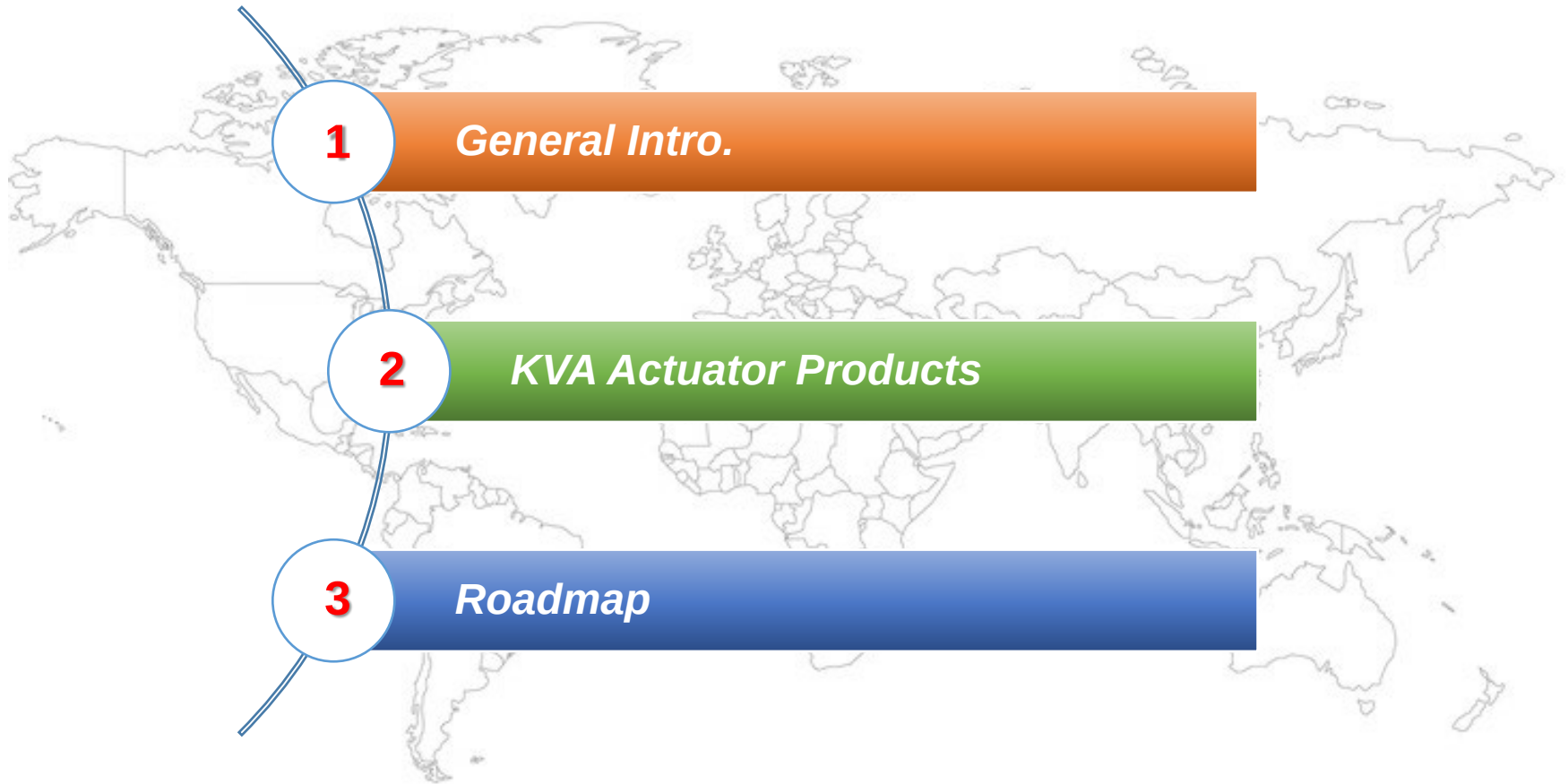


World Top Valve Automation Company

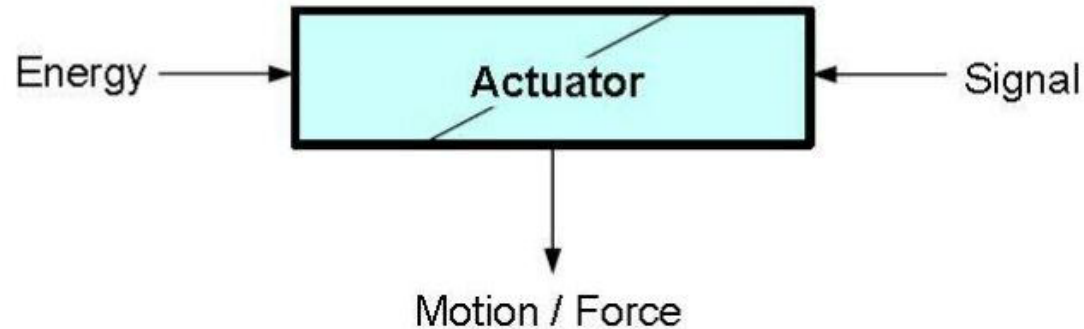
VALVE ACTUATOR

Contents



[General Introduction]

❖ What is an Actuator?



➤ Energy Sources

- Air / Gas
- Electricity
- Hydraulics

➤ Types of Motion

- Linear
- Rotary
- Oscillatory

❖ Valve Actuator – Classification

➤ Energy Sources

Classification	MOV	AOV	POV
Energy	Electricity	Compressed Air	Compressed Air
Driving Source	Electric Motor	Air Motor (Vane Type)	Pneumatic Cylinder
Operating Characteristics	Rotating Power of the Electric Motor	Rotating Power of the Air Motor	Pressure Force
Operation Time	Medium	Relatively Slow	Instant Open/Close
Picture			

➤ Types of Motion

Linear (Multi-turn)	AOV, MOV	Gate, Globe, Diaphragm, Needle V/V
Rotary (Quarter-turn)	MOV, POV	Butterfly, Ball V/V

❖ Valve Actuator – Classification

➤ Signal – Controller

Standard	- Control switches are not available on the actuator body - External Panel(Switch Box) required	KE : Standard Type KA : B type
Integral	- Integrated control switches on the actuator body [OPEN, STOP, CLOSE] / [LOCAL, REMOTE] - Required 3PH electric power (Air Line) for its operation	KE : Integral Type KA : Switch Panel Integrated Type

➤ Signal – Control Method

ON-OFF	- HOLDING Type : Press Once for FULL OPEN operation - INCHING Type : Operate while pressed - Configuration : INTEGRAL UNIT - Torque Margin : Min. 1.5 times	KA series KE series
Proportional Control	- Operate to the position indicated by external command signal (4-20mA) - Command Signal : Operates with Pressure gauge, Flow meter, Thermometer - Configurations : ON-OFF Type components w/Positioner - Torque Margin : Min. 2 times	KE series

❖ Valve Actuator

➤ Characteristics

Class	MOV	AOV	POV
Driving Source	Induction Motor	Air Motor	Air Cylinder
Reduction Gear	Worm Gear	Worm + Spur Gear	Rack & Pinion
Applicable Valves	Multi / Quarter Turn Valves	Multi / Quarter Turn Valves	Mostly Quarter Turn Valves
ESD	N/A (Require min. 15sec.s)	N/A (Require min. 15sec.s)	Available
Fail Position	Last	Last	Selectable between OP/CL
Emergency Operation	Requiring Air Tank	Requiring Emergency Generator	Spring Return
Install ability during line operation	Possible	Possible	Relatively hard
Maintenance	High cost due to modularized components	Low cost due to mechanical type pneumatic components	Low cost
Feasibility for existing line installation	High Cost for new electric line work	Low Cost by using existing air supply	Medium Cost Existing Air supply / New Control Line

❖ Valve Actuator

➤ Main Components – eg. KVA Actuators

Item	MOV (New KE series)	AOV (KA series)
MOTOR	3 PH INDUCTION MOTOR	AIR MOTOR (4AM, 6AM)
Reduction Gear (Internal)	WORM GEAR	SPUR GEAR + WORM GEAR
Control & Protection	LIMIT S/W (Position, Torque) Thermal Protector	LIMIT S/W (Position, Torque)
Controller	1) Controller Unit • Connection & OP Board • Magnetic Contactor • Transmitter • Phase Discriminator • Interposing Relay 2) Control • Knob Type (OP/ST/CL) / (Local/Remote)	1) Logic Valve • Master Valve (5 Ports – 2 Ways) 2) Control • Selector S/W (OP/ST/CL) • Selector S/W (Local/Remote)
Options	• Add Position Limit S/W • Potentiometer • R/I Converter • Proportional	• PT-01 LIMIT S/W (Electronic), Potentiometer R/I Converter • Solenoid Valve

❖ Valve Actuator

➤ Features – eg. KVA Actuators

MOV (New KE series)	AOV (KA series)
Operates by Electric Power	AIR / GAS
Easy for remote control and signal output 1) Integrated remote control circuit 2) Integrated signal transfer unit - Control / Signal output transfer from single axis ; no time deviation - Position Limit Switch contact - Torque Limit Switch contact 4-20mA Transmitter output signal - Local / Remote Selector contact	Hard for remote control and signal output 1) In case of Remote control, B type is available on the Control Panel. But C,D types are required Solenoid V/V 2) Signal Output : External Signal Transmitter (PT) is required - Control and Signal transmitter are composed separately ; time deviation - Position Limit Switch contact - Torque Limit Switch is not available 4-20mA Transmitter - Local / Remote Selector is not available
Many types of Torque and RPM - Many types of motor size (0.2-7.5kW)	Less types of Torque and RPM - Limited motor sizes (4/6/16AM)
Automatic return type of Auto/Manual Selector Lever	Fixed type of Auto/Manual Lever
Wheel is not rotate during automatic operation	Wheel is rotate during automatic operation
Proportional Control is available	Proportional Control is not available
Assembly type : Round fitting	Facet assembly

[Products]

❖ Actuator Line-up



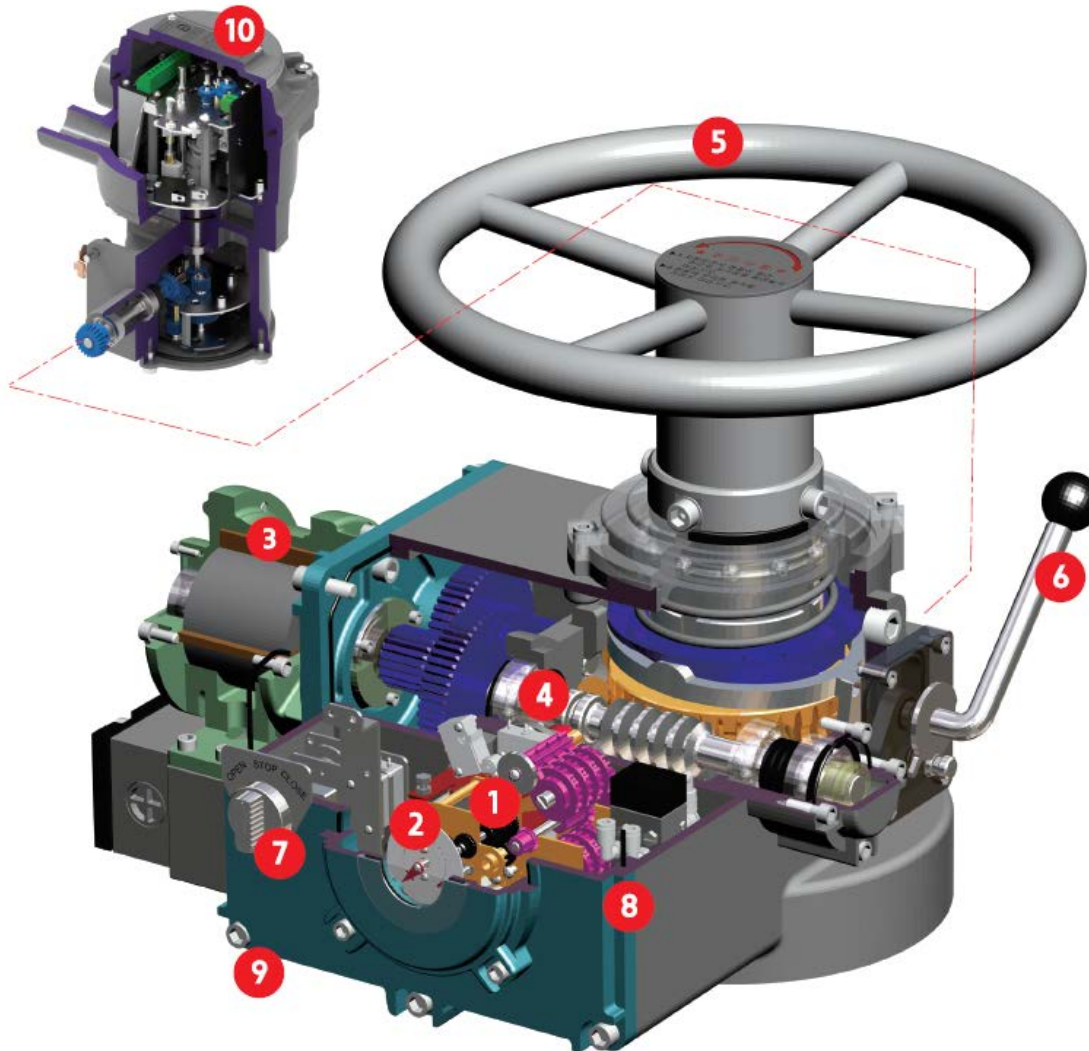
	KA series	KE series	KQ series
Motor	Air	Electric	
Power	-	3 Phase (50, 60hz)	1, 3 Phase, DC24V
Operation	Multi-trun	Multi-trun	Part & Multi-turn
Temperature	-20℃ ~ 70℃	-30℃ ~ 70℃	
Torque [kgf-m]	~ 180 (max)	~ 250 (max)	
Indicator	Mechanical of Continuous Pointer (0~100%) & LED		Digital (LED & LCD)
IP Grade	IP66	IP68	
Materials	Aluminium Alloy, Nodular graphite casting, Steel or Bronze		
Limit Switch	Position, Torque		
Option	Manual Hand Wheel Key Lock Position Transmitter(PT) Fireproofing Paint Color	Add Position Limit Switch Position Transmitter(4~20mA) Proportional Control(4~20mA) Safety Cover Fireproofing Paint Color	Add Position Limit Switch Position Transmitter(4~20mA) Proportional Control(4~20mA) Fireproofing Paint Color

❖ Characteristics



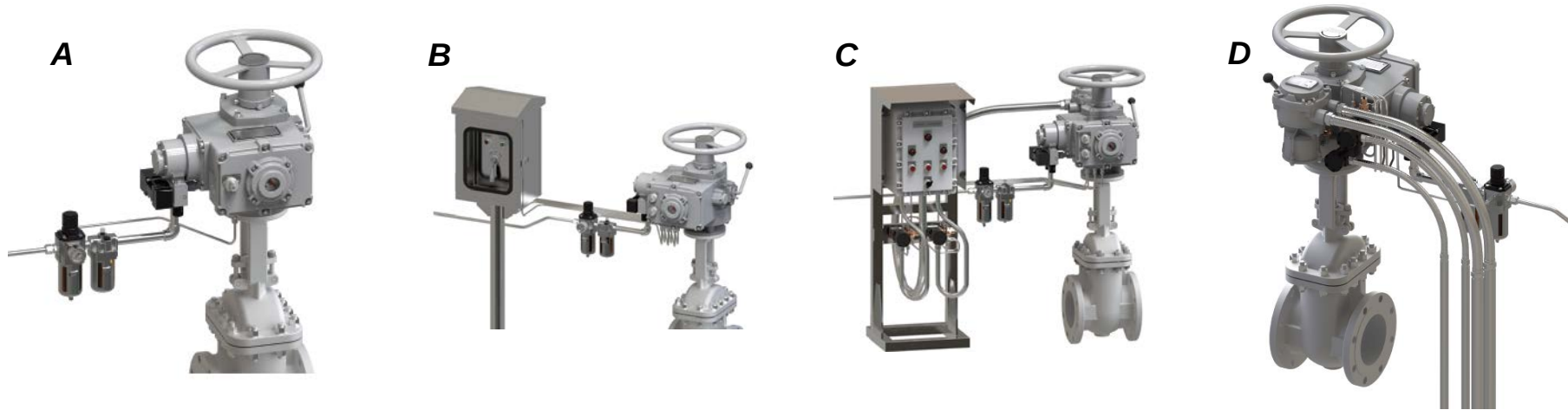
- Free from explosion
- Easier in valve automation only by industrial air supply
- Remote control available up to 50m distance only by air
- Simple local operation
- Lower installation cost for existing plants' automation
- Higher reliability in severe operation environments such as vibration, moisture, electrical noise
- Low maintenance cost in case of defection / Predictable and clear defection point
- Installation possible during the line operation

❖ Structure

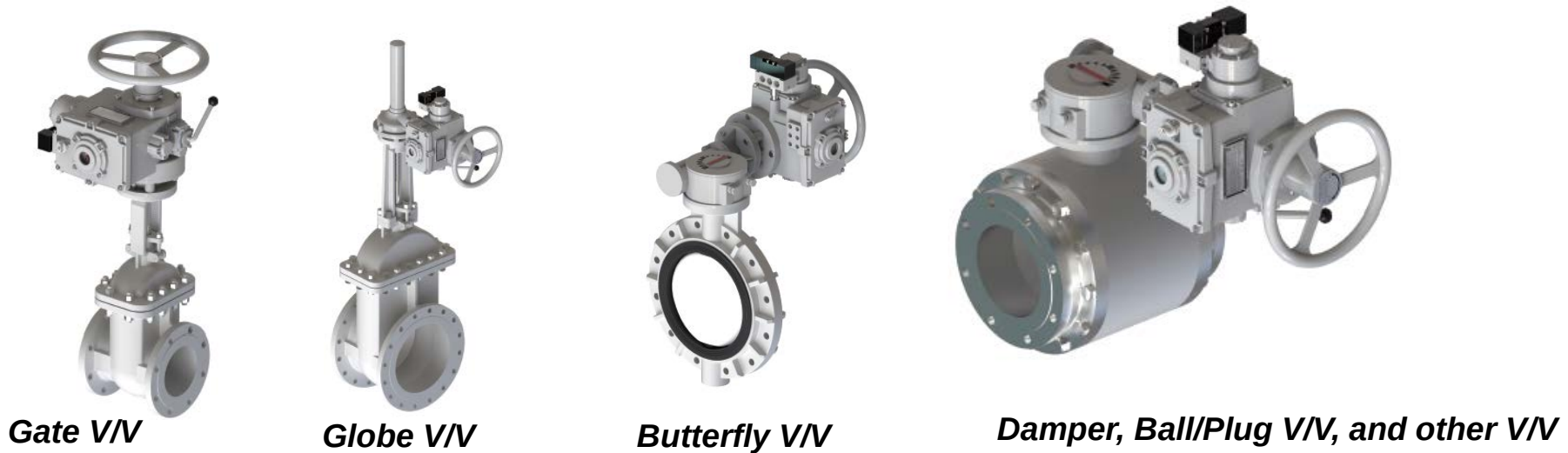


- ① Switch Unit
- ② Indicator
- ③ Air Motor
- ④ Driving Line
- ⑤ Manual Hand Wheel
- ⑥ Auto/Manual Selector Lever
- ⑦ Selector Switch
- ⑧ Sealing and Cover Design
- ⑨ Standardized the Signal Air Supply Connection is NPT1/4"
- ⑩ Position Transmitter

❖ Types



❖ Applications

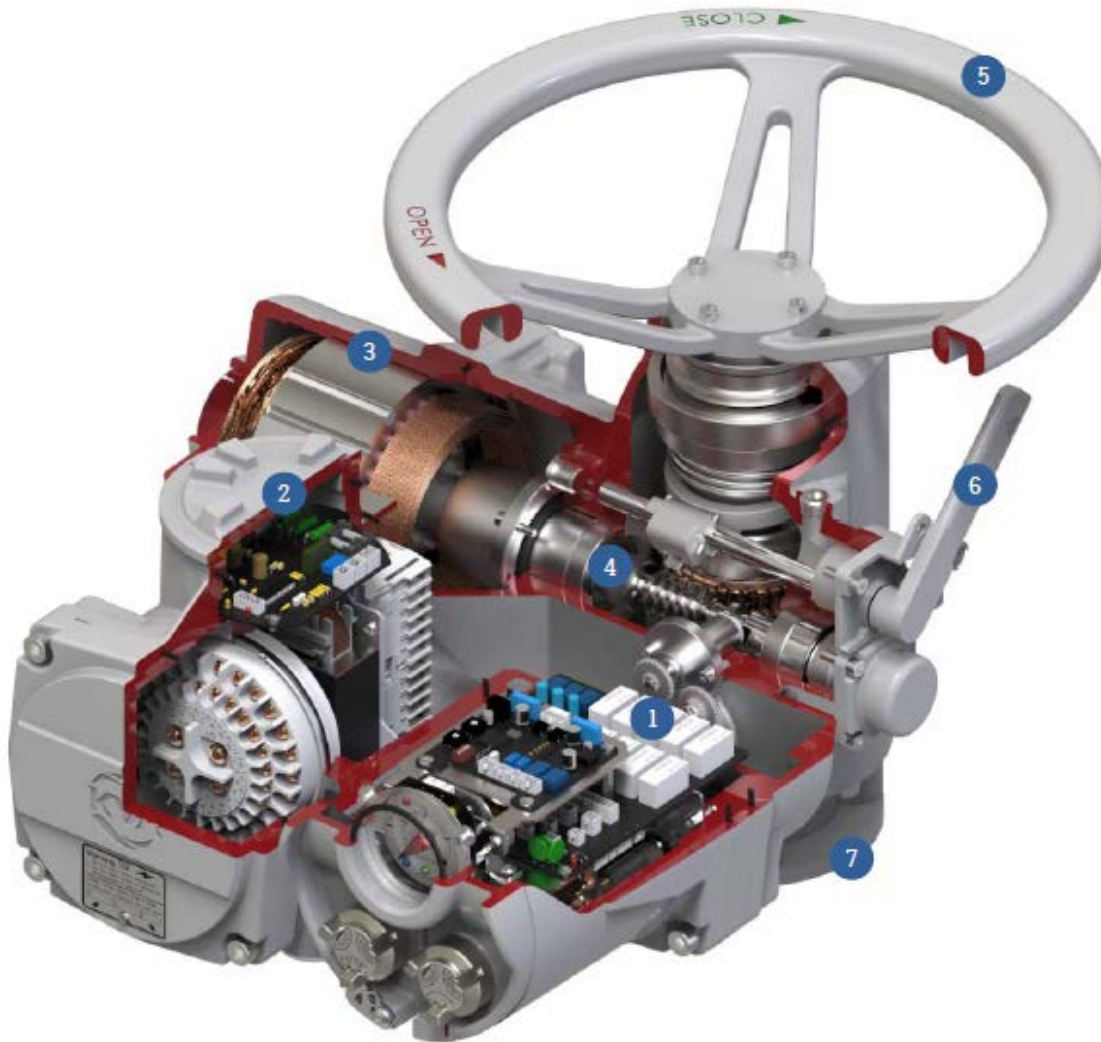


❖ Characteristics



- Easy operation & maintenance design
(Control, Indicator, lamps & terminal block locate at front side)
- Modularized components for easier maintenance
- 'Reverse Phase Protection' increases safety
- Perfect protection design for explosion, water, dust
- IECEx – Ex db IIC T4 Gb
- Space heater to prevent humidity & corrosion
- Thermal & torque protection
- Variable options

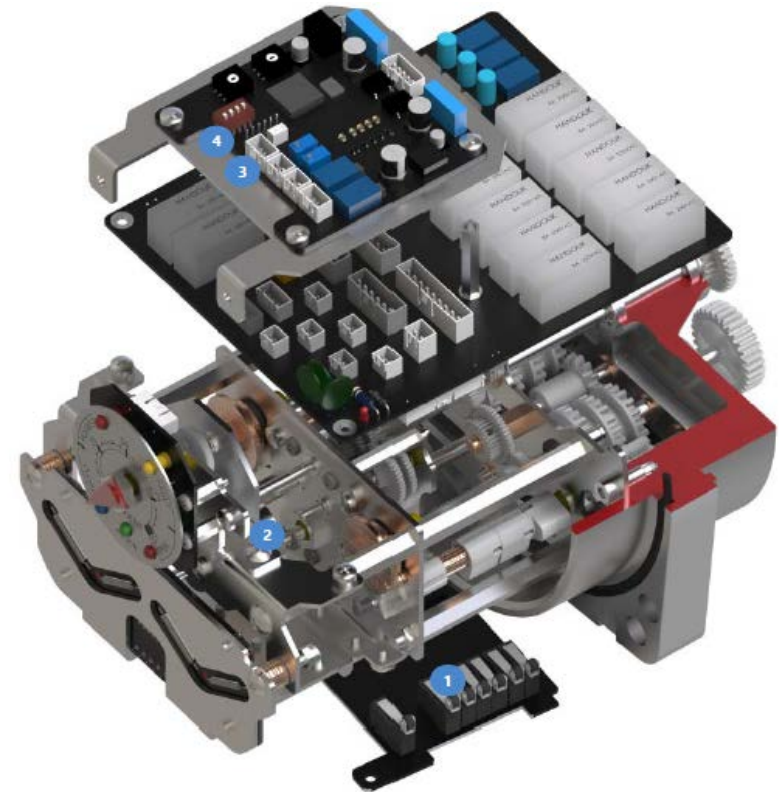
❖ Structure



- ① Control Unit
- ② Power Unit & Terminal Block
- ③ Electric Motor
- ④ Driving Line
- ⑤ Manual Hand Wheel
- ⑥ Auto/Manual Selector Lever
- ⑦ Thrust

❖ Options

- ① Add Position Limit Switch
- ② Potentiometer
- ③ Transmitter
 - 2 Wire : DC24V(Input), 4~20mA(Output)
 - 4 Wire : AC100V ~250V(Input), 4~20mA(Output)
- ④ Proportional Control : 4~20mA (Input & Output)
- ⑤ Safety Cover : Only Main Cover (A6061)
- ⑥ Fireproofing : FR Coating (FR SHELL) type



❖ Applications

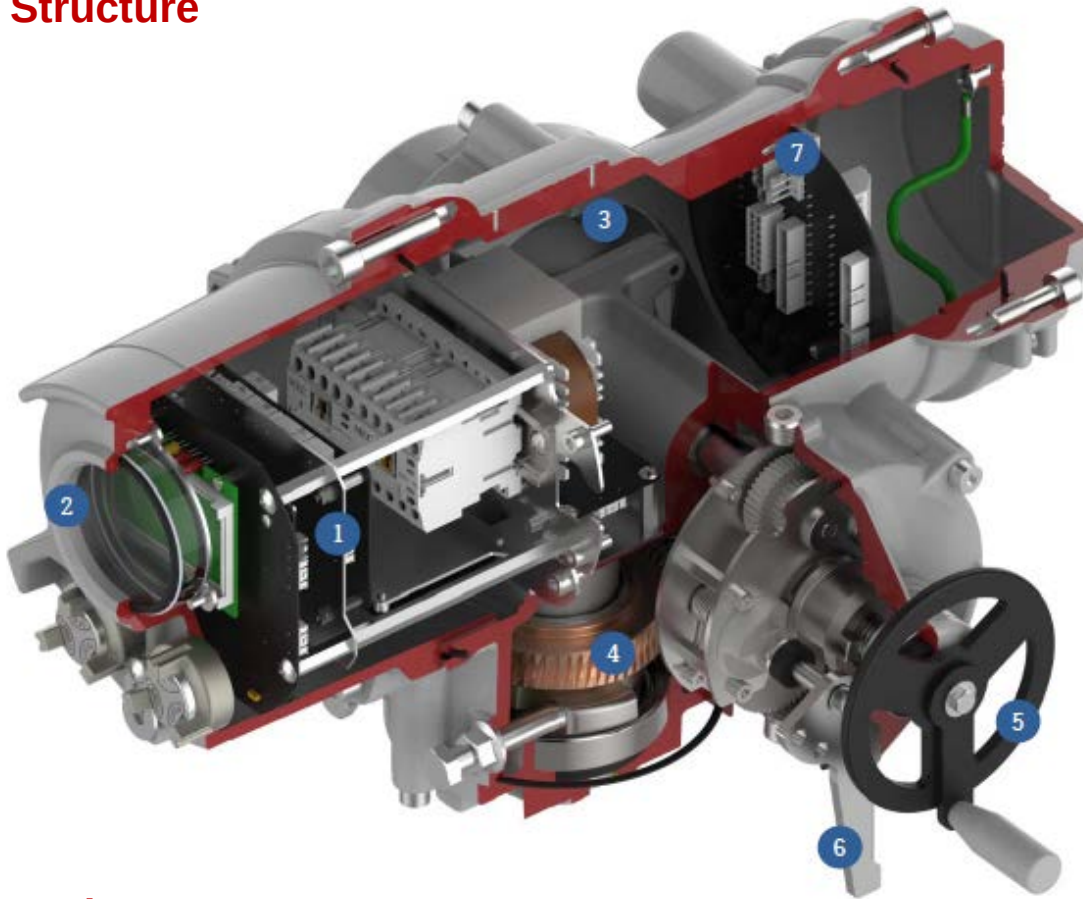
- Gate Valve
- Globe Valve
- Ball & Plug Valve
- Butterfly Valve
- Damper

❖ Characteristics



- KVA's first intelligent electric actuator
- Compact size
- Graphic LCD
 - Easy to recognize actuator status
- Absolute encoder * *Patent*
 - Memorize V/V position even in Power off
- 'Reverse Phase Protection' increases safety
- Perfect protection design for explosion, water, dust
- Thermal & torque protection
- Easier setting procedure
 - Do not need to open the cover
- One touch type Terminal Block
- Variable options
- Model Variation ; KQ(Q/T), KQM(M/T)

❖ Structure

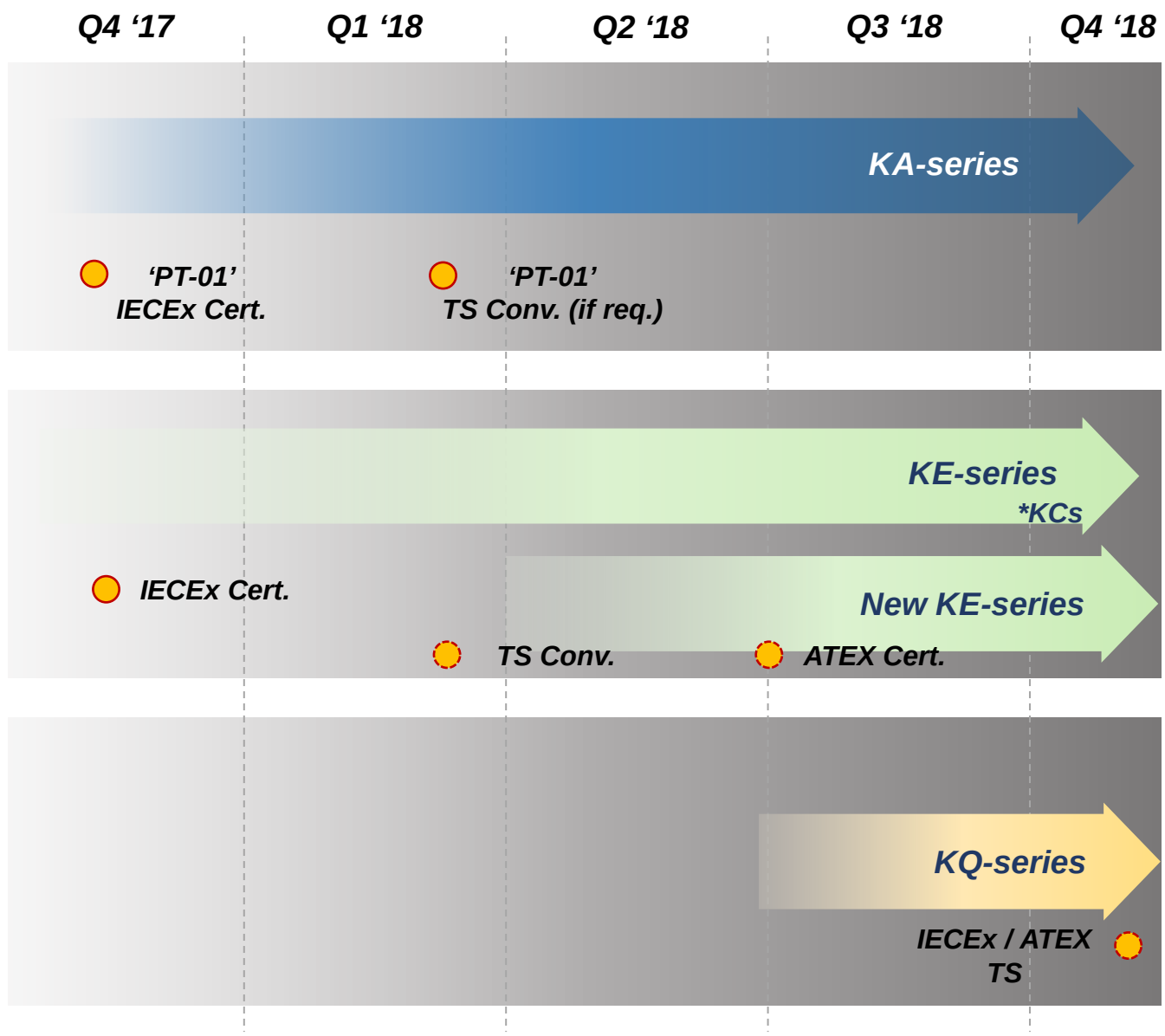


- ① Control Unit
- ② Display (Graphic LCD)
- ③ Electric Motor
- ④ Driving Line
- ⑤ Manual Hand Wheel
- ⑥ Auto/Manual Selector Lever
- ⑦ Terminal Block
- ⑧ Thrust (Only KQM)

❖ Options

- *Add Position Switch : Open & Close (1a/1b)*
- *Transmitter : 4 - 20mA*
- *Proportional Control : 4-20mA (Input & Output)*

[Roadmap]





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THANK YOU

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