

Pressure Reducing Valves

SERIES RE

Pressure Reducing Valves (PRV) are designed for regulating the downstream pressure and maintaining it within certain acceptable limits. Ideally, a PRV should provide constant downstream pressure while delivering the required flow, i.e. the PRV automatically adjusts the steam flow to meet the downstream system demand. Depending on the model, MIYAWAKI's pressure reducing valves are designed for steam, air, gases and liquids. MIYAWAKI is manufacturing three types of PRV:

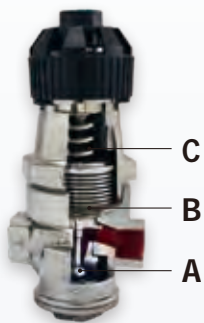
- Direct acting pressure reducing valves
- Pilot operated pressure reducing valves
- Pressure reducing valves with a downstream pressure sensing line (pulse line)

Operating principle General

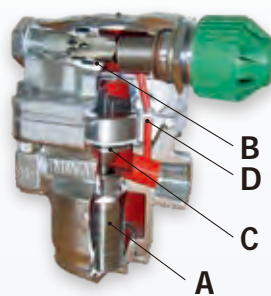
Direct Acting PRV

The direct acting PRV has 3 essential elements:

- A Main Valve Unit
- B Pressure Measuring Element (Bellows)
- C Adjust Spring



Changes in downstream pressure are sensed by the bellows, which expands or contracts depending on the pressure change. The movement of the bellows will be directly transferred to the spring, which will open or close the main valve, thus keeping the downstream pressure at a certain level.



Pilot Operated PRV

The pilot operated PRV has 4 essential elements:

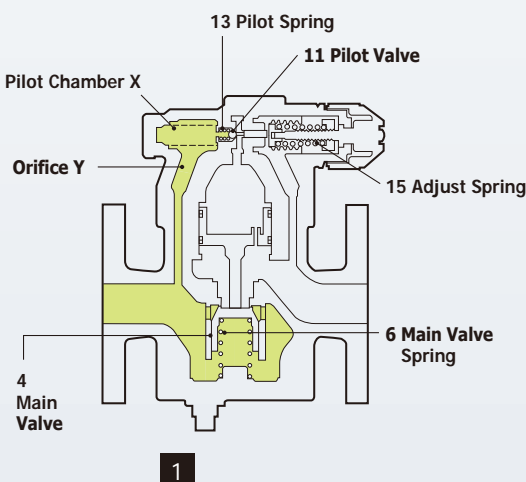
- A Main Valve Unit
- B Pilot Valve (same structure as the direct-acting PRV)
- C Adjusting Unit (piston and cylinder liner)
- D Downstream pressure sensing line (pulse line)

Changes in downstream pressure are sensed by the pilot valve mechanism (bellows connected with a pilot valve unit) through a signal line D, which connects the pilot valve regulator with the secondary pressure side. Movement of the bellows will open or close the pilot valve, regulating the amount of steam influencing the movement of the piston, which will close or open the main valve, thus keeping downstream pressure on a stable level.

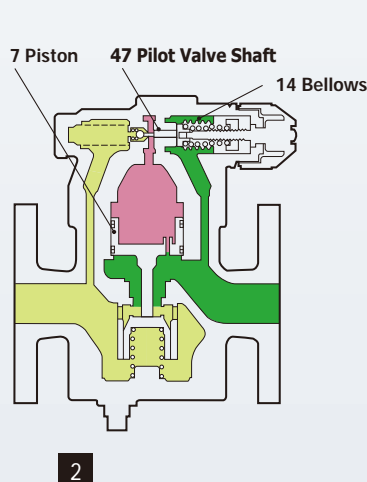
Pilot operated pressure reducing valves are used to improve accuracy and capacity, compared with direct acting pressure regulators. The decision whether to use a direct acting valve or a pilot operated valve depends on the demands of the steam using system.

Operating principle Pilot operated PRV

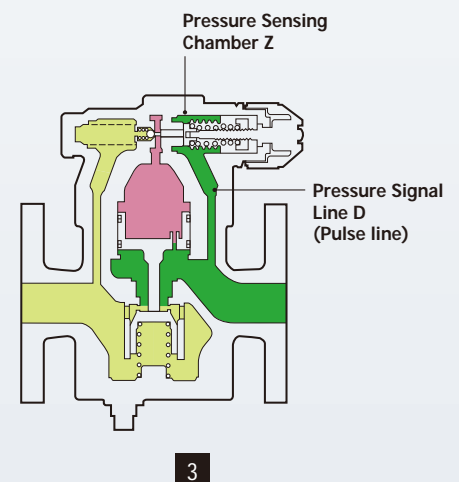
■ Inlet Steam Pressure
 ■ Secondary Steam Pressure
 ■ Adjusting Steam Pressure



Before adjusting the secondary pressure the green handle must be turned clockwise to release the adjust spring (15) until the handle moves freely. In this position the main valve (4) is closed by the force of the spring (6) and the pilot valve (11) is closed by the force of the spring (13). When steam enters the valve, part of the steam enters the pilot chamber (X) through the orifice (Y).

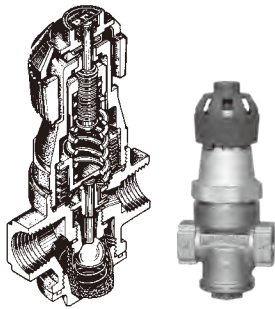


To adjust the secondary pressure the handle must be turned counterclockwise. As a result, the adjust spring (15) will be pressed into the bellows (14). The bellows will expand and the pilot valve shaft (47) will open the pilot valve (11). The steam, which has entered the pilot chamber (X) will flow through the pilot valve unit into the chamber above the piston (7). Due to the steam pressure the piston (7) will move downwards and open the main valve (4). Steam will flow towards the secondary side.



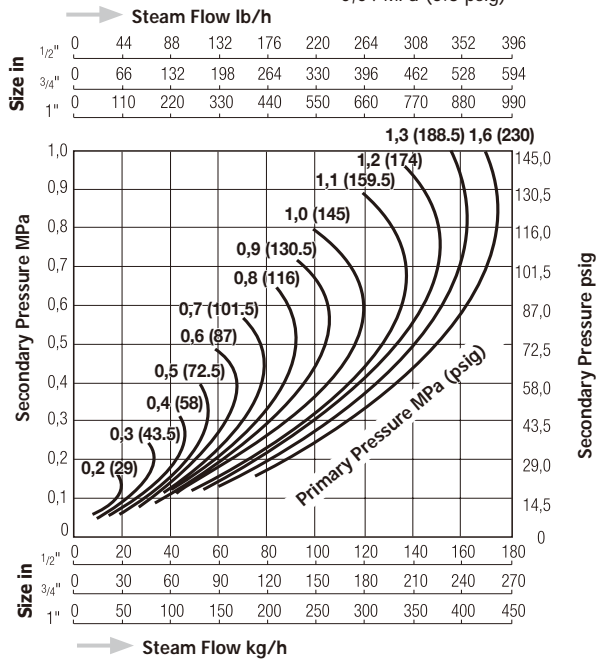
Part of the steam, which flows to the secondary side will enter the pressure sensing chamber (Z) through the pressure signal line (D). Due to the pressure influence, the bellows (14) will contract. Depending on the secondary pressure value the force exerted by the bellows and the force exerted by the adjust spring (15) will be balanced and the opening degree of the pilot valve (11) will be adjusted, thus regulating the amount of steam flowing through the pilot valve to the piston. Consequently, the opening degree of the main valve (4) will be also adjusted to regulate the steam flow in the direction of the secondary side maintaining a stable steam flow and steam pressure on the secondary side.

RE1

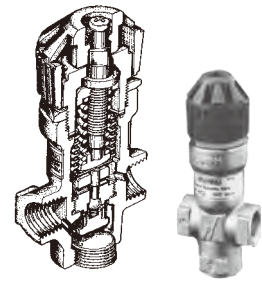


Capacity Chart RE1, RE1-4

Minimum Differential Pressure:
0,04 MPa (5.8 psig)

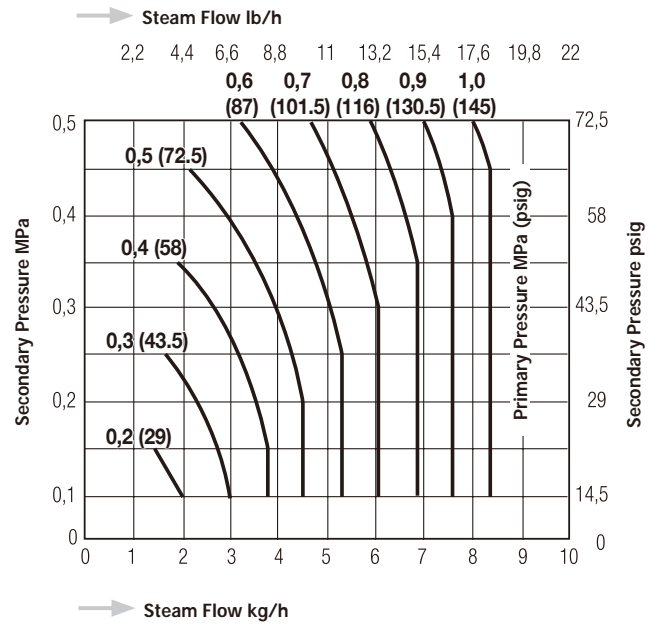


RE2



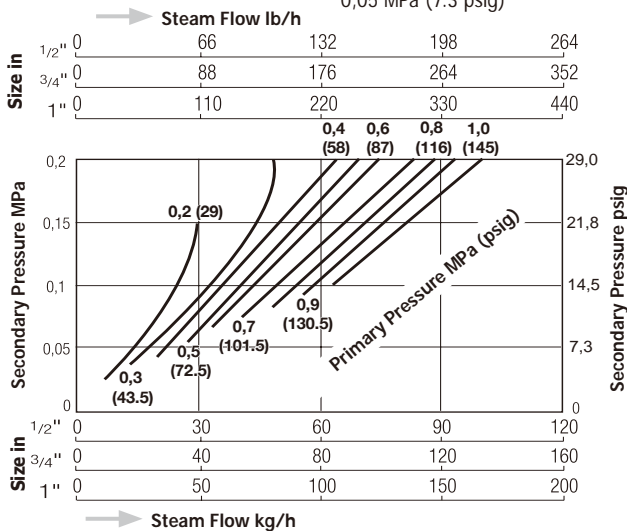
Capacity Chart RE2

Minimum Differential Pressure:
0,05 MPa (7.3 psig)

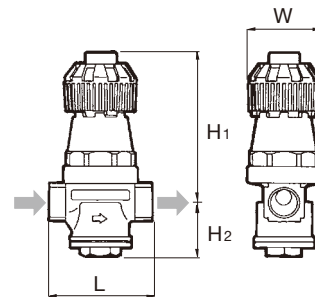


Capacity Chart RE1-2

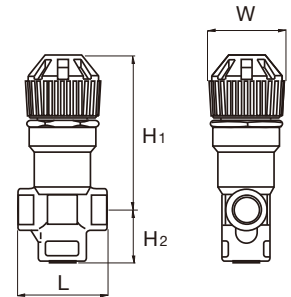
Minimum Differential Pressure:
0,05 MPa (7.3 psig)



Dimensions RE1



Dimensions RE2

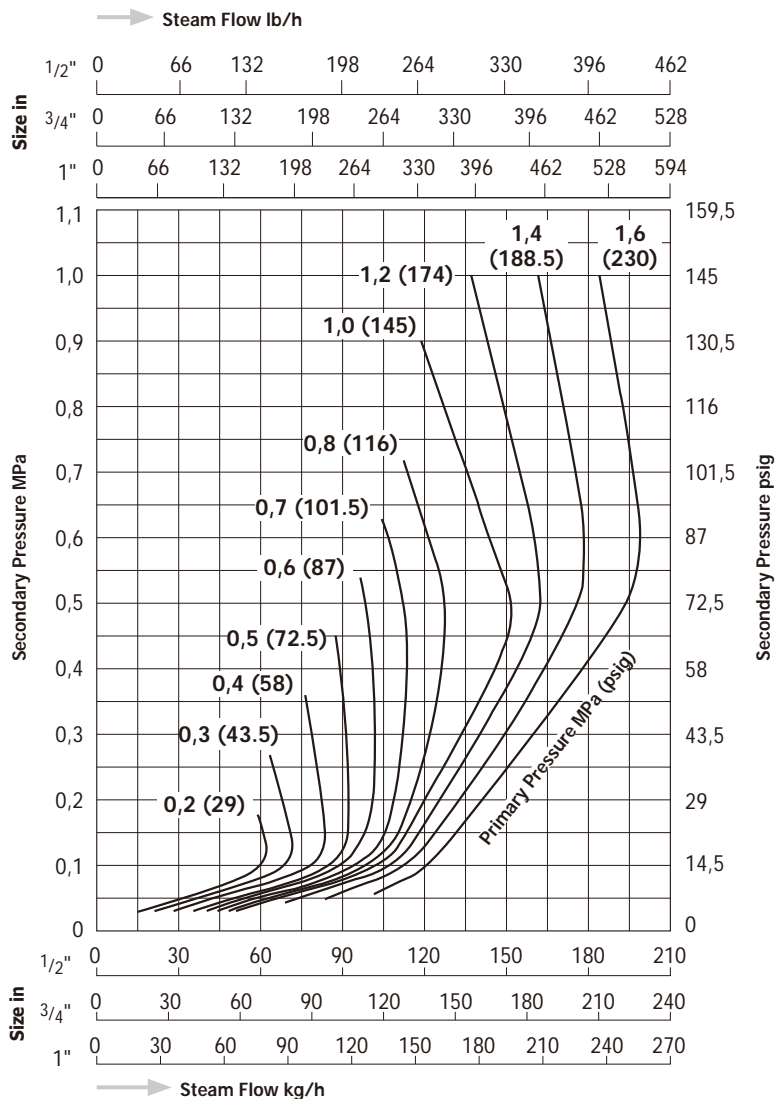
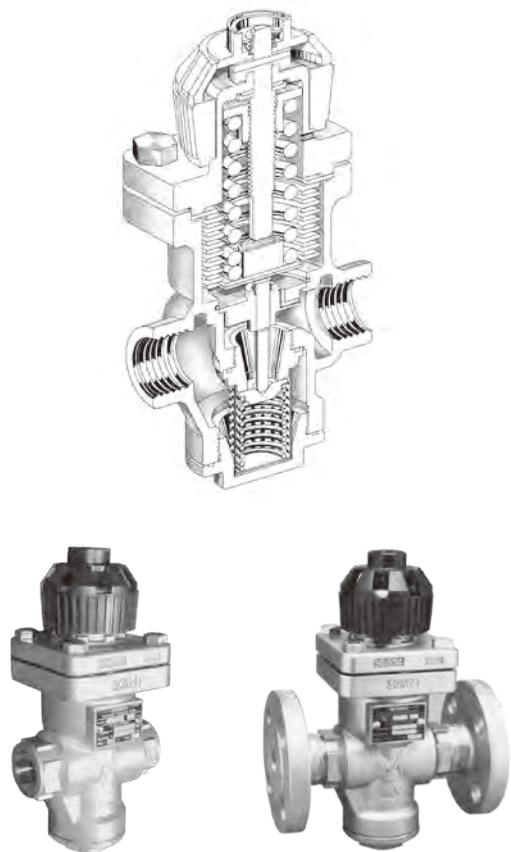


Cv Values	Size (in)	RE1 & RE1-4	RE1-2	Kvs Values	Size (in)	RE1 & RE1-4	RE1-2
	1/2"	1,2	1,9		1,0	3/4"	1,6
	3/4"	1,9	1,9		1"	2,8	1,8
	1"	3,2	2,1				

Model	Connection	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Body Material	Weight	
			MPa	psig	MPa	psig		°C	°F	L	H1	H2	W	L	H1	H2	W		kg	lb
RE1	Screwed Rc, NPT	1/2"	0,2 - 1,6	29 - 230	0,05 - 1,0	7,3 - 145	10 : 1	204	399	80	137	46	65	3,2	5,4	1,8	2,6	Brass C3771	1,4	3,1
		90								137	46	65	3,5	5,4	1,8	1,6			3,5	
		105								144	58	65	4,1	5,7	2,3	1,9			4,2	
RE1-4	Screwed Rc, NPT	1/2"	0,2 - 1,0	29 - 145	0,05 - 0,4	7,3 - 58	10 : 1	204	399	80	137	46	65	3,2	5,4	1,8	2,6	Brass C3771	1,4	3,1
		90								137	46	65	3,5	5,4	1,8	1,6			3,5	
		105								144	58	65	4,1	5,7	2,3	1,9			4,2	
RE1-2	Screwed Rc, NPT	1/2"	0,2 - 1,0	29 - 145	0,02 - 0,2	2,9 - 29	10 : 1	204	399	80	137	46	65	3,2	5,4	1,8	2,6	Brass C3771	1,4	3,1
		90								137	46	65	3,5	5,4	1,8	1,6			3,5	
		105								144	58	65	4,1	5,7	2,3	1,9			4,2	
RE2	Screwed Rc, NPT	3/8"	0,2 - 1,0	29 - 145	0,1 - 0,5	14 - 72	10 : 1	184	363	50	89	31	43	2,0	3,5	1,2	1,7	0,56	1,2	

REC1

Capacity Chart REC1



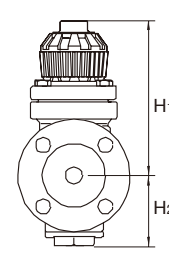
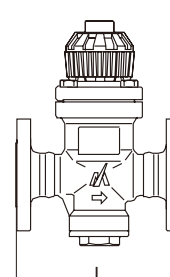
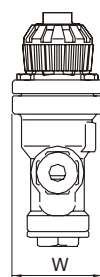
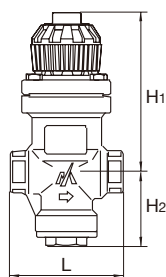
Minimum Differential Pressure:
more than 10 % of Operating Pressure

Body Material:
Stainless Steel SCS14

Dimensions REC1 - Screwed

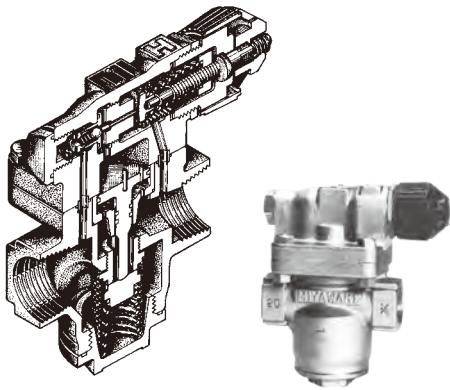
Dimensions REC1 - Flanged

	Size (in)	REC1
Cv Values	1/2"	3,8
	3/4"	4,0
	1"	4,0
Kvs Values	1/2"	3,3
	3/4"	3,4
	1"	3,4



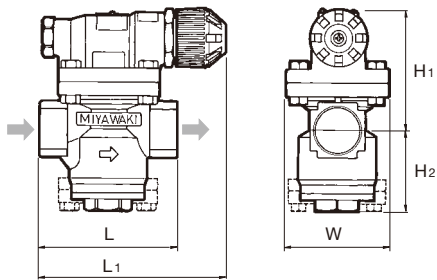
Model	Connections	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Weight										
			MPa	psig	MPa	psig		°C	°F	L	H1	H2	W	L	H1	H2	W	kg	lb									
REC1-2	Screwed Rc, NPT, Rp	1/2" - 1"	0,2 - 1,6	29 - 230	0,02 - 0,2	2,9 - 29	30 : 1	220	428	96	138	63	78	3,8	5,4	2,5	3,1	2,9	6,4									
REC1-6		1/2" - 1"	0,2 - 1,6	29 - 230	0,18 - 0,6	26 - 87	8,9 : 1											2,8	6,2									
REC1-10		1/2" - 1"	0,6 - 1,6	87 - 230	0,54 - 1,0	78 - 145	3 : 1											2,8	6,2									
REC1-2F	Flanged JIS, ASME, DIN	1/2"	0,2 - 1,6	29 - 230	0,02 - 0,2	2,9 - 29	30 : 1			220	428	150	138	63	78	5,9	5,4	2,5	3,1	4,5	9,9							
		3/4"																		5,1	11,2							
		1"																		5,9	13							
REC1-6F		1/2"										0,2 - 1,6	29 - 230	0,18 - 0,6	26 - 87	8,9 : 1	220	428	150	138	63	78	5,9	5,4	2,5	3,1	4,5	9,9
		3/4"																									5,1	11,2
		1"																									5,9	13
REC1-10F	1/2"	0,6 - 1,6	87 - 230	0,54 - 1,0	78 - 145	3 : 1	220			428	150								138	63	78	5,9	5,4	2,5	3,1	4,5	9,9	
	3/4"																									5,1	11,2	
	1"																									5,9	13	

RE3



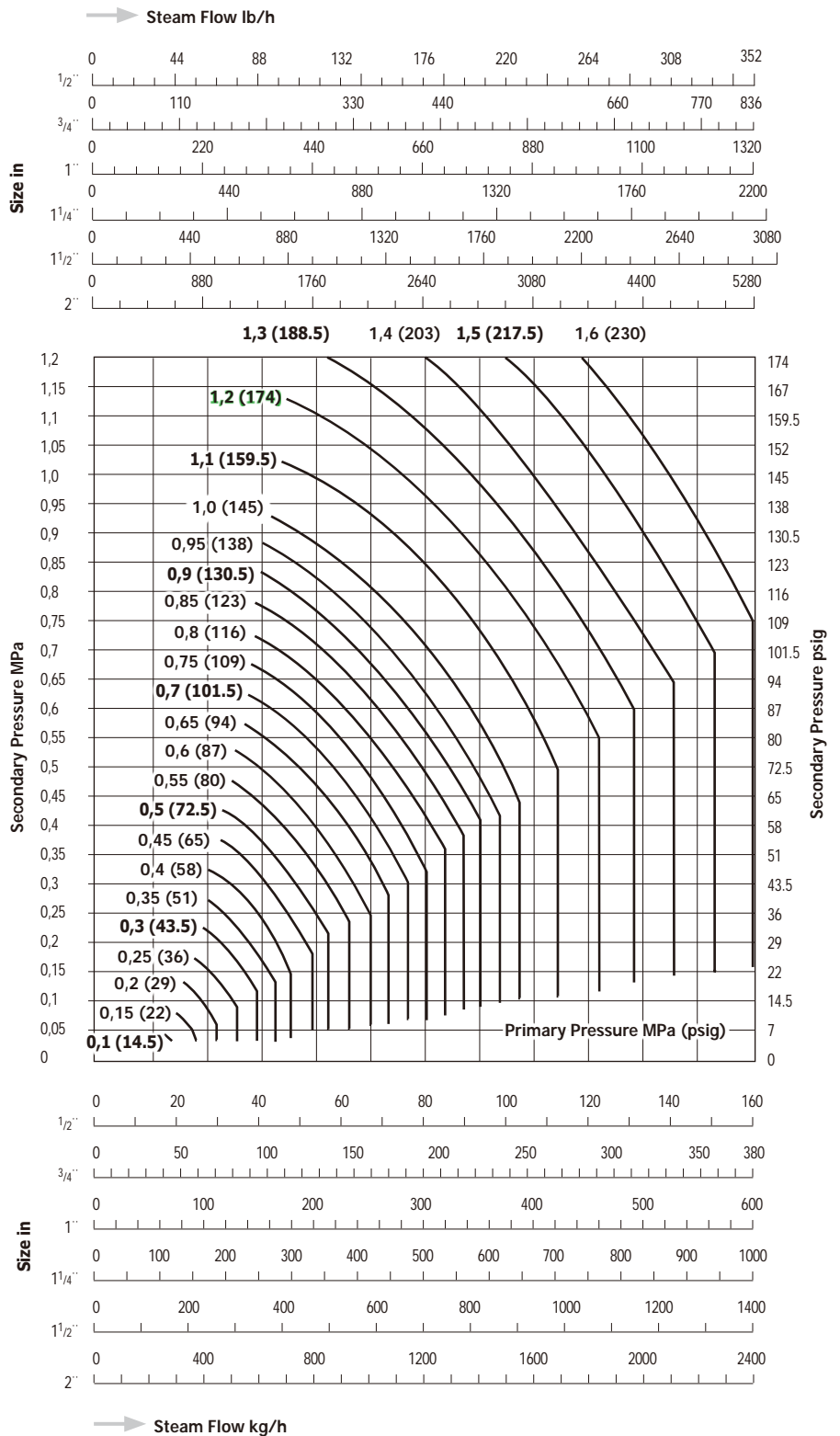
Body Material: Brass C3771

Dimensions RE3



Minimum Differential Pressure:
0,07 MPa (10.2 psig)

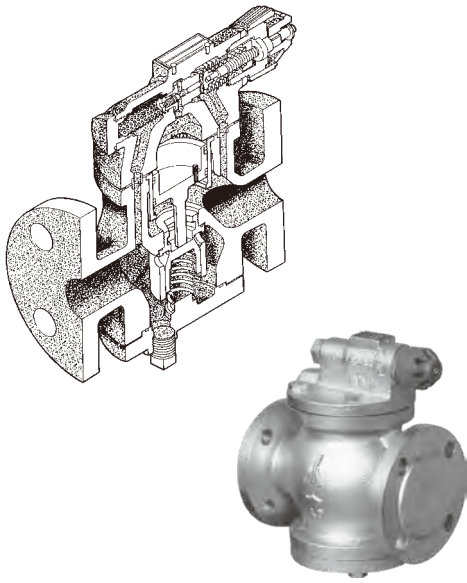
Capacity Chart RE3



Model	Connection	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Oper. Temperature		Dimensions (mm)					Dimensions (in)					Weight		Values	
			MPa	psig	MPa	psig		°C	°F	L	L1	H1	H2	W	L	L1	H1	H2	W	kg	lb	Cv	Kvs
RE3	Screwed Rc, NPT	1/2"	0,1 - 1,6	14.5 - 230	0,03 - 1,2	4.4 - 174	20 : 1	220	428	90	127	87	58	74	3.5	5.0	3.4	2.3	2.9	2,8	6,2	0,8	0,7
		95								130	3.7				5.1	2,9				6,4	1,9	1,6	
		100								132	3.9				5.2	3,0				2,6			
		130								155	111	73	96	5.1	6.1	4.4	2.9	3.8	6,2	13,6	4,9	4,2	
		130								155	111	73	96	5.1	6.1	4.4	2.9	3.8	6,3	13,9	6,8	5,9	
		140								157	121	79	110	5.5	6.2	4.8	3.1	4.3	8,2	18,0	12,0	10,3	

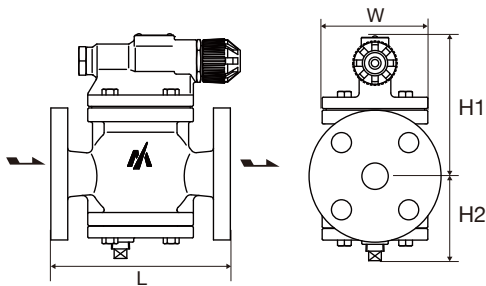
RE10N

Capacity Chart RE10N



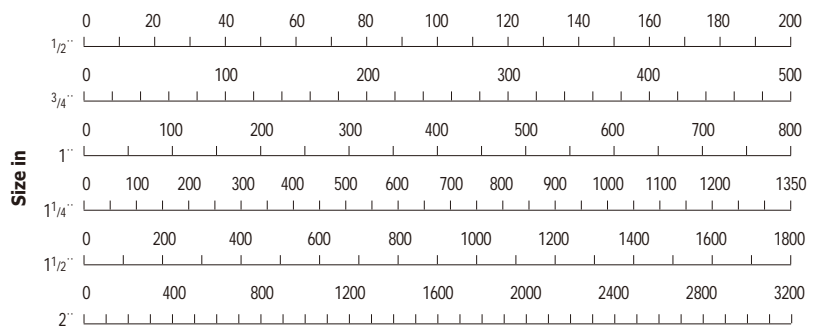
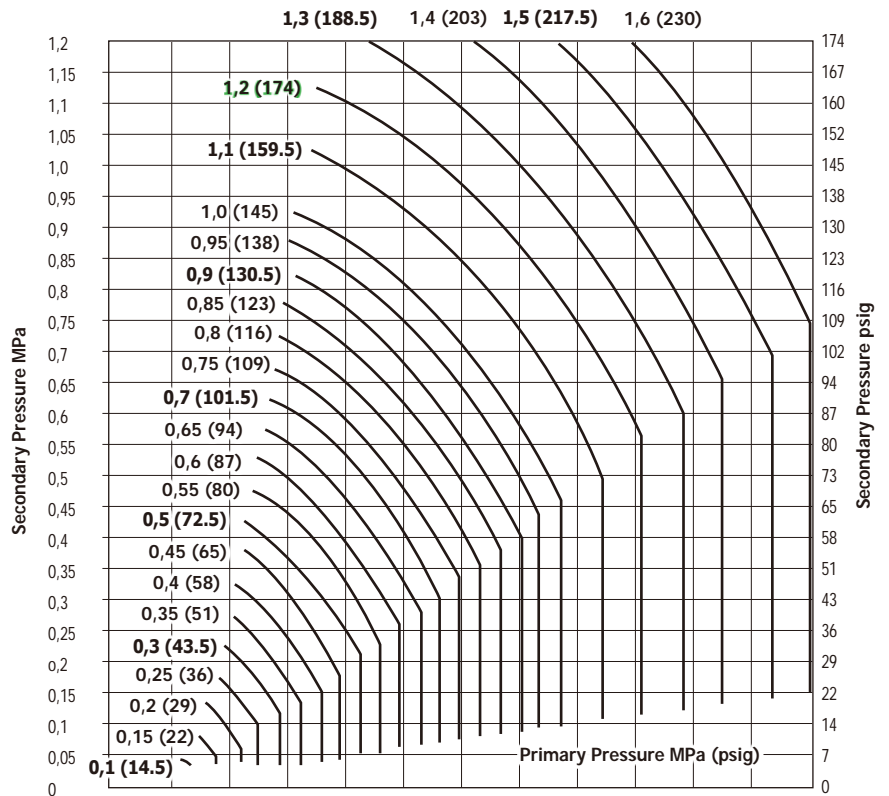
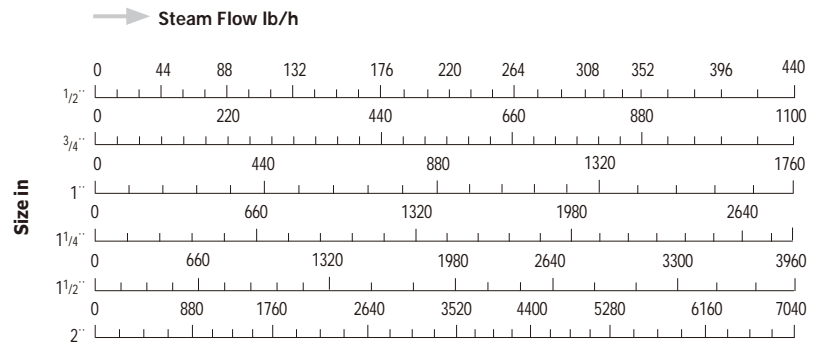
Body Material: Ductile Cast Iron FCD450

Dimensions RE10N



Minimum Differential Pressure:

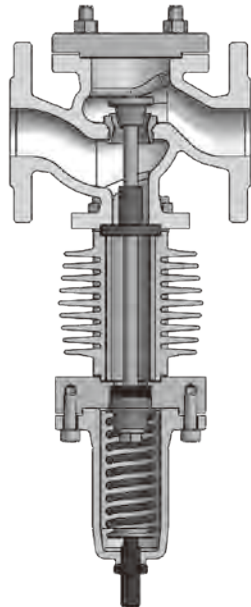
0,07 MPa (10.2 psig)



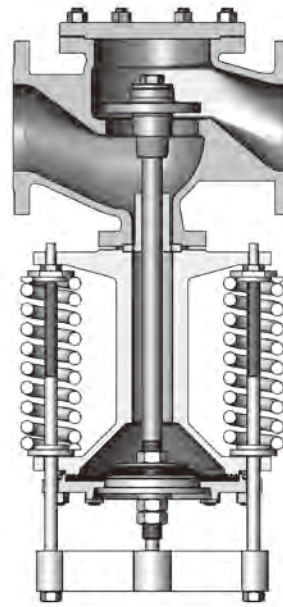
Model	Connection	Size (in)	Operating Pressure (Primary)		Secondary Pressure		Max. Red. Pressure Ratio	Max. Operating Temperature		Dimensions (mm)				Dimensions (in)				Weight		Values	
			MPa	psig	MPa	psig		°C	°F	L	H1	H2	W	L	H1	H2	W	kg	lb	Cv	Kvs
RE10N	Flanged JIS, ASME, DIN	1/2"	0,1 - 1,6	14,5 - 230	0,03 - 1,2	4,4 - 174	20 : 1	220	428	160	133	80	100	6.3	5.2	3.1	3.9	7,1	15,7	1,0	0,9
		3/4"								170				6.7				8,5	18,7	2,5	2,2
		1"								200	154	103	130	7.9	6.1	4.1	5.1	14,2	31,3	6,5	5,6
		1 1/4"																14,3	31,5	9,0	7,7
		2"								220				8.7				15,6	34,4	16,0	13,8

RE20 REH20 REC20

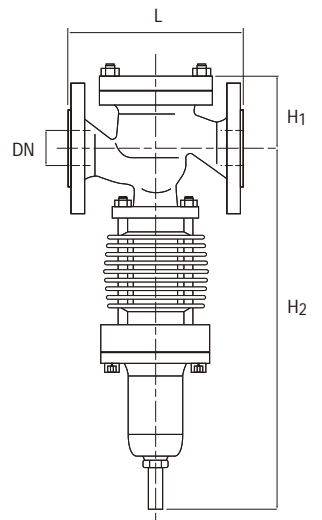
The model **RE20** is a direct acting pressure reducing valve designed for use of steam. The valve provides a constant downstream pressure at a stable given inlet pressure and constant running flowrates. Changes in the upstream pressure and fluctuating steam consumption on the secondary side will result in variations in downstream pressure. The valve is not designed for dead-end services. Due to carefully selected springs a wide range of pressure applications is available. The pressure reducing valve can be delivered with ductile cast iron, cast steel or stainless steel housings. All important internal parts are manufactured in stainless steel. As option the valves can be equipped with a pressure gauge on the valve body. Maximum pressure reduction ratio: 25:1



Size: DN 15 – 100

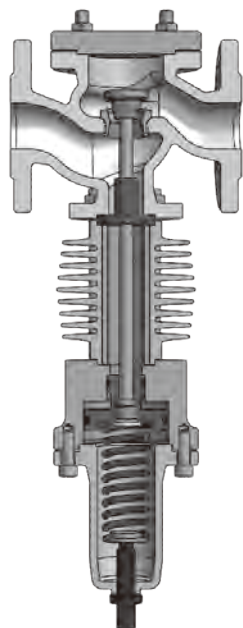


Size: DN 125 – 200

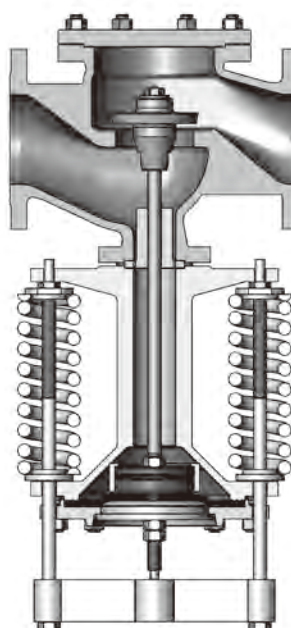


RE20L REH20L REC20L

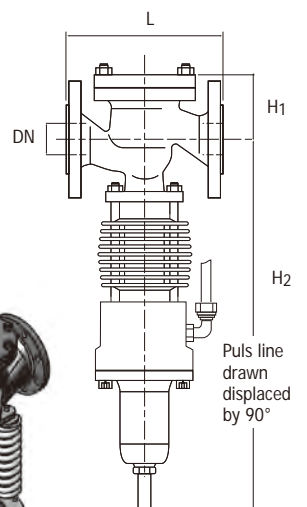
The model **RE20L** is a pressure reducing valve with a downstream pressure sensing line (pulse line) designed for use of steam. The valve provides a precise downstream pressure even at changing inlet pressures. Due to carefully selected springs a wide range of pressure applications is available. The valve is very well suited to intermittent or fluctuating loads at the secondary side. It closes securely when the load on the secondary side will be zero. The pressure reducing valve can be delivered with ductile cast iron, cast steel or stainless steel housings. All important internal parts are manufactured in stainless steel. As option the valves can be equipped with a pressure gauge on the valve body. Maximum pressure reduction ratio: 25:1



Size: DN 15 – 100



Size: DN 125 – 200



RE20 & RE20L

Body material

RE20 / RE20L	REH20 / REH20L	REH20-M / REH20L-M	REC20 / REC20L
PN16 & PN25	PN40, PN63 & PN100	PN63 & PN100	PN40
Ductile Cast Iron EN-GJS-400-15 (GGG-40, 0.7040)	Cast Steel GP240GH (GS-C25, 1.0619)	Cast Steel G17CrMo 5-5 (1.7357)	Stainless Steel GX5CrNiMo19-11-2 (1.4408)

Body design conditions

		RE20 / RE20L		REH20 / REH20L			REH20-M / REH20L-M		REC20 / REC20L
		PN16	PN25	PN40	PN63	PN100	PN63	PN100	PN40
Max. design pressure (MPa)	PMA	1,6	2,5	4,0	6,3	10,0	6,3	10,0	4,0
Max. design temperature (°C)	TMA	350	350	400	400	400	530	530	400
Max. operating pressure (MPa)	PMO	1,5	2,2	2,8	4,0	6,4	5,7	8,4	2,9
Max. operating temperature (°C)	TMO	350	350	400	400	400	530	530	400

Pressure – Temperature rating

PN	Body material	Temperature °C										
		-10... +50	100	150	200	250	300	350	400	450	500	530
		Pressure MPa										
16	0.7040	1,6	1,6	1,6	1,5	1,4	1,3	1,1				
25	0.7040	2,5	2,5	2,4	2,3	2,2	2,0	1,8				
40	1.0619	4,0	3,7	3,5	3,1	2,8	2,6	2,4	2,3			
	1.4408	4,0	3,7	3,4	3,1	2,9	2,8	2,7	2,6			
63	1.0619	6,3	5,9	5,5	4,9	4,5	4,1	3,8	3,6			
	1.7357	6,3	6,3	6,3	6,3	6,2	5,7	5,3	5,0	4,8	3,8	2,2
100	1.0619	10,0	9,3	8,7	7,8	7,1	6,4	6,0	5,8			
	1.7357	10,0	10,0	10,0	10,0	9,8	9,1	8,4	8,0	7,6	6,1	3,5

Available secondary pressure ranges

Downstream pressure range MPa	RE20 REH20 REC20	RE20L REH20L REC20L
	< 0,04	on request
0,04 – 0,063	✓	✓
0,063 – 0,1	✓	✓
0,1 – 0,16	✓	✓
0,16 – 0,25	✓	✓
0,25 – 0,4	✓	✓
0,4 – 0,63	✓	✓
0,63 – 1,0	✓	✓
1,0 – 1,6	✓	on request
> 1,6	on request	on request

Minimum differential pressure:
0,05 MPa (DN15-50), 0,07 MPa (DN65-125), 0,1 MPa (DN150-200)

Dimensions & Weights

Size (DN)	Model RE20 (REH20, REC20)							Model RE20L (REH20L, REC20L)							Kvs Value		
	Dimensions (mm)				Weight (kg)			Dimensions (mm)				Weight (kg)					
	L		H1	H2	0.7040	1.0619	1.4408	L		H1	H2	0.7040	1.0619	1.4408			
	PN16-40	PN63-100						PN16-40	PN63-100								
15	130	210	90	435	11,4	12,0	12,0	130	210	90	435	13,0	14,5	14,5	8,0		
20	150	230			11,4	12,0	12,0	150	230			13,0	14,5	14,5	11,0		
25	160	230			12,5	13,0	13,0	160	230			14,5	16,5	16,5	12,0		
32	180	260	120	455	14,5	16,0	16,0	180	260	120	455	16,0	18,5	18,5	12,0		
40	200	260			16,0	18,0	18,0	200	260			18,0	22,0	22,0	14,0		
50	230	300	130	605	35,0	37,5	37,5	230	300	130	605	34,0	37,5	37,5	63,0		
65	290	340	155	635	39,5	43,0	43,0	290	340	155	635	45,0	49,0	49,0	92,0		
80	310	380	180	800	52,5	58,0	58,0	310	380	180	800	61,0	65,0	65,0	113,0		
100	350	430			825	68,0	77,0	77,0	350			430	825	87,0	91,0	91,0	150,0
125	400				190	715	120,0	120,0	120,0			400		190	715	128,0	139,0
150	480		200	720	183,0	183,0	183,0	480		200	720	172,0	183,0	183,0	321,0		
200	600		275	950	358,0	358,0	358,0	600		275	950	302,0	343,0	343,0	483,0		

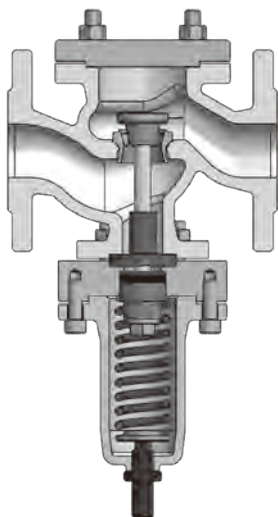
Connections: Flanged EN-DIN1092, ASME B16.5 (for ductile cast iron, PN25 only ≤ DN80, 300# only ½" and 1¼" - 3") available

For leakage class 6 acc. to ANSI order with soft sealing

For more information see the special MIYAWAKI leaflet.

REA20 REAH20 REAC20

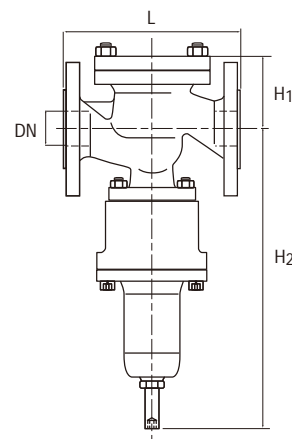
The model **REA20** is a direct acting pressure reducing valve designed for use of compressible media, such as air and various gases and for incompressible media such as water, oil and others. The valve provides a constant downstream pressure at a stable given inlet pressure and constant running flowrates. Changes in the upstream pressure and fluctuating consumption on the secondary side will result in variations in downstream pressure. The valve is not designed for dead-end services. Due to carefully selected springs a wide range of pressure applications is available. The pressure reducing valve can be delivered with ductile cast iron, cast steel or stainless steel housings. All important internal parts are manufactured in stainless steel. Depending on the medium the valve can be equipped with soft sealing or metal sealing valves/seats. As option the valves can be equipped with a pressure gauge on the valve body. Maximum pressure reduction ratio: 25:1



Size: DN 15 – 100

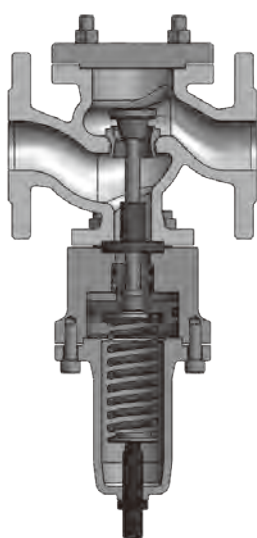
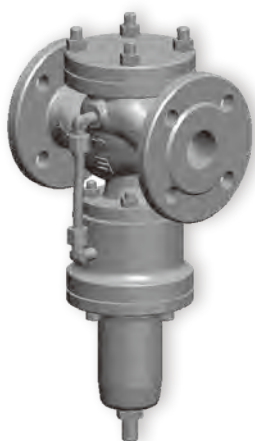


Size: DN 125 – 200

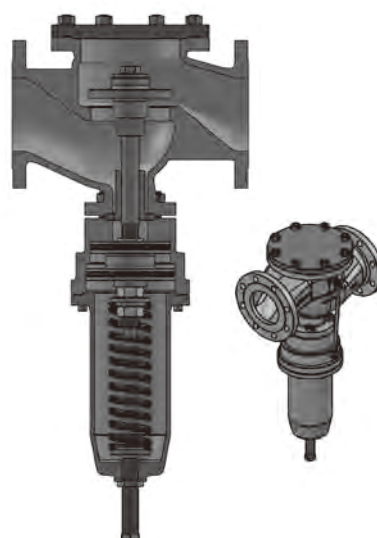


REA20L REAH20L REAC20L

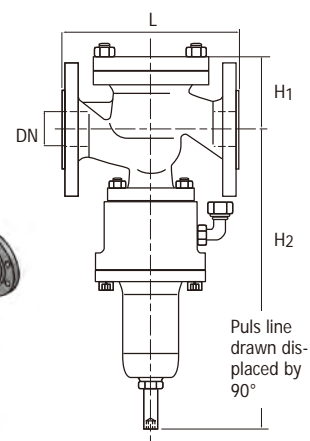
The model **REA20L** is a pressure reducing valve designed for use of compressible media, such as air and various gases and for incompressible media such as water, oil and others. Due to the use of a downstream pressure sensing line (pulse line) the valve provides a constant accurate downstream pressure. Carefully selected springs secure a wide range of downstream pressure applications. The pressure reducing valve can be delivered with ductile cast iron, cast steel or stainless steel housings. All important internal parts are manufactured in stainless steel. The valve is designed for dead-end services. In case of zero consumption on the secondary side the valve closes reliably. Depending on the medium the valve can be equipped with soft sealing or metal sealing valves/seats. As option the valves can be equipped with pressure gauges. Maximum pressure reduction ratio: 25:1



Size: DN 15 – 100



Size: DN 125 – 200



- Usable for the following gases :

Acetylene, Ammonia, Argon, Carbon dioxide, Carbon monoxide, Chlorine, Coal gas, Hydrogen, Ethylene, Helium, Methane, Nitrogen, Oxygen*, Sulphur dioxide

Others may be possible as well. Please ask MIYAWAKI Inc. or an authorized representative for more detail.

- Special cleaning to make the product oil-free / grease-free is available at an additional cost.

*** Special cleaning is mandatory for oxygen applications.**

REA20 & REA20L

Body material

REA20 / REA20L	REAH20 / REAH20L	REAH20-M / REAH20L-M	REAC20 / REAC20L
PN16 & PN25	PN40, PN63 & PN100	PN63 & PN100	PN40
Ductile Cast Iron EN-GJS-400-15 (GGG-40, 0.7040)	Cast Steel GP240GH (GS-C25, 1.0619)	Cast Steel G17CrMo 5-5 (1.7357)	Stainless Steel GX5CrNiMo19-11-2 (1.4408)

Body design conditions

		REA20 / REA20L		REAH20 / REAH20L			REAH20-M / REAH20L-M		REAC20 / REAC20L
		PN16	PN25	PN40	PN63	PN100	PN63	PN100	PN40
Max. design pressure (MPa)	PMA	1,6	2,5	4,0	6,3	10,0	6,3	10,0	4,0
Max. design temperature (°C)	TMA	350	350	400	400	400	530	530	400
Max. operating pressure (MPa)	PMO	1,6	2,5	4,0	6,3	10,0	6,3	10,0	4,0

The max. operating temperature (°C) TMO depends for all on the O-Ring material: 120 °C with NBR, 130 °C with EPDM, 200 °C with FKM.

Pressure – Temperature rating

PN	Body material	Temperature °C										
		-10... +50	100	150	200	250	300	350	400	450	500	530
		Pressure MPa										
16	0.7040	1,6	1,6	1,6	1,5	1,4	1,3	1,1				
25	0.7040	2,5	2,5	2,4	2,3	2,2	2,0	1,8				
40	1.0619	4,0	3,7	3,5	3,1	2,8	2,6	2,4	2,3			
	1.4408	4,0	3,7	3,4	3,1	2,9	2,8	2,7	2,6			
63	1.0619	6,3	5,9	5,5	4,9	4,5	4,1	3,8	3,6			
	1.7357	6,3	6,3	6,3	6,3	6,2	5,7	5,3	5,0	4,8	3,8	2,2
100	1.0619	10,0	9,3	8,7	7,8	7,1	6,4	6,0	5,8			
	1.7357	10,0	10,0	10,0	10,0	9,8	9,1	8,4	8,0	7,6	6,1	3,5

Available secondary pressure ranges

Downstream pressure range MPa	REA20 REAH20 REAC20	REA20L REAH20L REAC20L
	< 0,04	on request
0,04 – 0,063	✓	✓
0,063 – 0,01	✓	✓
0,1 – 0,16	✓	✓
0,16 – 0,25	✓	✓
0,25 – 0,4	✓	✓
0,4 – 0,63	✓	✓
0,63 – 1,0	✓	✓
1,0 – 1,6	✓	
> 1,6	on request	on request

Minimum differential pressure:
0,05 MPa (DN15-50), 0,07 MPa (DN65-125), 0,1 MPa (DN150-200)

Dimensions & Weights

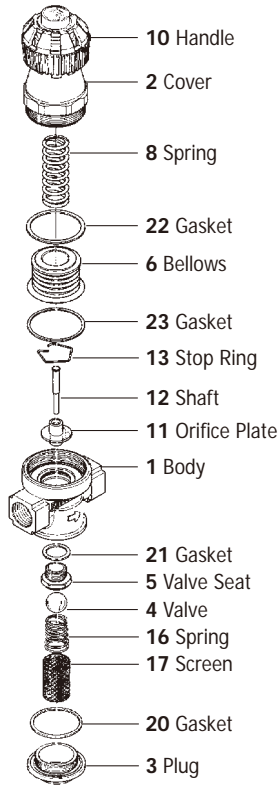
Size (DN)	Model REA20 (REAH20, REAC20)							Model REA20L (REAH20L, REAC20L)							Kvs Value
	Dimensions (mm)				Weight (kg)			Dimensions (mm)				Weight (kg)			
	L		H1	H2	0.7040	1.0619	1.4408	L		H1	H2	0.7040	1.0619	1.4408	
	PN16-40	PN63-100						PN16-40	PN63-100						
15	130	210	90	310	10,5	12,5	12,5	130	210	90	310	10,5	12,5	12,5	8,0
20	150	230			10,5	12,5	12,5	150	230			10,5	12,5	12,5	11,0
25	160	230			12,0	13,5	13,5	160	230			12,0	13,5	13,5	12,0
32	180	260	120	330	14,5	16,0	16,0	180	260	120	330	14,5	16,0	16,0	12,0
40	200	260			15,5	18,5	18,5	200	260			15,5	18,5	18,5	14,0
50	230	300	130	435	28,5	32,5	32,5	230	300	130	435	28,5	32,5	32,5	63,0
65	290	340	155	465	37,0	40,0	40,0	290	340	155	465	37,0	40,0	40,0	92,0
80	310	380	180	630	56,5	66,0	66,0	310	380	180	630	56,5	66,0	66,0	113,0
100	350	430			655	69,0	78,0	78,0	350			430	655	69,0	78,0
125	400		210	660	120,0	120,0	120,0	400		210	660	133,0	141,0	141,0	196,0
150	480		235	680	183,0	183,0	183,0	480		235	680	158,0	184,0	184,0	321,0
200	600		285	740	358,0	358,0	358,0	600		285	740	268,0	298,0	298,0	483,0

Connections: Flanged EN-DIN1092, ASME B16.5 (for ductile cast iron, PN25 only ≤ DN80, 300# only 1/2" and 1 1/4" - 3") available

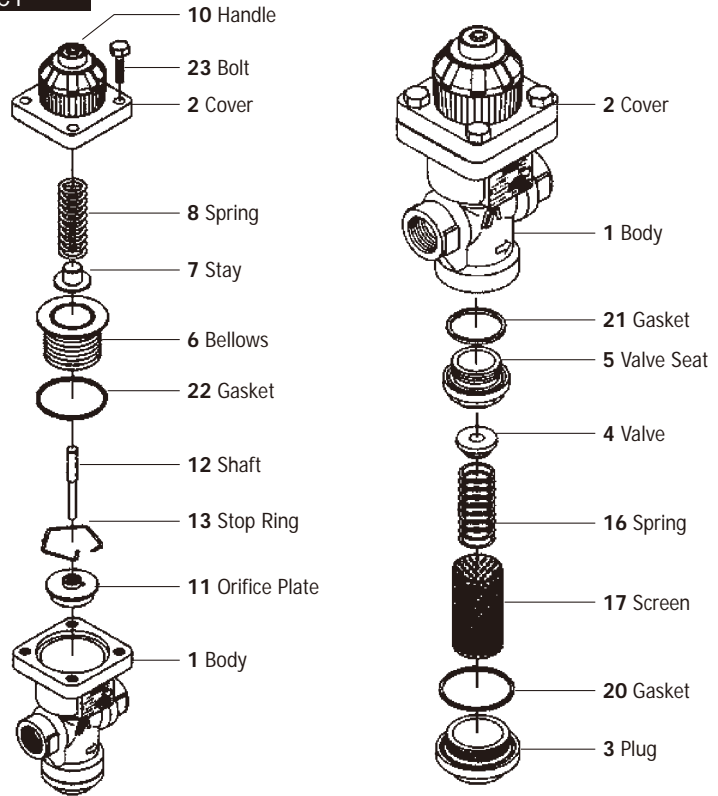
For leakage class 6 acc. to ANSI order with soft sealing

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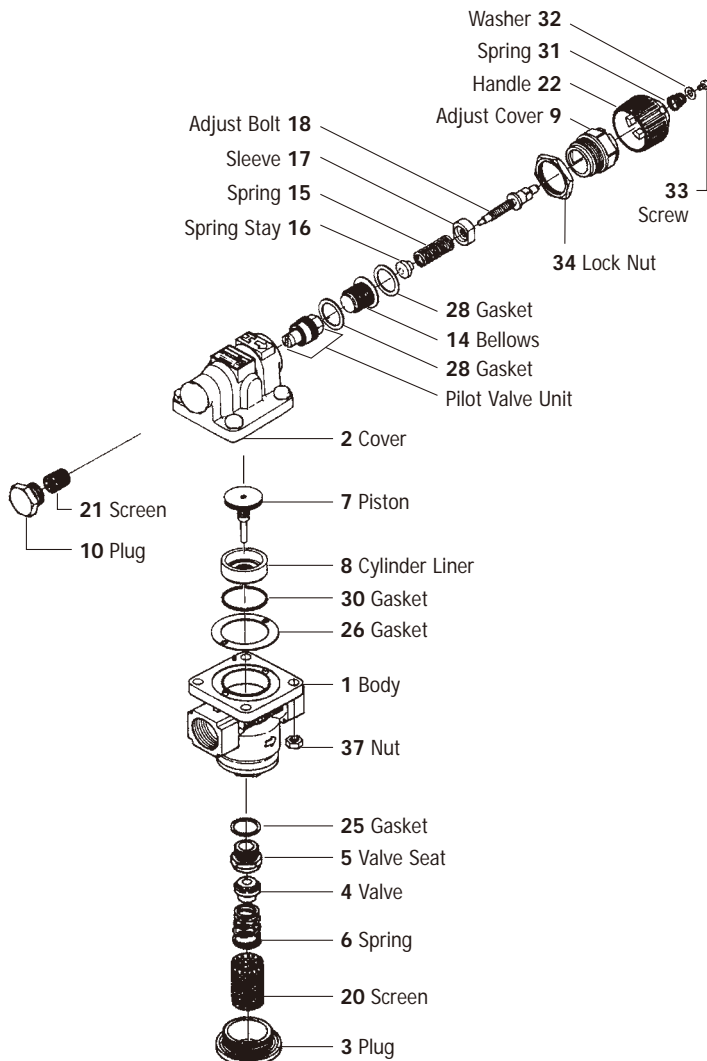
RE1



REC1



RE3



RE10N

