

Model 3306

SMALL FLOW CONTROL VALVES

1. FEATURES

1 Wide controllable range

Despite small flow type valve, inherent rangeability of these models is very wide (model 3306-L; 50:1, 3306-M; 500:1). Therefore these models are most suitable for control of varied process, for example, pilot plants, research & testing equipments and so on. Also, these models are suitable for the device that adds very small amount of coloring agent to the process in petroleum refining plant and the very small amount of hydrogen to charge device in the petrochemical plant.

In particular, model 3306-M of high rangeability, sometimes let one valve control possible where usually two valves are needed.

2 Excellent controllability at low valve travel

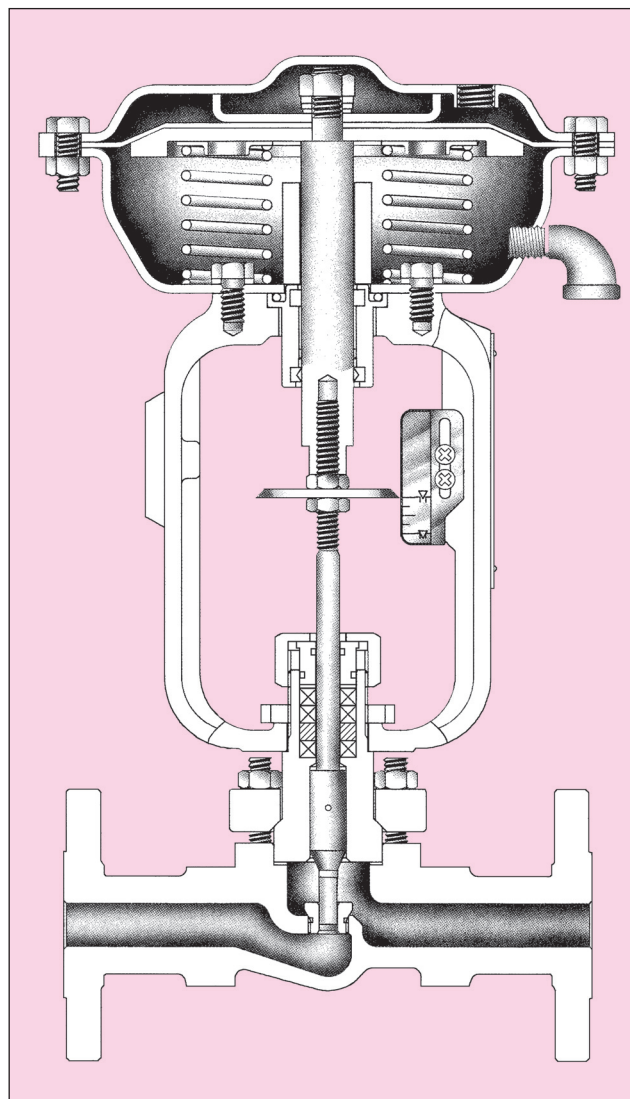
Because the standard flow characteristics is modified equal percentage, model 3306-M has excellent controllability at low valve travel.

3 Easy sizing

Within the range of Cv value from 0.0005 to 0.4, 15 kinds of Cv value enable you to choose the suitable Cv value to your service.

4 Rigid structure

The valve plugs are very thick (Model 3306-M; 7.9mm (5/16 in), Model 3306-L; 6.4mm (1/4 in)), and the thick plugs make the valve rigid and make it free from damage at the time of overhaul of valve.



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2. SPECIFICATIONS

Valve Type			Multi-spring Type Diaphragm Operated Single Seated	
Valve Model No.			3306 (- L , - M)	
			Casted Body	Forged Body
Valve Body	Valve Sizes mm (in.)	Flange Type	10(3/8) · 15(1/2) · 20(3/4) · 25(1)	
		Screw Type	6(1/8) · 8(1/4) · 10(3/8) · 15(1/2)	
	Pressure Rating		JIS 10K, 20K ANSI/JPI 150, 300	JIS 30K, JIS 40K ANSI/JPI 600
	End Connections		Flanged End	Flanged End Screwed end (Rc. NPT)
	Body Materials		SCS 14A, SCS 16A	SUSF316, SUSF316L, HC276, Ti etc.
	Gland Type		Union Gland	
	Gland Packing		P6610+C1065+V7010+ORING	
	Gaskets		T9007-LC, T1890-MT(SUS 316)	T1850-P(SUS 316)
	Bonnet		Plain, Extension, Bellow Seal	Plain, Extension

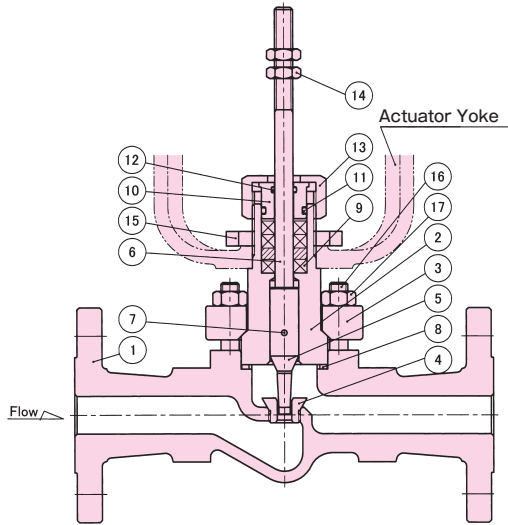
Trim	Plug Model		3306-L	3306-M	
	Plug Shapes		Contoured	Splined (V notch)	
	Materials		SUS316	SUS316 + Reinforced PTFE	
	Structure		See page 3 "Trim Structure"		
Actuator	Actuator Type		Model 3300 Multi-spring Type Diaphragm Operated		
	Action		Direct Action, Reverse Action		
	Diaphragm Rubber		Cloth Reinforced Chloroprene		
	Size (Stroke)		C20 (12.7mm)		
	Spring Range		See page 6 "Off-balance Classification"		
	Supply Air Press.		240kPaG (2.4kgf/cm ² G)		
	Air Connection		Rc 1/4, NPT 1/4 (Bushing)		
	Painting Color		Silver		
	Ambient Temperature		-20~+70°C		
Valve Characteristics	Rated Cv Value		See page 5 "Rated Cv Value"		
	Flow Characteristics		See page 5 "Flow Characteristics"		
	Inherent Rangeability		50 : 1	500 : 1	
	Allowable Shut-off Pressure		See page 5 "Allowable shut-off Pressure"		
	Allowable Seat Leakage Ratio		ANSI/FCI Class IV	ANSI/FCI Class VI	
	Allowable Max. Fluid Pressure		to Connection Rating	Conform to the Applicable Press. & Temp. of Seal-Ring	
	Fluid Temp	Standard		-20 ≤ t (°C) ≤ 230	-20 ≤ t (°C) ≤ 200
		Extension		-196 ≤ t (°C) < -20, 230 ≤ t (°C) ≤ 350	
		Bellows Seal		-196 ≤ t (°C) ≤ 350	
	Hysteresis Error (with positioner)		Max. 1.0%F.S.		
Linearity (with positioner)		Max. ±1.0%F.S.			
Face-to face Dimensions					
Standard Dimensions		See page 6, 7 "Main Dimensions and Weights"			
Mass					
Accessories		Electro-pneumatic Positioner (EA91A, EA90A,EA10S) , Pneumatic Positioner (PA92A, IP300) Air Filter Regulator (MR2000) (Note) Equipped with Positioner as Standard			
Options	Accessories		Solenoid Valve (at remote place)		
	Others		The High Pressure Gas Safety Law Certification, Yoke SCPH2, Top-mounted Handwheel, Oil Free, Water Free		

- [Notes]
1. Only JIS Flange type is applicable for valve size 3/8inch.
 2. For Bellows Seal Bonnet type, casting Body is only applicable.
 3. Forging Body only for Screwed type.
 4. On type # 3306-L , allowable seat leakage ratio 0.001% of rated Cv (TSO) is available as option.
 5. Body special materials are made of forging. Trim materials are available to fit to the Body materials.
 6. Other options are available on request.

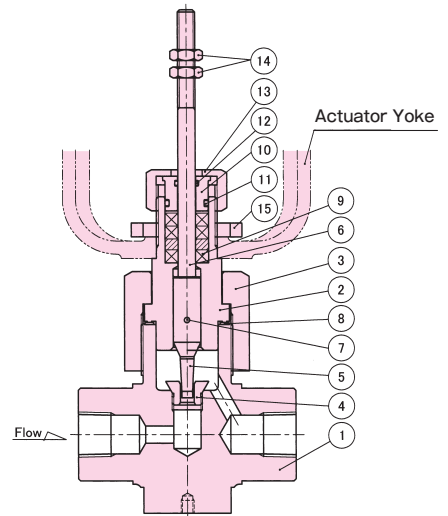
3. STRUCTURE

1 Body

No. 06 Casted Body

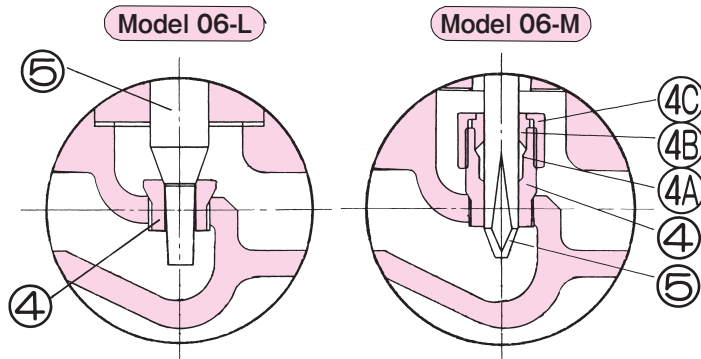


No. 06 Forged Body



No.	Part Name	No.	Part Name	No.	Part Name
1	Body	6	Valve Stem	12	O-Ring
2	Bonnet	7	Pin	13	Gland Nut
3	Bonnet Flange (Flange Type)	8	Gasket	14	Stem Nuts
	Bonnet Nut (Screw Tyoe)	9	Gland Packing	15	Clamp Nut
4	Seat-Ring	10	Gland Bushing	16	Stud Bolts
5	Valve Plug	11	O-Ring	17	Nuts

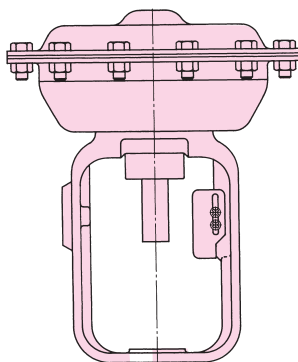
2 Trim



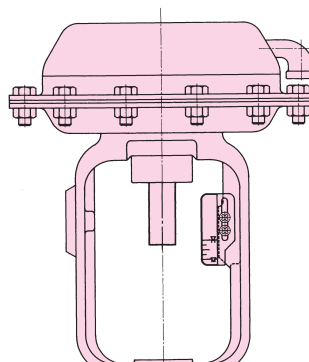
No.	Part Name
4	Seat-Ring
4A	Seal-Ring
4B	Sleeve
4C	Seal Cap
5	Valve Plug

3 Actuator

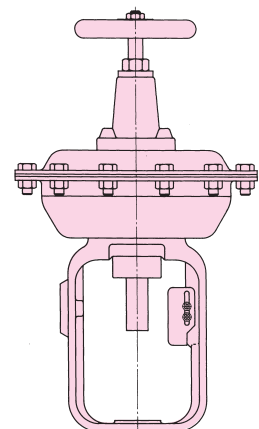
Direct Action



Reverse Action



With Top Mounted Hand Wheel



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4. MAIN MATERIALS

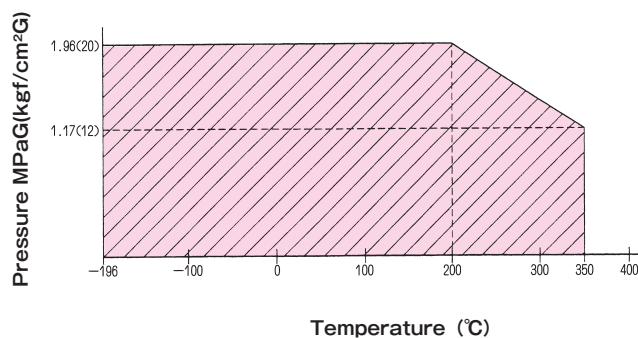
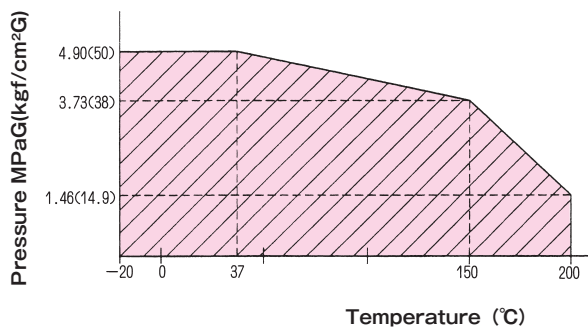
1 Typical Combinations of Materials

Parts Name	Model	No. 06 (Casted Body)	No. 06 (Forged Body)
Trim	Body	SCS14A	SUSF316
	Bonnet	SUS316	
	Seat Ring		
	Sleeve		
	Gland Bushing	SUS316	
	Valve Plug		
	Seal-Ring	Reinforced PTFE	
Other	Stud Bolt	ASTM A193 GrB8 CLASS2	SUS304
	Bonnet Flange	SCS13A	
	Bonnet Nut	SUS304	
	Gland Nut	SCS13A	
Yoke	FC200		

2 Applicable Pressure and Temperature

Plain Bonnet Model 06-M (Seal-Ring)

Bellows Seal Bonnet



5. FLOW CHARACTERISTICS

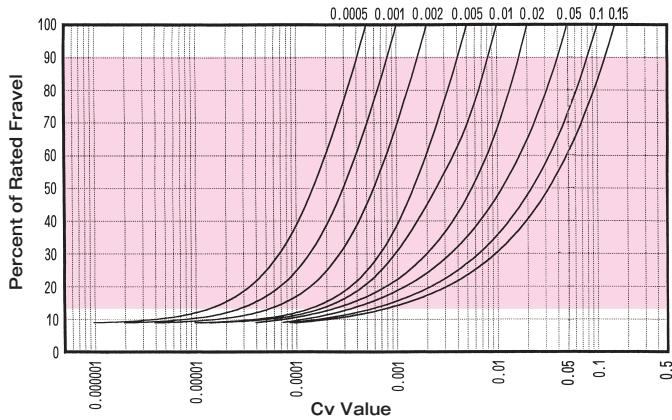
1 Rated Cv Value

Model No.	06-M										06-L				
Plug size	φ7.9(5/16in)										φ6.4(1/4in)				
Rated travel	12.7mm(1/2in)														
Rangeability	500 : 1										50 : 1				
Rated Cv	0.0005	0.001	0.002	0.005	0.01	0.02	0.05	0.1	0.15	0.02	0.05	0.1	0.15	0.2	0.4
Flow Characteristics	Modified Eq%										Linear				

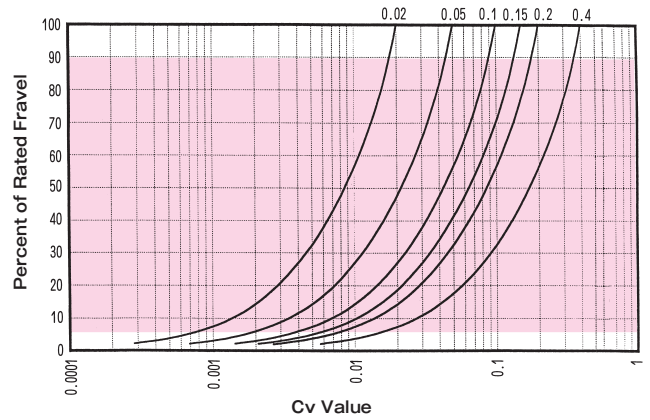
[Note] Cv value is calculated by the formula according to ISA90, and so inform us kinematic viscosity of the fluid.

2 Flow Characteristics

Modified Equal Percentage (06-M)



Linear (06-L)



[Note] Shaded zone represents proper throttling control range.

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6. ALLOWABLE DIFFERENTIAL PRESSURE

1 Off-balance Classification

Unit : kPaG(kgf/cm²G)

Action		Spring Range	Supply Air Pressure	Off-Balance
Direct Action		40~200 (0.4~2.0)	240 (2.4)	40 (0.4)
		60~180 (0.6~1.8)	240 (2.4)	60 (0.6)
Reverse Action		40~200 (0.4~2.0)	240 (2.4)	40 (0.4)
		60~180 (0.6~1.8)	240 (2.4)	60 (0.6)

[Note] Spring range 20~100kPaG (0.2~1.0kgf/cm²G) is available as option. Please consult with us.

2 Allowable Shut-off Pressure

Unit : kPa(kgf/cm²)

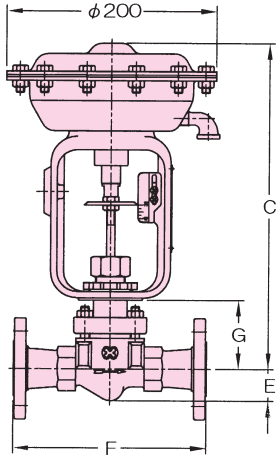
Body Model	Off-Balance kPaG(kgf/cm ² G)	Allowable shut-off Pressure MPaG(kgf/cm ² G)	
		DA	RA
-L	40 (0.4)	6.37 (65)	7.55 (77)
	60 (0.6)	9.61 (98)	9.80 (100)
-M	40 (0.4)	4.90 (50)	4.90 (50)
	60 (0.6)		

[Note] See Fig.1 on page 4, about allowable shut-off pressure of model M.

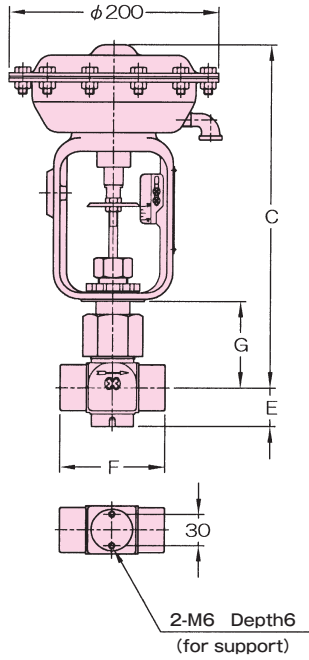
7. MAIN DIMENSIONS AND MASS

1 MAIN DIMENSIONS

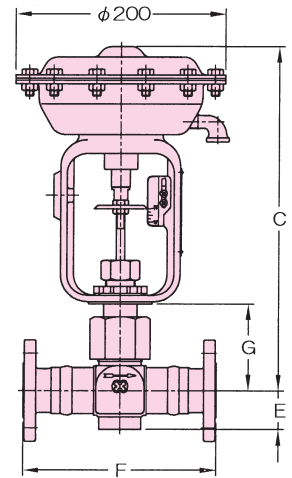
Plain Bonnet Type (Casted Body)
Flanged Connection



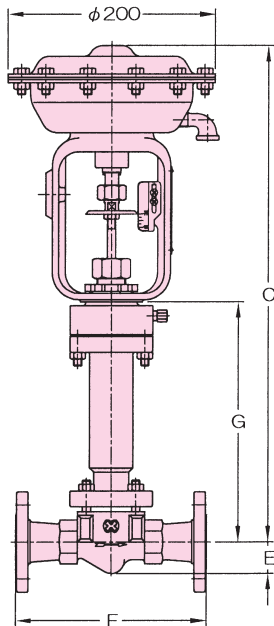
Plain Bonnet Type (Forged Body)
Screwed Connection



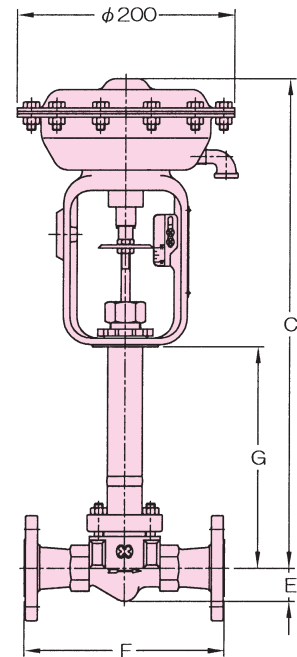
Plain Bonnet Type (Forged Body)
Flanged Connection



Bellows Seal Bonnet



Extension Bonnet



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■ Dimensions of C & G & E

Unit : mm

C/G	Body		Casted Body			Forged Body	
	Hand Wheel	Bonnet Action	Plain	Extension	Bellows Seal	Plain	Extension
C	Without	DA	308	444	472	325	461
		RA	298	434	462	315	451
	Top-mounted Hand Wheel		412	548	576	429	565
G			65	201	229	82	218
E			30			37	

■ Face-to-face Dimensions (F)

Unit : mm

Press. Rating Valve Size		Face-to-face Dimensions (F)					
		JIS10KRF	ANSI 150RF	JIS20KRF	ANSI 300RF	JIS30KRF	ANSI 600RF
10(mm)	3/8(in.)	184	184	190	190	203	203
15	1/2			194	194	206	206
20	3/4		197	197	210	210	
25	1						

- [Notes] 1. Face-to-face dimensions of JPI standard are the same as ANSI standard.
2. Face-to-face dimensions of Rc and NPT are 100mm all.

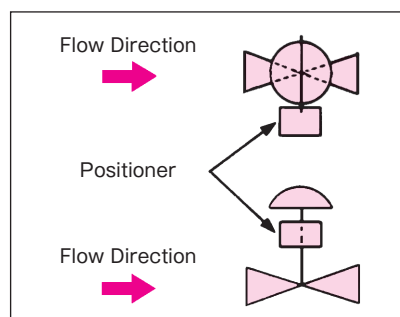
2 Mass

Body	End connection	Mass (kg)
Casted body	Flanged end	10
Forged body	Flanged end	11
	Screwed end	10

- [Notes] 1. The upper table means the case that model 3300 actuator and plain bonnet are installed.
2. EA91A positioner and MR2000 regulator increase the mass about 4.2kg.

8. MOUNTING ORIENTATIONS

Standard mounting orientation is as follows.





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