

PRESSURE REDUCING VALVES

[FOR STEAM OR GASES]

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VENN pressure reducing valves are manufactured based on our years of experience in this industry and advanced technology. The extensive lineup of our products can meet the needs of liquid or pressure applications in construction, factory, and a variety of other areas.

Please consider the conditions of use and select a most suitable model.

Model name	Size	Applicable fluid	Applicable pressure(MPa)		Materials		Page
			Primary side	Secondary side	Body	Disc & seat	
RP-6	15~200 (½"~8")	Steam	Max. 1.0	0.03~0.8	Cast iron	Stainless steel	12
RP-1H	100~200 (4"~8")	Steam	Max. 1.0	0.03~0.8	Cast iron	Stainless steel	13
RP-8	32~80 (1¼"~3")	Steam	Max. 1.0	0.03~0.8	Stainless steel	Stainless steel	14
RP-6BD	15~50 (½"~2")	Steam	Max. 1.0	0.03~0.8	Cast iron	Stainless steel	15
RP-2H	15~40 (½"~1½")	Steam	Max. 1.6	0.035~0.8	Ductile Cast iron	Stainless steel	17
	50~150 (2"~6")				Cast iron		
	15~150 (½"~6")				Cast steel		
RP-6A	15~80 (½"~3")	Air or gases	Max. 1.0	0.03~0.8	Cast iron	Brass or Stainless steel	20
RP-8A	32~80 (1¼"~3")	Air or gases	Max. 1.0	0.03~0.8	Stainless steel	Stainless steel	21
RP-1HA	100~200 (4"~8")	Air or gases	Max. 1.0	0.035~0.8	Cast iron	Stainless steel	23
RP-2HA	15~40 (½"~1½")	Air or gases	Max. 1.6	0.035~0.8	Ductile Cast iron	Brass or Stainless steel	24
	50~150 (2"~6")				Cast iron		
	15~150 (½"~6")				Cast steel	Stainless steel	
RP-7	15~25 (½"~1")	Steam	Max. 1.6	0.03~0.8	Cast bronze	Stainless steel	30
RD-30	15~40 (½"~1½")	Steam	Max. 1.0	0.02~0.4	Cast iron	Stainless steel	33
RD-29A	15~50 (½"~2")	Air or N ₂ gas	Max. 0.3	1~3kPa	Cast iron	Stainless steel	36
RD-29B		Coke oven gas					

RP-6 Type Pressure Reducing Valve (for Steam)

for **Building facilities** **Industrial facilities** etc., Multipurpose Pilot operated type (High capacity)

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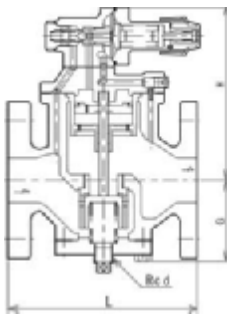
PRESSURE REDUCING VALVES (FOR STEAM)

This is a Pilot operated pressure reducing valve. It is suitable to install in the steam lines with the high capacity of flow, such as industrial production facility and building facility. This model is designed to ensure the perfect performance in various different conditions of the facility, with your easy handling and installation by the light weighted, compact valve body.

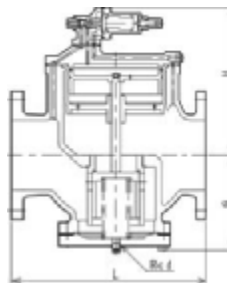
Refer to page 16 for valve size selection chart.



CONSTRUCTION



Size 15~80mm



Size 100~200mm

FEATURES

- It is performed and controlled constantly by adopting piston guide construction and special seal ring.
- Possible to install in a line for wide range of pressure and capacity.
- Easy pressure adjustment by manual handle with automatic lock mechanism. (Size 15~80mm)
- Compact design.

SPECIFICATIONS

Model name		RP-6	
Code name		RP6-B	RP6-G
Applicable fluid		Steam	
Applicable primary pressure		Max. 1.0MPa	
Adjustable secondary pressure		0.03~0.8MPa	
Maximum reducing rate		20:1	
Minimum pressure differential across the disc		Size 15~80mm: 0.05MPa Size 100~200mm: 0.07MPa	
Lock up pressure		Max. 0.02MPa	
Offset pressure	Size 15 ~ 80mm	Within 0.02MPa (Adjustable secondary pressure 0.03~0.035MPa) Within 0.03MPa (Adjustable secondary pressure 0.035~0.07MPa) Within 0.05MPa (Adjustable secondary pressure 0.07~0.8MPa)	
	Size 100 ~ 200mm	0.05MPa	
Leakage allowance		Less than 0.05% of rated flow	
Applicable temperature		Max. 184°C*	
End connection		Flanged JIS 10KFF	
Materials	Body	Cast iron	
	Disc & seat	Stainless steel	
	Piston & cylinder	Cast bronze	Stainless steel
Valve body pressure test		Hydraulic 1.5MPa	

*Applicable temperature Max. 220°C is available upon your request.

DIMENSIONS

(mm)

Size	L	G	H	d	Cv value	Mass (kg)
15(½")	140	62	155	¼"	1	7.5
20(¾")	140	62	155	¼"	2.5	7.5
25(1")	150	67	160	¼"	4	9
32(1¼")	180	73	182	¾"	6.5	12
40(1½")	180	73	182	¾"	9	12.5
50(2")	200	86	187	¾"	16	15.5
65(2½")	230	94	202	¾"	25	20.5
80(3")	260	110	221	¾"	36	26.5
100(4")	320	139	285	¾"	64	52
125(5")	380	187	320	¾"	100	82
150(6")	420	206	368	¾"	144	110
200(8")	540	255	425	¾"	256	176

Flange code JIS 10KFF

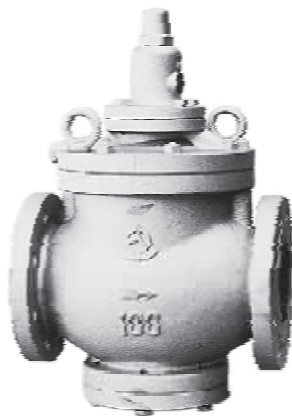
REFERENCE

When the existing RP-1H Type pressure reducing valve is replaced with the RP-6 due to changes in operating conditions, the same face-to-face dimension can be attained by the use of face-to-face dimension adjustment spacers. (Size 15~80mm)

For more details, please contact our agent in your area.

RP-1H Type Pressure Reducing Valve (for Steam)

Large diameter, pilot type pressure reducing valve, with the valve disc and seat made of durable stainless steel.



SPECIFICATIONS

Model name		RP-1H	
Code name		RP1H-B □	RP1H-G □
		※ L(low press.)or H(high press.)for adjustable secondary pressure is required in □.	
Applicable fluid		Steam	
Applicable primary pressure		Max. 1.0MPa	
Adjustable secondary pressure		L:0.03~0.4MPa, H:0.3~0.8MPa	
Maximum reducing rate		20:1	
Minimum pressure differential across the disc		0.07MPa	
Lock up pressure		Max. 0.02MPa	
Offset pressure		Within 0.05MPa	
Minimum adjustable flow		5% of rated flow	
Leakage allowance		Less than 0.05% of rated flow	
Applicable temperature		Max. 184°C ^{*1}	
End connection		Flanged JIS 10KRF	
Materials	Body	Cast iron	
	Disc & seat	Stainless steel	
	Piston & cylinder	Cast bronze	Stainless steel
Valve body pressure test		Hydraulic 1.5MPa	

*1. Applicable temperature Max. 220°C is available upon your request.
 *2. For size 15-80mm, select RP-6 or RP-7 Type (Size 15-25mm).

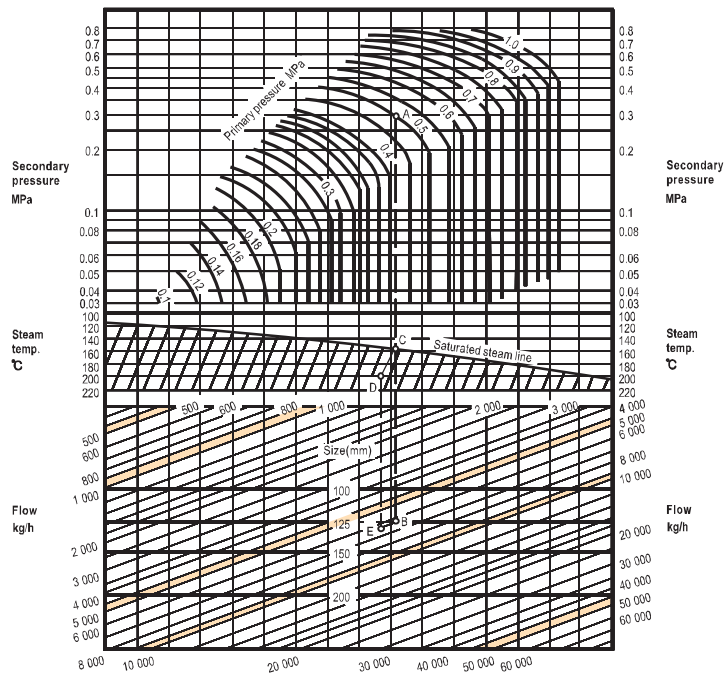
DIMENSIONS

Size	L	G	H	d	Cv value	Mass (kg)
100(4")	320	146	337	3/8"	64	66
125(5")	380	178	409	3/8"	100	104
150(6")	420	206	471	3/8"	144	147
200(8")	540	262	539	3/8"	256	275

(mm)

Flange code JIS 10KRF

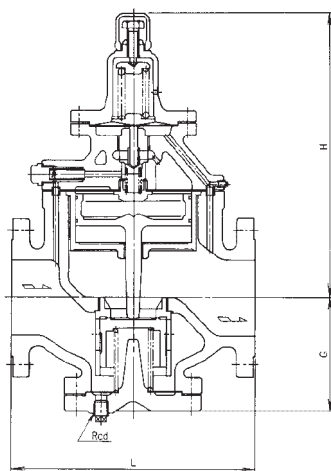
NOMINAL DIAMETER SELECTION CHART (for Steam)



Example:
 Primary pressure: 0.5MPa (saturated steam)
 Secondary pressure: 0.3MPa Flow: 6000 kg/h
 At the above conditions,
 the nominal diameter should be size 125mm.

Example:
 Primary pressure: 0.5MPa (200°C)
 Secondary pressure: 0.3MPa
 Flow: 6000 kg/h
 At the above conditions, the nominal diameter should be size 150mm.

CONSTRUCTION



RP-8 Type Pressure Reducing Valve (for Steam)

for **Food processing** **Manufacturing** **Sterilizing equipments** etc., General purpose (large capacity) pilot valve

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PRESSURE REDUCING VALVES (FOR STEAM)

The body and disc & seat of RP-8 Type Pressure Reducing Valve are made of stainless steel. This ensures clean supply of fluid, thus is ideal for application on food processing, sterilizing equipments. In addition, the corrosion resistance and durability of stainless steel also allow extensive applications in other areas.

For selecting the appropriate nominal diameter, see the table in page 16.

■ FEATURES

- Piston guide and special seal ring allow stable control.
- Wide range of pressure and flow for a variety of applications.
- Easy pressure adjustment by manual handle with automatic lock mechanism.
- Compact design.

■ SPECIFICATIONS

Model name	RP-8
Code name	RP8-D
Applicable fluid	Steam
Applicable primary pressure	Max. 1.0MPa
Adjustable secondary pressure	0.03~0.8MPa
Maximum reducing rate	20:1
Minimum pressure differential across the disc	0.05MPa
Lock up pressure	Max. 0.02 MPa
Offset pressure	Within 0.02MPa (Adjustable secondary pressure 0.03~0.035MPa) Within 0.03MPa (Adjustable secondary pressure 0.035~0.07MPa) Within 0.05MPa (Adjustable secondary pressure 0.07~0.8MPa)
Leakage allowance	Less than 0.05% of rated flow
Applicable temperature	Max. 200°C
End connection	Flanged JIS 10KFF
Materials	Body(Stainless steel), Disc & seat(Stainless steel), Diaphragm(Stainless steel)
Valve body pressure test	Hydraulic 1.5MPa

*For size 15~25mm, select RD-40 or RD-41F Type. For size 100~150mm and for pressure 1.6M or 2.0MPa, select RP-2H Type.

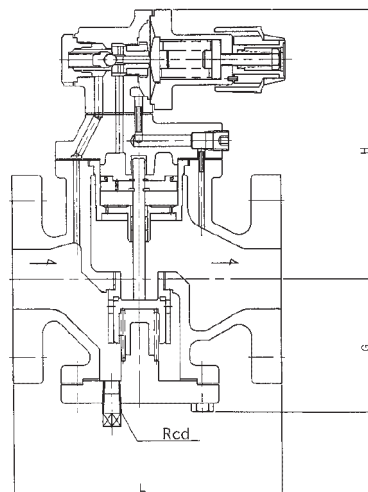
■ DIMENSIONS

(mm)

Size	L	G	H	d	Cv value	Mass (kg)
32(1¼")	180	90	182	¼"	6.5	12.5
40(1½")	180	90	182	¼"	9	12.5
50(2")	200	100	187	¼"	16	16
65(2½")	230	110	202	¾"	25	22
80(3")	260	118	221	¾"	36	27.5

Flange code JIS 10KFF

■ CONSTRUCTION



RP-6BD Type Steam Trap with Pressure Reducing Valve (for Steam)

for **Construction** **Factory equipments** etc., General purpose valve(Large capacity)

RP-6 Type with steam trap embedded. It is an ideal product for preventing drain flowing after the valve and application in locations such as vertical piping where drain can be easily accumulated.

For selecting the appropriate nominal diameter, see the table in page 16.



FEATURES

- The position of the drain hole can be changed at an interval of 90°, thus allows appropriate piping suiting locations.
- Piston guide and special seal ring allow stable control.
- Wide range of pressure and flow for a variety of applications.
- Easy pressure adjustment by manual handle with automatic lock mechanism.
- Compact design.

SPECIFICATIONS

Model name	RP-6BD	
Code name	RP6BD-B	RP6BD-G
Applicable fluid	Steam	
Applicable primary pressure	Max. 1.0MPa	
Adjustable secondary pressure	0.03~0.8MPa	
Maximum reducing rate	20:1	
Minimum pressure differential across the disc	0.05MPa	
Lock up pressure	Max.0.02MPa	
Offset pressure	Within 0.02MPa(Adjustable secondary pressure 0.03~0.035MPa) Within 0.03MPa(Adjustable secondary pressure 0.035~0.07MPa) Within 0.05MPa(Adjustable secondary pressure 0.07~0.8MPa)	
Leakage allowance	Less than 0.05% of rated flow	
Applicable temperature	Max. 184°C*	
Allowed back pressure trap part	within 70% of pressure on inlet side	
End connection	Flanged JIS 10KFF	
Materials	Body	Cast iron
	Disc& seat	Stainless steel
	Piston & cylinder	Cast bronze / Stainless steel
Valve body pressure test	Hydraulic 1.5MPa	

*Applicable temperature Max. 220°C is available upon your request.

DIMENSIONS

(mm)

Size	L	G	H	H _i	d	Cv value	Mass (kg)
15(½")	140	134	155	72	½"	1	10
20(¾")	140	134	155	72	½"	2.5	10
25(1")	150	139	160	77	½"	4	11.5
32(1¼")	180	145	182	88	¾"	6.5	14.5
40(1½")	180	145	182	88	¾"	9	15
50(2")	200	166	187	98	¾"	16	18.5

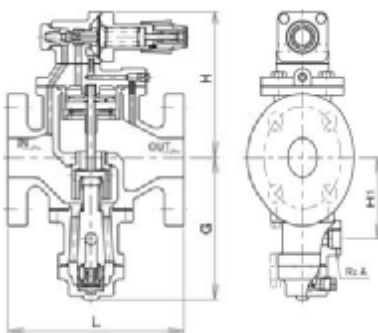
Flange code JIS 10KFF

DRAIN DISCHARGE AMOUNT (MAX. CONTINUAL DISCHARGE AMOUNT)

(l/h)

Pressure differential (MPa)	0.05	0.1	0.2	0.3	0.4	0.6	0.8	1.0
Discharge amount	100	160	260	340	400	500	550	590

CONSTRUCTION



REFERENCE

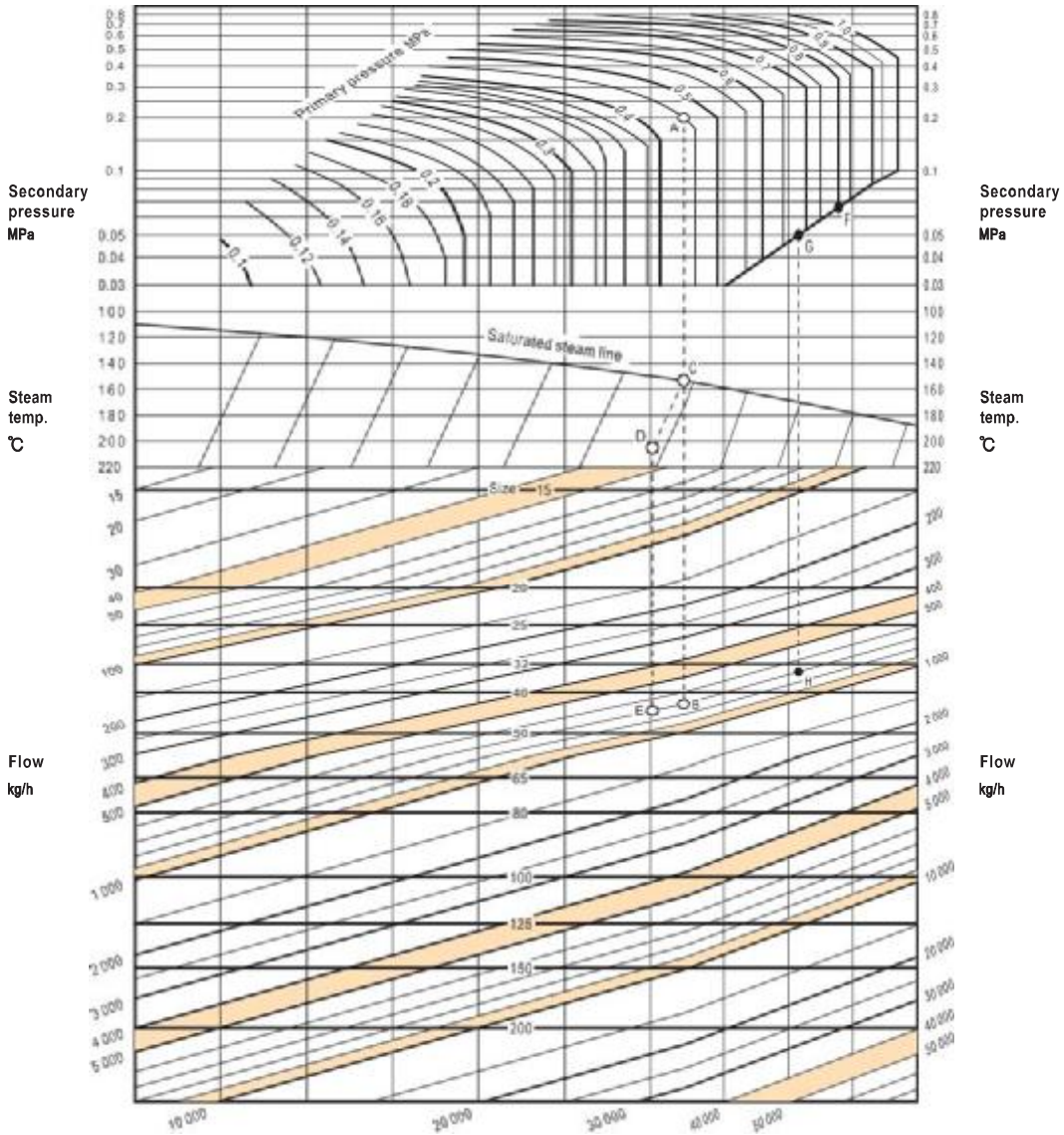
1. We also provide spacers for adjustment of face to face dimension. Such spacers are useful when replacing VENN RP-6BD with RP-1H valve, such as in the case of modification of equipment. Please contact us for details.
2. It is also possible that you attach trap (BD-2) to RP-6 valve that is in use. For more details, please contact our agent in your area.

DATA/RP-6, 6K, 6BD, 8 Type Pressure Reducing Valve (for Steam)

NOMINAL DIAMETER SELECTION CHART (for Steam)

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PRESSURE REDUCING VALVES (FOR STEAM)



HOW TO USE THE CHART

Example 1:

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 0.45MPa, secondary pressure 0.2MPa, flow of saturated steam 700 kg/h.

First, find out the intersection point A of primary pressure curve 0.45MPa and secondary pressure curve 0.2MPa.

Draw a vertical line from point A. This line intersects with flow curve 700kg/h. The intersection point is B. Since B is located between a nominal diameter range of size 40mm~50mm. The larger value, which is size 50mm is taken as the nominal diameter that we are looking for.

Now let's find out the nominal diameter at an

additional condition: the temperature is 205°C.

Draw a vertical from point A until it intersects with the saturated steam curve. The intersection point is named C. Now move from point C to temperature curve 205°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with flow curve 700kg/h. The intersection point is named E. Since point E is located between a nominal diameter range of size 40mm~50mm. The larger value, which is size 50mm is taken as the nominal diameter that we are looking for.

Example 2:

Now let's try to find out the nominal diameter at the following conditions: primary pressure 0.8MPa;

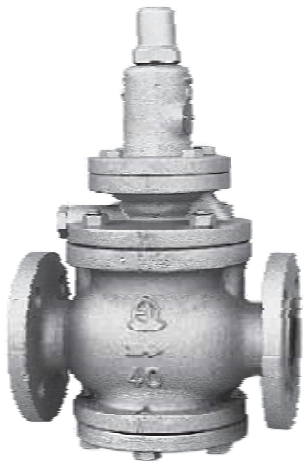
secondary pressure 0.05MPa; and flow of saturated steam 700kg/h.

First, we should find out the intersection point F between primary pressure curve 0.8MPa and oblique line. Next, move on the oblique line and find it the intersection point G on the secondary pressure curve 0.05MPa. Draw a vertical line from point G until it intersects with flow curve 700kg/h. the intersection point is named H.

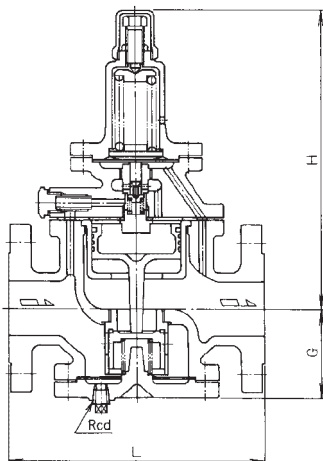
Since point H is located between a nominal diameter range of size 32mm~40mm. The larger value, which is size 40mm in this case, is taken as the nominal diameter that we are looking for.

RP-2H Type Pressure Reducing Valve (for Steam)

Pilot operated valve for reducing pressure of high-pressure steam. RP-2H Type has larger Cv value than RP-6, 1H Type, and allows large flow.



CONSTRUCTION



The structure may vary depending on material and nominal diameter.

SPECIFICATIONS

Model name		RP-2H		
Body material		Cast iron		Cast steel
Code name		Size 15~40mm:RP2H-L Size 50~150mm:RP2H-B	Size 15~40mm:RP2H-M Size 50~150mm:RP2H-G	RP2H-C1
Applicable fluid		Steam		
Applicable primary pressure		Max. 1.6MPa		Max. 2.0MPa*2
Adjustable secondary pressure		Size 15~40mm: 0.035~1.2MPa Size 50~100mm: 0.035~1.0MPa Size 125~150mm: 0.035~0.8MPa		
Maximum reducing rate		10:1		
Minimum pressure differential across the disc		0.07MPa		
Lock up pressure		Max. 0.02MPa		
Offset pressure		Within 0.05MPa		
Minimum adjustable flow		5% of rated flow		
Leakage allowance		Less than 0.05% of rated flow		
Applicable temperature		Max. 220°C		Max. 250°C
End connection		Flanged JIS 16KRF		Flanged JIS 20KRF*3
Materials	Body	Size 15~40mm (Ductile cast iron), Size 50~150mm (Cast iron)		Cast steel
	Disc & seat	Stainless steel	Stainless steel	Stainless steel
	Piston & cylinder	Cast bronze	Stainless steel	Stainless steel
Valve body pressure test		Twice as much pressure of flange rated pressure		

*1. Valve body with stainless is also available upon your request.
 *2. Applicable primary pressure Max. 3.0MPa is available upon your request.
 *3. Flanged JIS 10, 16, 30K are also available upon your request.
 *4. Applicable temperature Max. 350°C is available as RP-2HT Type, and adjustable secondary pressure 1.2~2.0MPa is available as RP-2HN Type.

DIMENSIONS (CAST IRON)

Size	L	G	H	d	Cv value	Mass(kg)
15(1/2")	170	65	255	1/4"	1.5	10.5
20(3/4")	170	65	255	1/4"	3.5	11
25(1")	210	75	265	1/4"	6	16
32(1 1/4")	210	75	265	1/4"	9.5	16
40(1 1/2")	220	80	270	1/4"	3.5	19
50(2")	250	101	290	3/8"	24	28.5
65(2 1/2")	290	119	305	3/8"	37.5	39
80(3")	350	134	323	3/8"	54	54
100(4")	384	175	390	3/8"	96	98
125(5")	434	218	480	3/8"	150	147
150(6")	544	259	528	3/8"	216	296

Flange code JIS 16KRF

DIMENSIONS (CAST STEEL)

Size	L		G	H	d	Cv value	Mass(kg)
	Flange code JIS						
	20K	30K					
15(1/2")	190	198	73	255	1/4"	1.5	12.5
20(3/4")	194	198	73	255	1/4"	3.5	13
25(1")	220	228	85	265	1/4"	6	17
32(1 1/4")	224	232	85	265	1/4"	9.5	18
40(1 1/2")	240	248	94	270	1/4"	13.5	20
50(2")	272	280	109	290	3/8"	24	30.5
65(2 1/2")	276	288	109	290	3/8"	28	33
80(3")	354	366	148	320	3/8"	54	69
100(4")	410	426	177	390	3/8"	96	115
125(5")	434	454	223	472	3/8"	150	180
150(6")	544	564	264	504	3/8"	216	298

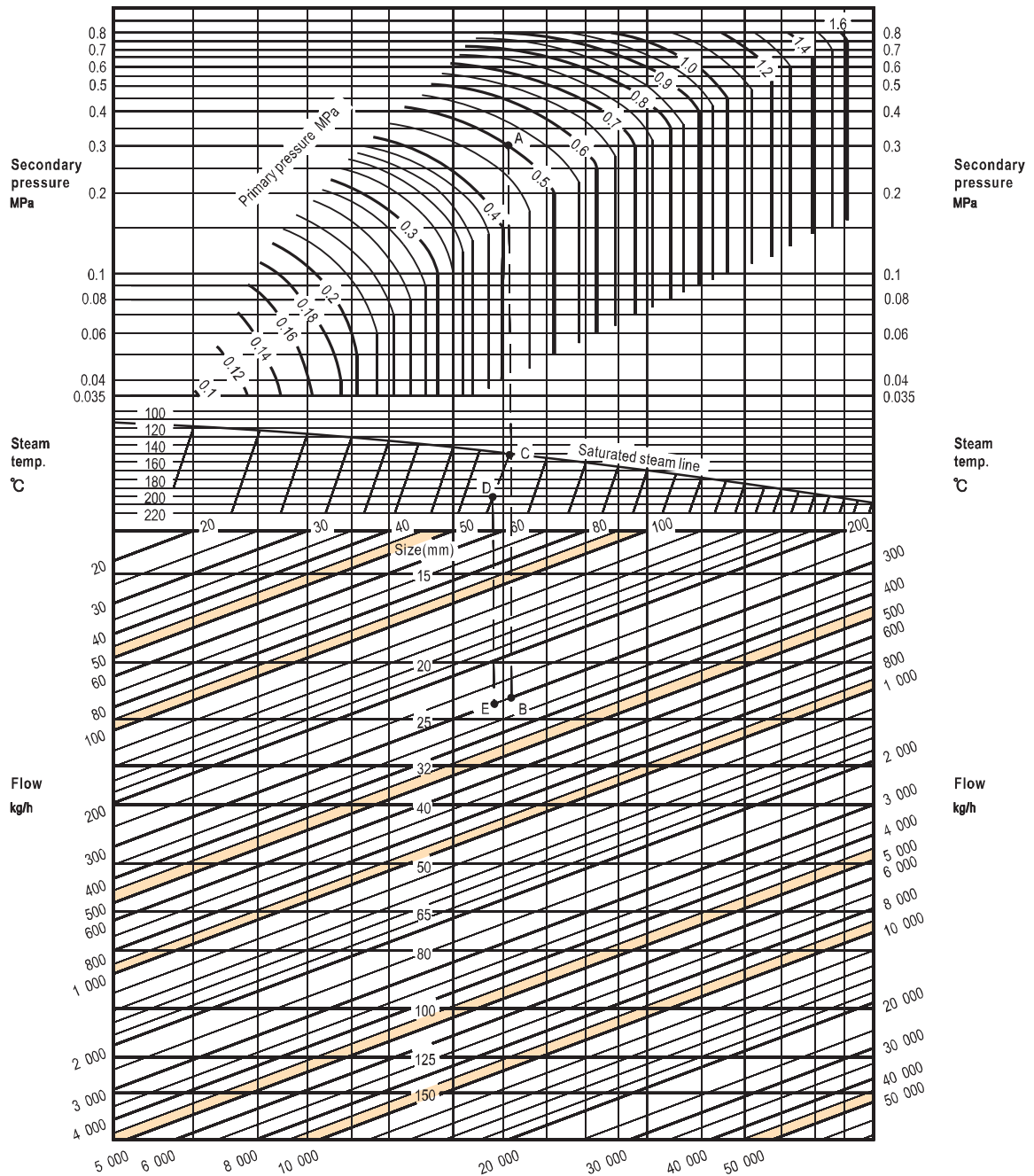
Weights listed are for those with flange code JIS 20KRF

DATA/RP-2H Type Pressure Reducing Valve (for Steam)

NOMINAL DIAMETER SELECTION CHART (for Steam) [Body: Cast iron]

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PRESSURE REDUCING VALVES (FOR STEAM)



HOW TO USE THE CHART

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 0.5MPa, secondary pressure 0.3MPa, flow of saturated steam 300kg/h.

First, find out the intersection point A of primary pressure curve 0.5MPa and secondary pressure curve 0.3MPa.

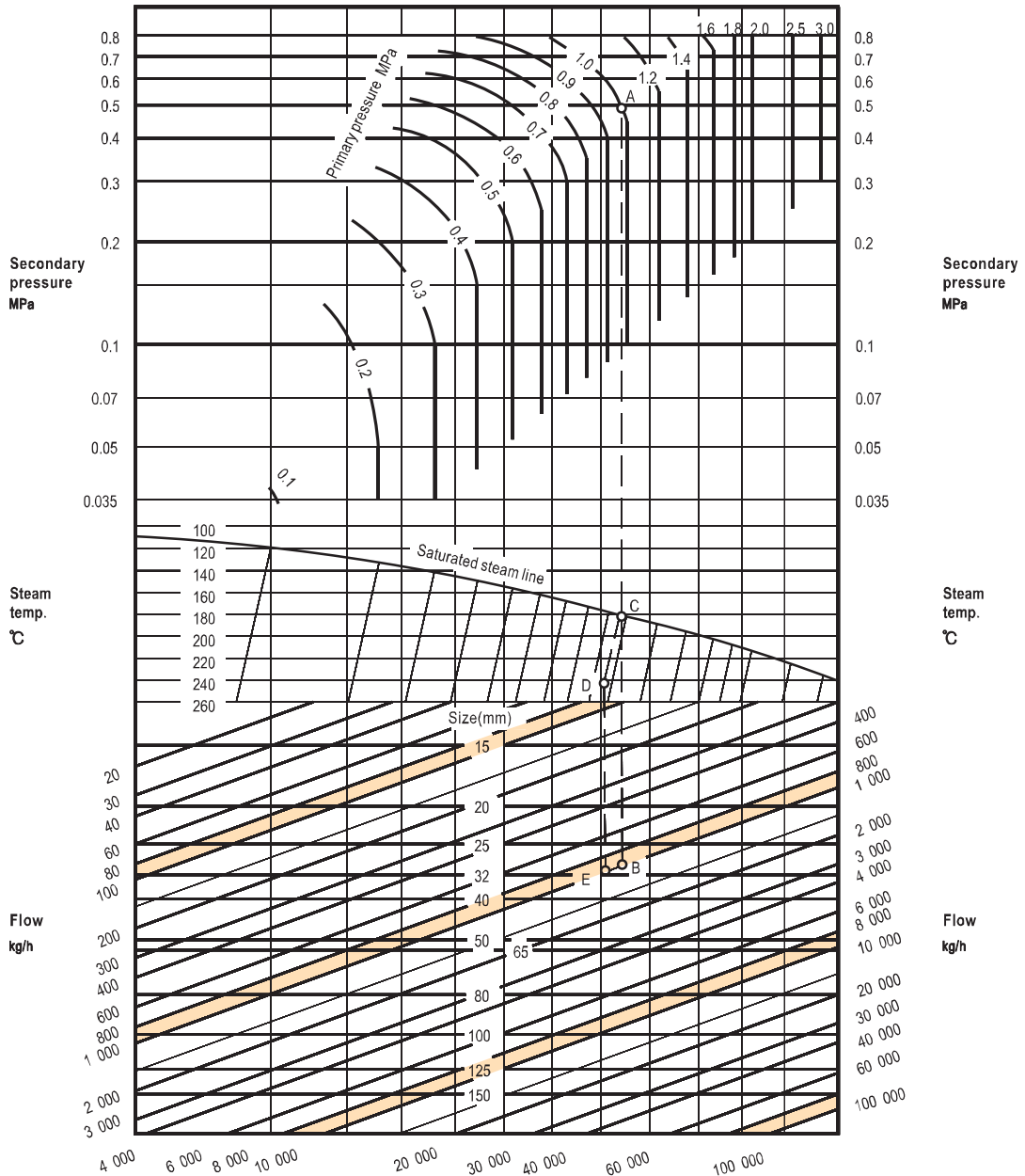
Draw a vertical line from point A. This line intersects with flow curve 300kg/h. The

intersection point is B. Since B is located between a nominal diameter range of size 20mm~25mm. The larger value, which is size 25mm is taken as the nominal diameter that we are looking for. Now let's find out the nominal diameter at an additional.

Condition: the temperature is 200°C. Draw a vertical line from point A until it intersects with the saturated steam curve. The intersection point

is named C. Now move from point C to temperature curve 200°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with flow curve 300kg/h. the intersection point is named E. Since point E is located between a nominal diameter range of size 20mm~25mm. The larger value, which is size 25 mm is taken as the nominal diameter that we are looking for.

NOMINAL DIAMETER SELECTION CHART (for Steam) [Body: Cast steel]



● HOW TO USE THE CHART

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 1.0MPa, secondary pressure 0.5MPa, flow of saturated steam 1000 kg/h.

First, find out the intersection point A of primary pressure curve 1.0MPa and secondary pressure curve 0.5MPa.

Draw a vertical line from point A. This line intersects with flow curve 1000kg/h. The intersection point is B. Since B is located

between a nominal diameter range of size 25mm~32mm. The larger value, which is size 32mm is taken as the nominal diameter that we are looking for.

Now let's find out the nominal diameter at an additional.

Condition: the temperature is 240°C. Draw a vertical line from point A until it intersects with the saturated steam curve. The intersection point is named C. Now move from point C to tem-

perature curve 240°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with flow curve 1000kg/h. the intersection point is named E. Since point E is located between a nominal diameter range of size 25mm~32mm. The larger value, which is size 32 mm is taken as the nominal diameter that we are looking for.

RP-6A Type Pressure Reducing Valve (for Air or Gases)

for **Factory equipments** **Variety of devices** etc., General-purpose pilot operated valve(Large capacity)

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PRESSURE REDUCING VALVES (FOR AIR OR GASES)

A companion to RP-6 Type especially designed for air and gases. For selecting nominal diameter, see the chart in page 22.

FEATURES/SPECIFICATIONS

- Piston guide and diaphragm allow stable control.
- Wide range of pressure and flow for a variety of applications.
- Easy pressure adjustment by manual handle with automatic lock mechanism.
- Compact design.

SPECIFICATIONS

Model name	RP-6A		
Code name	RP6A-B	RP6A-G	
Applicable fluid	Air & gases		
Applicable primary pressure	Max. 1.0MPa		
Adjustable secondary pressure	0.03~0.8MPa		
Maximum reducing rate	10:1		
Minimum pressure differential across the disc	0.07MPa		
Lock up pressure	Max. 0.02MPa		
Offset pressure	Within 0.02MPa (Adjustable secondary pressure 0.03~0.035MPa) Within 0.03MPa (Adjustable secondary pressure 0.035~0.07MPa) Within 0.05MPa (Adjustable secondary pressure 0.07~0.8MPa)		
Minimum adjustable flow	5% of rated flow		
Leakage allowance	Nil (Confirm at pressure Gauge)		
Applicable temperature	5~80°C		
End connection	Flanged JIS 10KFF		
Materials	Body	Cast iron	
	Disc & seat	Disc (Brass), Seat (Stainless steel)	Disc & seat (Stainless steel)
	Piston & cylinder	Brass	Stainless steel
Valve body pressure test	Hydraulic 1.5MPa		

*For size100~200mm, select RP-1HA Type.

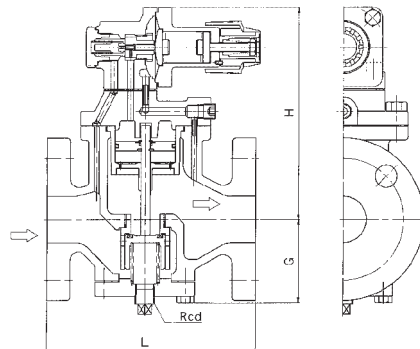
DIMENSIONS

(mm)

Size	L	G	H	d	Cv value	Mass(kg)
15(½")	140	62	155	¼"	1	7.5
20(¾")	140	62	155	¼"	2.5	7.5
25(1")	150	67	160	¼"	4	9
32(1¼")	180	73	182	¾"	6.5	12
40(1½")	180	73	182	¾"	9	12.5
50(2")	200	86	187	¾"	16	15.5
65(2½")	230	94	202	¾"	25	20.5
80(3")	260	110	221	¾"	36	26.5

Flange code JIS 10KFF

CONSTRUCTION



REFERENCE

We also provide spacers for adjustment of face to face dimension. Such spacers are useful when replacing RP-6A Type with RP-1HA Type valve, such as in the case of modification of equipment. For more details, please contact our agent in your area.



RP-8A Type Pressure Reducing Valve (for Air or Gases)

for **Factory equipments** **Variety of devices** etc., General-purpose pilot operated valve(Large capacity)

With the body and main parts made of stainless steel, RP-8A Type is ideal for applications with clean fluid. In addition, the durability and corrosion resistance of stainless steel also make RP-8A Type useful in a variety of other applications.

FEATURES SPECIFICATIONS

- Piston guide and diaphragm allow stable control.
- Easy pressure adjustment by manual handle with automatic lock mechanism.
- Wide range of pressure and flow for a variety of applications.
- Compact design.

SPECIFICATIONS

Model name	RP-8A
Code name	RP8A-D
Applicable fluid	Air & gases
Applicable primary pressure	Max. 1.0MPa
Adjustable secondary pressure	0.03-0.8MPa
Maximum reducing rate	10:1
Minimum pressure differential across the disc	0.07MPa
Lock up pressure	Max. 0.02MPa
Offset pressure	Within 0.02MPa (Adjustable secondary pressure 0.03-0.035MPa) Within 0.03MPa (Adjustable secondary pressure 0.035-0.07MPa) Within 0.05MPa (Adjustable secondary pressure 0.07-0.8MPa)
Minimum adjustable flow	5% of rated flow
Leakage allowance	Nil (Confirm at pressure Gauge)
Applicable temperature	5-80°C
End connection	Flanged JIS 10KFF
Materials	Body (Stainless steel), Diaphragm (Stainless steel), Disc & seat (Stainless steel) Disc tip & pilot disc (Synthetic rubber)
Valve body pressure test	Hydraulic 1.5MPa

*For size 15-25mm, select RD-20, 20F Type, and for size 100mm, select RP-2HA Type.

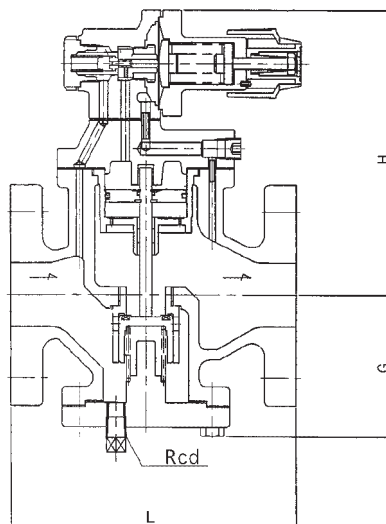
DIMENSIONS

(mm)

Size	L	G	H	d	Cv value	Mass (kg)
32(1¼")	180	90	182	¼"	6.5	12.5
40(1½")	180	90	182	¼"	9	12.5
50(2")	200	100	187	¼"	16	16
65(2½")	230	110	202	¾"	25	22
80(3")	260	118	221	¾"	36	27.5

Flange code JIS 10KFF

CONSTRUCTION

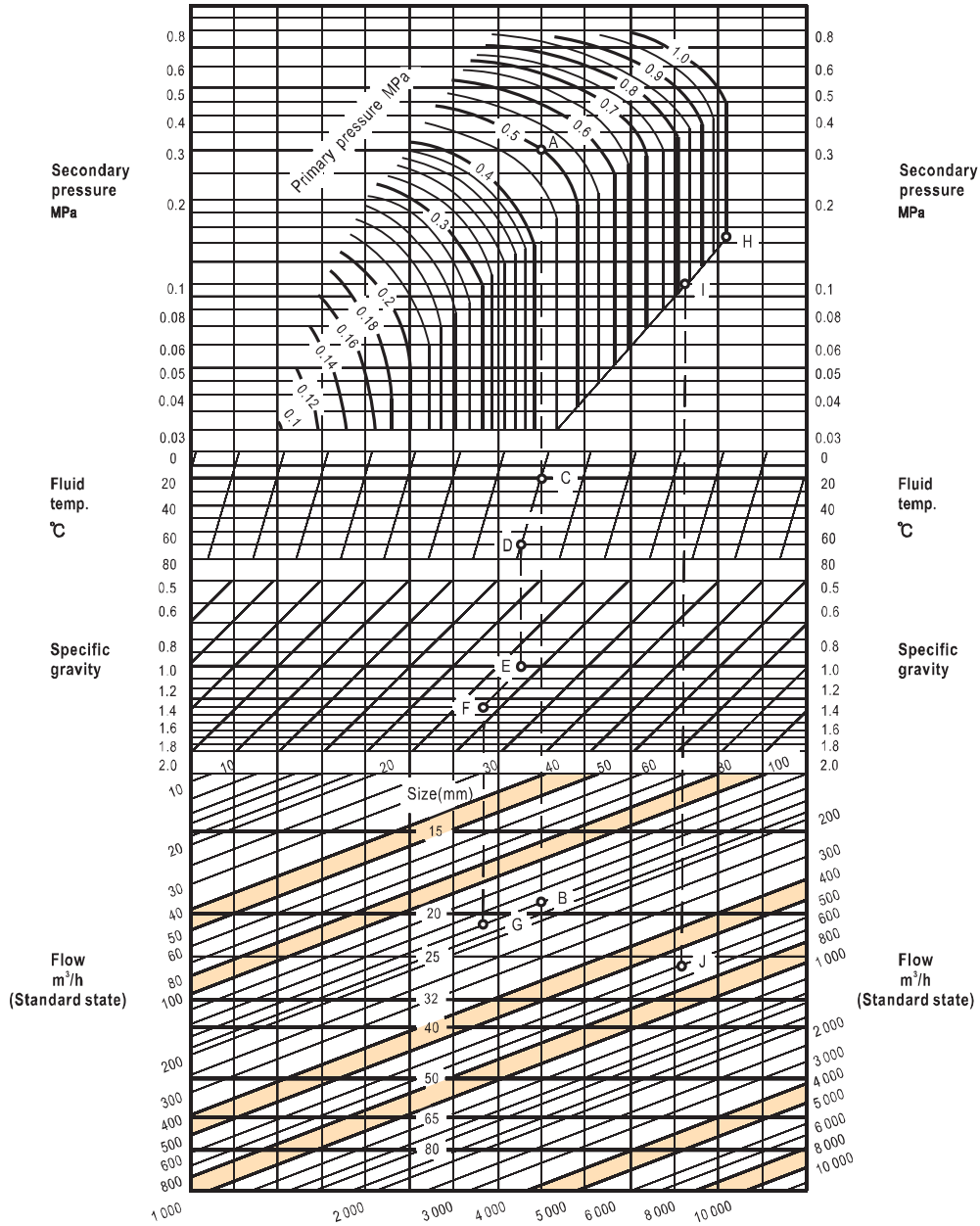


DATA/RP-6A, 8A Type Pressure Reducing Valve (for Air or Gases)

NOMINAL DIAMETER SELECTION CHART (for Air or Gases)

1

PRESSURE REDUCING VALVES (FOR AIR OR GASES)



HOW TO USE THE CHART

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 0.5 MPa; secondary pressure 0.3 MPa; temperature 20°C; specific gravity 1 (air); and flow 160m³/h (standard state).

First, find out the intersection point A of primary pressure curve 0.5MPa and secondary pressure curve 0.3MPa.

Draw a vertical line from point A. This line intersects with flow curve 160kg/h. The intersection point is B. Since B is located between a nominal

diameter range of size 15mm~20mm. The larger value, which is size 20mm is taken as the nominal diameter that we are looking for.

Now let's find out the nominal diameter when some conditions are changed. The other conditions are the same, but the temperature is 70°C, and the specific gravity is 1.4. Draw a vertical line from point A until it intersects with the temperature curve 20°C. The intersection point is named C. Now move from point C to temperature curve 70°C parallelly and we can stop at point D. Draw a

vertical line from point D until it intersects with specific gravity curve 1.4. The intersection point is named E.

Now move from point E parallelly to point F. Draw a vertical line from point F until it intersects with flow curve (160m³/h). The intersection point is named G. Since point G is located between a nominal diameter range of 20mm~25mm. The larger value, which is 25mm, is taken as the nominal diameter that we are looking for.

RP-1HA Type Pressure Reducing Valve (for Air or Gases)

1

PRESSURE REDUCING VALVES (FOR AIR OR GASES)

RP-1HA Type is a large-diameter pilot operated type pressure reducing valve for air and gases, and a companion to RP-1H Type pressure reducing valve for steam.

SPECIFICATIONS

Model name		RP-1HA	
Code name		RP1HA-B	RP1HA-G
Applicable fluid		Air & gases	
Applicable primary pressure		Max. 1.0MPa	
Adjustable secondary pressure		0.035~0.8MPa	
Maximum reducing rate		10:1	
Minimum pressure differential across the disc		0.07MPa	
Lock up pressure		Max. 0.02MPa	
Offset pressure		Within 0.05MPa	
Minimum adjustable flow		5% of rated flow	
Leakage allowance		Less than 0.01% of rated flow	
Applicable temperature		5~80°C	
End connection		Flanged JIS 10KRF	
Materials	Body	Cast iron	
	Disc & seat	Stainless steel	
	Piston & cylinder	Cast bronze	Stainless steel
Valve body pressure test		Hydraulic 1.5MPa	

*For size 15~80mm, select RP-6A Type.

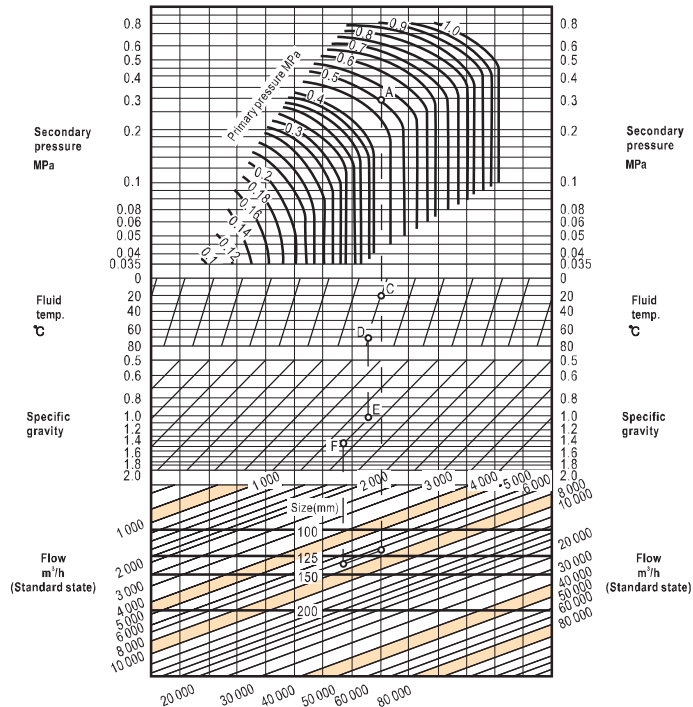
DIMENSIONS

Size	L	G	H	d	Cv value	Mass (kg)
100(4")	320	146	337	3/8"	64	66
125(5")	380	178	409	3/8"	100	104
150(6")	420	206	471	3/8"	144	147
200(8")	540	262	539	3/8"	256	275

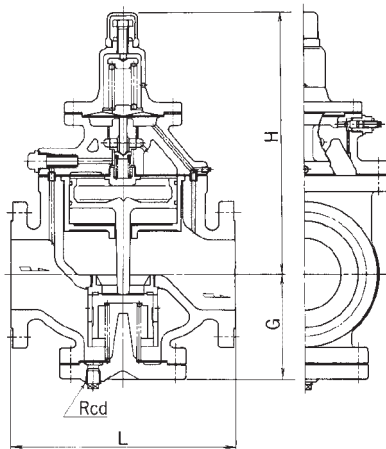
Flange code JIS 10KRF



NOMINAL DIAMETER SELECTION CHART (for Gases)



CONSTRUCTION



Example 1:
 Primary pressure: 0.5MPa (20°C)
 Secondary pressure: 0.3MPa
 Specific gravity: 1 (air)
 Flow: 7000 m³/h (standard state)
 The nominal diameter should be size 125mm.

Example 2:
 Primary pressure: 0.5MPa (70°C)
 Secondary pressure: 0.3MPa
 Specific gravity: 1.4
 Flow: 7000 m³/h (standard state)
 The nominal diameter should be size 150mm.

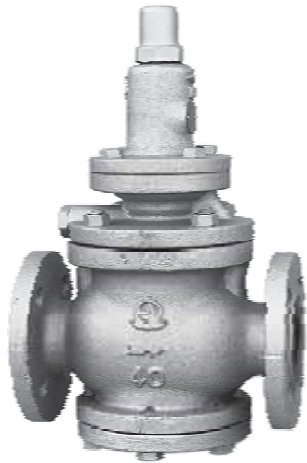
RP-2HA Type Pressure Reducing Valve (for Air or Gases)

1

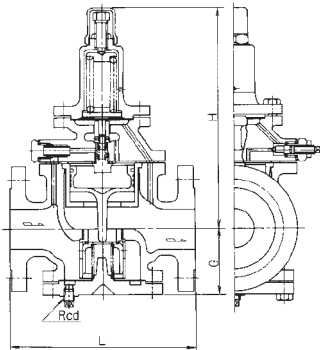
PRESSURE REDUCING VALVES (FOR AIR OR GASES)

RP-2HA Type is a large-diameter pilot operated type pressure reducing valve for air and gases, and a companion to RP-2H Type pressure reducing valve for steam.

RP-2HA Type has larger Cv value than RP-6A, 1HA Type, and allows large flow.



CONSTRUCTION



The structure may vary depending on material and nominal diameter.

SPECIFICATIONS

Model name		RP-2HA		
Body material		Cast iron		Cast steel
Code name		Size 15~40mm:RP2HA-L Size 50~150mm:RP2HA-B	Size 15~40mm:RP2HA-M Size 50~150mm:RP2HA-G	RP2HA-C □ ※ L or H for adjustable secondary pressure is required in □.
Applicable fluid		Air & gases		
Applicable primary pressure		Max. 1.6MPa		Max. 1.0,1.6,2.0,3.0MPa
Adjustable secondary pressure		Size 15~40mm:0.035~1.2MPa Size 50~100mm:0.035~1.0MPa Size 125~150mm:0.035~0.8MPa		L:0.035~0.4MPa H:0.3~1.2MPa
Maximum reducing rate		10:1		
Minimum pressure differential across the disc		0.07MPa		
Lock up pressure		Max. 0.02MPa		
Offset pressure		Within 0.05MPa		
Minimum adjustable flow		5% of rated flow		
Leakage allowance		Less than 0.01% of rated flow (Cast iron, Size 65mm or smaller: Nil (Confirm at pressure Gauge))		
Applicable temperature		5~80°C		
End connection		Flanged JIS 16KRF		Flanged JIS10,16,20 & 30KRF
Materials	Body	Size 15~40mm(Ductile cast iron), Size 50~150mm(Cast iron)		Cast steel
	Disc & seat	Size 15~65mm(Brass) Size 50~150mm(Stainless steel)	Stainless steel	Stainless steel
	Piston & cylinder	Cast bronze	Stainless steel	Stainless steel
Valve body pressure test		Twice as much pressure of flange rated pressure		

*For sizes 15~100mm, valve bodies with Stainless steel are also available upon your request.

DIMENSIONS (CAST IRON)

(mm)

Size	L	G	H	d	Cv value*	Mass(kg)
15(1/2")	170	65	255	1/4"	1.5	10.5
20(3/4")	170	65	255	1/4"	3.5	11
25(1")	210	75	265	1/4"	6	16
32(1 1/4")	210	75	265	1/4"	9.5	16
40(1 1/2")	220	80	270	1/4"	13.5	19
50(2")	250	101	290	3/8"	24	28.5
65(2 1/2")	290	119	305	3/8"	37.5	39
80(3")	350	134	323	3/8"	54	54
100(4")	384	175	390	3/8"	96	98
125(5")	434	218	480	3/8"	150	147
150(6")	544	259	528	3/8"	216	296

*The Cv values require correction depending on pressure conditions.

Flange code JIS 16KRF

DIMENSIONS (CAST STEEL)

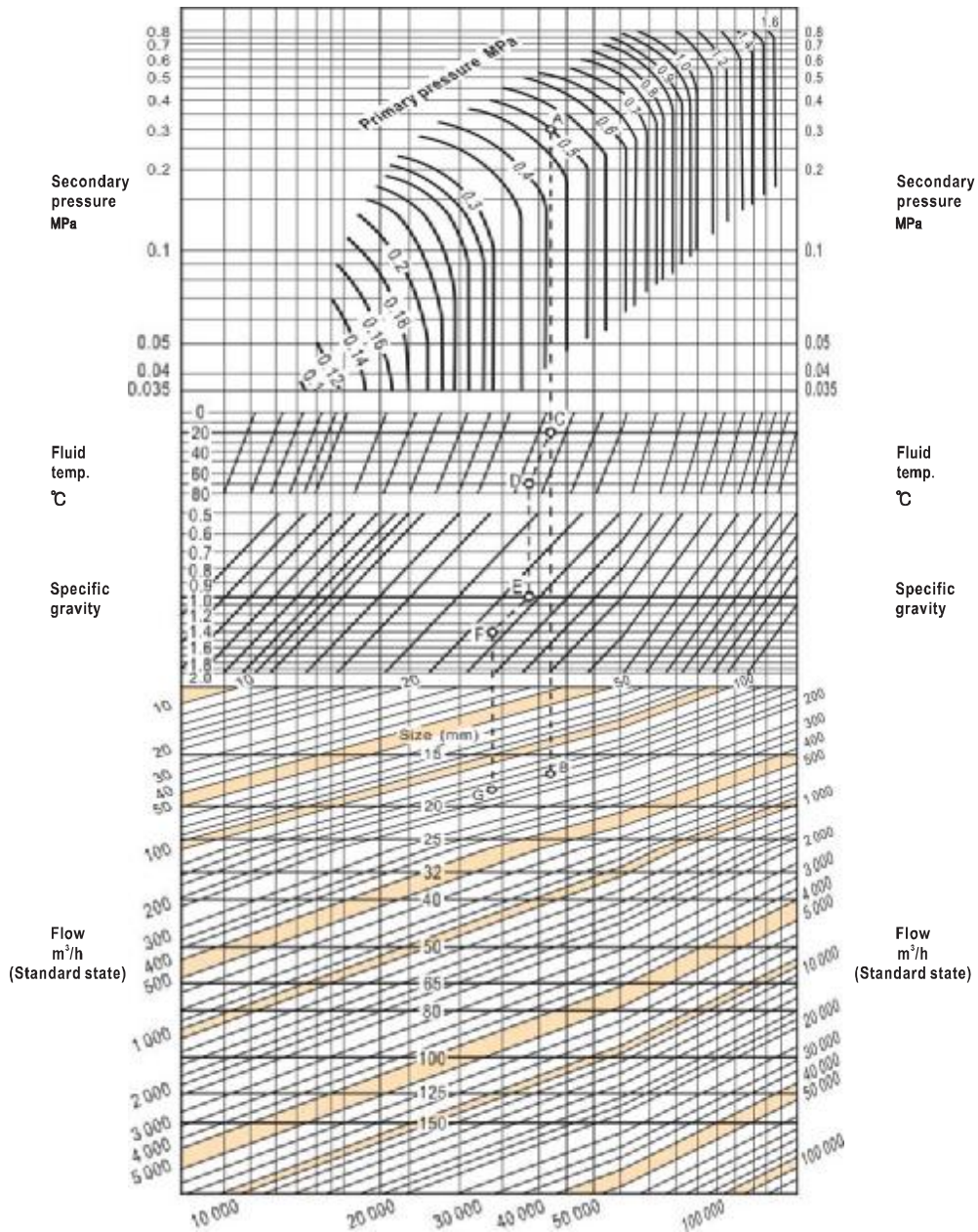
(mm)

Size	L		G	H	d	Cv value*	Mass(kg)
	Flange code JIS						
	20K	30K					
15(1/2")	190	198	73	255	1/4"	1.5	12.5
20(3/4")	194	198	73	255	1/4"	3.5	13
25(1")	220	228	85	265	1/4"	6	17
32(1 1/4")	224	232	85	265	1/4"	9.5	18
40(1 1/2")	240	248	94	270	1/4"	13.5	20
50(2")	272	280	109	290	3/8"	24	30.5
65(2 1/2")	276	288	109	290	3/8"	28	33
80(3")	354	366	148	320	3/8"	54	69
100(4")	410	426	177	390	3/8"	96	115
125(5")	434	454	223	472	3/8"	150	180
150(6")	544	564	264	504	3/8"	216	298

*The Cv values require correction depending on pressure conditions.

Weights listed are for those with flange code JIS 20KRF

NOMINAL DIAMETER SELECTION CHART (for Air or Gases) [Body: Cast iron]



● HOW TO USE THE CHART

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 0.5MPa; secondary pressure 0.3MPa; temperature 20°C ; specific gravity 1(air);and flow 160m³/h (standard state).

First, find out the intersection point A of primary pressure curve 0.5MPa and secondary pressure curve 0.3MPa.

Draw a vertical line from point A. This line intersects with flow curve 160m³/h. The intersection point is B. Since B is located between a nominal diameter

Range of size 15mm~20mm. The larger value, which is size 20mm is taken as the nominal diameter that we are looking for.

Now let's find out the nominal diameter when some conditions are changed. The other conditions are the same, but the temperature is 70°C, and the specific gravity is 1.4. Draw a vertical from point A until it intersects with the temperature curve 20°C.

The intersection point is named C. Now move from point C to temperature curve 70°C

parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with specific gravity curve 1.4. The intersection point is named E.

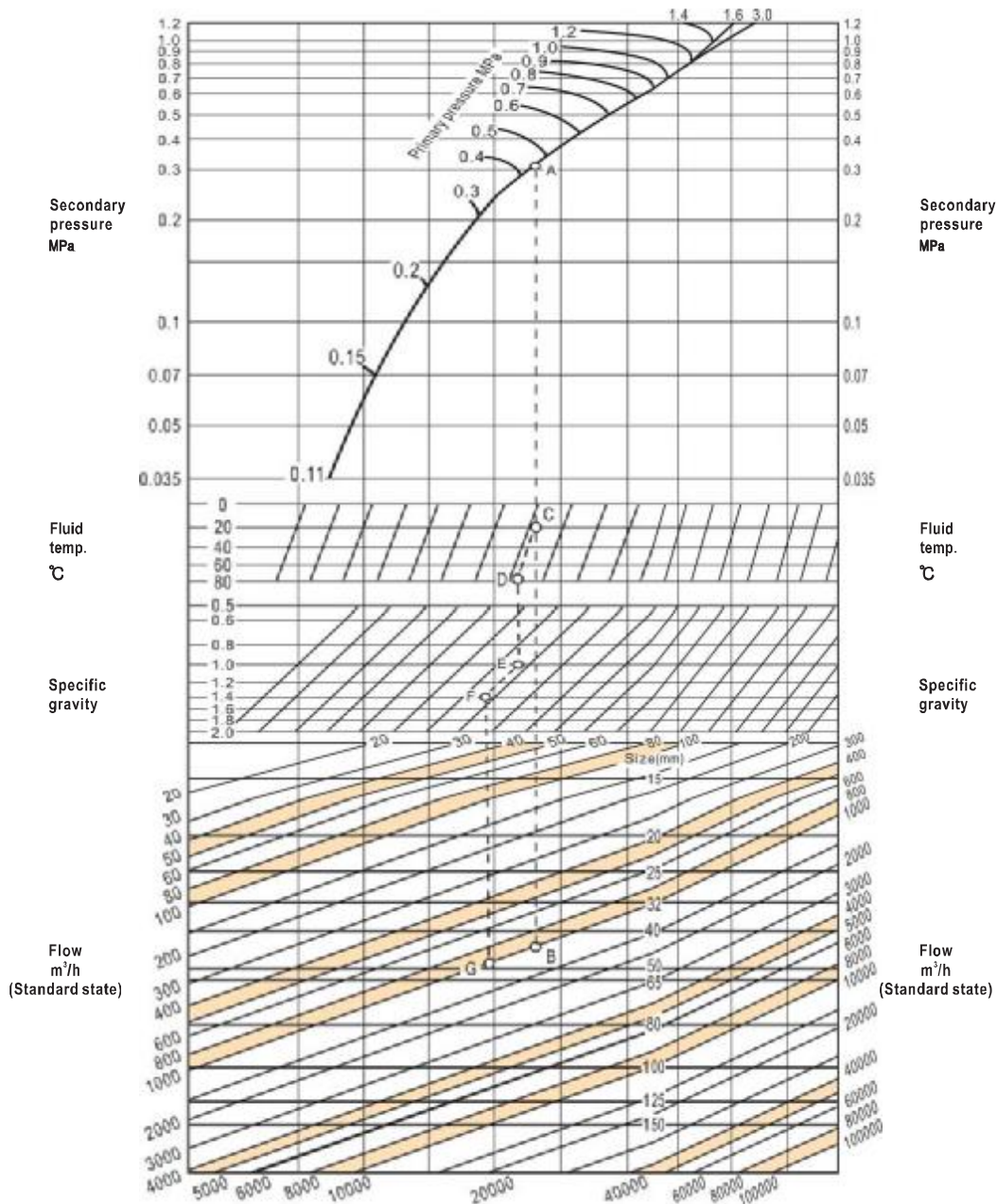
Now move from point E parallelly to point F. Draw a vertical line from point F until it intersects with flow curve 160m³/h. The intersection point is named G. Since point G is located between a nominal diameter range of size 15mm~20mm. The larger value, which is size 20mm, is taken as the nominal diameter that we are looking for.

DATA/RP-2HA Type Pressure Reducing Valve (for Air or Gases)

NOMINAL DIAMETER SELECTION CHART (for Air or Gases) [Body: Cast steel]

1

PRESSURE REDUCING VALVES (FOR AIR OR GASES)



● HOW TO USE THE CHART

This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 1.0MPa; secondary pressure 0.3MPa; temperature 20°C; specific gravity 1 (air); and flow 1000m³/h (standard state).

First, find out the intersection point A of primary pressure curve 1.0MPa and secondary pressure curve 0.3MPa.

Draw a vertical line from point A. This line intersects with flow curve 1000kg/h. The intersection point is B. Since B is located between a nominal diameter range of size 40mm~50mm. The larger value, which is size 20mm is taken as the nominal

diameter that we are looking for.

Now let's find out the nominal diameter when some conditions are changed. The other conditions are the same, but the temperature is 80°C, and the specific gravity is 1.4. Draw a vertical from point A until it intersects with the temperature curve 20°C.

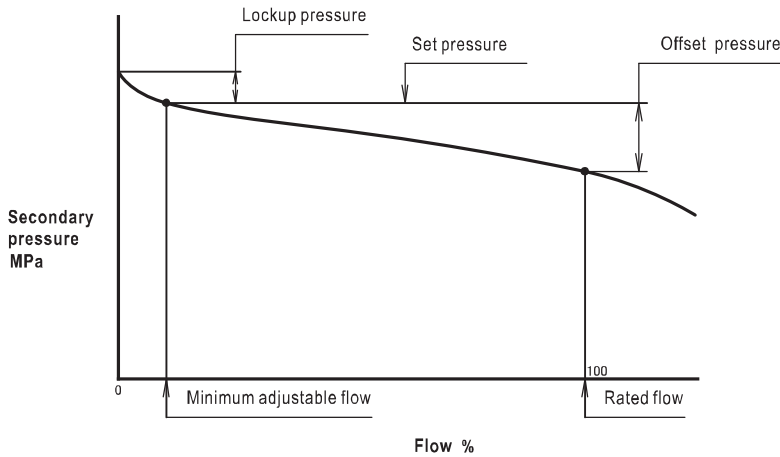
The intersection point is named C. Now move from point C to temperature curve 80°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with specific gravity curve 1.4. The intersection point is named E. Now move from point E

parallelly to point F. Draw a vertical line from point F until it intersects with flow curve 1000m³/h. The intersection point is named G. Since point G is located between a nominal diameter range of size 40mm~50mm. The larger value, which is size 50mm, is taken as the nominal diameter that we are looking for.

Note: When secondary pressure (MPa A)/primary pressure (MPa A) is less than 0.745, it will be necessary for flow (Cv) correction.

DATA/RP-Type Pressure Reducing Valve (RP-6, 8, 1H, 2H Type Series) (for Steam or Gases)

■ FLOW CHARACTERISTICS

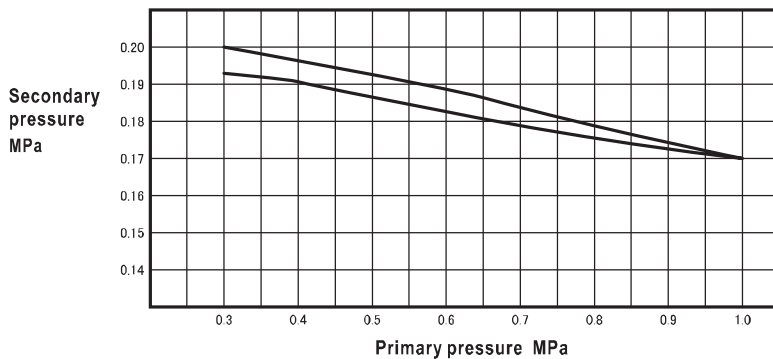


■ TERMS

- **Primary pressure:** The inlet pressure of pressure reducing valve or the inlet pressure of piping that is near to pressure reducing valve.
- **Secondary pressure:** The outlet pressure of pressure reducing valve or the outlet pressure of piping that is near to pressure reducing valve.
- **Set pressure:** secondary pressure at minimum adjustable flow.
- **Offset pressure:** The difference between secondary pressure and set pressure when primary pressure is kept at a constant level but flow increases gradually from minimal adjustable flow to the rated flow of pressure reducing valve.
- **Lockup pressure:** The increased pressure above set pressure when the secondary valve of pressure reducing valve is locked up.
- **Minimum adjustable flow:** The minimum flow of pressure reducing valve for maintaining stable flow.
- **Rated flow:** The maximum flow at the specified offset pressure when primary pressure is kept at a constant level.

■ PRESSURE CHARACTERISTICS

Example: RP-6 Type



The secondary pressure is set at 0.2 MPa when primary pressure is 0.3 MPa. The chart shows the change of secondary pressure when primary pressure changes between 0.3~1.0~0.3 MPa.

■ TIPS: HOW TO SELECT AN APPROPRIATE NOMINAL DIAMETER?

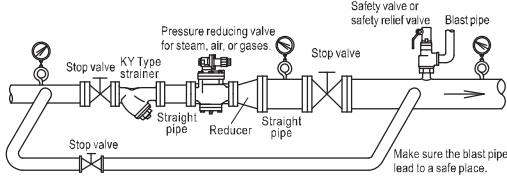
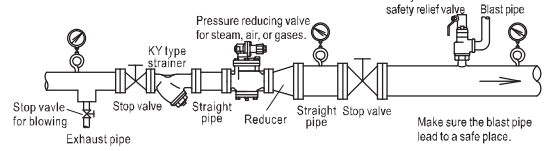
- ① When you select the size, use nominal diameter selection chart. Considering pressure loss and thermal loss, the flow amount for selecting the nominal diameter should be larger by 10-20% than designed flow amount, particularly in case of the pressure reducing ratio is large or the set pressure is lower than 0.1MPa.
- ② The secondary pressure of a pressure reducing valve changes when primary pressure or flow changes. Therefore, when selecting nominal diameter, it is necessary to consider lockup pressure and offset.
- (See flow characteristics and pressure characteristics.)
- ③ In the case when primary and secondary pressure are not constant but change within a certain range, the nominal diameter can be determined using the primary and secondary pressures that produce the smallest differential pressure.
- ④ In the case the pressure reduction ratio exceeds its maximum value, it is required to perform two-step pressure reduction by using 2 pressure reducing valves. Although the flow at step 1 and step 2 are the same, the nominal diameter of the valve at step 1 should be different from that at step 2, because primary pressure is different from secondary pressure. Therefore, it is necessary to select two nominal diameters for the valves to be used.
- ⑤ It is easy to understand that an extremely small valve allows only a tiny flow. However, this does not mean a large valve is better than small valve. In fact, an extremely large valve may cause the occurrence of "hunting", which can lead to abnormal wearing. Another thing to be noted is the minimum adjustable flow, which is about 5% of the rated flow. You should not select a valve which may be used when the flow is lower than the minimum adjustable flow. In winter or summer, flow may change extremely. It is recommended that you install two pressure reducing valves, a large one and a smaller one, and switch between them according to change of flow.

DATA/Pressure Reducing Valve (for Steam or Gases)

1

PRESSURE REDUCING VALVES (FOR STEAM OR GASES)

■ INSTALLATION EXAMPLE

Fig.1 With bypass piping

Fig.2 Without bypass piping


■ POINTS FOR INSTALLATION

- Installation of pressure reducing valve and piping.
- 1. Pressure reducing valve should be vertical to horizontal piping
- 2. Install safety valve or safety relief valve on the secondary side of pressure reducing valve.
 - ※1. Equipment may be damaged due to increase of secondary pressure at the time of failure of pressure reducing valve.
 - ※2. See Table 1 for set pressure of safety valve and safety relief valve.
 - ※3. In the case safety valve or safety relief valve is used as an alarm, its nominal diameter should be big enough to allow discharge of 10% maximum flow of pressure reducing valve, which is about the leakage of pressure reducing valve. In very few cases, safety valve or safety relief valve may allow discharge of maximum flow of pressure reducing valve. (reference value: see Table 2 and Table 3).

TABLE1. SET PRESSURE FOR SAFETY RELIEF VALVE (MPa)

Set pressure of Pressure reducing valve	Set pressure of Safety valve
0.1 or less	+ 0.05
Over 0.1 and below 0.4	+ 0.08
0.4 or more and below 0.6	+ 0.12
0.6 or more and below 0.8	+ 0.15
0.8 or more and below 1.0	+ 0.19
1.0 or more and 1.2 or less	+ 0.23

Add the above value to set pressure of the Pressure Reducing Valve.

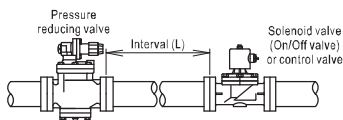
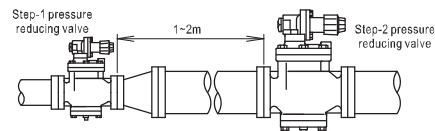
TABLE2. FLOW FOR SAFETY RELIEF VALVE (Saturated steam) SL-37~SL-40 TYPE (kg/h)

Set pressure (MPa)	Size(mm)					
	15(½")	20(¾")	25(1")	32(1¼")	40(1½")	50(2")
0.05	13.4	22.9	33.3	61.8	96.7	157
0.1	17.4	29.7	43.1	80	125	203
0.2	25.3	43.2	62.8	116	182	296
0.3	34.1	58	84.3	156	244	397
0.4	41.9	71.4	103	192	301	489
0.5	50.5	86	125	231	362	589
0.6	59	100	146	271	424	689
0.7	67.6	115	167	310	485	788
0.8	76.1	129	188	349	546	886
0.9	84.7	144	209	388	608	988
1.0	93.2	158	230	428	669	1080

TABLE3. FLOW FOR SAFETY RELIEF VALVE (Air) SL-37~SL-40 TYPE (kg/h)

Set pressure (MPa)	Size(mm)					
	15(½")	20(¾")	25(1")	32(1¼")	40(1½")	50(2")
0.05	21.8	37.1	53.9	100	156	254
0.1	28.2	48	69.8	129	202	329
0.2	41	69.9	101	188	294	479
0.3	55.1	93.9	136	253	396	643
0.4	69.3	118	171	318	497	808
0.5	83.4	142	206	382	598	972
0.6	97.5	166	241	447	700	1130
0.7	111	190	276	512	801	1300
0.8	125	214	311	577	902	1460
0.9	139	238	346	641	1000	1630
1.0	154	262	381	706	1100	1790

3. Install strainer at the primary side of pressure reducing valve.
4. For devices that cannot be stopped, install bypass piping (with stop valve) from the primary side to the secondary side of pressure reducing valve. If bypass piping is not suitable, then install blowing stop valve, which is derived from the main pipe before the primary side of pressure reducing valve, so as to make flushing possible.
5. Install straight piping, stop valve, and pressure gauge before and after pressure reducing valve. If end connection of pressure reducing valve is realized using screw, then use union joint to make it easy to fix and remove.
 - ※ The diameter of piping before and after pressure reducing valve should be determined based on the standard velocity of flow of fluid. Generally, since the nominal diameter of secondary piping of pressure reducing valve for steam and gases is larger than the diameter of pressure reducing valve, it is necessary to use reducer.
6. If you install solenoid valve (on/off operation) or control valve at the secondary side of pressure reducing valve, there should be an interval (L) between such solenoid valve or control valve and pressure reducing valve. The interval (L) should be larger than 2m in the case of solenoid valve. As for control valve, the interval should be larger than 1m if nominal diameter is less than 100mm, and larger than 1.5m if nominal diameter is larger than 125mm (see Fig.3).
7. In the case of 2-step pressure reduction, the interval between 2 valves should be 1~2m (see Fig.4).

Fig.3 INTERVAL BETWEEN PRESSURE REDUCING VALVE AND CONTROL VALVE

Fig.4 INTERVAL BETWEEN VALVES (2-STEP PRESSURE REDUCTION)


DATA/Pressure Reducing Valve (for Steam or Gases)

8. For pressure reducing valve for steam, "hunting" or vibration may occur if drain accumulates.

To prevent hunting and vibration, it is necessary to prevent drain from entering into the piping or install stem trap at the primary side.

In addition, since pressure reducing valve cannot be closed completely, it is necessary to install steam trap at the secondary side if the amount of steam used is near zero.

Fig.5: Proper installation

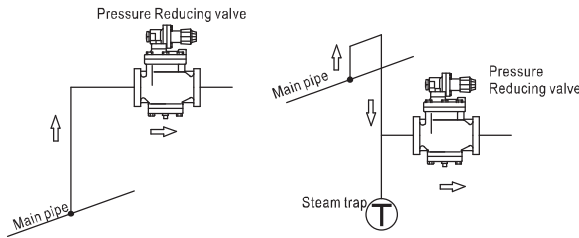
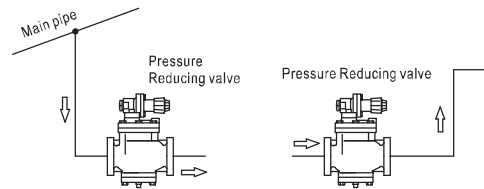


Fig.6: Improper installation



9. Make sure sufficient space is left for maintenance.

10. Apply appropriate support to pressure reducing valve to make sure it does not bear the weight of piping, bending force, or vibration directly.

11. If you think there is possibility of freezing, insulate or discharge the drain.

12. The secondary pressure of the valve is not adjusted at delivery.

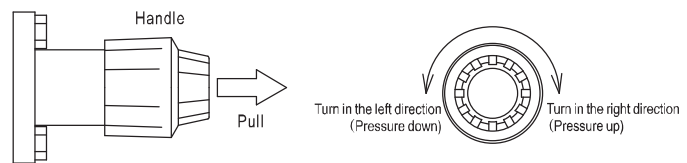
Therefore, you should adjust the secondary pressure to the desired pressure before use.

※ The secondary pressure of a non-adjusted valve is near to zero.

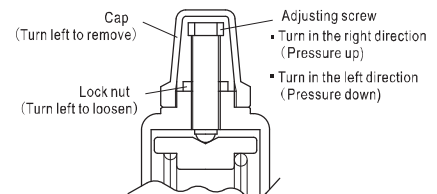
※ How to adjust the secondary pressure:

- ① Close the stop valves at primary and secondary sides.
- ② Open the blowing stop valve or stop valve in bypass and remove any content inside. Such operation is called flushing and should be carried out sufficiently by spending sufficient time on it. Take care not to make the secondary pressure rise excessively.
- ③ Close the stop valve in by pass or blowing stop valve completely.
- ④ Make sure there is not any spring load caused by adjusting screw.
- ⑤ Open the stop valve at primary side gradually.
- ⑥ Make sure you have adjusted the secondary pressure. Open the stop valve at the secondary side slightly to allow small flow.
- ⑦ Apply a small spring load using handle or adjusting screw. Once the fluid start flowing, open the stop valve at the secondary side gradually.
- ⑧ Read the pressure gauge and apply more spring load to make the pressure reaching the set pressure. The pressure rises if you turn the handle or adjusting screw in the right direction and falls if you turn them in the left direction.
- ⑨ Once the desired pressure is reached, use the lock nut to lock the adjusting screw. After the screw is locked, the spring load will not change.

• ADJUSTING SECONDARY PRESSURE
For RP-6 series and RD-40 series.



• OTHER PRESSURE REDUCING VALVES



■ DIAMETER OF PIPING BEFORE AND AFTER PRESSURE REDUCING VALVE

The nominal diameter of pressure reducing valve can be determined using relevant graphs made for such purpose. The diameter of piping before and after pressure reducing valve must be determined base on the standard velocity of fluid.

Extremely small diameter or large velocity of fluid may cause large loss of pressure inside the piping and wearing, vibration of the piping. Therefore, it is necessary to consider the standard velocity of fluid when determining the diameter of piping.

● Table of velocity of Steam as standard condition.

Item	For steam	Standard velocity (m/s)
Pipeage	Saturated steam (0.2~0.5MPa)	15~20
	Saturated steam (0.5~1.5MPa)	20~30
(Steam engine)	Saturated steam	20~30
	Super heated steam	30~40

● Table of velocity of Air as standard condition.

Item	For air	Standard velocity(m/s)
Pipeage	(0.1~0.2MPa)	8~15
	(20~30MPa)	5~7
(Compressor)	Saturated line	10~20
	Low pressure supplyline	20~30
	High pressure supply line	10~15

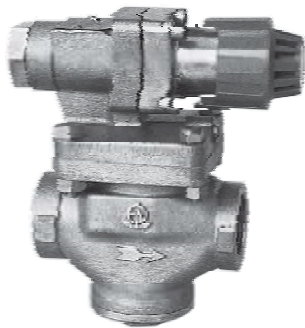
RP-7 Type Pressure Reducing Valve (for Steam)

Used in **Food processing** **Sterilizing** **Cleaning equipments** for clean steam

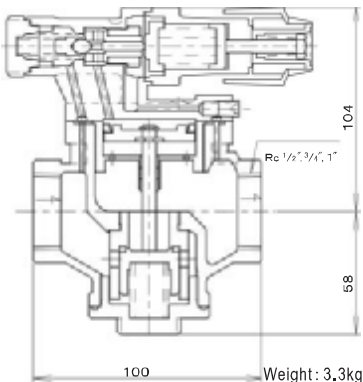
1
PRESSURE REDUCING VALVES (FOR STEAM)

RP-7 Type is a compact, pilot operated-type pressure reducing valve for application on equipments or devices with comparatively small flow.

It is small, light-duty (MAX.50% according to our data) and can be installed as a part of a machine.



CONSTRUCTION



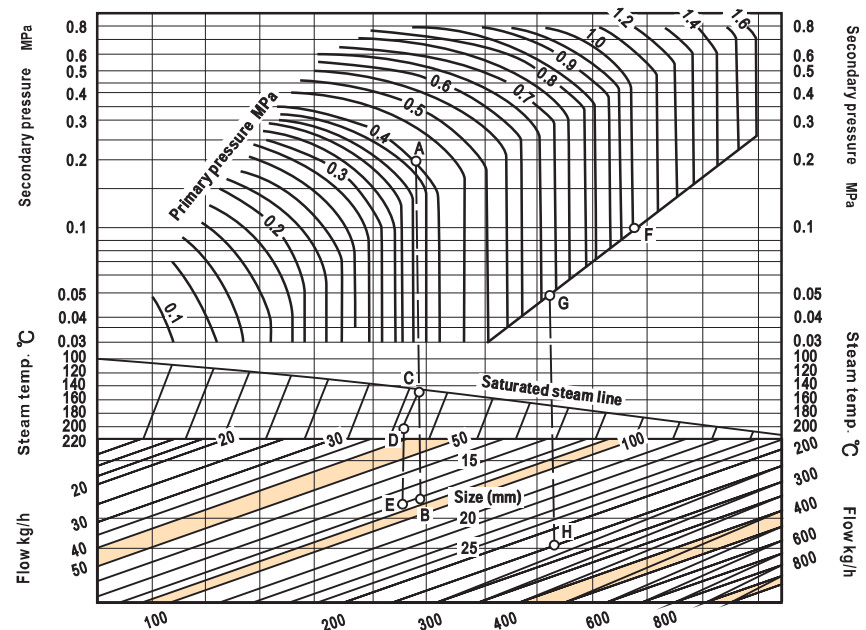
FEATURES

- Features
 - Piston guide and special seal ring allow stable control over small flow and rated flow of fluid.
 - Easy pressure adjustment by manual handle with automatic lock mechanism.
 - Compact design.

SPECIFICATIONS

Model name	RP-7	
	RP7-F □	RP7-J □
Code name	※ L(low press.) or H (high press.) For adjustable secondary pressure is required in □.	
Size	15 · 20 · 25(½" · ¾" · 1")	
Applicable fluid	Steam	
Applicable primary pressure	Max. 1.6MPa	
Adjustable secondary pressure	L:0.03~0.4MPa, H:0.3~0.8MPa	
Maximum reducing rate	20:1	
Minimum pressure differential across the disc	0.05MPa	
Lock up pressure	Max. 0.02MPa	
Offset pressure	Within 0.02MPa(Adjustable secondary pressure 0.03~0.035MPa) Within 0.03MPa(Adjustable secondary pressure 0.035~0.07MPa) Within 0.05MPa(Adjustable secondary pressure 0.07~0.8MPa)	
Leakage allowance	Less than 0.05% of rated flow	
Cv value	Size 15mm:1, Size 20mm:2, Size 25mm:3	
Applicable temperature	Max. 220°C	
End connection	Screwed JIS Rc	
Materials	Body	Cast bronze
	Disc & seat	Stainless steel
	Piston & cylinder	Cast bronze / Stainless steel
Valve body pressure test	Twice as much pressure of flange rated pressure	

NOMINAL DIAMETER SELECTION CHART (for Steam)



Example 1:
 Primary pressure: 0.4MPa (saturated steam)
 Secondary pressure: 0.2MPa
 Flow: 80 kg/h
 At the above conditions, the nominal diameter should be size 20 mm.
 At the same conditions and at 200°C, the nominal diameter is also size 20 mm.

Example 2:
 Primary pressure: 1.0MPa (saturated steam)
 Secondary pressure: 0.05MPa
 Flow: 250 kg/h
 At the above conditions, the nominal diameter should be size 25 mm.

RD-40, 41, 41F Type Pressure Reducing Valve (for Steam)

for **Food processing** **Medical Devices**, **Laundry Machines** and other Steam Equipments/Devices

Compact, light-duty, direct operated pressure reducing valve, ideal for integration into a variety of equipments for precise steam control.

Most suitable for food processing equipments, kitchen equipments, medical devices, laundry machines, air-conditioning (humidifying) equipments, and other equipments /devices that are required to be rust free.

For high-grade steam lines, a valve with stainless steel body is most suitable.



RD-40, 41 Type



RD-41F Type

FEATURES

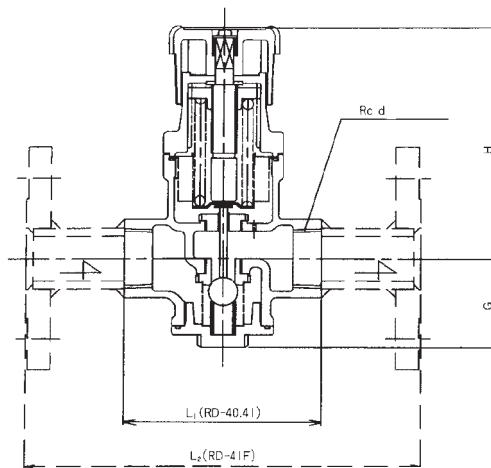
- Ensure large flow (heat) necessary for starting up machines.
- The stainless steel/bronze body and stainless steel disc & seat ensure supply of clean steam.
- Precise adjustment of secondary pressure with manual handle with automatic lock mechanism.
- Stainless steel bellows and embedded strainer (80 mesh) allow high durability.

SPECIFICATIONS

Body material	Cast bronze, Screwed	Stainless steel, Screwed	Stainless steel, Flanged
Model name	RD-40 L/MH	RD-41 L/MH	RD-41F L/MH
Code name	RD40-J □	RD41-D □	RD41F-D □
	※L, M or H for adjustable secondary pressure is required in □.		
Applicable fluid	Steam		
Applicable primary pressure	Max. 1.0MPa*		
Adjustable secondary pressure (Color of name plate and spring)	L: 0.02~0.25MPa (Green) M: 0.2~0.4MPa (Blue) H: 0.35~0.8MPa (Red)		
Maximum reducing rate	20:1		
Minimum pressure differential across the disc	0.02MPa		
Lock up pressure	Max. 0.02MPa		
Offset pressure at rated flow	Within set pressure 0.5 (Adjustable secondary pressure: Max. 0.13MPa) Within 0.07MPa (Adjustable secondary pressure: 0.13MPa~0.4MPa) Within 0.12MPa (Adjustable secondary pressure: 0.4MPa~0.8MPa)		
Leakage allowance	Less than 0.05% of rated flow		
Applicable temperature	Max. 220 °C		
End connection	Screwed JIS Rc		Flanged JIS 10KRF
Materials	Body	Cast bronze	Stainless steel
	Trim	Disc & seat (Stainless steel), Bellows (Stainless steel)	
Valve body pressure test	Hydraulic 1.5MPa		

*Applicable primary pressure 1.6MPa is also available upon your request.

CONSTRUCTION



The structure of the flange-type of welded part may be different from what is shown in the drawing.

DIMENSIONS

Size	d	L ₁	L ₂	G	H
15(1/2")	1/2"	83	186	55	128
20(3/4")	3/4"	96	190	55	128
25(1")	1"	108	190	55	128

MASS

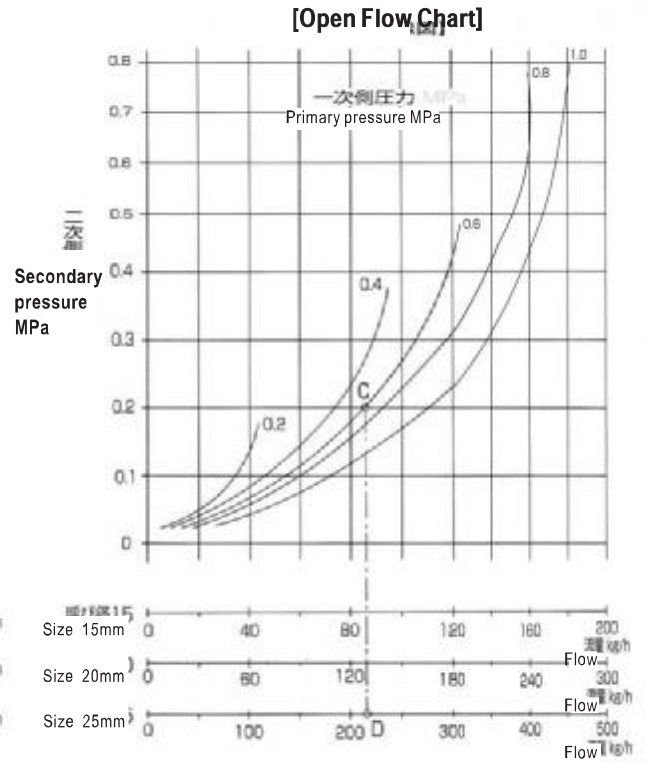
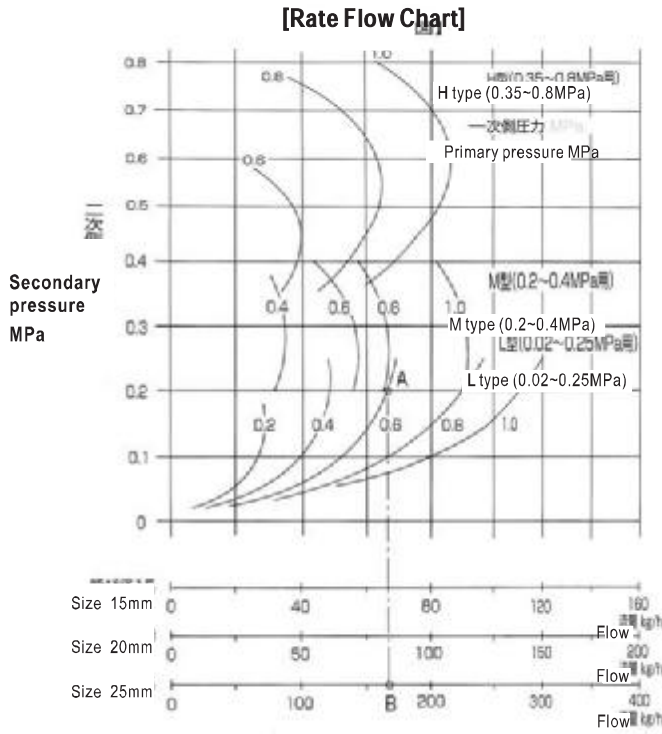
Size	RD-40 Type	RD-41 Type	RD-41F Type
15(1/2")	1.7	2	3.8
20(3/4")	1.7	2	4
25(1")	1.9	2.4	5.5

DATA/RD-40, 41, 41F Type Pressure Reducing Valve (for Steam)

1

PRESSURE REDUCING VALVES (FOR STEAM)

NOMINAL DIAMETER SELECTION CHART (For saturated steam)



● Offset pressure of rated flow (MPa)

Set pressure	Offset pressure
0.13 or less	Set pressure within 0.5
Over 0.13~0.4	Within 0.07
Over 0.4~0.8	Within 0.12

HOW TO USE THE CHART

Example (conditions):
 Primary pressure: 0.6MPa
 Secondary pressure: 0.2MPa
 Saturated steam: 100kg/h

Generally, the nominal diameter can be decided using the Rated Flow Chart.

- Find out the intersection point A between primary pressure 0.6MPa and secondary pressure 0.2MPa.
- Draw a vertical line from point A. The line intersects with the flow 100kg/h line. From the intersection point B, we can find the desired nominal diameter, or size, i.e. 25mm.

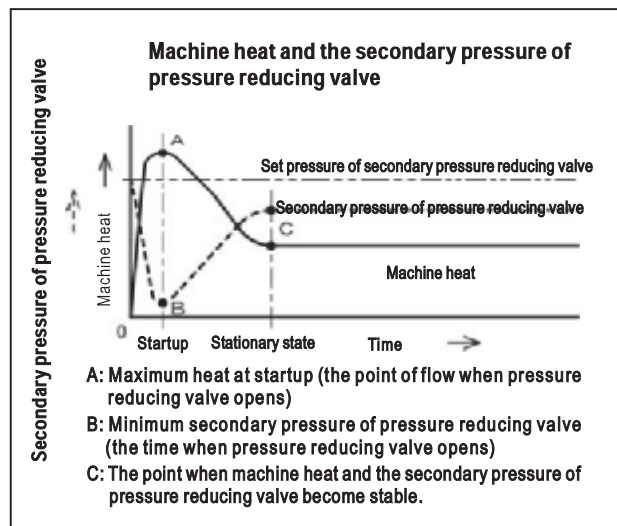
To decide the flow necessary for starting up a machine, use the Open Flow Chart.

- Under the same pressure condition above mentioned, the open flow of size 25mm valve can be determined using intersection points C and D. In this case, the open flow is 215kg/h.

Opening flow

Opening flow is the full opening flow of the stop valve at the secondary side when the diameter of the secondary piping is the same as that of pressure reducing valve.

Note: At opening flow, the secondary pressure reduces significantly.



RD-30 Type Pressure Reducing Valve (for Steam)

1

PRESSURE REDUCING VALVES (FOR STEAM)

for Building Equipments, Factory Equipments etc. General-purpose direct acting valves (small/medium capacity)

Direct operated pressure reducing valve with diaphragm made of special synthesized rubber. Suitable for a variety of applications from small to large flow for piping lines, steam equipments etc.



FEATURES

- Stable operation in small flow applications, which are not controllable using pilot-operated type, and large flow applications.
- Structure which is not influenced by foreign materials easily and easy maintenance.

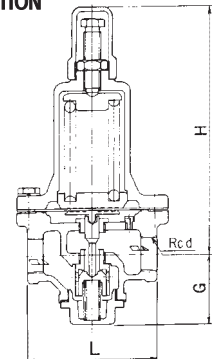
SPECIFICATIONS

Model name	RD-30	
Code name	RD30-GL	RD30-GH
Applicable fluid	Steam	
Applicable primary pressure	Max. 1.0MPa	
Adjustable secondary pressure	0.02~0.2MPa	0.15~0.4MPa
Maximum reducing rate	20:1	
Minimum pressure differential across the disc	0.02MPa	
Lock up pressure	Max. 0.02MPa	
Offset pressure	Within 0.045MPa However in case of Set pressure at 0.08MPa or less: Set pressure 0.5 or less	Within 0.06MPa
Minimum adjustable flow	2~5kg/h	
Leakage allowance	Less than 0.05% of rated flow	
Applicable temperature	Max. 184°C	
End connection	Screwed JIS Rc	
Materials	Body (Cast iron), Disc & seat (Stainless steel), Diaphragm (Synthetic rubber)	
Valve body pressure test	Hydraulic 1.5MPa	

DIMENSIONS

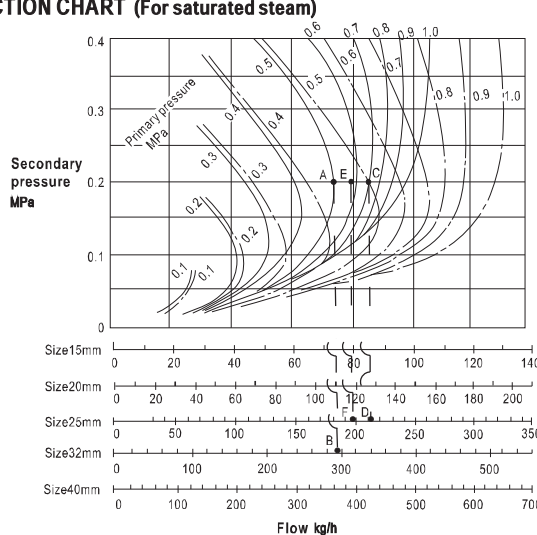
Size	d	L	G	H	Mass (kg)
15(½")	½"	110	57	207	5.5
20(¾")	¾"	110	57	207	5.5
25(1")	1"	120	63	223	7
32(1¼")	1¼"	150	78	278	14
40(1½")	1½"	150	78	278	14

CONSTRUCTION



NOMINAL DIAMETER SELECTION CHART (For saturated steam)

- Example (conditions):
- Primary pressure: 0.5MPa
 - Secondary pressure: 0.2MPa
 - Saturated steam: 205kg/h



determine the nominal diameter, which is size 32mm in this case.

- ① The secondary piping diameter is 2 sizes larger than that of pressure reducing valve
- ① Find out the intersection point C between primary pressure 0.5MPa line (dash line) and secondary pressure 0.2MPa line.
- ② Draw a vertical line from point C until the line intersects with the flow 205kg/h line. From the intersection point D, it is able to determine the nominal diameter, which is size 25mm (size 40mm for the secondary piping diameter).

- In the above example, the flow at point D is 213kg/h, which is larger than the necessary flow (205kg/h). It is necessary to check whether the necessary flow can be satisfied when the secondary piping diameter is 1 size larger. When the secondary piping diameter is 1 size larger, draw a vertical line from point E (the median point between points A and C) until it intersects with the nominal diameter size 25mm line. From the intersection point F, it is able to find out the flow 196kg/h, which is insufficient in this case.

How to use the chart

The flow increases when selecting a larger diameter for the secondary piping.

① Secondary piping diameter

Types of primary pressure line

Solid line (—): The secondary piping diameter is the same as that of pressure reducing valve.

Dashed line (---): The secondary piping diameter is 2 sizes larger than that of pressure reducing valve.

② The secondary piping diameter is the same as that of pressure reducing valve

- ① Find out the intersection point A between primary pressure 0.5MPa line (solid line) and secondary pressure 0.2MPa line.

- ② Draw a vertical line from point A until the line intersects with the flow 205kg/h line. From the intersection point B, it is able to

RD-3H Type Series Pressure Reducing Valve (for Steam or Gases, Liquids)

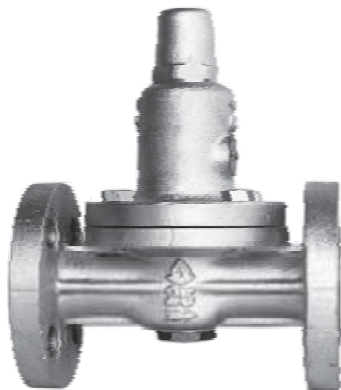
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PRESSURE REDUCING VALVES (FOR STEAM OR GASES, LIQUIDS)

Direct operated pressure reducing valves with good pressure control, wide range of pressure adjustment, and disc & seat Stainless steel (for steam). Suitable for small flow applications that are not controllable using pilot-operating valves. RD-3H and RD-3HF are for steam use. RD-3HA and RD-3HAF are for air and gases.



RD-3H, 3HA Type



RD-3HF, 3HAF Type

SPECIFICATIONS

Model name	RD-3H	RD-3HF	RD-3HA	RD-3HAF
Code name	RD3H-GH	RD3HF-GH	RD3HA-BH	RD3HAF-BH
End connection	Screwed JIS Rc	Flanged JIS 10KRF	Screwed JIS Rc	Flanged JIS 10KRF
Applicable fluid	Steam		Air, gases & liquids	
Applicable primary pressure	Max. 1.0MPa			
Adjustable secondary pressure	0.035~0.5MPa*1			
Maximum reducing rate	15:1			
Minimum pressure differential across the disc	0.02MPa			
Lock up pressure	Max. 0.02MPa			
Leakage allowance	Less than 0.05% of rated flow		Nil(Confirm at Pressure Gauge)	
Fluid viscosity	—		Max. 150cSt	
Applicable temperature	Max. 184°C*2		5~80°C	
Materials	Body(Cast iron), Seat ring(Stainless steel)			
	Disc		Brass with Synthetic rubber heat treatment*3	
Valve body pressure test	Hydraulic 1.5MPa			

*1. Adjustable secondary pressure 0.02~0.1MPa is available upon request.

*2. Applicable temperature Max. 220°C is available upon your request.

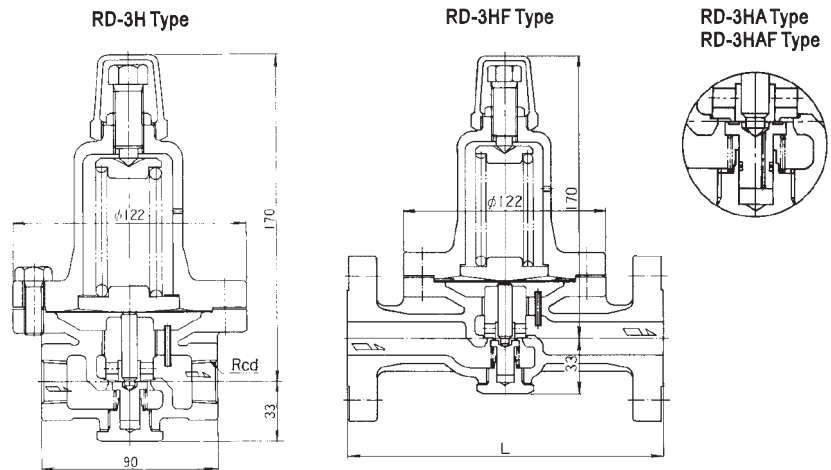
*3. Disc with Stainless steel - Synthetic rubber by heat treatment is also available upon you request.

DIMENSIONS

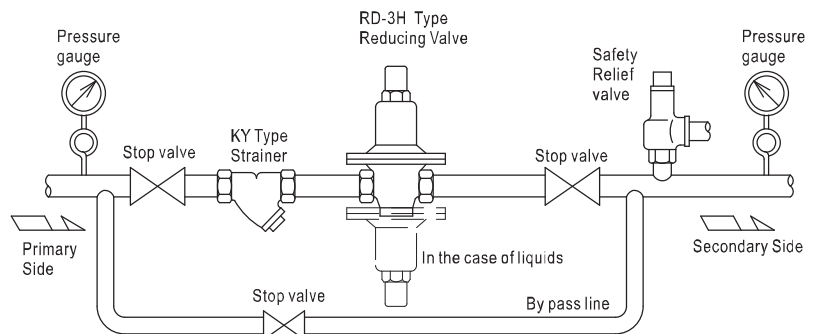
(mm)

Size	Cv value	RD-3H, 3HA Type		RD-3HF, 3HAF Type	
		d	Mass(kg)	L	Mass(kg)
15(½")	0.8	½"	4.1	186	5.7
20(¾")	0.8	¾"	4.1	190	6.1
25(1")	1	1"	4.2	190	7.2

CONSTRUCTION



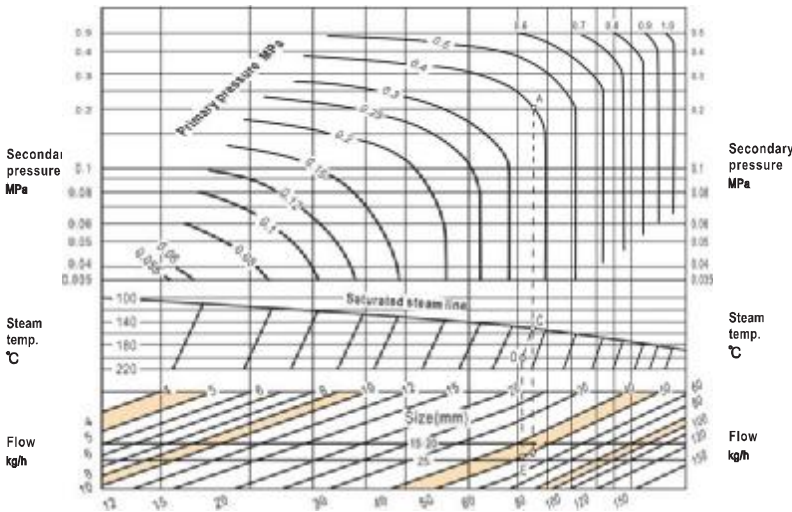
PIPING EXAMPLE



※In the case of liquid, turn upside down.

DATA/RD-3H Type Series Pressure Reducing Valve (for Steam or Gases, Liquids)

RD-3H, 3HF TYPE NOMINAL DIAMETER SELECTION CHART (for Steam)



HOW TO USE THE CHART

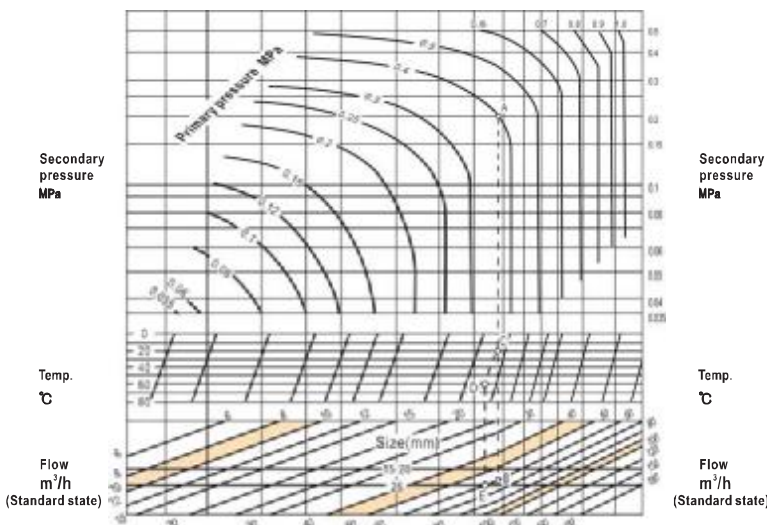
This example shows you how to decide nominal diameter of valve at the following conditions: primary pressure 0.4MPa, secondary pressure 0.2MPa, flow of saturated steam 50 kg/h.

First, find out the intersection point A of primary pressure curve 0.4MPa and secondary pressure curve 0.2MPa.

Draw a vertical line from point A. This line intersects with flow curve 50kg/h. The intersection point is B. Since B is located between a nominal diameter range of 15/20mm and 25mm. The larger value, which is 25mm is taken as the nominal diameter that we are looking for. Now let's find out the nominal diameter at an additional.

Condition: the temperature is 200°C. Draw a vertical from point A until it intersects with the saturated steam curve. The intersection point is named C. Now move from point C to temperature curve 200°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with flow curve 50kg/h. the intersection point is named E. Since point E is located between a nominal diameter range of 15/20mm and 25mm. The larger value, which is 25mm is taken as the nominal diameter that we are looking for.

RD-3HA, 3HAF TYPE NOMINAL DIAMETER SELECTION CHART (for Air)



HOW TO USE THE CHART

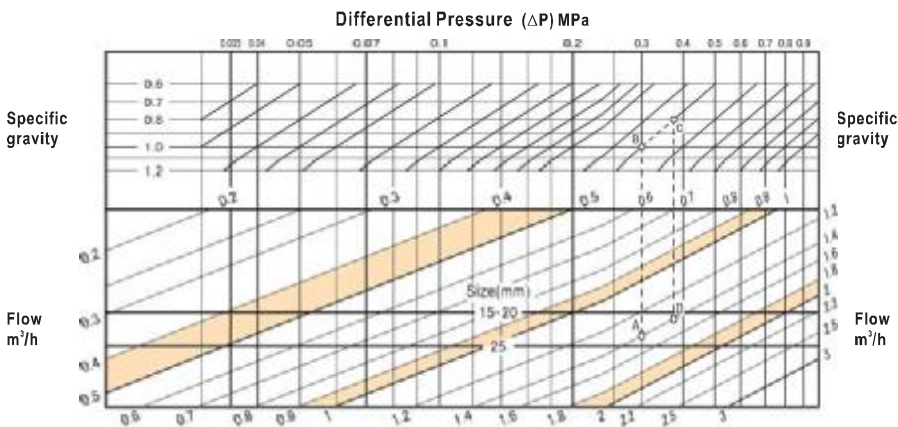
Example: Find out the nominal diameter meeting the following conditions: Primary pressure: 0.4MPa, Secondary pressure: 0.2MPa, Temperature: 20°C, Flow: 60m³/h

First, find out the intersection point A of primary pressure curve 0.4MPa and secondary pressure curve 0.2MPa.

Draw a vertical line from point A. This line intersects with flow curve 60m³/h. The intersection point is B. Since B is located between a nominal diameter range of 15/20mm and 25mm. The larger value, which is 25mm is taken as the nominal diameter that we are looking for. Now let's find out the nominal diameter at an additional.

Condition: the temperature is 60°C. Draw a vertical from point A until it intersects with the saturated steam curve. The intersection point is named C. Now move from point C to temperature curve 20°C parallelly and we can stop at point D. Draw a vertical line from point D until it intersects with flow curve 60m³/h. the intersection point is named E. Since point E is located between a nominal diameter range of 15/20mm and 25mm. The larger value, which is 25mm is taken as the nominal diameter that we are looking for. (Note: the flow is standard flow)

RD-3HA, 3HAF TYPE NOMINAL DIAMETER SELECTION CHART (for Liquids)



HOW TO USE THE CHART

Example: Find out the nominal diameter meeting the following conditions: Primary pressure: 0.5MPa, Secondary pressure: 0.2MPa, Specific gravity: 1 (water), Flow: 1.4m³/h, Differential pressure (ΔP): 0.5-0.2=0.3MPa

Find out the intersection point A between the 0.3MPa differential pressure (ΔP) line and the 1.4m³/h flow line. Since point A is between the lines representing nominal diameter 15/20mm and 25mm, the nominal diameter should be the larger one, i.e. 25mm.

In the case other conditions remain the same but the specific gravity is 0.8, find out the intersection point B between the 0.3MPa differential pressure (ΔP) line and the 1.0 specific gravity line. Move from point B on the 0.8 specific gravity line parallelly to reach point C. Now draw a vertical line from point C until it intersects with the 1.4m³/h flow line. The intersection point is named D. since point D is located between the lines representing nominal diameter 15/20mm and 25mm, the nominal diameter should be the larger one, i.e. 25mm.

RD-29A, 29B Type Pressure Reducing Valve (for Low Pressure Gases)

1

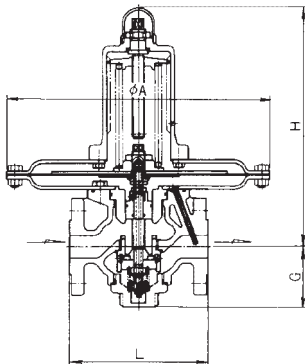
PRESSURE REDUCING VALVES (FOR LOW PRESSURE GASES)

Direct operated pressure reducing valves for low pressure applications in chemical and steel plants. With embedded dual detecting devices, it is not necessary to install detecting pipes. In addition, these valves allow small pressure control with different differential pressures.

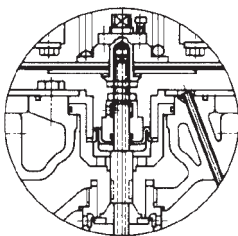


CONSTRUCTION

RD-29A Type O-ring sealed pressure balance construction



RD-29B Type Bellows seal pressure balance construction



FEATURES

- Maximum reducing rate 300:1. (e.g. reduce pressure from 300kPa to 1kPa)
- No leakage through disc and seat ring due to single seat valve.
- Most suitable pressure balance construction must be selected depending on fluid.

SPECIFICATIONS

Model name	RD-29A	RD-29B								
Code name	RD29A-G □	RD29B-G □								
	※L, M or H for adjustable secondary pressure is required in □.									
Applicable fluid	Air, N ₂ gas & non-corrosive gases	Coke oven gas & containing tar								
Applicable primary pressure	Max. 300kPa									
Adjustable secondary pressure	L:1-3kPa (Offset, Within 0.9kPa), M:3-10kPa (Offset, Within 1.5kPa), H:10-30kPa (Offset, Within 4.5kPa)									
Maximum reducing rate	300:1									
Minimum pressure differential across the disc	2kPa									
Lock up pressure	Max. 2kPa									
Applicable temperature	5~60°C									
Minimum adjustable flow	2~5m ³ /h (Standard condition)									
Leakage allowance	Nil (Confirm at Pressure Gauge)									
End connection	Flanged JIS 10KRF									
Materials	Body (Cast Iron), Disc & seat ring (Stainless steel), Diaphragm & disc tip (Synthetic rubber)									
Valve body pressure test	Hydraulic 1.5MPa (Excluding actuator)									
Airtight test	Primary side: 300kPa Secondary side: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Adjustable secondary pressure range</th> <th>Airtight test</th> </tr> </thead> <tbody> <tr> <td>L:1-3kPa</td> <td>5kPa</td> </tr> <tr> <td>M:3-10kPa</td> <td>12kPa</td> </tr> <tr> <td>H:10-30kPa</td> <td>32kPa</td> </tr> </tbody> </table>		Adjustable secondary pressure range	Airtight test	L:1-3kPa	5kPa	M:3-10kPa	12kPa	H:10-30kPa	32kPa
Adjustable secondary pressure range	Airtight test									
L:1-3kPa	5kPa									
M:3-10kPa	12kPa									
H:10-30kPa	32kPa									

*Adding of pressure exceeding hydraulic test and airtight test pressure may damage the pressure reducing valve.

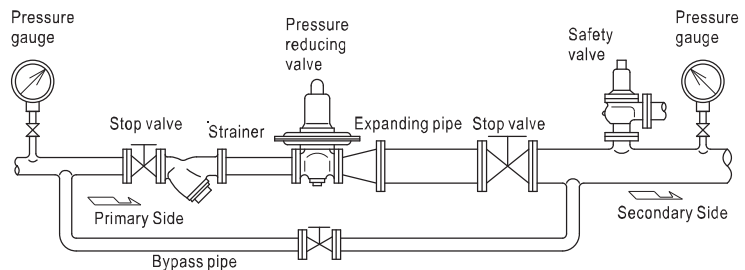
DIMENSIONS

(mm)

Size	L	A	G	H	Mass (kg)
15(1/2")	170	360	75	323	21
20(3/4")	170	360	75	323	22
25(1")	170	360	75	323	22
32(1 1/4")	190	360	85	333	27
40(1 1/2")	190	360	85	333	27
50(2")	240	360	95	343	32

Flange code JIS 10KRF

PIPING EXAMPLE



NOMINAL DIAMETER SELECTION CHART (for Air)

This nominal diameter selecting chart is based on air (20°C).
For other gases, convert them into air.

Gases other than air → Convert into air

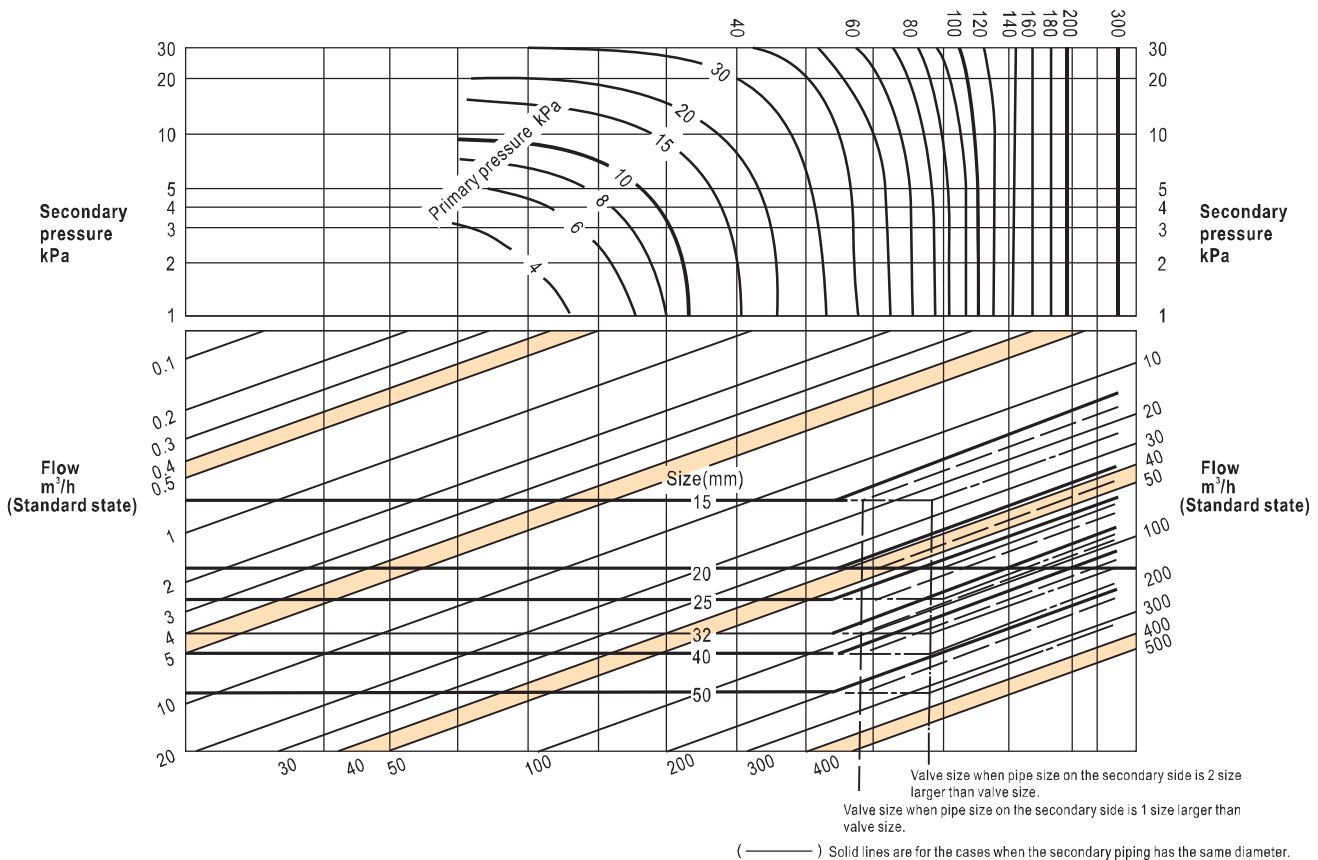
Flow of gas × Conversion factor = Flow of air

■ CONVERSION FACTOR

(Temperature: 5 to 60°C)

Fluid name	Gas constant R(J/kg·K)	Conversion
Dry air	287.03	1.000
Nitrogen gas	296.80	0.983
Methane	518.27	0.744
City gas (13A)	437.67	0.810
Coke oven gas	813.60	0.587

*In the above table, conversion factors are obtained from gas constants. Therefore, for coke oven and city gases, pay attention that their components, and gas constants vary in districts.



● How to use the chart

Example: find out the nominal diameter meeting the following conditions.

Fluid: air

Primary pressure: 200kPa

Secondary pressure: 2kPa

Temperature: 20°C

Flow: 120m³/h (standard state)

- 1) First, find out the intersection point A of primary pressure curve 200kPa and secondary pressure curve 2kPa.
- 2) Draw a vertical line from point A. This line intersects with flow curve 120m³/h. The intersection point is B.
- 3) When the secondary piping diameter is the same as that of pressure reducing valve, the nominal diameter line is a solid line (———). Since point B is between size 40mm and size 50mm lines, the larger one, which is size 50mm, is selected.

- 4) When the secondary piping diameter is 1 size larger than the diameter of pressure reducing valve, the nominal diameter line is a dashed line(— —). Since point B is between size 32mm and size 40mm lines, the larger one, which is size 40mm, is selected as the nominal diameter. The secondary piping diameter, which is 1 size larger than the diameter of pressure reducing valve, is thus size 50mm.
- 5) When the secondary piping diameter is 2 size larger than the diameter of pressure reducing valve, the nominal diameter line is a dotted and dashed line (— · —). Since point B is between size 25mm and size 32mm lines, the larger one, which is size 32mm, is selected as the nominal diameter. The secondary piping diameter, which is 2 size larger than the diameter of pressure reducing valve, is thus size 50mm.

- The rated flow of pressure reducing valve depends on pressure condition. In this chart, the flows at the intersection points of nominal diameter lines are the rated flows of pressure reducing valve at relevant pressure conditions.

The flow of gases other than air can be calculated by converting air flow.

Air flow/Conversion factor = Flow of gas