



# Actuator Driven Compact Ball Valves

■KELMO® Electric Actuators : EA, EC, EAE, ED and ES Series

■Pneumatic Actuators : C, CS, FBS Series

■1/4"~2" Class 5K / 10K Bronze and Stainless Steel Threaded Ball Valves



KITZ CORPORATION

# Contents

## KELMO® Electric Actuators Driven Threaded Ball Valves

Type	KITZ Fig.	Actuator		Threaded Ball valves						Page
		Rotation *	Function	Material	Port	Neck	Bore **	Ends connection	Size	
<b>EA</b> 100V AC 200V AC	EA100 / 200-TE	90°B.D.	AC (Basic version)	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	6
	EA100 / 200-TFE			Bronze or brass	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	7
	EA100 / 200-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 2"	8
	EA100 / 200-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	9
	EA100 / 200-TGE			Bronze	2-way	Short	S.B.	Threaded	3/8" to 1"	10
	EA100 / 200-TUE			Bronze	2-way	Short	R.B.	Male & female threaded	1/2" & 3/4"	11
	EA100 / 200-TLUE			Bronze	2-way	Long	R.B.	Male & female threaded	1/2" & 3/4"	
	EA100 / 200-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 2"	12
	EA100 / 200-UTFE			Stainless steel	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	13
	EA100 / 200-UTGE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1"	14
	EA100 / 200-UTWE			Stainless steel	2-way	Short	F.B.	Wafer	3/8" to 1"	15
<b>EAB</b> 100V AC 200V AC	EAB100 / 200-TE	90°B.D.	EA with terminal box	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	16
	EAB100 / 200-TFE			Bronze or brass	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EAB100 / 200-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 2"	
	EAB100 / 200-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	
	EAB100 / 200-TGE			Bronze	2-way	Short	S.B.	Threaded	3/8" to 1"	
	EAB100 / 200-TUE			Bronze	2-way	Short	R.B.	Male & female threaded	1/2" & 3/4"	
	EAB100 / 200-TLUE			Bronze	2-way	Long	R.B.	Male & female threaded	1/2" & 3/4"	
	EAB100 / 200-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 2"	
	EAB100 / 200-UTFE			Stainless steel	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EAB100 / 200-UTGE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1"	
	EAB100 / 200-UTWE			Stainless steel	2-way	Short	F.B.	Wafer	3/8" to 1"	
<b>EAL</b> 100V AC 200V AC	EAL100 / 200-TE	90°B.D.	EA with built-in relay	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	17
	EAL100 / 200-TFE			Bronze or brass	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EAL100 / 200-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 2"	
	EAL100 / 200-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	
	EAL100 / 200-TGE			Bronze	2-way	Short	S.B.	Threaded	3/8" to 1"	
	EAL100 / 200-TUE			Bronze	2-way	Short	R.B.	Male & female threaded	1/2" & 3/4"	
	EAL100 / 200-TLUE			Bronze	2-way	Long	R.B.	Male & female threaded	1/2" & 3/4"	
	EAL100 / 200-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 2"	
	EAL100 / 200-UTFE			Stainless steel	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EAL100 / 200-UTGE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1"	
	EAL100 / 200-UTWE			Stainless steel	2-way	Short	F.B.	Wafer	3/8" to 1"	
<b>EALB</b> 100V AC 200V AC	EALB100 / 200-TE	90°B.D.	EA with terminal box and built-in relay	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	18
	EALB100 / 200-TFE			Bronze or brass	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EALB100 / 200-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 2"	
	EALB100 / 200-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	
	EALB100 / 200-TGE			Bronze	2-way	Short	S.B.	Threaded	3/8" to 1"	
	EALB100 / 200-TUE			Bronze	2-way	Short	R.B.	Male & female threaded	1/2" & 3/4"	
	EALB100 / 200-TLUE			Bronze	2-way	Long	R.B.	Male & female threaded	1/2" & 3/4"	
	EALB100 / 200-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 2"	
	EALB100 / 200-UTFE			Stainless steel	2-way	Short	F.B.	Threaded	1/2" to 1 1/2"	
	EALB100 / 200-UTGE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1"	
	EALB100 / 200-UTWE			Stainless steel	2-way	Short	F.B.	Wafer	3/8" to 1"	

\*Actuator rotation: B.D.=Bi-directional, U.D.=Uni-directional

\*\*Bore design: F.B.=Full bore, S.B.=Standard bore, R.B.=Reduced bore

Type	KITZ Fig.	Actuator		Threaded Ball valves						Page
		Rotation*	Function	Material	Port	Neck	Bore**	Ends connection	Size	
<b>EAH</b> 100V AC 200V AC	EAH100 / 200-TNVE	180°B.D.	EA for 180° turn (Basic)	Bronze	Vertical 3-way	Short	S.B.	Threaded	1/2" to 1/4"	20
	EAH100 / 200-UTVE			Stainless steel	Vertical 3-way	Short	R.B.	Threaded	1/4" to 1"	
<b>EAHB</b> 100V AC 200V AC	EAHB100 / 200-TNVE	180°B.D.	EAH with terminal box	Bronze	Vertical 3-way	Short	S.B.	Threaded	1/2" to 1/4"	21
	EAHB100 / 200-UTVE			Stainless steel	Vertical 3-way	Short	R.B.	Threaded	1/4" to 1"	
<b>EC•ECS</b> 100V AC 200V AC	EC100 / 200-TKE*1	90°U.D.	Economy version of EA (Basic)	Brass	2-way	Short	R.B.	Threaded	1/4" to 1"	23
	ECS100 / 200-TKVE*1	180°U.D.		Brass	Vertical 3-way	Short	R.B.	Threaded	1/2" to 1"	
<b>EAE</b> 100V AC 200V AC	EAE100 / 200-TE*2	90°B.D.	Spring-return	Bronze	2-way	Short	S.B.	Threaded	3/8" & 1/2"	25
	EAE100 / 200-TNE*2			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 1/2"	
	EAE100 / 200-TUE			Bronze	2-way	Short	R.B.	Male & female threaded	1/2"	
	EAE100 / 200-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1/2"	
	EAE100 / 200-TKSE*2			Brass	2-way	Short	R.B.	Threaded	1/4" to 3/4"	
<b>ED</b> 12V DC 24V DC	ED12 / 24-TE	90°B.D.	DC (Basic Version)	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	27
	ED12 / 24-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	
	ED12 / 24-UTE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 2"	
	ED12 / 24-UTFE			Stainless steel	2-way	Short	F.B.	Threaded	1/2" to 1/2"	
	ED12 / 24-UTGE			Stainless steel	2-way	Short	R.B.	Threaded	1/4" to 1"	
	ED12 / 24-UTWE			Stainless steel	2-way	Short	F.B.	Wafer	3/8" to 1"	
<b>ES</b> 100V AC 200V AC	ESA100/200-TASE	90°B.D.	for compact Values (Basic)	Brass	2-way	Short	R.B.	Threaded	1/2" to 1"	29
	ESA100/200-UTASE			Stainless steel	2-way	Short	R.B.	Threaded	1/2" to 1"	

\*1 3/4" and 1" of TKE and TKVE for 5K service.

\*2 1/2" of TE, 1/2" of TNE and 3/4" of TKSE are for 5K service.

### C•CS/FBS Series pneumatic Actuators Driven Threaded Ball Valves

Type	KITZ Fig.	Actuator		Threaded Ball valves						Page
		Rotation*	Function	Material	Port	Neck	Bore**	Ends connection	Size	
<b>C</b>	C-TE	90°B.D.	Double action	Bronze	2-way	Short	S.B.	Threaded	3/8" to 2"	33
	C-TFE			Brass or Bronze	2-way	Short	F.B.	Threaded	1/2" to 1/2"	34
	C-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 2"	35
	C-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 2"	36
	C-TGE			Bronze	2-way	Short	S.B.	Threaded (with gland)	3/8" to 1"	37
	C-TUE			Bronze	2-way	Short	R.B.	Male & female threaded***	1/2" & 3/4"	38
	C-UTE			Stainless	2-way	Short	R.B.	Threaded	1/2" to 1/2"	39
	C-UTFE			Stainless	2-way	Short	F.B.	Threaded	1/2" to 1/2"	40
	C-UTGE			Stainless	2-way	Short	R.B.	Threaded (with gland)	1/4" to 1"	41
	C-5 / 10UTWE			Stainless	2-way	Short	F.B.	Wafer	3/8" to 1"	42
<b>CS/ FBS</b>	CS / FBS-TE	90°B.D.	Spring-return	Bronze	2-way	Short	S.B.	Threaded	3/8" to 1"	33
	CS-TFE			Brass or Bronze	2-way	Short	F.B.	Threaded	1/2"	34
	CS / FBS-TLE			Bronze	2-way	Long	S.B.	Threaded	1/2" to 1"	35
	CS / FBS-TNE			Bronze	Horizontal 3-way	Short	S.B.	Threaded	1/4" to 1"	36
	CS / FBS-TGE			Bronze	2-way	Short	S.B.	Threaded (with gland)	3/8"	37
	CS-TUE			Bronze	2-way	Short	R.B.	Male & female threaded***	1/2" & 3/4"	38
	CS / FBS-UTE			Stainless	2-way	Short	R.B.	Threaded	1/4" to 1"	39
	CS / FBS-UTFE			Stainless	2-way	Short	F.B.	Threaded	1/2"	40
	CS / FBS-UTGE			Stainless	2-way	Short	R.B.	Threaded (with gland)	1/4" & 3/8"	41
	CS / FBS-5 / 10UTWE			Stainless	2-way	Short	F.B.	Wafer	3/8" & 1/2"	42

\*Actuator rotation: B.D.=Bi-directional, U.D.=Uni-directional

\*\*Bore design: F.B.=Full bore, S.B.=Standard bore, R.B.=Reduced bore

\*\*\*Provided with an union-ring



## KITZ 10K Compact Ball Valves

### Valve design features

- Convenient size range from 1/4" through 2".
- Integral actuator mounting pads enabling easy mounting or dismantling of actuators for speedy maintenance.
- Tight contact between PTFE ball seats and high precision machined balls for leakage-free service.
- Stems, made of high strength brass, are used for long service life.
- Choice of materials: Stainless steel for corrosion resistant service, or brass and bronze for general W.O.G. service.

### Valve design specifications

Threaded ends:	JIS B 0203
Union ends:	JIS B 2301
Maximum service pressure:	1.0MPa TKE, TKVE & TKSE for 3/4" and larger, 5UTWE: 0.5MPa
Seat P-T rating:	See Page 2

### Ball valve design and applications

KITZ Fig.	JIS Material	Port	Bore *	Neck	End connection	Applications	Electric Actuator	Pneumatic Actuator
TE	CAC406	2-way	S.B.	Short	Threaded	On-off control of water, oil, and gas.	EA EAB EAL EALB ED** EAE**	Type C & CS (FBS)
TFE	C3771BE or CAC406		F.B.			Insulation for thermal isolation.		
TLE	CAC406	Horizontal 3-way	S.B.	Long		Instantaneous change of line fluid.		
TNE				Short		High temperature service.		
TGE		2-way	R.B.		Male and female threaded with an union ring	Easy installation.		Type C & CS
TUE				Long		TUE with insulation for thermal isolation.		
TLUE	Chrome plating C3771BE	Vertical 3-way	R.B.	Short	Threaded	On-off control of water, oil and gas. M5 tapped for panel mounting.	EC	
TKE						Instantaneous change of line fluid. (Free from concern of fluid mixing.)	ECS	
TKVE						On-off control of water, oil and gas. M5 tapped for panel mounting.	EAE**	
TKSE	2-way	Instantaneous change of line fluid. (Free from concern of fluid mixing.)	EAH EAHB					
TNVE		On-off control of water, oil and gas. M5 tapped for panel mounting.	ES**					
TASE	C3771BE	2-way	R.B.			Wafer	TE made of stainless steel.	EA EAB EAL EALB ED EAE**
UTE	SCS14A	2-way	R.B.		TEE made of stainless steel.			
UTFE			R.B.		TGE made of stainless steel.			
UTGE			F.B.		Full bore wafer design. Maintenance ease.			
5/10UTWE	SCS13A	Vertical 3-way	F.B.		Threaded	Integrally molded body. Instantaneous change of fluid. (Free from concern of fluid mixing.)	EAH EAHB	
UTVE	SCS14A		R.B.			On-off control of water, oil and gas. M5 tapped for panel mounting.	ES**	
UTASE	SCS13A	2-way	R.B.					

\*Bore design: F.B.=Full bore, S.B.=Standard bore, R.B.=Reduced bore to API 608.

\*\*ED Series are available only for TE, TNE, UTE, UTFE, UTGE and 5/10UTWE ball valves.

EAE Series are available only for TE, TNE, TUE, TKSE and UTE ball valves.

ES Series are available only for TASE, UTASE ball valves.

### Applications

Automated on-off or 3-way flow control in HAVC service handling water, oil, gas and air (by brass and bronze valves) or in light load industrial processes for pharmaceutical, fine chemical, petro-chemical, food, beverage, textile and other general industries.

### Precautions

- ① No application to fluids including powders, dirt or sands.
- ② ● Fluid of high viscosity, steam or vacuum
  - Velocity of 3 m/sec or faster
  - Service with concern of an extraordinary pressure rise of line fluid or a variation of fluid temperature higher than 60°C.
  - For voltages other than KITZ standard specification, contact KITZ or its local distributors for technical advice on application to:



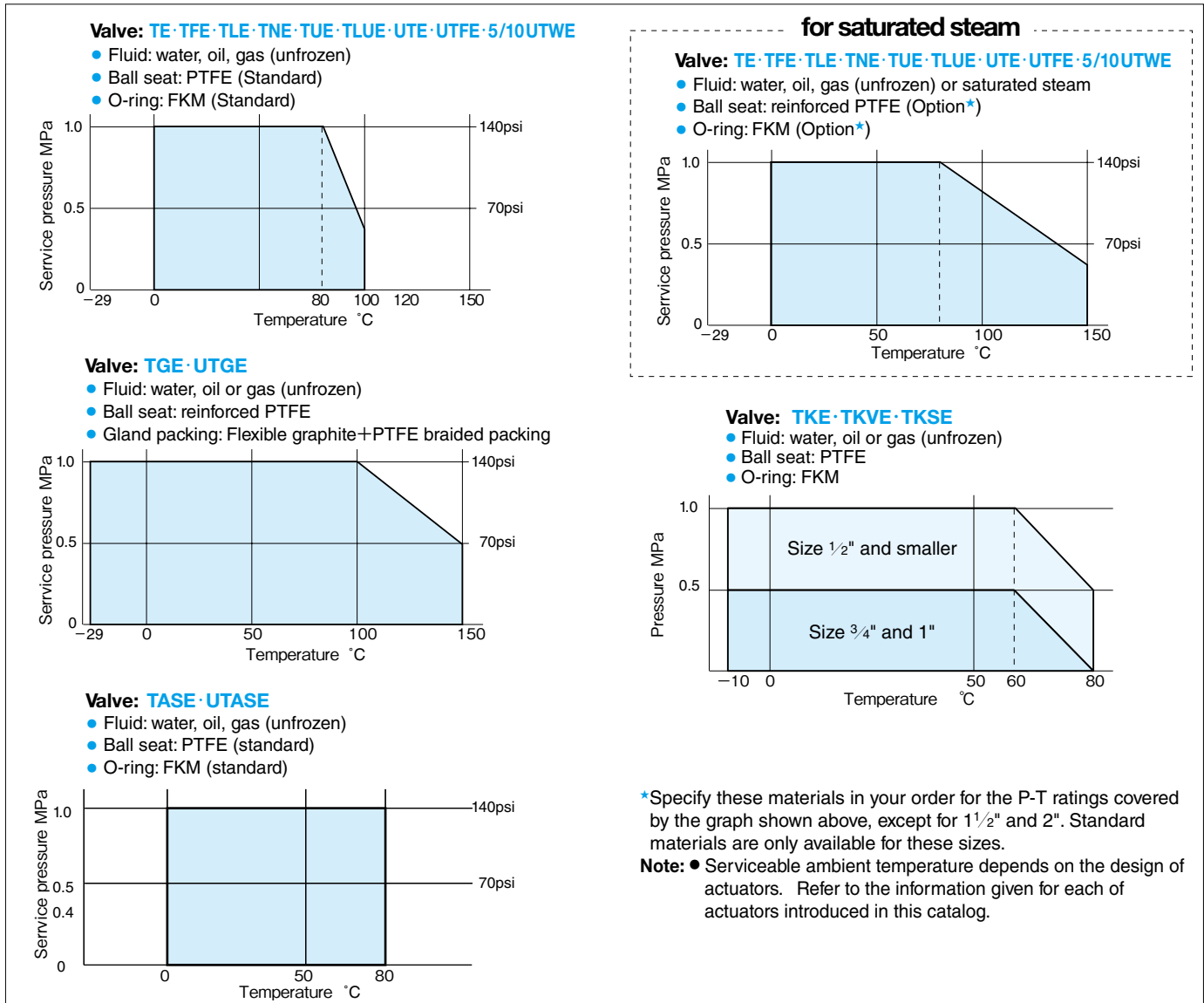
# KITZ 10K Compact Ball Valves

## Valve flow coefficient (Cv for fully opened valves)

KITZ Fig. Size (inch)	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
TE·TLE★	—	2.1	5.6	15	27	45	85	120
TNE	0.5	1	3	6	11	17	28	37
TGE	—	2.1	5.6	15	27	—	—	—
TUE·TLUE	—	—	3	6.2	—	—	—	—
TKE·TKSE★	0.9	2.4	3.4	6.1	11.5	—	—	—
TNVE	—	—	3	7.3	13	17	—	—
TKVE	—	—	2	3.6	6.5	—	—	—
TASE	—	—	5	10	15	—	—	—
UTE·UTGE★·UTASE★	1	2	5	8	15	20	37	60
TFE·UTFE	—	—	18	46	58	92	170	—
5/10UTWE	—	6.5	18	46	58	—	—	—
UTVE	0.5	1	2.2	3.9	7	—	—	—

★1/2" and larger for TLE. 3/4" and smaller for TKSE. 1" and smaller for UTGE. 1/2" to 1" for UTASE.

## PTFE seat pressure-temperature ratings



Type EA · EAB

Type EAL · EALB

Type EAH · EAHB

Type EC · ECS

Type EAE

Type ED

Type ES

Type C-CS/FBS

## KITZ 3-way Compact Ball Valves: Change of Flow Directional Form

KITZ horizontal 3-way ball valves are principally used for quick change of flow direction. Also 3-way ball valves can be used for simplification of piping systems as shown in Fig. 1.

KITZ Fig. TNE, TNVE, TKVE, UTNE and UTVE 3-way ball valves are provided with L-port and double face seating design for change of flow direction between Form 1 and 2. It should be noted that, if the line pressure of the closed bore is higher than that of the open bores, a small rate of fluid leakage may occur from the closed bore. (Fig. 2)

Fig. 1

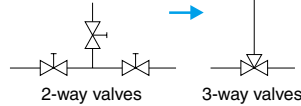
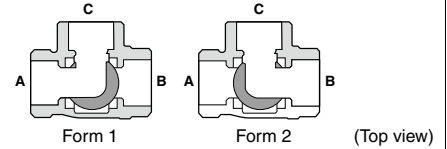
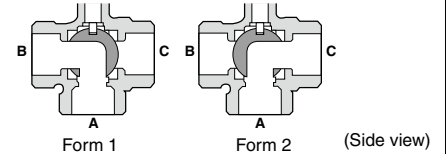


Fig. 2

### Horizontal 3-way ball valves



### Vertical 3-way ball valves



## KITZ 3-way Compact Ball Valves: Flow Directional Form

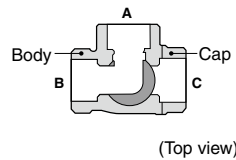
Shipment shall be made with the flow directional form fixed as illustrated here. (Fig. 3)

### Location of cord connectors (top view):

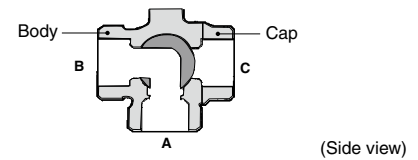
Horizontal 3-way: Size 1 & 1.5: Right hand side  
 Size 2: Diagonally forward right  
 Vertical 3-way: Size 1: Right hand side  
 Size 2: Diagonally forward left

Fig. 3

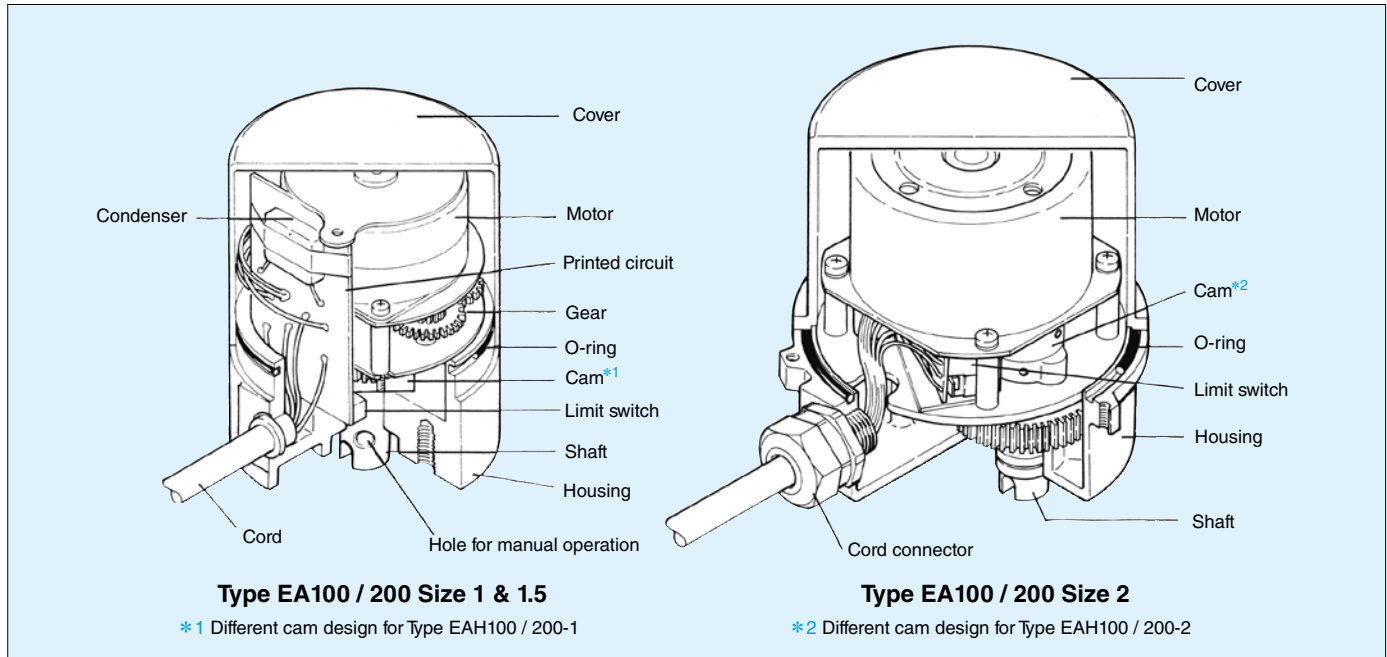
### Horizontal 3-way ball valves



### Vertical 3-way ball valves



## KITZ KELMO® Electric Actuators



### General design features

- Compact size and light weight with die-cast aluminum housing and powerful miniature motor for economy and handling ease.
- Simple mechanism with minimized number of component parts for high durability and trouble-free service.
- Free from concerns common with conventional solenoid valves such as water hammer, pressure loss, and restricted flow direction.
- All weather type design for outdoor service.
- Availability of manual operation in case of electric failure.
- Versatile applications by means of optional built-in relay circuit for parallel drive, terminal boxes and 180° rotary mechanism for 3-way flow direction.
- Safety provision to protect the motor from overheat damage caused by accidental overload.
- Factory-made actuator-to-valve assembly for off-the-shelf supply.

### Compact KELMO® actuators: power sources and functional features

Type of actuator		* Power source	Functional features
EA Series	EA100 / EA200	100V / 200V AC (50Hz / 60Hz)	90°bi-directional rotation
	EAB100 / EAB200		90°bi-directional rotation / Terminal box
	EAL100 / EAL200		90°bi-directional rotation / Built-in relay
	EALB100 / EALB200		90°bi-directional rotation / Built-in relay / Terminal box
	EAH100 / EAH200		180°bi-directional rotation
	EAHB100 / EAHB200		180°bi-directional rotation / Terminal box
EC Series	EC100 / EC200	100V / 200V AC (50Hz / 60Hz)	90°Uni-directional rotation
	ECS100 / ECS200		180°Uni-directional rotation
EAE Series	EAE100 / EAE200	100V / 200V AC (50Hz / 60Hz)	90°bi-directional rotation / Spring-return
ED Series	ED12 / ED24	12V / 24V DC	90°bi-directional rotation / Parallel drive
ES Series	ESA100 / ESA200	100V / 200V AC (50Hz / 60Hz)	90°bi-directional rotation

\* Optional Specification (EA Series)

AC110V (50/60HZ)

AC230V\* (50/60HZ)

AC115V\* (50/60HZ)

AC240V (50/60HZ)

\*EA100/200-1 only

AC120V (50/60HZ)



## Type EA and EAB Electric Actuators / Class 10K Bronze or Stainless Steel Ball Valves

100V / 200V AC 50Hz / 60Hz

■ **90° bi-directional rotation**

■ **Factory assembled terminal box for easier installation of actuators (EAB)**

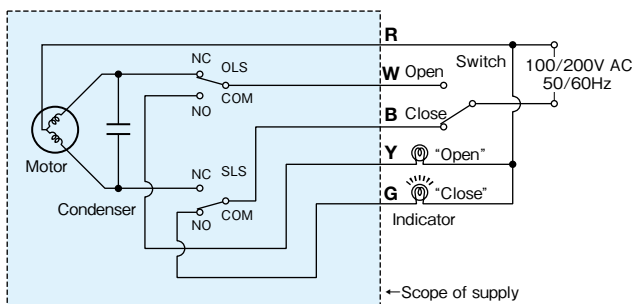
### Type EA and EAB actuator design specifications

Specification	Type	EA100-1 EAB100-1	EA200-1 EAB200-1	EA100-1.5 EAB100-1.5	EA200-1.5 EAB200-1.5	EA100-2 EAB100-2	EA200-2 EAB200-2
Power source 50Hz / 60Hz		100V AC±10%	200V AC±10%	100V AC±10%	200V AC±10%	100V AC±10%	200V AC±10%
Rated current		90mA	50mA	90mA	50mA	100mA	50mA
Max. power consumption		9W	10W	9W	10W	10W	
Valve closing time 90°	50Hz	Approx.6 sec.		Approx.12 sec.		Approx.15 sec.	
	60Hz	Approx.5 sec.		Approx.10 sec.		Approx.13 sec.	
Max. output torque		1.9N·m		3.9N·m		9.8N·m	
Rated time		Continuous					
Insulation Class		JIS Class E					
Sensitive switch contact capacity		100V AC 3A (Resistance load) 200V AC 1A (Resistance load)				100V AC 3A (Resistance load) 250V AC 3A (Resistance load)	
Position limit switch		1 unit each for opening / closing (Using the same power source as that of the actuator)					
Insulation strength		1500V AC (1 min. interval)					
Insulation resistance		Minimum 10MΩ (500V DC)					
Standard protection		All weather type (for outdoor use, avoid sunlight) IP56 (IEC60529)					
Ambient temperature		-20℃ ~ +50℃					
Mounting position		Vertical to horizontal					
Wiring	Vinyl cabtyre cord with 5 cores, 700mm in length						
	0.3mm <sup>2</sup>				0.5mm <sup>2</sup>		
Lubrication		Grease					
Overload protection		Impedance protection					
Coating color		Housing: black    Cover: light blue					

**Note:** Contact KITZ for technical advice when the service conditions differ from the above.

### Type EA actuator circuit diagrams (with the valve fully closed)

#### EA100 / 200 Size 1~2



● Wire color: **R** red **W** white **B** black **Y** yellow **G** green

● Actuator rotates:

**R-W:** counter-clockwise to fully open the valve

**R-B:** clockwise to fully close the valve

● Limit switches activate:

OLS: on fully opening the valve (R-W: off W-Y: on)

SLS: on fully closing the valve (R-B: off B-G: on)

**Note:** For all sizes of Type EAB 100 / 200, the terminals are numbered 1, 2, 3, 4 and 5 in place of R, W, B, Y and G respectively.

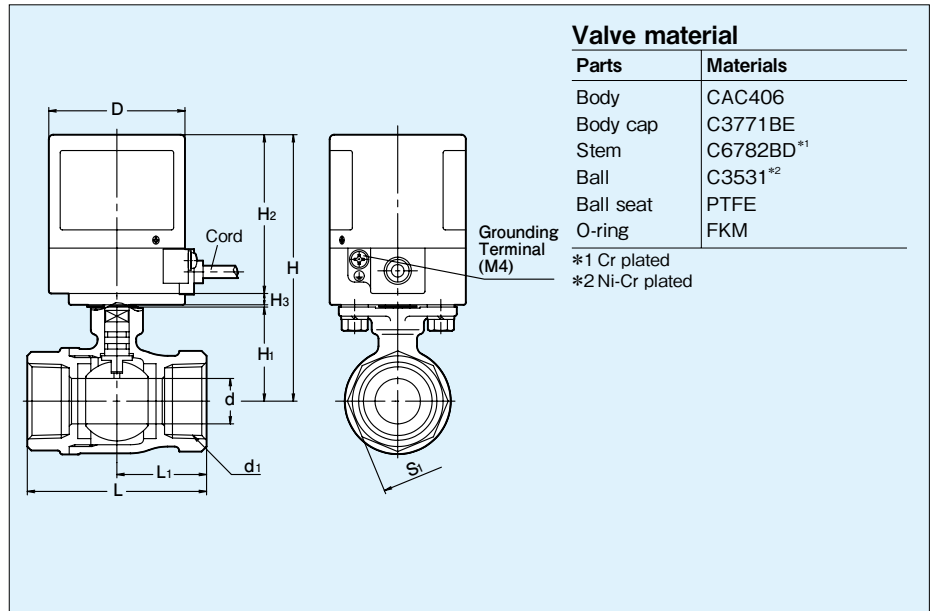
**Note:** ● When two or more actuators are operated by a single switch, ensure to prevent unintended current flows by using relay contacts.

● Auxiliary devices, such as lamps or relays, where minute current is used, may cause failure in the contacts of limit switches. Consult KITZ for such applications.

# Type EA Electric Actuators / Class 10K Bronze Ball Valves

Fig. EA100 / 200-TE

Actuator size: 1 and 1.5  
Valve size: 3/8" to 1" (Standard bore)

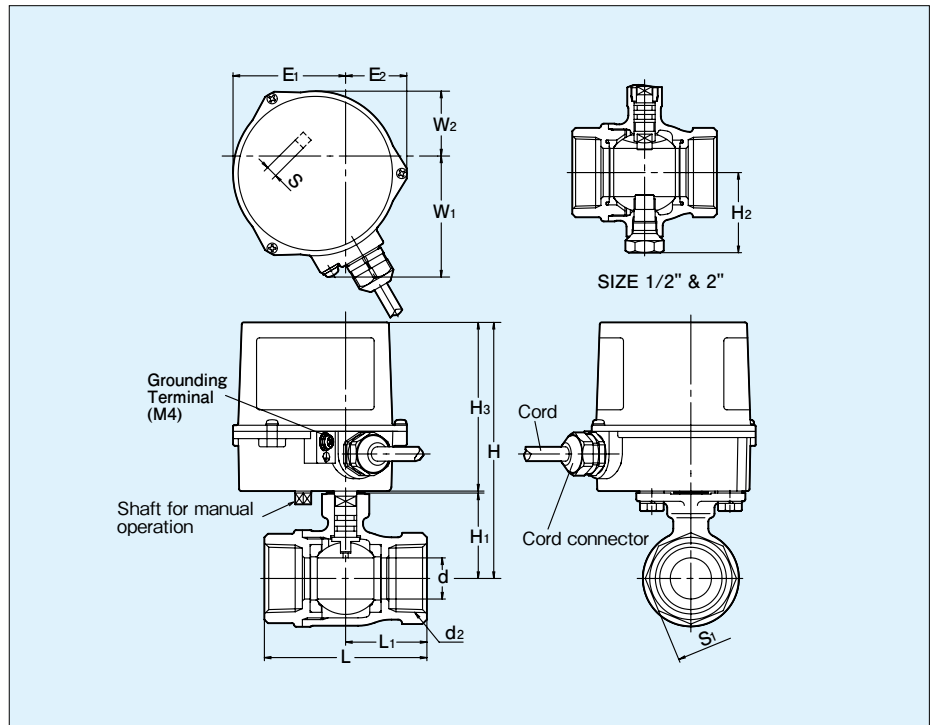
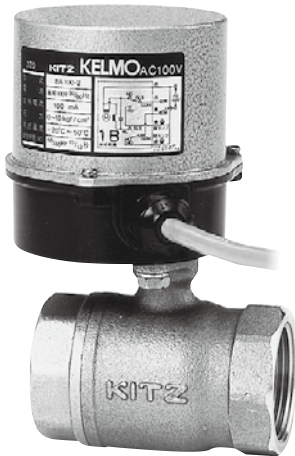


## Dimensions

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
3/8	7.5	Rc3/8	104	28	46	22	22	70	5	60	EA100 / 200-1
1/2	10	Rc1/2	109.5	33.5	65	32.5	28				EA100 / 200-1.5
3/4	15	Rc3/4	113.5	37.5	68	34	34				
1	20	Rc1	117.5	41.5	79	39.5	41				

Fig. EA100 / 200-TE

Actuator size: 2  
Valve size: 1 1/4" to 2" (Standard bore)



## Dimensions

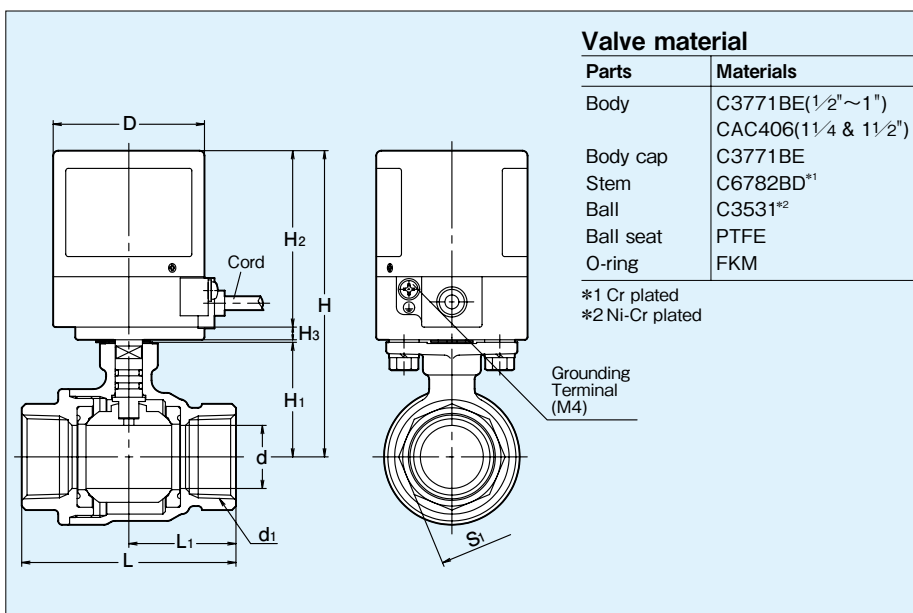
Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						Type
									H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1 1/4	25	Rc1 1/4	128.5	45.5	—	86	43	50	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1 1/2	32	Rc1 1/2	142.5	59.5	53.5	96	48	56							
2	40	Rc2	148.5	65.5	60	109	54.5	68							

# Type EA Electric Actuators / Class 10K Bronze or Brass Ball Valves

Fig. EA100 / 200-TFE

Actuator size: 1.5

Valve size: 1/2" and 3/4" (Full bore)



## Dimensions

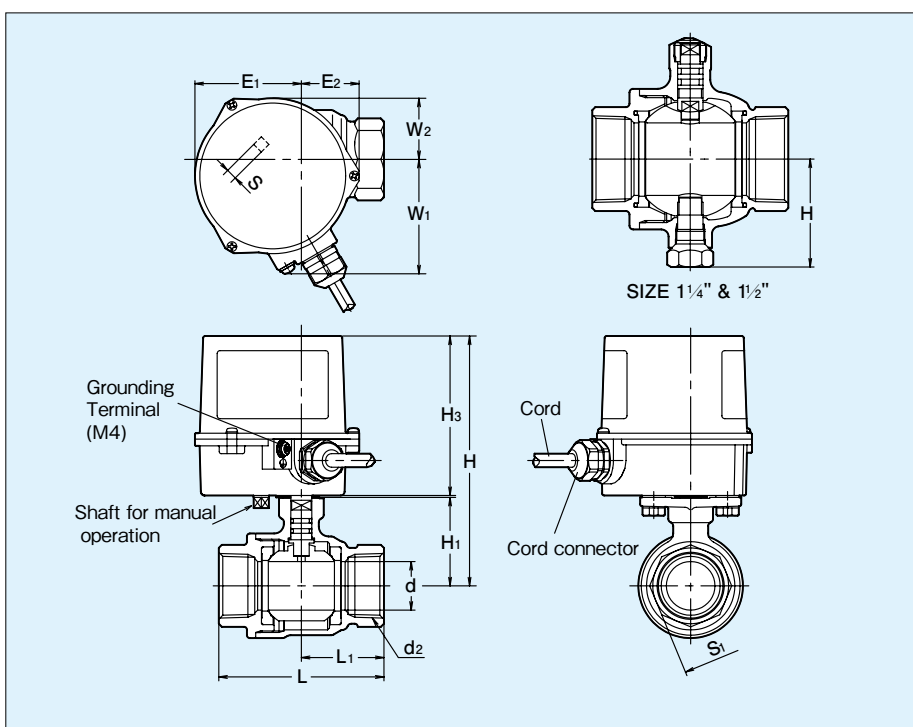
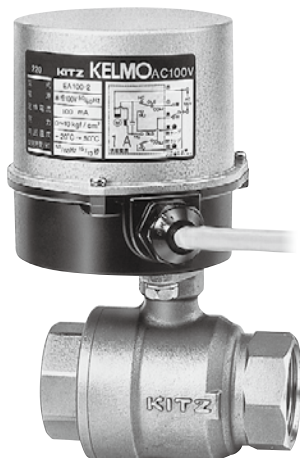
(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	15	Rc1/2	113.5	37.5	63	31.5	26	70	5	60	EA100 / 200-1.5
3/4	20	Rc3/4	117.5	41.5	73	36.5	32				

Fig. EA100 / 200-TFE

Actuator size: 2

Valve size: 1" to 1 1/2" (Full bore)



## Dimensions

(mm)

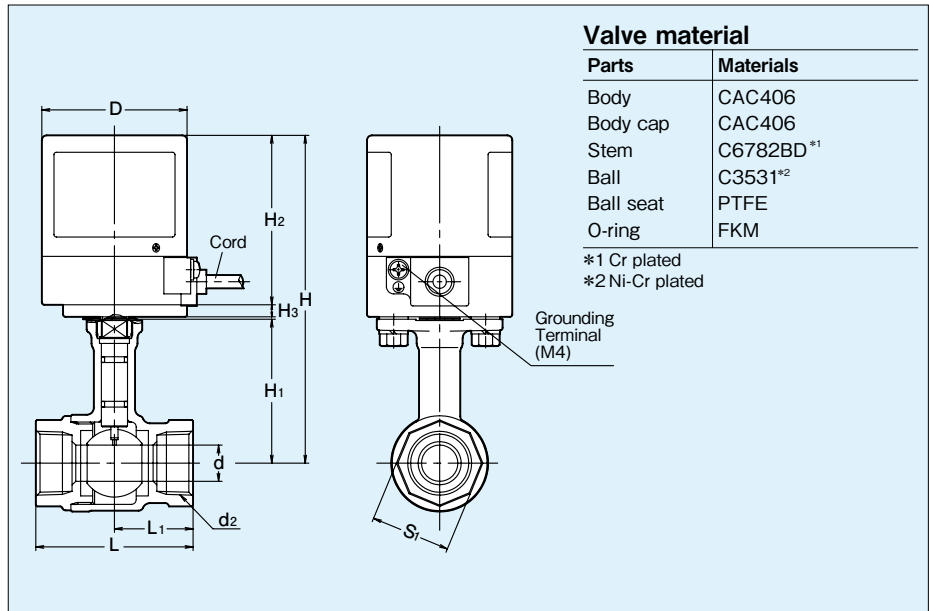
Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						Type
									H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1	25	Rc1	128.5	45.5	—	85	42.5	39	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1 1/4	32	Rc1 1/4	142.5	59.2	53.5	98	49	50							
1 1/2	40	Rc1 1/2	148.5	65.5	59.5	108	54	56							



# Type EA Electric Actuators / Class 10K Long Neck Bronze Ball Valves

Fig. EA100 / 200-TLE

Actuator size: 1 and 1.5  
Valve size: 1/2" to 1" (Standard bore)



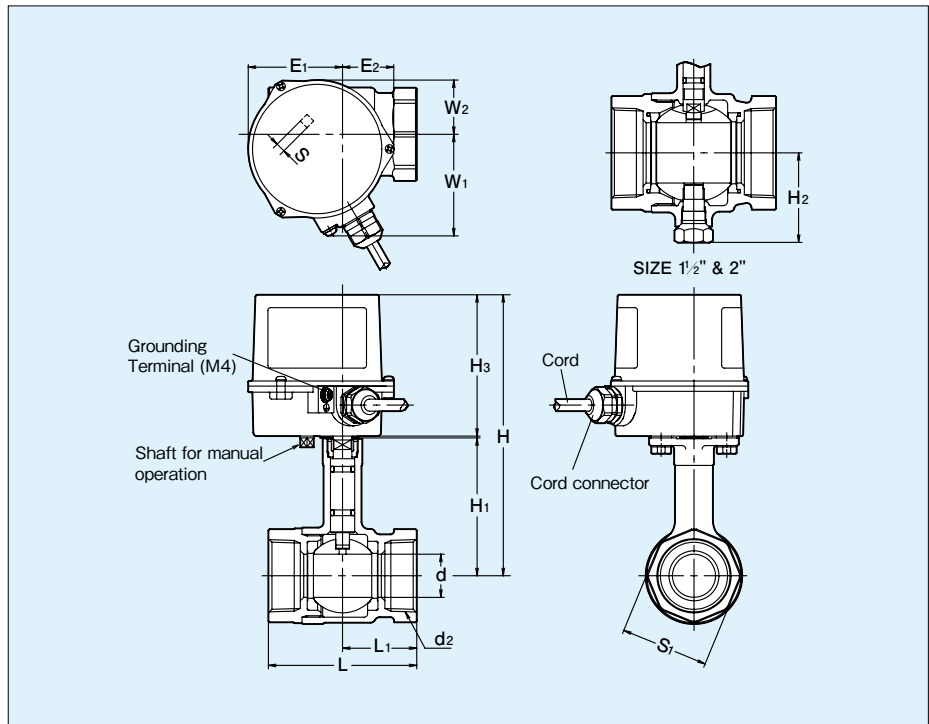
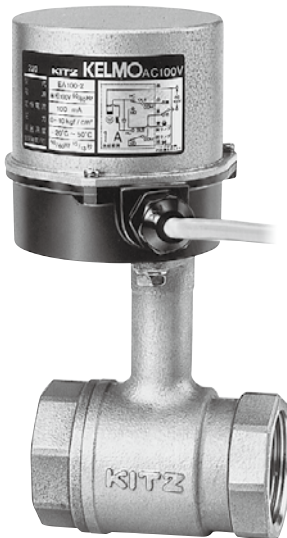
## Dimensions

(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	10	Rc1/2	132	56	56	28	27	70	5	60	EA100 / 200-1
3/4	15	Rc3/4	136.5	60.5	65	32.5	33				EA100 / 200-1.5
1	20	Rc1	140	64	78	39	41				

Fig. EA100 / 200-TLE

Actuator size: 2  
Valve size: 1 1/4" to 2" (Standard bore)



## Dimensions

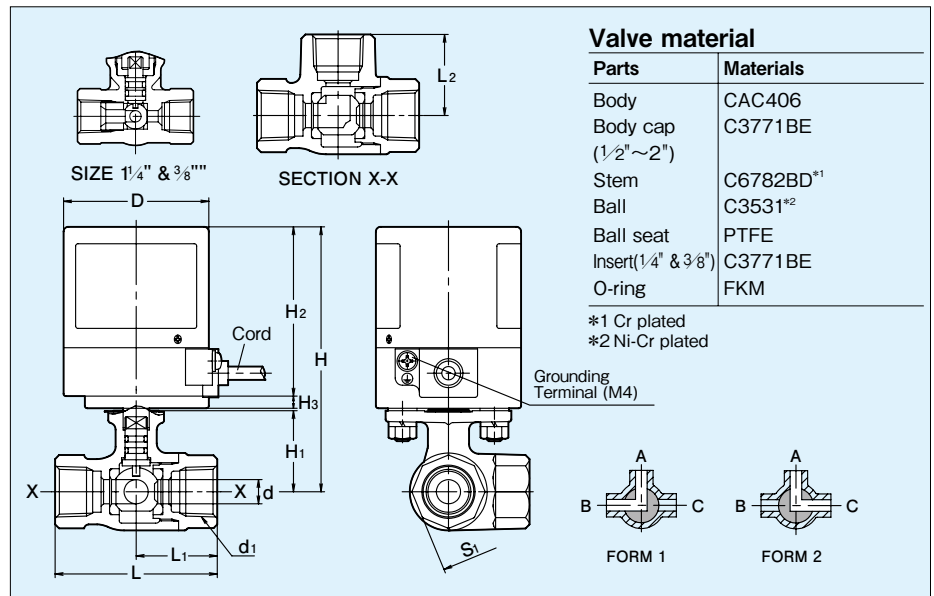
(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						Type
									H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1 1/4	25	Rc1 1/4	163	80	—	86	43	51	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1 1/2	32	Rc1 1/2	166	83	53.5	96	48	58							
2	40	Rc2	173	90	60	109	54.5	71							

# Type EA Electric Actuators / Class 10K Horizontal 3-way Bronze Ball Valves

Fig. EA100 / 200-TNE

Actuator size: 1 and 1.5  
Valve size: 1/2" to 1" (Standard bore)



\* Stainless steel body available Fig. EA100/200-UTNE

Note: Refer to Page 3 for flow directional forms.

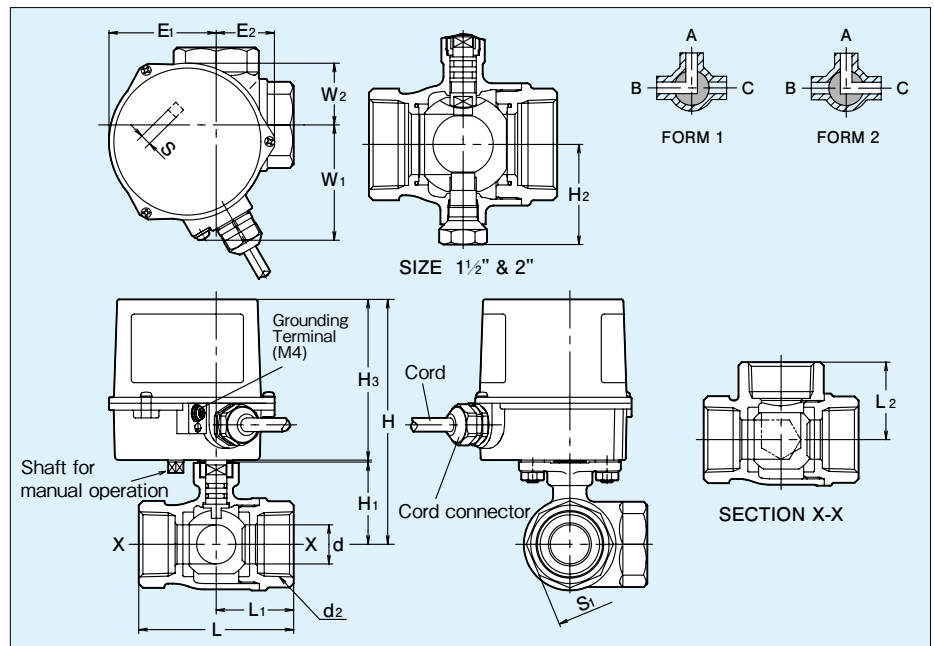
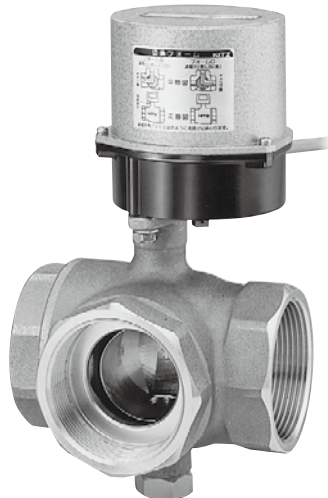
Products are adequately identified with nameplates indicating Form 1 as Form B or Form 2 as Form C. (mm)

## Dimensions

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	Actuator			
									H <sub>2</sub>	H <sub>3</sub>	D	Type
1/4	4.5	Rc1/4	101.5	25.5	46	23	23	21	70	5	60	EA100 / 200-1
3/8	6.8	Rc3/8	101.5	25.5	46	22	22	21				EA100 / 200-1.5
1/2	10	Rc1/2	109.5	33.5	67	33.5	33.5	28				
3/4	15	Rc3/4	114	38	68	34	34	34				
1	20	Rc1	118	42	79	39.5	39.5	41				

Fig. EA100 / 200-TNE

Actuator size: 2  
Valve size: 1/4" to 2" (Standard bore)



\* Stainless steel body available Fig. EA100/200-UTNE

Note: Refer to Page 3 for flow directional forms.

Products are adequately identified with nameplates indicating Form 1 as Form B or Form 2 as Form C. (mm)

## Dimensions

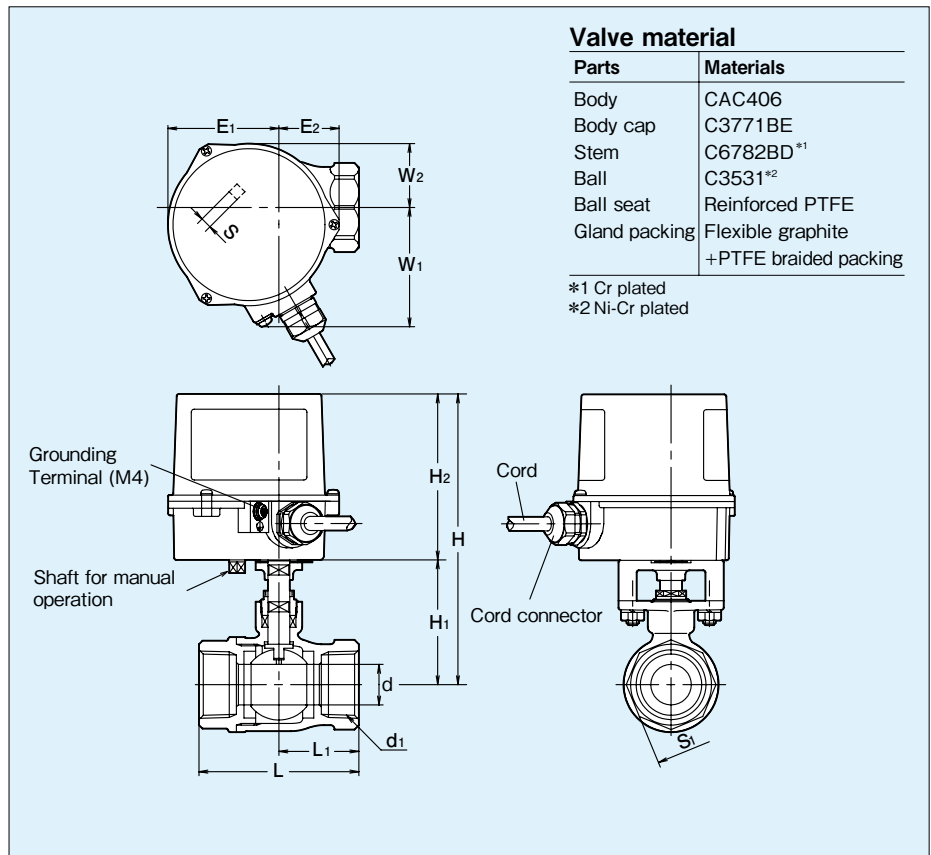
Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	Actuator						Type
										H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1/4	25	Rc1/4	128.5	46.5	—	89	44.5	44.5	50	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1/2	32	Rc1/2	142.5	59.5	53.5	100	50	50	56							
2	40	Rc2	148.5	65.5	60	115	57.5	57.5	68							

# Type EA Electric Actuators / Class 10K Bronze Ball Valves with Gland Packing

Fig. EA100 / 200-TGE

Actuator size: 2

Valve size: 1/2" to 1" (Standard bore)



## Dimensions

(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						
								H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	Type
3/8	7.5	Rc3/8	130	48	46	22	22	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1/2	10	Rc1/2	135.5	53.5	65	32.5	28							
3/4	15	Rc3/4	139.5	57.5	68	34	34							
1	20	Rc1	143.5	61.6	79	39.5	41							

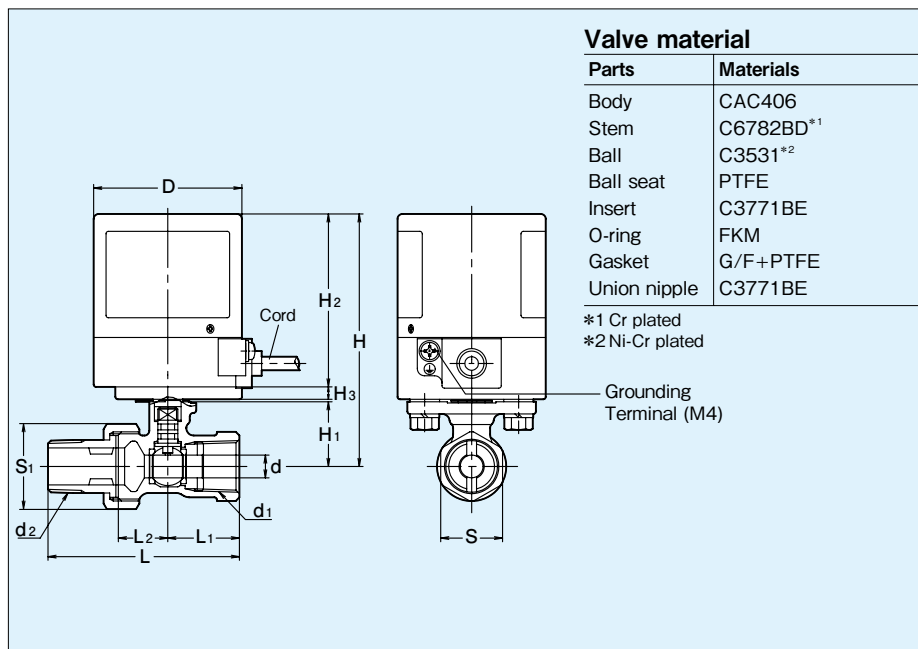


## Type EA Electric Actuators / Class 10K Union Ring Bronze Ball Valves

Fig. EA100 / 200-TUE

Actuator size: 1

Valve size: 1/2" and 3/4" (Reduced bore)



### Valve material

Parts	Materials
Body	CAC406
Stem	C6782BD* <sup>1</sup>
Ball	C3531* <sup>2</sup>
Ball seat	PTFE
Insert	C3771BE
O-ring	FKM
Gasket	G/F+PTFE
Union nipple	C3771BE

\*1 Cr plated

\*2 Ni-Cr plated

Grounding  
Terminal (M4)

### Dimensions

(mm)

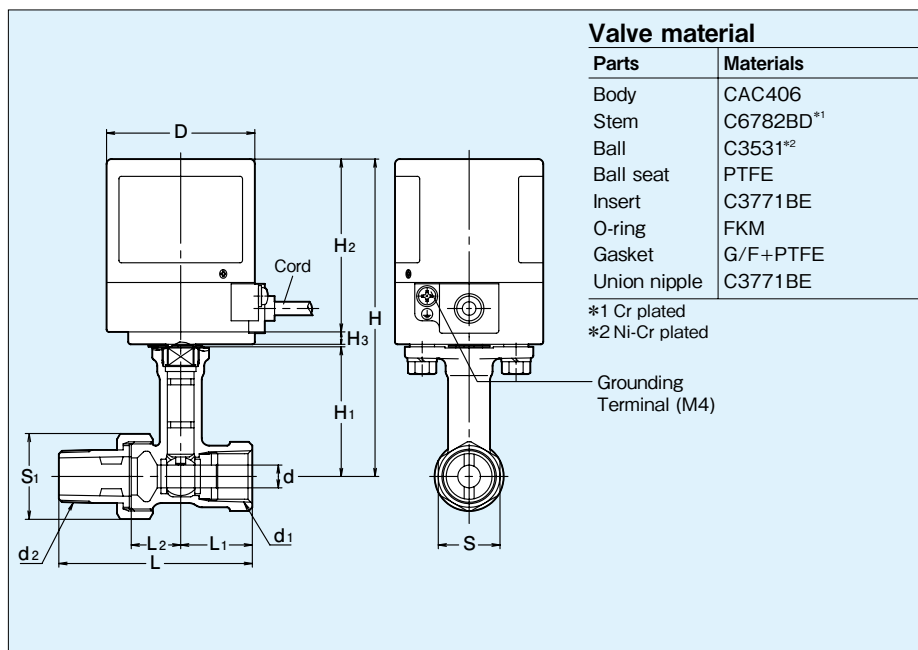
Valve Size (inch)	d	d <sub>1</sub>	d <sub>2</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S	S <sub>1</sub>	Actuator			
											H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	8	Rc1/2	Rc1/2	102	26	78.5	29	20	25	31	70	5	60	EA100 / 200-1
3/4	11	Rc3/4	Rc3/4	104.5	28.5	81	29	20	32	36				

## Type EA Electric Actuators / Class 10K Long Neck Union Ring Bronze Ball Valves

Fig. EA100 / 200-TLUE

Actuator size: 1

Valve size: 1/2" and 3/4" (Reduced bore)



### Valve material

Parts	Materials
Body	CAC406
Stem	C6782BD* <sup>1</sup>
Ball	C3531* <sup>2</sup>
Ball seat	PTFE
Insert	C3771BE
O-ring	FKM
Gasket	G/F+PTFE
Union nipple	C3771BE

\*1 Cr plated

\*2 Ni-Cr plated

Grounding  
Terminal (M4)

### Dimensions

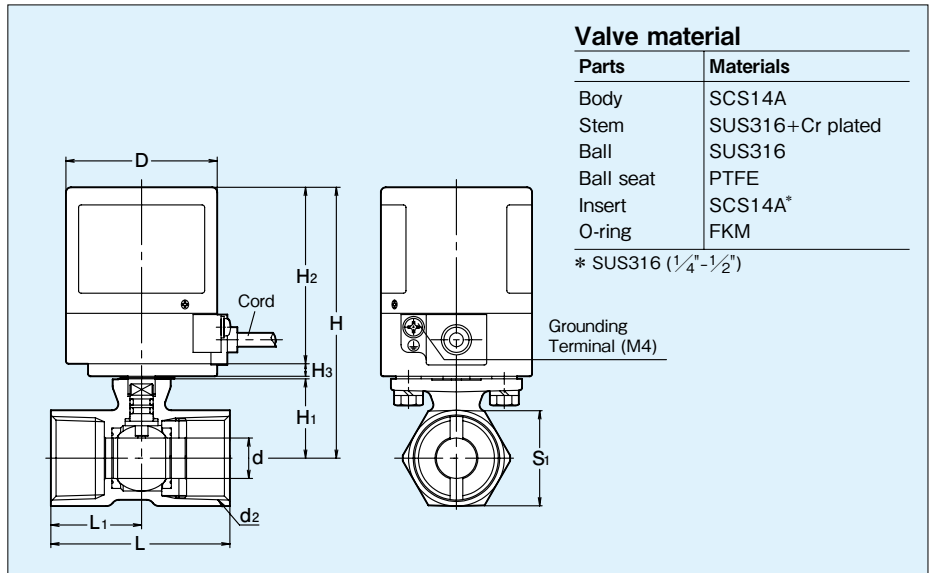
(mm)

Valve Size (inch)	d	d <sub>1</sub>	d <sub>2</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S	S <sub>1</sub>	Actuator			
											H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	8	Rc1/2	Rc1/2	128.5	52.5	78.5	29	20	25	31	70	5	60	EA100 / 200-1
3/4	11	Rc3/4	Rc3/4	131	55	81	29	20	32	36				

# Type EA Electric Actuators / Class 10K Stainless Steel Ball Valves

Fig. EA100 / 200-UTE

Actuator size: 1 and 1.5  
Valve size: 1/4" to 1" (Reduced bore)

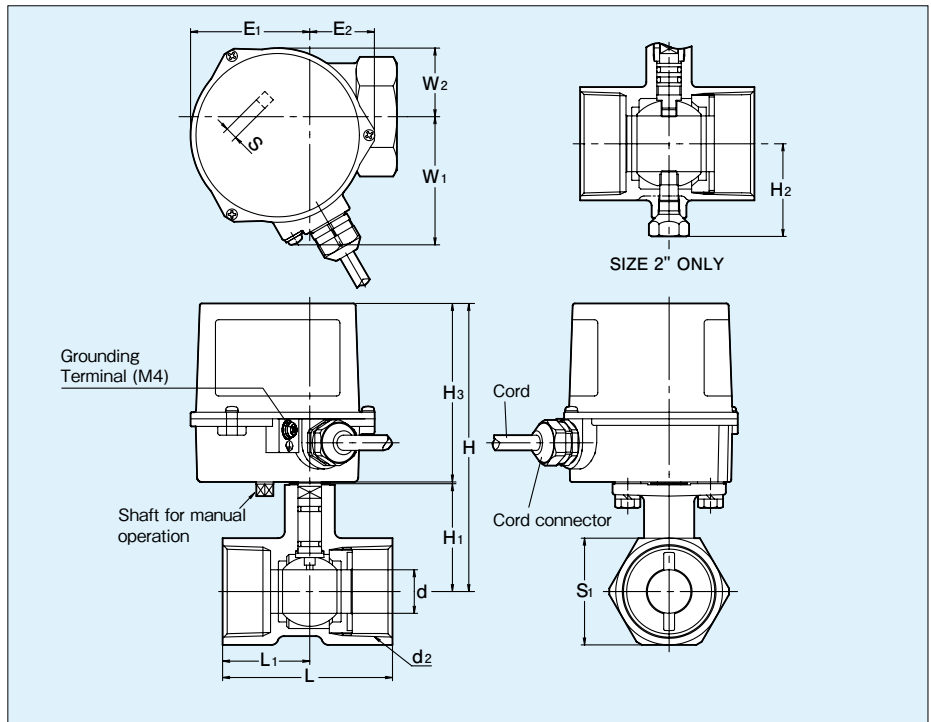
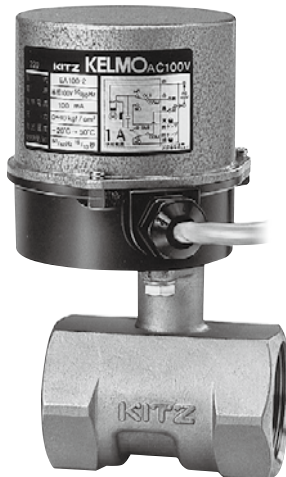


## Dimensions

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
1/4	5.3	Rc1/4	102	26	44	21	21	70	5	60	EA100 / 200-1
3/8	7.7	Rc3/8	102	26	44	21	21				
1/2	9.2	Rc1/2	102	26	56.5	27.5	25				EA100 / 200-1.5
3/4	12.5	Rc3/4	105	29	59	30	32				
1	16	Rc1	108	32	71	36	38				

Fig. EA100 / 200-UTE

Actuator size: 2  
Valve size: 1/4" to 2" (Reduced bore)



## Dimensions

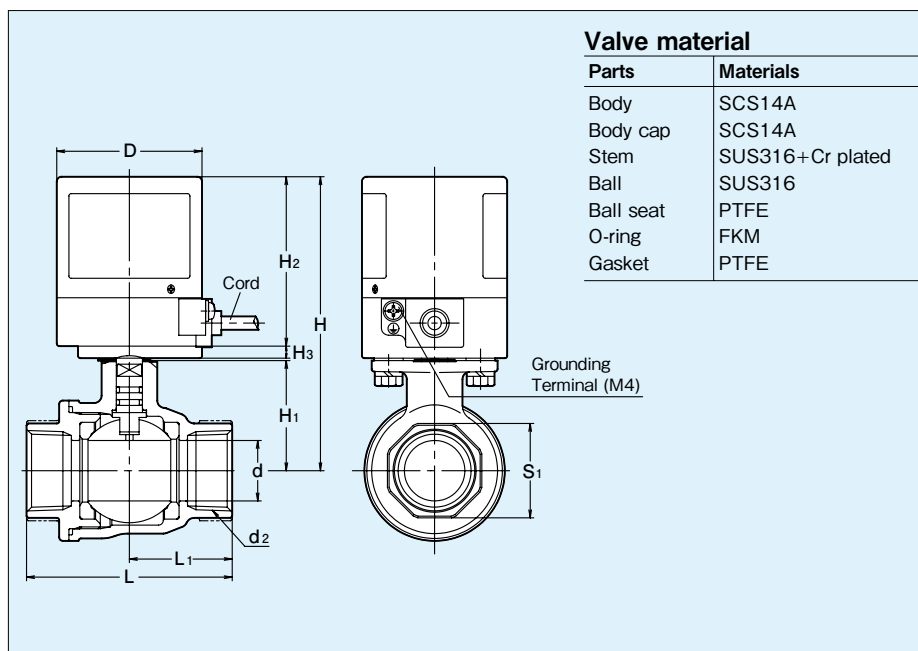
Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						Type
									H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1/4	20	Rc1/4	132.5	49.5	—	78	40	49	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1/2	24.5	Rc1/2	135.5	52.5	—	83	42.5	53							
2	32	Rc2	141.5	58.5	53.5	100	51	65							

# Type EA Electric Actuators / Class 10K Stainless Steel Ball Valves

Fig. EA100 / 200-UTFE

Actuator size: 1.5

Valve size: 1/2" and 3/4" (Full bore)



## Dimensions

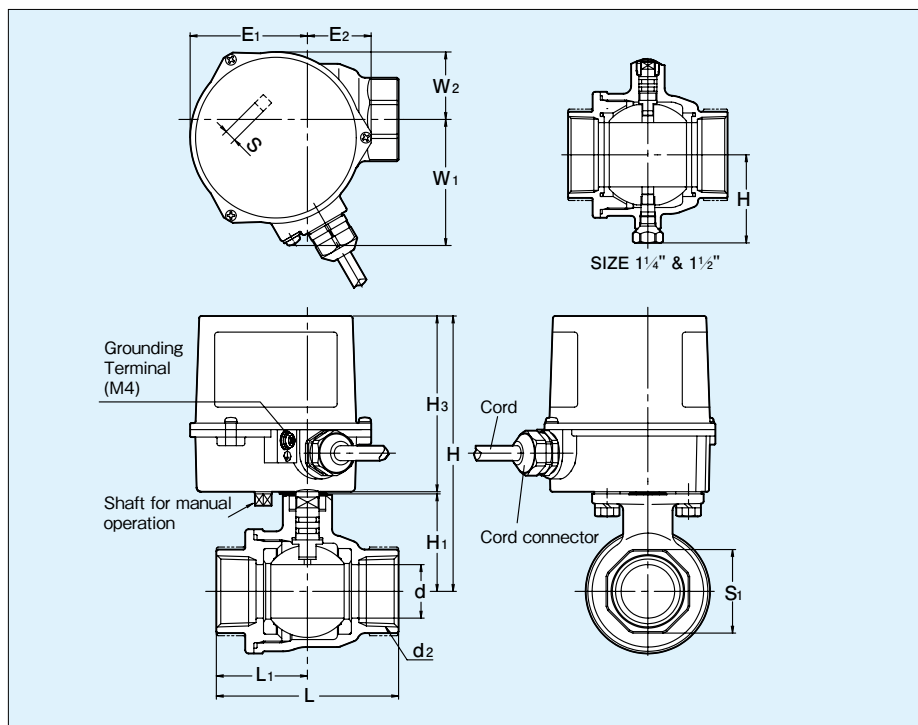
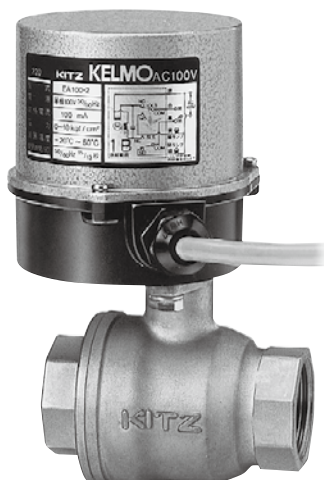
(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	15	Rc1/2	113.5	37.5	63	31	26	70	5	60	EA100 / 200-1.5
3/4	20	Rc3/4	117.5	41.5	73	36.5	32				

Fig. EA100 / 200-UTFE

Actuator size: 2

Valve size: 1" to 1 1/2" (Full bore)



## Dimensions

(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						Type
									H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	
1	25	Rc1	128.5	45.5	—	85	42.5	39	82	54.5	30	59	31.5	5.5	EA100 / 200-2
1 1/4	32	Rc1 1/4	143.5	60.5	55	98	49	48							
1 1/2	40	Rc1 1/2	149.5	66.5	61	108	54	54							

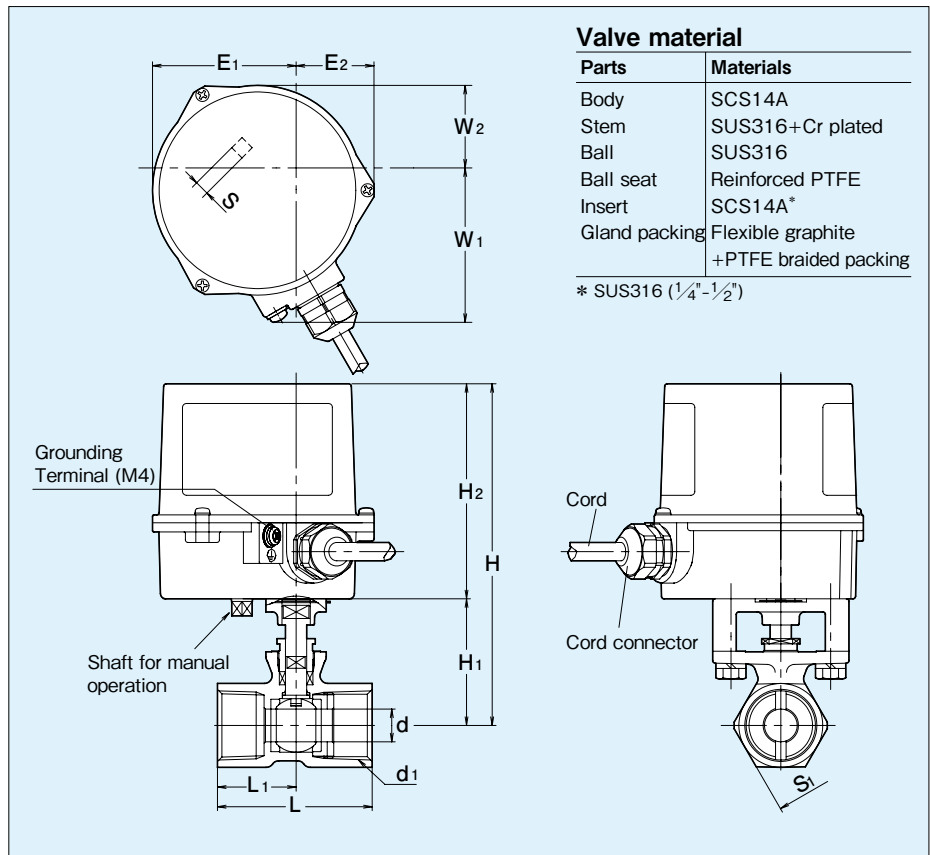


# Type EA Electric Actuators / Class 10K Glanded Stainless Steel Ball Valves

Fig. EA100 / 200-UTGE

Actuator size: 2

Valve size: 1/4" to 1" (Reduced bore)



## Dimensions

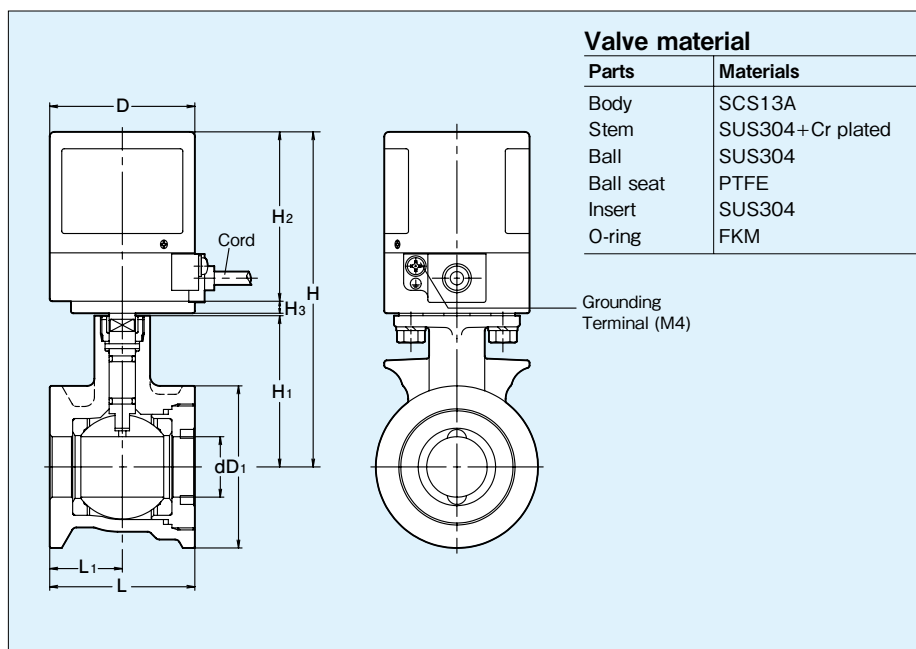
(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator						
								H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S	Type
1/4	4.5	Rc1/4	128	46	44	21	21	82	54.5	30	59	31.5	5.5	EA100 / 200-2
3/8	6.8	Rc3/8	128	46	44	21	21							
1/2	9.2	Rc1/2	128	46	56.5	27.5	25							
3/4	12.5	Rc3/4	131	49	59	30	32							
1	16	Rc1	134	52	71	36	38							

# Type EA Electric Actuators / Class 5K / 10K Wafer Stainless Steel Ball Valves

Fig. EA100 / 200-5UTWE  
EA100 / 200-10UTWE

Actuator size: 1 and 1.5  
Valve size:  $\frac{3}{8}$ " to  $\frac{3}{4}$ " (Full bore)



## Valve material

Parts	Materials
Body	SCS13A
Stem	SUS304+Cr plated
Ball	SUS304
Ball seat	PTFE
Insert	SUS304
O-ring	FKM

Grounding  
Terminal (M4)

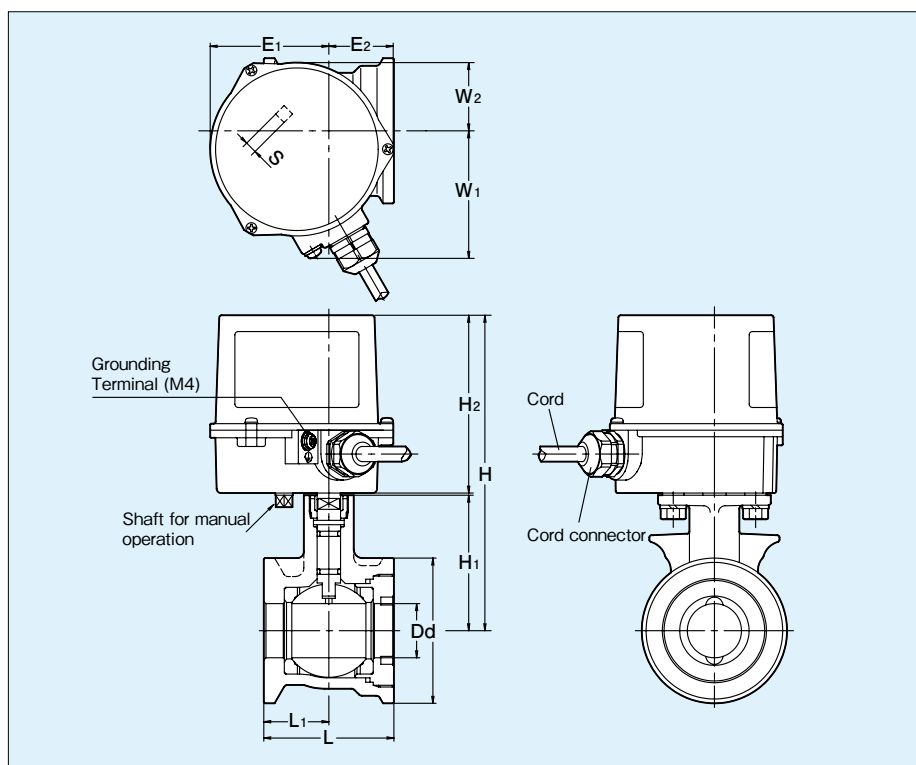
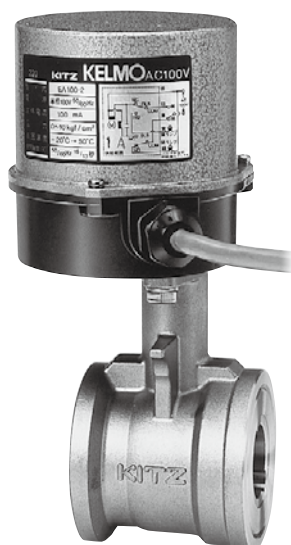
## Dimensions

(mm)

Valve Size (inch)	d	H	H <sub>1</sub>	L	L <sub>1</sub>	D <sub>1</sub>		Actuator			
						5K	10K	H <sub>2</sub>	H <sub>3</sub>	D	Type
$\frac{3}{8}$	10	131	55	35	17.5	43	48	70	5	60	EA100 / 200-1
$\frac{1}{2}$	15	134	58	40	20	48	53				EA100 / 200-1.5
$\frac{3}{4}$	20	136	60	50	25	53	58				

Fig. EA100 / 200-5UTWE  
EA100 / 200-10UTWE

Actuator size: 2  
Valve size: 1" (Full bore)



## Dimensions

(mm)

Valve Size (inch)	d	H	H <sub>1</sub>	L	L <sub>1</sub>	D		Actuator					
						5K	10K	H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S
1	25	151	68	60	30	63	69	82	54.5	30	59	31.5	5.5

EA100 / 200-2

## Type EAB Electric Actuators / Class 10K Bronze or Stainless Steel Ball Valves

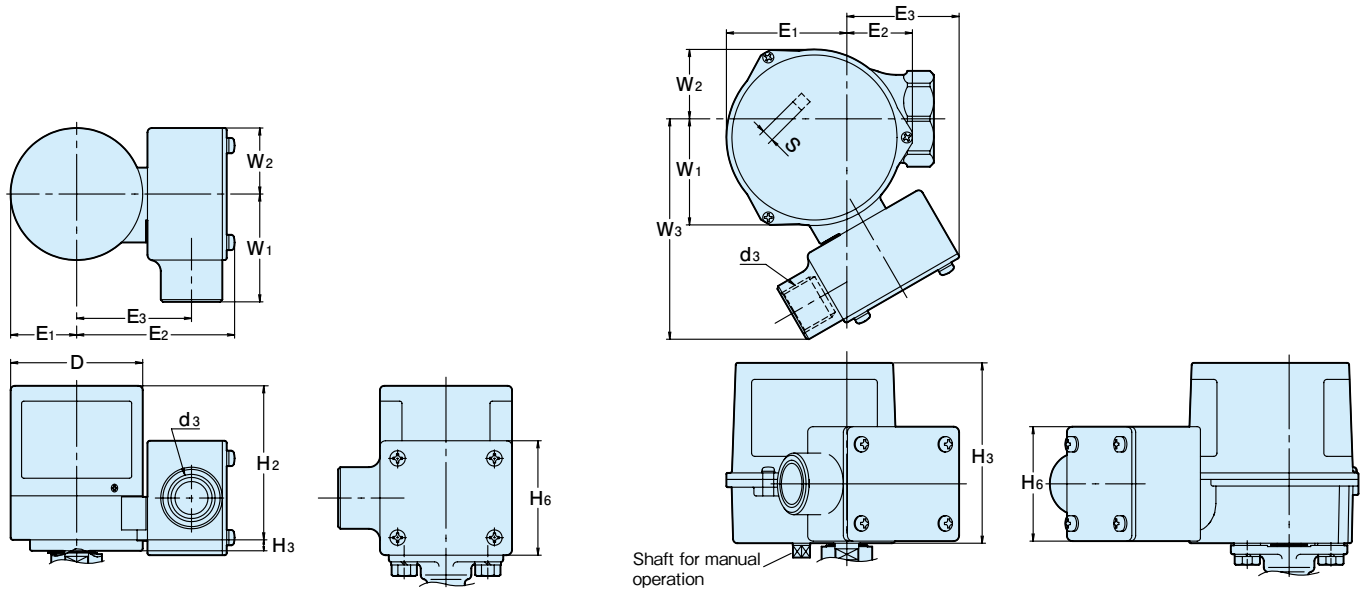
The circuit diagram is the same as the one for Type EA actuators.

Refer to Page 5.

Note: Terminal box (M3) is equipped for electric connection with the power source.

Fig. of actuator-to-valve assemblies

**EAB100 / 200-TE**      **EAB100 / 200-TLUE**  
**EAB100 / 200-TFE**    **EAB100 / 200-UTE**  
**EAB100 / 200-TLE**    **EAB100 / 200-UTFE**  
**EAB100 / 200-TNE**    **EAB100 / 200-UTGE**  
**EAB100 / 200-TGE**    **EAB100 / 200-5 / 10UTWE**  
**EAB100 / 200-TUE**    **EAB100 / 200-UTNE**



Dimensions of actuator size 1 & 1.5

(mm)

$d_3$	$H_2$	$H_3$	$H_6$	$E_1$	$E_2$	$E_3$	$W_1$	$W_2$	$D$
$G\frac{1}{2}$	70	5	52	30	72	52	49	30	60

Note: Actuator sizing for ball valves is the same as the one for Type EA actuators.

Dimensions of actuator size 2

(mm)

$d_3$	$H_3$	$H_6$	$E_1$	$E_2$	$E_3$	$W_1$	$W_2$	$W_3$	$S$
$G\frac{1}{2}$	82	52	54.5	30	52	49	31.5	100	5.5

Note: Actuator sizing for ball valves is the same as the one for Type EA actuators.

# Type EAL and EALB Electric Actuators / Class 10K Bronze or Stainless Steel Ball Valves

100V / 200V AC 50Hz / 60Hz

- **Built-in relay circuit for parallel drive of two or more actuators**
- **Factory assembled terminal box for easier installation of actuators (EALB)**

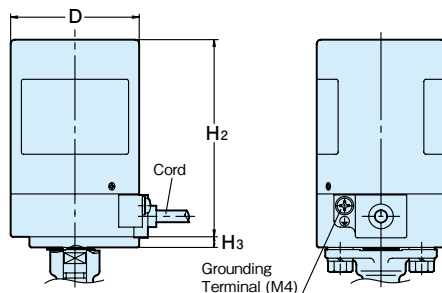
## Type EAL and EALB actuator design specifications

Specification	Type	EAL100-1	EAL200-1	EAL100-1.5	EAL200-1.5	EAL100-2	EAL200-2
		EALB100-1	EALB200-1	EALB100-1.5	EALB200-1.5	EALB100-2	EALB200-2
Power source 50Hz / 60Hz		100V AC	200V AC	100V AC	200V AC	100V AC	200V AC
Rated current		100mA	60mA	100mA	60mA	110mA	60mA
Max. power consumption		10W	12W	10W	12W	11W	12W
Valve closing time 90°	50Hz	Approx.6 sec.		Approx.12 sec.		Approx.15 sec.	
	60Hz	Approx.5 sec.		Approx.10 sec.		Approx.13 sec.	
Max. output torque		1.9N·m		3.9N·m		9.8N·m	
Rated time		Continuous					
Insulation Class		JIS Class E					
Sensitive switch contact capacity		125V AC 2A, 250V AC 0.6A (Resistance load)				250V AC 3A (Resistance load)	
Position limit switch		1 unit each for opening / closing (Using the same power source as that of the actuator)					
Insulation strength		1500V AC (1 min. interval)					
Insulation resistance		Minimum 10MΩ (500V DC)					
Standard protection		All weather type (for outdoor use, avoid sunlight)					
Ambient temperature		-20℃ ~ +50℃					
Mounting position		Vertical to horizontal					
Wiring	Vinyl cabtyre cord with 5 cores, 700mm in length						
	0.3mm <sup>2</sup>				0.5mm <sup>2</sup>		
Lubrication		Grease					
Overload protection		Impedance protection					
Coating color		Housing: black    Cover: light blue					

\* Terminals(M3) are used to connect EALB with the power source.

Fig. of actuator-to-valve assemblies

**EAL100 / 200-TE**    **EAL100 / 200-TLUE**  
**EAL100 / 200-TFE**    **EAL100 / 200-UTE**  
**EAL100 / 200-TLE**    **EAL100 / 200-UTFE**  
**EAL100 / 200-TNE**    **EAL100 / 200-UTGE**  
**EAL100 / 200-TGE**    **EAL100 / 200-5 / 10UTWE**  
**EAL100 / 200-TUE**    **EAL100 / 200-UTNE**



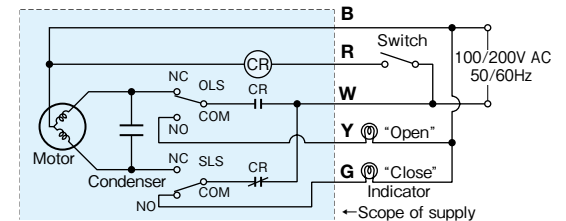
Dimensions of actuator size 1 & 1.5 (mm)		
H <sub>2</sub>	H <sub>3</sub>	D
92	5	60

Note: Refer to Page 18 for actuator sizing for ball valves.

## Type EAL actuator circuit diagrams

(with the valve fully closed)

### EAL 100 / 200 Size 1, 2



● Wire color: B black R red W white Y yellow G green

● Actuator rotates:

Switch ON: Counter-clockwise to fully open the valve

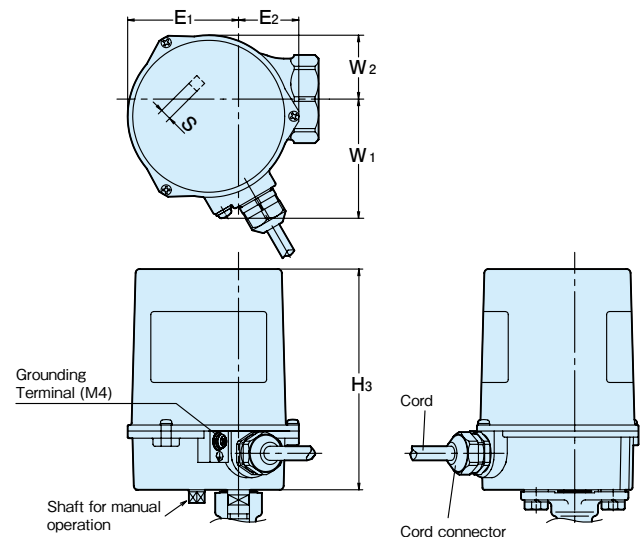
Switch OFF: Clockwise to fully close the valve

● Limit switches activate:

OLS: on fully opening the valve (B-W: off W-Y: on)

SLS: on fully closing the valve (B-W: off W-G: on)

Note: For all sizes of Type EALB 100 / 200, the terminals are numbered 1, 2, 3, 4 and 5 in place of B, R, W, Y and G respectively.



Dimensions of actuator size 2 (mm)					
H <sub>3</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S
108.5	54.5	30	59	31.5	5.5

# Type EALB Electric Actuators / Class 10K Bronze or Stainless Steel Ball Valves

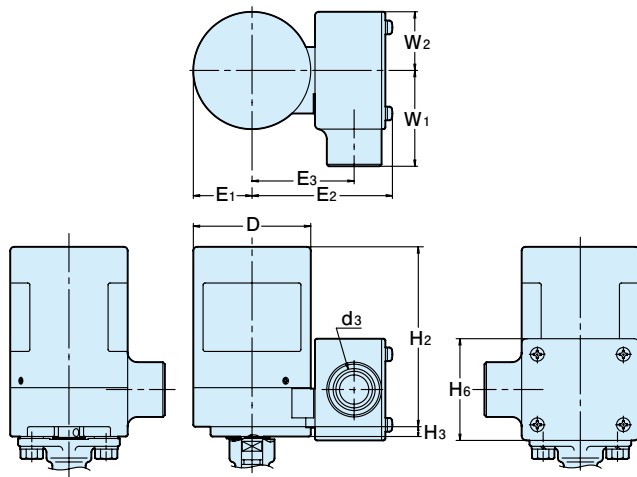
The circuit diagram is the same as the one for Type EAL actuators.

Refer to Page 17.

Note: Terminal box (M3) is equipped for electric connection with the power source.

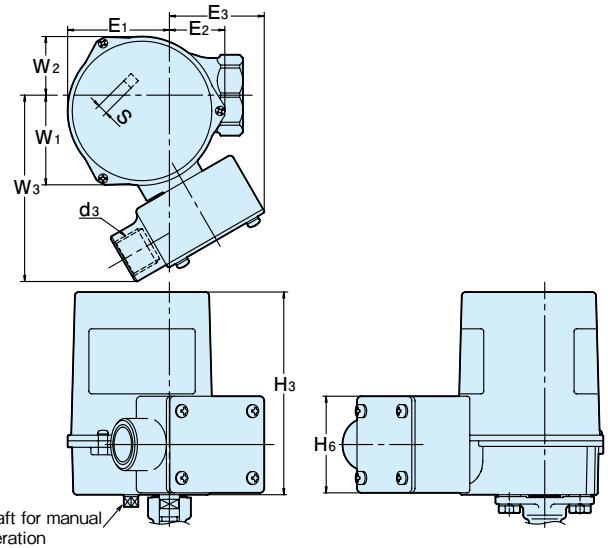
Fig. of actuator-to-valve assemblies

**EALB100 / 200-TE**    **EALB100 / 200-TUE**    **EALB100 / 200-5 / 10UTWE**  
**EALB100 / 200-TFE**    **EALB100 / 200-TLUE**    **EALB100 / 200-VT**  
**EALB100 / 200-TLE**    **EALB100 / 200-UTE**    **EALB100 / 200-VTS**  
**EALB100 / 200-TNE**    **EALB100 / 200-UTFE**    **EALB100 / 200-10VT**  
**EALB100 / 200-TGE**    **EALB100 / 200-UTGE**    **EALB100 / 200-UTNE**



Dimensions of actuator size 1 & 1.5 (mm)

d <sub>3</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>6</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	W <sub>1</sub>	W <sub>2</sub>	D
G $\frac{1}{2}$	92	5	52	30	72	52	49	30	60



Dimensions of actuator size 2 (mm)

d <sub>3</sub>	H <sub>3</sub>	H <sub>6</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	S
G $\frac{1}{2}$	108.5	52	54.5	30	52	49	31.5	100	5.5

Actuator sizing table (EAL·EALB Type)

Fig	Size	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
TE		Size-1			Size-1.5		Size-2		
TFE					Size-1.5		Size-2		
TLE					Size-1		Size-2		
TNE		Size-1			Size-1.5		Size-2		
TGE		Size-1.5			Size-2				
TUE					Size-1				
TLUE									
UTE		Size-1			Size-1.5		Size-2		
UTFE					Size-1.5		Size-2		
UTGE		Size-2							
5/10UTWE		Size-1			Size-1.5		Size-2		
VT, VTS, 10VT					Size-2				



## Type EAH and EAHB Electric Actuators / Class 10K Vertical 3-way Bronze or Stainless Steel Ball Valves

100V / 200V AC 50Hz / 60Hz

- **Automated change of flow direction**
- **Choice of 3-way operation: 2 different flow passages and flow block without leakage**
- **Exclusive mounting with KITZ TNVE & UTVE ball valves**
- **Factory assembled terminal box for easier installation of actuators (EAHB)**

### Type EAH and EAHB actuator design specifications

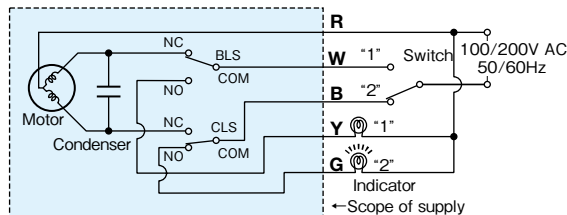
Specification \ Type	Type	EAH100-1 EAHB100-1	EAH200-1 EAHB200-1	EAH100-1.5 EAHB100-1.5	EAH200-1.5 EAHB200-1.5	EAH100-2 EAHB100-2	EAH200-2 EAHB200-2
Power source 50Hz / 60Hz		100V AC	200V AC	100V AC	200V AC	100V AC	200V AC
Rated current		90mA	50mA	90mA	50mA	100mA	50mA
Max. power consumption		9W	10W	9W	10W	10W	
Valve closing time 90°	50Hz	Approx.12 sec.		Approx.24 sec.		Approx.30 sec.	
	60Hz	Approx.10 sec.		Approx.20 sec.		Approx.26 sec.	
Max. output torque		1.9N·m		3.9N·m		9.8N·m	
Rated time		Continuous					
Insulation Class		JIS Class E					
Sensitive switch contact capacity		125V AC 2A, 250V AC 0.6A (Resistance load)				250V AC 3A (Resistance load)	
Position limit switch		1 unit each for opening / closing (Using the same power source as that of the actuator)					
Insulation strength		1500V AC (1 min. interval)					
Insulation resistance		Minimum 10MΩ (500V DC)					
Standard protection		All weather type (for outdoor use, avoid sunlight)					
Ambient temperature		-20℃ ~ +50℃					
Mounting position		Vertical to horizontal					
Wiring	Vinyl cabtyre cord with 5 cores, 700mm in length						
	0.3mm <sup>2</sup>					0.5mm <sup>2</sup>	
Lubrication		Grease					
Overload protection		Impedance protection					
Coating color		Housing: black    Cover: light blue					

\* Terminals(M3) are used to connect EAHB with the power source.

### Type EAH actuator circuit diagrams

(with the valve positioned at Form 2)

#### EAH 100 / 200



- Wire color: **R** red **W** white **B** black **Y** yellow **G** green
- Actuator rotates: **R-W**: clockwise to Form 1  
**R-B**: counter-clockwise to Form 2
- Limit switches activate: **BLS**: at Form 1 (R-W: off W-Y: on)  
**CLS**: at Form 2 (R-B: off B-G: on)

Note: For all sizes of Type EAHB 100 / 200, the terminals are numbered 1, 2, 3, 4 and 5 in place of R, W, B, Y and G respectively.

## Type EAH Electric Actuators / Class 10K Vertical 3-way Bronze Steel Ball Valves

Fig. EAH100 / 200-TNVE

Actuator size: 1 & 1.5  
Valve size: 1/2" to 1" (Standard bore)

### Valve material

Parts	Materials
Body	CAC406
Body cap	C3771BE
Stem	C6782BD* <sup>1</sup>
Ball	C3531* <sup>2</sup>
Ball seat	PTFE
O-ring	FKM

\*1 Cr plated

\*2 Ni-Cr plated

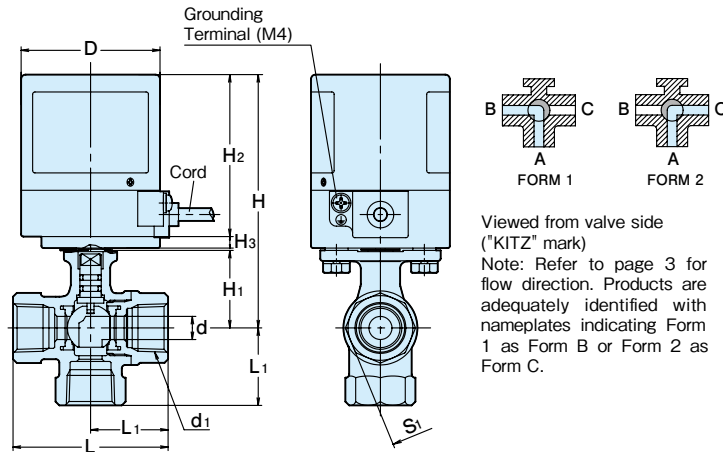
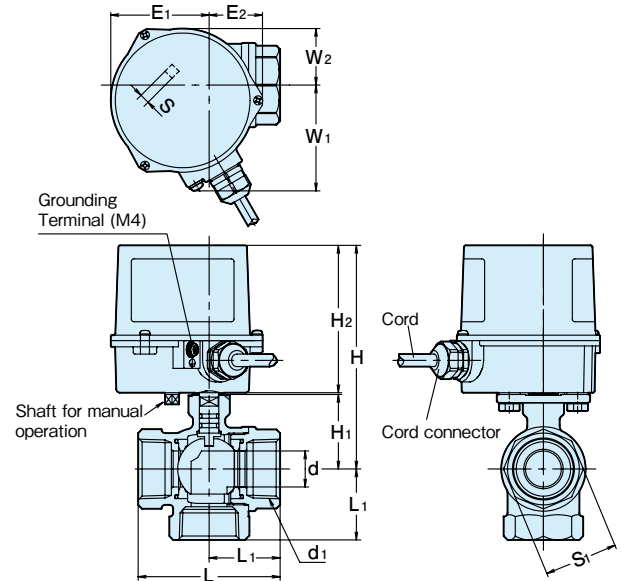


Fig. EAH100 / 200-TNVE

Actuator size: 2  
Valve size: 1 1/4" (Standard bore)



Dimensions of actuator size 1 & 1.5

(mm)

Valve size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	Actuator			
							H <sub>2</sub>	H <sub>3</sub>	D	Type
1/2	10	Rc1/2	109.5	33.5	67	33.5	70	5	60	EAH100 / 200-1
3/4	15	Rc3/4	113.5	37.5	68	34.0				EAH100 / 200-1.5
1	20	Rc1/2	117.5	41.5	79	39.5				

Dimensions of actuator size 2

(mm)

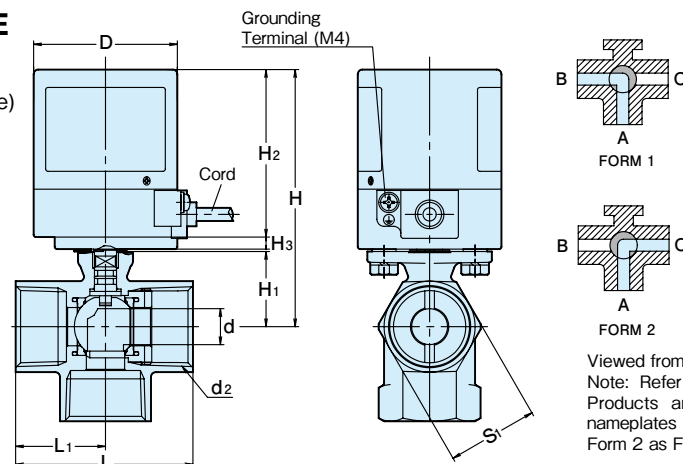
Valve size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator							Type
								H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S		
1 1/4	25	Rc1/4	129.5	46.5	89	44.5	50	82	54.5	30	59	31.5	5.5		EAH 100/200-2

Note: Contact KITZ for technical advice when valve operation at an intermediate position is required\*

## Type EAH Electric Actuators / Class 10K Vertical 3-way Stainless Steel Ball Valves

Fig. EAH100 / 200-UTVE

Actuator size: 1 & 1.5  
Valve size: 1/4" to 1" (Reduced bore)



### Valve material

Parts	Materials
Body	SCS14A
Stem	SUS316+Cr plated
Ball	SUS316
Ball seat	PTFE
O-ring	FKM

Dimensions

(mm)

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuator			
								H <sub>2</sub>	H <sub>3</sub>	D	Type
1/4	4.5	Rc1/4	101.5	25.5	44.0	21.0	21	70	5	60	EAH100 / 200-1
3/8	6.8	Rc3/8	101.5	25.5	44.0	21.0	21				
1/2	8.5	Rc1/2	102.0	26.0	58.0	29.0	25				
3/4	11.5	Rc3/4	104.5	28.5	61.5	31.5	32				
1	15.0	Rc1	107.5	31.5	74.0	37.5	38				EAH100 / 200-1.5

Note: Contact KITZ for technical advice when valve operation at an intermediate position is required\*

## Type EAHB Electric Actuators / Class 10K Vertical 3-way Bronze or Stainless Steel Ball Valves with Terminal Box

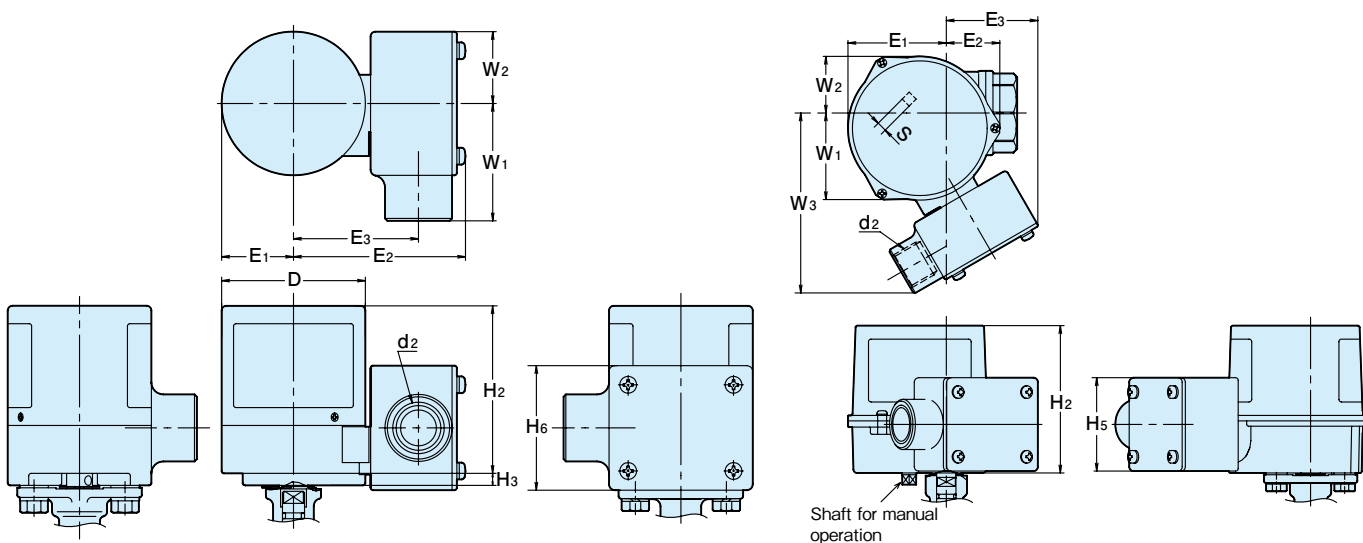
The circuit diagram is the same as the one for Type EAL actuators.

Refer to Page 19.

Note: Terminal box (M3) is equipped for electric connection with the power source.

Fig. of actuator-to-valve assemblies

**EAHB100 / 200-TNVE**  
**EAHB100 / 200-UTVE**



**Dimensions of actuator size 1 & 1.5**

(mm)

d <sub>2</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>6</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	W <sub>1</sub>	W <sub>2</sub>	D
G <sup>1</sup> / <sub>2</sub>	70	5	52	30	72	52	49	30	60

**Dimensions of actuator size 2**

(mm)

d <sub>2</sub>	H <sub>2</sub>	H <sub>5</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	S
G <sup>1</sup> / <sub>2</sub>	82	52	54.5	30	52	49	31.5	100	5.5

# Type EC and ECS Electric Actuators / Class 10K Brass Ball Valves

100V / 200V AC 50Hz / 60Hz

- **Economy version of KITZ EA series driven ball valves**
- **Exclusive mounting KITZ TKE ball valves**
- **90° or 180° Uni-directional drive**
- **Automated change of flow direction**
- **Choice of 3-way operations: 2 different flow passages and flow block without leakage**

## Type EC and ECS actuator design specifications

Specification \ Type	EC100 / 200 ECR100 / 200	ECS100 / 200 ECSR100 / 200
Power source 50Hz / 60Hz	100 / 200V AC	
Rated current	50mA / 30mA	
Max. power consumption	About 4W	
Valve closing time 90°/180°	50Hz	Approx.4.5 sec. / Approx.9 sec.
	60Hz	Approx.3.8 sec. / Approx.7.6 sec.
Max. output torque	0.98N·m	
Rated time	Continuous	
Insulation Class	JIS Class E	
Sensitive switch contact capacity	200V AC 1A, (Resistance load)	
Position limit switch	1 unit each for opening / closing (Using the same power source as that of the actuator)	
Insulation strength	1500V AC (1 min. interval)	
Insulation resistance	Minimum 10MΩ (500V DC)	
Standard protection	All weather type (for outdoor use, avoid sunlight)	
Ambient temperature	-10°C ~ +60°C	
Mounting position	Vertical to horizontal	
Wiring	Vinyl cabtyre cord with 5 cores 0.3mm <sup>2</sup> (300mm long)	
Lubrication	Grease	

**Note:** Refer to Page 1 and 2 for design features, applications flow coefficient of ball valves

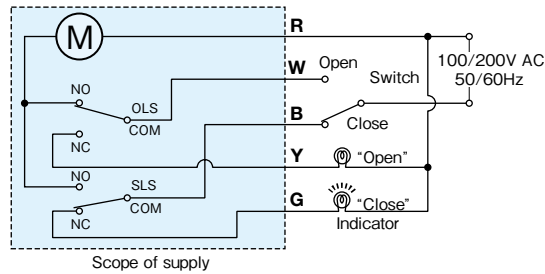
## Valve design specifications

Threaded ends: JIS B 0203

Maximum service pressure  
 1/2" and smaller: 1.0MPa  
 3/4" and 1": 0.5MPa

## Actuator circuit diagrams

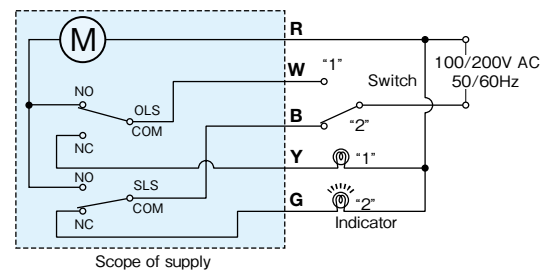
### Type EC (with the valve fully closed)



- Wire color: **R** red **W** white **B** black **Y** yellow **G** green
- Actuator rotates:
  - R-W:** clockwise to fully open the valve
  - R-B:** clockwise to fully close the valve
- Limit switches activate:
  - OLS: on fully opening the valve (R-W: off W-Y: on)
  - SLS: on fully closing the valve (R-B: off B-G: on)

Note: (1) When two or more actuators are operated by a single switch, ensure to prevent unintended current flows using relay contacts.  
 (2) Please note that when the switch is changed from "open" to "shut" or "shut" to "open" in the middle of operation, the actuator will reverse its movement after the completion of original direction. For example, the actuator will start to open the valve after completely shuts it or vice versa.

### Type ECS (with the valve positioned at Form 2)



- Wire color: **R** red **W** white **B** black **Y** yellow **G** green
- Actuator rotates (top view):
  - R-W:** clockwise to stop the valve at Form 1
  - R-B:** clockwise to stop the valve at Form 2
- Limit switches activate:
  - BLS: at Form 1 (R-W: off W-Y: on)
  - CLS: at Form 2 (R-B: off B-G: on)

Note: (1) When two or more actuators are operated by a single switch, ensure to prevent unintended current flows using relay contacts.  
 (2) Please note that when the switch is changed from "open" to "shut" or "shut" to "open" in the middle of operation, the actuator will reverse its movement after the completion of original direction. For example, the actuator will start to open the valve after completely shuts it or vice versa.

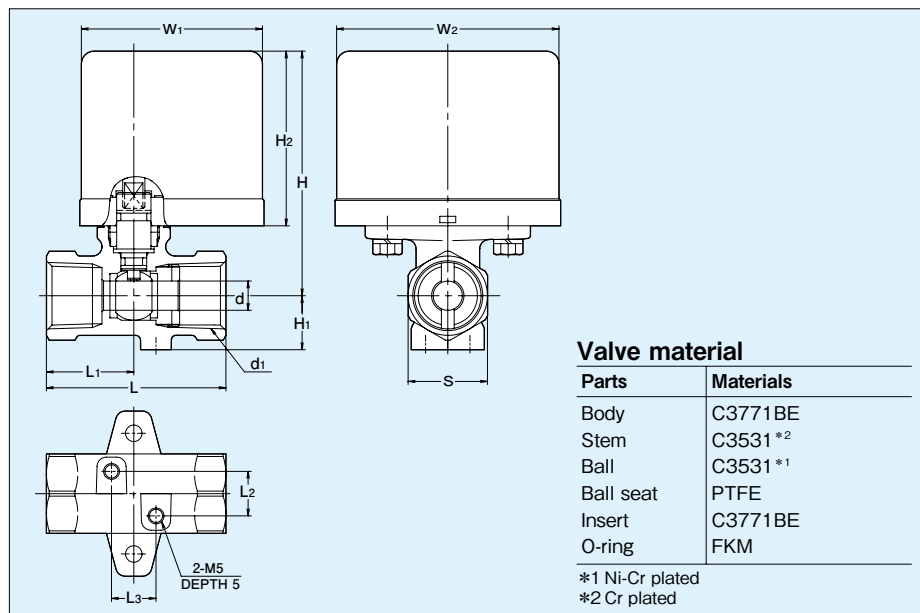
## CAUTION

Actuator housings are made of polyacetal. Don't use these actuators in an atmosphere which contains corrosive gases such as chloride, and solvents such as Trichloroethylene or methylene chloride.

## Type EC Electric Actuators / Class 10K Brass Ball Valves

Fig. EC100 / 200-TKE

Valve size: 1/4" to 3/4"



### Dimensions

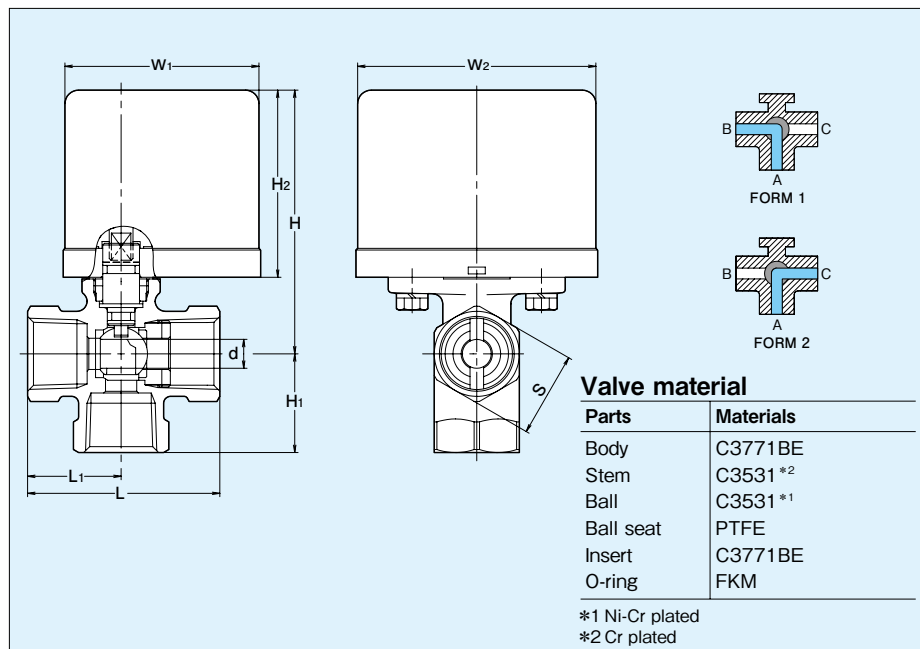
Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	S	Actuator			
										H <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	Type
1/4	4.5	Rc1/4	76.5	15	44	21	14	14	21	55	58	71	EC100 / 200-1
3/8	6.8	Rc3/8	76.5	15	44	21	14	14	21				
1/2	8	Rc1/2	77.5	17	56.5	27.5	14	14	25				
3/4	11	Rc3/4	80	20	59	30	17	16	32				

(mm)

## Type ECS Electric Actuators / Class 10K Vertical 3-way Brass Ball Valves

Fig. ECS100 / 200-TKVE

Valve size: 1/2" to 3/4"



Note: Refer to Page 3 for flow directional.

Products are adequately identified with nameplates indicating either one of Form 1 or Form 2.

(mm)

### Dimensions

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S	Actuator			
								H <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	Type
1/2	8	Rc1/2	77.5	29	56.5	27.5	25	55	58	71	ECS100 / 200-1
3/4	11	Rc3/4	80	33	60	30	32				



## KELMO® EAE Series Spring Electric Actuator

100V / 200V AC 50Hz / 60Hz

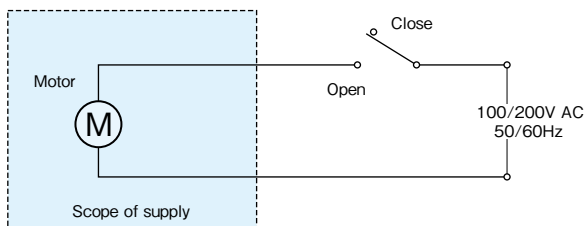
- **Two-wire power supply system for easy replacement of conventional solenoid valves as a valve actuating device.**
- **Modest operating speed with no concern of water hammer, which is problem for conventional solenoid valves.**
- **Availability of manual operation.**
- **Auto-lock provision to hold valve opening position when the actuator is turned off.**

### Type EAE actuator design specifications

Specification	Type	EAE100-1	EAE200-1
Power source 50Hz / 60Hz		100V AC	200V AC
Rated current		200mA	100mA
Max. power consumption		8.5W	7.2W
Valve closing time 90°	50Hz / 60Hz	Approx.10 sec.	
	Spring return	Approx.20 sec.	
Rated time		Continuous	
Insulation Class		JIS Class E	
Insulation strength		1500V AC (1 min. interval)	
Insulation resistance		Minimum 100MΩ (500V DC)	
Standard protection		for indoor use*	
Ambient temperature		-10°C ~ +50°C	
Mounting position		Vertical to horizontal	
Wiring		0.3mm <sup>2</sup> lead wire	
Lubrication		Grease	
Coating color		Housing: black Cover: light blue	

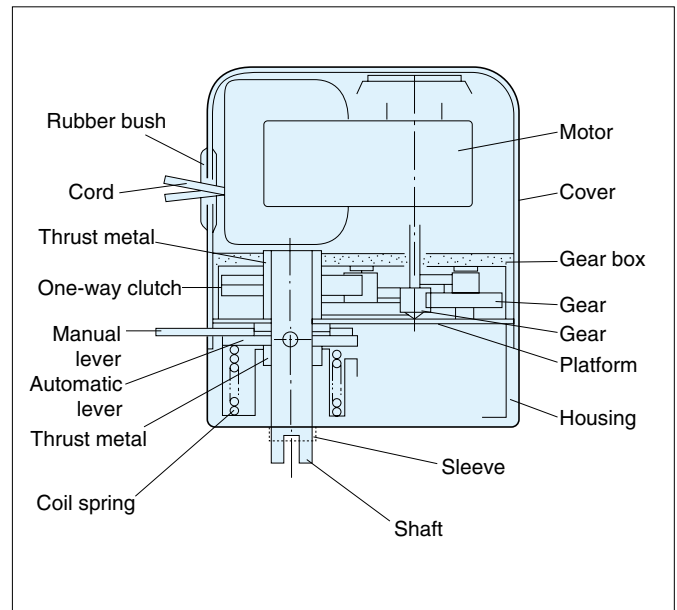
\* The use in outdoor, such as the place where the actuator may get splashed or the place of high humidity, is prohibited.  
Terminal boxes and cabtire cables are available as an option

### Actuator circuit diagrams



### Operating mechanism

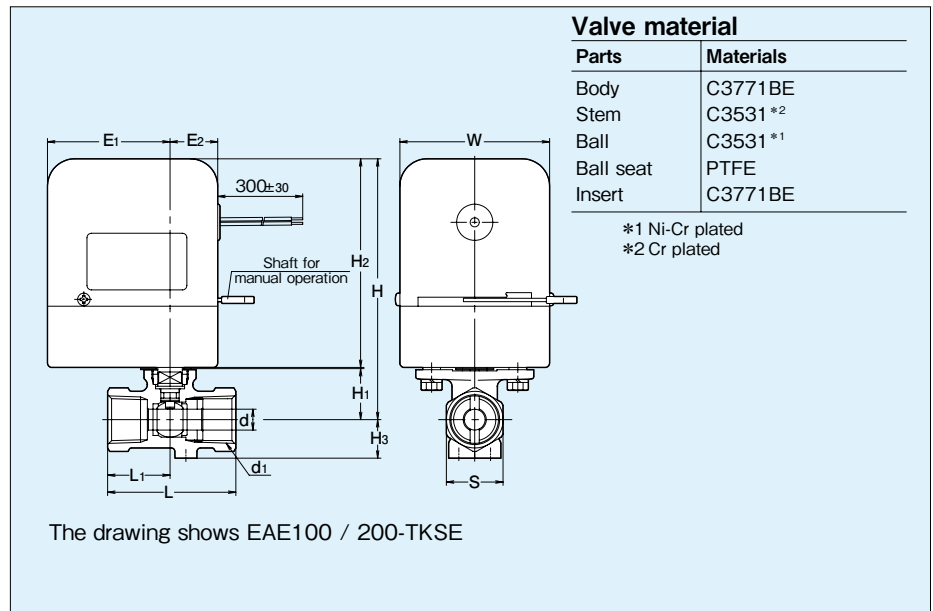
- The basic mechanical structure is given in the illustration below.
- Energizing an actuator rotates a motor and transfer the torque to a one-way clutch via reducing gears. The torque will be, then, transferred to the shaft and open the valve, while winding up the core spring simultaneously.
- 90° rotation of the shaft activates an automatic lever to contact a stopper and stay in thus fixed position, while the actuator remains energized.
- De-energizing an actuator activates the ball to rotate clockwise to its closed position, by means of repulsing force of the coil spring.



## Type EAE Electric Actuators / Class 10K\* Bronze, Brass or Stainless Steel Ball Valves

Fig. of actuator-to-valve assemblies

**EAE100 / 200-TE** ( $\frac{3}{8}$ " and  $\frac{1}{2}$ ")  
**EAE100 / 200-TNE\*** ( $\frac{1}{4}$ " to  $\frac{1}{2}$ ")  
**EAE100 / 200-TUE** ( $\frac{1}{2}$ ")  
**EAE100 / 200-UTE** ( $\frac{1}{4}$ " to  $\frac{1}{2}$ ")  
**EAE100 / 200-TKSE\***



### Dimensions

Valve Size (inch)	d	d <sub>1</sub>	H	H <sub>1</sub>	H <sub>3</sub>	L	L <sub>1</sub>	S	Actuator				
									H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W	Type
$\frac{1}{4}$	5.3	Rc $\frac{1}{4}$	114.5	21.5	15	44	21	21	92	21	54	66	EAE100 / 200-1
$\frac{3}{8}$	7.7	Rc $\frac{3}{8}$	114.5	21.5	15	44	21	21					
$\frac{1}{2}$	8	Rc $\frac{1}{2}$	115.5	22.5	17	56.5	27.5	25					
$\frac{3}{4}$	11	Rc $\frac{3}{4}$	118	25	20	59	30	32					

\* 5K service pressure for  $\frac{3}{4}$ " TKSE,  $\frac{1}{2}$ " TE and  $\frac{1}{2}$ " TNE. Refer to Page 2 for valve design specifications and PTFE seat pressure-temperature ratings.

Note: ● Terminal box and cable are available for option.

● EAE actuators are on-off actuators. Do not use them for partially opening or closing valves.



### Cautions for use of EAE actuators

- These actuators have no provision of explosion-proof and should not be used in an explosive atmosphere. They have no provision of airtight enclosure and are not recommended for use in corrosive gaseous or excessively humid atmosphere, or where the actuators may get splashed.
- These actuators are designed only for on-off fluid control by means of full opening or closing of valves. Don't use them for partial opening or closing for intermediate valve positioning.
- Excessively high frequency of operation such as 20 cycles per hour may shorten service life of actuators. Application to air-conditioning or ventilation service may cause this problem.
- Don't use them for handling highly viscous fluids containing particles, dirt or sands.
- Actuator housings are made of PBT resin. To avoid damage, don't place any other heavy objects on actuators, or don't step on actuators.

# Type ED Electric Actuators / Class 10K Bronze or Stainless Steel Ball Valves

12V / 24V DC

■ **DC 12V or 24V for handy, on-the-spot automated valve operation**

## Type ED actuator design specifications

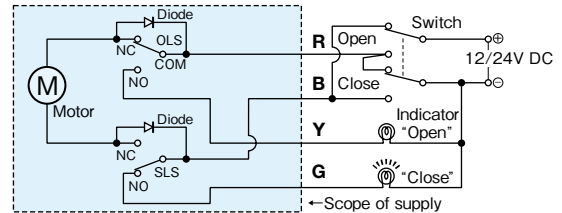
Specification \ Type	ED12-1	ED24-1	ED12-2	ED24-2
Power source 50Hz / 60Hz	12V DC	24V DC	12V DC	24V DC
Rated current	360mA	140mA	520mA	260mA
Starting current	0.4A	0.5A	1.9A	0.95A
Max. power consumption	5W	4W	9W	10W
Valve closing time 90° 50Hz	Approx.5 sec.			
Max. output torque	1.4N·m		7.3N·m	
Rated time	5 min			
Insulation Class	JIS Class E			
Position limit switch	1 unit each for opening / closing (Using the same power source as that of the actuator)			
Insulation strength	250V DC (1 min. interval)		500V DC (1 min. interval)	
Insulation resistance	Minimum 10MΩ (250V DC)			
Standard protection	All weather type (for outdoor use)			
Ambient temperature	-20℃ ~ +50℃			
Mounting position	Vertical to horizontal			
Wiring	Vinyl cabtyre cord with 5 cores		UL approved noninflammable cord with 5 cores	
	0.3mm <sup>2</sup>		0.5mm <sup>2</sup>	
Lubrication	Grease			
Overload protection	Impedance protection		Thermal protection	
Coating color	Housing: black		Cover: light blue	

**Note:** Type ED12-2 and ED24-2 are optionally available for mobile application.  
Don't spray high pressure water directly to Type ED actuator during car wash.

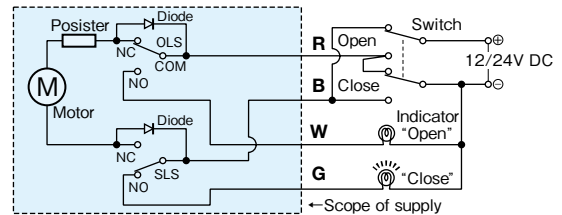
## Type ED actuator circuit diagrams

(with the valve fully closed)

### ED 12 / 24 Size 1



### ED 12 / 24 Size 2



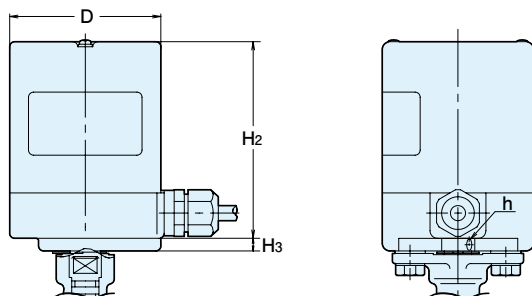
- Wire color: **R** red **W** white **B** black **Y** yellow **G** green
- Actuator rotates:  
**R**⊕ - **B**⊖: Counter-clockwise to fully open the valve  
**R**⊖ - **B**⊕: Clockwise to fully close the valve
- Limit switches activate:  
 OLS: on fully opening the valve (R-B: off R-Y(W): on)  
 SLS: on fully closing the valve (R-B: off B-G: on)

## Actuator sizing table (ED Type)

Fig\Size	1/4	3/8	1/2	3/4	1	1¼	1½	2
TE		Size-1			Size-2			
TNE	Size-1				Size-2			
UTE	Size-1					Size-2		
UTFE			Size-1	Size-2				
UTGE	Size-2							
5/10UTWE		Size-2						

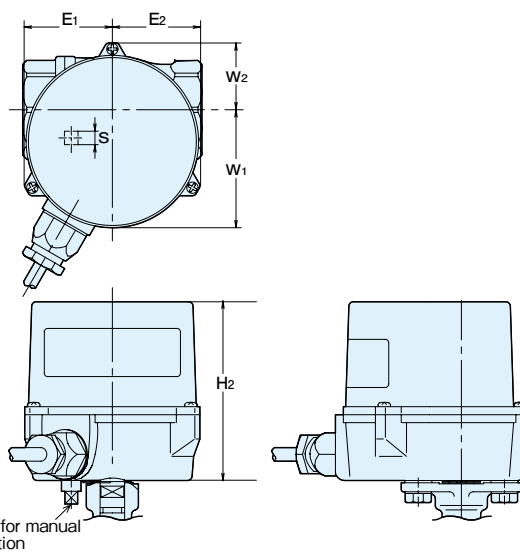
Fig. of actuator-to-valve assemblies

**ED12 / 24-TE**  
**ED12 / 24-TNE**  
**ED12 / 24-UTE**  
**ED12 / 24-UTFE**  
**ED12 / 24-UTGE**  
**ED12 / 24-5 / 10UTWE**



Dimensions of actuator size 1 (mm)

H <sub>2</sub>	H <sub>3</sub>	D	h
78	5	60	4



Dimensions of actuator size 2 (mm)

H <sub>2</sub>	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	S
79	39	39	52	30	5.5

## Type ES Electric Actuators / Class 10K Brass or Stainless Steel Ball Valves

100V / 200V AC 50Hz / 60Hz

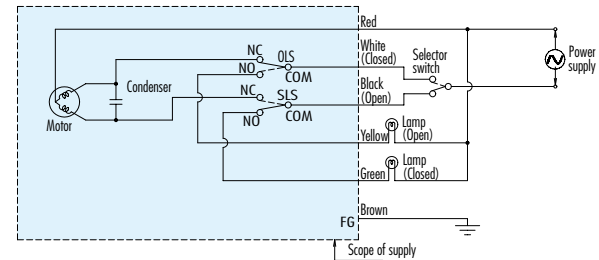
- Shock-resistant and tough polycarbonate (PC) is adopted to the actuator cover and the gear case to improve durability.
- Dust-prevention and drip-proof construction compliant with IP65 ensure the installation in a severe environment. (Contact KITZ for submergence resistance.)
- Easy separation of valve-actuator assemblies for replacement by hand even in a confined space.
- Semi-translucent actuator cover allows easy viewing of the valve position indicator.
- Downsizing of the product has been achieved by modifications to the layout of the actuator internal parts and the valve connecting structure.
- This product can be installed to the arbitrary location of the intended device using the tapped holes for fixing at the bottom of the valve. Efficiency of piping work is significantly improved and connection to nylon tubing is easily done.

### Type ES actuator design specifications

Specification	Type	ESA100-1	ESA200-1
Operation		ON-OFF (Fully open ⇔ Fully closed)	
Power source (single phase) 50Hz/60Hz		100V AC±10%	200V AC±10%
Rated current		90mA	50mA
Valve open/closing time		Approx. 9 sec.	Approx. 7.5 sec.
Rated time		30%ED (Maximum continuous operation time: 10 min)	
External output		1 each for opening/closing	
Insulation Class		Class E	
Insulation strength		1 min./1500V AC or 1 sec./1800V AC	
Insulation resistance		10MΩ or more (500V DC)	
Service environment		Indoor use only (No direct exposure to the sunlight) -20°C to +50°C (No freezing)	
Mounting orientation		Vertical to horizontal	
Overload protection		Impedance protection	
Cable specification	Connection	Cable connection	
	Cable	0.5SQ, 6 cores, Length: 500mm	
External material		PC, PPC	
Protection rate		Equivalent to IP65 of IEC60529 (Contact KITZ for submergence resistance.)	
Dismounting of actuator		Removal of 2 fixing pins	
Manual operation		Removal of actuator	
Compliance with RoHS		ESA□□00-UTASE (SCS 13A valves) :Standard	

### Type ES actuator circuit diagrams

(with the valve fully closed)



- \* Wire color: R red, W white, B black, Y yellow, G green, Br brown
- \* Valve in the fully closed position is shown in the circuit diagram above.
- \* In the case where yellow cable or green cable is not loaded for connection, do not connect them. Please insulate them individually.
- \* Ground the product to prevent an electric shock.

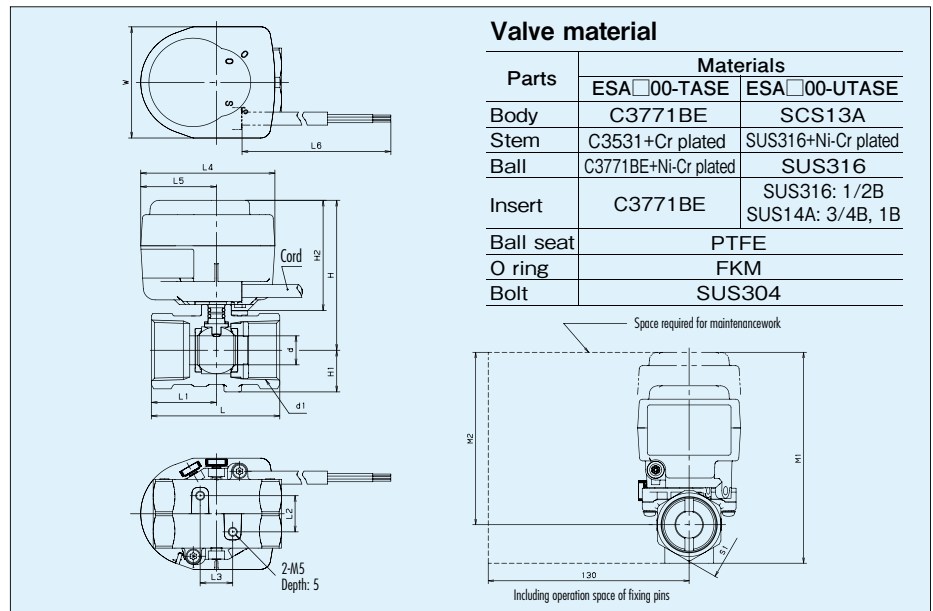


# Type ES Electric Actuators / Class 10K Brass or Stainless Steel Ball Valves

Fig. of actuator-to-valve assemblies  
**ESA100 / 200-TASE**  
**ESA100 / 200-UTASE**



The photo shows ESA 100 / 200-TASE



## Dimensions

(mm)

Valve Size (inch)	Cv	d	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	S <sub>1</sub>	M <sub>1</sub>	M <sub>2</sub>	Actuator				
													H <sub>2</sub>	L <sub>4</sub>	L <sub>5</sub>	L <sub>6</sub>	W
1/2	5	9.2	Rc1/2	77.3	17	56.5	27.5	14	14	25	115	98	61.5	74.5	42	500	61.5
3/4	10	12.5	Rc3/4	79.8	20	59	30	17	16	32	120	100					
1	15	16	Rc1	83	23	71	36	20	18	38	126	103					

## Precautions for Trouble-free Operation of Electric Actuator Driven Ball Valves

### Storage and Handling

Electrically operated KITZ compact ball valves are individually packed in styrofoam boxes. Don't unpack until you are ready to mount on the pipeline. Store in dry, corrosion-free environment to keep rust-free, although they are adequately coated for primary protection. Handle units carefully when actuators are equipped with solenoid valves and other accessories. Don't place any other objects on actuators, and don't step on actuators. Overloading actuators must always be prevented.

### Mounting and Piping

Before mounting electrically operated KITZ compact ball valves, make visual inspection of all valves, actuators and accessories to assure trouble-free condition. Tighten any loosened bolts securely. Clean valve and pipe bores to remove welding spatters, scales or any other foreign objects which may have been left inside. After mounting has been completed, blow the inside of all connected pipes and valves prior to the pilot operation of the system.

Don't use them in explosive or corrosive gaseous conditions, to avoid explosions, or damage to terminal contacts.

If there are materials containing silicon in the surrounding environment, a contact failure may occur due to the generation of siloxane gas. Do not use the product in a siloxane gas atmosphere.

### Wiring and Operation

Color-coded wires should be connected to each correct terminal according to the actuator circuit diagram shown on each page of this catalog. Incorrect wiring may damage electric components and accessories.

The following actuator are not provided with built-in relays. For parallel operation with other actuators, be sure to deploy a separate relay for each valve to drive.

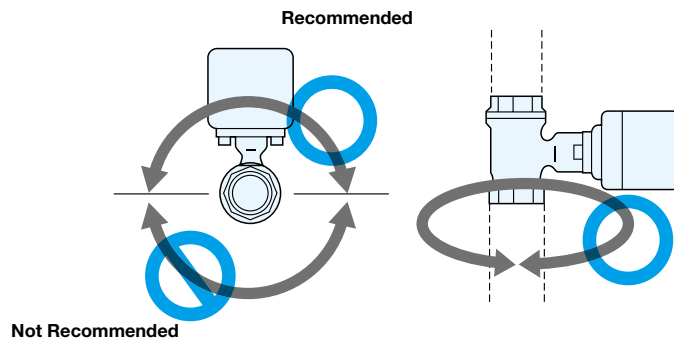
<b>EA</b>	<b>EAL</b>	<b>EAH</b>	<b>EC</b>	<b>EAE</b>	<b>ED</b>	<b>ES</b>
<b>EAB</b>	<b>EALB</b>	<b>EAHB</b>	<b>ECS</b>			

When valve opening or closing indicator lamp is not required, cut the exposed part of the wire end and isolate it from the electric current. Before manual operation, be sure to turn off the switch.

Do not use silicon-containing materials (electric wire, filler, adhesive) when wiring. It may result in a contact failure due to the generation of siloxane gas.

### Maintenance

Disassembly of actuators is not recommended. Electrically operated KITZ compact ball valves can be mounted vertically, horizontally or with any intermediate angle as illustrated here. However, don't mount any lower than the horizontal level, as intrusion of rainwater may affect the quality of electric components and accessories.



## Design Features of KITZ C·CS /FBS Series Actuators

- Lightweight and compact size  
Die-casted aluminum body and double piston mechanism make the actuator lightweight and compact.
- Simple mechanism and less malfunction  
This actuator consists of minimum number of parts. That makes the actuator longer service life and less possibility of malfunction.
- Special solenoid valve  
Direct mount type special solenoid valve exclusively use for KITZ C type actuator is available.
- High efficient quarter turn actuator  
Double piston type rack and pinion mechanism provides high efficient quarter turn rotation.
- Direct mount type  
The actuator is directly mounted on a valve with only two bolts.

FBS type actuator should be chosen for bigger size valves.

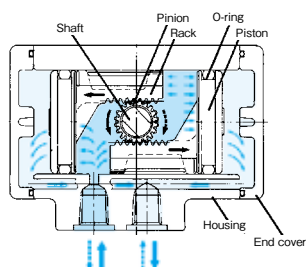
### Standard guide actuator selection

Fig	Size	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2		
TE			C-1				CS-2				
			CS-1	CS-2			(FBS-1)				
TFE				C-1			C-2				
				CS-2	(FBS-1)						
TLE				C-1				C-2			
				CS-2				(FBS-1)			
TNE			C-1				C-2				
			CS-1	CS-2			(FBS-1)				
TGE				C-1	C-2						
				CS-2	(FBS-1)						
TUE			C-1								
			CS-2								
UTE	C-1						C-2				
	CS-1			CS-2			(FBS-1)				
UTFE			C-1			C-2					
			CS-2	(FBS-1)							
UTGE	C-1			C-2							
	CS-2			(FBS-1)							
5/10UTWE		C-1			C-2						
		CS-2			(FBS-1)						

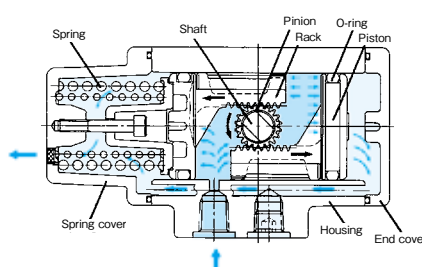
For the size ranges not covered by KITZ C Series actuators, more powerful KITZ Type FBS-1 actuators are recommended.

## KITZ C·CS Series Pneumatic Actuators

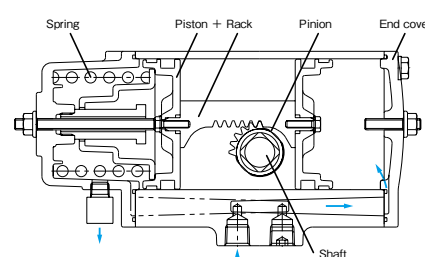
Type C (Double action)



Type CS (Spring return)



Type FBS (Spring return)



## Actuator design Specifications

Specification	Type	C-1	C-2	CS-1	CS-2	FBS-1
Operating media		Instrumentation air				
Standard operating pressure		0.4 MPa (60psi)				
Operating pressure range		0.4 ~ 0.7 MPa (60~100psi)				
Output torque *1		3.9 N-m	8.5 N-m	1.3 N-m	3.1 N-m	7.6 N-m
Housing shell test pressure		1.0 MPa (140psi)				
Angle of Revolution		90°(+1°~+5°)				90°±7°
Cylinder Volume (Litter)		0.073	0.160	0.033	0.071	0.15
Operation Time		Max. 1 sec.*4				
Service Temperature range *2		-20°C ~ +60°C -4°F ~ +140°F				-20°C ~ +80°C -4°F ~ +176°F
Ambient Condition *3		Indoor				

### Notes:

\*1 At supply pressure, 0.4MPa

\*2 Free from freezing of supply air

\*3 For outdoor service, consult a KITZ Engineer

\*4 On a condition of KITZ standard air equipments and no load on a valve

## KITZ Standard Accessories

C type actuator has a direct mount type special solenoid valve. It makes piping-less and compact mounting. This special solenoid valve is not waterproof type. Prevent water if you use them outdoor.

### ◆ Special solenoid valve

Electrical connection	Lead wire type
Working pressure range	0.15~0.7MPa
Ambient temperature range	5~50°C
Air inlets	Rc1/8
Effective area of valve	4.0mm <sup>2</sup>
Power supply	AC100, 110V/50, 60Hz:±10% AC200, 220V/50, 60Hz:±10% DC24:±10%

### ◆ Limit Switch

Sensing position	1 position
Power supply	AC: 5A-125VAC 5A-250VAC DC: 0.5A-115VDC 0.25A-230VDC
Ambient temperature range	-10~70°C
Electrical connection	Conduit type
Electric wire diameter	φ5.8-φ7.8

### ◆ Filter-Regulator

Structure	Relief type
Working pressure range	0.04~0.83MPa
Ambient temperature range	5~65°C
Nominal filtration rating	5μm
Air inlets	Rc1/4

### ◆ Silencer

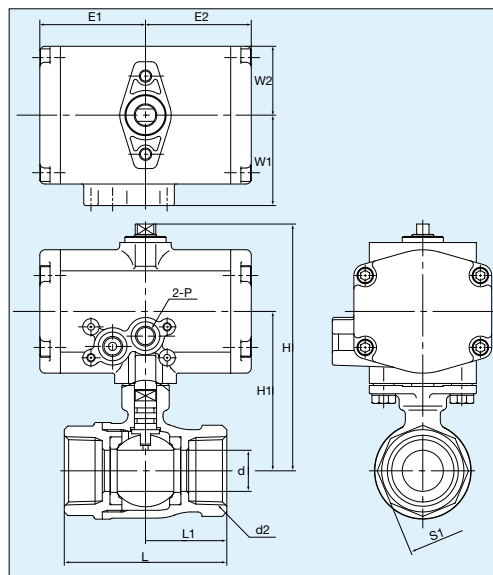
Connection	Rc1/8
Effective area	15mm <sup>2</sup>
Noise reduction	18dB
Maximum working pressure	0.9MPa
Ambient temperature range	5~60°C

### ◆ Speed Controller

Structure	Restrictor	Exhaust restrictor	Exhaust restrictor with silencer
Working pressure range	0.05~1MPa	0.1~1MPa	0~1MPa
Ambient temperature range	5~60°C	-5~60°C	0~60°C
Air inlets	Rc1/8	R1/8·Rc1/8	Rc1/8

## Type C Pneumatic Actuators / Class 10K Bronze Ball Valves

Fig. **C-TE**  
(Standard bore)

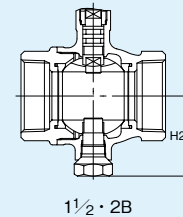


### Valve material

Parts	Materials
Body	CAC406
Body cap	C3771BE
Stem	C6782BD <sup>*1</sup>
Ball	C3531 <sup>*2</sup>
Ball seat	PTFE
O-ring	FKM

<sup>\*1</sup> Cr plated

<sup>\*2</sup> Ni-Cr plated



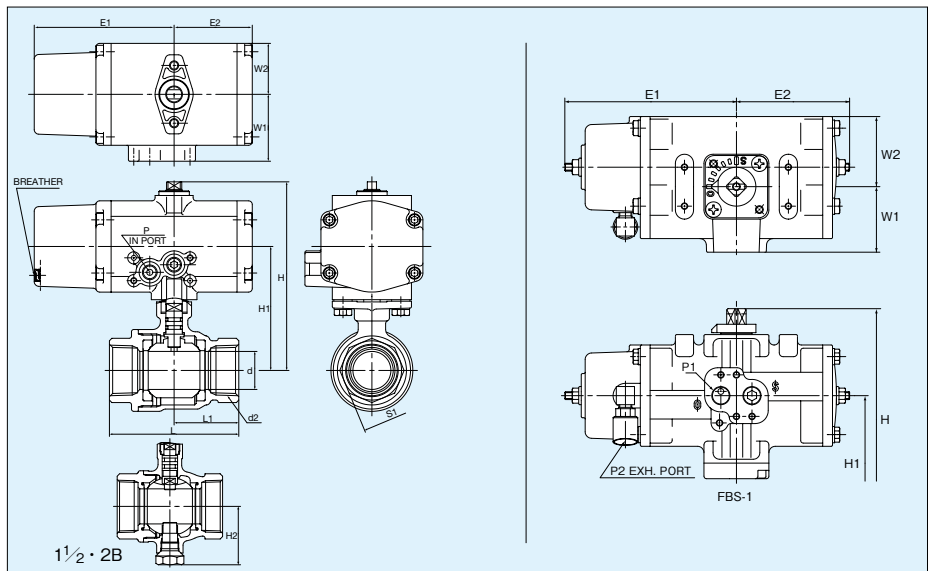
### Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
3/8	7.5	Rc3/8	87.5	56	—	46	22	22	43	43	34.5	26	Rc1/8	C-1
1/2	10	Rc1/2	93.5	62	—	65	32.5	28						
3/4	15	Rc3/4	97.5	66	—	68	34	34						
1	20	Rc1	101.5	70	—	79	39.5	41						
1 1/4	25	Rc1 1/4	124.5	82	—	86	43	50	51.4	51.4	44	33.5	Rc1/8	C-2
1 1/2	32	Rc1 1/2	137.5	95	53.5	96	48	56						
2	40	Rc2	144.5	102	60	109	54.5	68						

(mm)

## Type CS / FBS Pneumatic Actuators / Class 10K Bronze Ball Valves

Fig. **CS-TE**  
Valve size: 3/8" to 1"  
**FBS-TE**  
Valve size: 1 1/4" to 2"  
(Standard bore)



### Dimensions

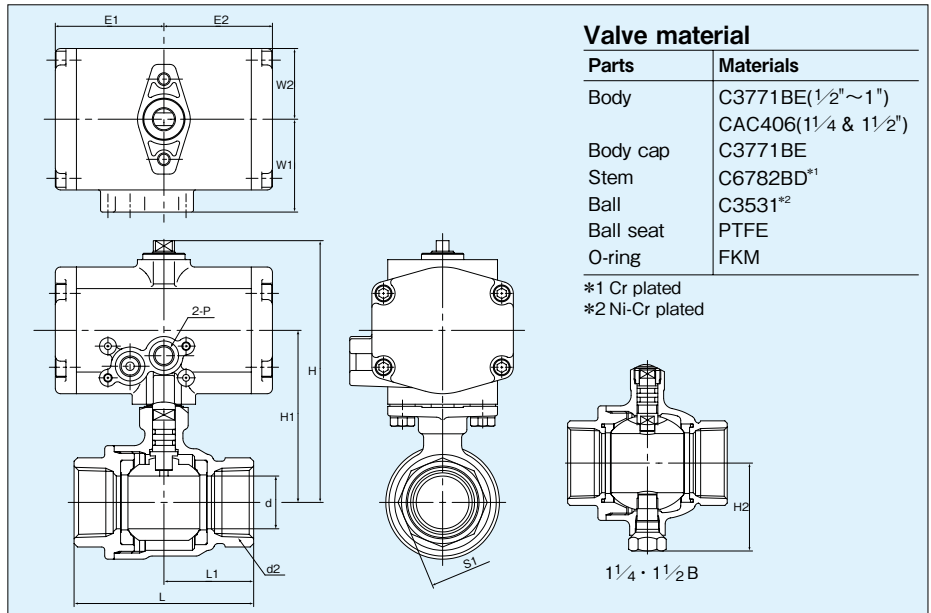
Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators						
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Type
3/8	7.5	Rc3/8	87.5	56	—	46	22	22	69.5	43	34.5	26	—	Rc1/8	CS-1
1/2	10	Rc1/2	112.5	70	—	65	32.5	28	92	51.4	44	33.5	—	Rc1/8	CS-2
3/4	15	Rc3/4	116.5	74	—	68	34	34							
1	20	Rc1	120.5	78	—	79	39.5	41							
1 1/4	25	Rc1 1/4	182	112	—	86	43	50	132	87	50	54	Rc1/4	Rc1/8	FBS-1
1 1/2	32	Rc1 1/2	195	125	53.5	96	48	56							
2	40	Rc2	202	132	60	109	54.5	68							

(mm)



# Type C Pneumatic Actuators / Class 10K Copper Alloy Ball Valves , Full Bore

Fig. **C-TFE**  
(Full bore)



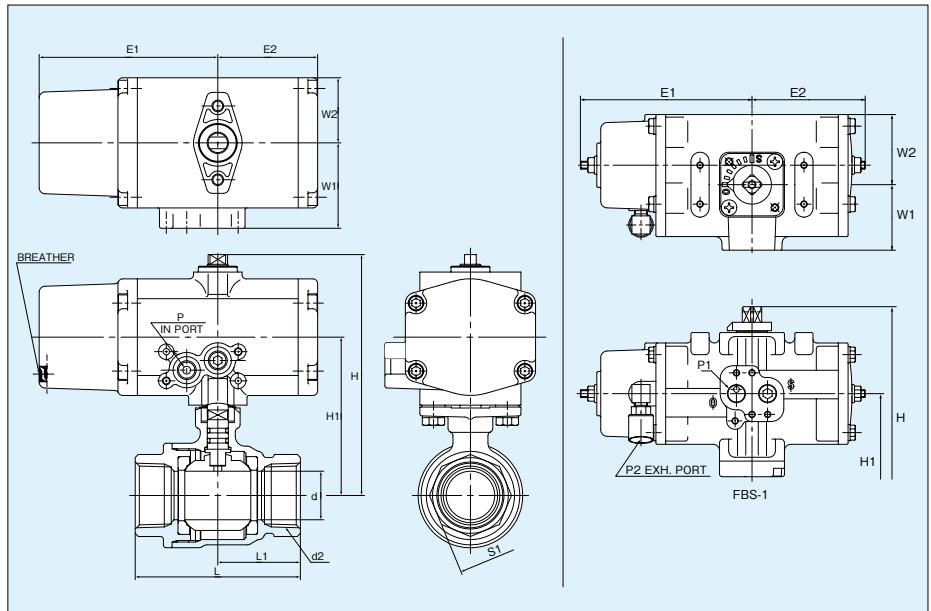
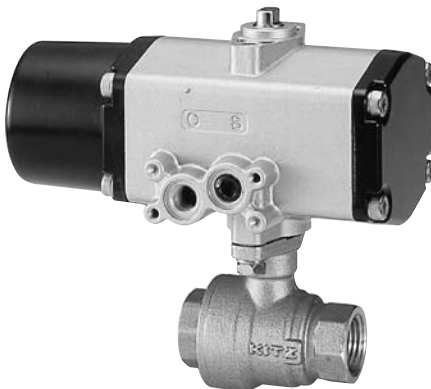
## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/2	15	Rc1/2	97.5	66	—	63	31.5	26	43	43	34.5	26	Rc1/8	C-1
3/4	20	Rc3/4	101.5	70	—	73	36.5	32	51.4	51.4	44	33.5	Rc1/8	C-2
1	25	Rc1	124.5	82	—	85	42.5	39						
1 1/4	32	Rc1 1/4	138.5	96	53.5	98	49	50						
1 1/2	40	Rc1 1/2	144.5	102	59.5	108	54	56						

(mm)

# Type CS / FBS Pneumatic Actuators / Class 10K Copper Alloy Ball Valves , Full Bore

Fig. **CS-TFE**  
Valve size: 1/2"  
**FBS-TFE**  
Valve size: 3/4" to 1 1/2"  
(Full bore)



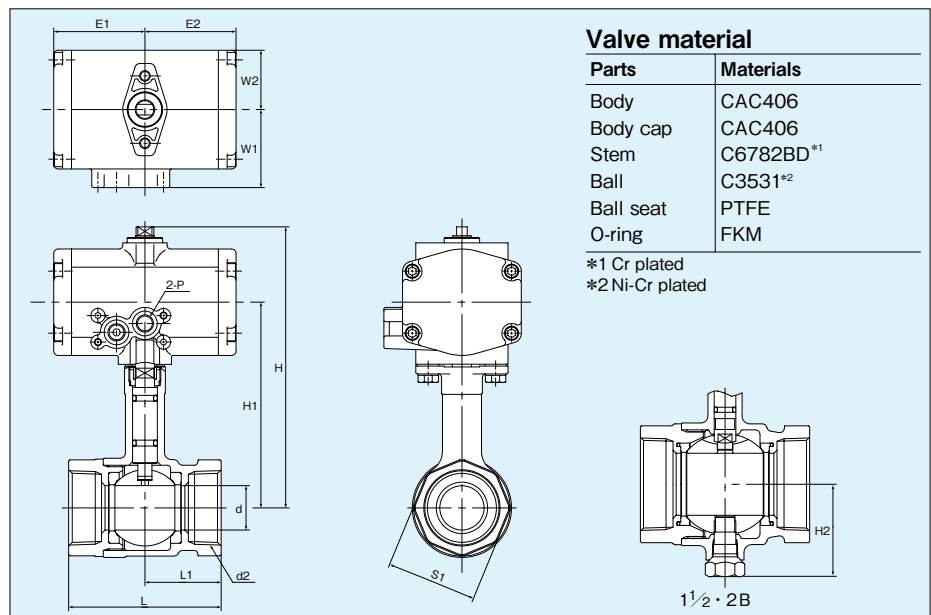
## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators						
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Type
½	15	Rc½	108.5	66	—	63	31.5	26	92	51.4	44	33.5	—	Rc⅛	CS-2
¾	20	Rc¾	178	108	—	73	36.5	32	132	87	50	54	Rc¼	Rc⅛	FBS-1
1	25	Rc1	182	112	—	85	42.5	39							
1¼	32	Rc1¼	196	126	53.5	98	49	50							
1½	40	Rc1½	202	132	59.5	108	54	56							

(mm)

## Type C Pneumatic Actuators / Class 10K Long Neck Bronze Ball Valves

Fig. **C-TLE**  
(Standard bore)



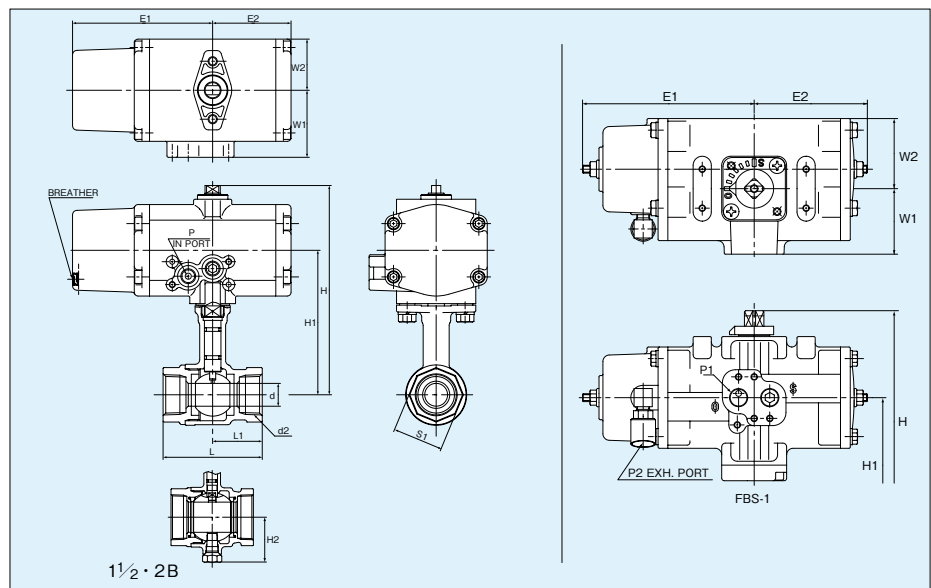
### Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/2	15	Rc1/2	97.5	66	—	63	31.5	26	43	43	34.5	26	Rc1/8	C-1
3/4	20	Rc3/4	101.5	70	—	73	36.5	32						
1	25	Rc1	124.5	82	—	85	42.5	39	51.4	51.4	44	33.5	Rc1/8	C-2
1 1/4	32	Rc1 1/4	138.5	96	53.5	98	49	50						
1 1/2	40	Rc1 1/2	144.5	102	59.5	108	54	56						

(mm)

## Type CS / FBS Pneumatic Actuators / Class 10K Long Neck Bronze Ball Valves

Fig. **CS-TLE**  
Valve size: 1/2" to 1"  
**FBS-TLE**  
Valve size: 1 1/4" to 2"  
(Standard bore)



### Dimensions

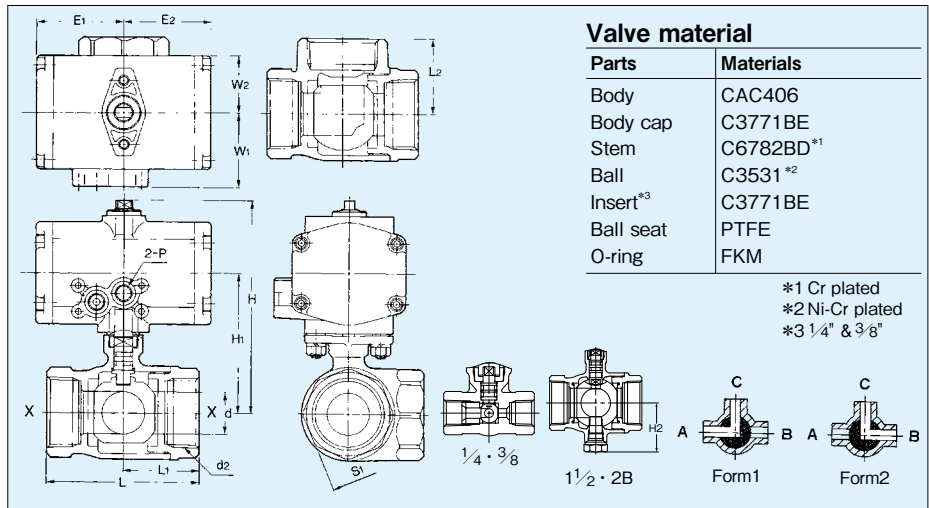
Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
1/2	10	Rc1/2	134.5	92	—	56	28	27	92	51.4	44	33.5	—	Rc1/8
3/4	15	Rc3/4	139.5	97	—	65	32.5	33						
1	20	Rc1	142.5	100	—	78	39	41	132	87	50	54	Rc1/4	Rc1/8
1 1/4	25	Rc1 1/4	215	145	—	86	43	51						
1 1/2	32	Rc1 1/2	218	148	53.5	96	48	58						
2	40	Rc2	226	156	60	109	54.5	71						

(mm)

# Type C Pneumatic Actuators / Class 10K Horizontal 3-way Bronze Ball Valves

Fig. C-TNE

(Standard bore)



Note: Refer to page 3 for flow directional forms.

Products are adequately identified with nameplates indicating either one Form 1 or Form 2.

## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	Actuators					
										E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/4	4.5	Rc1/4	85.5	54	—	46	23	23	21	43	43	34.5	26	Rc1/8	C-1
3/8	6.8	Rc3/8	85.5	54	—	46	23	23	21						
1/2	10	Rc1/2	93.5	62	—	67	33.5	33.5	28						
3/4	15	Rc3/4	97.5	66	—	68	34	34	34						
1	20	Rc1	101.5	70	—	79	39.5	39.5	41	51.4	51.4	44	33.5	Rc1/8	C-2
1 1/4	25	Rc1 1/4	125.5	83	—	89	44.5	44.5	50						
1 1/2	32	Rc1 1/2	138.5	96	53.5	100	50	50	56						
2	40	Rc2	144.5	102	60	115	57.5	57.5	68						

(mm)

# Type CS / FBS Pneumatic Actuators / Class 10K Horizontal 3-way Bronze Ball Valves

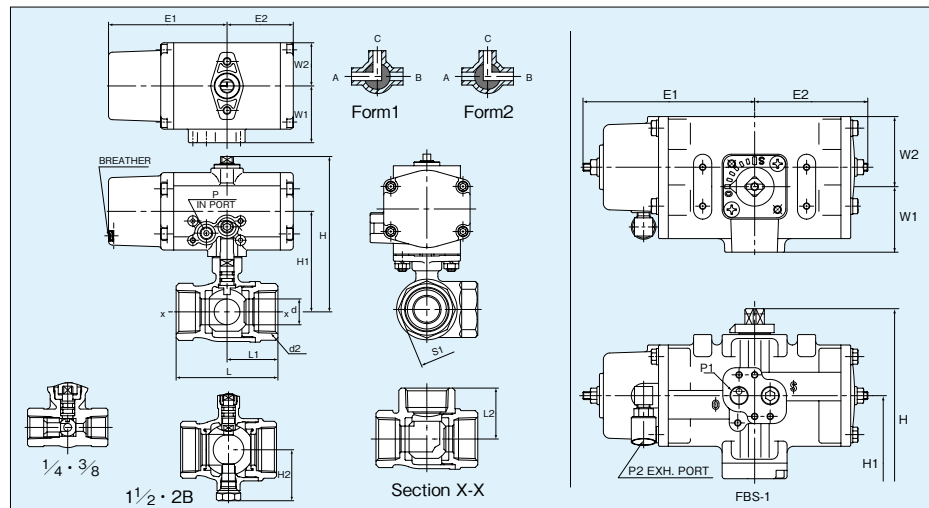
Fig. CS-TNE

Valve size: 1/4" to 1"

## FBS-TNE

Valve size: 1/4" to 2"

(Standard bore)



Note: Refer to page 3 for flow directional forms.

Products are adequately identified with nameplates indicating either one Form 1 or Form 2.

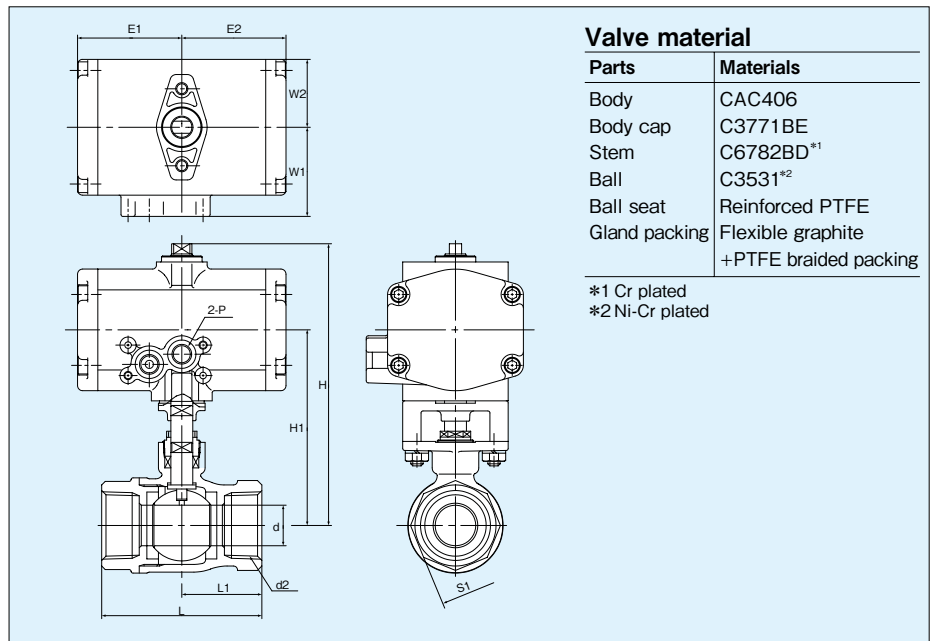
## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	Actuators					
										E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
1/4	4.5	Rc1/4	85.5	54	—	46	23	23	21	69.5	43	34.5	26	—	Rc1/8
3/8	6.8	Rc3/8	85.5	54	—	46	23	23	21						
1/2	10	Rc1/2	112.5	70	—	67	33.5	33.5	28						
3/4	15	Rc3/4	116.5	74	—	68	34	34	34						
1	20	Rc1	120.5	78	—	79	39.5	39.5	41	92	51.4	44	33.5	—	Rc1/8
1 1/4	25	Rc1 1/4	183	113	—	89	44.5	44.5	50						
1 1/2	32	Rc1 1/2	196	126	53.5	100	50	50	56						
2	40	Rc2	202	132	60	115	57.5	57.5	68						

(mm)

## Type C Pneumatic Actuators / Class 10K Bronze Ball Valves, with Gland

Fig. **C-TGE**  
(Standard bore)



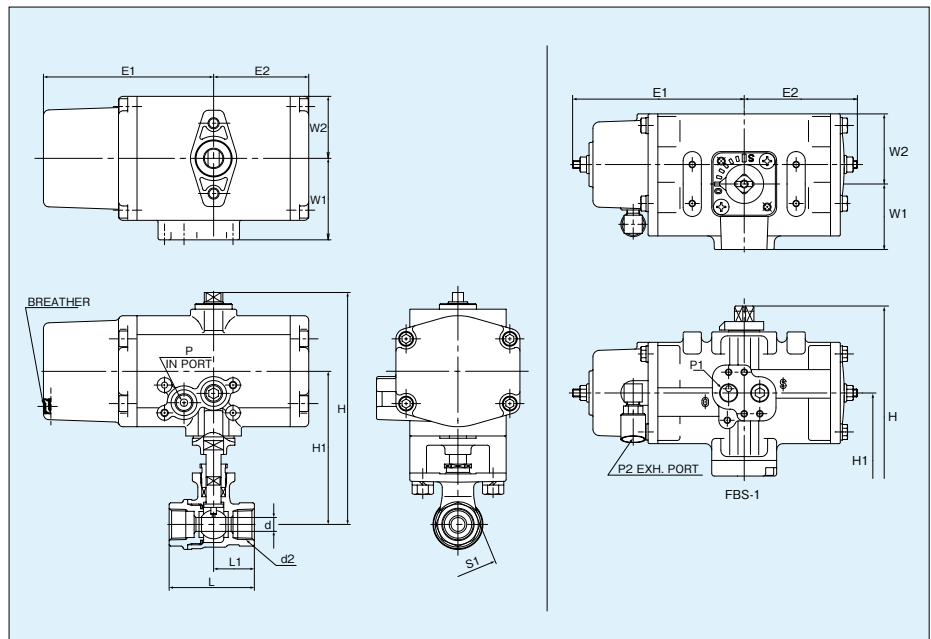
### Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
								E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
3/8	7.5	Rc3/8	107.5	76	46	22	22	43	43	34.5	26	Rc1/8	C-1
1/2	10	Rc1/2	132.5	90	65	32.5	28	51.4	51.4	44	33.5	Rc1/8	C-2
3/4	15	Rc3/4	136.5	94	68	34	34						
1	20	Rc1	140.5	98	79	39.5	41						

(mm)

## Type CS / FBS Pneumatic Actuators / Class 10K Bronze Ball Valves, with Gland

Fig. **CS-TGE**  
Valve size: 3/8"  
**FBS-TGE**  
Valve size: 1/2" to 1"  
(Standard bore)



### Dimensions

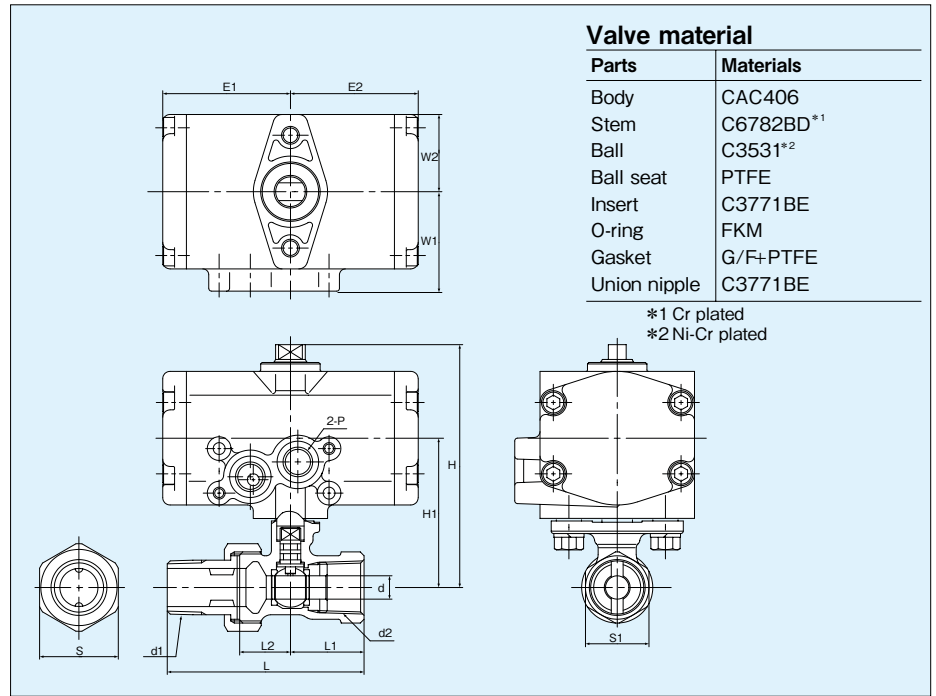
Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>i</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators						
								E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Type
3/8	7.5	Rc3/8	126.5	84	46	22	22	92	51.4	44	33.5	—	Rc1/8	CS-2
1/2	10	Rc1/2	188.5	118.5	65	32.5	28	132	87	50	54	Rc1/4	Rc1/8	FBS-1
3/4	15	Rc3/4	192.5	122.5	68	34	34							
1	20	Rc1	196.5	126.5	79	39.5	41							

(mm)

## Type C Pneumatic Actuators / Class 10K Union-ring Bronze Ball Valves

Fig. C-TUE

(Reduced bore)



### Dimensions

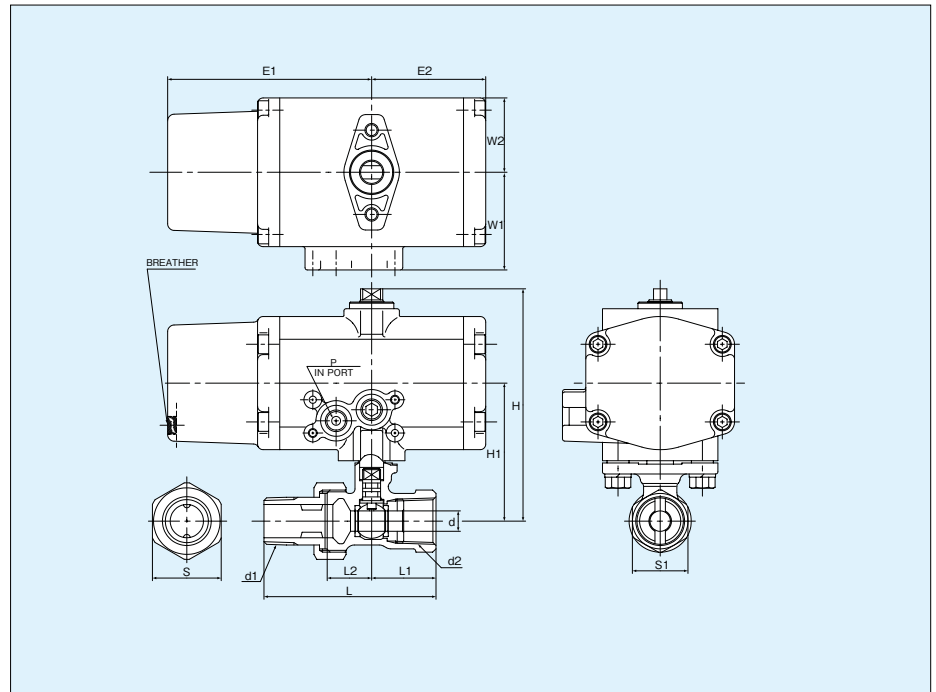
(mm)

Valve Size (inch)	d	d <sub>2</sub>	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S	S <sub>1</sub>	Actuators					
											E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>2</sub>	Type
1/2	8	Rc1/2	R1/2	85.5	54	78.5	29	20	31	25	43	43	34.5	26	Rc1/8	C-1
3/4	11	Rc3/4	R3/4	88.5	57	81	29	20	36	32						

## Type CS Pneumatic Actuators / Class 10K Union-ring Bronze Ball Valves

Fig. CS-TUE

(Reduced bore)



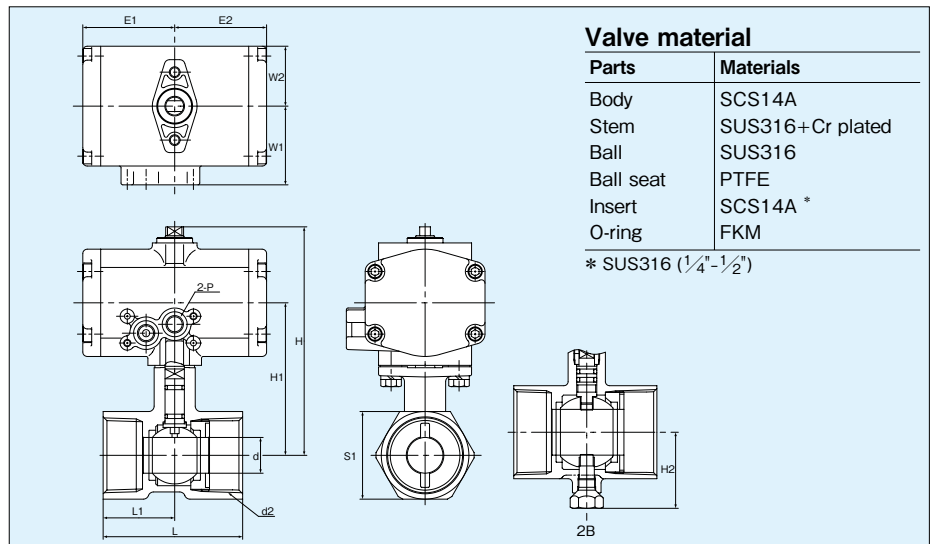
### Dimensions

(mm)

Valve Size (inch)	d	d <sub>2</sub>	d <sub>1</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	S	S <sub>1</sub>	Actuators					
											E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>2</sub>	Type
1/2	8	Rc1/2	R1/2	104.5	62	78.5	29	20	31	25	92	51.4	44	33.5	Rc1/8	CS-2
3/4	11	Rc3/4	R3/4	107.5	65	81	29	20	36	32						

# Type C Pneumatic Actuators / Class 10K Stainless Steel Ball Valves

Fig. **C-UTE**  
(Reduced bore)



## Valve material

Parts	Materials
Body	SCS14A
Stem	SUS316+Cr plated
Ball	SUS316
Ball seat	PTFE
Insert	SCS14A *
O-ring	FKM

\* SUS316 (1/4"-1/2")

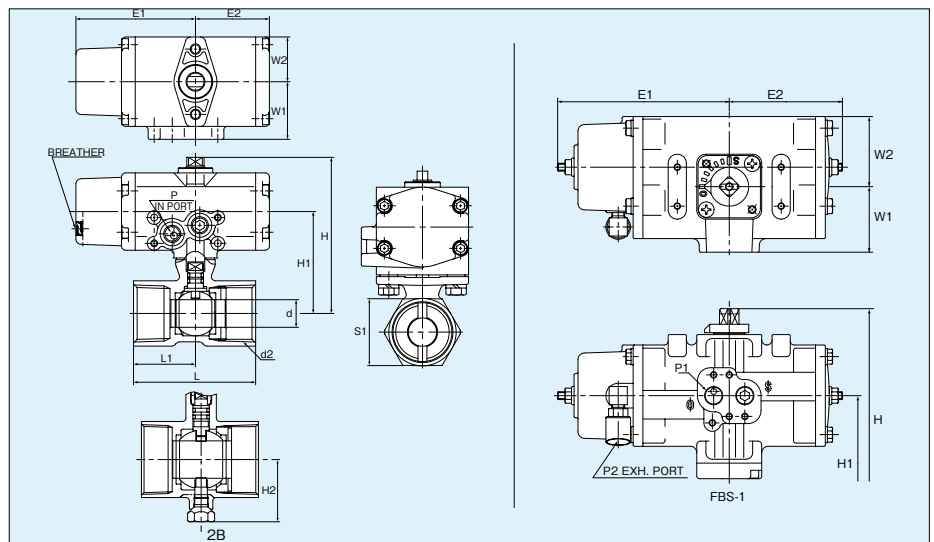
## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/4	4.5	Rc1/4	85.5	54	—	44	21	21	43	43	34.5	26	Rc1/8	C-1
3/8	6.8	Rc3/8	85.5	54	—	44	21	21						
1/2	9.2	Rc1/2	85.5	54	—	56.5	27.5	25						
3/4	12.5	Rc3/4	88.5	57	—	59	30	32						
1	16	Rc1	91.5	60	—	71	36	38	51.4	51.4	44	33.5	Rc1/8	C-2
1 1/4	20	Rc1 1/4	128.5	86	—	78	40	49						
1 1/2	24.5	Rc1 1/2	131.5	89	—	83	42.5	53						
2	32	Rc2	137.5	95	53.5	100	51	65						

(mm)

# Type CS / FBS Pneumatic Actuators / Class 10K Stainless Steel Ball Valves

Fig. **CS-UTE**  
Valve size: 1/4" to 1"  
**FBS-UTE**  
Valve size: 1 1/4" to 2"  
(Reduced bore)



## Dimensions

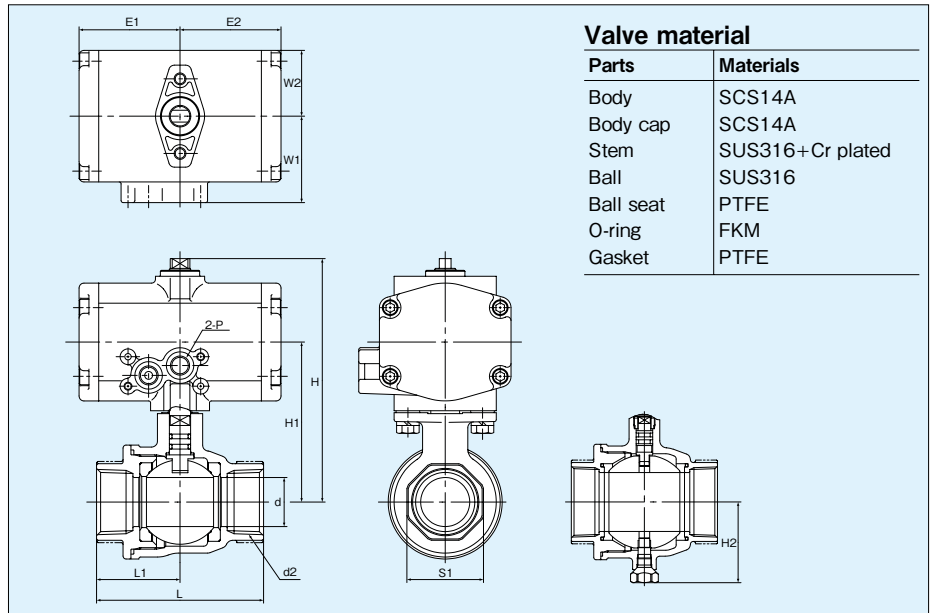
Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
1/4	4.5	Rc1/4	85.5	54	—	44	21	21	69.5	43	34.5	26	—	Rc1/8
3/8	6.8	Rc3/8	85.5	54	—	44	21	21						
1/2	9.2	Rc1/2	104.5	62	—	56.5	27.5	25						
3/4	12.5	Rc3/4	107.5	65	—	59	30	32						
1	16	Rc1	110.5	68	—	71	36	38	92	51.4	44	33.5	—	Rc1/8
1 1/4	20	Rc1 1/4	186	116	—	78	40	49						
1 1/2	24.5	Rc1 1/2	189	119	—	83	42.5	53						
2	32	Rc2	195	125	53.5	100	51	65						

(mm)



# Type C Pneumatic Actuators / Class 10K Stainless Steel Ball Valves , Full Bore

Fig. **C-UTFE**  
(Full bore)



## Valve material

Parts	Materials
Body	SCS14A
Body cap	SCS14A
Stem	SUS316+Cr plated
Ball	SUS316
Ball seat	PTFE
O-ring	FKM
Gasket	PTFE

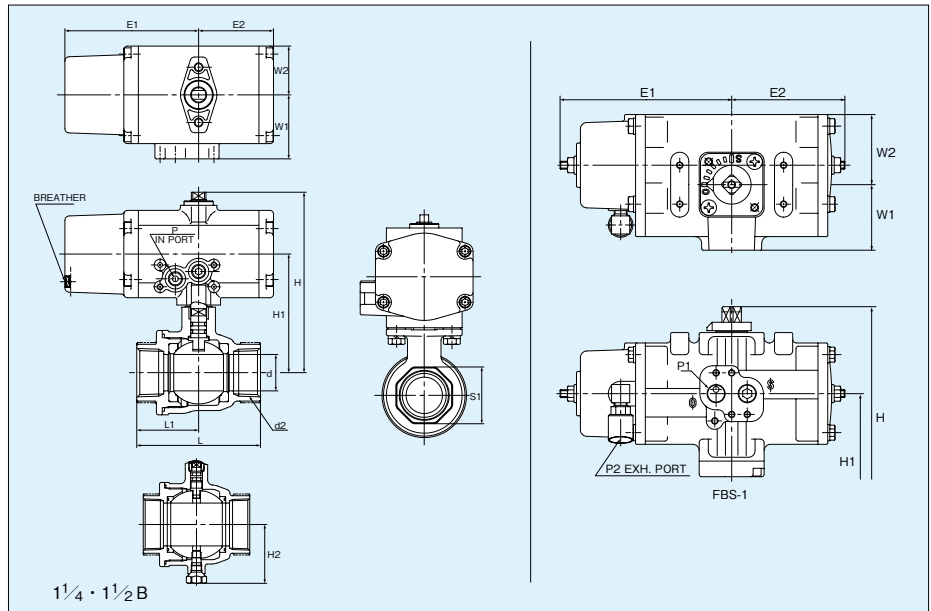
## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/2	15	Rc1/2	97.5	66	—	62	31	26	43	43	34.5	26	Rc1/8	C-1
3/4	20	Rc3/4	101.5	70	—	73	36.5	32	51.4	51.4	44	33.5	Rc1/8	C-2
1	25	Rc1	124.5	82	—	85	42.5	39						
1 1/4	32	Rc1 1/4	138.5	96	55	98	49	48						
1 1/2	40	Rc1 1/2	144.5	102	61	108	54	54						

(mm)

# Type CS / FBS Pneumatic Actuators / Class 10K Stainless Steel Ball Valves , Full Bore

Fig. **CS-UTFE**  
Valve size: 1/2"  
**FBS-UTFE**  
Valve size: 3/4" to 1 1/2"  
(Full bore)



## Dimensions

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators						
									E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	Type
½	15	Rc½	108.5	66	—	62	31	26	92	51.4	44	33.5	—	Rc⅛	CS-2
¾	20	Rc¾	178	108	—	73	36.5	32	132	87	50	54	Rc¼	Rc⅛	FBS-1
1	25	Rc1	182	112	—	85	42.5	39							
1¼	32	Rc1¼	196	126	55	98	49	48							
1½	40	Rc1½	202	132	61	108	54	54							

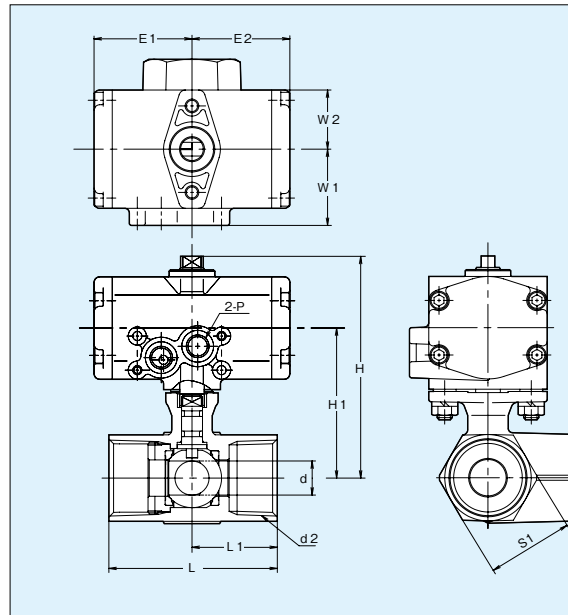
(mm)



## Type C Pneumatic Actuators / Class 10K Stainless Steel Ball Valves , with Gland

Fig. **C-UTGE**

(Reduced bore)



### Valve material

Parts	Materials
Body	SCS14A
Stem	SUS316+Cr plated
Ball	SUS316
Ball seat	Reinforced PTFE
Insert	SCS14A*
Gland packing	Flexible graphite +PTFE braided packing

\* SUS316 (1/4"-1/2")

### Dimensions

(mm)

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
								E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
1/4	4.5	Rc1/4	105.5	74	44	21	21	43	43	34.5	26	Rc1/8	C-1
3/8	6.8	Rc3/8	105.5	74	44	21	21						
1/2	9.2	Rc1/2	124.5	82	56.5	27.5	25	51.4	51.4	44	33.5	Rc1/8	C-2
3/4	12.5	Rc3/4	127.5	85	59	30	32						
1	16	Rc1	130.5	88	71	36	38						

## Type CS / FBS Pneumatic Actuators / Class 10K Stainless Steel Ball Valves , with Gland

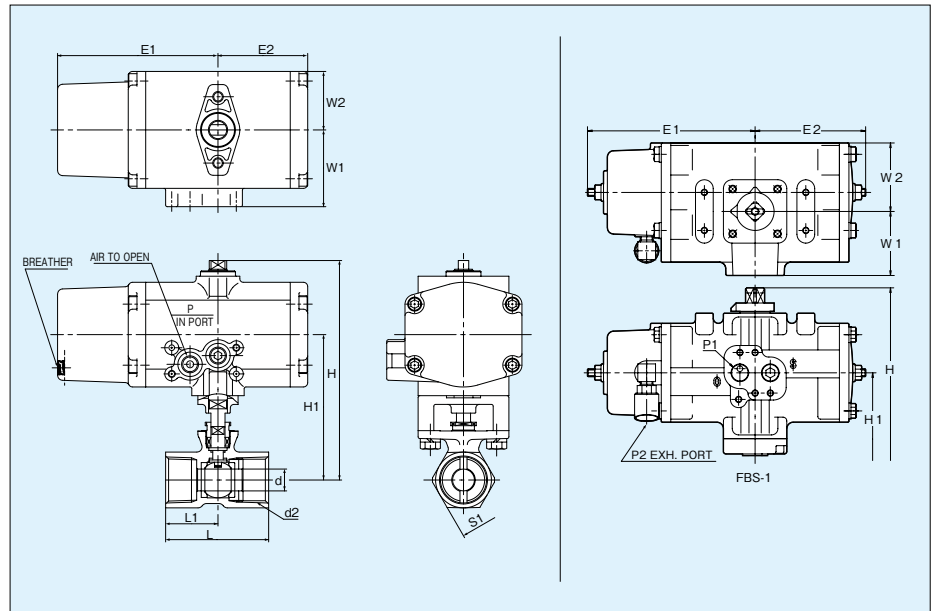
Fig. **CS-UTGE**

Valve size: 1/4" to 3/8"

### FBS-UTGE

Valve size: 1/2" to 1"

(Reduced bore)



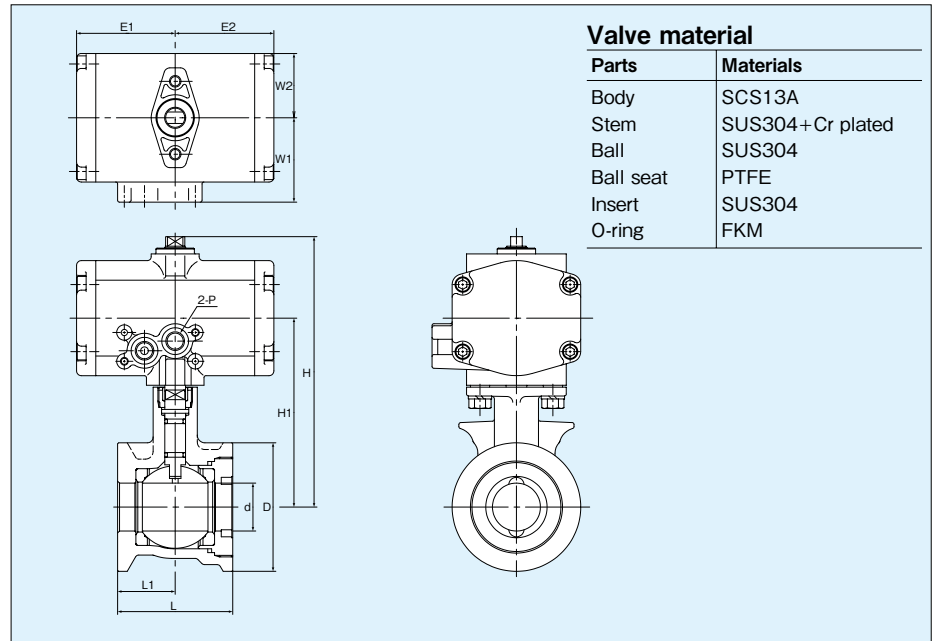
### Dimensions

(mm)

Valve Size (inch)	d	d <sub>2</sub>	H	H <sub>1</sub>	L	L <sub>1</sub>	S <sub>1</sub>	Actuators					
								E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>
1/4	4.5	Rc1/4	124.5	82	44	21	21	92	51.4	44	33.5	—	Rc1/8
3/8	6.8	Rc3/8	124.5	82	44	21	21						
1/2	9.2	Rc1/2	180.7	110.7	56.5	27.5	25	132	87	50	54	Rc1/4	Rc1/8
3/4	12.5	Rc3/4	183.2	113.2	59	30	32						
1	16	Rc1	186.4	116.4	71	36	38						

## Type C Pneumatic Actuators / Class 5K·10K Wafer Stainless Steel Ball Valves

Fig. C-5/10UTWE  
(Full bore)



### Dimensions

(mm)

Valve Size (inch)	d	H	H <sub>1</sub>	L	L <sub>1</sub>	D		Actuators					
						5UTWE	10UTWE	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P	Type
3/8	10	114.5	83	35	17.5	43	48	43	43	34.5	26	Rc 1/8	C-1
1/2	15	117.5	86	40	20	48	53						
3/4	20	138.5	96	50	25	53	58	51.4	51.4	44	33.5	Rc 1/8	C-2
1	25	146.5	104	60	30	63	69						

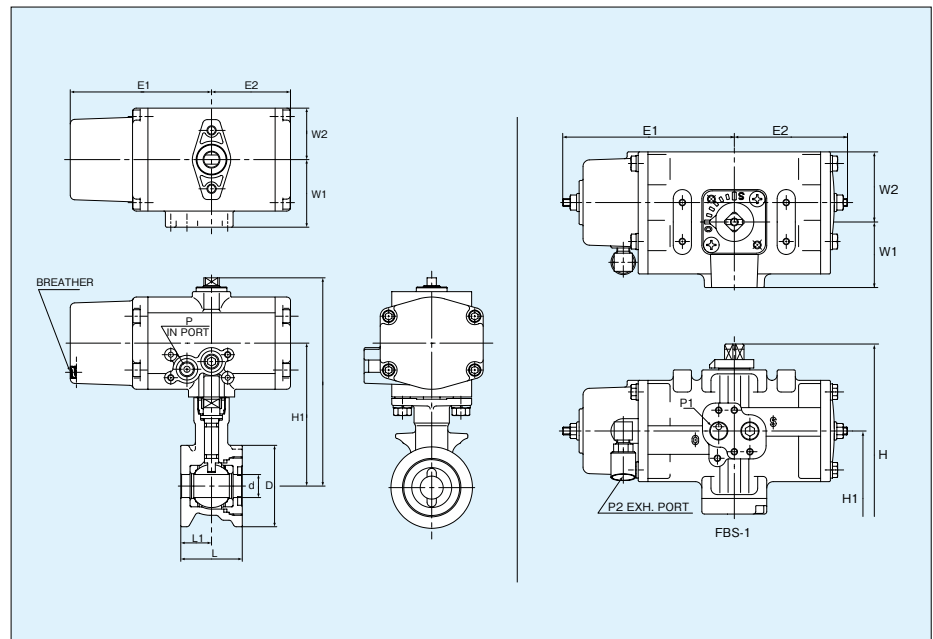
## Type CS / FBS Pneumatic Actuators / Class 5K·10K Wafer Stainless Steel Ball Valves

Fig. CS-5/10UTWE

Valve size: 3/8" to 1/2"

FBS-5/10UTWE

Valve size: 3/4" to 1" (Full bore)



### Dimensions

(mm)

Valve Size (inch)	d	H	H <sub>1</sub>	L	L <sub>1</sub>	D		Actuators						Type
						5UTWE	10UTWE	E <sub>1</sub>	E <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	P <sub>1</sub>	P <sub>2</sub>	
3/8	10	133.5	91	35	17.5	43	48	92	51.4	44	33.5	—	Rc 1/8	CS-2
1/2	15	136.5	94	40	20	48	53							
3/4	20	196	126	50	25	53	58	132	87	50	54	Rc 1/4	Rc 1/8	FBS-1
1	25	204	134	60	30	63	69							

## Precautions for Trouble-free Operation of Pneumatic Actuator Driven Ball Valves

### Storage and Handling

Pneumatically operated KITZ compact ball valves are individually packed in Styrofoam boxes. Don't unpack until you are ready to mount on the pipeline. Store in dry, corrosion-free environment to keep rust-free, although they are adequately coated for primary protection. Handle units carefully when actuators are equipped with solenoid valves and other accessories. Don't place any other objects on actuators, and don't step on actuators. Overloading actuators must always be prevented.

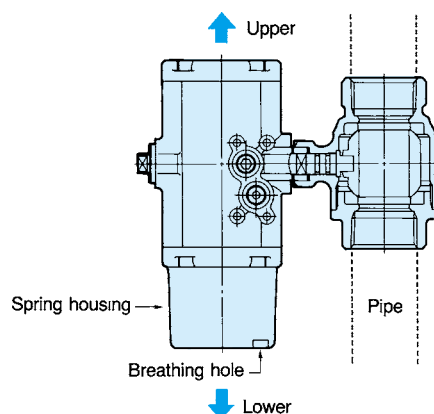
### Mounting and Piping

Before mounting pneumatically operated KITZ compact ball valves, make visual inspection of all valves, actuators and accessories to assure trouble-free condition. Tighten any loosened bolts securely. Clean valve and pipe bores to remove welding spatters, scales or any other foreign objects which may have been left inside. After mounting has been completed, air blow the inside of all connected pipes and valves prior to the pilot operation of the system.

Don't use where corrosive gas, chemical liquids, sea water cause contamination. Exposed rotating parts, such as the actuator shaft, must be protected from water or rainfall. They are not designed whether-proof.

Threading pipes or nipples on actuators must be maximized to five rotations, so that over-tightening threads may not develop cracks in die-cast aluminum housing, and cause air leakage and operational difficulty to actuators (Recommended tightening torque : 10N-m for Rc  $\frac{1}{8}$  15N-m Rc  $\frac{1}{4}$ ). Type CS spring return actuators should be mounted so that the exhaust hole on the cylinder, faces downwards at times (See the below) or, when unavoidable, the hole must be protected by adequate water-prevention measures.

KITZ compact ball valves can be mounted on KITZ Type C or CS actuators either horizontally, vertically or at any angle depending on your piping or operational convenience. However, filter-regulators must be mounted always horizontally, using amounting bracket.



### Operation

Pneumatically operated KITZ compact ball valves are designed to be driven by air pressure ranging from 0.4Mpa to 0.7Mpa (60 to 100 psi). Smaller or larger air pressure will result in malfunction. We recommend to employ 0.4Mpa(60psi),our standard operating pressure.

Be sure to dry and filter the air supply for trouble-free operation.This is particularly important in cold and humid climates.

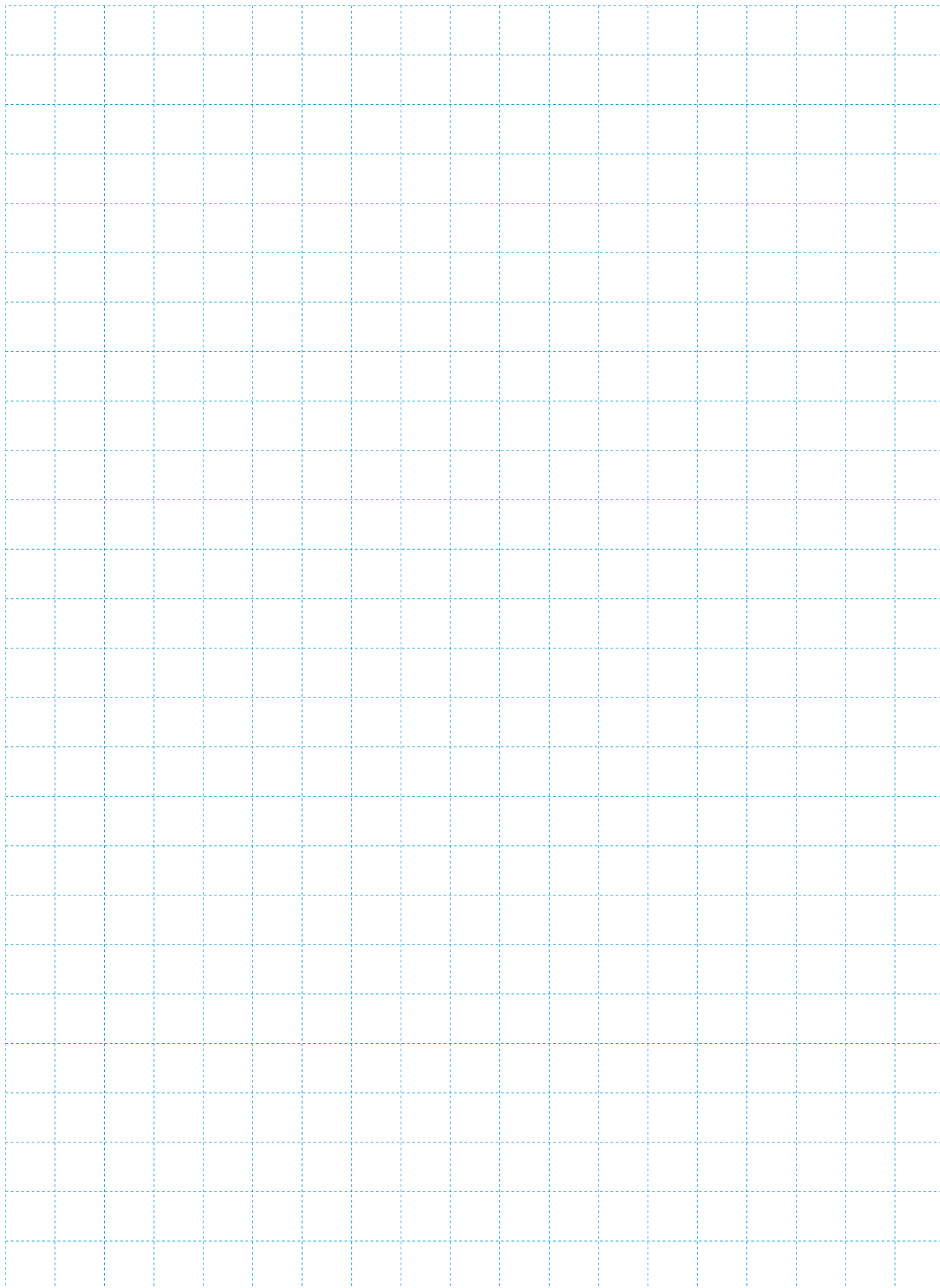
### Maintenance

Pneumatically operated KITZ compact ball valves are lubrication-free.When a leakage is detected on the actuator after a few years of operation, we recommended the actuator be disassembled to detect wear or deformation of sealers such as O-rings and gaskets for possible replacement.



**MEMO**

## MEMO



## CAUTION

Pressure-temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for proving suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

While this catalog has been compiled with the utmost care, we assume no responsibility for errors, impropriety or inadequacy. Any information provided in this catalog is subject to from-time-to-time change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that KITZ Corporation considers necessary. This edition cancels all previous issues.

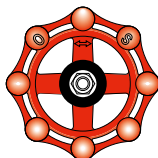
Read instruction manual carefully before use.

## NOTICE

If any products designated as strategic material in the Foreign Exchange and Foreign Trade Law, Cabinet Order Concerning Control of Export Trade, Cabinet Order Concerning Control of Foreign Exchange and other related laws and ordinances ("Foreign Exchange Laws") are exported to any foreign country or countries, an export license issued by the Japanese Government will be required under the Foreign Exchange Laws.

Further, there may be cases where an export license issued by the government of the United States or other country will be required under the applicable export-related laws and ordinances in such relevant countries.

The contract shall become effective subject to that a relevant export license is obtained from the Japanese Government.



*A chrysanthemum-handle is a symbol of KITZ,  
the brand of valve reliability*

ISO 9001 certified since 1989

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