Direct acting

Type AWR Back Pressure Regulating Valves (Single seat · Double seat)

For all Fluid

- Simple construction
- Stainless steel diaphram allows for use with steam, gases and liquids.

Single seat

Double seat

Specifications

Fluid	Valve seat	Inlet set pressure range (MPa)	Temp. (℃)	Material for main parts					Diaphragm
				Body	Spring case	Bottom cover	Valve disc & seat	Diaphragm	
Air, water, non- corrosive gases & liquids	Single	(Standard) 0.03 −0.055 0.055−0.085 0.085−0.13 0.13 −0.2 0.2 −0.3 (Medium) 0.3 −0.45 0.45 −0.7 0.7 −1.0 (High) 1.0 −1.6 1.4 −2.0	0 ~ 60	Cast iron or Cast steel	Cast iron	—	Stainless steel	Synthetic rubber	Flanged JIS10KFF
	Double			Cast iron		Cast iron			Flanged JIS10KFF
				Cast steel		Carbon steel			Flanged JIS20KRF
Steam, air, water, non-corrosive gases & liquids	Single		0 ~ 220	Cast iron or Cast steel		—		Stainless steel	Flanged JIS10KFF
	Double			Cast iron		Cast iron			Flanged JIS10KFF
				Cast steel		Carbon steel			Flanged JIS20KRF

Remark : Stainless cast steel body is available on request.

Performance

Offset pressure	10% of maximum set pressure
Seat leakage	0.05% of rated flow or less (for single seat) 0.5% of rated flow or less (for double seat)

Cv values

Valve seat	Material of diaphragm	Size	Inlet set pressure range (MPa)							
			0.03−0.055	0.055−0.085	0.085−0.13	0.13−0.2	0.2−0.3	0.3−0.45	0.45−0.7	above 0.7
			Cv							
Single	Synthetic rubber	15	0.35	0.24	0.25	0.20	0.20	0.20	0.31	0.31
		20·25	0.42	0.43	0.55	0.41	0.62	0.44	0.72	0.72
		40	0.69	0.89	0.82	0.96	1.04	0.88	1.44	1.44
	Stainless steel	15	0.05	0.08	0.09	0.10	0.12	0.09	0.15	0.15
		20·25	0.12	0.13	0.17	0.25	0.23	0.20	0.30	0.30
		40	0.18	0.20	0.30	0.37	0.38	0.22	0.34	0.34
Double	Synthetic rubber	15	0.40	0.78	1.30	1.71	1.55	1.74	1.75	1.75
		20	0.42	0.82	1.38	2.11	1.79	2.20	2.28	2.28
		25	0.42	0.82	1.38	2.14	1.82	2.23	2.28	2.28
		40	0.70	1.34	2.23	3.88	2.72	3.70	3.36	3.36
		50	0.79	1.50	2.52	4.44	3.65	5.35	5.12	5.12
	Stainless steel	15	0.08	0.15	0.24	0.78	0.96	0.96	1.08	1.08
		20	0.09	0.17	0.28	0.79	1.02	1.02	1.11	1.11
		25	0.09	0.17	0.28	0.80	1.02	1.02	1.11	1.11
		40	0.21	0.41	0.66	1.49	1.58	1.64	2.20	2.20
		50	0.35	0.69	1.10	1.88	2.09	2.09	2.20	2.20

Remark : Cv value will be double of above value when 20% offset is allowed.

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Sizing

Fluid	In case of $(P_1-P_2) \leqq \frac{P_1}{2}$	In case of $(P_1-P_2) \geqq \frac{P_1}{2}$	Description
Steam	$Cv=\frac{WK}{0.198\sqrt{(P_1-P_2)P_2}}$ $\left\{Cv=\frac{WK}{198\sqrt{(P_1-P_2)P_2}}\right\}$	$Cv=\frac{WK}{0.099P_1}$ $\left\{Cv=\frac{WK}{99P_1}\right\}$	W : Flow rate kg /h P_1 : Set pressure kPa abs {MPa abs} P_2 : Outlet pressure kPa abs {MPa abs} K : 1+0.0013× (super heated steam temp. −saturated steam temp.) ℃
Gas	$Cv=\frac{V}{3.94}\sqrt{\frac{G(273+t)}{(P_1-P_2)P_2}}$ $\left\{Cv=\frac{V}{3940}\sqrt{\frac{G(273+t)}{(P_1-P_2)P_2}}\right\}$	$Cv=\frac{V\sqrt{G(273+t)}}{1.97P_1}$ $\left\{Cv=\frac{V\sqrt{G(273+t)}}{1970P_1}\right\}$	V : Flow rate m^3/h (normal) G : Specific gravity (air : 1) t : Temperature ℃ P_1 : Set pressure kPa abs {MPa abs} P_2 : Outlet pressure kPa abs {MPa abs}
	In case of amb. temp. (20℃)		
	$Cv=\frac{V}{0.23}\sqrt{\frac{G}{(P_1-P_2)P_2}}$ $\left\{Cv=\frac{V}{230}\sqrt{\frac{G}{(P_1-P_2)P_2}}\right\}$	$Cv=\frac{V\sqrt{G}}{0.115P_1}$ $\left\{Cv=\frac{V\sqrt{G}}{115P_1}\right\}$	
Liquid	$Cv=\frac{0.696Q\sqrt{\gamma}}{\sqrt{\triangle P}}$ $\left\{Cv=\frac{0.022Q\sqrt{\gamma}}{\sqrt{\triangle P}}\right\}$		Q : Flow rate ℓ /min γ : Specific gravity (air : 1) $\triangle P$: Differential pressure P_1-P_2 kPa {MPa}

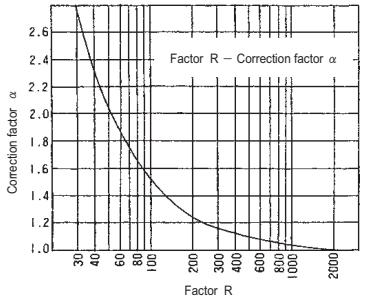
When viscosity is over 20mm²/s, correct the flow rate by the following formula.

① $Cv=\frac{0.696Q\sqrt{\gamma}}{\sqrt{\triangle P}}$ $\left\{Cv=\frac{0.022Q\sqrt{\gamma}}{\sqrt{\triangle P}}\right\}$

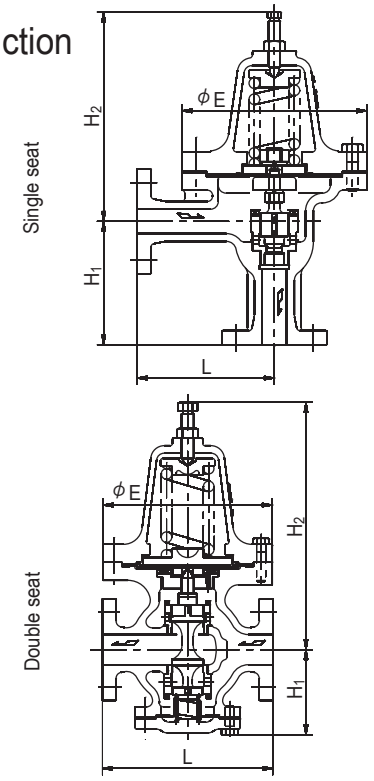
② $R=\frac{2462\times Q}{\sqrt{Cv}\times \text{Viscosity at operating temperature mm}^2/\text{s}}$

③ Obtain correction factor α from the graph using factor R.
④ Corrected $Q=Q\times\alpha$
⑤ Then obtain corrected Cv from ① by using corrected Q.

Where :
Q : Flow ℓ /min
$\triangle P$: Differential pressure kPa {MPa}
γ : Specific gravity (water : 1)



Construction



Dimensions and weights

(mm, kg)

Valve seat	Material Connection	Size	L	H_1	H_2	E	Weight
Single	Cast iron JIS10K	15	115	100	210	165	9
		20	130	110	215	190	15
		25	140	120	215	190	15
		40	165	140	270	225	27
	Cast steel, Stainless cast steel JIS10K	15	126	124	187	165	11
		20	141	126	215	190	18
		25	141	126	215	190	18
		40	165	140	270	225	32
Double	Cast iron JIS10K	15	186	89	320	225	25
		20	190	89	320		25
		25	190	89	320		28
		40	230	113	328		38
		50	250	127	336		40
	Cast steel, Stainless cast steel JIS20K	15	182	93	320	225	27
		20	186	93	320		27
		25	186	93	320		30
		40	226	117	328		40
		50	246	131	336		45

Remark : Size 65 of double seat is available.