

World Top Valve Automation Company

Multi-turn Electric Valve Actuators

KE-SERIES



KE SERIES

Multi-turn Actuator

KE SERIES ACTUATOR is developed upon various field experiences and accumulated technology of KVA for customer convenience. This product is high performance electric Multi-turn actuator equipped with safety, durability and convenient maintenance required at the industrial field.



User friendly

- > Easy maintenance due to the modularized component.
- > Easy for inspection due to the integrated control unit.
- > Good visibility and control as indicator and control part are located on one cover.
- > Easy to check actuator specification as the main body, motor and terminal cover have name plate respectively.



Product Features

Appearance

- > Front located controls and terminal block bring better accessibility and easy wiring no matter its installation direction.
- > For good visibility, indicator and lamps(Power, Blink, Open, Close and Fault) are integrated.
- > For quicker operation at emergency cases, manual handwheel(Top or Side) designed to connect with operating shaft directly.

Safety

- > All assembly parts of KE SERIES is designed to assemble O-shape ring on the embossed groove which is perfectly protected against explosion proof, water proof and dust proof.
- > Water proof IP-68 (10m 72 hours water proof available)
- > Best safety design with Ex db II C T4 Gb (acetylene, hydrogen) level (IECEX)

Convenience

- > Motor's torque delivery efficiency is maximized to enhance output torque of actuator and it expands scope of selection of actuator according to categorization by characteristics of use (S Type, i type, iT Type)
- > Indication part and control part are located on the same cover for better controllability and visibility.
- > Easy disassembly of cover as Air Vent Plug is located at the bottom of Main Cover
- > Modularized unit for quick and easy inspection and repair.
- > A space heater is applied to secure internal components from corrosion by humidity and the use of stainless steel is obligated.
- > Easy control by adopting rotatable knob and prevention from moisture penetration by to non-penetrating switch design
- > Coated PCBs are adapted to resist in severe environment operation and humidity, and it provides enhanced durability.
- > Motor and actuator control power are separated to enhance maintainability.
For improved maintenance, the fuse is located in separate space.

Type

» STANDARD TYPE : KE - S

> It is designed for open/close control by external control panel only.

> Composition

- Motor & Driving Gear
- Control Unit
 - * Switch Unit, Space Heater
 - * Position Limit Switch, Torque Limit Switch
 - * Local Mechanical Indicator(% Type)
- Power Unit
 - * Terminal Block

> Option

- Add Limit Switch
- 4~20mA Transmitter(Potentiometer + R/I Converter)

> Features

- Interlocking panel configuration for several actuators is available to lower installation cost
- Installable in narrow space by its compact size
- Separated Controller Box for Input/Output control
- Suitable for attachment to small valve due to light weight.



» INTEGRAL TYPE : KE - i

> It is designed for both site control and remote control (panel) by the embedded control device.

> Composition

- Motor & Driving Gear
- Control Unit
 - * Switch Unit, Space Heater
 - * Connection Board + LED Board + O.P Board
 - * Position Limit Switch, Torque Limit Switch
 - * Local Mechanical Indicator(% Type)
- Local / Stop / Remote Selector Switch (Lock Type)
- Open / Close Selector Switch (Return Type)
- Power Unit
 - * Magnetic Contactor, Transformer, Phase Discriminator, Terminal Block

> Option

- Add Limit Switch
- ESD(Emergency Shutdown)
- 4~20mA Transmitter(Potentiometer + R/I Converter)
- Interposing Relay (DC24V, AC110V)

> Features

- As it applies pure electric connection board that excludes vibration, noise and any other electric obstacles, it can control stably against external disturbance.



» INTELLIGENT TYPE : KE - iT

> Embedded control device, Proportional control and communication available

> Composition

- Motor & Driving Gear
- Control Unit
 - * Switch Unit, Space Heater
 - * Connection Board + LED Board + O.P Board
 - * Position Limit Switch, Torque Limit Switch
 - * Local Mechanical Indicator(% Type)
- Local / Stop / Remote Selector Switch (Lock Type)
- Open / Close Selector Switch (Return Type)
- Power Unit
 - * Magnetic Contactor, Transformer, Phase Discriminator, Terminal Block

> Option

- Add Limit Switch
- ESD(Emergency Shutdown)
- 4~20mA Transmitter(Potentiometer + R/I Converter)
- Interposing Relay (DC24V, AC110V)
- Proportional Control
- Communication : MODBUS MODULE : RS485, PROFIBUS, FIELD BUS

> Features

- Proportional control and communication available



Applicable Valves

- > Gate Valve (Solid Wedge, Slide Flexible Wedge)
- > Globe Valve (Rising & Nonrising)



- > Ball Valve / Plug Valve
- > Butterfly Valve & Damper



- > Polymer Valve
- > All type of valves which has manual hand wheel,

Structure

»» Main Components

1. Control Unit

- › Switch Unit and control board are All-in-one type for easy maintenance which is used commonly for all models.
- * Control board : Limit Switch Board, Connection Board, LED Board, OP Board
- * S type, i Type iT Type are applied respectively.

2. Power Unit & Terminal Block

- › Actuator motor's magnet contact for rotation and reverse rotation, and transformer for control power supply are integrated for easy inspection and maintenance.
- › Phase discriminator for discriminating normality of main power supply, and supplying and disconnecting control power is located in separated space for easy inspection and maintenance such as fuse replacement.
- › Independent Terminal Block is double sealing structure and internal control part, power and cable connection part are sealed for enhanced durability.

3. Motor

- › High torque low inertia motor is applied.

4. Driving Line

- › Main power delivery gear is operated at Oil Bath that ensures durability at long-term use.
 - * It enhances valve safety with Self Locking.(Please refer to KE SERIES Speed-Torque Table)
- › Internal power and signal delivery axis is double sealing structure that is excellent for sealing.
- › Top and bottom part of operating shaft are secured by oil seal against leakage.

5. Manual Hand Wheel

- › Wheel is not rotate during automatic operation. It directly connect to Drive shaft and its hammer blow device enables easier valve operation.

6. Auto/Manual Selector Lever

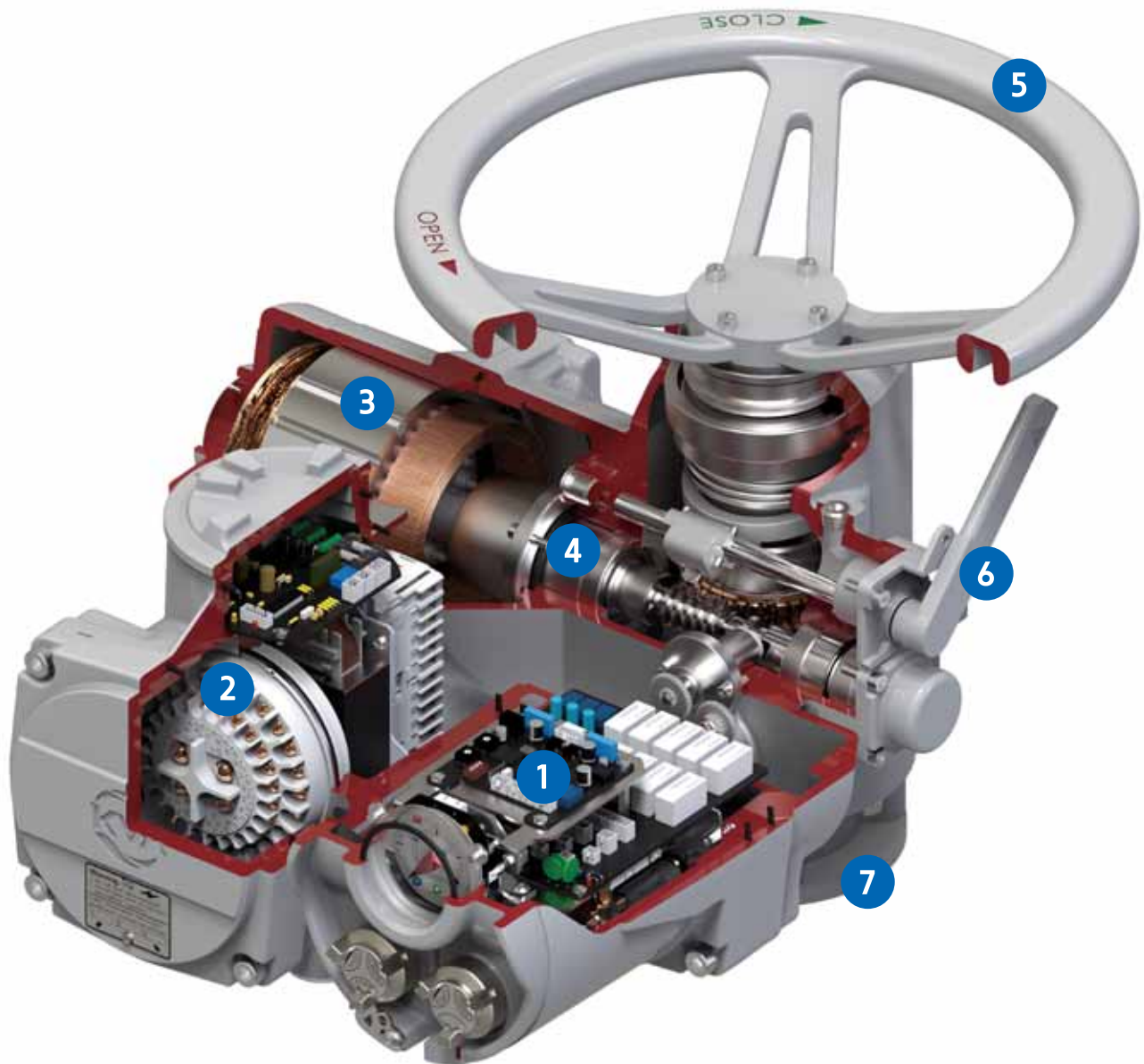
- › It is Auto Declutch Type and it will be switched to Auto mode when the motor operates.

7. Thrust

- › Its independent structure enhances the applicability of the thrust force in high load, and it is easy to replace and disassemble.

KE SERIES

Electric Multi-turn Actuator



Specifications

»» Speed-Torque Table

Model	kw / RPM	Max(Rated) Torque [kgf-m]									
		21 [18]	27.0 [24]	42 [36]	62 [54]	84 [72]	124 [105]	140 [120]	165 [140]	190 [165]	
KE-01	0.2	10.5	8.5	7.0	5.5	4.5	3.0				
		(2.4)	(2.0)	(1.6)	(1.3)	(1.0)	(0.8)				
	0.4	20	17	13.5	11	9	6.5				
		(4.8)	(4.0)	(3.1)	(2.6)	(3.1)	(1.5)				
	0.75	30	30	25	20	18	12				
		(9.0)	(7.4)	(5.9)	(4.9)	(3.9)	(2.8)				
KE-02	0.75	41.0	35	30	24	18	13	11	9	8	
		(9.5)	(8.3)	(6.8)	(5.1)	(4.2)	(3.0)	(2.5)	(2.1)	(1.9)	
	1.5		70.0	52	42	34	25	22	19	16	
			(16.6)	(13.6)	(10.3)	(8.4)	(6.0)	(5.0)	(4.3)	(3.8)	
	2.2			70.0	62	50	35	32	26	24	
				(19.9)	(15.1)	(12.4)	(8.8)	(7.3)	(6.3)	(5.6)	
	3.7				70.0	70.0	54	45	38	33	
					(25.0)	(20.8)	(14.8)	(12.3)	(10.6)	(9.3)	
	KE-03	3.7	185	170	125	95	75	52			
			(47.2)	(44.4)	(32.7)	(25.0)	(20.9)	(14.5)			
5.5		250	250	185	140	115	80				
		(70.2)	(66.0)	(48.6)	(37.1)	(31.1)	(21.6)				
7.5				250	190	155	110				
				(66.2)	(50.6)	(42.3)	(29.5)				

Control	Proportional	O	X	X
	On-Off	O	O	O
Starts per hour		200	100	50
Install		Direct & Gear Box	Direct & Gear Box	Only Gear Box
Worm Self Locking		O	X	X

※ Above data described based on AC380V / 3PH / 60Hz, for others please contact us.

※ () Rating Torque

»» Mechanical Table

Model	Max Torque		Max Thrust		Max Stem Dia (mm)		Flange Dia ISO No. TAB PCD/Size pilot dia. [mm]	Weight inc. motor [kg]
	kgf.m	N.m	ton	kn	key	threaded		
KE-01	30.0	294	9	88.2	36	40	φ125, F10 102/4 x M10 φ70 *Option F12, F14	44
								45
								48
KE-02	70.0	686	13	127.4	52	60	φ175, F14 140/4xM16 φ100 *Option F16	55
								60
								63
								70
KE-03	250.0	2450	27	264.6	80	95	φ300, F25 254/8xM16 φ200	112
								118
								126

※ Weight : Based on Integral Type, excluding Thrust Unit

※ For other than above data, please contact us.

» Specification

Design Specification	KE Actuator complies with "EN 15714-2 Industrial Valve - Part II: Electric industry valve actuator - Basic requirements and motor actuator standard".																																																					
Duty Rating	On-off & Inching		It allows S3 50%, 30min, 50~200 ignition per hour																																																			
	Proportional		It allows S3 50%, 30min, 50~200 ignition per hour																																																			
Motor	<p>Motor must be designed with low inertia and insulation grade must be F or above, Hazardous area certification of motor is S3 50% of T4 135℃, which has 50 ~ 200 ignitions per hour. CLASS A and B On-off / Inching or Class C Modulating 4-pole : 1800rpm(60Hz), 1500rpm(50Hz) Squirrel cage ph Induction Type Motor</p>																																																					
Thermal Protection	<p>Motor temperature protection device 3 Thermal Protectors are mounted in Winding of Motor to detect temperature, Thermal Protector trips Actuator if the motor reaches temperature indicated below.. For re-start of Thermal Protector, it is automatically reset if the motor is cooled down to a certain temperature.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #d9e1f2;">Operating Temperature(To)</td> <td colspan="5">KE-01, 02 : 120℃ ±5℃ / KE-03 : 100℃ ±5℃</td> </tr> <tr> <td style="background-color: #d9e1f2;">Reset Temperature(Tc)</td> <td colspan="5">KE-01, 02 : 76℃ ±15℃ / KE-03 : 56℃ ±15℃</td> </tr> </table>						Operating Temperature(To)	KE-01, 02 : 120℃ ±5℃ / KE-03 : 100℃ ±5℃					Reset Temperature(Tc)	KE-01, 02 : 76℃ ±15℃ / KE-03 : 56℃ ±15℃																																								
Operating Temperature(To)	KE-01, 02 : 120℃ ±5℃ / KE-03 : 100℃ ±5℃																																																					
Reset Temperature(Tc)	KE-01, 02 : 76℃ ±15℃ / KE-03 : 56℃ ±15℃																																																					
Enclosures for Hazardous Area use	<p>International Hazardous Area - IECEx_BAS_17,0076X_0 Ex db IIC T4 / Ta -30 to +70 ℃(-22 to +158 °F) Korea Hazardous Area - KCs Ex d IIC T4 / Ta -30 to +70 ℃(-22 to +158 °F)</p>																																																					
Operating Temperature	<p>Ambient temperature range for Actuator operation is - 30~70℃ (-22 to +158 °F). If the temperature is beyond the range, please contact us. KE Series' IP rating for explosion proof and non explosion proof area is IP68 / NEMA 6P, water proof.</p>																																																					
Power Supply	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d9e1f2;">Standard Voltages</th> <th style="background-color: #d9e1f2;">Phase</th> <th style="background-color: #d9e1f2;">Hz</th> <th style="background-color: #d9e1f2;">KE-01</th> <th style="background-color: #d9e1f2;">KE-02</th> <th style="background-color: #d9e1f2;">KE-03</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d9e1f2;">220</td> <td style="background-color: #d9e1f2;">3</td> <td style="background-color: #d9e1f2;">60</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">x</td> </tr> <tr> <td style="background-color: #d9e1f2;">220</td> <td style="background-color: #d9e1f2;">3</td> <td style="background-color: #d9e1f2;">50</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">x</td> </tr> <tr> <td style="background-color: #d9e1f2;">380, 440, 460, 480</td> <td style="background-color: #d9e1f2;">3</td> <td style="background-color: #d9e1f2;">60</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> </tr> <tr> <td style="background-color: #d9e1f2;">380, 400, 415, 440, 460, 480</td> <td style="background-color: #d9e1f2;">3</td> <td style="background-color: #d9e1f2;">50</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> <td style="background-color: #d9e1f2;">o</td> </tr> <tr> <td style="background-color: #d9e1f2;">Voltage tolerance</td> <td colspan="2" style="background-color: #d9e1f2;">+/-10%</td> <td colspan="3" style="background-color: #d9e1f2;">※1</td> </tr> <tr> <td style="background-color: #d9e1f2;">Hertz tolerance</td> <td colspan="2" style="background-color: #d9e1f2;">+/-5%</td> <td colspan="3" style="background-color: #d9e1f2;">※1</td> </tr> <tr> <td style="background-color: #d9e1f2;">Max. starting voltage reduction</td> <td colspan="2" style="background-color: #d9e1f2;">Max -15%</td> <td colspan="3" style="background-color: #d9e1f2;"></td> </tr> </tbody> </table> <p>※1 - Applicable to rated torque performance: Cycle and speed are not guaranteed.</p>						Standard Voltages	Phase	Hz	KE-01	KE-02	KE-03	220	3	60	o	o	x	220	3	50	o	o	x	380, 440, 460, 480	3	60	o	o	o	380, 400, 415, 440, 460, 480	3	50	o	o	o	Voltage tolerance	+/-10%		※1			Hertz tolerance	+/-5%		※1			Max. starting voltage reduction	Max -15%				
Standard Voltages	Phase	Hz	KE-01	KE-02	KE-03																																																	
220	3	60	o	o	x																																																	
220	3	50	o	o	x																																																	
380, 440, 460, 480	3	60	o	o	o																																																	
380, 400, 415, 440, 460, 480	3	50	o	o	o																																																	
Voltage tolerance	+/-10%		※1																																																			
Hertz tolerance	+/-5%		※1																																																			
Max. starting voltage reduction	Max -15%																																																					

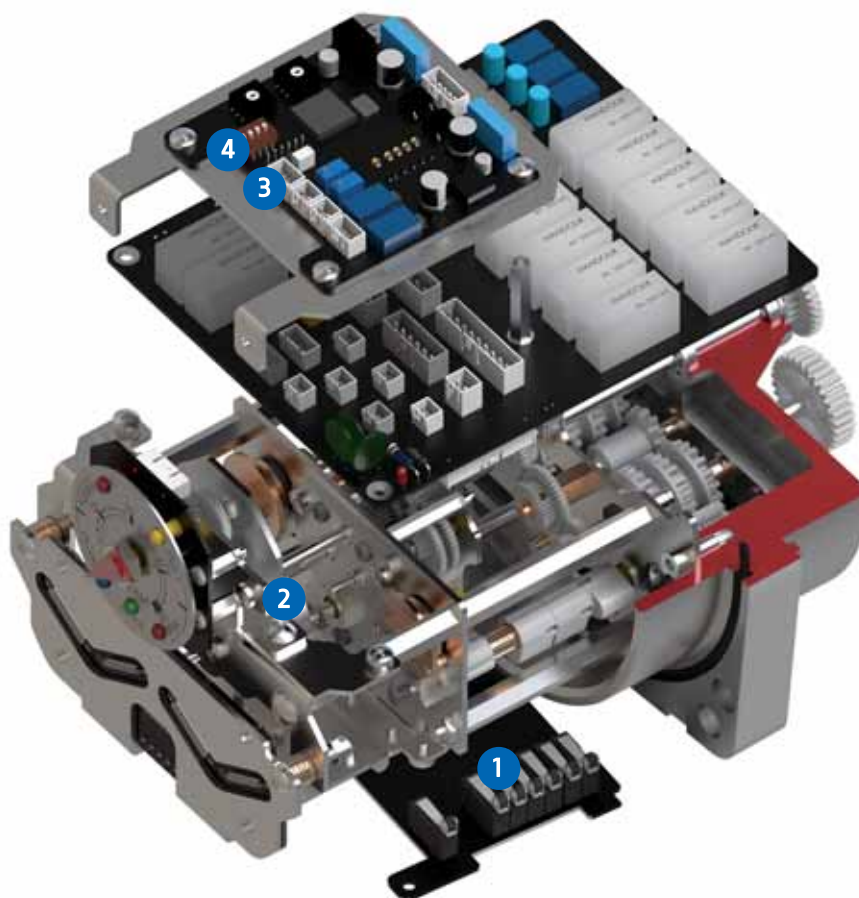
Cable Entry	KE SERIES' standard Cable entry is as below,			
	Entry No	1	2	3
	Type 1	NPT1"	NPT1 ½"	NPT1"
Type 2	M25	M40	M25	
Terminal Block	External wiring part of KE Series' Terminal is isolated from internal part, Terminal internal and external wiring is designed as Screw Type against vibration,			
	Main Power Supply Terminal	4Pin	M6 x 10L Screw type	
	Signal Terminal	48Pin	M4 x 10L Screw type	
Please close the safety cover after the Main Power U, V, W, E are wired.				
Wiring	Harness is made with UL3398 PE Cable that ensures durability up to Rated 300V and 150℃ and is excellent in heat resistance, cold resistance, oil resistance, chemical resistance and electric stability. It has low loss of dielectric and dielectric substance and has no change of electric characteristics at high temperature and high frequency, Terminal connection of all lines used inside is Wire to Wire connector and connection of PCB uses plug and socket for easy maintenance.			
Manual Hand wheel	Exclusive handle for manual control is mounted in case of power supply problem or unexpected failure of actuator. The size of manual hand wheel is selected for the most efficient valve operation at the emergency operation.			
	Model	Standard / Ratio	Option	
	KE-01	Direct / 1 : 1	Geared / 3 : 1	
	KE-02	Direct / 1 : 1	Geared / 3.25 : 1	
KE-03	Geared / 20 : 1	Geared / 13.3 : 1		
Manual Override type is Auto Declutching Mechanism.				
Position Limit Switch	Type : Gear driven, Cam operated, snap Action Max drive sleeve turns : 5000 turns Micro Switch - 250VAC 10A, 1a/1b, Relay - 2C / 250VAC 8A			
Torque Limit Switch	Type : Gear driven, Cam operated, snap Action Micro Switch - 250VAC 10A, 1a/1b, Relay - 2C / 250VAC 8A			
Indicator	Type : Mechanical of Continuous Pointer(0~100%) Power, Open, Close, Fault, Blink LED Lamp			
Space Heater	PTC Self-limiting Heater, AC100~250V, 30W			
Remote Power	Dry contact(AC110V), Option : Interposing Relay -DC24V, AC110V			
Noise Level	Noise at 1m does not exceed 70dB.			
Lubrication	Grease Moly(EP0 type)			
Materials	Aluminium Alloy, Nodular graphite casting, Steel or Bronze			
Surface Treatment	Anodizing : 10 micron min			
External Coating	Power Coating : 60 micron min / Colour: Munsell No, 4,9B 6,7 / 0,2			
Durability Life	Open/Close 10,000 Cycle of Rated load			

※ For other than above specifications, please contact us.

» Options

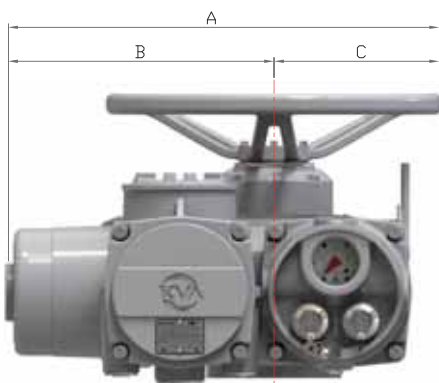
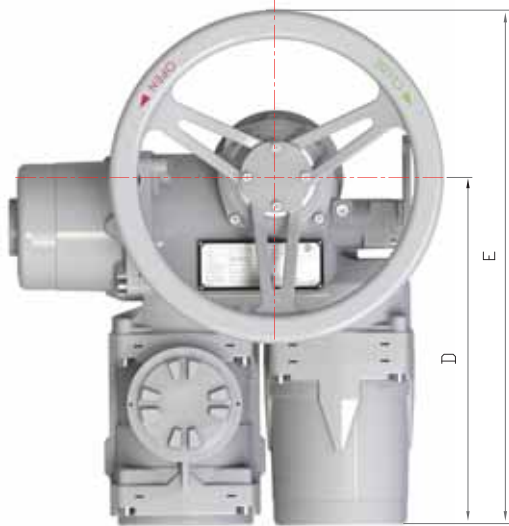
① Add Position Switch	Open, Close : 2C (Change the Contact - a or b)
② Potentiometer	Cermet Type, 1K Ω , Precision $\pm 0,5\%$, Max Input Power 25V
③ Transmitter - 4Wire Type - 2Wire Type	Input : AC100V~250V, Output 4~20mA, Precision $\pm 0,5\%$ Input : DC24, Output 4~20mA, Precision $\pm 0,5\%$
④ Proportional Control Input	Input, Output 4~20mA(Only Integral type)
④ 2Wire Control	MODBUS MODULE : RS485, PROFIBUS, FIELD BUS
Safety Cover	Only Main Cover(A6061)
FireProofing	FR Coating(FR SHELL) Type
Coating other than standard	Specification other than standard

※ For other than above specifications, please contact us.



Size

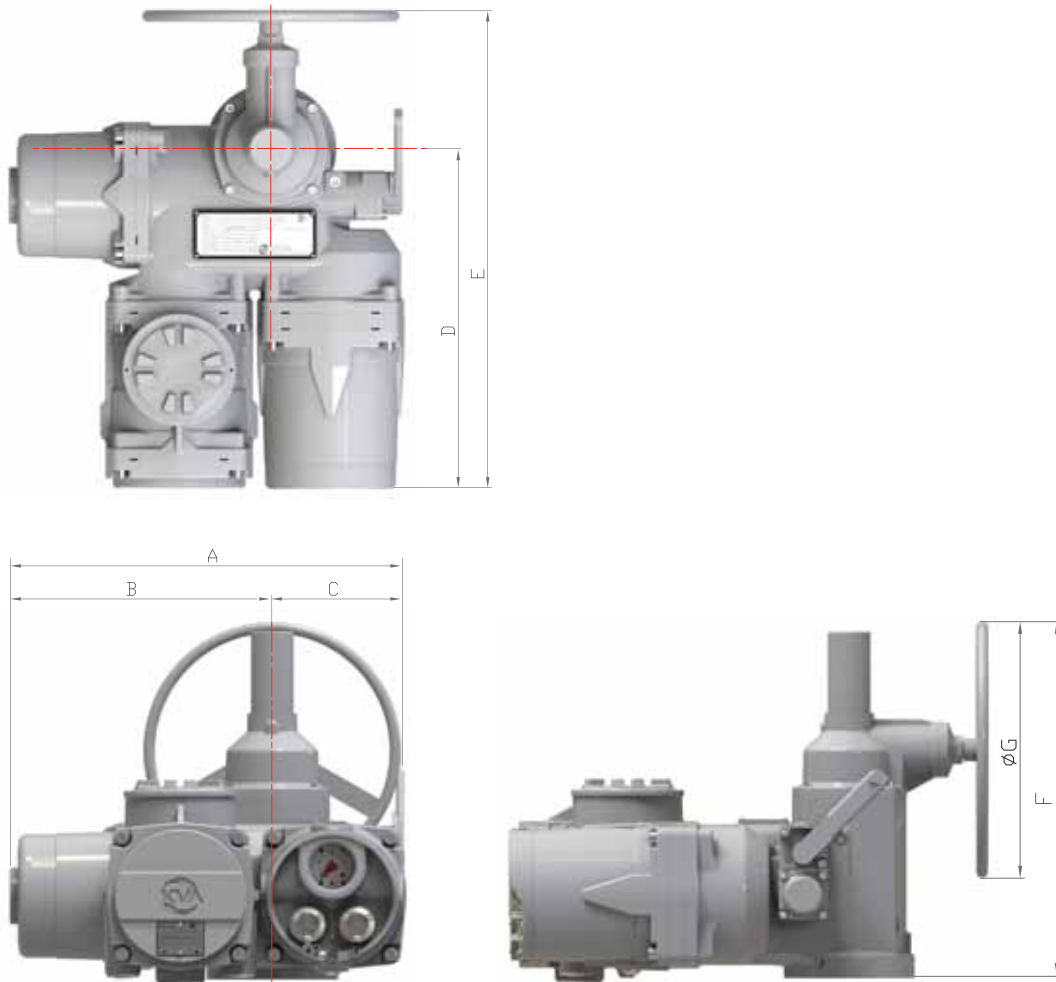
» KE-01 / KE-02 Top Hand wheel



Category	Top						
	A	B	C	D	E	F	G
KE-01020	504	303	200	417	617	338	400
KE-01040	504	303	200	417	617	338	400
KE-01075	520	320	200	417	617	338	400
KE-02075	553	327	225	435	660	372	450
KE-02150	617	392	225	435	660	372	450
KE-02220	617	392	225	435	660	372	450
KE-02370	780	480	300	435	660	372	600

※ The size may vary by specification or option. For detailed size, please refer to Approved Drawing.

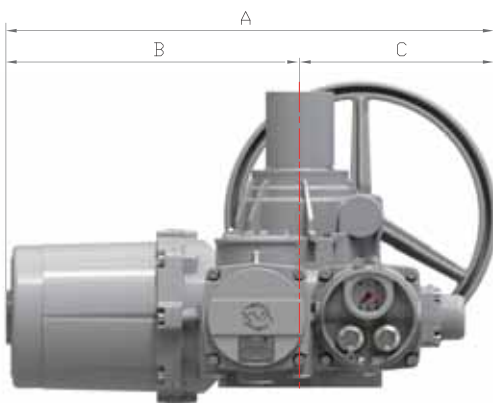
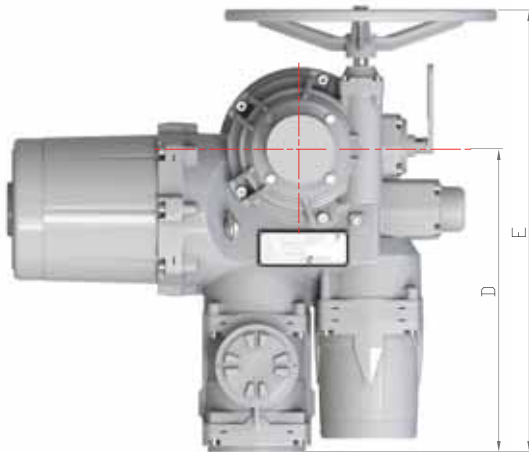
» KE-01 / KE-02 Side Hand wheel



Category	Side						
	A	B	C	D	E	F	G
KE-01020	464	303	160	417	587	440	320
KE-01040	464	303	160	417	587	440	320
KE-01075	479	230	160	417	587	440	320
KE-02075	553	328	225	435	686	554	450
KE-02150	617	392	225	435	686	554	450
KE-02220	617	392	225	435	686	554	450
KE-02370	705	480	225	435	686	554	450

※ The size may vary by specification or option. For detailed size, please refer to Approved Drawing.

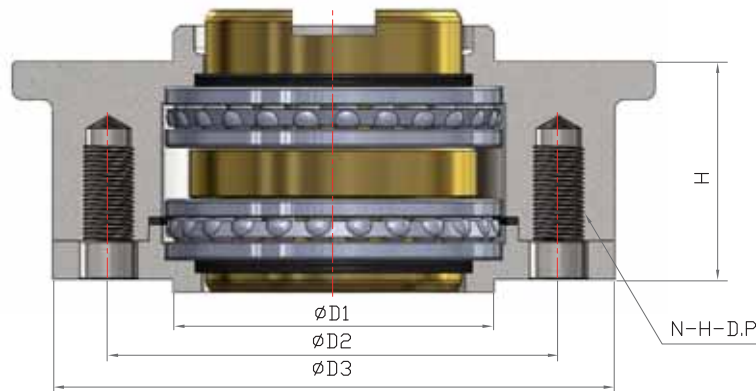
» KE-03



Category	A	B	C	D	E	F	G
KE-03370	781	456	325	504	735	506	450
KE-03550	810	485	325	504	735	506	450
KE-03750	810	485	325	504	735	506	450

※ The size may vary by specification or option, For detailed size, please refer to Approved Drawing.

» Thrust Unit(ISO-5210/5211)



[Unit : mm]

Model	ISO	D1	D2	D3	N-H-DP	H	Weight [kg]	Remark
KE-01	F10	70	102	125	4-M10-35	63	5,3	std.
	F12	150	125	150	4-M12-35	63	6	
	F14	100	140	175	4-M16-14	67	6,5	
KE-02	F14	100	140	175	4-M16-37	68	10	std.
	F16	130	165	210	4-M20-42	68	11,5	
KE-03	F20	140	205	250	4-M16-50	116	35	
	F25	200	254	300	4-M16-50	115	40	std.
	F30	230	298	350	4-M20-55	115	50	

Model Selection Guide

Actuator Code	Valve Code
KE- <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	
<p>Series Name</p>	<p>Valve Size 01 : 1"(25A) 02 : 2"(50A) ... 40 : 40"(1000A) ...</p>
<p>Model 01 : 0~30kgf-m 02 : 0~70kgf-m 03 : 0~250kgf-m</p>	<p>Valve Type G : Gate L : Globe B : Ball U : Butterfly (Damper) P : Plug E : Other</p>
<p>Motor Size 020 : 0.2kw 040 : 0.4 kw 075 : 0.75kw 150 : 1.5kw 220 : 2.2kw 370 : 3.7kw 550 : 5.5kw 750 : 7.5kw</p>	<p>Valve Rating 1 : ANSI 150 (JIS 10K) 2 : ANSI 300 (JIS 20K) 3 : ANSI 600 (JIS 30K) 4 : ANSI 900 5 : ANSI 1500 6 : ANSI 2500 7 : Other</p>
<p>Cable Entry Type N : 2-NPT1 " , 1-NPT1 ½" M : 2-M25, 1-M40</p>	
<p>Control Type S : Standard type I : Integral type iT : Intelligent type</p>	<p>Gear Box N : None V : BEVEL W : WORM S : SPUR</p>



KE-SERIES(MOV)



KQ-SERIES(MOV)



KA-SERIES(AOV)



KVA CO., LTD.

Head Office / Factory

468-18, Simogoecheon-ro, Nami-myeon, Seowongu, Cheongju-si,
Chungcheongbuk-do, 28185 Korea

Tel. +82-43-279-3600

Fax. +82-43-269-2666

E-mail : admin@kva.co.kr