	100
LR-10	760	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	150

Table No. 3 - P1 max/min = 5/0.5 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-11	110	40	FAG-A/0.5	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	40
LR-12	270	50	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	65
LR-13	400	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	80
LR-14	530	65	FAG-A/2	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	100
LR-15	660	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	100

Flow Rate Tables - Steel Filter

Table No. 4 - P1 max/min = 5/1 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-16	155	40	FAG-A/0.5	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	50
LR-17	540	65	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-18	775	65	FAG-A/2	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-19	900	80	FAG-A/2	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	150
LR-20	1150	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	150

Table No. 5 - P1 max/min = 5/1 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-21	225	40	FAG-A/1	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	65
LR-22	470	50	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-23	745	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-24	900	80	FAG-A/2	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	150
LR-25	1150	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	150

Table No. 6 - P1 max/min = 5/1 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-26	220	40	FAG-A/1	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	65
LR-27	490	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	80
LR-28	765	65	FAG-A/2	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	100
LR-29	890	80	FAG-A/2	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	150
LR-30	1150	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	150

LR Series Regulating Lines

Flow Rate Tables - Steel Filter

Table No. 7 - P1 max/min = 5/1.5 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-31	250	40	FAG-A/1	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	65
LR-32	700	65	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-33	1000	65	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-34	1150	80	FAG-A/2	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	150
LR-35	1300	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	150

Table No. 8 - P1 max/min = 5/1.5 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-36	200	40	FAG-A/0.5	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	65
LR-37	600	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-38	900	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-39	1000	65	FAG-A/1.5	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	150
LR-40	1450	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	150

Table No. 9 - P1 max/min = 5/1.5 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-41	290	40	FAG-A/1	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	65
LR-42	500	50	FAG-A/1	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	80
LR-43	1000	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-44	1000	65	FAG-A/1.5	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	150
LR-45	1450	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	150

Flow Rate Tables - Steel Filter

Table No. 10 - P1 max/min = 5/2 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-46	340	40	FAG-A/1	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	80
LR-47	850	65	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-48	1200	80	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-49	1300	80	FAG-A/1.5	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	150
LR-50	1550	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	150

Table No. 11 - P1 max/min = 5/2 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-51	350	40	FAG-A/1	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	80
LR-52	700	50	FAG-A/1	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-53	1200	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-54	1300	80	FAG-A/1.5	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	150
LR-55	1700	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	200

Table No. 12 - P1 max/min = 5/2 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-56	370	40	FAG-A/1	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	80
LR-57	800	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	100
LR-58	1200	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-59	1300	80	FAG-A/1.5	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	150
LR-60	1700	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	150

LR Series Regulating Lines

Flow Rate Tables - Steel Filter

Table No. 13 - P1 max/min = 5/3 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-61	475	40	FAG-A/1	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	100
LR-62	1100	65	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-64	1770	80	FAG-A/2	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	200
LR-65	1800	80	FAG-A/2	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	200
LR-66	2300	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	200

Table No. 14 - P1 max/min = 5/3 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-66	550	40	FAG-A/1	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	100
LR-67	1100	65	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-68	1700	80	FAG-A/2	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	200
LR-69	1800	80	FAG-A/2	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	200
LR-70	2300	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	200

Table No. 15 - P1 max/min = 5/3 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Qmax (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-71	500	40	FAG-A/1	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	80
LR-72	1100	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-73	1700	80	FAG-A/2	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-74	1800	80	FAG-A/2	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	150
LR-75	2300	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	200

Flow Rate Tables - Steel Filter

Table No. 16 - P1 max/min = 5/4 barg - P2 = 100 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-76	500	40	FAG-A/1	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	100
LR-77	1200	50	FAG-A/1.5	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-78	2000	65	FAG-A/2	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	200
LR-79	2200	80	FAG-A/2	MBN	DN40X80 PN16	Internal	80 to 140	200	V/51	100 to 200	200
LR-80	2800	80	FAG-A/2	MBN	DN50X100 PN16	Internal	80 to 140	200	V/51	100 to 200	250

Table No. 17 - P1 max/min = 5/4 barg - P2 = 150 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-81	550	40	FAG-A/1	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	100
LR-82	1200	50	FAG-A/1.5	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-83	2000	65	FAG-A/2	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	200
LR-84	2200	80	FAG-A/2	MBN	DN40X80 PN16	Internal	140 to 200	250	V/51	100 to 200	200
LR-85	2800	80	FAG-A/2	MBN	DN50X100 PN16	Internal	140 to 200	250	V/51	100 to 200	200

Table No. 18 - P1 max/min = 5/4 barg - P2 = 300 mbarg - Steel Filter 5 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-86	700	40	FAG-A/1	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	100
LR-87	1400	65	FAG-A/1.5	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-88	2110	65	FAG-A/2	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	200
LR-89	2200	80	FAG-A/2	MBN QA	DN40X80 PN16	Internal	200 to 320	450	V/51	180 to 400	200
LR-90	2800	80	FAG-A/2	MBN QA	DN50X100 PN16	Internal	200 to 320	450	V/51	180 to 400	200

LR Series Regulating Lines

Flow Rate Tables - Aluminum Filter

Table No. 19 - P1 max/min = 5/0.5 barg - P2 = 100 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-1-F	50	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	40
LR-2-F	130	40	FFMPM40000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	50
LR-3-F	200	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	65
LR-4-F	340	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	80
LR-5-F	500	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100

Table No. 20 - P1 max/min = 5/0.5 barg - P2 = 150 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-6-F	50	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	25
LR-7-F	130	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	50
LR-8-F	200	50	FFMPM50000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	65
LR-9-F	340	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	80
LR-10-F	445	80	FFMPM90000 B50	CSB724	DN50 PN16	Internal	140 to 200	250	V/51	100 to 200	100

Table No. 21 - P1 max/min = 5/0.5 barg - P2 = 300 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-11-F	50	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	25
LR-12-F	130	40	FFMPM40000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	40
LR-13-F	200	50	FFMPM50000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	50
LR-14-F	340	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	65
LR-15-F	400	80	FFMPM90000 B50	CSB724	DN50 PN16	External	200 to 320	450	V/51	180 to 400	80

Flow Rate Tables - Aluminum Filter

Table No. 22 - P1 max/min = 5/1 barg - P2 = 100 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-16-F	70	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	40
LR-17-F	175	40	FFMPM40000 B50	CSB404	DN40 PN16	External	54 to 110	170	V/51	100 to 200	65
LR-18-F	270	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	65
LR-19-F	450	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-20-F	700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100

Table No. 23 - P1 max/min = 5/1 barg - P2 = 150 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-21-F	70	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	40
LR-22-F	175	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	50
LR-23-F	270	50	FFMPM50000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	65
LR-24-F	450	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	80
LR-25-F	700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100

Table No. 24 - P1 max/min = 5/1 barg - P2 = 300 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-26-F	70	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	40
LR-27-F	168	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	50
LR-28-F	270	50	FFMPM50000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	65
LR-29-F	450	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	80
LR-30-F	700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	100

LR Series Regulating Lines

Flow Rate Tables - Aluminum Filter

Table No. 25 - P1 max/min = 5/1.5 barg - P2 = 100 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-31-F	83	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	40
LR-32-F	220	40	FFMPM40000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	65
LR-33-F	340	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	80
LR-34-F	580	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-35-F	880	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150

Table No. 26 - P1 max/min = 5/1.5 barg - P2 = 150 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-36-F	83	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	40
LR-37-F	220	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	65
LR-38-F	340	50	FFMPM50000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	80
LR-39-F	580	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-40-F	880	80	FFMPM90000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150

Table No. 27 - P1 max/min = 5/1.5 barg - P2 = 300 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-41-F	83	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	40
LR-42-F	220	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	65
LR-43-F	340	50	FFMPM50000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	65
LR-44-F	580	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	100
LR-45-F	880	80	FFMPM90000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150

Flow Rate Tables - Aluminum Filter

Table No. 28 - P1 max/min = 5/2 barg - P2 = 100 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-46-F	100	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	40
LR-47-F	265	40	FFMPM40000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	65
LR-48-F	400	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	80
LR-49-F	680	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-50-F	1050	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150

Table No. 29 - P1 max/min = 5/2 barg - P2 = 150 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-51-F	100	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	40
LR-52-F	265	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	65
LR-53-F	400	50	FFMPM50000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	80
LR-54-F	680	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-55-F	1050	80	FFMPM90000 B50	CSB724	DN50 PN16	Internal	140 to 200	250	V/51	100 to 200	150

Table No. 30 - P1 max/min = 5/2 barg - P2 = 300 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-56-F	100	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	40
LR-57-F	265	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	65
LR-58-F	400	50	FFMPM50000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	80
LR-59-F	680	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	100
LR-60-F	1050	80	FFMPM90000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150

LR Series Regulating Lines

Flow Rate Tables - Aluminum Filter

Table No. 31 - P1 max/min = 5/3 barg - P2 = 100 mbarg - Aluminum Filter 50 _μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-61-F	135	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	50
LR-62-F	350	40	FFMPM40000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	80
LR-63-F	550	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-64-F	940	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-65-F	1400	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150

Table No. 32 - P1 max/min = 5/3 barg - P2 = 150 mbarg - Aluminum Filter 50 _μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-66-F	135	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	50
LR-67-F	350	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	80
LR-68-F	550	50	FFMPM50000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	100
LR-69-F	940	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-70-F	1400	80	FFMPM90000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150

Table No. 33 - P1 max/min = 5/3 barg - P2 = 300 mbarg - Aluminum Filter 50 _μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-71-F	135	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	50
LR-72-F	350	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	80
LR-73-F	550	50	FFMPM50000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	100
LR-74-F	940	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-75-F	1400	80	FFMPM90000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150

Flow Rate Tables - Aluminum Filter

Table No. 34 - P1 max/min = 5/4 barg - P2 = 100 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-76-F	170	25	FGMPM25000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	50
LR-77-F	440	40	FFMPM40000 B50	CSB404	DN40 PN16	Internal	54 to 110	170	V/51	100 to 200	80
LR-78-F	680	50	FFMPM50000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	100
LR-79-F	1150	65	FFMPM80000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	150
LR-80-F	1700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	61 to 110	170	V/51	100 to 200	200

Table No. 35 - P1 max/min = 5/4 barg - P2 = 150 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-81-F	170	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	50
LR-82-F	440	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	100 to 160	250	V/51	100 to 200	80
LR-83-F	680	50	FFMPM50000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	100
LR-84-F	1150	65	FFMPM80000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	150
LR-85-F	1700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	105 to 220	250	V/51	100 to 200	200

Table No. 36 - P1 max/min = 5/4 barg - P2 = 300 mbarg - Aluminum Filter 50 μ											
Type	Q _{max} (Stm ³ /h)	DN Inlet (mm)	Filter	Regulator					Relief valve		DN Outlet (mm)
				Model	Connections	Impulse	Spring (mbarg)	OPSO Set point (mbarg)	Model	Spring (mbarg)	
LR-86-F	170	25	FGMPM25000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	50
LR-87-F	440	40	FFMPM40000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	80
LR-88-F	680	50	FFMPM50000 B50	CSB424	DN40 PN16	Internal	138 to 300	450	V/51	180 to 400	100
LR-89-F	1150	65	FFMPM80000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150
LR-90-F	1700	80	FFMPM90000 B50	CSB724	DN50 PN16	External	210 to 380	450	V/51	180 to 400	150

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