

# EMICO

## Valve & Actuator



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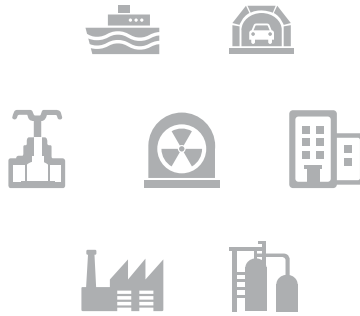
**EMICO**, founded in 1986, is the leading manufacturer of electric actuators in Korea and provides the best quality products with high technology and satisfactory services.

**EMICO** supplies electric actuators especially to buildings, plant, steelworks, power plants over 30 countries as well as domestic sales.

**EMICO** has launched spring return actuator for the first time in Korea and accelerated to expand market and to satisfy customers' need by specialized products.

We have made concerted efforts with expertise in electric actuators and continuous investment in R&D to be the world best in the market.

We promise we do everything we can to supply the reliable products and competent services.



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## Multi-turn Actuator MA Series



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Configuration



Side Handle Type



Top Handle Type

- ① Motor
- ② Eye Bolts
- ③ Terminal Cover
- ④ Cable Entries
- ⑤ Base
- ⑥ Local Control Unit
- ⑦ Nameplate
- ⑧ Stem Cover
- ⑨ Handle
- ⑩ Manual Lever
- ⑪ Body
- ⑫ Remote Control



## Features

### Motor

Insulated Class F, 3phase squirrel cage motor.  
Built in thermal protector( $130^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ).  
IE1 grade and IE2 grade(optional specification)  
are available and the duty cycle is S2 30min.

### Case

MA series are finished in polyester powder  
(Polyester, TGIC-Free) after anodized with  
aluminum alloy to prevent corrosion.  
The actuators provide the explosion proof  
protection Explosion Proof Ex d IIC T4)  
as an optional specification and ultimate  
performance.

### Terminal

The double-sealed terminal protects the actuators  
from environment such as dust and moisture.

### Torque Control

Output torque of the worm shaft is read by a precise  
sensor to prevent overload.  
Errors in voltage, frequency, temperature is resolved.  
Torque can be set between 30%-100%  
when the rated torque is 100%.

### Manual Operation

The bevel gear (MA01, MA02) structure and worm gear (MA03, MA04)  
enable manual operation effectively.  
The actuator can be returned to electric operation by an auto/manual clutch.

### Absolute Encoder

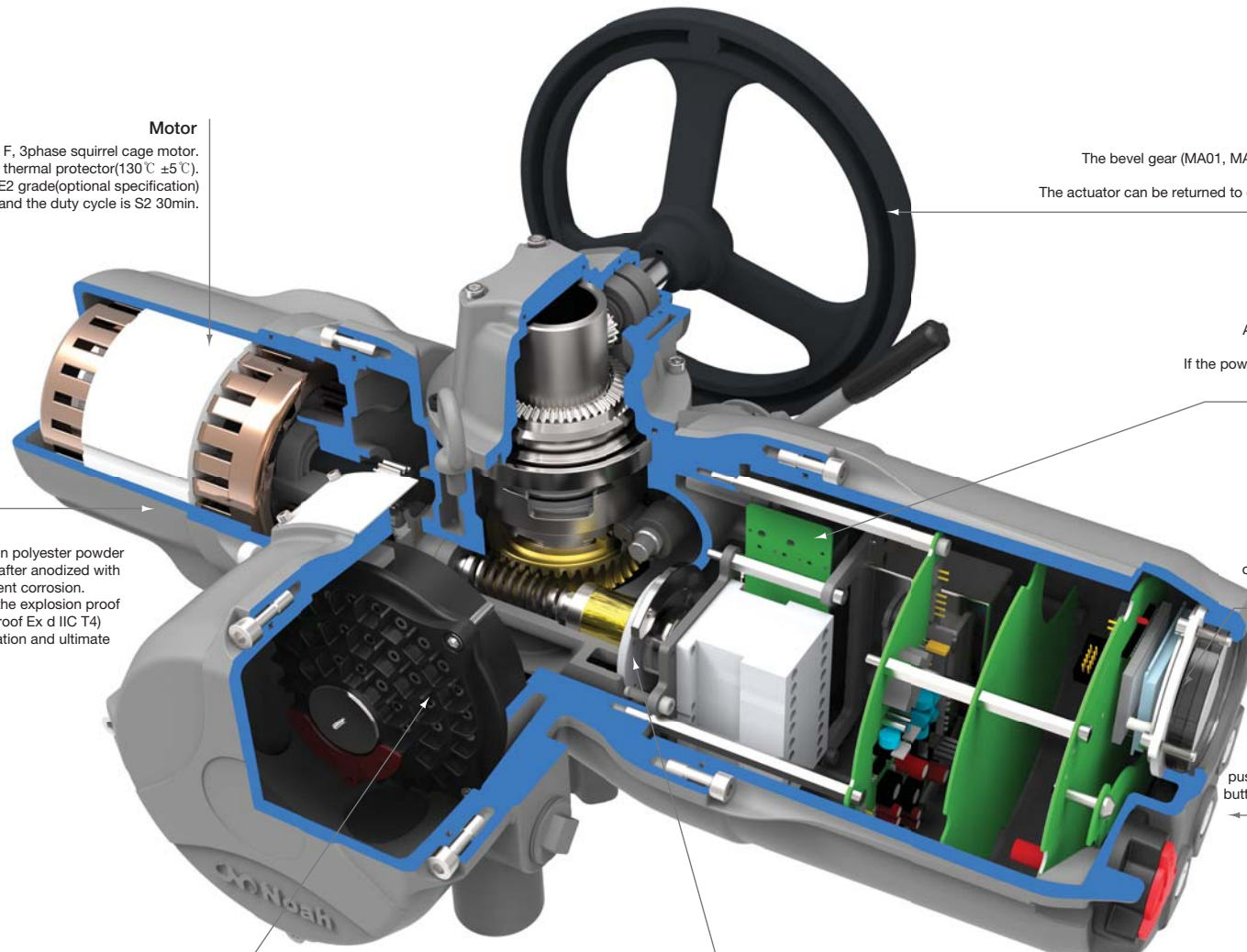
Absolute encoder is used as a valve position  
measurement with low error range.  
If the power is shut off, it remember the valve position  
so users don't need to set limits again.

### LCD & Setting Tool

Valve's position and settings are presented  
on the display. Setting Tool enables actuator  
setting without removing its cover.



### Local Control

Actuators can be controlled by  
push buttons on the actuator cover. Unpierced  
buttons can protect the actuator from moisture.



### Base & Drive Bushing

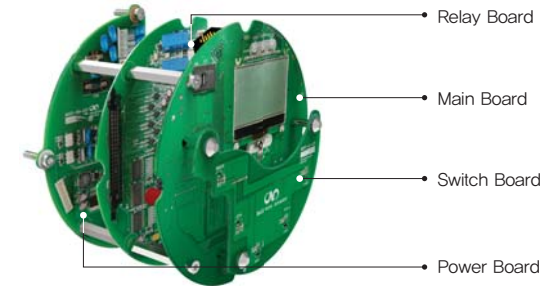
Manufactured in accordance with ISO5210 and both Thrust type and Non-Thrust type are available.

Thrust Type	Non-Thrust Type
	
<ul style="list-style-type: none"> <li>In case of mounting the valve with the actuator directly. For gate valves or glove valves.</li> </ul>	<ul style="list-style-type: none"> <li>When there is a gear box between the valve and the actuator. For butterfly valves or ball valves.</li> </ul>

### Base & Drive Bushing & Cable Entries SPEC.

Model	Flange (ISO5210)	P.C.D	Tap	Max Size		Cable Entries Standard	Cable Entries Option
				Screw	Key		
MA001.0	F10	Ø102	4 - M10	40	30	2 x PF1" 1 x PF1 1/2"	4 x PF1" 1 x PF1 1/2"
MA002.0	F14	Ø140	4 - M16	58	46	2 x NPT1" 1 x NPT1 1/2"	4 x NPT1" 1 x NPT1 1/2"
MA003.0	F16	Ø165	4 - M20	72	58	2 x NPT1" 1 x NPT1 1/2"	4 x NPT1" 1 x NPT1 1/2"
MA004.0	F25	Ø254	8 - M16	97	82	2 x M25 Pitch1.5 1 x M40 Pitch1.5	4 x M25 Pitch1.5 1 x M40 Pitch1.5

### Board



- ① Main Board
  - A main board provides precise control depending on the user's need
  - Output 4-20mA
  - The saved settings can be reset again.
- ② Relay Board
  - Valve's running direction can be measured by 8 relays on the board. (terminal number 24--42)
  - Provided 4 relays(terminal number4--11) can be used as the user's need among the 10 functions.
- ③ Power Board
  - It receives the 3phase power and provides the power supply to internal boards.
  - It delivers the control signal to the magnet switch to operate the motor.
  - It includes safety circuit against external noise and depending on the environment a heater can be added.
- ④ LCD & LED
  - It can be controlled by push buttons and setting tool, and all the settings and are presented on the LCD. Valve position and actuator's mode are shown on the LED.
- ⑤ ESD
  - Decision of behavior for Emergency shut down signal
- ⑥ Auto reversing magnetic contactors
- ⑦ MOTOR TP
  - Motor protection. If the temperature of the motor exceeds 130°C ±5°C, the thermal protector is disconnected to protect the motor.
- ⑧ Connector
  - connectors' shapes and colors are different for ease of assembly and produced against vibration.

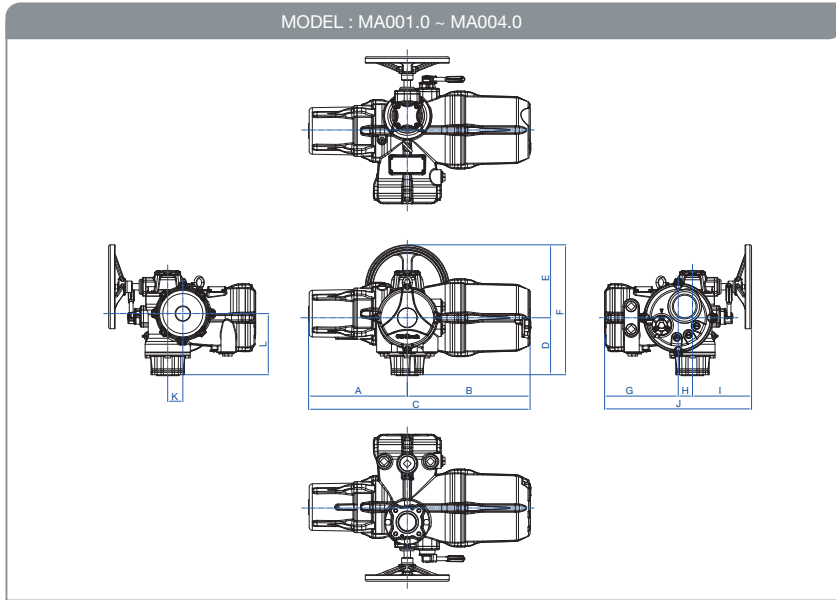
### Battery

If the power is shut off, valve position and running direction can be presented on the display by the battery. If there is no operation in actuators, LCD screen is turned off for the battery lifespan and recover when there is operation.

Manufacturer / Model	Saft / LS17500	Voltage	3.6V	Capacity	3600mAh	UL Approval Number	MH12609
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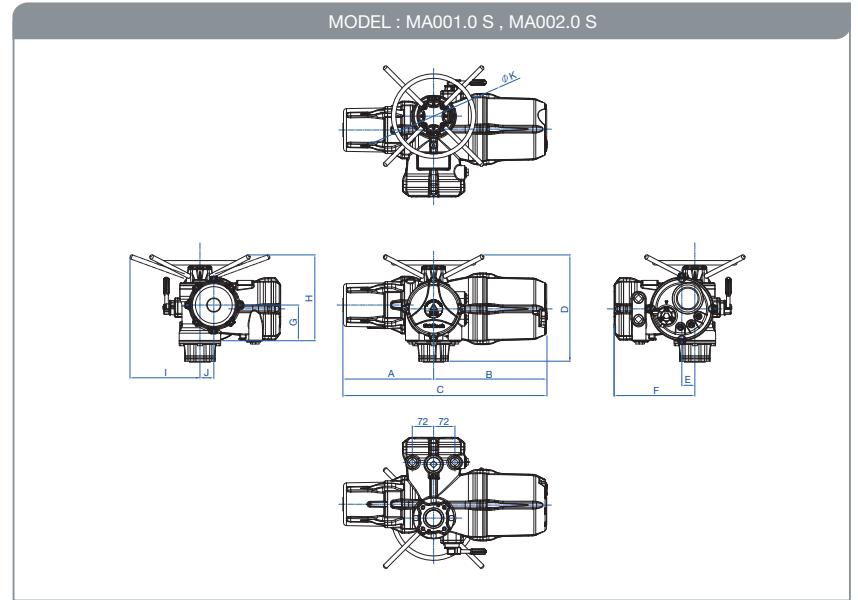


**Side Handle Dimension (MA001.0~MA004.0)**



Type	A	B	C	D	E	F	G	H	I	J	K	L
MA001.0	306	380.5	686.5	176.5	226	402.5	228.5	44	183	455.5	46.8	189.5
MA002.0	388	395	783	193	263.5	456.5	228	37.8	205.5	471.3	34.5	217.5
MA003.0	483.75	420.75	904.5	227	280.5	507.5	228	53	206	487	33.5	254.5
MA004.0	549.5	521	1070.5	270.5	323.5	594	249	69	235	553	74	332

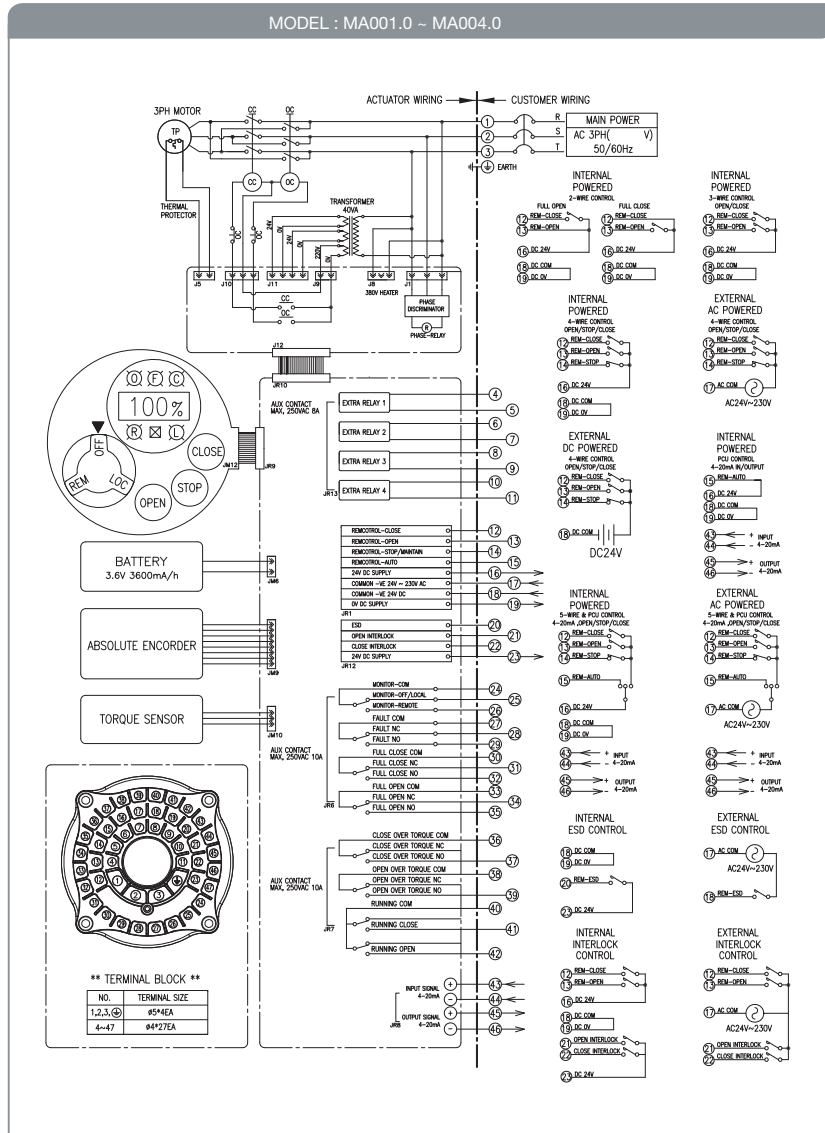
**Top Handle Dimension (MA001.0 , MA002.0)**



Type	A			B	C			D	E	F	G	H	I	J	ØK
	0.2kW	0.4kW	0.75kW		0.2kW	0.4kW	0.75kW								
MA001.0	299.5	299.5	306	382.5	682	682	688.5	358.5	44	272.5	120.4	289.5	236	46.8	472
Type	A			B	C			D	E	F	G	H	I	J	K
	0.75kW	1.5kW	2.2kW		0.75kW	1.5kW	2.2kW								
MA002.0	327	365	388	397	724	762	785	418.5	37.8	265.8	113.8	339.5	307.3	34.3	614.5



Wiring



# Electric Actuator SA Series



The above wiring diagram is for the multi-turn actuator with full optional specification. Please contact EMICO or its distributor to get the wiring diagrams with other specification.



SA Series Feature

Included with the end of travel motor switches are two additional dry-contacts for auxiliary indication.	Standard enclosure with o-ring sealing is watertight to IEC IP67.
To help protect the components and extend the actuator's life, heater is included as standard.	4-LED lights are located inside the high impact dome indicator.
In case of a power loss, the manual over-ride is provided for positioning the valve.(6mm L-Wrench)	The dome lights will illuminate and allow added visibility over a greater distance or in low light areas.
Use spacious voltage (AC, DC 24V / 1PH AC110, 220V) * Except the 3PH 380V, 440V	3 ISO mounting pads are provided for greater flexibility. (F03,05,07) * SA003: F03, F04, F05
Quality terminal block containing segregated power and control terminal are designed for use in high vibration environments. (* SA003: PCB Screw Terminal Block used)	Valve stem connections is 14x14, 11X11, 9X9 inserts default. * SA003: 11x11, 9x9

### Performance

Model	Type	Output Torque		Operating Time(90°)		Motor Class(E)	Rated Current (A)				Duty Cycle	Number Of Handle Turns	Weight kg	Valve a range of application (10K)	
		Kg-m	N-m	60Hz	50Hz		W	1 Phase (AC) DC							
								24V	110V	220V					24V
SA003	ON-OFF	3	30	12	12	3	1	0.2	0.11	0.8	15	7.5	1.5	2way Screw Ball Valve: ~25A 3way Screw Ball Valve: ~20A	
SA005	ON-OFF	5	50	14	17	6	1.8	0.35	0.23	1.8	15	6	2.8	Butterfly Valve: ~65A Ball Valve : ~32A	
SA005L	Modulating Built-in Battery	5	50	14	17	6	1.8	0.35	0.23	1.8	15	6	3.2		
SA05X	EXP	5	50	14	17	6	1.8	0.35	0.23	1.8	15	6	5		
SA009	ON/OFF	9	90	26	32	6	2.1	0.35	0.25	2.1	15	4.5	2.8	Butterfly Valve: ~100A Ball Valve : ~50A	
SA009L	Modulating Built-in Battery	9	90	26	32	6	2.1	0.35	0.25	2.1	15	4.5	3.2		
SA09X	EXP	9	90	26	32	6	2.1	0.35	0.25	2.1	15	4.5	5		

\* Note: Standard Spec. (Power: 1PH AC220V)

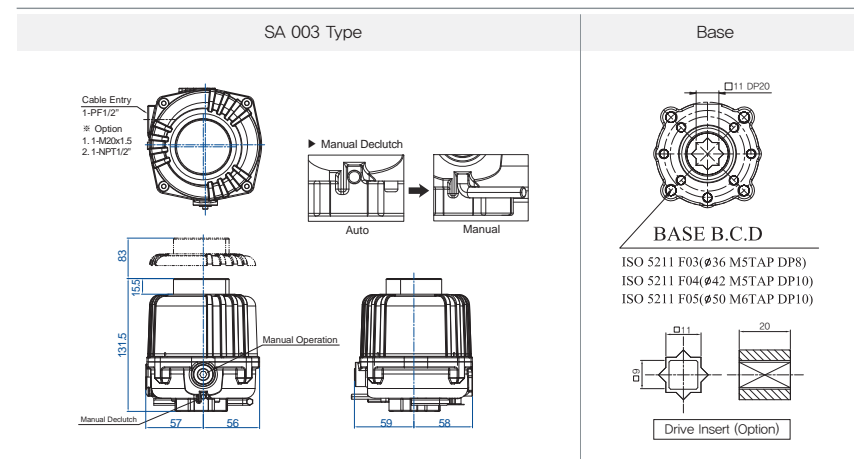
\* Note: Except the 3PH AC380V, 440V

### SA003 Type Standard Specification



Enclosure	Weather Proof Enclosure IP67 (Nema 4 and 6)
Ambient Temperature	-20°C to 70°C
Main Power	AC 110/220V 1PH ±10% 50/60Hz, AC/DC24V
Indicator	Dome Type (LED Light inside)
Limit Switch	2 Open/Close + Dry Contact 2 Open/Close (250VAC)
Travel Angle	90° ± 5° (Extension : upto 270°)
Manual Operation	By L-wrench (6mm hexagon)
Self Locking	Provided by means of magnetic in motor
Heater	2 x 2W (110/230VAC, 24VDC)
Cable Entry	1-PF 1/2" (Option : M 20 x Pitch 1.5, NPT 1/2")
Lubrication	Grease (Shell Gadus S2 V220 2)
Consist Of Materials	Aluminium Alloy
Surface Treatment	Anodizing
External Coating	Polyester (TGIC-free)

### SA003 Type Dimension



**SA005,005L / SA009,009L Type Standard Specification**

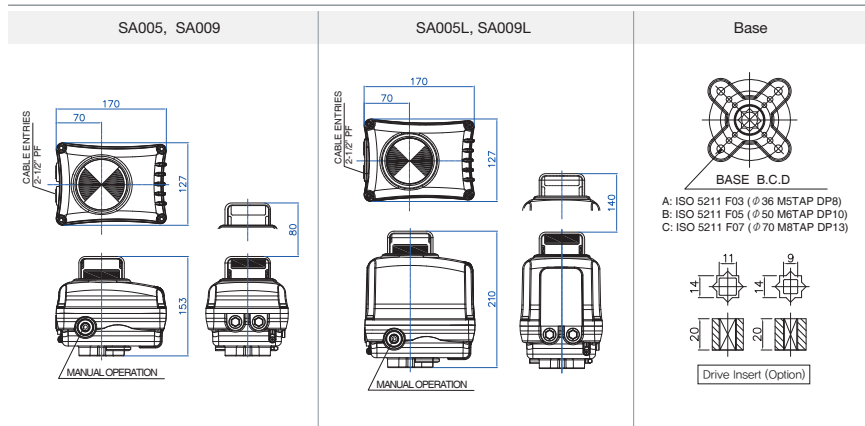


Enclosure	Weather Proof Enclosure IP67 (Nema 4 and 6)
Ambient Temperature	-20°C to 70°C (Option: On-Off, PCU 250°C)
Main Power	AC 110/230V 1PH ±10% 50/60Hz, AC/DC24V
Indicator	Dome Type (LED Light inside)
Limit Switch	2 Open/Close + Dry contact 2 Open/Close (250VAC)
Travel Angle	90° ± 5° (Extension : upto 270°)
Manual Operation	By L-wrench (6mm hexagon)
Self Locking	Provided by means of worm gearing
Heater	5W (110/230VAC, 24VDC)
Cable Entries	2-PF 1/2" (Option : 2-M20 x Pitch 1.5, 2-NPT 1/2")
Lubrication	Grease (Shell Gadus S2 V220 2)
Consist Of Materials	Aluminium Alloy
Surface Treatment	Anodizing
External Coating	Polyester (TGIC-free)

**SA005, SA009 Series Optional Specification**

Option	Spec.	Option	Spec.
P.I.U	Potentiometer Unit (1k-ohm)	P.C.U	Proportional Control Unit Input: DC 4-20mA, 2-10VDC, 1-5VDC, 0-5VDC, 0-10VDC Output: DC 4-20mA
C.P.T	Current Position Transmitter Output DC 4-20mA	R.B.P	Rechargeable Battery Pack

**SA005,005L / SA009,009L Type Dimension**



**SA05X, SA09X Type Standard Specification**

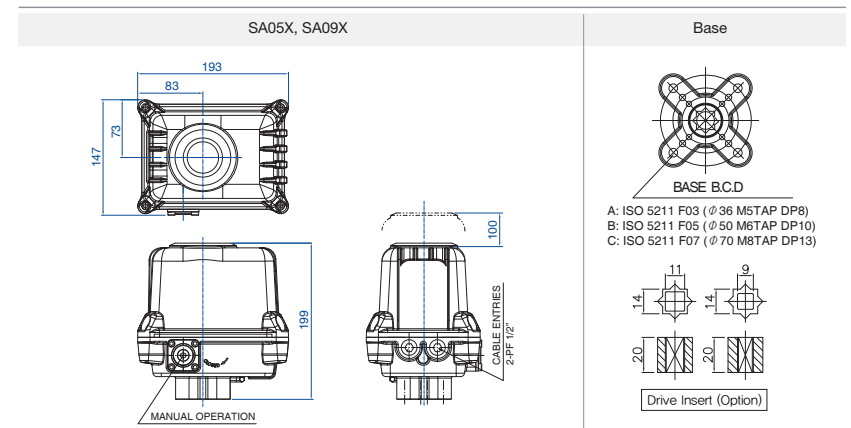


Enclosure	Weatherproof enclosure IP67 (Nema 4 and 6), Ex d IIB T4 (Flameproof Enclosure)
Ambient Temperature	-20°C to 70°C
Main Power	AC 110/230V 1PH ±10% 50/60Hz, AC/DC24V
Indicator	Flat Type
Limit Switch	2 Open/Close + Dry contact 2 Open/Close (250VAC)
Travel Angle	90° ± 5° (Extension : upto 270°)
Manual Operation	By L-wrench (6mm hexagon)
Self Locking	Provided by means of worm gearing
Heater	5W (110/230VAC, 24VDC)
Cable Entries	2-PF 1/2" (Option : 2-M20 x Pitch 1.5, 2-NPT 1/2")
Lubrication	Grease (Shell Gadus S2 V220 2)
Consist Of Materials	Aluminium Alloy
Surface Treatment	Anodizing
External Coating	Polyester (TGIC-free)

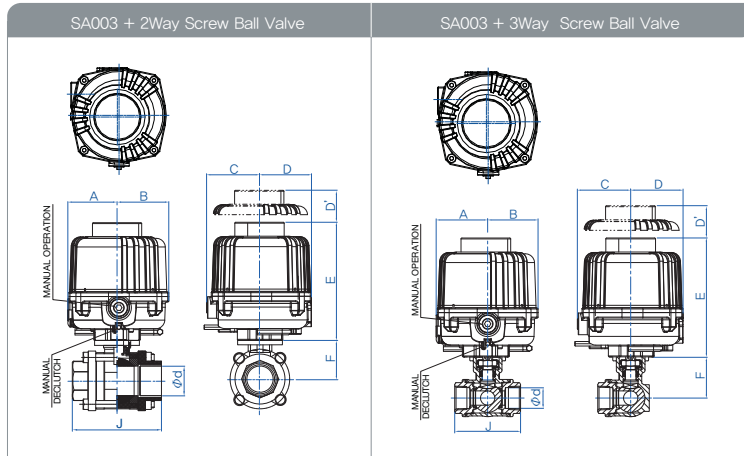
**SA05X, SA09X Type Optional Specification**

Option	Spec.	Option	Spec.
P.I.U	Potentiometer Unit (1k-ohm)	P.C.U	Proportional Control Unit Input: DC 4-20mA, 2-10VDC, 1-5VDC, 0-5VDC, 0-10VDC Output: DC 4-20mA
C.P.T	Current Position Transmitter Output DC 4-20mA		

**SA05X, SA09X Type Dimension**



**SA003 Type M.O.V Dimension**



**SA003 Type + 2Way Screw Ball Valve**

Valve Size	Model	A	B	C	D	D'	E	F	φd	J
15A	SA003	57	56	59	58	83	131.5	42	15	75
20A		57	56	59	58	83	131.5	49	20	80
25A		57	56	59	58	83	131.5	58	25	90

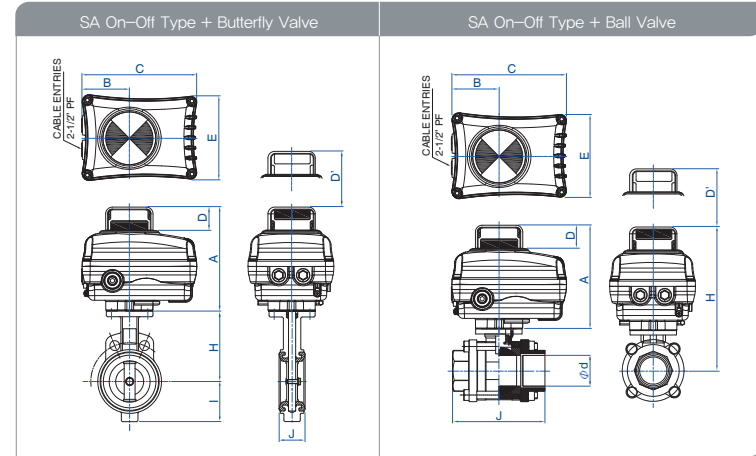
※ Rating: 1000 PSI Type / ※ Except the 3PH AC380V, 440V.

**SA003 Type + 3Way Screw Ball Valve**

Valve Size	Model	A	B	C	D	D'	E	F	φd	J
15A	SA003	57	56	59	58	83	131.5	43	15	72
20A		57	56	59	58	83	131.5	46	20	87

※ Rating: 1000 PSI Type / ※ Except the 3PH AC380V, 440V.

**SA005, 009 Type M.O.V Dimension**



**SA On/Off Type + Butterfly Valve**

Valve Size	Model	A	B	C	D	D'	E	H	I	J
40A	SA005	153	70.5	171	34	80	127	107	57	41
50A		153	70.5	171	34	80	127	118	60	43
65A		153	70.5	171	34	80	127	126	68	46
80A	SA009	153	70.5	171	34	80	127	136	78	46
100A		153	70.5	171	34	80	127	157	80	52

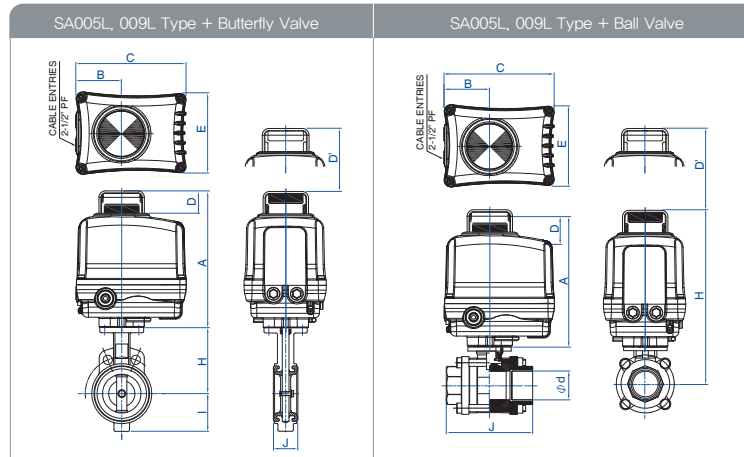
※ Rating: JIS 10K Wafer Type / ※ Except the 3PH AC380V, 440V.

**SA On/Off Type + Ball Valve**

Valve Size	Model	A	B	C	D	D'	E	φd	H	J
15A	SA005	153	70.5	171	34	80	127	φ15	169.5	75
20A		153	70.5	171	34	80	127	φ20	175	75
25A		153	70.5	171	34	80	127	φ25	180.5	85
32A		153	70.5	171	34	80	127	φ32	187	100
40A	SA009	153	70.5	171	34	80	127	φ40	194	110
50A		153	70.5	171	34	80	127	φ50	202	121.5

※ Rating: 1000 PSI Type / ※ Except the 3PH AC380V, 440V.

**SA005L, 009L Type M.O.V Dimension**



**SA005L, 009L Type + Butterfly Valve**

Valve Size	Model	A	B	C	D	D'	E	H	I	J
40A	SA005L	210	70.5	170.5	34	140	127	107	57	41
50A		210	70.5	170.5	34	140	127	118	60	43
65A		210	70.5	170.5	34	140	127	126	68	46
80A	SA009L	210	70.5	170.5	34	140	127	136	78	46
100A		210	70.5	170.5	34	140	127	157	89	52

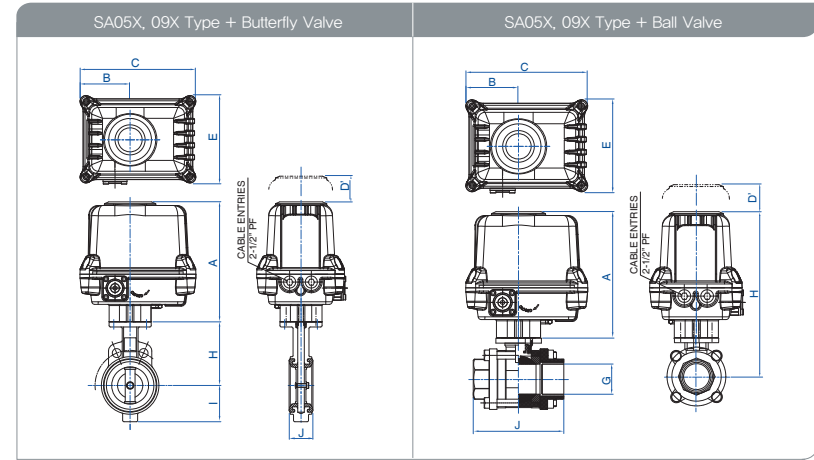
※ Rating: JIS 10K Wafer Type / ※ Except the 3PH AC380V, 440V.

**SA005L, 009L Type + Ball Valve**

Valve Size	Model	A	B	C	D	D'	E	ϕd	H	J
15A	SA005L	210	70.5	170.5	34	140	127	ϕ15	229.5	75
20A		210	70.5	170.5	34	140	127	ϕ20	235	75
25A		210	70.5	170.5	34	140	127	ϕ25	240.5	85
32A		210	70.5	170.5	34	140	127	ϕ32	247	100
40A	SA009L	210	70.5	170.5	34	140	127	ϕ40	254	110
50A		210	70.5	170.5	34	140	127	ϕ50	262	121.5

※ Rating: 1000 PSI Type / ※ Except the 3PH AC380V, 440V.

**SA05X, 09X Type M.O.V Dimension**



**SA05X, 09X Type + Butterfly Valve**

Valve Size	Model	A	B	C	D'	E	H	I	J
40A	SA05X	199	83	193	100	147	107	57	41
50A		199	83	193	100	147	118	60	43
65A		199	83	193	100	147	126	68	46
80A	SA09X	199	83	193	100	147	136	78	46
100A		199	83	193	100	147	157	89	52

※ Rating: JIS 10K Wafer Type / ※ Except the 3PH AC380V, 440V.

**SA05X, 09X Type + Ball Valve**

Valve Size	Model	A	B	C	D'	E	ϕd	H	J
15A	SA05X	199	83	193	100	147	ϕ15	229.5	75
20A		199	83	193	100	147	ϕ20	235	75
25A		199	83	193	100	147	ϕ25	240.5	85
32A		199	83	193	100	147	ϕ32	247	100
40A	SA09X	199	83	193	100	147	ϕ40	254	110
50A		199	83	193	100	147	ϕ50	262	121.5

※ Rating: 1000 PSI Type / ※ Except the 3PH AC380V, 440V.



EMICO

## Electric Actuator NA Series



### Performance

Type	Max Output Torque		Operating Time (90/sec)		Rated Current (A)						Motor		Duty Cycle	Max Stem Dia	Handle Turns	Weight
	Kg.m	N.m	50Hz	60Hz	DC24V	AC110V	AC220V	AC230V	AC380V	AC440V	W	Class	S4 (%)	mm		kg
NA006	6	60	17	14	2.5	0.7	0.38	0.38	0.15	0.15	15	F	50	22	8.5	9
NA009	9	90	17	14	3.5	1.1	0.51	0.56	0.18	0.18	25	F	50	22	8.5	9
NA015	15	150	20	17	5.0	1.6	0.75	0.75	0.3	0.3	40	F	50	22	10	11.5
NA019	19	190	20	17	5.0	1.6	0.75	0.75	0.3	0.3	40	F	50	22	10	11.5
NA028	28	280	24	20	6.5	1.6	0.75	0.75	0.32	0.32	40	F	50	32	12.5	14
NA038	38	380	24	20	-	2.3	1.1	1.06	0.34	0.32	60	F	30	32	12.5	14
NA050	50	500	24	20	-	3.5	1.2	1.2	0.47	0.47	90	F	25	32	12.5	14
NA060	60	600	29	24	-	3.5	1.2	1.2	0.47	0.47	90	F	25	42	14.5	24
NA080	80	800	29	24	-	3.8	1.8	1.8	0.75	0.75	180	F	25	42	14.5	24
NA100	100	1000	29	24	-	4.0	2.0	2.0	0.85	0.85	180	F	25	42	14.5	24
NA150	150	1500	87	72	-	3.5	1.2	1.2	0.47	0.47	90	F	25	75	43.5	60
NA200	200	2000	87	72	-	3.8	1.8	1.8	0.75	0.75	180	F	25	75	43.5	60
NA250	250	2500	87	72	-	4.0	2.0	2.0	0.85	0.85	180	F	25	75	43.5	60
NA300	300	3000	116	96	-	4.0	2.0	2.0	0.85	0.85	180	F	25	75	58	60

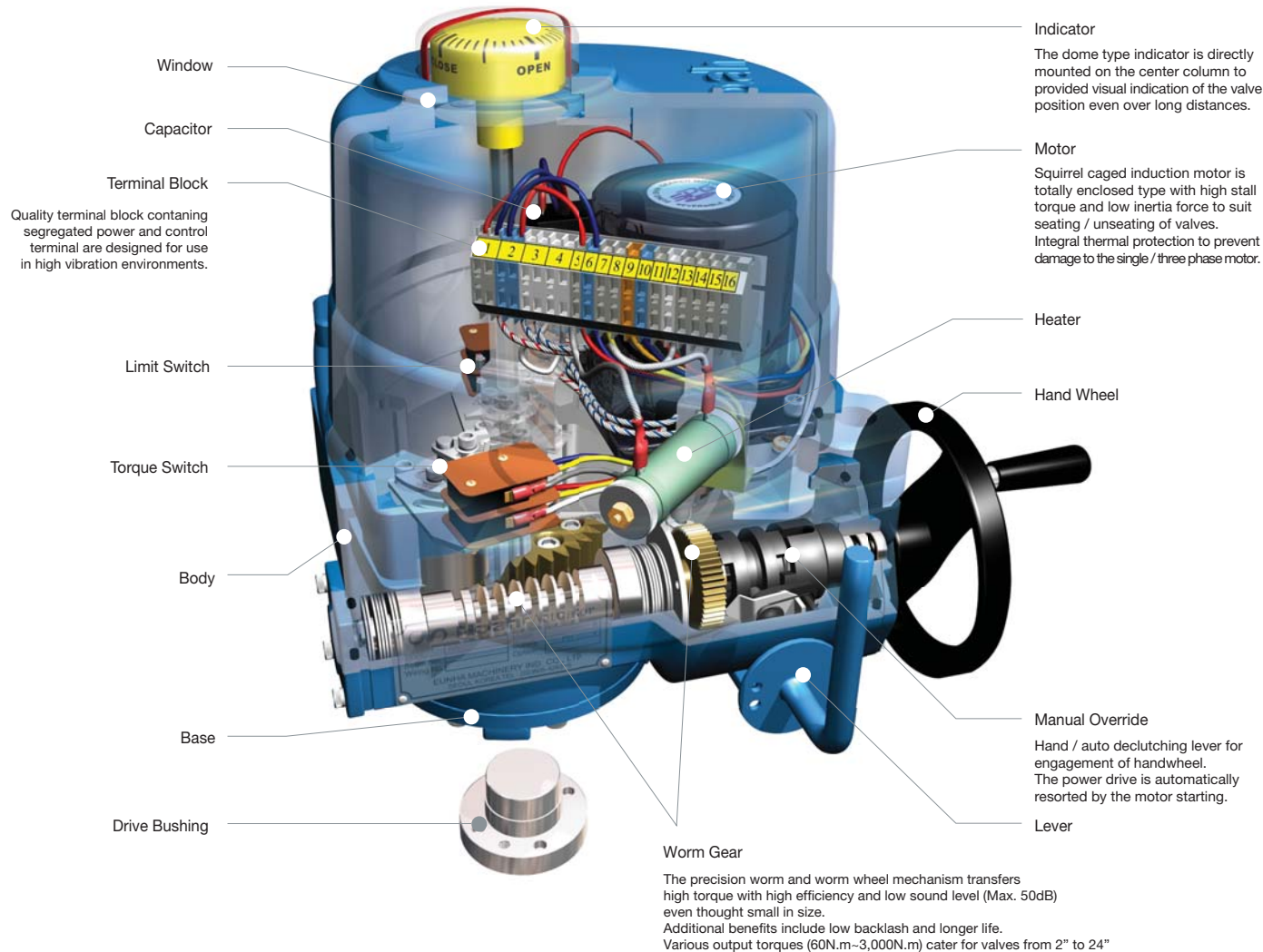
### Standard Specification

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6
Ambient Temperature	-20°C to +70°C , 150°C / 1hr (Option: -60°C, 400°C / 1hr)
Power Supply	110 / 220 VAC 50/60Hz , 380 / 440 VAC 50/60Hz Option : AC 24V , DC 24V
Torque Switches	2 Open / Close (Except NA006, NA009)
Limit Switches	2 Open / Close, 250VAC 15A Rating
Stall Protection	Built - in Thermal Protection (Open 150°C ± 5°C / Close 97°C ± 15°C)
Travel Angle	90±5°
Indicator	Continuous Position Indicator
Manual Override	Hand / Auto Decoupling Mechanism
Self Locking	Provided by means of Worm Gearing
Mechanical Stops	External Adjustable Screws
Space Heater	20W
Cable Entries	2-PF 3/4", 2-NPT 3/4", 2-M20 x 1.5 (Pitch)
Lubrication	Shell Gadus S2 V220 2
Material	Aluminium
Surface Treatment	Anodizing
External Coating	Polyester(TGIC-Free)

### Optional Specification

E X P	Explosion Proof / Ex d IIB T4
IP68	Watertight Enclosure IP68 / 1bar 72h (KTL)
A L S	Auxiliary Open, Close Limit Switches
A T S	Auxiliary Open, Close Torque Switches
P I U	Potentiometer 1K Ohm
P C U	Proportional Control Unit / Input : DC 4-20mA, DC 0-10V / Output: DC 4-20mA
C P T	Current Position Transmitter
L C U	Local Control Unit
I M S	Integral Motor Starter (On-Off Action)
E X T	Travel Angle (120°, 135°, 180°, 270°, 300°)
D C M	Power Supply DC 24V (NA006-NA028)
Field-Bus	Profi-Bus, Mod-Bus, Can-Bus

**Configuration**



**FEATURES**

- **SEALING**  
Standard enclosure with o-ring sealing is watertight to IEC IP67, NEMA 4 and 6. the actuator is available with optional explosion proof enclosure.
- **WIRING**  
Electric wiring of control circuit is standardized for single and three phase power supply in a single module. Multiple terminal contacts sufficiently cover additional requirements such as auxiliary contacts for interlocking and other options.
- **COMPONENT ARRANGEMENT**  
Mechanical and electrical module can be separated easily to improve assembling, maintenance and alteration of electrical requirements. Actuator has enough internal space for optional accessories.
- **HAND WHEEL**  
Size of hand wheel is designed for safe and efficient emergency manual operation.
- **MANUAL OVERRIDE**  
Hand / auto declutching lever for hand wheel engagement. The power drive is automatically restored by motor start.
- **ADAPTION**  
Base mounting is standard to ISO5211. Drive bushing os removable for maching to valve stem requirement. The actuator position on the valve can be selected for 4 positions by means of 4 bolt holes in the drive bushing.
- **HEATER**  
A space heater inside the actuator prevents condensation due to temperature and weather changes. Standard 20W heater keeps all electrical components in the actuator clean and dry.
- **LIMIT SWITCHES**  
The limit switch is activated by means of a simple and yet reliable cam mechanism mounted and driven by the center column. The valve position can be accurately and easily set with the simple adjustable switch mechanism. The set position is permanent and is not affected by over-treval resulting form manual operation.
- **TORQUE SWITCHES**  
Cam activated torque switches are easily adjustable to provide over-load protection.
- **SELF LOCKING**  
Rolled steel wormgear on aluminium bronze wormwheel self locking to prevent valve back drive on control signal or power failure.

Optional

ALS (Auxiliary Limit Switches)

Providing the dry contact signal to check valve's positions (cam switches structure).

ATS (Auxiliary Torque Switches)

Providing the dry contact signal send to customer's panel as fault signal (cam switches structure).

CPT (Current Position Transmitter)

Combined with P.I.U and transfer output signal (DC 4-20mA) from P.I.U's value of resistance.

- Output Signal : DC 4-20mA



PCU (Proportional Control Unit)

Combined with P.I.U and control the valve's position proportionally by input signal and provide valve's position as their output signal.

- Input signal : DC 4-20mA / DC 1-5V / DC 2-10V
- Output signal : DC 4-20mA



PIU (Position Indication Unit)

Providing resistance value (0~1KΩ) according to valve's position.



LCU (Local Control Unit)

LCU can be installed either on the actuator or distantly by cable. It can be controlled conveniently as it consists of Local / Remote Switch, Open / Stop / Close Switch and LED Lamp



Field-Bus

Field-Bus can control 126pcs of electric actuators at the same time using communication hardware system based on PC.

(Profi-Bus, Mod-Bus, Can-Bus) For more information please contact EMICO.



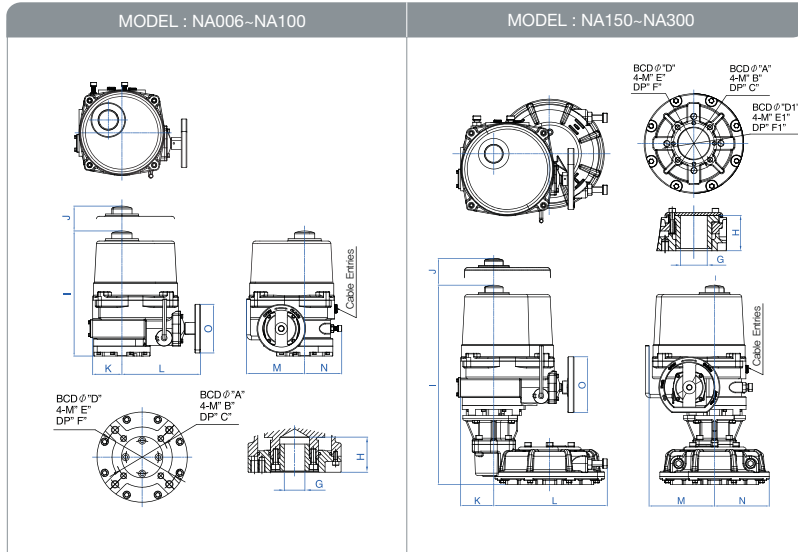
NA Integral Standard Specification

Main Power	110/220 VAC 50/60Hz , 380/440 VAC 50/60Hz
Internal Control Power	24 VDC
External Control Power	110 VAC, 24 VDC
Torque Switches	2 Open / Close (Except NA006, NA009)
Limit Switches	2 Open / Close, 250VAC 15A Rating
Control Unit	1. Non Intrusive Push Buttons [Open/ Stop/ Close] 2. Non Intrusive Selector Switch [Remote / Off / Local] 3. Reversing Contactor 4. Phase Discriminator
Position Indicator	Digital Display (0~100%)
Remote Dry Contact (Max 250VAC 5A)	1. Full Open / Close 2. Opening / Closing 3. Open / Close Over Torque 4. Monitor ( Remote / Local )
Cable Entries	Standard 1-PF 1", 2-PF 3/4"
	Option 1-NPT 1", 2-NPT 3/4" 1-M25 Pitch 1.5 , 2-M20 Pitch 1.5
Potentiometer	0 ~ 1 KΩ
Lubrication	Shell Gadus S2 V220 2
Consist of Materials	Aluminium
Surface Treatment	Anodizing
External Coating	Polyester(TGIC-Free)

NA Integral Optional Specification

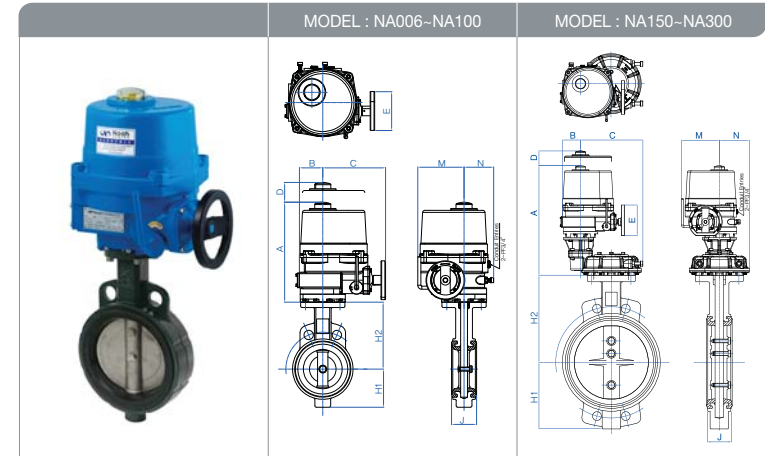
P C U	PCU enables the actuator to be controlled form a distance. Input: DC 4-20mA, DC 1-5V, DC 2-10V / Output: DC 4-20mA
C P T	CPT outputs by converting the actuator's place value to ampere. Output Signal: DC 4-20mA
F D B	FDB is used when controlling actuators using communication hardware system based on PC. (Profi-Bus, Mod-Bus, Can-Bus) For more information please contact EMICO.

Dimension



Type	NA006 NA009	NA015 NA019	NA028 NA038 NA050	NA060 NA080 NA100	NA150, NA200, NA250, NA300	
A	BCD70	BCD70	BCD102	BCD125	BCD125	
B	4-M8	4-M8	4-M10	4-M12	4-M12	
C	12	12	18	22	22	
Flange ISO5211	F07	F07	F10	F12	F12	
D	D1	-	BCD102	BCD125	BCD140	BCD165
E	E1	-	4-M10	4-M12	4-M16	4-M20
F	F1	-	15	18	22	25
Flange ISO5211	-	F10	F12	F14	F14	F16
Option	BCD82	BCD82	-	BCD102(F10)	-	
G(MAX)	Key	22	22	32	42	75
	Square	20	20	26	34	65
H	46	46	55	62	100	
I	270	274	321	362	554	
J	108	108	130	178	178	
K	55	70	75	92	92	
L	174	184	202	223	315	
M	120	139	149	192	192	
N	68	85	95	105	152	
O	102	102	125	155	170	
Cable Entries	2-PF3/4"	2-PF3/4"	2-PF3/4"	2-PF3/4"	2-PF3/4"	
	2-M20x1.5	2-M20x1.5	2-M20x1.5	2-M20x1.5	2-M20x1.5	
	2-NPT3/4"	2-NPT3/4"	2-NPT3/4"	2-NPT3/4"	2-NPT3/4"	

NA On-Off Type + Butterfly Valve



Dimension(mm)											
Size	Model	A	B	C	D	E	M	N	H1	H2	J
80A	NA006	270	55	174	108	102	120	68	78	136	46
100A	NA009	270	55	174	108	102	120	68	89	157	46
125A	NA015	274	70	184	108	102	139	85	109	175	52
150A	NA019	274	70	184	108	102	139	85	124	195	56
200A	NA028	321	75	202	130	125	149	95	174	226	60
250A	NA038	321	75	202	130	125	149	95	205	268	68
300A	NA060	362	92	223	178	155	192	105	228	301	78
350A	NA080	362	92	223	178	155	192	105	254	327	78

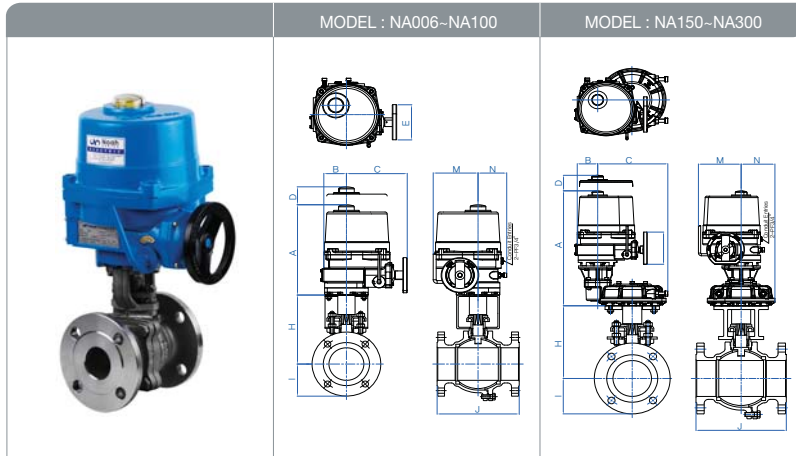
Gear Box Type											
Size	Model	A	B	C	D	E	M	N	H1	H2	J
400/450A	NA150	554	92	315	178	170	192	152	290/318	348/400	102/108
500A	NA200	554	92	315	178	170	192	152	348	435	125
600A	NA250	554	92	315	178	170	192	152	461	508	150
600/650A	NA300	554	92	315	178	170	192	152	461/487	508/542	150/160

\* Note : Makers standard 220V. Other AC110V, 380V, 440V, OPTION DC 24V contact with the manufacture.  
\* Rating : JIS 10K Wafer Type



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### NA On-Off Type + Ball Valve



Dimension(mm)

Size	Model	A	B	C	D	E	M	N	H	I	J
40A	NA006	270	55	174	108	102	120	68	196	70	165
50A	NA009	270	55	174	108	102	120	68	204	72.5	178
65A	NA015	274	70	184	108	102	139	85	216	87.5	190
80A	NA019	274	70	184	108	102	139	85	236	92.5	203
100A	NA028	321	75	202	130	125	149	95	254	105	229
125A	NA050	321	75	202	130	125	149	95	310	125	356
150A	NA060	362	92	223	178	155	192	105	335	140	394
200A	NA100	362	92	223	178	155	192	105	406	165	457

Gear Box Type

250A	NA200	554	92	315	178	170	192	152	442	200	533
300A	NA250	554	92	315	178	170	192	152	506	222.5	610
300A(350A)	NA300	554	92	315	178	170	192	152	506	222.5	610

- ※ Note : Makers standard 220V. Other AC110V, 380V, 440V, OPTION DC 24V contact with the manufacture.
- ※ Rating : JIS 10K RF

## Electric Actuator NA Series

### Built-in Super Capacitor Type







NA Built-in Super Capacitor Type

- Anodized with aluminium alloy and powder coating(Polyester, TGIC-Free) is followed for corrosion protection.
- The enclosure is rated IP67 and sealed with o-rings. It enables actuators to be installed outside. (IEC IP67, NEMA 4 and 6)
- 20W space heater is provided to protect internal components from condensation.
- The gears are self-locking mechanically.
- Torque switches (Open/Close) are provided to protect the actuator and its application electrically and mechanically from overload.
- NA series with SCP are operated by the power of super capacitor in case of power failure.
- Actuators can stop at current position or they can be driven to open or close position depending on user's requirement.
- When a charge lamp blinks super capacitor must be charged. If super capacitor is fully charged it goes off.

Performance

Model	Output Torque		Operating Time(90°) (Sec)	Rated Current (A)		Motor Class (W)	Number of Handle Turns	Weight kg
	Kg.m	N.m		110V	220V			
NA006	6	60	15	0.6	0.3	15	8.5	13.5
NA009	9	90	17	0.8	0.37	25	8.5	13.5
NA015	15	150	17	1	0.43	40	10	16
NA019	19	190	19	1	0.43	40	10	16
NA028	28	280	22	2.25	1.13	40	12.5	18.5

Standard Specification

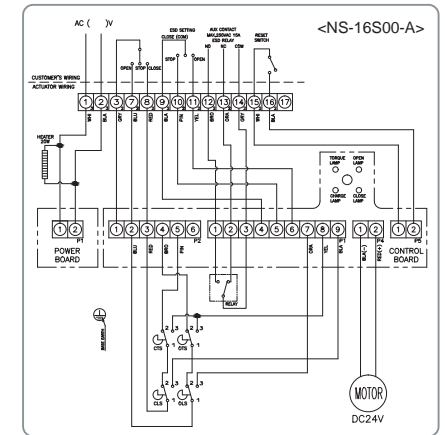
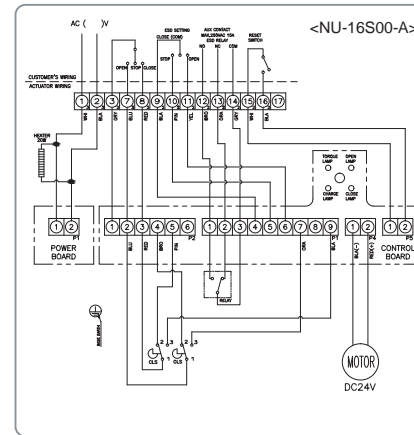
Enclosure	Watertight Ingress Protection 67 Nema 4 and 6		
Ambient Temperature	-20°C to +70°C	Self Locking	Provided by means of Worm Gearing
Power Supply	95~260VAC 50/60Hz	Mechanical Stops	External Adjustable Screws
Limit Switches	2 Open / Close, 250VAC 15A Rating	Space Heater	20W
Torque Switches	2 Open / Close (Except NA006, NA009)	Cable Entries	2-PF 3/4" (Option: M20xPitch1.5, NPT 3/4")
Stall Protection	Built - in Thermal Protection	Lubrication	Shell Gadus S2 V220 2
Travel Angle	90±5°C	Material	Aluminium
Indicator	Continuous Position Indicator	Surface Treatment	Anodizing
Manual Override	Hand / Auto Decoupling Mechanism	External Coating	Polyester(TGIC-Free)

Built In Super Capacitor Specification

Power Supply	AC90V ~ 250V 50/60Hz	Number of Emergency Operating	1 travel (Open to Close or Close to Open)		
Charging Voltage	26.5V		Charging Current	110V	1.1A
Charging Time	NA006~019 3 min 30 sec			220V	0.45A
	NA028 2 min		110V	2.2A	
Weight	0.7kg		220V	1.1A	

⚠ Charge up a super capacitor before use. If the capacitor is not fully charged, emergency operating is not available.

Standard Wiring

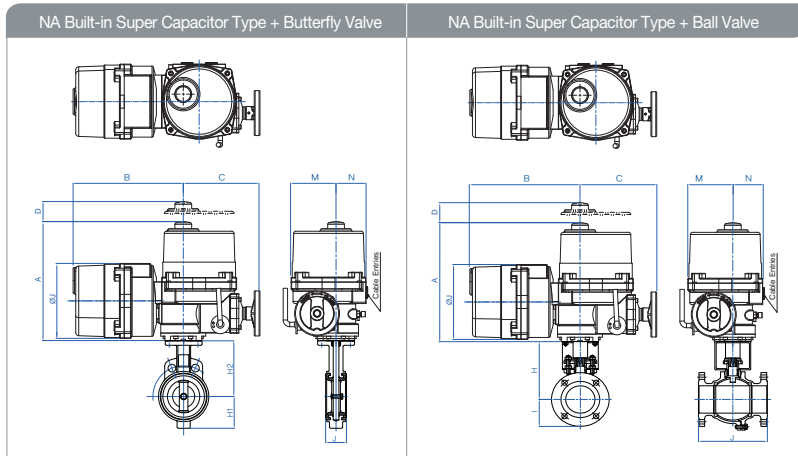


Dimension

	NA006	NA009	NA015	NA019
A	6		6	
B	244		265	
C	174		184	
D	424		455	
E	120		139	
F	68		85	
G	188		224	
H	270		274	
H1	108		108	
I	5		5	
ØJ	170		170	
Base ISO5211	F07 Ø70 / 4-M8 DP12 MAX Ø22		F07 Ø70 / 4-M8 DP12 F10 Ø102 / 4-M10 DP15 MAX Ø22	
Cable Entries	2-PF3/4" ( Option : M20xPitch1.5, NPT3/4")			

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### NA Built-in Super Capacitor Type + M.O.V Dimension



#### NA Built-in Super Capacitor Type + Butterfly Valve

Dimension(mm)											
Size	Model	A	B	C	D	ØJ	M	N	H1	H2	J
80A	NA006	270	250	174	108	170	120	68	78	136	46
100A	NA009	270	250	174	108	170	120	68	89	157	46
125A	NA015	274	271	184	108	170	139	85	109	175	52
150A	NA019	274	271	184	108	170	139	85	124	195	56

※ Note : Makers standard 220V.

#### NA Built-in Super Capacitor Type + Ball Valve

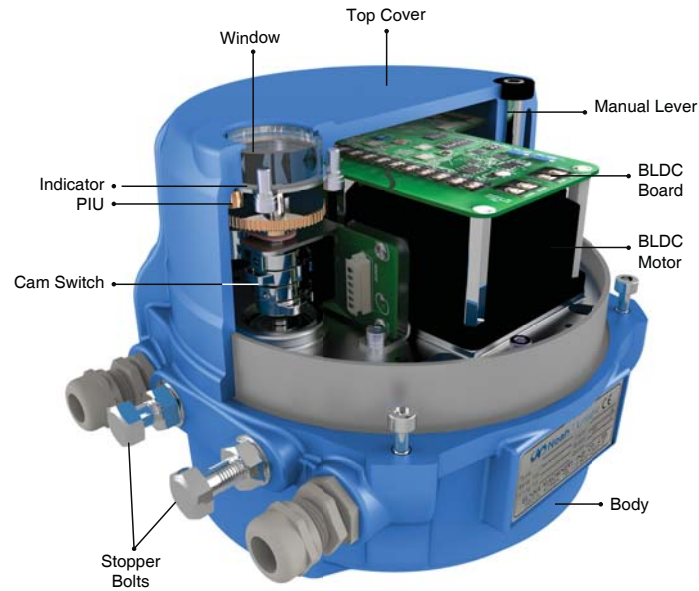
Dimension(mm)											
Size	Model	A	B	C	D	ØJ	M	N	H	I	J
40A	NA006	270	250	174	108	170	120	68	196	70	165
50A	NA009	270	250	174	108	170	120	68	204	72.5	178
65A	NA015	274	271	184	108	170	139	85	216	87.5	190
80A	NA019	274	271	184	108	170	139	85	236	92.5	203

※ Note : Makers standard 220V.

## Electric Spring Return Actuator SR03 Type



## Configuration



### Features

#### Sealing

Standard enclosure with o-ring sealing is watertight to IP67, NEMA 4 and 6. The actuator is available with optional explosion-proof enclosure.

#### Motor

Squirrel caged induction motor is totally enclosed type with high stall torque and low inertia force to suit seating/unseating of valves. Integral thermal protection to prevent damage to the single phase motor.

#### Adaption

3 ISO mounting pads are provided for greater flexibility. (F03, F04, F05)

#### Wiring

Electric wiring of control circuit is standard size for single and three phase power supply in a signal module. Multiple terminal contacts sufficiently cover additional requirements such as auxiliary contacts for DCS, interlocking and other options.

#### Heater

A space heater inside the actuator prevents condensation due to temperature and weather changes. Standard 20W heater keeps all electrical components in the actuator lean and dry.

#### How to operate SR03

- Open/Close operation by motors
- In case of power failure, actuators can be operated to Full Open or Full Close position by the power of the spring.
- Operation to open position using the lever.

## Standard Specification

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6, Flameproof Enclosure Ex d IIB T4
Ambient Temperature	-20°C ~ 55°C
Power Supply	1Ph AC110~230V Free Voltage 50/60Hz, DC24V
Limit Switch	Open/Close Limit Switch (250VAC 15A)
A.L.S	Auxiliary Open, Close Limit Switches
Fail Action Speed Control	4, 7, 10 sec
P.I.U	Potentiometer 1 K Ohm
Travel Angle	90° ± 5°
Indicator	Continuous Position Indicator
Self Locking	BLDC Board Control
Manual override	External Adjustable Screws
Mechanical Stops	Hand / Auto Clutching Mechanism
Space Heater	20W
Cable Entries	2-PF 3/4" Option : 2-M20x1.5, 2-NPT 3/4" (* It identically applies to EXP Type)
Lubrication	Shell Gadus S2 V220 2
Consist of Materials	Aluminium Alloy
Surface Treatment	Anodizing
Coating	Polyester (TGIC - Free)

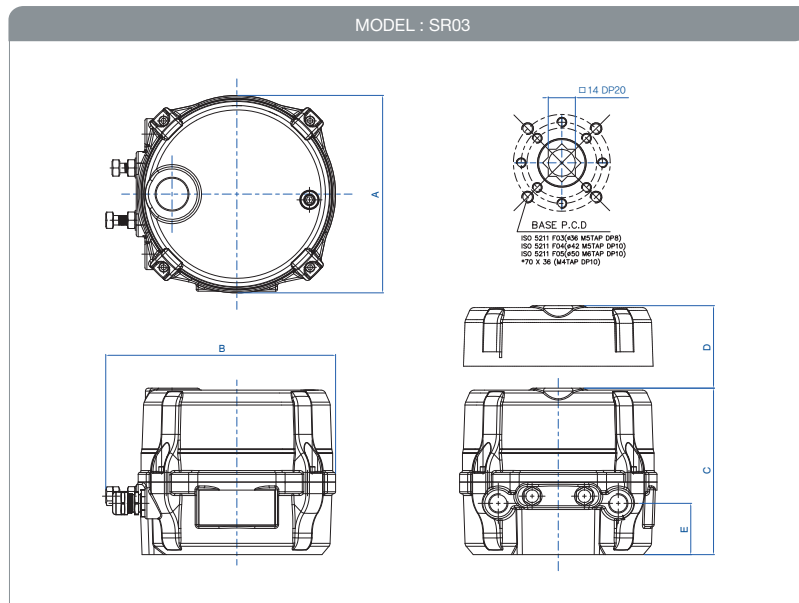
## Optional Specification

BLDC PCU	Proportional Contact Unit (Modulation) Input : 4-20mA DC 1~5VDC, 2~10VDC, 0~5VDC, 0~10VDC Output : 4-20mA DC
Field-Bus	Mod-Bus, Profi-Bus, Can-Bus

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**Performance**

Type	Max Output Torque		Spring Return Time(90°)	Operating Time (90°) (Open/Close)	Motor			Mounting Base	Handle Turns	Weight kg
	Kg.m	N.m	sec	sec	W	Class	S2 (min)	ISO5211		
SR03	3	30	4, 7, 10 Selection	10 ~ 35, Speed Control	40	E	15	F03/F04/F05	8.5	9.2

**Dimension**

Model	A	B	C	D	E	F	G	H
SR03	204	238	172	110	164	134	20	200

**Electric Spring Return Actuator  
SR Series**



## Configuration



### Features

#### Sealing

Standard enclosure with o-ring sealing is watertight to IP67, NEMA 4 and 6. The actuator is available with optional explosion-proof enclosure.

#### Motor

Squirrel caged induction motor is totally enclosed type with high stall torque and low inertia force to suit seating/unseating of valves. Integral thermal protection to prevent damage to the single/three phase motor.

#### Heater

A space heater inside the actuator prevents condensation due to temperature and weather changes. Standard 20W heater keeps all electrical components in the actuator lean and dry.

#### Adaption

Base mounting is standard to ISO 5211. Drive bush is removable for machining to valve stem requirement. The actuator position on the valve can be selected for 4 positions by means of 4 bolt holes in the drive bush.

#### Wiring

Electric wiring of control circuit is standard size for single and three phase power supply in a signal module. Multiple terminal contacts sufficiently cover additional requirements such as auxiliary contacts for DCS, interlocking and other options.

#### Limit Switches

The limit switch is activated by means of a simple and yet reliable cam mechanism mounted and driven by the center column. The valve position can be accurately and easily set with the simple adjustable switch mechanism. The set position is permanent and is not affected by over-travel resulting from manual operation.

## Standard Specification

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6
Ambient Temperature	-20°C ~ 55°C
Process Temperature	-20°C ~ 80°C
Power Supply	1Ph 110/120/220/230 VAC 50/60Hz, 3Ph 380/440VAC 50/60Hz, DC24V
Limit Switch	Open/Close Limit Switch (250VAC 15A)
Travel Angle	90° ± 5°
Indicator	Continuous Position Indicator
Self Locking	Provided by means of worm wheel
Mechanical Stops	External Adjustable Screws
Space Heater	20W
Cable Entries	2-PF 3/4" Option : 2-M20x1.5, 2-NPT 3/4" (* It identically applies to EXP Type)
Lubrication	Shell Gadus S2 V220 2
Consist of Materials	Aluminium Alloy
Surface Treatment	Anodizing
Coating	Polyester (TGIC - Free)

## Optional Specification

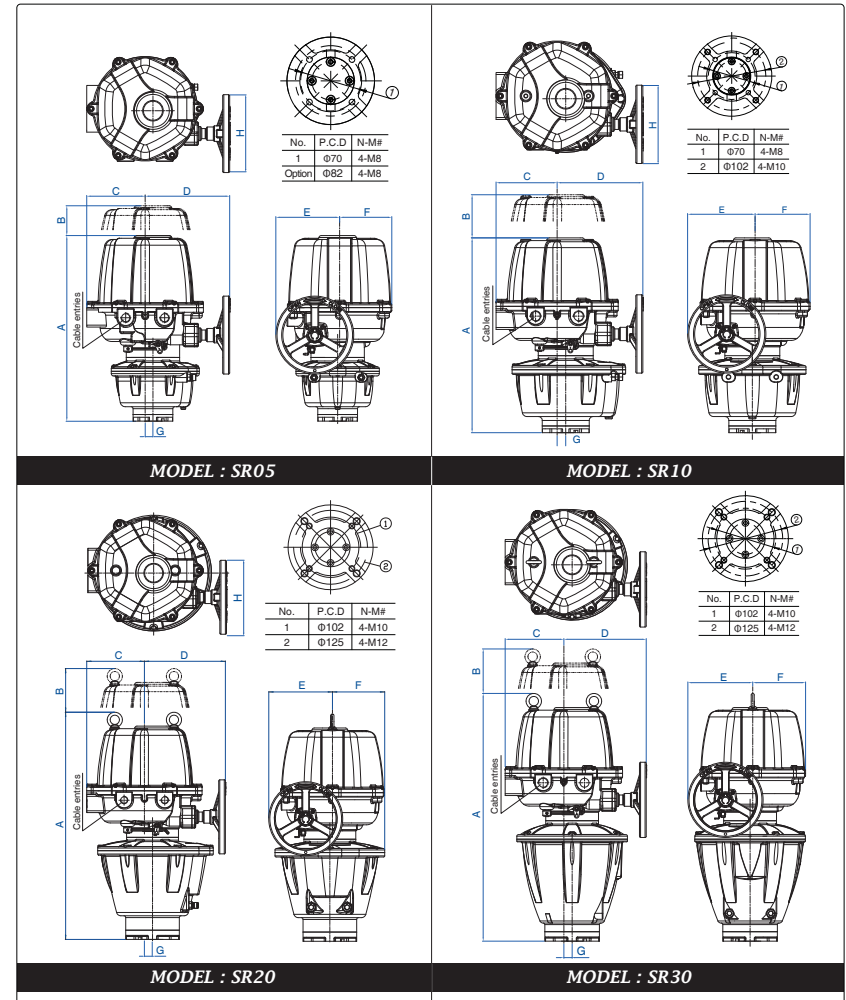
EXP	Flameproof Enclosure Ex d IIB T4
ALS	Auxiliary Open, Close Limit Switches
LCU	Local Control Unit
PIU	Potentiometer 1 K Ohm
PCU	Proportional Contact Unit ( Modulation ) Input : 4-20mA DC 1-5VDC, 2-10VDC, 0-5VDC, 0-10VDC Output : 4-20mA DC
CPT	Current Position Transmitter / Output : DC 4-20mA
IMS	Integral Motor Starter
GOV	Governor
Field-Bus	Profi-Bus, Mod-Bus, Can-Bus



**Performance**

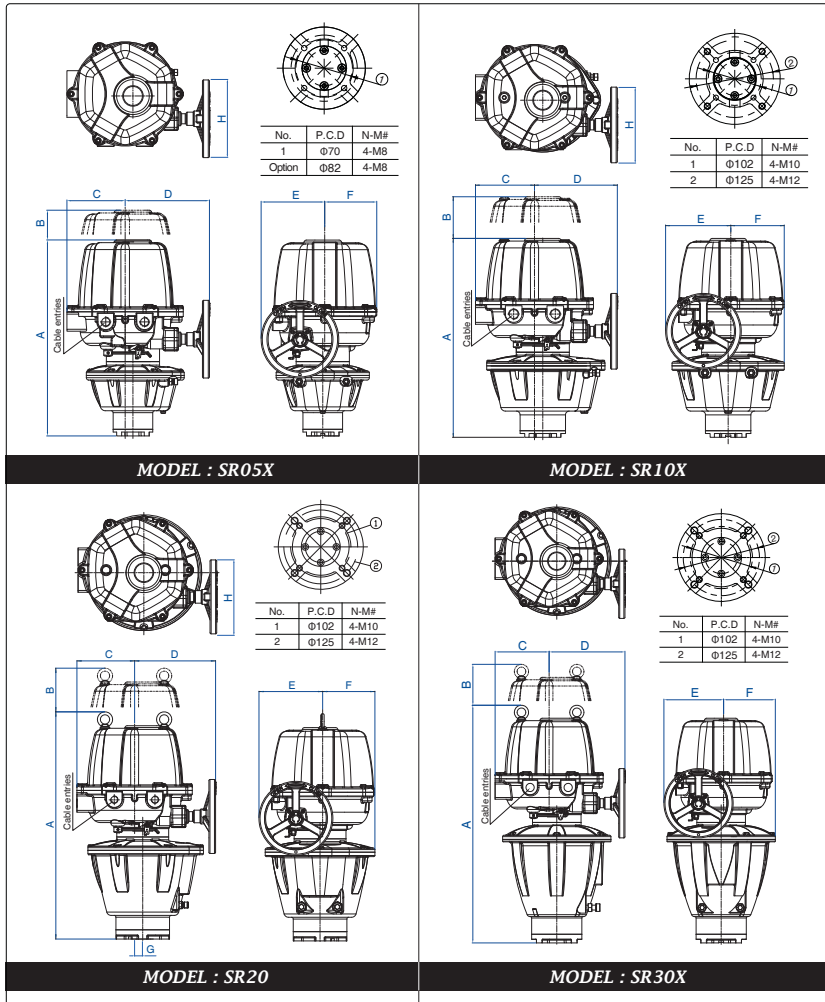
Type		SR05	SR10	SR20	SR30		
Max Output Torque	Kg.m	5	10	20	30		
	Nm	50	100	200	300		
Spring Return Time (90°)	sec	1 (When Governor Setting: 2 ± 1 sec)		1-2 (Governor Standard)	2 ± 1 (Governor Setting)		
Operating Time (90°) sec (Open/Close)	110V	50hz	16/14	18/16	61/56	90/81	
		60hz	14/12	16/14	51/46	72/68	
	220V	50hz	16/14	20/19	62/57	89/82	
		60hz	13/12	17/15	51/47	75/68	
	380V	50hz	17/15	21/19	62/57	87/82	
		60hz	15/13	19/16	52/47	74/68	
	440V	50hz	17/15	21/19	62/57	86/82	
		60hz	15/13	17/16	52/47	73/67	
Motor (W)	AC	60	90	90	90		
	DC	40	40	40	40		
Duty(S2)	Min	15	15	15	15		
Rated Current (A) (Open/Close)	110V	50hz	1.75/1.68	2.4/2	2.8/2.43	2.3/1.8	
		60hz	1.7/1	3/2.2	3.9/2.9	3.15/2.3	
	220V	50hz	1/0.95	1.06/0.98	1.3/0.97	1.02/0.98	
		60hz	1.03/0.7	1.3/0.9	1.8/0.43	1.3/0.95	
	380V	50hz	0.24/0.18	0.4/0.33	0.38/0.3	0.35/0.3	
		60hz	0.25/0.15	0.4/0.22	0.35/0.3	0.29/0.2	
	440V	50hz	0.28/0.27	0.5/0.5	0.5/0.5	0.62/0.6	
		60hz	0.24/0.17	0.4/0.3	0.36/0.31	0.31/0.27	
	DC24V	50hz	6.3/1.9	8.6/1.65	9/1.8	7.6/1.8	
		60hz	3.72	4.0	4.78	4.7	
	Stall Current (A)	110V	50hz	3.55	4.1	5	4.72
			60hz	1.95	2.55	2.4	2.8
220V		50hz	1.9	2.5	2.5	2.93	
		60hz	0.82	0.8	1.3	0.7	
380V		50hz	0.77	1.22	1.3	0.8	
		60hz	0.92	0.83	1.54	0.6	
440V		50hz	0.9	1	1.45	0.7	
		DC24V	15	13	15.7	13.5	
Mounting Base (ISO 5211)	ISO5211	F07	F07 / F10	F10/ F12	F10 / F12		
Number Of Handle Turns		25	25	75	113		
Weight	Kg	SR05:26 / SR05X:31	SR10:35 / SR10X:40	51	SR30:62 / SR30X:67		

**Spring Return Actuator Standard Dimension**



Model	A	B	C	D	E	F	G	H
SR05	477	155	150	206	164	134	20	200
SR10	498	212.5	156	208	172	141	22	200
SR20	614.5	212.5	156.5	217	172.5	141.5	22	200
SR30	658.5	212.5	156	214	173	141	22	200

Spring Return Actuator EXP Type Dimension

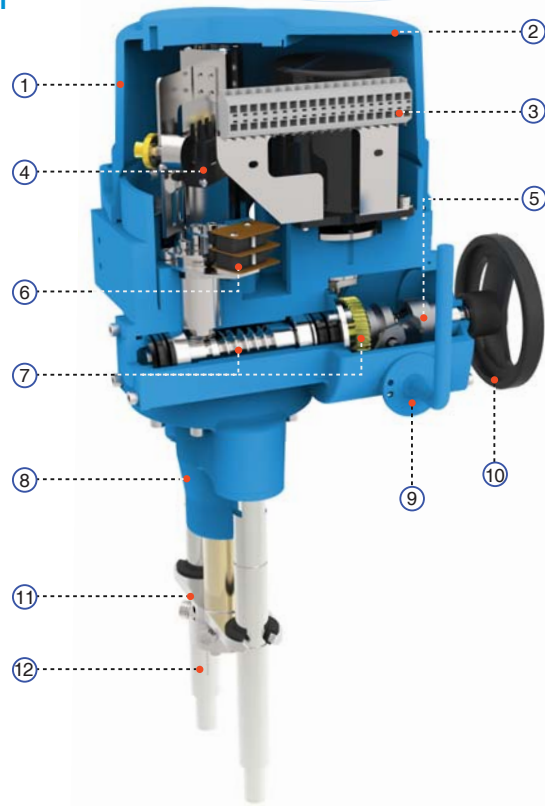


Model	A	B	C	D	E	F	G	H
SR05X	504	155	150	217	164	134	20	200
SR10X	526	212.5	156.5	219	172.5	141.5	22	200
SR20	614.5	212.5	156.5	217	172.5	141.5	22	200
SR30X	686.5	212.5	156.5	219	172.5	150	22	200

Electric Linear Actuator NL Series



## Configuration



### Features

- |  |  |
|--|--|
| <p>1 Top Cover</p> <p>2 Motor<br/>Squirrel caged induction motor is totally enclosed type with high stall torque and low inertia force to suit seating/unseating of valves.<br/>Integral thermal protection to prevent damage to the single/three phase motor</p> <p>3 Terminal<br/>Quality terminal block containing segregated power and control terminal are designed for use in high vibration environments.</p> <p>4 Limit Switch (Open, Close)</p> | <p>5 Manual Override (Hand/Auto Clutch System)</p> <p>6 Torque Switch (Open, Close)</p> <p>7 Worm, Worm Wheel precision machining of high-efficiency, low noise (50db or less), and compact, delivers greater Torque.</p> <p>8 Base</p> <p>9 Lever</p> <p>10 Handle Wheel</p> <p>11 Indicator</p> <p>12 Pillar</p> |
|--|--|

## Performance

Type	Max Output Torque KN	Speed (50/60Hz) mm/sec	Stroke mm	Duty Cycle S4 (%)	Rated Current										Motor		Number of Handle Turns	Valve Stem Threads (Max) mm	Pillar Threads mm	PCD in Flange mm	Weight Kg
					110V		220V		380V		440V		DC		W	Class					
					50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	24V	48V							
NL04	4	0.8/0.93	40	50	0.46	0.43	0.28	0.27	0.11	0.09	0.1	0.09	1.65	15	F (150)	190	M20	M16	100	16	
NL06	6	0.79/0.9	40	50	0.73	0.72	0.38	0.37	0.14	0.12	0.12	0.11	1.87	25	F (150)	190	M20	M16	100	16	
NL08	8	0.75/0.86	50	50	0.84	0.81	0.46	0.43	0.16	0.14	0.15	0.13	2.46	25	F (150)	250	M20	M16	100	18	
NL10	10	0.72/0.83	50	50	1.52	1.5	0.79	0.75	0.25	0.24	0.23	0.21	4.02	40	F (150)	250	M20	M16	100	18	
NL20	20	0.85/1	100	50	1.9	1.95	1	1.5	0.33	0.33	0.25	0.32	9.45	60	F (150)	475	M24	M20	150	31	
NL25	25	0.72/0.87	100	50	2.53	3.25	1.05	1.45	0.45	0.45	0.54	0.45	-	90	F (150)	550	M24	M20	150	31	

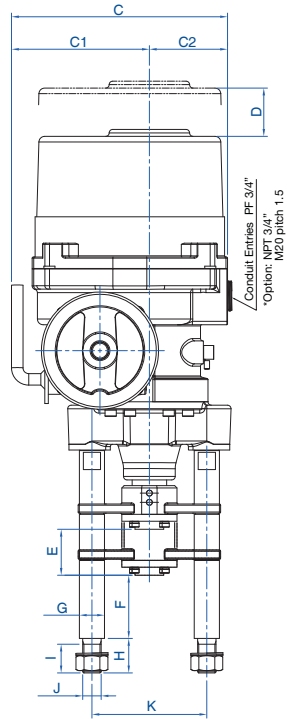
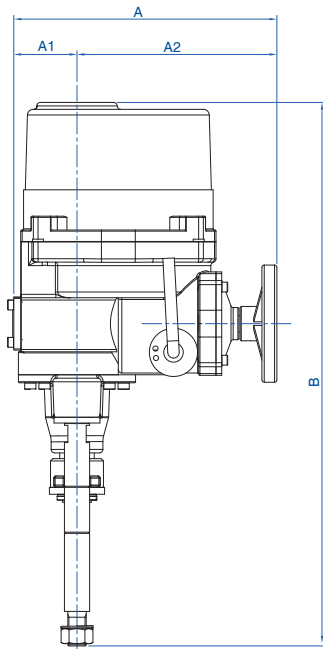
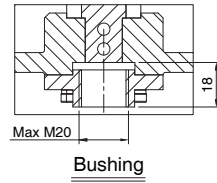
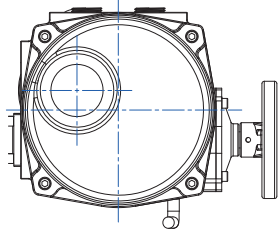
## Standard Specification

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6 (Option : IP68, Ex d IIB T4)
Ambient Temperature	-20°C ~ +70°C 150°C/1hr
Power Supply	110 / 220V AC 50/60Hz , 380 / 440V AC 50/60Hz, Option : DC24V
Torque Switches	Open / Close Torque Switch (※Except : NL04 , NL06)
Limit Switches	Open / Close Limit Switch
Stall Protection	Thermal Protection (Open 150°C)
Indicator	Continuous Position Indicator
Manual Override	Hand / Auto Decutching Mechanism
Self Locking	Provided by Means of Worm Gearing
Space Heater	20W
Cable Entries	Two PF 3/4" (Option : Two M20 Pitch 1.5 , Two NPT 3/4")
Lubrication	Shell Gadus S2 V220 2
Materials	Aluminium
Surface Treatment	Anodizing
External Coating	Polyester

## Optional Specification

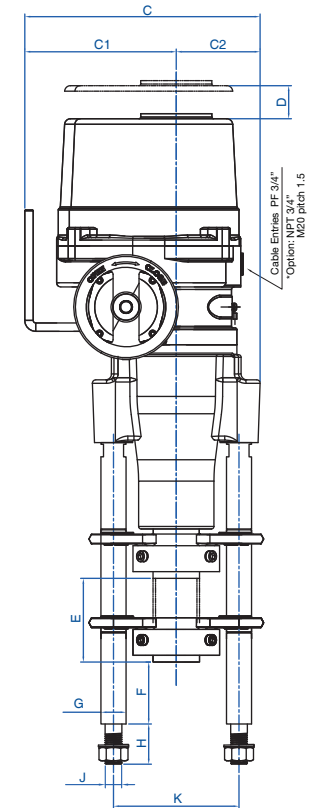
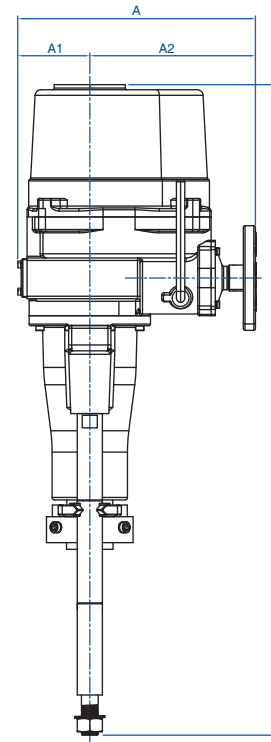
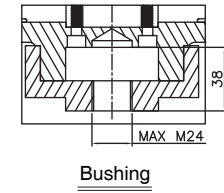
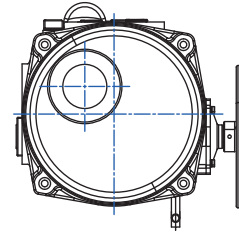
E X P	Explosion Proof Ex d IIB T4
I P 6 8	Watertight Enclosure IP68
A L S	Auxiliary Open, Close Limit Switches
A T S	Auxiliary Open, Close Torque Switches
L C U	Local Control Unit
P C U	Proportional Contact Unit ( Modulation ) Input : 4-20mA DC 1~5VDC, 2~10VDC, 0~5VDC, 0~10VDC Output : 4-20mA DC
C P T	Current Position Transmitter / Output : DC 4-20mA
P I U	Potentiometer 1 K Ohm
I M S	Reversing Magnet Contacts and Transformer
I N T E G R A L	Integral Actuator Control Unit

**NL04~NL10 Dimension**



Type	A	A1	A2	B	C	C1	C2	D	E	F	G	H	I	J	K
NL04, NL06	229	55	174	494	188	120	68	108	40	76	∅22	30	25	M16	100
NL08, NL10	260	76	184	508	216	139	77	108	50	66	∅22	30	25	M16	100

**NL20, NL25 Dimension**



Type	A	A1	A2	B	C	C1	C2	D	E	F	G	H	J	K
NL20, NL25	284	86	198	777	281	181	100	130	100	74	∅30	48	M20	150

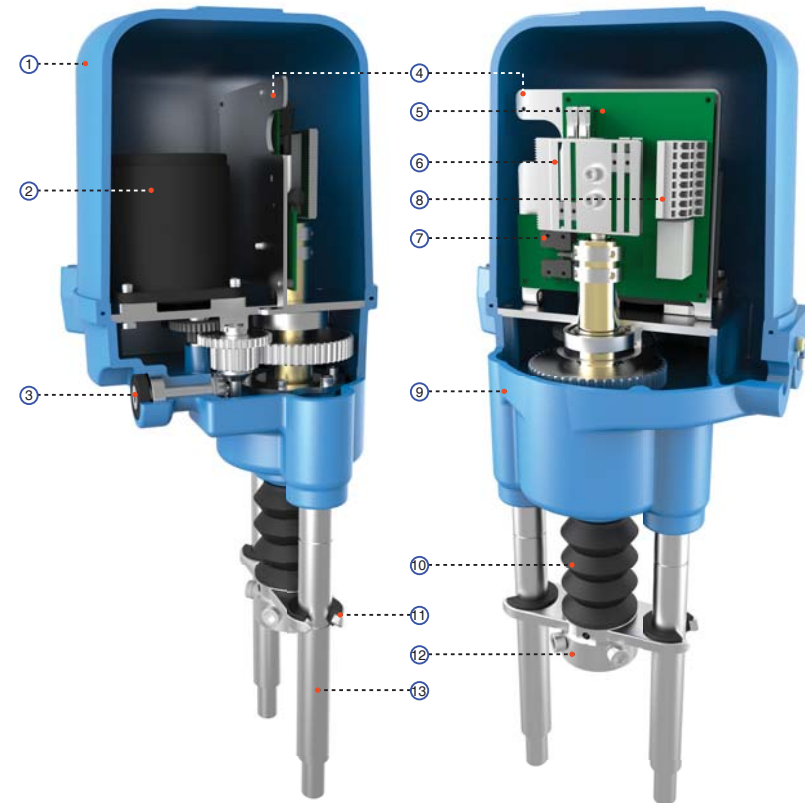


EMICO

## Electric Actuator SL Series



### Configuration



### Features

- |   |   |
|---|---|
| <p>1 Top Cover</p> <p>2 Motor<br/>Squirrel caged induction motor is totally enclosed type with high stall torque and low inertia force to suit seating/unseating of valves.<br/>Integral thermal protection to prevent damage to the single/three phase motor</p> <p>3 Manual Override<br/>SL01-07: By L-Wrench (6mm hexagon)<br/>SL10-15: Hand/Auto declutching mechanism</p> <p>4 Plate</p> <p>5 Terminal Board</p> <p>6 Limit Switch (Open, Close)</p> | <p>7 Torque Switch (Open, Close)</p> <p>8 Terminal<br/>Quality terminal block containing segregated power and control terminal are designed for use in high vibration environments.</p> <p>9 Body</p> <p>10 Bellow</p> <p>11 Indicator</p> <p>12 Bushing</p> <p>13 Pillar</p> |
|---|---|



**Performance**

Type	Max Output Torque	Speed (50/60Hz)	Stroke	Duty Cycle	Motor		Valve Stem Threads (Max)	Pillar Threads	PCD in Flange
	KN	mm/sec	mm	S4 (%)	W	Class	mm		mm
SL01	1	0.65/0.8	20	50	6	F (150)	M16	M16	80
SL02	2	0.65/0.8	20	50	6	F (150)	M16	M16	80
SL04	4	1.1/1.3	50	50	25	F (150)	M20	M16	100
SL07	7	1.1/1.3	50	50	40	F (150)	M20	M16	100
SL10	10	0.85/1.0	80	50	25	F (150)	M20	M16	100
SL15	15	0.85/1.0	80	50	40	F (150)	M20	M16	100

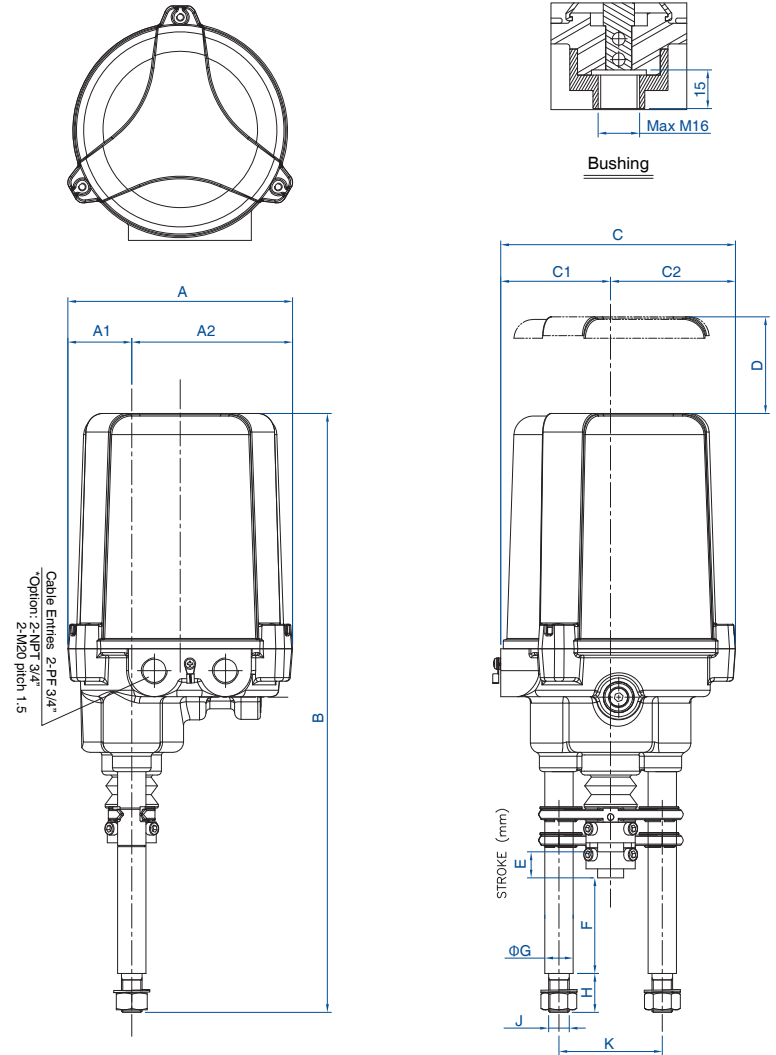
**Standard Specification**

Enclosure	Watertight Ingress Protection 67 Nema 4 and 6
Ambient Temperature	-20°C ~ +70°C 150°C/1hr
Power Supply	110/220V AC 50/60Hz, DC24V (Option: 380/440V AC 50/60Hz—ONLY NL04~NL15)
Torque Switches	Open / Close Torque Switch
Limit Switches	Open / Close Limit Switch
Stall Protection	Thermal Protection (Open 150°C)
Indicator	Continuous Position Indicator
Manual Override	SL01,02,04,07: By L-wrench (6mm Hexagon)
	SL10,15: Hand / Auto Declutching Mechanism
Space Heater	5W
Cable Entries	Two PF 3/4" (Option : Two M20 Pitch 1.5 , Two NPT 3/4")
Lubrication	Shell Gadus S2 V220 2
Materials	Aluminium
Surface Treatment	Anodizing
External Coating	Polyester
Dielectric Strength	AC1800V / 1min
Insulation	DC500V more Than 100M Ohm

**Optional Specification**

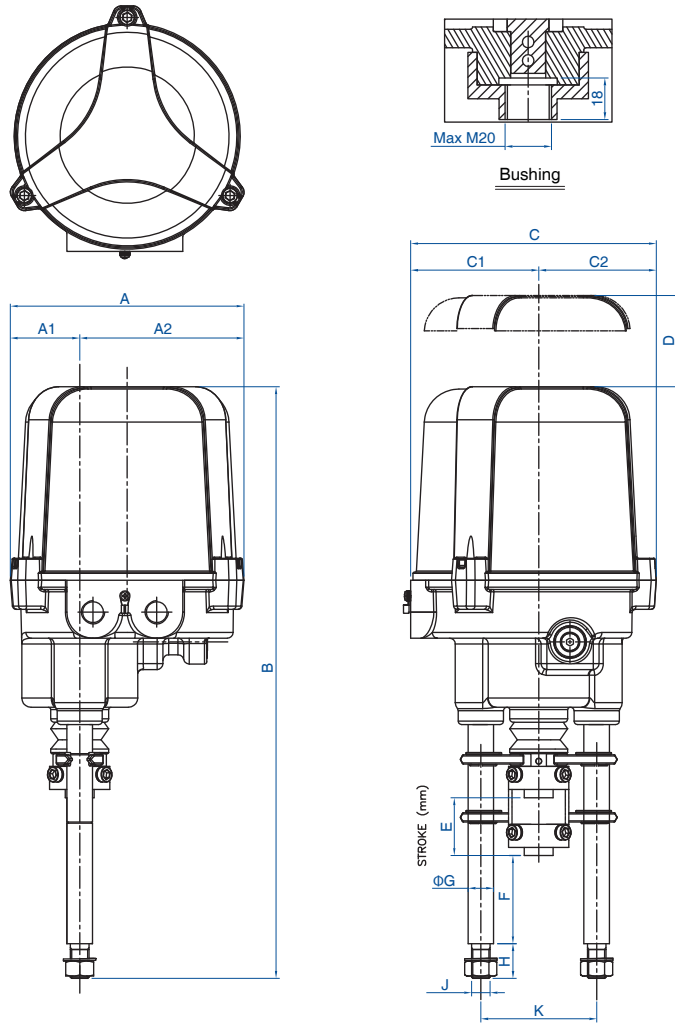
BLDC PCU	Proportional Contact Unit (Modulation) Input : 4-20mA DC 1~5VDC, 2~10VDC, 0~5VDC, 0~10VDC Output : 4-20mA DC
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**SL 01,02 Dimension**



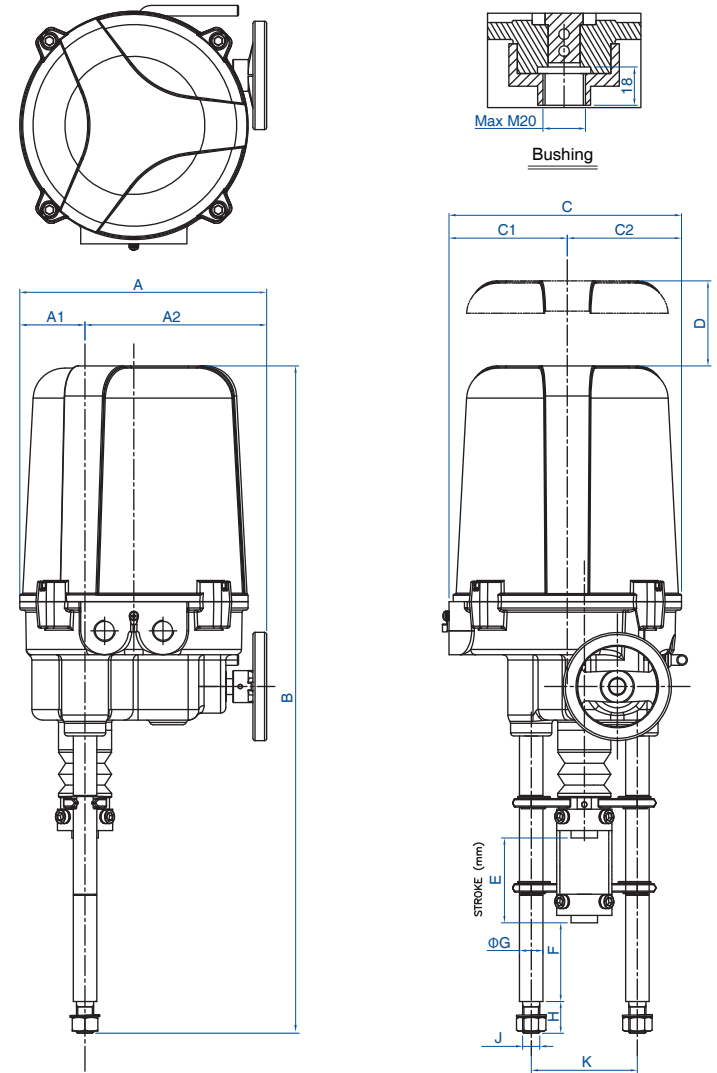
Type	A	A1	A2	B	C	C1	C2	D	E	F	G	H	J	K
SL01, SL02	174	49.5	124.5	463.5	181.5	85	96.5	182	20	74	φ22	30	M16	80

SL 04,07 Dimension



Type	A	A1	A2	B	C	C1	C2	D	E	F	G	H	J	K
SL04, SL07	202	60	142	511	212	110.5	101.5	167	50	76	∅22	30	M16	100

SL 10,15 Dimension

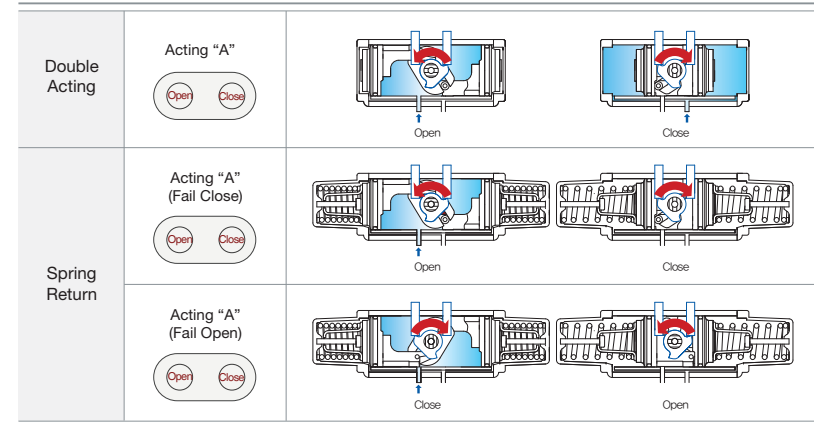


Type	A	A1	A2	B	C	C1	C2	D	E	F	G	H	J	K
SL10, SL15	233.5	61.5	172	629	219	111.5	107.5	222	80	74	∅22	30	M16	100

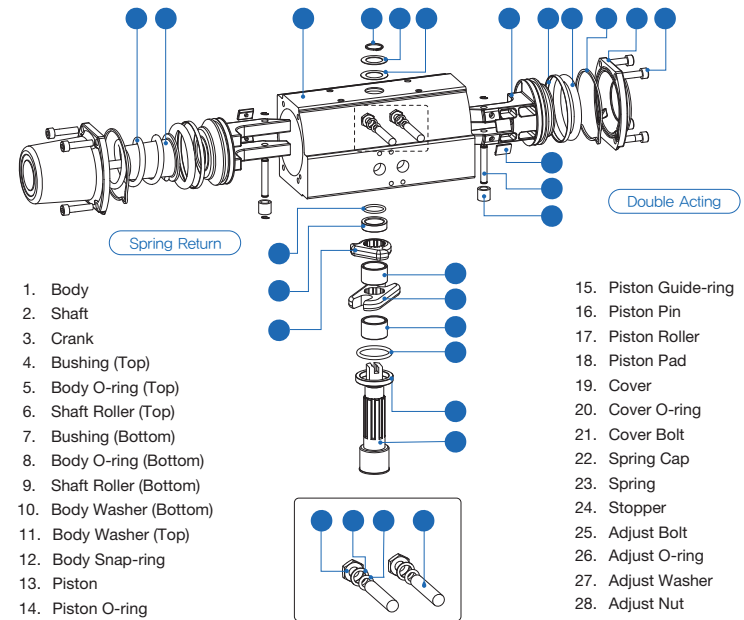
# Pneumatic Actuator NOD/NOS Series



## Operating Mechanism



## Part List







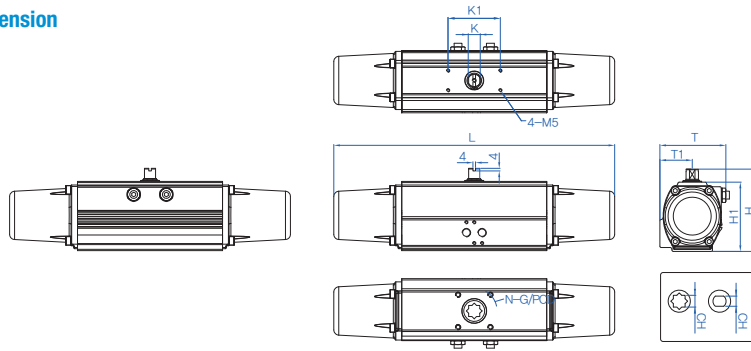
EMICO

**NOS Series  
Single Acting**

90° Operation for valves and damper

**Specification**

Model	OTS50	OTS65	OTS80	OTS100	OTS125	OTS140	OTS160	OTS185	OTS210	OTS250	OTS300
Operation Type	Scotch - Yoke										
Operating fluid	Compressed Dry Air										
Operating Pressure	4bar ~ 7bar										
Operating Temperature	-20 ~ 80°C										
Weight (kg)	1.7	3.4	5.7	10.6	17.9	25.2	36.8	62.5	76.9	119.6	145.0

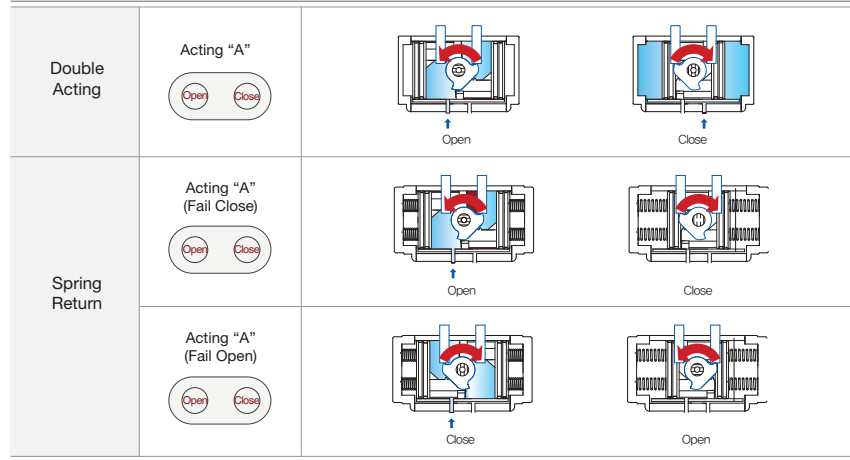
**Dimension**

UNIT:mm

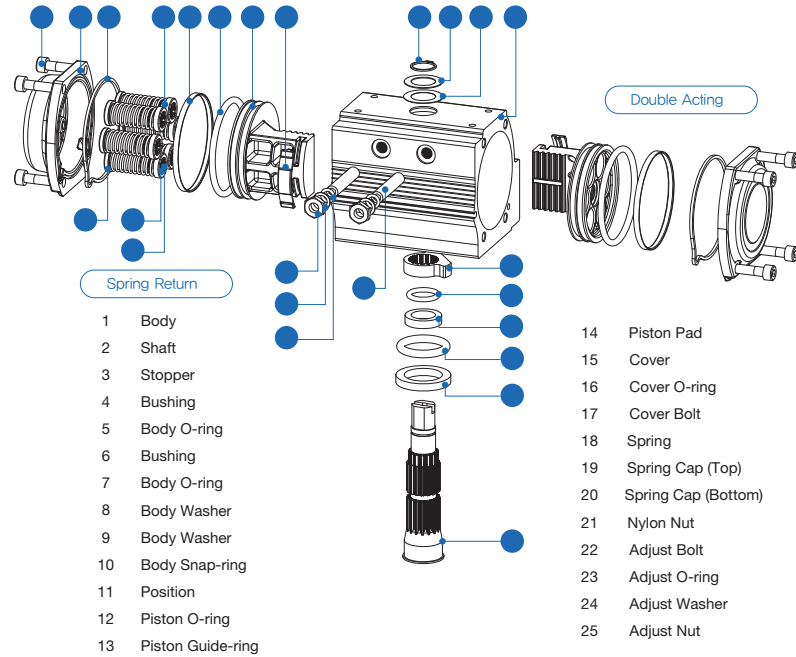
Model	ISO	P.C.D	N-G	K	K1	L	T	T1	H	H1	CH	DP	Weight
NOS50	F03/F05/F07	36/50/70	4-M5/4-M6 /4-M8	10	80	257	75	40	90	70	11x11	13	1.7
											14x14	14	
											9.7xφ15	14	
NOS65	F05/F07	50/70	4-M6/4-M8	13	80	314	89	46	107	87	14x14	17	3.4
											11.7xφ17	17	
											9.7xφ15	14	
NOS80	F07	70	4-M8	17	80	430	101	49.5	126	106	17x17	19	5.7
											14.7xφ19	20	
NOS100	F07/F10	70/102	4-M8/4-M10	22	80	500	129	61.5	148	128	22x22	26	10.6
											17.7xφ22	27	
NOS125	F07/F10	70/102	4-M8/4-M10	22	80	606	151	71.5	174	154	22x22	26	17.9
											27x27	30	
NOS140	F10/F12	102/125	4-M10/4-M12	24	80	682	164	77	192	172	22x22	26	25.2
											36x36	30	
NOS160	F14 F10/F12	140 102/125	4-M16 4-M10/4-M12	24	80	781	188	89	216	196	27x27	30	36.8
											27x27	30	
NOS185	F14	140	4-M16	30	130	894	217	102	254	224	36x36	30	62.5
											36x36	30	
NOS210	F16	165	4-M20	36	130	982	231	115	284	254	46x46	60	76.9
											36x36	50	
NOS250	F16	165	4-M20	36	130	1108	301	152	335	305	46x46	60	119.6
											36x36	60	
NOS300	F16/F25	165/254	4-M20/4-M16	36	130	1344	360	170	408	378	55x55	60	145.0

**Pneumatic Actuator  
RD/RS Series**

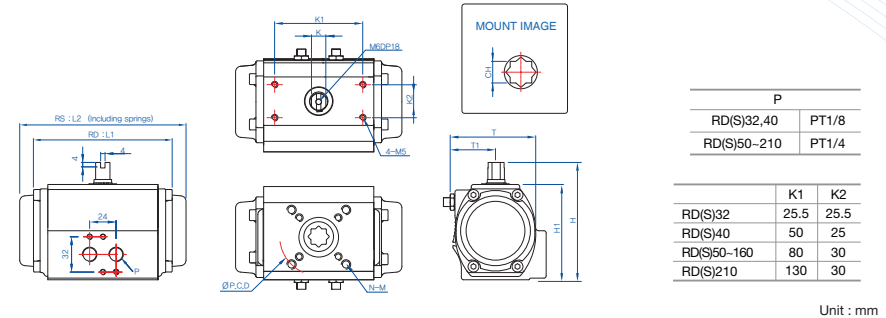
**Operating Mechanism**



**Part List**



**Dimension**



Model	ISO	P.C.D	N-G	K	L1 (RD)	L2 (RS)	T	T1	H	H1	CH	DTH	P	
													RD(S)32,40	PT1/8
RD(S)32	F03	36	4-M5	7	66	-	45	25	55	45	9x9	9		
RD(S)40	F03/F05	36/50	4-M5/4-M6	9	97	97	63	32	75	55	9x9	9		
RD(S)50	F03/F05/F07	36/50/70	4-M5/4-M6/4-M8	9	119	133	75	40	90	70	11x11	13		
RD(S)65	F05/F07	50/70	4-M6/4-M8	13	131	154	89	46	106.5	86.5	14x14	16		
RD(S)80	F07	70	4-M8	19	189	220	101	49.5	126	106	17x17	19		
RD(S)90	F07	70	4-M8	19	188	223	104	54.5	136	116	17x17	19		
RD(S)100	F07/F10	70/102	4-M8/4-M10	19	229	256	132	61.5	148	128	22x22	26		
RD(S)125	F07/F10	70/102	4-M8/4-M10	19	299	330	151	71.5	174	154	22x22	19		
RD(S)140	F10/F12	102/125	4-M10/4-M12	24	332	389	164	77	192	172	27x27	30		
RD(S)160	F10/F12	102/125	4-M10/4-M12	24	364	416	188	103.5	216	196	27x27	30		
RD(S)210	F14	140	4-M16	36	444	527	231	115	284	254	36x36	30		

**RD Series (Rack & Pinion Type) Torque Table**

Model	Supply Air						
	3Bar	4Bar	4.5Bar	5Bar	6Bar	7Bar	8Bar
RD32	3.2	4.5	5.3	6.0	7.3	8.5	9.7
RD40	5.0	7.0	8.0	9.0	11.0	12.8	14.7
RD50	10.3	13.7	15.5	17.1	20.6	24.0	27.4
RD65	19.1	25.4	28.5	31.8	38.2	44.6	50.0
RD80	39.3	52.2	53.8	65.3	78.4	91.5	104.7
RD90	57.8	77.1	86.8	96.4	115.7	134.9	153.8
RD100	84.4	112.5	126.5	140.6	168.7	196.8	220.4
RD125	171.2	228.4	256.9	285.4	342.5	399.5	456.6
RD140	243.3	374.4	365.0	405.5	486.6	567.7	648.8
RD160	350.7	467.6	526.0	584.4	701.3	818.2	935.2
RD210	725.4	967.2	1088.1	1209.0	1450.8	1692.6	1934.4

**RS Series (Rack & Pinion Type) Torque Table**

Unit : Nm

Model	Spring Unit	Supply air															
		3Bar		4Bar		4.5Bar		5Bar		6Bar		7Bar		SPRING			
		0°	90°	0°	90°	0°	90°	Close	Open	Close	Open	Close	Open	Close	Open	90°	0°
RS40	1	2.8	1.8	4.9	3.8	5.8	4.7	6.7	5.6	8.6	7.5	10.4	9.3	2.8	1.8		
	2	-	-	-	-	3.6	1.4	4.5	2.3	6.4	4.2	8.2	6.0	6.4	4.2		
	op3	2.5	11.0	4.3	3.0	5.3	3.9	6.2	4.8	8.0	6.6	9.8	8.5	3.9	2.5		
	op4	-	-	3.8	2.1	4.6	3.0	5.6	4.0	7.5	5.8	9.3	7.0	4.0	3.0		
	op5	-	-	-	-	4.2	2.2	5.1	3.2	6.9	5.0	8.7	5.0	5.5	3.6		
RS50	8	4.7	2.3	8.1	5.7	9.9	7.4	11.5	9.1	15.0	12.6	18.4	16.0	8.0	5.6		
	9	-	-	7.4	4.6	9.2	6.4	10.8	8.0	14.3	11.5	17.7	14.9	9.1	6.3		
	10	-	-	6.8	3.7	8.5	5.5	10.2	7.1	13.7	10.6	17.1	14.0	10.0	6.9		
	11	-	-	-	-	7.8	4.4	9.5	6.1	13.0	9.6	16.4	13.0	11.0	7.6		
	12	-	-	-	-	-	-	-	-	12.3	8.5	15.7	11.9	12.1	8.3		
RS65	8	9.6	4.7	16.0	11.1	19.2	14.3	22.4	17.5	28.7	23.8	35.1	30.2	14.4	9.5		
	9	-	-	14.8	9.3	18.0	12.5	21.2	15.6	27.6	22.0	34.0	28.4	16.2	10.6		
	10	-	-	13.6	7.5	16.8	10.6	20.0	13.8	26.4	20.2	32.8	26.6	18.0	11.8		
	11	-	-	-	-	15.6	8.8	18.8	12.0	25.2	18.4	31.6	24.8	19.8	13.0		
	12	-	-	-	-	-	-	-	-	24.1	16.7	30.4	23.1	21.5	14.2		
RS80	8	19.1	7.7	32.1	20.7	38.7	27.3	45.2	33.8	58.3	46.9	71.3	60.0	90.7	20.1		
	9	-	-	29.6	16.7	36.2	23.3	42.7	29.8	55.7	42.9	68.8	56.0	35.5	22.6		
	10	-	-	27.1	12.9	33.7	19.5	40.4	25.9	53.2	39.0	66.6	52.1	39.4	25.1		
	11	-	-	-	-	31.2	15.5	37.7	22.0	50.7	35.0	63.8	48.1	43.3	27.6		
	12	-	-	-	-	-	-	-	-	48.2	31.2	61.3	44.3	47.2	30.1		
RS90	8	27.2	9.5	46.4	28.8	56.2	38.5	65.8	48.1	85.0	67.4	104.3	86.6	48.3	30.6		
	9	-	-	42.6	22.7	52.3	32.4	61.9	42.0	81.2	61.3	100.4	80.5	54.4	34.5		
	10	-	-	38.7	16.6	48.4	26.4	58.0	36.0	77.3	55.2	96.5	74.5	60.5	38.4		
	11	-	-	-	-	44.7	20.4	54.3	30.0	73.5	49.3	92.8	68.5	66.4	42.1		
	12	-	-	-	-	-	-	-	-	69.7	43.2	88.9	62.4	72.5	46.0		
RS100	8	42.6	19.5	70.8	47.6	84.8	61.6	98.9	75.7	127.0	103.8	155.1	131.9	64.9	41.7		
	9	-	-	65.5	39.4	79.5	53.5	93.6	67.6	121.7	95.7	149.9	123.8	73.0	47.0		
	10	-	-	60.3	31.3	74.3	45.3	88.4	59.4	116.5	87.6	144.6	115.7	81.2	52.2		
	11	-	-	-	-	69.1	37.2	83.2	51.3	111.3	79.4	139.5	107.5	89.3	57.4		
	12	-	-	-	-	-	-	-	-	106.1	71.4	134.2	99.5	97.3	62.6		
RS115	8	56.4	25.7	93.6	62.9	112.1	81.5	130.8	100.1	168.0	137.3	205.1	174.5	85.8	55.2		
	9	-	-	86.6	52.2	105.2	70.7	123.8	89.4	161.0	126.5	198.2	163.7	96.6	62.1		
	10	-	-	79.7	41.4	98.2	59.9	116.9	78.6	154.1	115.8	191.2	153.0	107.3	69.1		
	11	-	-	-	-	91.4	49.2	110.1	67.8	147.3	105.0	184.4	142.2	118.1	75.9		
	12	-	-	-	-	-	-	-	-	140.3	94.4	177.5	131.6	128.7	82.8		
RS125	8	84.7	35.2	141.8	92.4	170.4	120.9	198.9	149.5	256.0	206.5	313.0	263.6	136.0	86.5		
	9	-	-	131.0	75.9	159.5	104.4	188.1	133.0	245.1	190.0	302.2	247.1	152.4	97.3		
	10	-	-	120.2	58.4	148.7	86.9	177.3	115.5	234.3	172.5	291.4	229.6	170.0	108.2		
	11	-	-	-	-	137.4	70.5	165.9	99.0	223.0	156.0	280.1	213.1	186.4	119.5		
	12	-	-	-	-	-	-	-	-	212.7	138.5	269.8	195.6	203.9	129.8		
RS140	8	79.7	10.7	201.4	132.4	241.9	172.9	282.5	213.5	363.6	294.6	444.7	375.7	192.0	123.1		
	9	-	-	186.4	108.1	227.0	148.7	267.5	189.2	348.6	270.3	429.7	351.4	216.3	138.0		
	10	-	-	170.6	83.9	211.1	124.4	251.7	165.0	332.8	246.1	413.9	327.2	240.5	153.8		
	11	-	-	-	-	196.2	101.1	236.8	141.7	317.9	222.8	399.0	303.9	263.8	168.7		
	12	-	-	-	-	-	-	-	-	302.0	198.6	383.1	279.7	288.0	184.6		
RS160	8	165.3	76.7	282.2	193.6	340.6	252.0	399.0	310.4	515.9	247.3	632.8	544.3	274.0	185.4		
	9	-	-	259.6	159.7	318.0	218.1	376.4	276.5	493.3	393.4	610.2	510.3	308.0	208.1		
	10	-	-	236.9	125.7	295.3	184.1	353.7	242.5	470.6	359.4	587.5	476.3	342.0	230.7		
	11	-	-	-	-	271.6	150.1	330.0	208.5	446.9	325.4	563.8	442.3	376.0	254.4		
	12	-	-	-	-	-	-	-	-	424.3	290.4	541.2	407.3	411.0	277.1		
RS185	8	221.0	102.6	377.3	258.9	455.4	337.0	533.5	415.0	689.8	571.3	846.0	727.6	366.3	247.9		
	9	-	-	347.0	213.4	425.1	291.5	503.2	369.6	656.5	525.9	815.7	682.2	411.7	278.2		
	10	-	-	316.7	168.0	394.8	246.1	472.9	324.2	623.2	480.4	785.5	636.7	457.2	308.5		
	11	-	-	-	-	363.1	200.6	441.2	278.7	597.5	435.0	753.8	591.3	502.6	340.1		
	12	-	-	-	-	-	-	-	-	567.2	388.2	723.5	544.5	549.4	370.4		
RS210	8	-	-	644.0	402.2	764.9	523.1	885.8	644.1	1,127.9	885.8	1,369.9	1,127.9	565.0	323.2		
	9	-	-	603.6	331.6	724.5	452.5	845.4	573.4	1,087.7	815.1	1,328.7	1,056.8	635.6	363.6		
	10	-	-	563.2	260.9	684.1	381.8	805.0	502.7	1,046.5	744.5	1,288.5	986.3	706.9	404.0		
	11	-	-	-	-	643.8	311.3	764.7	432.2	1,006.4	673.9	1,248.4	915.8	776.8	444.3		
	12	-	-	-	-	603.3	240.6	724.2	361.5	965.9	603.3	1,208.2	845.1	847.5	484.8		