Electric Top-Guided Single Seated Control Valve

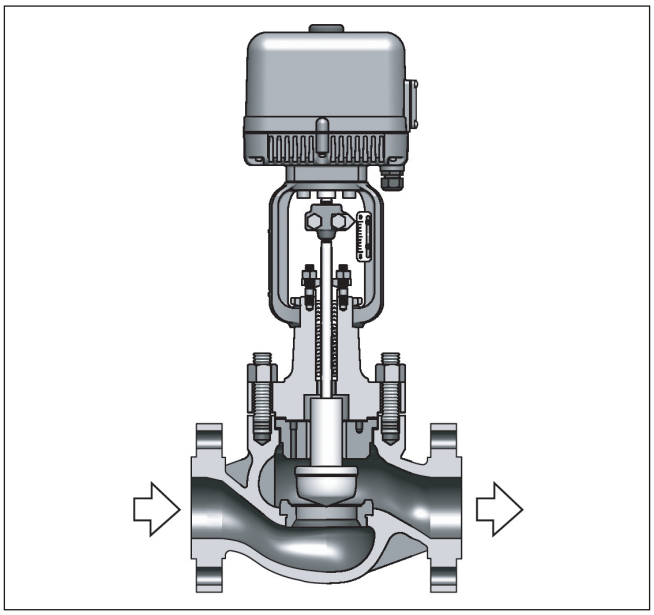
Model HTS_ _ _

OVERVIEW

Model HTS_ _ _ Top Guided Single Seated Control Valves are designed for heavy-duty service. The compact valve body, having an S-shaped flow passage that features low pressure loss, allows a large flow capacity, rangeability, and high-accuracy flow characteristics.

The valve plug is highly vibration-resistant as it is held by a top guide section which has a small sliding area. The flow shut-off performance complies with the IEC or JIS Standards. The actuator section performs two-position operation or proportional operation by directly receiving the signal of 4 to 20 mA DC or 1 to 5V DC from the electronic-type controller. The provided electric-type actuator offers high accuracy, compactness, and sturdy structure.

The model HTS Valves are widely applicable for reliable control of process lines where high shut-off performance is required.



SPECIFICATIONS

Body

Type: Straight-through, Cast globe valve

Nominal size: 1-1/2, 2, 2-1/2, 3, 4, 6, 8 inches

Pressure rating: JIS 10K, 16K, 20K, 30K, 40K
ANSI Class 150, 300, 600
JPI Class 150, 300, 600

End connection:
Flanged end;

Connection type	Pressure rating	Applicable standard
FF	JIS10K	JIS B2210-1984
RF	JIS10K, 16K, 20K, 30K, 40K	JIS B2210-1984
	ANSI Class 150, 300, 600	ANSI B16.5-1981
	JPI Class150, 300, 600	JPI-7S-15-1993
RJ, LG	ANSI Class 150, 300, 600	ANSI B16.5-1981
	JPI Class 150, 300, 600	JPI-7S-15-1993
Tongue and groove(groove) Male and female(female)	JIS16K, 20K, 30K, 40K	JIS B2202-1984

Welded end; SW (1-1/2, 2 inches), BW (2-1/2 to 8 inches)

Material:

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Bonnet style:

Plain bonnet	– 17 to + 230 °C	—
Extention bonnet Type1	– 45 to – 17 °C 230 to 566 °C	—
Extention bonnet Type2	– 100 to – 45 °C	Integral-cast type
	– 196 to – 100 °C	Welded type
Bellows type	– 50 to + 350 °C	Formed or welded bellows (Detail is showing in Fig.3)"

Note) Take care not to exceed the operating temperature ranges specified for respective materials.

Gland type: Bolted gland

Packing/grease:

- Grease not provided;
  When V shaped PTFE packing or PTFE yarn packing is used.
- Grease provided;
  When graphite packing is used.

Note) PTFE: Polytetrafluoroethylene.

Gasket:

Type	Flat type, serrated type
Material	SUS316,SUS316L, SUS329J1, copper, aluminum, titanium, alloy 20, ASTM B574 (Hastelloy C-276 equivalent),

Trim

Valve plug:

Single seated, contoured type plug
High-capacity type

Metal seat	Equal percentage (%V), Linear (LV)
Soft seat	Equal percentage (%T), Linear (LT)

High-flow characteristics type

Metal seat	Equal percentage (%CF), Linear (LCF)
Soft seat	Equal percentage (%TF), Linear (LTF)

Note)
- *For flow characteristics refer to Figure 1 or Figure 2.*
- *For operating temperature and max. differential pressure range of soft-seat type, refer to Figure 4.*

Material:

For body/trim material combinations and operating temperature ranges, refer to Table 1 and 2.

Note) For fluid conditions requiring CoCr-A, refer to Figure 5.

Actuator

Type: Electric motor

Action: Direct or reverse action

Control operation:

Proportional or two-position operation

Input signal:

- Proportional operation
  Current input: 4-20, 4-12 or 12-20 mA DC
  Voltage input: 1-5, 1-3 or 3-5V DC
- Two-position operation
  Power supply voltage, relay point of contact

Note) Select the control valve operation mode during input signal "OFF" (At the selected position, the valve stops, or is fully open or closed).

Power supply:

Single phase 100, 200, 24V AC (±10 %, 50/60 Hz)
or 110, 115, 120, 210, 215, 220, 230, 240V AC (note that model EA4, EA5 removes 24V AC)

Input resistance: 250 Ω

Power consumption:

Model EA2 and EA3

- 50VA during operation, 1.5VA during non-operation (100V AC)
- 50VA during operation, 1.5VA during non-operation (200V AC)
- 75VA during operation, 1.5VA during non-operation (24V DC)

Model EA4 and EA5

- 130VA during operation, 1.5VA during non-operation (100V AC)
- 140VA during operation, 1.5VA during non-operation (200V AC)

Insulation resistance:

Between input terminal and housing; 100 MΩ/500V DC
Between power supply terminal and housing;
100 MΩ/500V DC

Withstand voltage:

Between input terminal and housing; 500V AC, 1 min.
Between power supply terminal and housing; 1500V AC, 1 min.

Housing material: Aluminum diecast (ADC12)

Housing: Waterproof type
(NEMA4, 4X, IEC529(1989)IP-65 equivalent)

Motor: Capacitor motor (Built-in continuous rating thermal switch, Class E insulation)

Feedback mechanism:

Conductive-plastic-type potentiometer (with backlash compensation mechanism)

Electrical conduit connection: G1/2 (Two positions)

Protective device: Built-in open/close limit switch (with motor burn-preventive thermal switch)

Ambient temperature: -5 to +55 °C

Ambient humidity: 10 to 90 % RH

Allowable vibration: 2G / 100 Hz

Output

Analog feedback:

4 to 20 mA DC (for proportional control)

Contact feedback (Option)

Open/Close 2 points

- Model EA2, EA3 contact capacity ;
  5A, 125V AC or more
- Model EA4, EA5 contact capacity ;
  Upper limit.....10A, 250V AC or more
  Lower limit.....21A, 250V AC or more

Resistance feedback: With 135 Ω potentiometer (accuracy 135 Ω ±10 %, linearity ±1 %)

Manual operation: With multi-turn lever

Hazardous chemical regulations:

Compliant with China RoHS
RoHS (EU) and CE marks available

Additional specification (by special order)

- Special inspection
  Flow characteristics inspection, material inspection (Material certificate), non-destructive inspection, steam inspection, low-temperature inspection
- Seat chamfered flange
- With drain plug
- Double gland
- Steam jacket
- Oil/water free treatment

- Stainless steel (SUS304) nuts and bolts for atmospheric exposure
- Yoke material (SCPH2)
- Sand-/dust-preventive measure
- Vacuum service
- Explosion proof [Exd II BT4]

Performance

Rated Cv value: Refer to Table 3 and Table 4.

Flow characteristics: Refer to Figure 1 and Figure 2.

Inherent rangeability: 50 : 1 (option 75 : 1)

Allowable differential pressure:

Refer to Table 8 and Table 11.

Leakage specification

Contoured type plug
IEC 60534-4:2006 or JIS B 2005-4:2008
<Metal seat>
Standard.....Class IV: Leakage less than 0.01 % of maximum valve capacity.
Option.....Leakage less than 0.001 % of maximum valve capacity.

<Soft seat>
Standard.....Class VI: Leakage less than 0.00001 % of maximum valve capacity.
Option.....Leakage less than 0.001 % of maximum valve capacity.

Accuracy: Within ±2 % F.S.

Dead band: Within 1 % F.S.

Hysteresis error: Within 2 % F.S.

Linearity: Within ±2 % F.S.

Operating time

(fully open ↔ fully closed, load reference value)

Valve size	1-1/2, 2 inches;	21 sec.
	2-1/2 to 4 inches;	32 sec.
	6 inches;	31 sec.
	8 inches;	47 sec.

Dimensions

Refer to Figure 7, Table 12 and Table 13.

Weight

Refer to Table 14.

Block diagram

Refer to Figure 8.

Terminal connection

Refer to Figure 9.

Finish

Valve body and bonnet; Blue or silver.
Actuator ; Silver

Table 1. Body/trim material combinations and operating temperature ranges (°C)

Trim material \ Body material		JIS	SCPH2	SCPH21	SCPH61	SCPL1	SCS13A	SCS14A	SCS16A
		ASTM	A216WCB	A217WC6	A217C5	A352LCB	A351CF8	A351CF8M	A351CF3M
JIS	SUS316		-5 to +300	—	—	-45 to +300	-196 to +300	-196 to +300	—
JIS	SUS316L		-5 to +300	—	—	-45 to +300	-196 to +300	-196 to +300	-196 to 300
JIS	SUS440C		-5 to +425	-5 to +425	-5 to +425	—	—	—	—
JIS	SUS329J1		—	—	—	—	—	-196 to +300	—
JIS	SUS316 CoCr-A		-5 to +425	-5 to +550	-5 to +566	-45 to +350	-196 to +550	-196 to +550	—
JIS	SUS316 CoCr-A face		-5 to +425	-5 to +550	-5 to +566	-45 to +350	-196 to +550	-196 to +550	—
JIS	SUS316L CoCr-A		—	—	—	-45 to +350	-196 to +450	-196 to +450	-196 to +450
JIS	SUS329J1 CoCr-A		—	—	—	—	—	-196 to +550	—
JIS	SUS316 Soft seat		-5 to +230	—	—	-45 to +230	-80 to +230	-80 to +230	—
JIS	SUS316L Soft seat		—	—	—	-45 to +230	-80 to +230	-80 to +230	-80 to +230
JIS	SUS329J1 Soft seat		—	—	—	—	—	-80 to +230	—

Note) " ▭ " shows standard combination of valve body and trim materials.

Table 2. Body / trim material combinations and operating temperature ranges (°C)

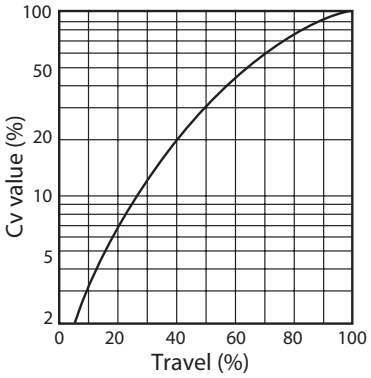
Trim material \ Body material		JIS	SCPH2	SCS31A	SCS14A	SCS16A	Titanium	ASTM B574	Alloy 20
		ASTM	A216WCB	A351CF8	A351CF8M	A351CF3M	—	—	—
JIS	Titanium alloy		—	—	—	—	-196 to +315	—	—
JIS	Titanium		—	—	—	—	-196 to +315	—	—
JIS	ASTM B574		—	—	—	—	—	-196 to +450	—
JIS	Alloy 20		—	—	—	—	—	—	-196 to +300
JIS	Monel		-5 to +300	-196 to +300	-196 to +300	-196 to +300	—	—	—

Cv value and travel

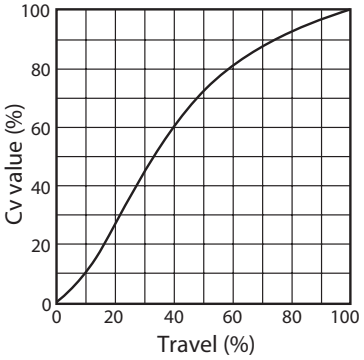
High-capacity type

Table 3. High-capacity type contoured plug (%C, LC, %T, LT)

Nominal size (inches)	1-1/2	2	2-1/2	3	4	6	8
Port size (inches)	1-1/2	2	2-1/2	3	4	6	8
Rated Cv value (%C, LC, %T, LT)	30	50	85	125	200	420	700
Rated travel (mm)	25		38			50	75



a. Equal percentage characteristics (%C: Metal seat, %T: Soft seat)



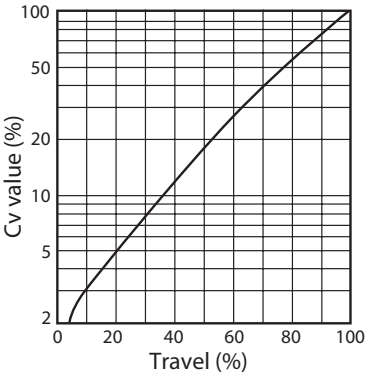
b. Linear characteristics (LC: Metal seat, LT: Soft seat)

Figure 1. Flow characteristics: High-capacity type cage

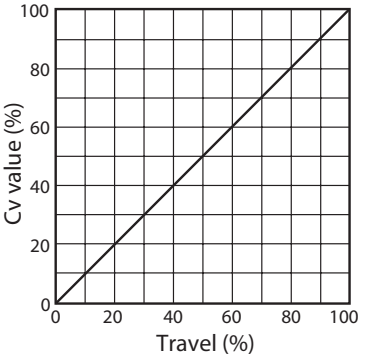
High-flow characteristics type

Table 4. High-flow characteristic type contoured plug

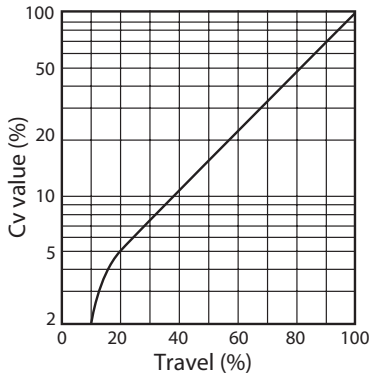
Nominal size (inch)	1-1/2						2							2-1/2			3			4			6			8		
Port size (inch)	2.5	4	6.3	1	1-1/4	1-1/2	2.5	4	6.3	1	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2	2-1/2	3	2-1/2	3	4	4	5	6	5	6	8
Rated Cv value (%CF, LCF, %TF, LTF)				10	17	24				10	17	24	44	24	44	68	44	68	99	68	99	175	175	275	360	275	360	640
Rated travel (mm)	14.3			25			14.3			25				38									50			75		



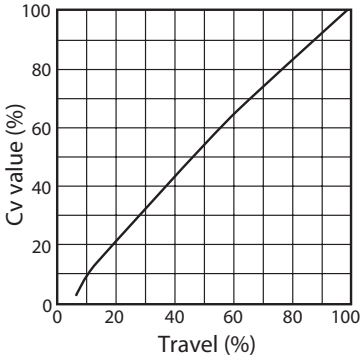
a. Equal percentage characteristics (%CF: Metal seat)



b. Linear characteristics (LCF: Metal seat)



c. Equal percentage characteristics (%TF: Soft seat)



d. Linear characteristics (LTF: Soft seat)

Figure 2. Flow characteristics: High flow characteristics type cage

Note) The above graphs indicate typical flow characteristics.

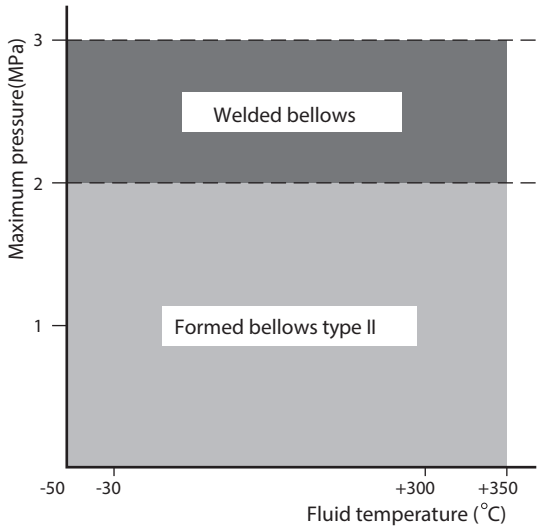


Figure 3. Bellows Type by Temperature and Pressure Ranges

Note) Bellows type are classified into Formed bellows type II and welded bellows by temperature and pressure ranges. Please refer to No. SS2-BSL100-0100 about detail of bellows specification.

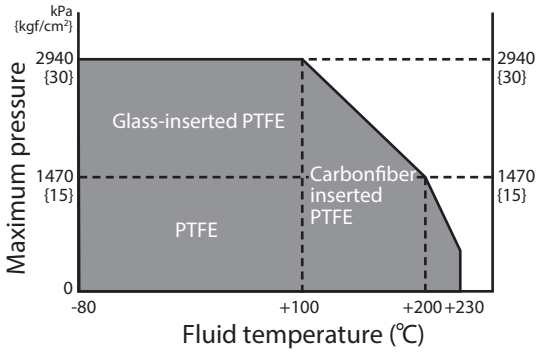


Figure 4. Temperature and maximum differential pressure range of soft-seat type

Note) If there is any possibility to cause erosion due to saturated steam or superheated-water, use the metal seat.

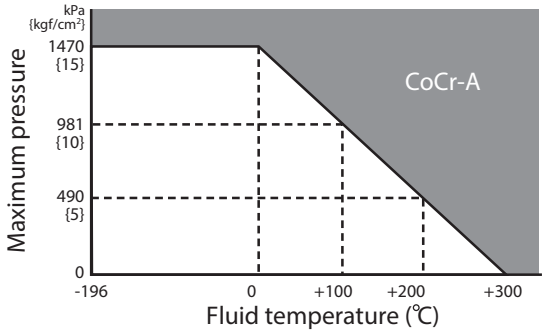


Figure 5. Temperature / normal differential pressure ranges requiring CoCr-A

Note) 1. SCS24 (Precipitation-hardened stainless steel) requires no CoCr-A.

2. When cavitation / flashing service or oil prohibited service is required, use of SCS24 or CoCr-A is recommended regardless of temperature and differential pressure.

Structural drawing of trim and body/trim material combinations

Major material combinations of body and trim parts are shown here.

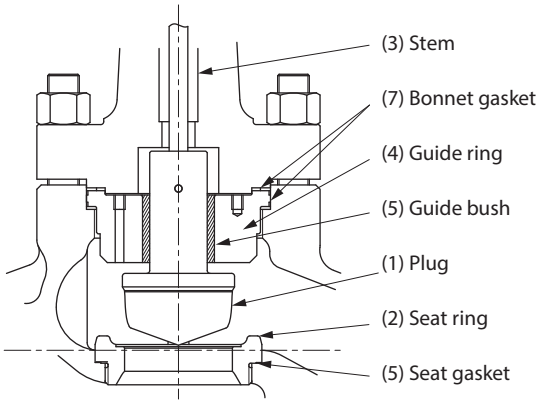


Figure 6-1. Trim construction (w/ guide bush)

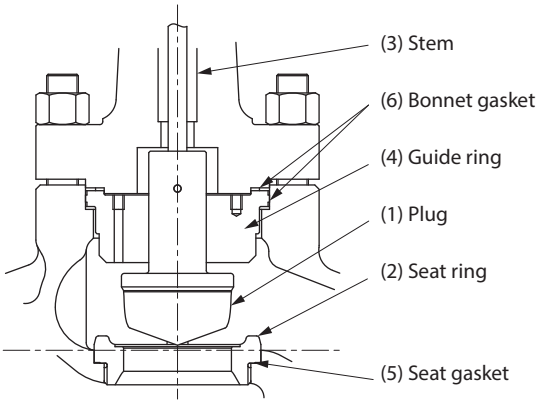


Figure 6-2. Trim construction (w/o guide bush)

Figure 6.

Table 5. Body material carbon steel (SCPH2/A216WCB)

(1) Plug (2) Seat ring	SUS316	SUS440C	SUS316 CoCr-A seat SUS316 CoCr-A face		SUS316 Soft seat	
			General	Oil free	General	Oil free
(3) Stem	SUS316					
(4) Guide ring	S25C or SFVC2A		S25C CoCr-A overlay welded or SFVC2A CoCr-A overlay welded		S25C or SFVC2A	S25C CoCr-A overlay welded or SFVC2A CoCr-A overlay welded
(5) Guide bush	SUS440C		No		SUS440C	No
(6) Seat gasket	No (D.T. -17 to +230 °C)		SUS316 (PTFE coated)		No	SUS316 (PTFE coated)
	SUS316 (D.T. > +230 °C)					
(7) Bonnet gasket	SUS316		SUS316 (PTFE coated)		SUS316	SUS316 (PTFE coated)

D.T. : Design Temperature

Table 6. Body material stainless steel (SCS13A/A351CF8)

(1) Plug (2) Seat ring	SUS316	SUS316 CoCr-A seat SUS316 CoCr-A face		SUS316 Soft seat	
	General	General	Oil free	General	Oil free
(3) Stem	SUS316				
(4) Guide ring	SUS304	SUS304 CoCr-A overlay welded		SUS304	SUS304 CoCr-A overlay welded
(6) Seat gasket	No (D.T. -17 to +230 °C)		SUS316 (PTFE coated)	No (D.T. -17 to +230 °C)	SUS316 (PTFE coated)
	SUS316 (D.T. < -17 °C and D.T. >+230 °C)			SUS316 (D.T. < -17 °C)	
(7) Bonnet gasket	SUS316		SUS316 (PTFE coated)	SUS316	SUS316 (PTFE coated)

D.T. : Design Temperature

Table 7. Body material stainless steel (SCS14A/A351CF8M)

<table>
<tr><td rowspan="2">(1) Plug
(2) Seat ring</td><td rowspan="2">SUS316</td><td colspan="2">SUS316 CoCr-A seat
SUS316 CoCr-A face</td><td colspan="2">SUS316 Soft seat</td></tr>
<tr><td>General</td><td>Oil free</td><td>General</td><td>Oil free</td></tr>
<tr><td>(3) Stem</td><td colspan="5">SUS316</td></tr>
<tr><td>(4) Guide ring</td><td>SUS316</td><td colspan="2">SUS316 CoCr-A overlay welded</td><td>SUS316</td><td>SUS316 CoCr-A
overlay welded</td></tr>
<tr><td rowspan="2">(6) Seat gasket</td><td colspan="2">No
(D.T. -17 to +230 °C)</td><td rowspan="2">SUS316
(PTFE coated)</td><td>No
(D.T. -17 to +230 °C)</td><td rowspan="2">SUS316
(PTFE coated)</td></tr>
<tr><td colspan="2">SUS316
(D.T. < -17 °C and D.T. > +230 °C)</td><td>SUS316
(D.T. < -17 °C)</td></tr>
<tr><td>(7) Bonnet gasket</td><td colspan="2">SUS316</td><td>SUS316
(PTFE coated)</td><td>SUS316</td><td>SUS316
(PTFE coated)</td></tr>
</table>

D.T. : Design Temperature

Allowable differential pressure

Table 8. Contoured-type metal seat (%CF, LCF, %C, LC) : PTFE packing

Actuator type	Differential pressure (upper: nominal size (inches), lower: port size) kPa {kgf/cm²}																				
	1-1/2			2			2-1/2			3			4			6			8		
	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2	2-1/2	3	2-1/2	3	4	4	5	6	5	6	8
EA2	3350 {34.2}	2060 {21.0}	1460 {14.9}	2060 {21.0}	1460 {14.9}	840 {8.6}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EA3	-	-	-	-	-	-	2110 {21.5}	1220 {12.4}	770 {7.9}	1220 {12.5}	770 {7.9}	550 {5.6}	770 {7.9}	550 {5.6}	300 {3.1}	-	-	-	-	-	-
EA4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	490 {5.0}	310 {3.2}	185 {1.9}			
EA5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700 {7.1}	430 {4.4}	360 {3.7}

Table 9. Contoured-type soft seat (%TF, LTF, %T, LT) : PTFE packing

Actuator type	Differential pressure (upper: nominal size (inches), lower: port size) kPa {kgf/cm²}																				
	1-1/2			2			2-1/2			3			4			6			8		
	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2	2-1/2	3	2-1/2	3	4	4	5	6	5	6	8
EA2	2350 {24.0}	1440 {14.7}	1020 {10.4}	1440 {14.7}	1020 {10.4}	590 {6.0}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EA3	-	-	-	-	-	-	1470 {15.0}	840 {8.6}	540 {5.5}	840 {8.6}	540 {5.5}	380 {3.9}	540 {5.5}	380 {3.9}	200 {2.1}	-	-	-	-	-	-
EA4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	340 {3.5}	215 {2.2}	126 {1.3}	-	-	-
EA5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	490 {5.0}	300 {3.1}	250 {2.5}

Note) 1. "▭" shows a model with standard actuator.

2. Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

Table 10. Contoured-type metal seat (%CF, LCF, %C, LC) : Graphite packing "P6610CH+P6528" (+230 to +500 °C)

Actuator type	Differential pressure (upper: nominal size (inches), lower: port size) kPa {kgf/cm²}																				
	1-1/2			2			2-1/2			3			4			6			8		
	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2	2-1/2	3	2-1/2	3	4	4	5	6	5	6	8
EA2	2360 {24.0}	1440 {14.6}	1020 {10.4}	1440 {14.6}	1020 {10.4}	590 {6.0}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EA3	-	-	-	-	-	-	1330 {13.5}	770 {7.8}	480 {4.8}	770 {7.8}	480 {4.8}	340 {3.4}	480 {4.8}	340 {3.4}	190 {1.9}	-	-	-	-	-	-
EA4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	370 {3.7}	230 {2.3}	140 {1.4}	-	-	-
EA5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600 {6.1}	360 {3.6}	220 {2.2}

Note) Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

Table 11. Contoured-type metal seat (%CF, LCF, %C, LC) : Graphite packing "P6610CH+P8590" (+500 to +566 °C)

Actuator type	Differential pressure (upper: nominal size (inches), lower: port size) kPa {kgf/cm²}																				
	1-1/2			2			2-1/2			3			4			6			8		
	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2	2-1/2	3	2-1/2	3	4	4	5	6	5	6	8
EA2	1860 {18.9}	1130 {11.5}	800 {8.1}	1130 {11.5}	800 {8.1}	460 {4.6}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EA3	-	-	-	-	-	-	940 {9.5}	540 {5.5}	340 {3.4}	540 {5.5}	340 {3.4}	240 {2.4}	340 {3.4}	240 {2.4}	130 {1.3}	-	-	-	-	-	-
EA4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	310 {3.1}	200 {2.0}	120 {1.2}	-	-	-
EA5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510 {5.2}	310 {3.1}	190 {1.9}

Note) Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

DIMENSIONS

Table 12. Face-to-face dimensions [Unit: mm]

Nominal size (inches)	A							
	JIS 10K FF, RF JPI 150RF ANSI 150RF JPI 150RF *	JIS 16K RF	JIS 20K RF JIS 30K RF ANSI 300RF JPI 300RF *	JIS 40K RF ANSI 600RF JPI 600RF *	JIS 16K Tongue & groove Male & female	JIS 20K Tongue & groove Male & female	JIS 30K Tongue & groove Male & female	JIS 40K Tongue & groove Male & female
1-1/2	222	231	235	251	235	236	248	251
2	254	263	267	286	265	267	276	286
2-1/2	276	288	292	311	290	292	303	311
3	298	313	317	337	310	317	326	337
4	352	364	368	394	360	368	379	394
6	451	465	473	508	475	473	486	508
8	543	560	568	610	570	568	580	610

Nominal size (inches)	A						
	ANSI 150RJ JPI 150RJ	ANSI 300RJ JPI 300RJ	ANSI 600RJ JPI 600RJ	ANSI 300LG JPI 300LG	ANSI 600LG JPI 600LG	ANSI 150 JPI 150 (SW, BW) *	ANSI 300, 600 JPI 300, 600 (SW, BW) *
1-1/2	235	248	251	244	248	251	251
2	267	283	289	276	283	286	286
2-1/2	289	308	314	302	308	311	311
3	311	333	340	327	333	337	337
4	365	384	397	378	391	394	394
6	464	489	511	483	505	473	508
8	556	584	613	578	606	568	610

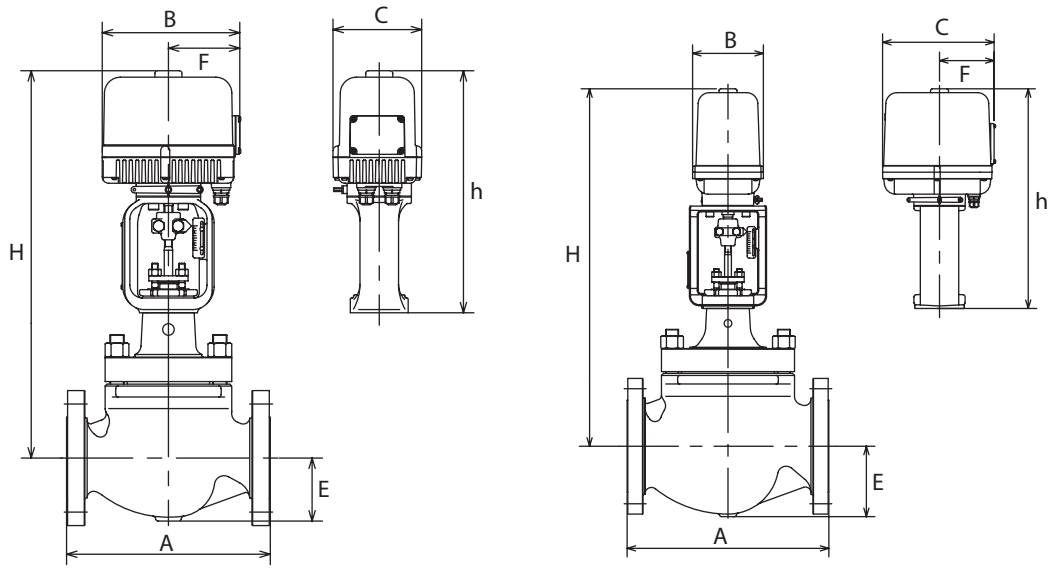
*Note) * : Face-to-face dimensions conform to following standards.*
- IEC 60534-3-1 : 2001 - IEC 60534-3-3 : 1998 (2-1/2 inches or over)
- JIS B 2005-3-1 : 2005 - JIS B 2005-3-3 : 2005 (2-1/2 inches or over)

Table 13. External dimensions [Unit: mm]

Nominal size (inches)	Actuator model No.	H					h	B	E	C	F
		Plain bonnet	Extension type 1	Extension type 2		Bellows-type bonnet					
				Integral-cast type	Welded type						
1-1/2	EA2	540	705	820	1060	700	346	214	70	138	115
2	EA2	540	710	825	1065	700	346	214	80	138	115
2-1/2	EA3	625	795/805	930	1180	845	376	244	88	140	120
3	EA3	630	805/815	950	1185	850	376	244	98	140	120
4	EA3	660	860/870	965	1200	880	376	244	113	140	120
6	EA4	838	1073/1098	1300	1435	1125	515	264	170	166	131
8	EA5	1068	1328	1558	1688	1318	588	264	220	166	131

Note) 1. "H" dimensions are applicable when a hand wheel is provided. When the hand wheel is not required, subtract the hand wheel dimensions.

2. "H" dimensions of Extended bonnet type 1 are as follows: Top rows for JIS 10K and ANSI 150, and bottom row for JIS 16K and ANSI 300 or over.



Model EA2 and EA3 Model EA4 and EA5

Figure 7. Face-to-face and other dimensions

Table 14. Weight

[Unit: kg]

Valve Size (inches)	Actuator Model No.	Weight															
		Flanged type JIS 10K, ANSI/JPI 150				Flanged type JIS 16K, 20K, 30K, ANSI/JPI 300				Flanged type JIS 40K, ANSI/JPI 600				Welded type JIS 10K, 16K, 20K, 30K ANSI/JPI 150, 300, 600			
		Plain	Extension Type 1, bellows type	Extension type 2		Plain	Extension Type 1, bellows type	Extension type 2		Plain	Extension Type 1, bellows type	Extension type 2		Plain	Extension Type 1, bellows type	Extension type 2	
				Integral-cast type	Welded type			Integral-cast type	Welded type			Integral-cast type	Welded type			Integral-cast type	Welded type
1-1/2	EA2	27	30	33	35	32	35	38	40	40	43	46	48	32	35	38	40
2	EA2	33	36	39	41	38	41	44	46	43	46	49	51	38	41	44	46
2-1/2	EA3	39	43	47	49	44	48	52	54	61	65	69	71	44	48	52	54
3	EA3	49	55	61	64	59	65	71	74	81	87	93	96	59	65	71	74
4	EA3	59	69	74	77	74	84	89	92	109	119	124	127	71	81	86	89
6	EA4	152	167	174	177	182	197	204	207	232	247	254	257	172	187	194	197
8	EA5	230	250	260	265	280	300	310	315	400	420	430	435	270	290	300	305

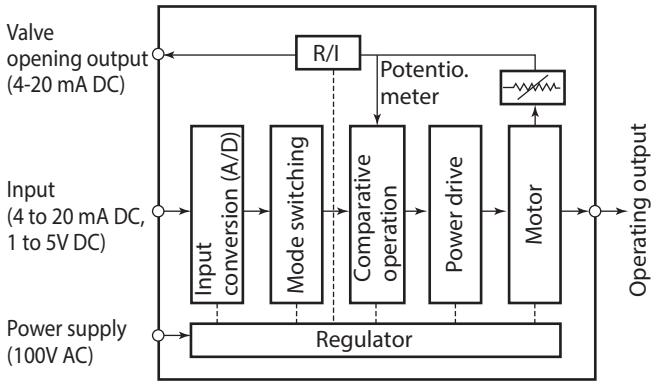


Figure 8. Operating principle of block diagram

- **Input conversion block:**
  Receives gate opening command signals of 1-5V DC under high impedance (4-20 mA DC signals are converted to voltage signals by a resistor of 250 Ω connected to the input terminal) and converts to the level convenient for internal processing.
- **Mode switching block:**
  Monitors gate opening command signals, judges signal "OFF", and generates drive signals according to the preset mode.
- **Comparative operation block:**
  Effects comparative operation between output axis rotating angle signals (potentiometer) and signals converted by the input conversion block.
- **Power drive block:**
  Issues direct/reverse rotation command output to the motor depending on comparative judgment signals received from the comparative operation block.

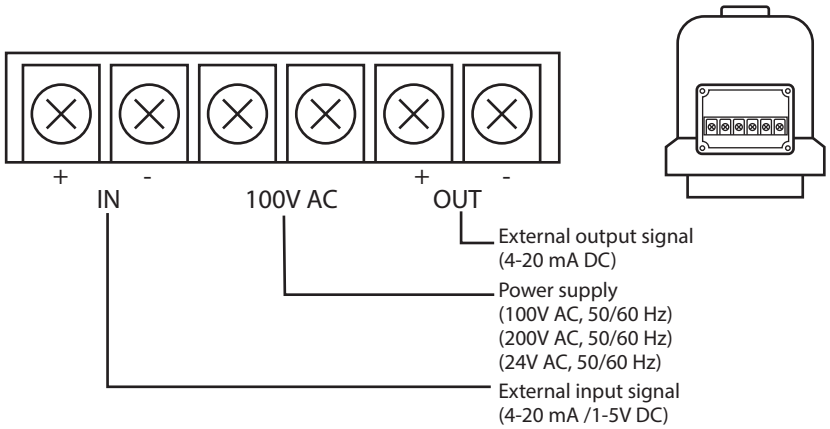


Figure 9. Terminal connection

Ordering Information

When ordering, please specify;

1) Model number: HTS
2) Nominal size × Port size
3) Type and rating of end connections
4) Body and trim material, necessity of hardening
5) Type of bonnet
6) Valve and plug characteristics
7) Type of actuator, power supply, frequency.
8) Valve action (direct or reverse), operation mode of input signal "OFF".
9) Accessories (limit switch)
10) Special requirement of oil free treatment, and etc.
11) Name of flow medium
12) Normal flow and maximum required flow
13) Pressure of flow medium, upstream and downstream pressure at maximum and minimum, required flow
14) Temperature and specific gravity of flow medium
15) Viscosity of flow medium, inclusive or exclusive of slurry

Please read "Terms and Conditions" from the following URL before ordering and use.
https://www.azbil.com/products/factory/order.html

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