

Electrically-Operated, Single-Seated Control Valve

Model ACT_ _ _

OVERVIEW

Model ACT control valve is a compact, lightweight, and economical simple-function control valve designed for JIS 10K process line. It is best suited for the automation of a semi-fixed line or a manual line, or for the automation of a simple equipment loop.

SPECIFICATIONS

Body

Type

Straight-through type, cast glove valve

Valve size

1/2, 3/4, 1, 1-1/2, 2, 2-1/2, 3 inches

Rating

JIS 10K

End connection

Flange end

FF (SCPH2) : JIS B2210-1984

RF (SCPH2, SCS13A) : JIS B2210-1984

Material

Carbon steel (SCPH2), stainless steel (SCS13A)

Note: Refer to Table 3 for configurations of the valve body and trim materials and for the operating temperature ranges.

Bonnet

Plain bonnet

Fluid temperature

-5 to +200°C (SCPH2, SCS13A)

Gland type

Screw gland (with O-ring)

Packing/grease

V shaped PTFE (without grease)

Gasket

Bonnet, body: Serrated type (SUS316 + PTFE coating)

Seat: Flat type (SUS316 + PTFE coating)

Note: 1. PTFE: Polytetra fluoroethylene resin

2. Seat: Applicable to oil free specification only.

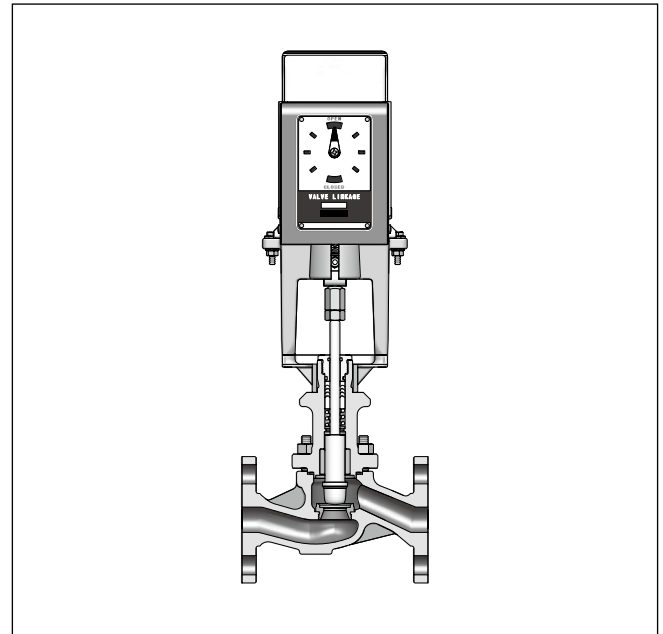
Trim

Valve plug

Single-seated contoured plug

Equal-percentage metal seat (%C)

Equal-percentage soft seat (%T)



Material

Metal seat

SUS316, SUS316 CoCr-A

Soft seal

SUS316 + PTFE combined with fiber

(In the case of oil free specification, PTFE with glass fiber.)

Actuator

Type

Electrically-operated model ECM3000

Model No.	Power (50/60 Hz)	Input signal	Operation
ECM3000D020_	24 V AC	Relay contact	ON/OFF
ECM3000E020_	24 V AC	Potentiometer	Position proportional
ECM3000F020_	24 V AC	Relay contact	Position proportional
ECM3000F120_	100 V AC	Relay contact	Position proportional
ECM3000F220_	200 V AC	Relay contact	Position proportional
ECM3000G020_	24 V AC	4 to 20 mA DC	Position proportional
ECM3000G920_	85 to 264 V AC	4 to 20 mA DC	Position proportional
ECM3000F040_	24 V AC	Relay contact	High-speed/Position proportional *2

*1 _ : 0 (Zero) = Standard type, C = China GB standard model

*2 The high speed motor type must be used within a duty ratio (operation ratio) of 40 %.

Power supply

24 V AC, 100 V AC, 200 V AC, 85 to 264 V AC,
50/60 Hz

Input signal

Relay contact, potentiometer, 4 to 20 mA DC

Input impedance

50 Ω ±5 %

Power consumption

9 VA (Relay contact, potentiometer, 4 to 20 mA DC)
14 W (4 to 20 mA DC/85 to 264 V AC)
14 VA (High-speed motor)

Output torque

12.5 N·m (High-speed motor: 6 N·m)

Case material

Aluminum diecast

Protection

Splash-proof structure IP54 or equivalent when water-proof cable gland is used.

Operating condition**Ambient condition**

Do not use with atmosphere of corrosive gas or explosive gas.

Ambient temperature

-5 to +60 °C

Ambient humidity

5 to 95 %RH (no condensation allowed)

Vibration resistance

9.8 m/s²

Additional specifications (by special order)

- Oil/water free treatment
- Copper free specification
- Saline damage countermeasures
- Vacuum service

Performance**Rated Cv value**

Refer to Table 4.

Flow characteristics

Refer to Figure 1 and Figure 2.

Inherent rangeability**Table 1. Inherent rangeability**

Nominal size (in.)	Rated Cv value	Inherent rangeability
1/2	0.35	20 : 1
	0.55	30 : 1
3/4 1 1-1/2 2 2-1/2 3	0.93, 2.3, 3.4	50 : 1
	0.93, 2.3, 3.4, 8.0	
	0.93, 2.3, 3.4, 8.0, 13	
	13, 29	
	29, 48	
	70	
	100	

Allowable pressure drops

Refer to Table 5 and Table 6.

Leakage Specification (percentage to rated Cv value)

Select the performance at valve full close from the following two leakage classes in compliance with IEC60534-4-2006 and JIS B2005-2008

- Class IV (metal seat): 0.01% rated Cv
- Class VI (soft seat): $3 \times \Delta P$ (MPa) × (following leakage factor) ml/min

Table 2. Leakage factor

Port size (in.)	~ 1	1-1/2	2	2-1/2	3
Leakage factor	0.15	0.23	0.36	0.51	0.62

Dimensions

Refer to Figure 3 and Table 7.

Weight

Refer to Table 7.

Finish

Finish specification

Body

Standard coating: blue, silver, other

Heat-resistant coating: blue, silver

Salt-resistant coating: blue

Actuator

No coating

Table 3. Trim material and temperature range (°C)

Trim material	Body material	SCPH2	SCS13A
	SUS316	-5 to +200	-5 to +200
SUS316 CoCr-A	-5 to +200	-5 to +200	
SUS316 soft seat	-5 to +200	-5 to +200	

Table 4. Cv value and travel

Nominal size (in.)		1					1-1/2	2	2-1/2	3		
		3/4		1/2								
Port size (in.)		Cv value					1	1-1/2	1-1/2	2	2-1/2	3
		0.35 0.55	0.93	2.3 3.4	8.0	13						
Rated Cv value	Equal percentage	0.35		2.3								
	• Metal seat • Soft seat	0.55	0.93	3.4	8.0	13	13	29	29	48	70	100
Travel value (mm)		19										

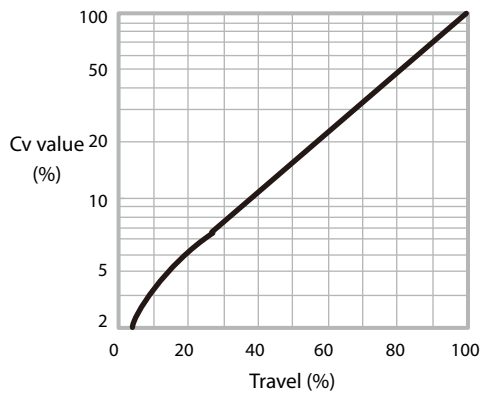


Figure 1-1. Equal percentage (size: 1/2 to 1 inches)

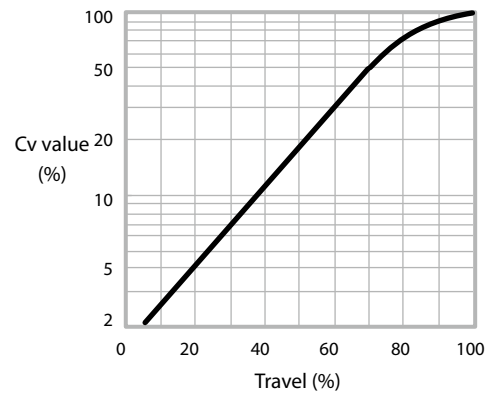


Figure 1-2. Equal percentage (size: 1-1/2 to 2 inches)

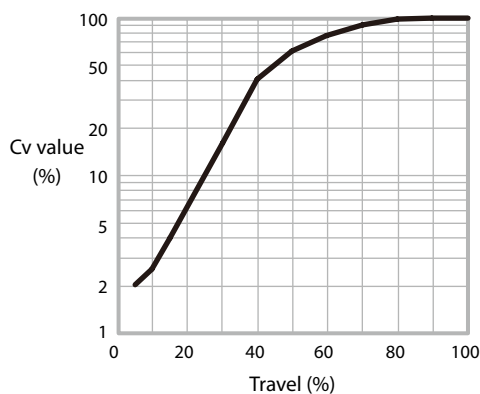


Figure 1-3. Equal percentage (size: 2-1/2 inches)

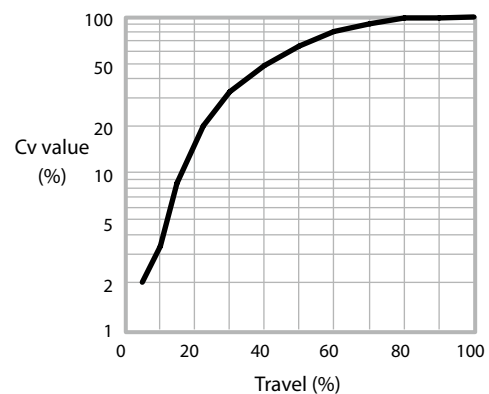


Figure 1-4. Equal percentage (size: 3 inches)

Allowable pressure drops

Table 5. Allowable pressure drops (Metal seat:%C)

Actuator	Pressure drops (MPa)									
	Cv value					Port size (inches)				
	0.35 0.55	0.93	2.3 3.4	8.0	13	1	1-1/2	2	2-1/2	3
ECM3000	0.98	0.98	0.98	0.98	0.98	0.98	0.47	0.31	0.19	0.13

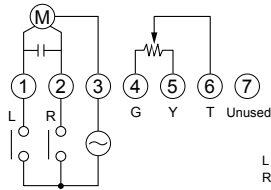
Table 6. Allowable pressure drops (Soft seat:%C)

Actuator	Pressure drops (MPa)									
	Cv value					Port size (inches)				
	0.35 0.55	0.93	2.3 3.4	8.0	13	1	1-1/2	2	2-1/2	3
ECM3000	0.98	0.98	0.98	0.69	0.69	0.69	0.24	0.16	0.10	0.07

■ Wiring

L : counterclockwise (CCW) rotation
R : clockwise (CW) rotation

● Relay contact input (24 Vac power supply)

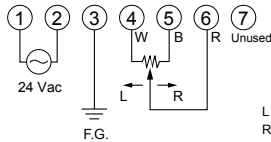


L : Operating direction CCW
R : Operating direction CW

⚠ Handling Precautions

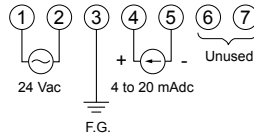
In using ON-OFF control action, terminal No. 4, 5 and 6 are not connected.

● Potentiometer (135 Ω) input (24 Vac power supply)



L : Operating direction CCW
R : Operating direction CW

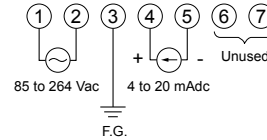
● 4 to 20 mAdc input (24 Vac power supply)



⚠ Handling Precautions

Terminals 2 and 5 are isolated from each other inside the motor.

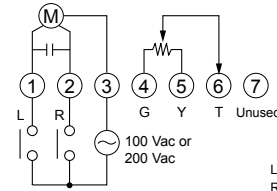
● 4 to 20 mAdc input (85 to 264 Vac power supply)



⚠ Handling Precautions

Terminals 2 and 5 are isolated from each other inside the motor.

● Relay contact input (100 Vac/200 Vac power supply)



L : Operating direction CCW
R : Operating direction CW

⚠ Handling Precautions

- Set the parameters of the controller, (for example derivative time (D) is set to 0 second or dead band is widened), so that the internal relay of the controller does not repeat ON and OFF excessively due to hunting during motor operation. If the internal relay operates excessively, the life of the motor or the relay of the controller on the host side might be shortened. If frequent operation cannot be avoided, an auxiliary relay must be installed between the motor and the controller.
- The maximum allowable voltage to the feedback potentiometer is 5 Vdc. Mechanical balancing relays (e.g., Azbil models R9107A, R927C, etc.) cannot be used.

Figure 2. External connection between model ECM3000 motor and controller and the valve action

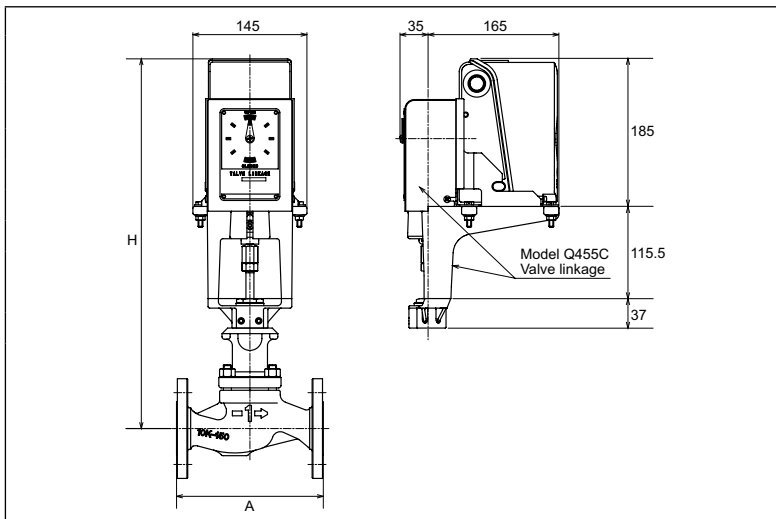


Figure 3. Face-to-face and dimension drawing

Table 7. Dimensions and weight

Nominal size (inches)	Dimensions (mm)		Weight (kg)
	A	H	
1/2	184	465	13
3/4	184	465	14
1	184	465	15
1-1/2	222	465	22
2	254	465	25
2-1/2	276	485	38
3	298	485	39

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Specifications are subject to change without notice.

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