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# HK Contromatic

## Introduction to Valve Automation Products



**VALVE AUTOMATION**

## Dear Customers and Partners,

We, HKC, Thank all of you for giving us endless support and heartfelt advice for the progress of the company.

Since 1991, We have done our best to make the best quality products and service for our customers. And also, we have worked very hard to be a leading company that show how and what to do for the progress of the change of world industry through continuous management innovation, technical development, stable employment, etc.

HKC's unique know-how comes from technical theory and experience is basic power of development and production of all products, and HKC is growing into a first class corporation that leads valve automation industry with potential energy and edge-technic.



HKC is very responsible for social community and culture.

So, we always share a lot of chances with partners and customers for mutual progress. And, our management system was transferred to meet customer's satisfaction.

We will keep our best efforts to be a global leading corporation of valve automation industry in 21st century by creating a great contribution towards the future of the world with the best quality products, endless development of technical know-how, and perfect customer service.

Best Regards,

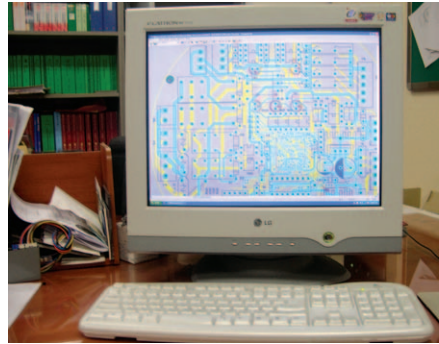
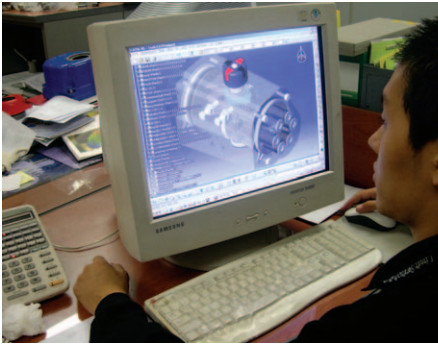
S. M. Han

President of HK Contromatic.Co.,Ltd.





## R&D



## Die-Cast & Programmed Machining Center



Aluminum Die-Cast Foundry

Actuator Covers

Horizontal & Vertical  
Machining Center

## Machining & Assembly



HQ Series

HP Series

APL Series

Assembly



## HKC Products Ranges



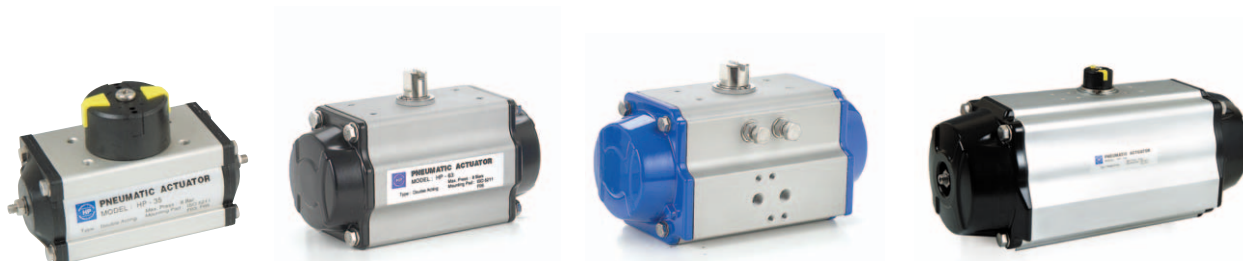
### HQ Electric Actuator

- HQ-006 small & compact actuator with motor brake system
- HQ-series actuators with worm gear system
- Intelligent actuator with digital control unit or integral control unit
- Rechargeable battery backup actuator for emergency application



### HP Pneumatic Actuator

- Rack & pinion
- Double acting & single acting (spring return)
- International connection standard : ISO5211/DIN3337, VDI/VDE3845, NAMUR
- ※ Economical & Reliable application



### APL series Valve Position Monitor

- APL-210 : Small & compact with standard operation
- APL-310 : Solid & flexible design for various application
- APL-410 : Explosion proof application(Exd IIB T4 / IP67)
- APL-510 : Explosion proof application(Exd IIC T6 / IP68)







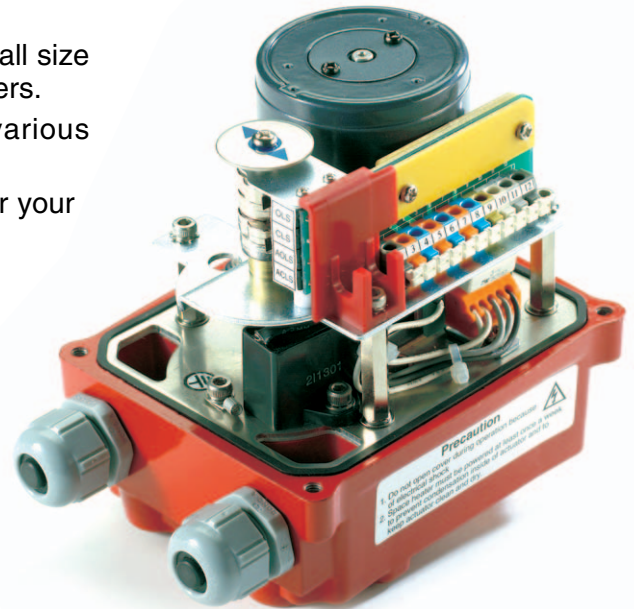


### HQ-006 Series

- HQ-006 Actuator is newly designed and invented for small size valve automation like ball, butterfly, plug and even dampers.
- Small, light and compact design, high torque and various control options will meet your specific requirements.
- HQ provides high technical service & quality products for your automation system.

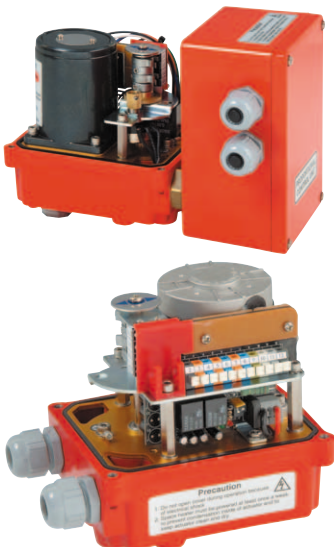
### FEATURES

- Compact and light due to high grade aluminum alloy housing.
- High resistance for corrosion due to hard anodizing on inside & outside and polyester powder coating on external surface
- Output torque : 60Nm(6kg.m)
- The actuator motor is reversible, high torque and low current design.
- Solid with O-ring system giving weatherproof (IP67)



### STANDARD CONFIGURATION

- Manual handwheel
- Wide, easy mounting base standard to ISO5211(F03/F05/F07)
- Standard 4 limit switches.  
2 for operation, 2 for extra(dry contacts)
- Captive cover bolt.
- Space heater.
- Limit switches for easy and tight setting.
- Terminal block. (11P)
- Standard color : Red or Blue

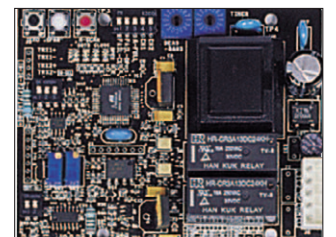


### OPTION CONFIGURATION

- Position Indication Unit (Potentiometer kit, PIU)  
High resolution potentiometer with precisely machined gearing directly engaged with driving shaft provides continuous monitoring of position of valve and actuator



- Proportional Control Unit (PCU)  
-HQ PCU is a combination of electronic positioner.  
-Input signal range :  
4~20mA, or 0~10VDC  
-Output signal range :  
4~20mA, or 0~10VDC  
-Adjustable range:  
zero 8mA, open 16mA  
-Position conversion accuracy :  
0.5~1.5%(depends on installation)



- AC/DC 24V Control Unit  
-AC or DC power input (2-wire) only by user  
-Control function built inside



## PERFORMANCE

TYPE (MODEL)	Maximum output torque		Operating time 60/50Hz	Mounting size	Motor class F Model & frame size	Rated current(A) 60Hz			Duty cycle IEC 34-1	Number of handle turn	Weight Kg
	Kg.m	N.m				AC 1PH. 60Hz/50Hz		DC			
			90°	ISO 5211	M * F	110V	220V		24V	S2(%)	N
HQ-006	6	58	12/14	F03/F05/F07	6 * 70	0.4 / 0.39	0.2 / 0.19	0.2	35	8	3

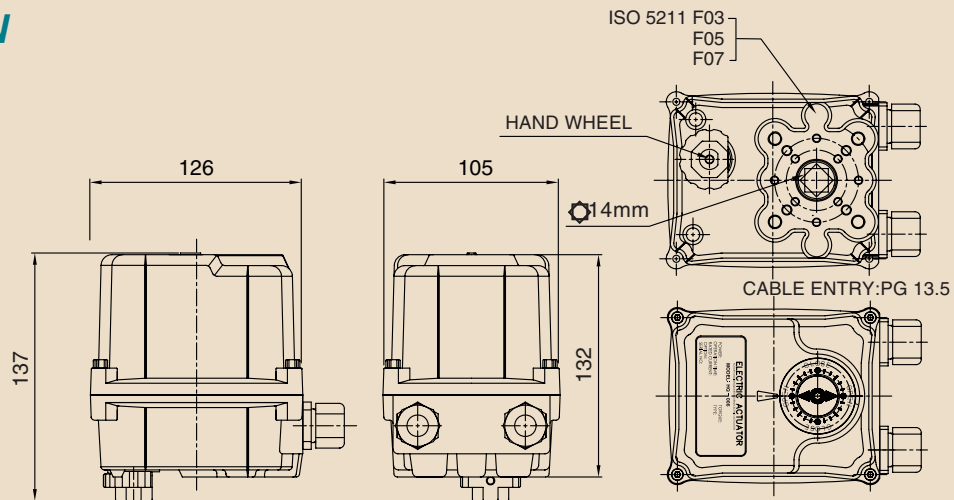
## STANDARD SPECIFICATION

Enclosure	Weatherproof enclosure IP67
Power supply	110/220V AC 1PH, 50/60Hz, ±10%
Duty cycle(on-off duty)	S2 35%
Motor	Reversible motor
Limit switches	Open/close, SPDT, 250V AC 10A rating
Additional limit switches	Open/ close, SPDT, 250V AC 10A rating
Space heater	2W (110/220V AC)Anti-condensation
Manual override	Handwheel (hexagon design)
Cable entries	Two PG 13.5 Tap(OPTION : NPT1/2", PT1/2", PF 1/2")
Movement angle	320° ± 10° (0° ~330°)
Ambient temperature	-20°C~70°C
External coating	Polyester powder coating

## OPTION SPECIFICATION

PIU	Potentiometer unit(0~1 KΩ)
PCU	Proportional control unit (In/out:0~10V, 4~20mA DC)
CPT	Current position transmitter (Output 4~20mA DC)
ADCM	Multi(24VAC/DC)
DCM	DC motor (24VDC)
LCU	Local control unit -remote/local -open/stop/close

## DIMENSION



## APPLICATION



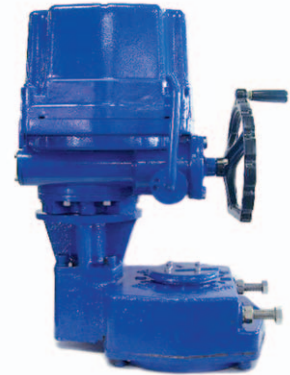
BUTTERFLY VALVES  
BALL VALVES  
DAMPER VALVES  
PLUG VALVES

VALVE AUTOMATION (ROTARY MOTION VALVES)





### HQ Series



### PERFORMANCE

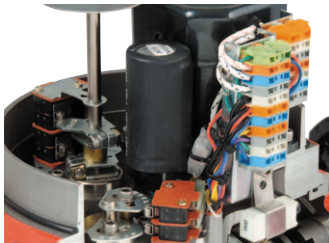
TYPE (MODEL)	Maximum output torque Kg-m	Operating time(sec.) 60/50Hz 90°	Maximum bore size mm	Motor class F Model & frame size M * F	Rated current(A) 60Hz				Duty cycle IEC 34-1 S4(%)	Number of handle turn N	Weight Kg
					1 Phase		3 Phase				
					110V	220V	380V	440V			
HQ-008	8	13/16	φ 20	15 * 70	0.96/0.97	0.47/0.46	N/A	N/A	70	10	7.4
HQ-010	10	16/20	φ 20	15 * 70	0.96/0.97	0.47/0.46	N/A	N/A	70	10	7.4
HQ-015	15	21/25	φ 22	40 * 80	1.51/1.62	0.72/0.84	0.35/0.27	0.55/0.34	70	11	16.6
HQ-020	20	21/25	φ 22	40 * 80	1.51/1.62	0.72/0.84	0.35/0.27	0.55/0.34	70	11	16.6
HQ-030	30	26/31	φ 35	40 * 90	1.37/1.67	0.68/0.81	0.33/0.27	0.43/0.30	70	13.5	22
HQ-050	50	26/31	φ 35	90 * 90	4.27/3.56	1.37/1.27	0.51/0.42	0.66/0.46	70	13.5	23
HQ-060	60	26/31	φ 35	90 * 90	4.27/3.56	1.37/1.27	0.51/0.42	0.66/0.46	70	13.5	23
HQ-080	80	31/37	φ 45	180 * 90	3.47/4.45	1.81/2.32	0.83/0.61	1.10/0.73	70	16.5	29
HQ-120	120	31/37	φ 45	180 * 90	3.47/4.45	1.81/2.32	0.83/0.61	1.10/0.73	70	16.5	29
HQ-200	200	93/112	φ 65	180 * 90	3.47/4.45	1.81/2.32	0.83/0.61	1.10/0.73	70	49.5	75
HQ-300	300	93/112	φ 65	180 * 90	3.47/4.45	1.81/2.32	0.83/0.61	1.10/0.73	70	49.5	75

### STANDARD SPECIFICATION

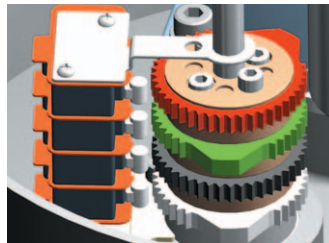
Enclosure	Weatherproof enclosure IP67, NEMA 4 and 6
Power supply	110 / 220V AC 1PH, 380 / 440V AC 3PH 50 / 60Hz, ±10%
Control power supply	110 / 220V AC 1PH, 50 / 60Hz, ±10%
Duty cycle(on-off)	S2, 100% Max 30Min
Duty cycle(modulating)	S4, 70% Max 300~1600 start/hour
Motor	Induction motor (Reversible motor)
Limit switches	Open / close, SPDT, 250V AC 16A rating
Additional limit switches	Open / close, SPDT, 250V AC 16A rating
Torque switches	Open / close, SPDT, 250V AC 16A rating (except HQ-008)
Stall protection/operating temp'	Built-in thermal protection, open 150°C ± 5°C / close 97°C ± 15°C
Travel angle	90° ± 10° (0° ~ 110°)
Indicator	Continuous position indicator
Manual override	Declutching mechanism
Self locking	Provided by double worm gearing
Mechanical stopper	2 × external adjustable screws
Space heater	10W(110/220V AC) Anti-condensation
Cable entries	Three PF3/4" tap (standard type only)
Lubrication	Grease moly (EP type)
Terminal block	Spring loaded lever push type
Materials	Steel, Aluminium alloy, Al bronze, Polycarbonate
Ambient temperature	-20°C ~ +70°C (except option electronic board)
Ambient humidity	90% RH Max.(non-condensing)
Anti vibration	X Y Z 10g, 0.2~34Hz, 30minute
External coating	Anodizing treatment before dry powder, Polyester, Munsell no. 5R 3.5/12

## OPTION SPECIFICATION

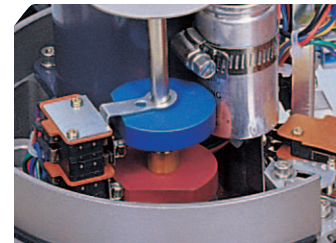
EXA	Explosionproof enclosure actuator (Eexd II B T4)	HQ-series
WTA	Watertight enclosure actuator (IP68 10M 72HR)	HQ-series
PIU	Potentiometer unit (0~1 K $\Omega$ )	HQ-series
PCU	Proportional control unit (input, output 0~10V DC, 4~20mA DC)	HQ-series
ATS	Additional torque switches (SPDT x 2EA 250V AC 10A Rating)	except HQ-008/010
SICU	Semi-Integral control unit (LCU + IMS + phase protect indicator)	except HQ-008/010
ICU	Intelligent digital control unit (LCU + IMS + auto phase discriminator)	except HQ-008/010
CPT	Current position transmitter (output 4~20mA DC)	HQ-series
EXT	Extension 120°, 180°, 270° turn	except HQ-200, 300
RBP	Rechargeable battery backup	HQ-008, 015, 020, 030
DCM	DC motor (24V DC)	HQ-008, 015, 020, 030
ADCM	Multi AC/DC 24V(integral)	HQ-008, 015, 020, 030
LPA	Lever plate actuator	except HQ-008/010
SLU	Signal lamp unit (white-power on, red-open, green-close, yellow-over torque)	except HQ-008/010
FPA1	Fire Proofing Actuator 1050 $\pm$ 5°C / 50min	Engineering consult in advance
FPA2	Fire Proofing Actuator 250 $\pm$ 5°C / 150min	Engineering consult in advance



(Standard cam)

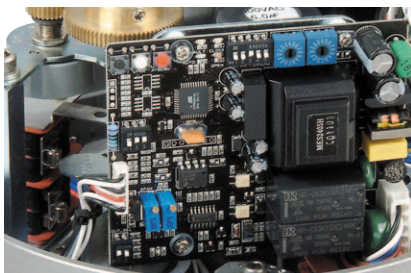


(Cam block)



(D-Type cam)

- 2 travel limit switches for operation
- 2 auxiliary limit switches as dry contact for customer usage
- Easy setting from upside by two screws for tight lockup
- Each cam be set independently



Proportional Control Unit (PCU)

- Input signal range : 0~10VDC, 1~5VDC, 4~20mA, 20~4mA
- Output signal range : 4~20mA, 0~10VDC
- Adjustable range : Zero 8mA, Open 16mA
- Position conversion accuracy :  $\pm$ 0.5~1.5%(depends on installation)



Potentiometer Kit (PIU)

- 0~1K ohm( $\pm$ 0.5%), high resolution



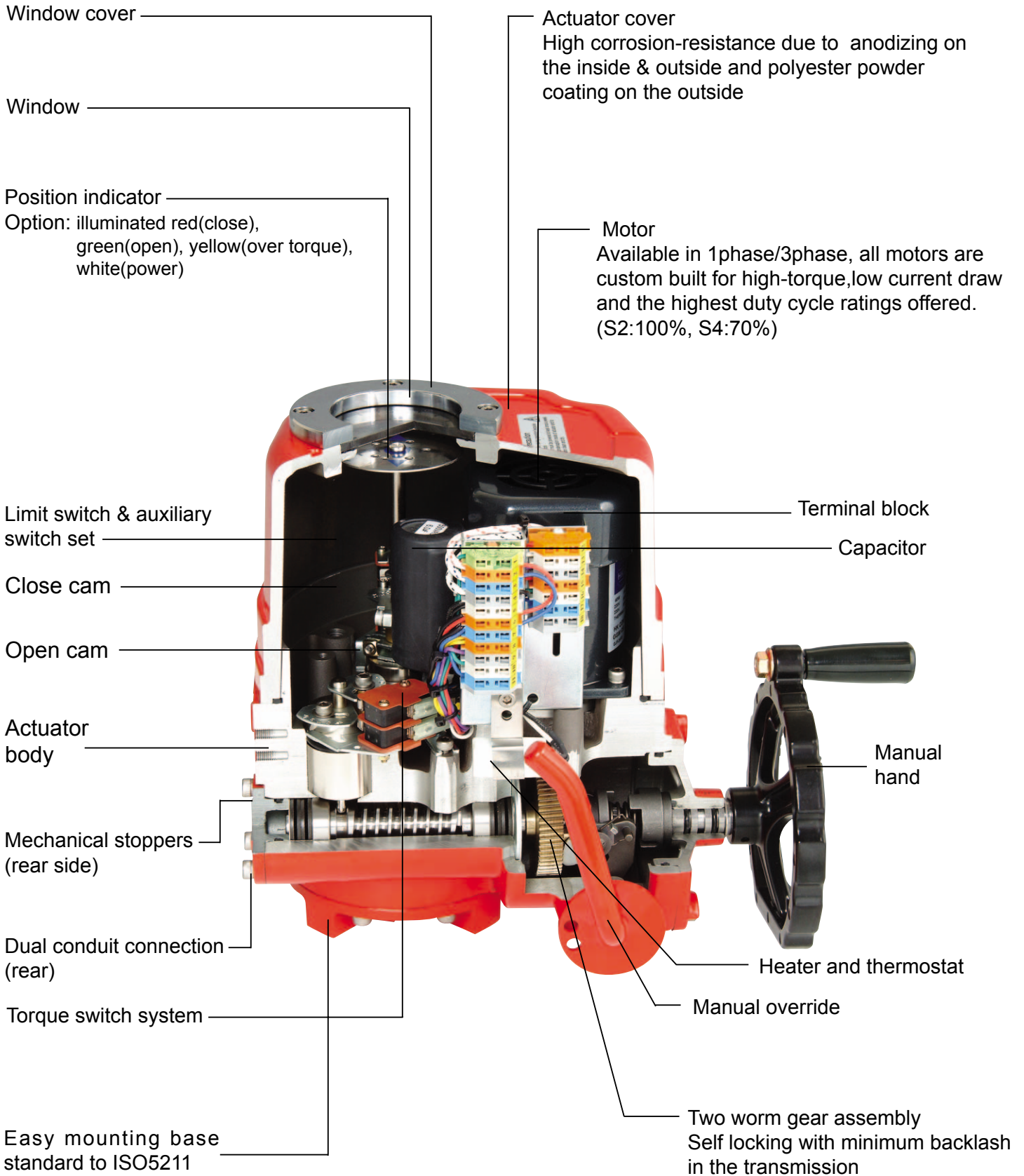
Fire Proofing Actuator (FPA)



Rechargeable Battery Backup



## CONSTRUCTION

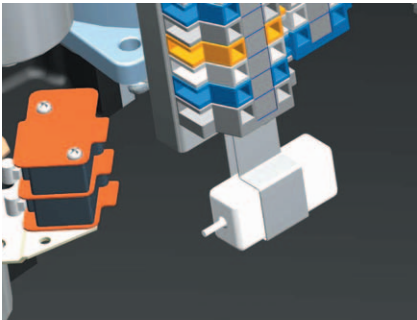


## STANDARD CONFIGURATION



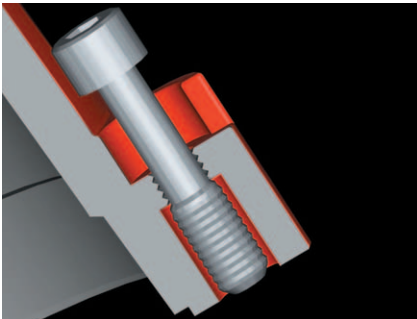
### Terminal block

- Enough number of terminal strips for customer's convenience
- Proven reliability and tight wiring connection.
- Stripped length: 8-9 mm / 0.33 in (2.5mm<sup>2</sup>)
- Terminal dimensions: 10 × 22 × 32mm



### Heater

- Ceramic housing with thermostat to prevent over heat comparing with set temperature.
- No risk of electricity leakage.



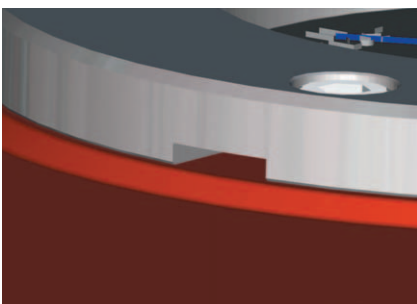
### Captive cover bolt

- Cover bolts are specially designed to prevent losing it during maintenance or installation.
- All external bolts are stainless steel for rust prevention.



### Indicator sustained by spring

- Direction of visual indicator is set by factory.
- In case of changing it's direction, just grip the indicator plate and change the position.
- Spring beneath indicator plate sustains the set position unchanged.
- No need to loose screw and tight it again at all !



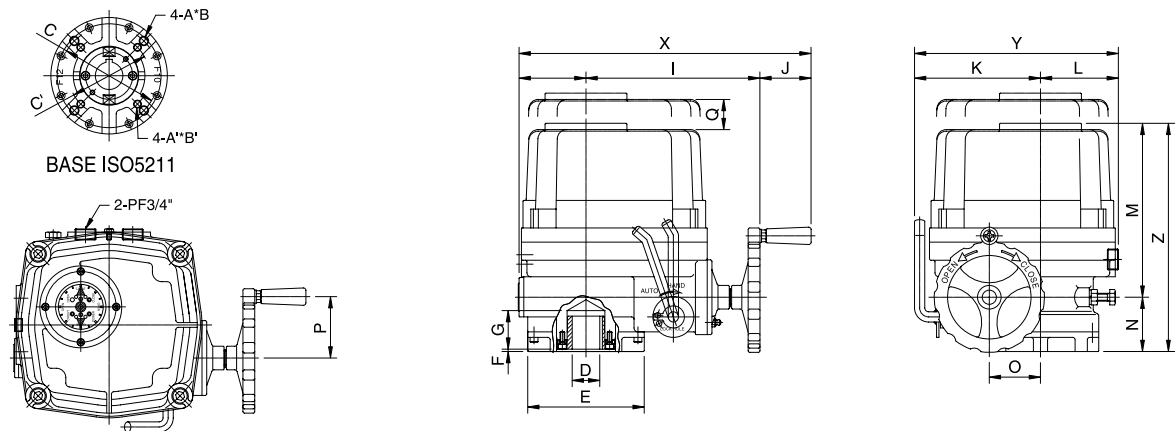
### Slot on window cover for draining rainwater

- Rainwater inside of window cover may affect the sealing of window.
- To prevent this, drain slat is useful to prevent this effect.

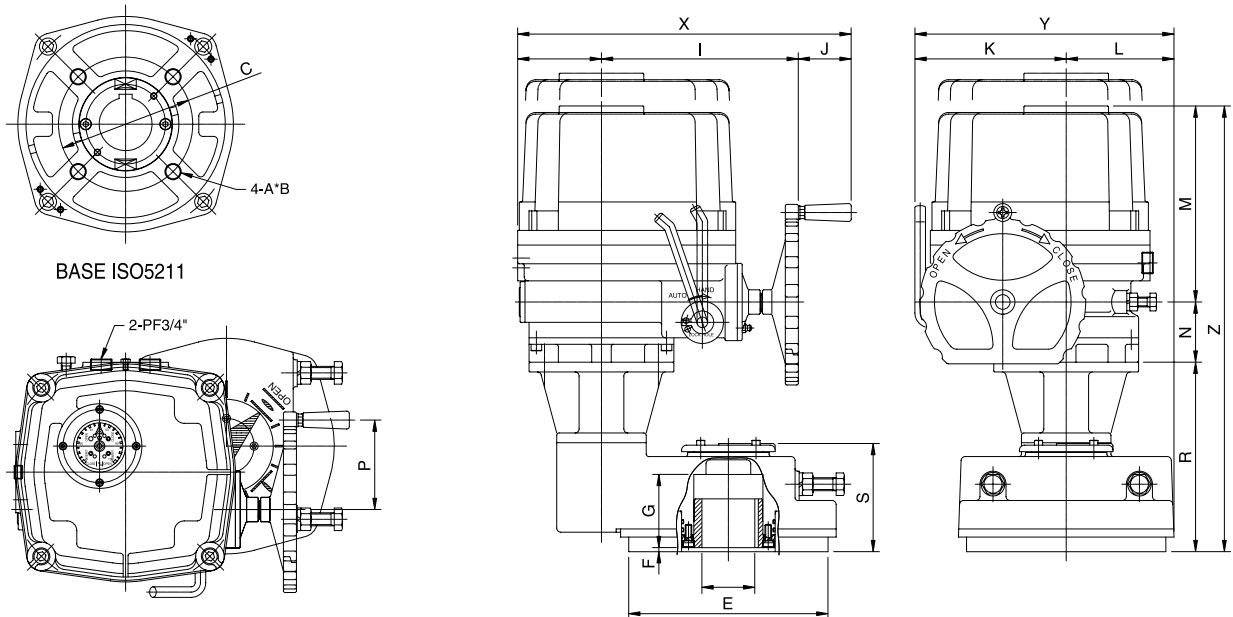


## DIMENSIONAL DRAWING

HQ008, HQ010, HQ015, HQ020, HQ030, HQ050, HQ060, HQ080, HQ120



HQ200, HQ300

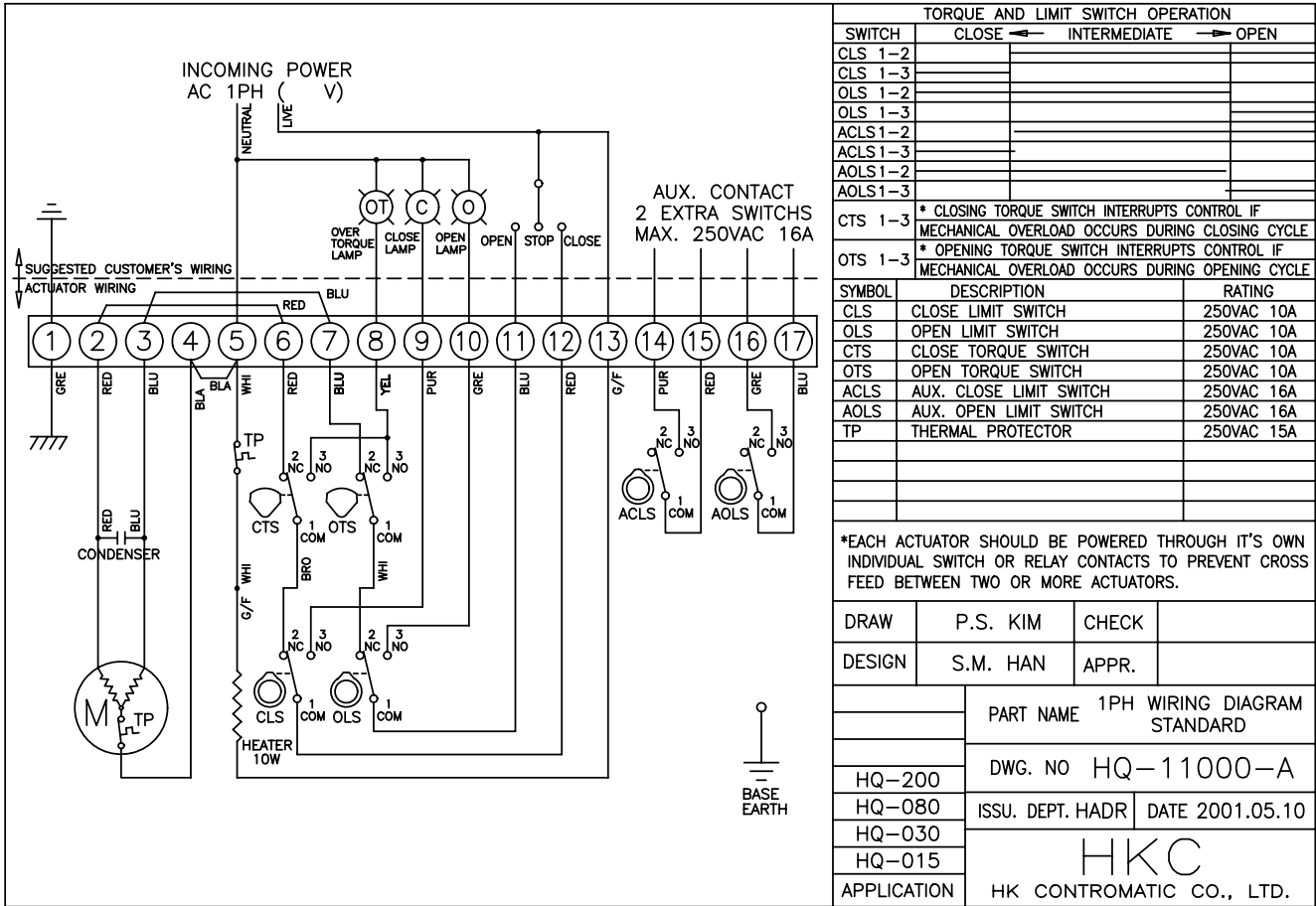


## DIMENSION

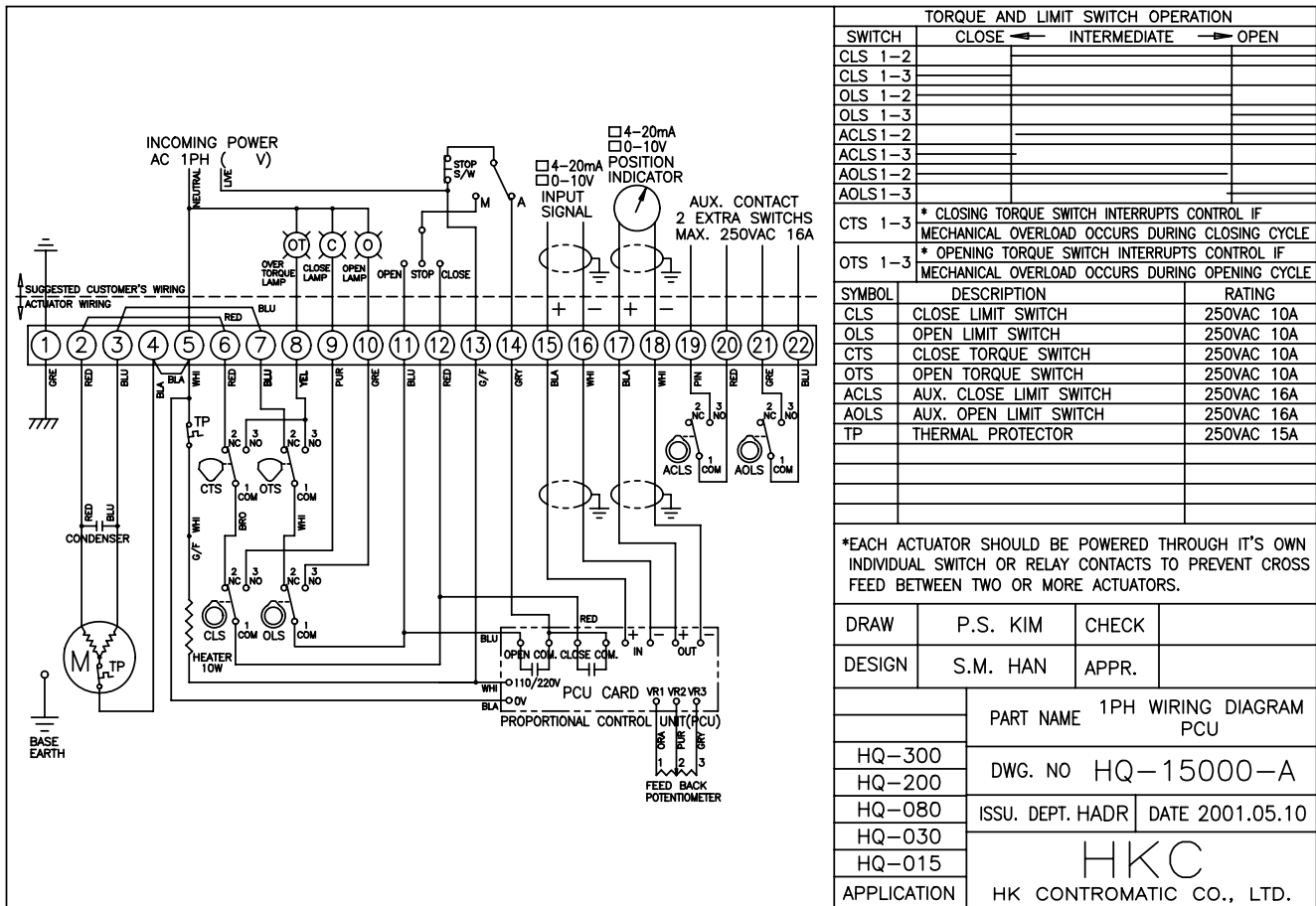
unit(mm)

Model	Base ISO 5211	A	D (max)	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	X	Y	Z
HQ008	φ70	M8	20	88	3	32	50	157	51	100	70	182	53	40	60	120	-	-	258	170	235
	φ70	12																			
HQ010	F07	M8	20	88	3	32	50	157	51	100	70	182	53	40	60	120	-	-	258	170	235
	φ70	12																			
HQ015	F07/F10	M8/M10	22	125	3	42	73	200	65	142	87	200	68	54	78	160	-	-	338	229	268
	φ70 φ102	12/15																			
HQ020	F07/F10	M8/M10	22	125	3	42	73	200	65	142	87	200	68	54	78	160	-	-	338	229	268
	φ70 φ102	12/15																			
HQ030	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	368	259	304
	φ102 φ125	15/18																			
HQ050	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	368	259	304
	φ102 φ125	15/18																			
HQ060	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	368	259	304
	φ102 φ125	15/18																			
HQ080	F12/F14	M12/M16	45	178	3	57	103	242	65	186	111	256	74	78	110	210	-	-	410	297	330
	φ125*/φ140	18/24																			
HQ120	F12/F14	M12/M16	45	178	3	57	103	242	65	186	111	256	74	78	110	210	-	-	410	297	330
	φ125*/φ140	18/24																			
HQ200	F14*/F16	M16*/M20	65	245	5	90	103	242	65	186	133	256	74	78	110	210	233	133	410	319	563
	φ140*/φ165	24*/30																			
HQ300	F14*/F16	M16*/M20	65	245	5	90	103	242	65	186	133	256	74	78	110	210	233	133	410	319	563
	φ140*/φ165	24*/30																			

## Standard Type (1-phase, 50/60Hz)



## Proportional Type (1-phase, 50/60Hz)



\* Wiring drawings are provided upon request.



## RBP ACTUATOR FOR EMERGENCY APPLICATION

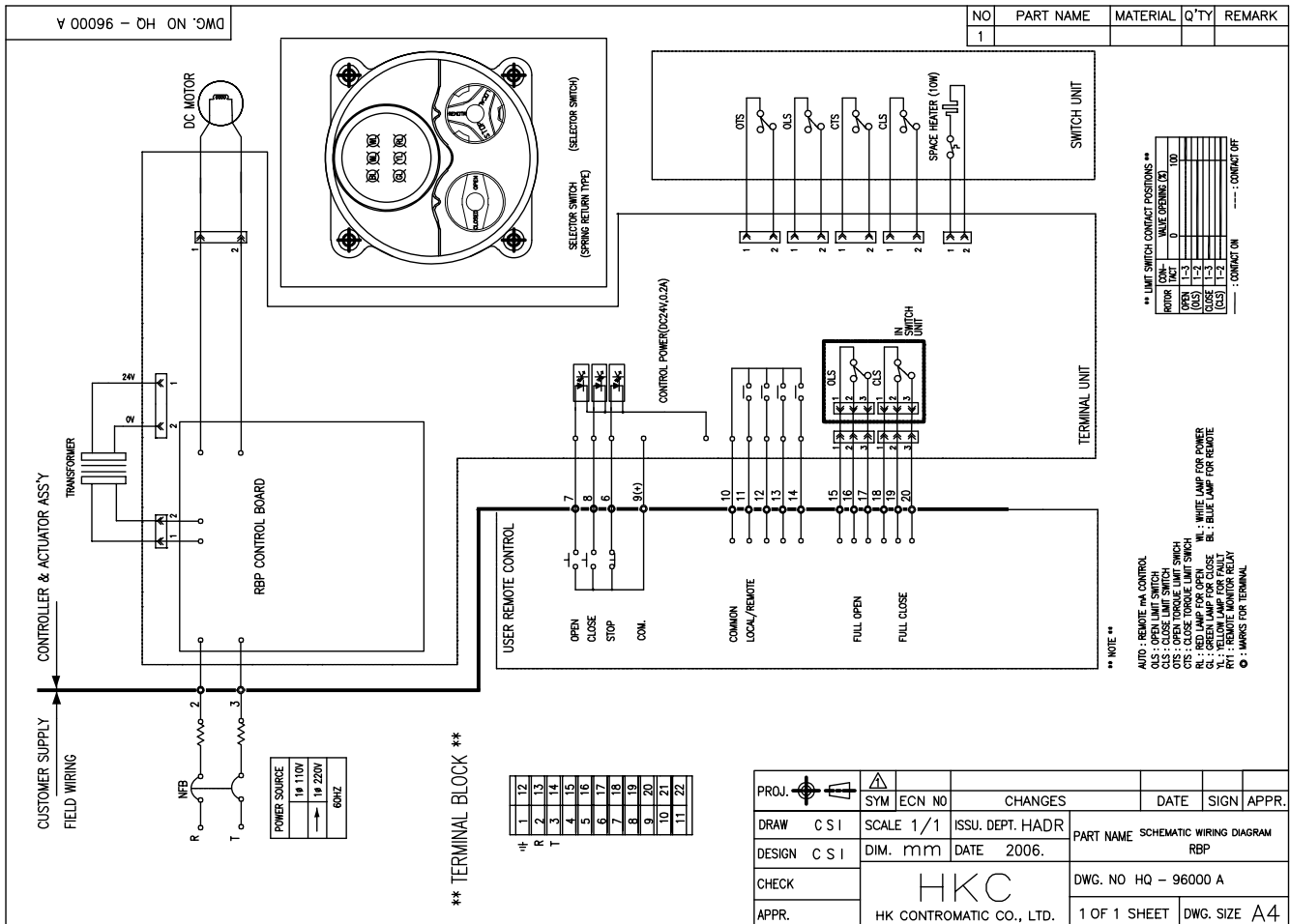
### RBP : Rechargeable Battery Backup (NEW)

- Emergency application when power failed at site
- 1 phase power
- Litium Battery
- Indication of battery level
- Automatic recharge
- 5 times operation per hour

LED lamp signal	
White ○	: Power
GBR ●	: Battery level
Blue ●	: Remote
Yellow ●	: Fault
Red ●	: Open/ Opening
Green ●	: Close/ Closing



### RBP wiring (1-phase, 50/60Hz, on-off standard)



# INTELLIGENT & INTEGRAL CONTROL UNIT FOR SPECIAL APPLICATION

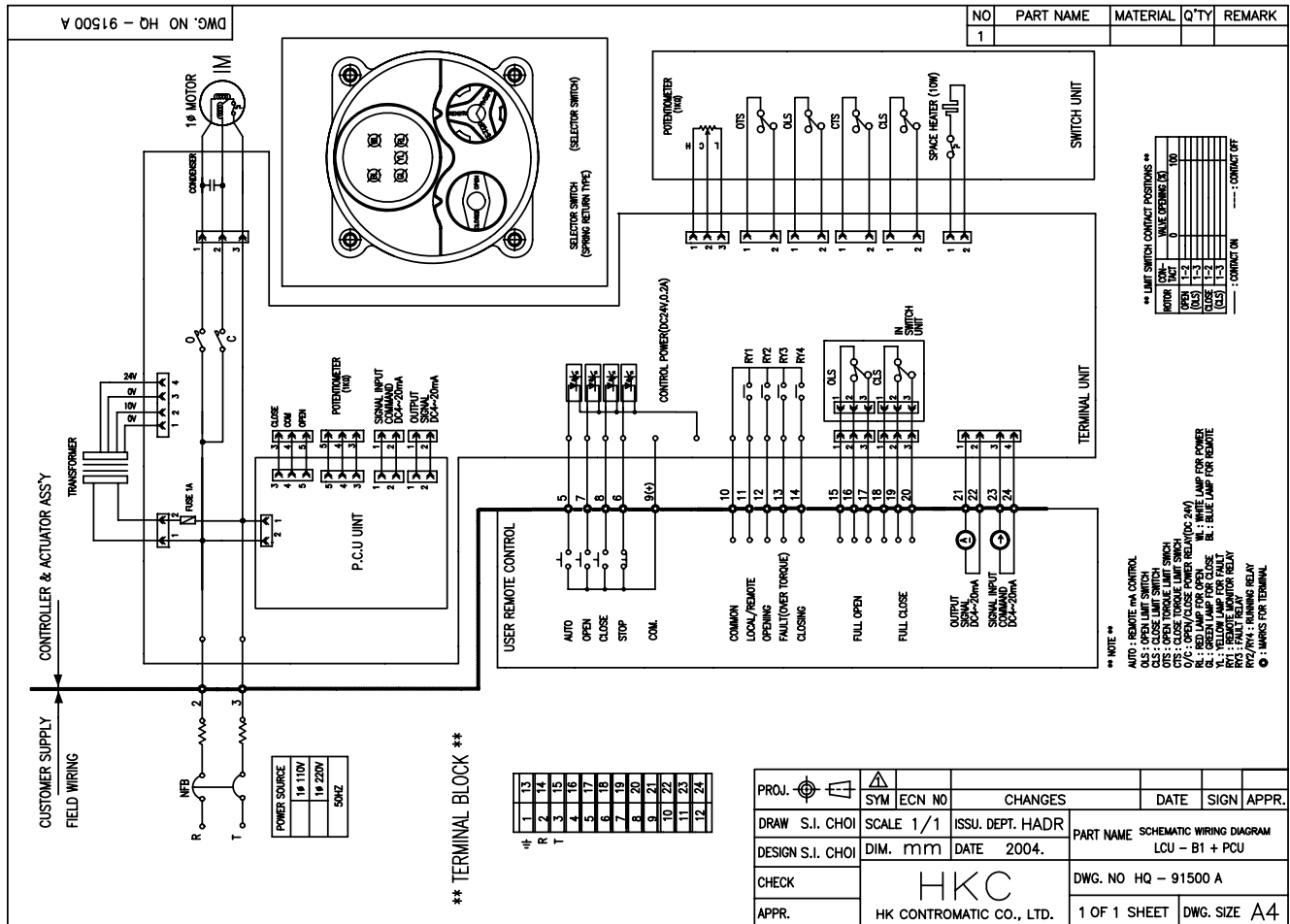
## SICU : Semi-Integral Control Unit

- Light, compact & Integrated design (IMS, Local/Remote control)
- Wide range of electric power application
- 1  $\phi$  AC 110~220V 50/60HZ
- 3  $\phi$  AC 220V~460V 50/60HZ
- Phase protect monitoring by LED in case of wrong wiring
- Easy application for HQ-series actuators
- Various option available (Duty cycle:70%)

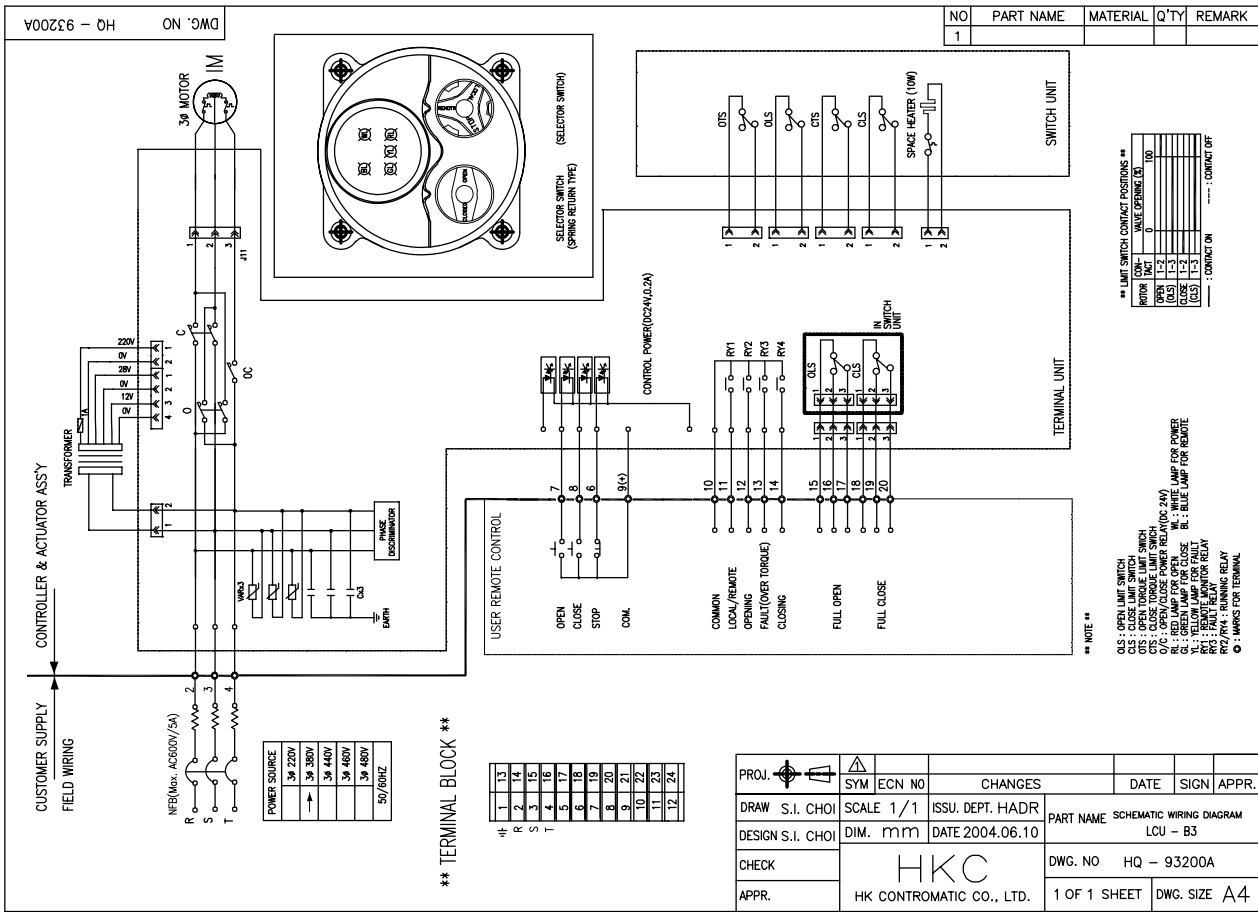
LED lamp signal	
White ○	: Power
Blue ●	: Remote
Yellow ●	: Fault
Red ●	: Open/ Opening
Green ●	: Close/ Closing



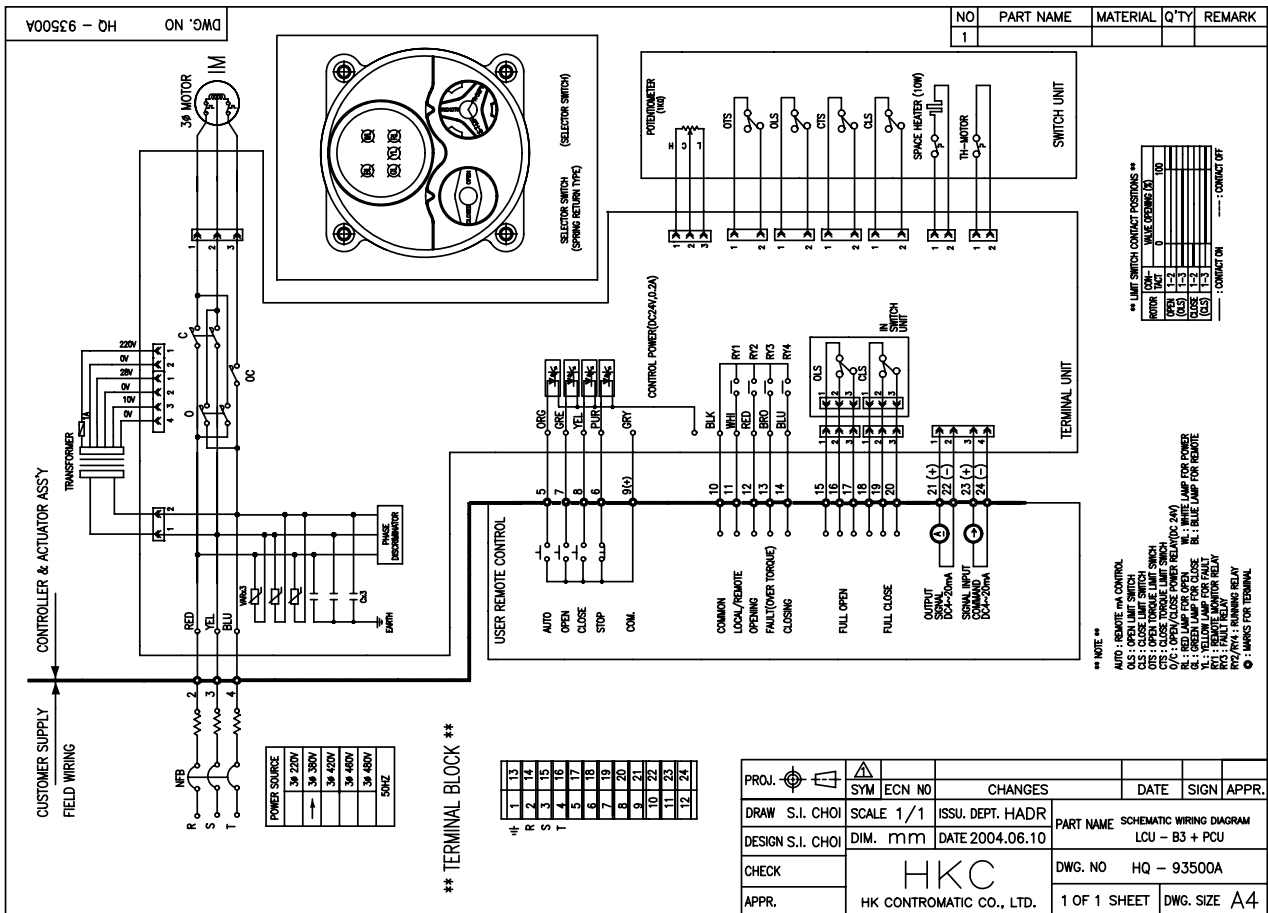
## SICU Wiring (1-phase, 50/60Hz, proportional type)



## SICU Wiring (3-phase, 50/60Hz, on-off, standard)



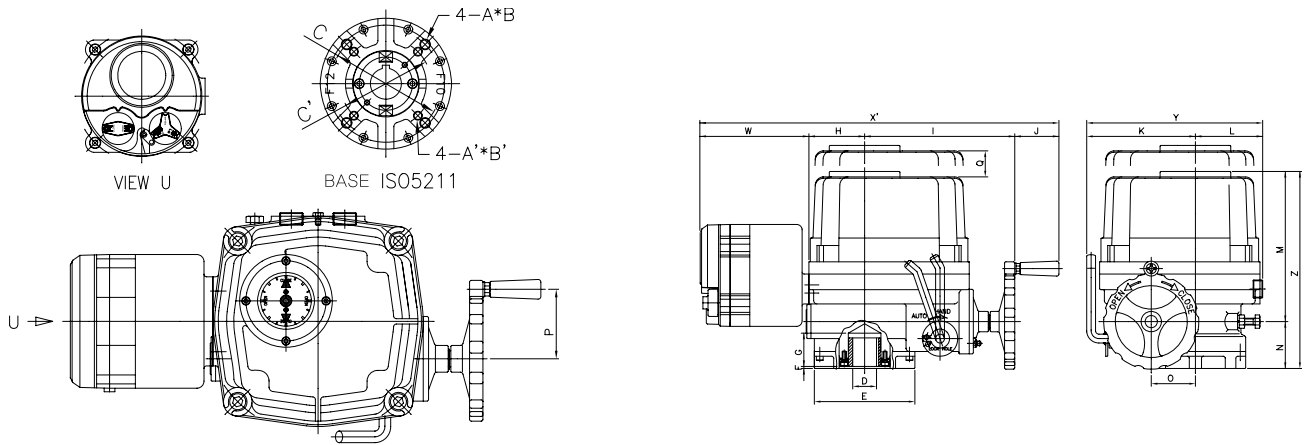
## SICU Wiring (3-phase, 50/60Hz, Integral+PCU)



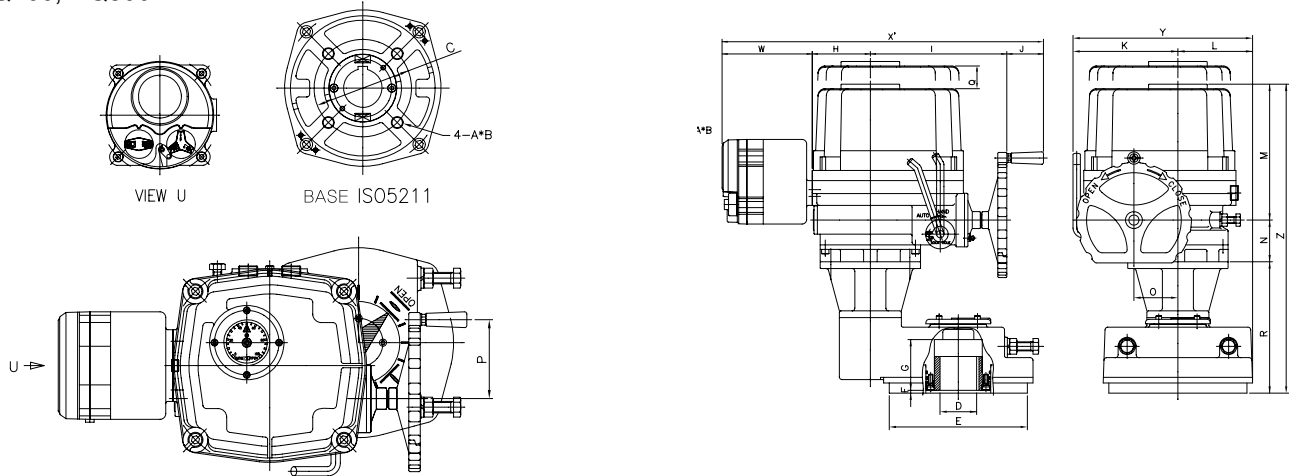


# Dimensional Drawing (with SICU)

HQ015, HQ020, HQ030, HQ050, HQ080, HQ120



HQ200, HQ300



## DIMENSION (with SICU)

unit(mm)

Model	Base ISO 5211	A	D (Max)	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	W	X'	Y	Z
	∅C	B																				
HQ015	F07/F10	M8/M10	22	125	3	42	73	200	65	142	87	200	68	54	78	160	-	-	160	498	229	268
	∅70/∅102	12/15																				
HQ020	F07/F10	M8/M10	22	125	3	42	73	200	65	142	87	200	68	54	78	160	-	-	160	498	229	268
	∅70/∅102	12/15																				
HQ030	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	160	528	259	304
	∅102/∅125	15/18																				
HQ050	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	160	528	259	304
	∅102/∅125	15/18																				
HQ060	F10/F12	M10/M12	35	148	3	49	82	221	65	160	99	235	69	65	78	180	-	-	160	528	259	304
	∅102/∅125	15/18																				
HQ080	F12/F14	M12/M16	45	178	3	57	103	242	65	186	111	256	74	78	110	210	-	-	160	570	297	330
	∅125/∅140	18/24																				
HQ120	F12/F14	M12/M16	45	178	3	57	103	242	65	186	111	256	74	78	110	210	-	-	160	570	297	330
	∅125/∅140	18/24																				
HQ200	F14*/F16	M16*/M20	65	245	5	90	103	242	65	186	133	256	74	78	110	210	233	133	160	570	319	563
	∅140*/∅165	24*/30																				
HQ300	F14*/F16	M16*/M20	65	245	5	90	103	242	65	186	133	256	74	78	110	210	233	133	160	570	319	563
	∅140*/∅165	24*/30																				

※ Wiring drawings are provided upon request.

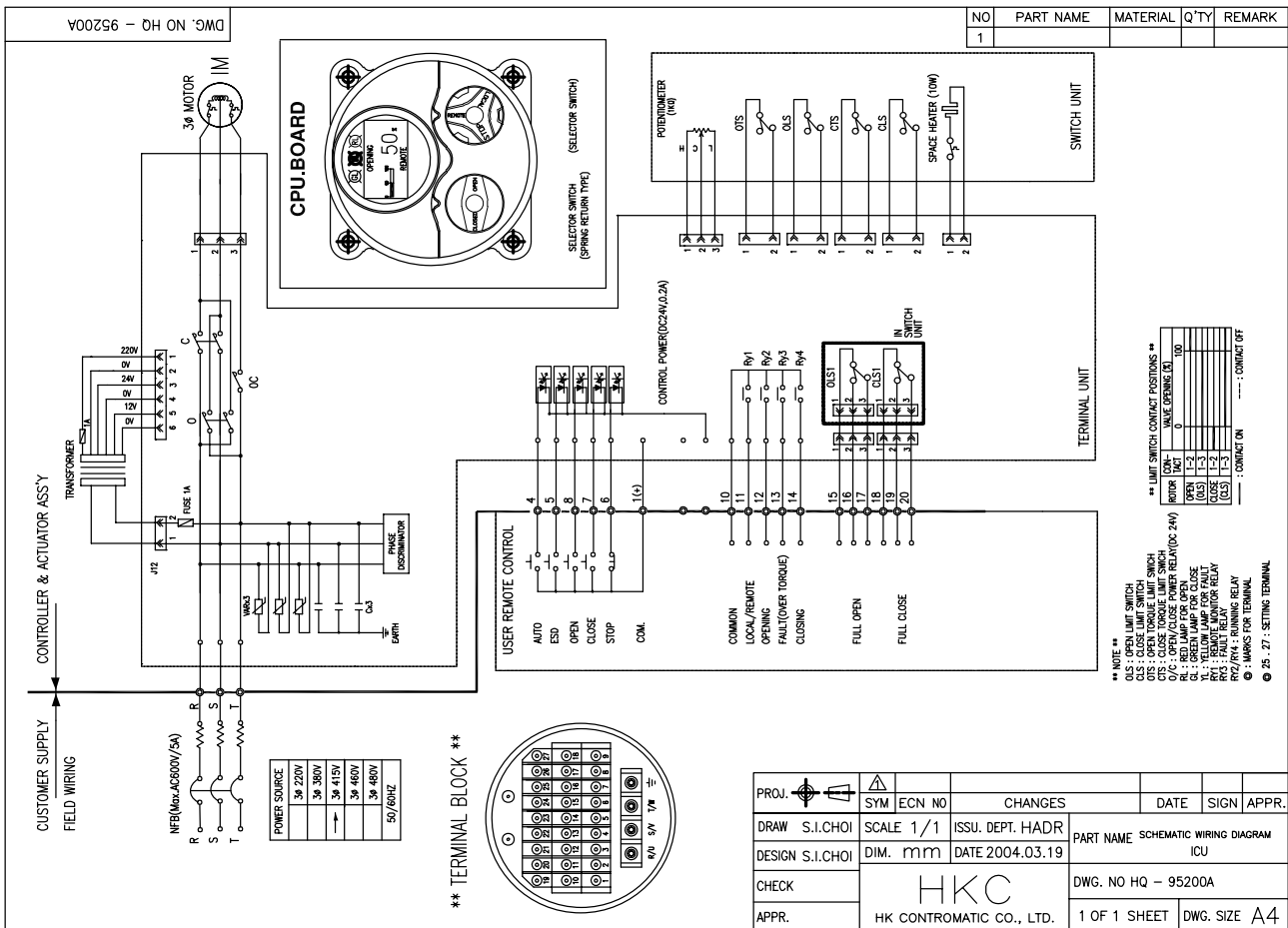
# HK Contromatic

## ICU : Intelligent Digital Control Unit

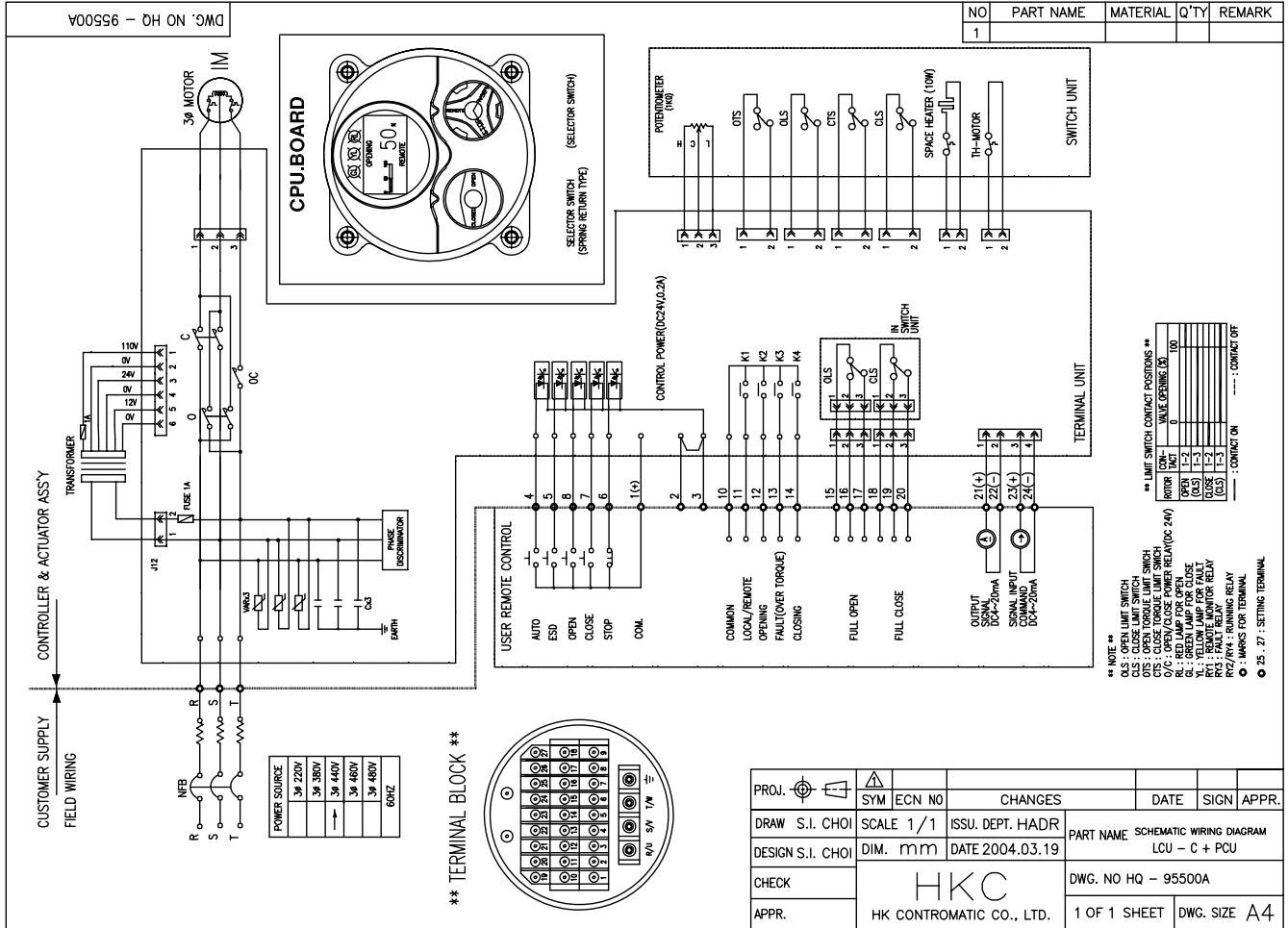
- Light, Compact & Intergrated design
- Wide range of electric power application  
(AC 220V~AC460V/3-phase, No Fuse Break Max.AC600V/5A)
- Built-in auto phase discriminator (Easy & convenient wiring)
- Digital indicator with number, bar graph & literature
- Seperate terminal chamber
- (Reliable against water, vibration, temp', etc)
- Easy application for HQ-series actuators
- Various option available



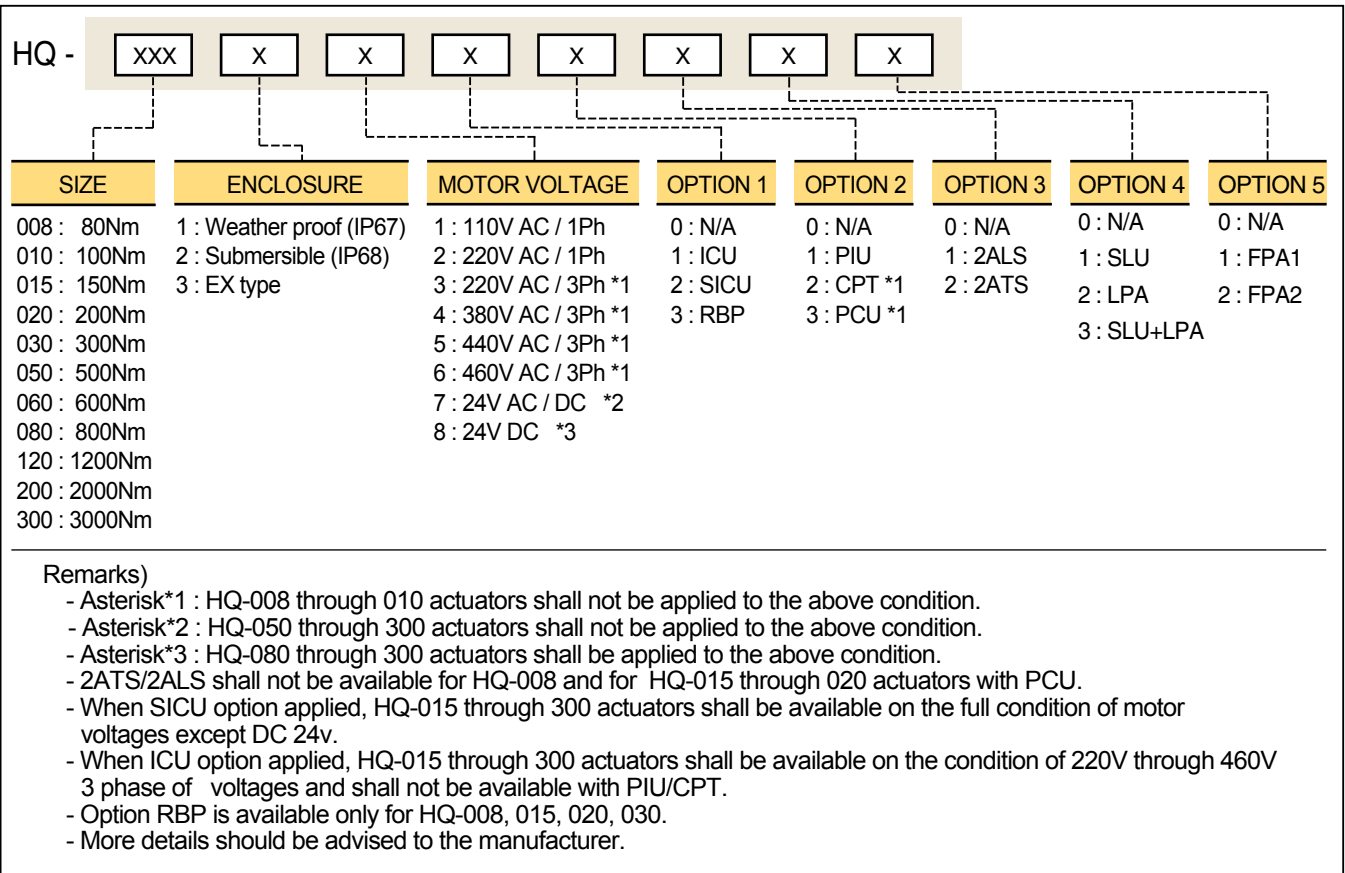
## ICU Wiring (3-phase, 50/60Hz, on-off, standard)



# ICU Wiring (3-phase, 50/60Hz, PCU type)



## ELECTRIC ACTUATOR ORDER CODING SYSTEM (EXA : EEx d // B T4)







## PNEUMATIC ACTUATOR HP SERIES

### INTRODUCTION

HP series actuators are compact, high cycle, high quality, rack & pinion pneumatic actuator specifically designed to meet the demanding needs of the quarter turn valve automation market. HP actuators provide a wide range of torque outputs to suit quarter turn ball, butterfly, plug and dampers valves, together with the APL range of valve position monitors for complete valve automation solutions.

Quality has been our primary concept in actuator development, the latest manufacturing technologies have been employed to provide both quality and performance on every HP actuator produced.

### DESIGN FEATURES

#### ① ACTUATOR BODY

Aluminium extruded body, hard anodized internally polished to 45–50 microns and nickel plate plated to protect against wear and corrosion, and reducing piston friction to a minimum

#### ② INDICATOR

A disc open/close indicator is standard on all models

#### ③ TRAVEL ADJUSTMENT

Standard adjustment +5° to –5° via two external adjustment screws.

#### ④ END CAPS

Heavy duty die cast aluminum end caps polyester coated to provide maximum resistance against potentially corrosive elements

#### ⑤ HEAVY DUTY SPRINGS

Multiple high tensile spring sets for spring return fail safe operation manufactured in high strength alloy steel guaranteed to provide high performance in fail safe and emergency shut down operations.

#### ⑥ PINION

Alloy steel pinion is precision ground and then nickel plated in order to reduce friction, provide maximum wear resistance, and protect against corrosion under severe conditions.

#### ⑦ PISTON GUIDES

Self lubricating (polypropylene+GF) piston guides provide high trust, stability.

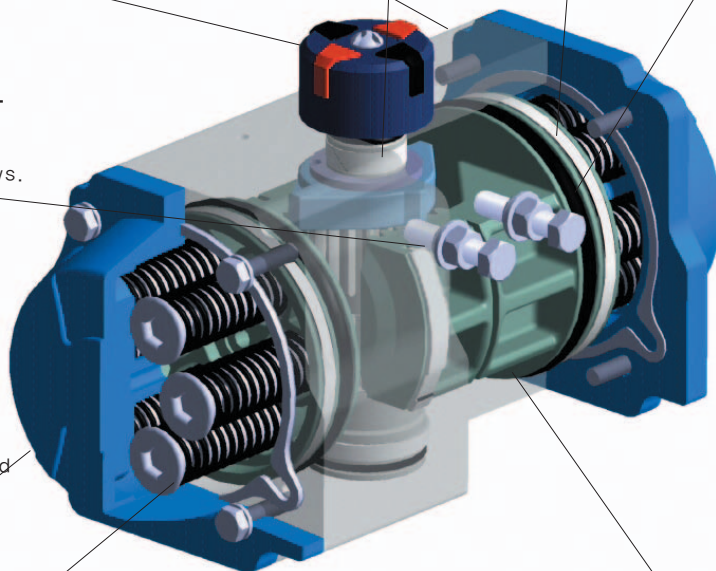
#### ⑧ PISTON SEALS

NBR-70 rubber pinion seals provide trouble free operation at standard temperature ranges, viton seals are available for higher or lower temperature extremes

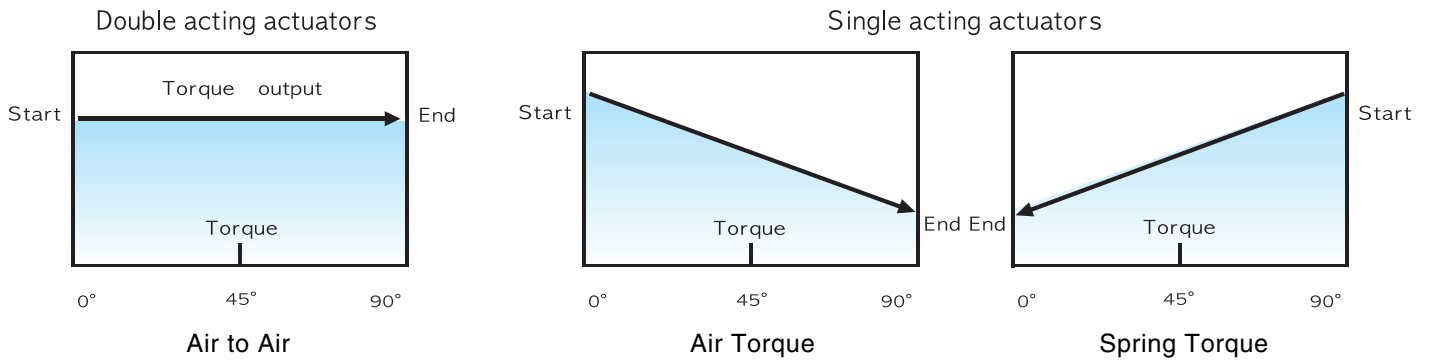
#### ⑨ PISTON

Pistons are heavy duty die cast aluminium pistons, fitted with high quality seals and guides, providing high ratio output torques vs. input air pressure.

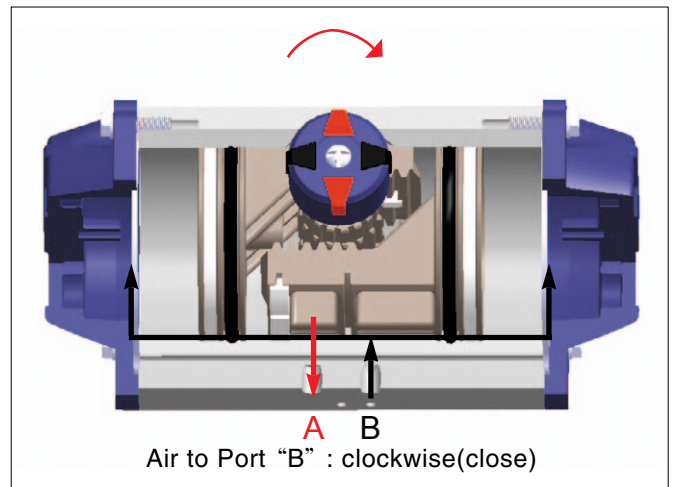
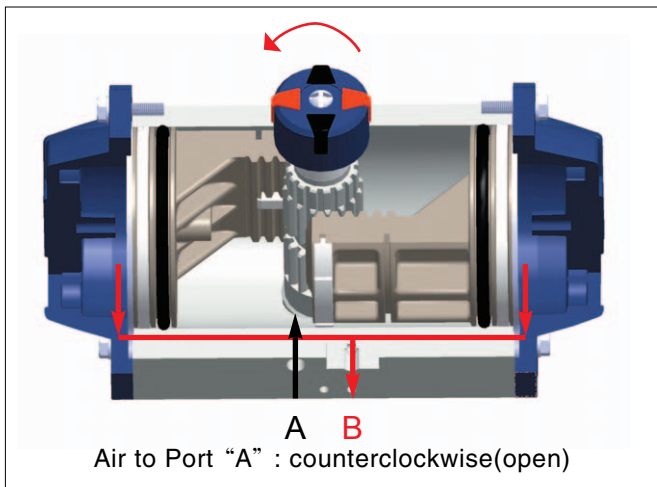
Twin rack and pinion design provides a constant torque on all models



# Torque diagram

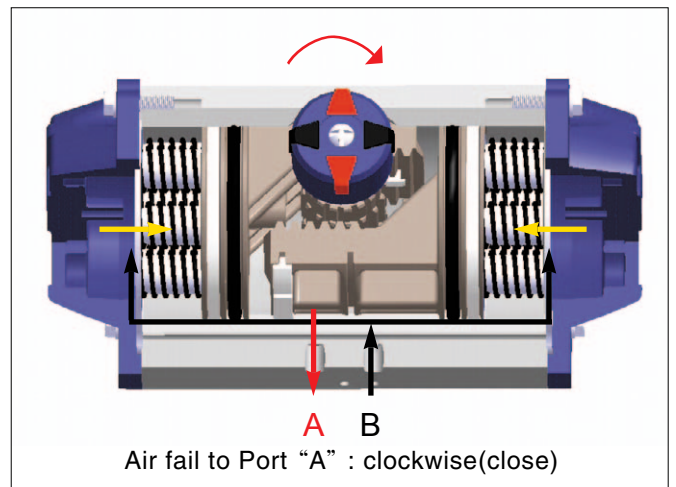
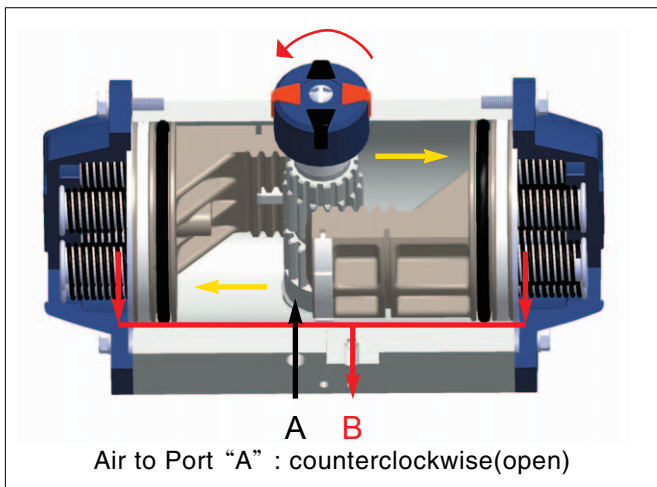


## Double acting operation



\* Pistons must be inverted to reverse actuator rotation

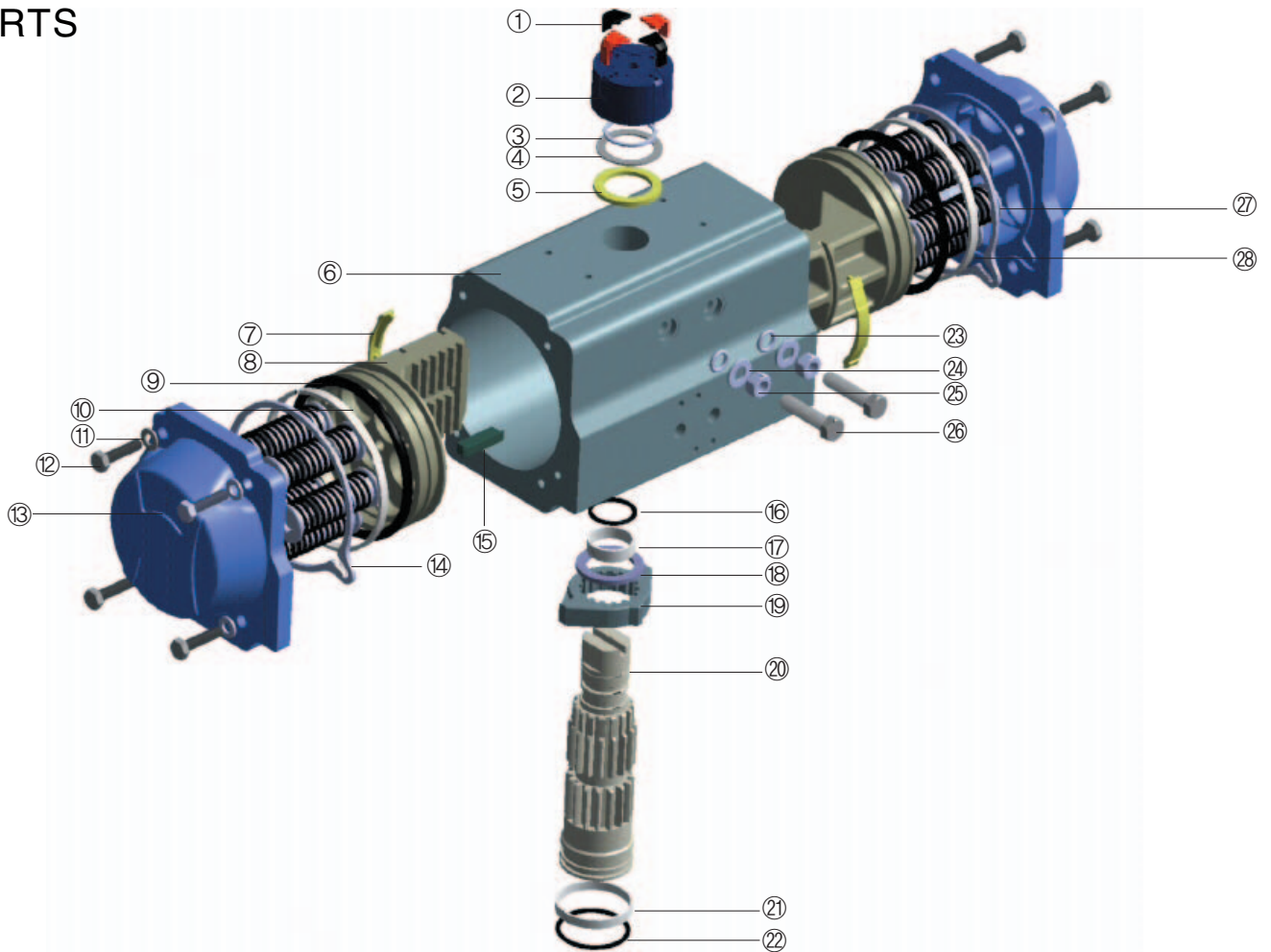
## Spring return operation



\* Spring force makes the actuator clockwise when the air is exhausted at port "A"

\* When air fail to counterclockwise is required, the pistons must be inverted

## PARTS



## MATERIALS

PART NO	UNIT Q'TY	PART DESCRIPTION	STANDARD MATERIAL	CORROSION PROTECTION	OPTIONAL MATERIAL
1	4	Position indicator	Polypropylene +GF	-----	-----
2	1	Position indicator holder	Polypropylene +GF	-----	-----
3	1	Spring clip(pinion)	Stainless Steel	HP160,200 Nickel plated	-----
4	1	Thrust washer(pinion)	Stainless Steel	-----	-----
5	1	Thrust bearing(pinion)	Polyphthalamide	-----	-----
6	1	Body	Extruded Aluminium alloy	Hard anodized	-----
7	2	Bearing(piston back)	Polyphthalamide	-----	-----
8	2	Piston	Die Cast Aluminium	Hard anodized	-----
9	2	"O" Ring(piston)	Nitrile (NBR70)	-----	Viton SiliconViton
10	2	Bearing(piston head)	Polyphthalamide	-----	-----
11	8	Cap bolt washer	Stainless Steel	-----	-----
12	2	Cap bolt(end cap)	Stainless Steel	-----	-----
13	2	Right and left end cap	Die Cast Aluminium	Chromate + Polyester coated	-----
14	2	"O" Ring(end cap)	Nitrile (NBR70)	-----	Viton SiliconViton
15	2	Piston guide	Polypropylene +GF	-----	-----
16	1	"O" Ring(pinion top)	Nitrile (NBR70)	-----	Viton SiliconViton
17	1	Bearing(piston top)	Nylon 46	-----	-----
18	1	Thrust bearing(pinion)	Polyphthalamide	-----	-----
19	1	Open.Close cam(stop arrangement)	Stainless Steel	-----	-----
20	1	Drive shaft	Steel alloy	Nickel plated	-----
21	1	Bearing(piston bottom)	Nylon 46	-----	-----
22	1	"O" Ring(pinion bottom)	Nitrile (NBR70)	-----	Viton SiliconViton
23	1	"O" Ring(stop screw)	Nitrile (NBR70)	-----	Viton SiliconViton
24	2	Stop bolt washer	Stainless Steel	-----	-----
25	2	Stop nut	Stainless Steel	-----	-----
26	2	Stop bolt	Stainless Steel	-----	-----
27	min.5/max.12	Spring(cartridge)	High alloy Spring Steel	Epoxy coated	-----
28	1	Spring holder	Polypropylene +GF	-----	-----



## SPECIFICATION

- Pressure range -
  - Max working pressure 10 bar
  - Double acting : 2.5bar ~ 8bar      Spring return : 2.5bar ~ 8bar
- Temperature range -
  - Standard : -20°C ~ 80°C      Option : -35°C ~ 80°C / -20°C~150°C
- Movement -
  - 90 ° with standard adjustable  $\pm 5^\circ$
- Lubrication -
  - All moving parts are factory lubricated for cycle life of the actuator.
- Cycle Life -
  - 1,000,000 operations



## CONNECTION



-Top mounting connection is designed in accordance with VDI/VDE3845 NAMUR standard to allow easy installation of accessories like limit switch boxes and positioners.

-HKC manufactures switch boxes and positioners for various application



-Side mounting connection is designed in accordance with VDI/VDE3845 NAMUR standard to install solenoid valve.



-Bottom mounting connection is designed in accordance with ISO 5211 and DIN3337 standard for direct mounting with valves.

-Star drive and square insert permits easy installation of the actuator directly.

## Models available



HP35

HP50 ~ HP125

HP160 ~ HP200

## HP series torque outputs

### Double Acting Actuator

Output torque(Nm) for double acting actuators

Model	air supply in bar	2.5 Bar	3 Bar	3.5 Bar	4 Bar	4.5 Bar	5 Bar	5.5 Bar	6 Bar	7 Bar	8 Bar
HP - 35		3.6	4.3	5	5.7	6.4	7.3	8	8.7	10	11.6
HP - 50		8.4	10.1	11.7	13.5	15.1	16.7	18.4	20	23.4	26.7
HP - 63		14.8	17.7	20.6	23.6	26.5	29.4	32.3	35.3	41.1	47
HP - 75		29.2	35	40.8	46.6	52.5	58.3	64.1	69.9	81.5	93.2
HP - 88		45.9	55	64.2	73.3	82.5	91.6	101.1	110.1	128.1	146.1
HP - 100		66.8	80.1	93.4	106.3	120.3	133.3	146.3	160.3	186.3	213.3
HP - 125		139	167	195	223	250	278	306	333	389	444
HP - 160		285	341	398	455	512	577	625	682	795	909
HP - 200		533	639	746	852	976	1065	1171	1277	1490	1703

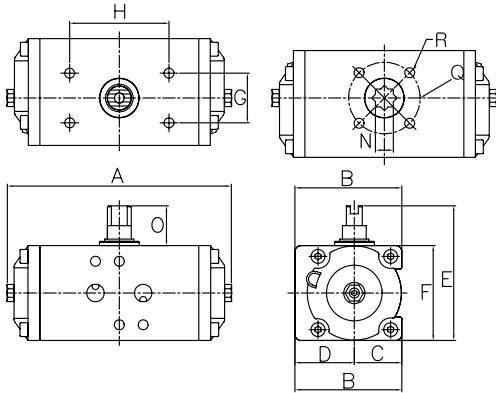
### Single Acting Actuator

Output torque(Nm) for single acting (spring return) actuators

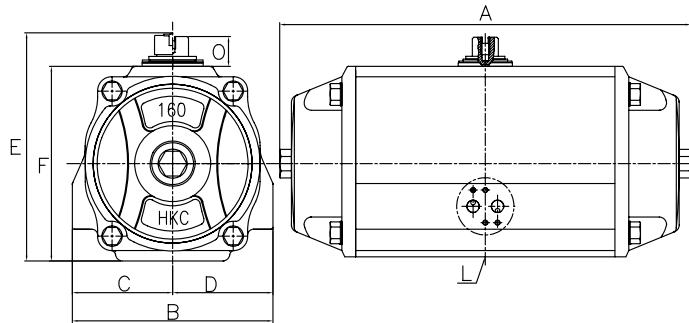
Model (spring weight)	S.set	2.5 Bar		3 Bar		3.5 Bar		4 Bar		4.5 Bar		5 Bar		5.5 Bar		6 Bar		7 Bar		8 Bar		Spring Torque		
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
HP-50S  (0.108)	5	5.0	3.5	6.7	5.2	8.4	6.9	10.0	8.5	11.7	10.2	13.3	11.8									5	3.5	
	6	4.4	2.6	6.0	4.2	7.7	5.9	9.4	7.5	11.0	9.2	12.7	10.9	14.3	12.5							5.9	4.1	
	7			5.4	3.2	7.0	4.9	8.7	6.6	10.3	8.2	12	9.9	13.7	11.6	15.3	13.2					6.9	4.8	
	8					6.3	3.9	8.0	5.6	9.7	7.3	11.3	8.9	13.0	10.6	14.7	12.2	18.0	15.6				7.9	5.5
	9							7.3	4.6	9.0	6.3	10.7	7.9	12.3	9.6	14.0	11.3	17.3	14.6	20.6	17.9		8.9	6.2
	10									8.3	5.3	10.0	7.0	11.6	8.6	13.3	10.3	16.6	13.6	19.9	16.9		9.8	6.8
	11											9.3	6.0	11.0	7.7	12.6	9.3	16.0	12.6	19.3	16.0		10.8	7.5
	12													10.3	6.7	12.0	8.3	15.3	11.7	18.6	15.0		11.8	8.1
	HP-63S  (0.204)	5	9.2	6.3	12.1	9.3	15.1	12.2	18.0	15.1	20.9	18.0	23.9	21.0									8.5	5.6
		6	8.1	4.6	11.0	7.6	14.0	10.5	16.9	13.4	19.8	16.4	22.8	19.3	25.7	22.2							10.2	6.8
		7			9.9	5.9	12.9	8.8	15.8	11.7	18.7	14.7	21.6	17.6	24.6	20.5	27.5	23.5					11.9	7.9
		8					11.7	7.1	14.7	10.1	17.6	13.0	20.5	15.9	23.5	18.8	26.4	21.8	32.3	27.6				13.6
9								13.6	8.4	16.5	11.3	22.4	17.2	25.3	20.1	31.2	26.0			38.0	31.8		15.3	10.1
10										15.4	9.6	18.3	12.54	21.2	15.5	24.2	18.4	30.0	24.3	35.9	30.1		17	11.2
11												17.2	10.9	20.1	13.8	23.1	16.7	28.9	22.6	34.8	28.4		18.7	12.3
12														19.0	12.1	22.0	15.0	27.8	20.9	33.7	26.8		20.3	13.4
HP-75S  (0.132)		5	18.1	11.9	23.9	17.7	29.8	23.5	35.6	29.3	41.4	35.1	47.2	41.0									17.4	11.2
		6	15.9	8.4	21.7	14.2	27.6	20.0	33.4	25.9	39.2	31.7	45.0	37.5	50.8	43.3							20.9	13.4
		7			19.5	10.8	25.3	16.6	31.2	22.4	37.0	28.2	42.8	34.0	48.6	39.9	54.4	45.7					24.3	15.6
		8					23.1	13.1	28.9	18.9	34.8	24.8	40.6	30.6	46.4	36.4	52.2	42.2	63.8	53.8				27.8
	9							26.7	15.5	32.6	21.3	38.4	27.1	44.2	32.9	52.0	38.7	61.6	50.4	73.3	62.0		31.3	20
	10									30.3	17.8	36.2	23.7	42.0	29.5	47.8	35.3	59.4	46.9	71.1	58.6		34.7	22.2
	11											33.9	20.2	39.8	26.0	45.6	31.8	57.2	43.5	68.8	55.1		38.2	24.4
	12													37.6	22.5	43.4	28.4	55.0	40.0	66.6	51.6		41.6	26.6
	HP-88S  (0.672)	5	27.5	17.0	36.7	26.1	45.8	35.3	55.0	44.4	64.1	53.6	73.3	62.7									29	18.4
		6	23.9	11.2	33.0	20.4	42.2	29.5	51.3	38.7	60.5	47.8	69.6	57.0	78.8	66.1							24.8	22.1
		7			29.3	14.6	38.5	23.7	47.6	32.9	56.8	42.0	65.9	51.2	75.1	60.3	84.32	69.5					40.5	25.8
		8					34.8	18.0	44.0	27.1	53.1	36.3	62.3	45.4	71.4	54.6	80.6	63.7	98.9	82.0				46.3
9								40.3	21.3	49.5	30.5	58.6	39.6	67.8	48.8	76.9	57.9	95.2	76.2	113	94.6		52.1	33.1
10										45.8	24.7	54.9	33.9	64.1	43.0	73.2	52.2	91.6	70.5	110	88.8		57.9	36.8
11												51.3	28.1	60.4	37.2	69.6	46.4	87.9	64.7	106	83.0		63.6	40.4
12														56.8	31.5	65.9	40.6	84.2	58.9	102	77.2		69.4	44.1
HP-100S  (0.936)		5	41.2	27.2	54.5	40.5	67.8	53.8	81.1	67.1	94.4	80.4	108	93.7									39.5	25.4
		6	36.2	19.3	49.5	32.6	62.8	45.9	76.1	59.2	89.4	72.5	103	85.8	116	99.1							47.4	30.5
		7			44.4	24.7	57.7	38.0	71.0	51.3	84.3	64.6	97.6	77.9	111	91.2	124	104					55.2	35.6
		8					52.6	30.1	65.9	43.4	79.2	56.7	92.5	70.0	106	83.3	119	96.6	146	123				63.1
	9							60.9	35.6	74.1	48.9	87.4	62.2	101	75.4	114	88.7	141	115	167	142		71	45.7
	10									69.1	41.0	82.4	54.3	95.7	67.6	109	80.9	135	107	162	134		78.9	50.8
	11											77.3	46.4	90.6	59.7	104	73.0	130	99.1	157	126		86.8	55.8
	12													85.5	51.8	98.8	65.1	125	92.1	152	118		94.6	60.9
	HP-125S  (1.980)	5	86.1	56.2	113.7	84.0	141	111	169	139	197	167	224	195									82.1	52.6
		6	75.6	39.7	103.2	67.4	131	95.1	159	123	186	150	214	178	242	206							99.1	63.1
		7			92.8	50.9	120.5	78.6	148	106	176	134	203	162	231	189	259	217					115	73.6
		8					110	62.1	137.6	89.8	165	117	193	145	221	173	248	201	304	256				132
9								127	73.4	155	101	182	129	210	156	238	184	293	239	349	295		148	94.6
10										144	84.6	172	112	200	140	227	168	283	223	338	278		165	105
11												161	95.8	189	123	217	151	272	206	328	262		181	116
12														179	107	206	135	262	109	317	245		198	126
HP-160S  (4.308)		5	171	118	228	174	285	231	342	288	398	344	455	401									166	112
		6	149	84.4	206	141	262	198	319	255	376	311	433	368	489	425							199	135
		7			183	108	240	165	297	221	353	278	410	335	467	391	524	448					233	157
		8					218	131	274	188	331	245	388	302	444	358	501	415	615	528				266
	9							252	155	309	212	365	268	422	325	479	382	592	495	706	609		299	202
	10																							

# DIMENSIONAL DRAWING

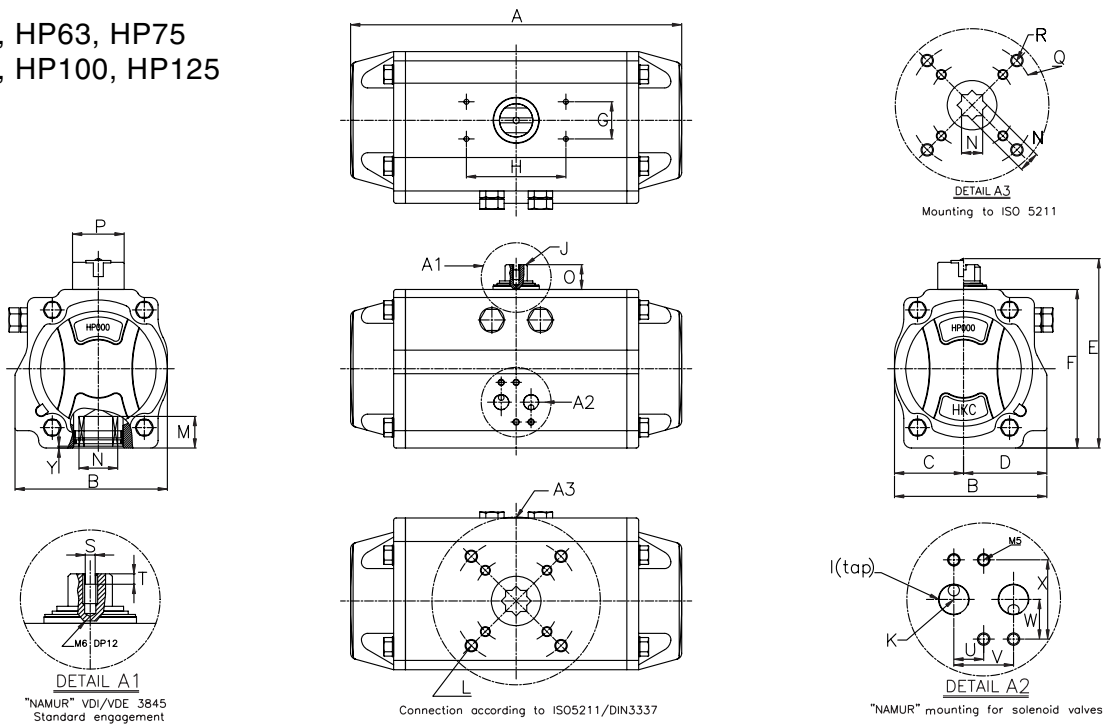
HP35



HP160, HP200



HP50, HP63, HP75  
HP88, HP100, HP125



## DIMENSION

unit(mm)

Model	FLANGE L (ISO 5211)		A	B	C	D	E	F	G	H	I	J	K	O	P	S	T	U	V	W	X	Weight (kg)
	Q	R M/N(min)																				
HP35	F03/F05	M5/M6	125	54	24	30	76	48	25	50	PF	M6	1/8"	20	41.5	4	4	12	24	16	32	0.52
	ø36/ø50	10/9																				
HP50	F03/F05	M5/M6	142	72	30	42	100	72	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32	1.16
	ø36/ø50	12/11																				
HP63	F05/F07	M6/M8	162	84	37	47	113	85	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32	1.68
	ø50/ø70	16/14																				
HP75	F05/F07	M6/M8	208	96	42.5	53.5	131	103	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32	2.96
	ø50/ø70	19/17																				
HP88	F05/F07	M6/M8	246	108	49.5	58.5	144	116	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32	4.34
	ø50/ø70	19/17																				
HP100	F07/F10	M8/M10	266	123	56	67	156	128	30	80	PF	M6	1/4"	20	41.5	4	4	12	24	16	32	5.92
	ø70/ø102	22/17																				
HP125	F7/F10	M8/M10	347	151	69	82	196	159	30	80	PF	M6	1/4"	30	41.5	4	4	12	24	16	32	12.0
	ø70/ø102	24/22																				
HP160	F10/F12	M10/M12	475	202	101	101	233	197	30	80	PF	M6	1/4"	30	41.5	4	4	12	24	16	32	21.62
	ø102/ø125	29/27																				
HP200	F14	M16	570	232	116	116	274	246	30	130	PF	M6	1/4"	50	•	4	4	12	24	16	32	35.00
	ø140	38/36																				



## HP series Repair Kit

### O-Ring Repair Kit

PART	STEM BOTTOM O-RING	STEM TOP O-RING	PISTON O-RING	STOP BOLT O-RING	COVER O-RING	TOTAL
Q'TY	1	1	2	2	2	8

#### Part number

MODEL	HP-35	HP-50	HP-63	HP-75	HP-88	HP-100	HP-125	HP-160	HP-200
Part.No	0480	0630	0817	1147	1861	2147	2608	4070	6660

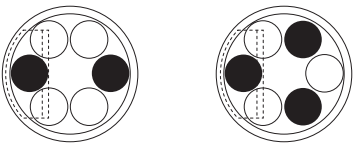
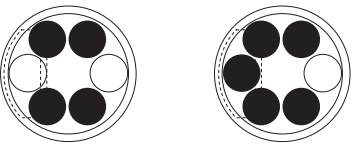
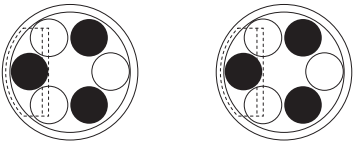
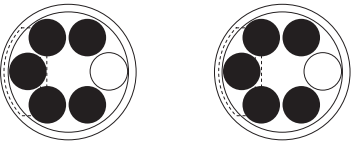
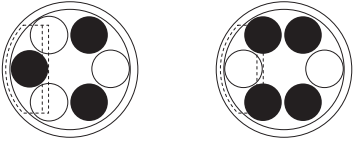
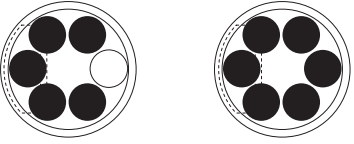
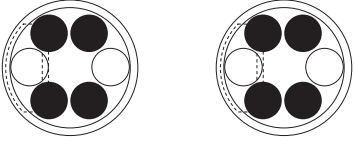
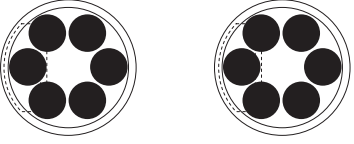
### Bearing & Guide Repair Kit

PART	POSITION BACK BEARING PP(AST)	POSITION TOP BEARING NYLON46	POSITION TOP BEARING NYLON46	POSITION THRUST BEARING PP(AST)	POSITION THRUST WASHER STS	POSITION GUIDE PP+GF15%	POSITION BACK BEARING PP(AST)	TOTAL
Q'TY	2	1	1	2	1	2	2	11

#### Part number

MODEL	HP-35	HP-50	HP-63	HP-75	HP-88	HP-100	HP-125	HP-160	HP-200
Part.No	0580	0885	0895	0915	0916	0920	0960	0990	2240

## HP series Spring Set

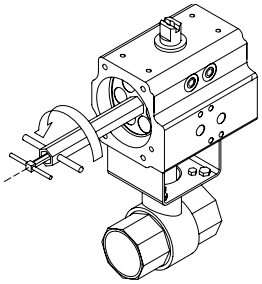
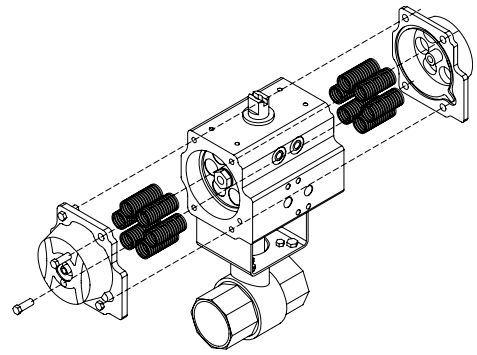
set #5		set #9	
set #6		set #10	
set #7		set #11	
set #8		set #12	

## OPEN/CLOSE Adjustment of HP 160, 200 series

### 1. Adjustment for CLOSE

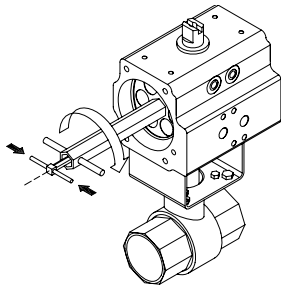
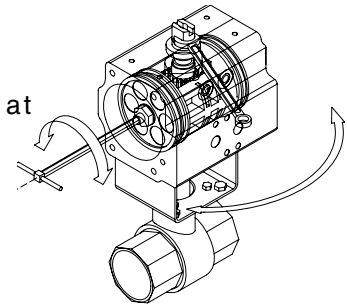
- ① After Valve and Actuator are assembled for Close condition, adjust stop bolt inside actuator for correct closed condition as shown on picture on the right-hand.

Disassemble bolts both side like shown on the picture and, take end-cap covers and springs(single acting actuator)



- ② Loosen nut for adjustment of stop bolt like shown on the picture on the right-hand.

- ③ Adjust stop bolt using hex-lench while actuator stem is fixed by spanner at closed position.  
 - Clockwise : CLOSED  
 - Counterclockwise : OPEN

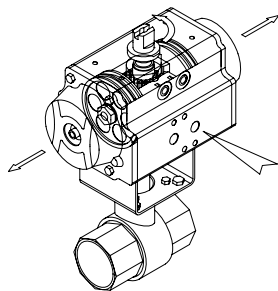
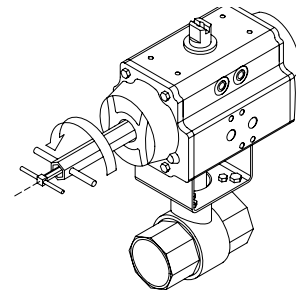


- ④ Tighten and fasten NUT while STOP BOLT is being fixed by hex-lench like picture on the right-hand.

And assemble end-cap covers and springs in reversed order of number.

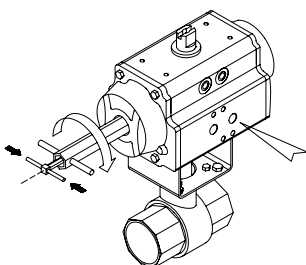
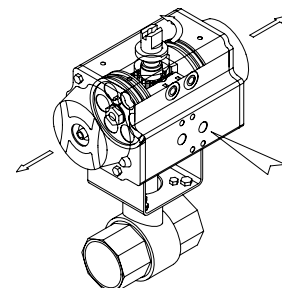
### 1. Adjustment for OPEN

- ① Loosen NUT a little to adjust OPEN STOP BOLT like picture on the right-hand.



- ② Make actuator OPEN position by air like picture on the right-hand.

- ③ Adjust fix STOP BOLT using hex-lench.  
 - Clockwise : CLOSED  
 - Counterclockwise : OPEN



- ④ Tighten and fasten NUT while STOP BOLT is being fixed by hex-lench.

## Valve Position Monitor APL-2, 3, 4, 5N Series

	<p style="text-align: center;"><b>MODEL : APL - 2N SERIES</b></p> <ul style="list-style-type: none"> <li>- Enclosure : Weatherproof IP67/NEMA4&amp;4X (Standard ) IP68(Optional)</li> <li>- Solid and compact design</li> <li>- Bolts on visual position indicator (Re-adjustment available upon required direction)</li> <li>- Dual cable entries : 2 x 1/2 NPT(Standard) M20, PG13.5, PF1/2", PT1/2".(Option)</li> <li>- Terminal Strips : 8 points(0.08-2.5mm<sup>2</sup>)</li> <li>- Captive cover bolts</li> <li>- Easy mounting bracket</li> <li>NAMUR standard stainless steel shaft and bracket.</li> </ul>
	<p style="text-align: center;"><b>MODEL : APL - 3N SERIES</b></p> <ul style="list-style-type: none"> <li>- Enclosure : Weatherproof IP67/NEMA4&amp;4X (Standard ) IP68(Optional)</li> <li>- Solid and beautiful design &amp; various options available <ul style="list-style-type: none"> <li>• 3~4 additional switches</li> <li>• 8~16 points Terminal Strips</li> </ul> </li> <li>- Bolts on visual position indicator</li> <li>- Dual cable entries : 2 x 1/2 NPT(Standard ) M20, PG13.5, PF1/2", PT1/2".(Option)</li> <li>- Terminal Strips : 8 points(0.08-2.5mm<sup>2</sup>)</li> <li>- Captive cover bolts</li> <li>- Easy mounting bracket</li> <li>NAMUR standard stainless steel shaft and stainless steel or steel bracket.</li> </ul>
	<p style="text-align: center;"><b>MODEL : APL - 4N SERIES</b></p> <ul style="list-style-type: none"> <li>- Enclosure : Weatherproof IP67/NEMA4,4X,7,9 (Standard ) IP68(Optional) Explosionproof : E EX d IIB T6</li> <li>- Solid and beautiful design &amp; various options available <ul style="list-style-type: none"> <li>• 3~4 additional switches</li> <li>• 8~20 points Terminal Strips</li> <li>• various options switches</li> </ul> </li> <li>- Bolts on visual position indicator</li> <li>- Cable entries : 2 x 3/4 NPT(Standard ) M20, M25, PF3/4", PT3/4" 4Cable entries(Optional)</li> <li>- Terminal Strips : 8 points(0.08-2.5mm<sup>2</sup>)</li> <li>- Captive cover bolts</li> <li>- Easy mounting bracket</li> <li>NAMUR standard stainless steel shaft and stainless steel or steel bracket.</li> </ul>
	<p style="text-align: center;"><b>MODEL : APL - 5N SERIES <span style="color: red;">NEW</span></b></p> <ul style="list-style-type: none"> <li>- Enclosure : Weatherproof IP67/NEMA4,4X,7,9 (Standard ) IP68(Optional) Explosionproof : E EX d IIC T6, E EX ia IIC T6, E EX d IIB T6</li> <li>- Solid and compact design</li> <li>- Shaft holder built in the cover(Dual shaft) Easy to set the visual position indicator. Unique design to put the visual indicator on the threaded joint type cover.</li> <li>- Bolts on visual position indicator</li> <li>- Dual Cable entries : 2 x 3/4 PF(Standard ) M20, M25, NPT3/4", PT3/4"(Option)</li> <li>- Terminal Strips : 8 points(0.08-2.5mm<sup>2</sup>)</li> <li>- Captive cover bolts &amp; Spring loaded cover bolts No worry to loose bolts while cover open &amp; Unique design to hold bolts inside cover</li> <li>- Easy mounting bracket</li> <li>NAMUR standard stainless steel shaft and stainless steel or steel bracket.</li> </ul>

## FEATURES

- Solid and flexible design  
Aluminium die-casting housing and powder coating.
- Bolts on visual position indicator
- Quick-set™ cam  
Spring loaded splined cam.  
No need to adjust again after initial setting.  
Easy setting without tool
- Dual cable entries
- Captive cover bolts  
No worry to loose bolts while cover open.  
Spring loaded cover bolts(APL-5N)
- Easy mounting bracket  
NAMUR standard stainless steel shaft and bracket.



## STANDARD SPECIFICATION

Specification \ Model	APL- 2N Series	APL- 3N Series	APL- 4N Series	APL- 5N Series
Enclosure	Weatherproof IP67/NEMA4&4X	Weatherproof IP67/NEMA4&4X	Weatherproof IP67/NEMA4&4X Explosionproof E EX d IIB T6	Weatherproof IP67/NEMA4&4X Explosionproof E EX d IIC T6
Cable entries	Two NPT1/2"	Two NPT1/2"	Two NPT3/4"	Two NPT3/4"
Ambient temperature	-20 °C ~ 80 °C	-20 °C ~ 80 °C	-20 °C ~ 80 °C	-20 °C ~ 80 °C
Terminal strips	8 points (0.08-2.5mm <sup>2</sup> )	8 points (0.08-2.5mm <sup>2</sup> )	8 points (0.08-2.5mm <sup>2</sup> )	8 points (0.08-2.5mm <sup>2</sup> )
Position indicator	0 ~ 90° (90° turn free join) close:red open:yellow	0 ~ 90° (90° turn free join) close:red open:yellow	0 ~ 90° (90° turn free join) close:red open:yellow	0 ~ 90° (90° turn free join) close:red open:yellow
Switches	Mechanical switch x2 proximity sensor x2	Mechanical switch x2 proximity sensor x2	Mechanical switch x2 proximity sensor x2	Mechanical switch x2 proximity sensor x2
Painting	Chromate Polyester podwer coating(black)	Chromate Polyester podwer coating(black)	Chromate Polyester podwer coating(black)	Chromate Polyester podwer coating(black)

## OPTION SPECIFICATION

Specification \ Model	APL- 2N Series	APL- 3N Series	APL- 4N Series	APL- 5N Series
Enclosure	Weatherproof IP68	Weatherproof IP68	Weatherproof IP68	Weatherproof IP68 Explosionproof E EX d IIB T6 E EX ia IIC T6
Cable entries	Two PF1/2", PT1/2" M20, PG13.5	Two PF1/2", PT1/2" M20, PG13.5	FOUR PF3/4", PT3/4" M20, M25	Two NPT3/4" PT3/4"
Option temperature	-	-40 °C ~ 80 °C -20 °C ~ 150 °C	-	-
Terminal strips	-	16 points (0.08-2.5mm <sup>2</sup> )	20 points (0.08-2.5mm)	-
Position indicator	three position close:red open:Green	three position close:red open:Green	three position close:red open:Green	three position close:red open:Green
Switches	-	Mechanical switch x4 proximity sensor x4	Mechanical switch x4 proximity sensor x4	Mechanical switch x4 proximity sensor x4
Potentiometer	-	1k ohm standard. 5k ohm. 0-10k ohm	1k ohm standard. 5k ohm. 0-10k ohm	1k ohm standard. 5k ohm. 0-10k ohm
Current output signal unit	-	4~20mA DC 12.5 to 37VDC (24V typical)	4~20mA DC 12.5 to 37VDC (24V typical)	4~20mA DC 12.5 to 37VDC (24V typical)
Painting	Nylon others on request red, green, blue, yellow, silver	Nylon others on request red, green, blue, yellow, silver	Nylon others on request red, green, blue, yellow, silver	Nylon others on request red, green, blue, yellow, silver



## STRUCTURE



### APL-310N

- Enclosure  
Solid and beautiful design  
aluminium die-casting  
IP67
- Painting  
Powder coating
- Housing Body  
Aluminium die-casting
- Quick-Set Cam  
Easy to set, Splined cam  
Open-Yellow, Close-Red
- Various Switches  
Mechanical  
Proximity(P & F)  
Reed & Pneumatic
- Mounting Bracket



- O-rings
- Shaft  
Stainless steel  
NAMUR



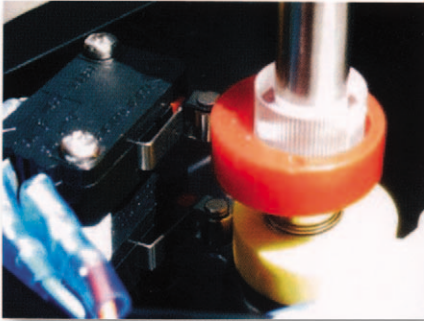
- Visual Position Indicator  
Poly-carbonated  
Open-Yellow, Close-Red
- Name Plate
- Housing Cover  
Aluminium die-casting
- Captive Bolts  
Stainless steel
- Terminal Strip  
Standard 8 points
- Earth lug
- Multi-Ports  
Main.2, Max.4Ports

## Material

Housing cover&body	Aluminium die casting	O -ring	NBR
Shaft	Stainless steel	Bushing	Bronze
Indicator cover	Polycarbonate	E-ring(shaft)	Stainless steel
Cam	Polycarbonate	Earth lug	Stainless steel
Spring	Stainless steel	Indicator	ABS/Polycarbonate
Housing cover bolt	Stainless steel	Bracket	Stainless steel

## SWITCH SPECIFICATION

### - Mechanical switch -



#### Standard switches

2SPDT switches

Contact arrangement:

250VAC/16A, 250VDC/0.3A

125VDC/0.6A, 30VDC/10A,

- Operating frequency

600 operating per minute max (mechanical)

60 operating per minute max (electrical)

#### Option switches

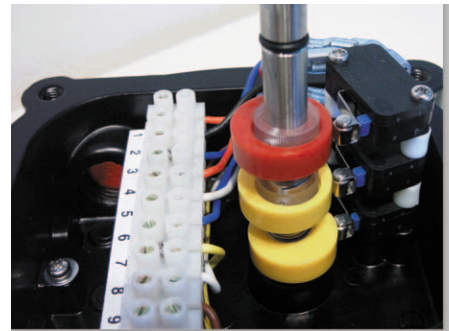
3SPDT switches

Contact arrangement:

250VAC/16A, 250VDC/0.3A

125VDC/0.6A, 30VDC/10A,

Except APL 2N series



#### Option switches

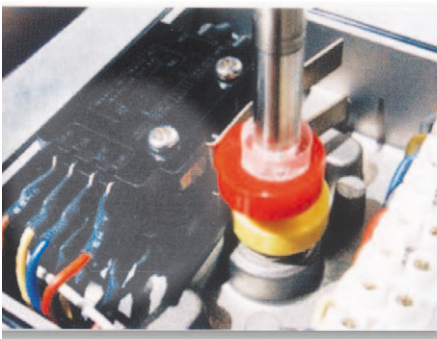
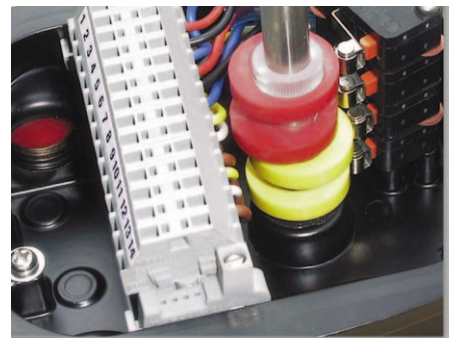
4SPDT switches

Contact arrangement:

250VAC/16A, 250VDC/0.3A

125VDC/0.6A, 30VDC/10A,

Except APL 2N series



#### DPDT switches

Contact arrangement:

20amp 125/250VAC

1HP 125 VAC

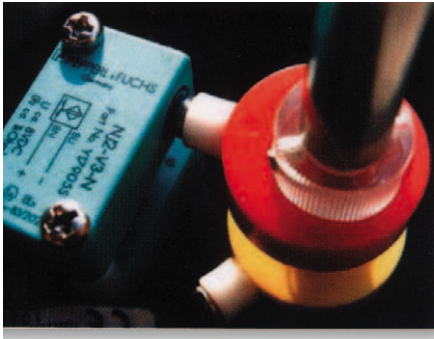
2HP 250VAC

0.5amp 250VDC

Except APL 2N, 3N, 5N series

## SWITCH SPECIFICATION

### - Proximity sensor -

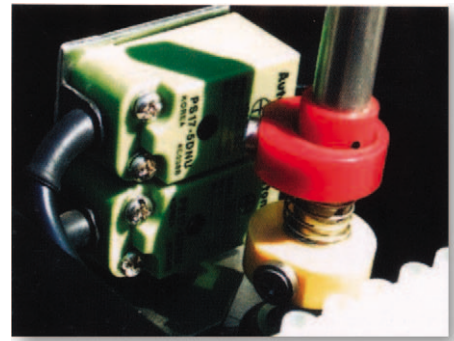


#### **NJ2-V3-N P&F**

(intrinsically safe)  
Inductive proximity sensor  
Voltage range : 8V DC  
Operating distance : 2mm

#### **NPS17-5DN**

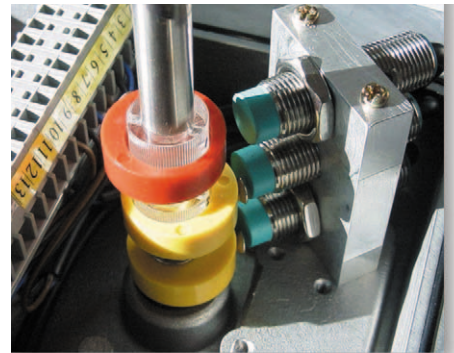
Inductive proximity sensor  
Voltage range : 10~30V DC  
AC110V or 220V  
Operating distance : 5mm  
Except APL 2N series



#### **Optional sensor**

NBB2-V3-E2/E3(PNP) : 10-30V DC  
NBB2-V3-E0(NPN) : 10-30V DC  
NBB2-V3-Z4/Z5 : 5-60V DC

APL 4N Proximity sensor  
NJ2-12GM-40-E2 : 10-60V DC  
NJ4-12GM-40-E2 : 10-60V DC  
NBB2-12GM-40 : 6-60V DC  
Except APL2, 3, 5N series



### - Reed proximity sensor -



#### **2SPST switches**

Contact Form : NO. NC  
Contact Rating : 10W max  
Switching Voltage : 200VDC max  
Switching Current : 1A max  
Breakdown Voltage : 250VDC min  
Contact Resistance(initial) : 0.3 Ohm max  
Electrical Life :  $10^7$ (6VDC, 10mA)

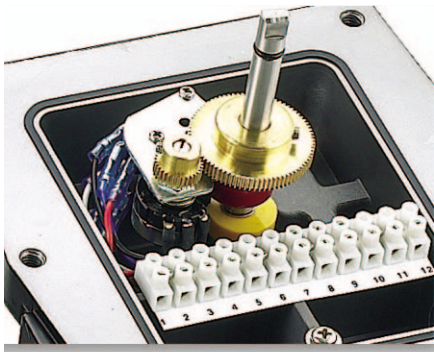
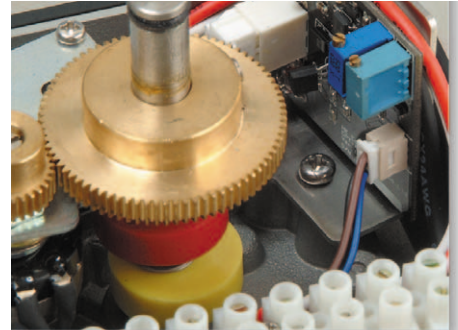


## ELECTRICAL CONNECTION

### - Position transmitter & potentiometer -

#### Position Transmitter

Power Supply Range  
: 12.5 to 37VDC (24V typical)  
Output signal range : 4~20mA  
Potentiometer : 0~1K Ohm  
Operating Temperature : -20℃ to 80℃  
[Except APL 2N series](#)



#### Potentiometer

Potentiometer : 500~10K Ohm  
Operating Temperature : -20℃ to 80℃  
[Except APL 2N series](#)



#### Position monitor

Continuous visual position indicator  
Made of high impact, heat, chemical resistance  
and transparent carbonate  
Excellent corrosion protection  
High visibility and reliability

#### Flow port Monitor

L port, T port  
3-way valve

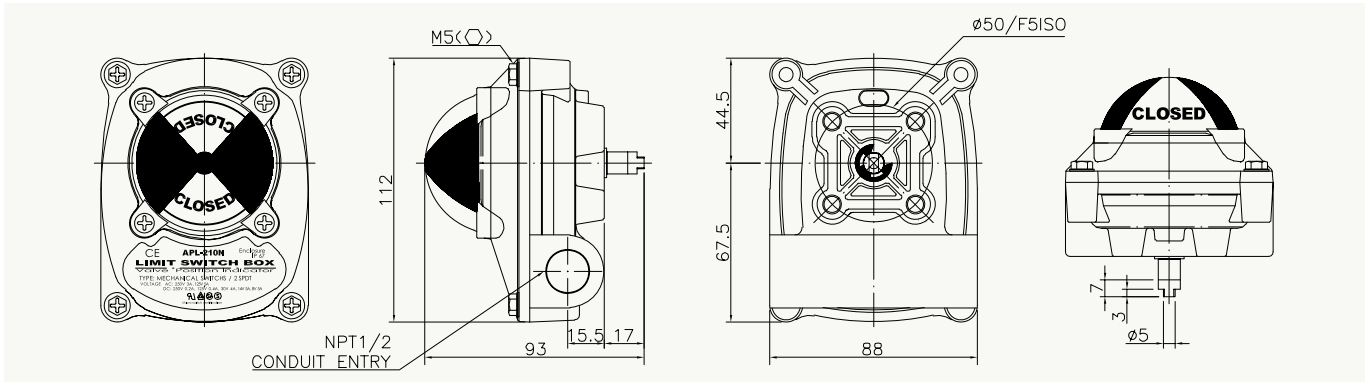




## DIMENSION

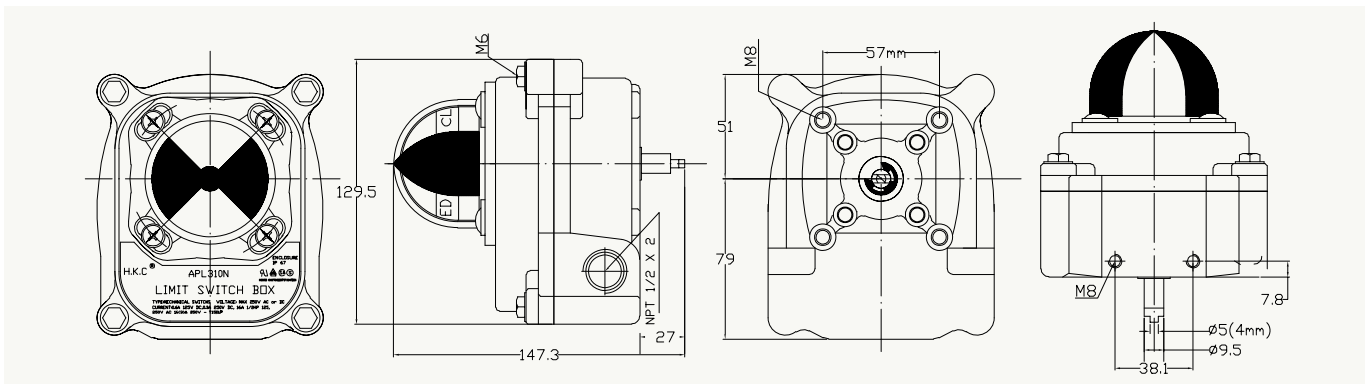
UNIT : mm

### APL 2N SERIES



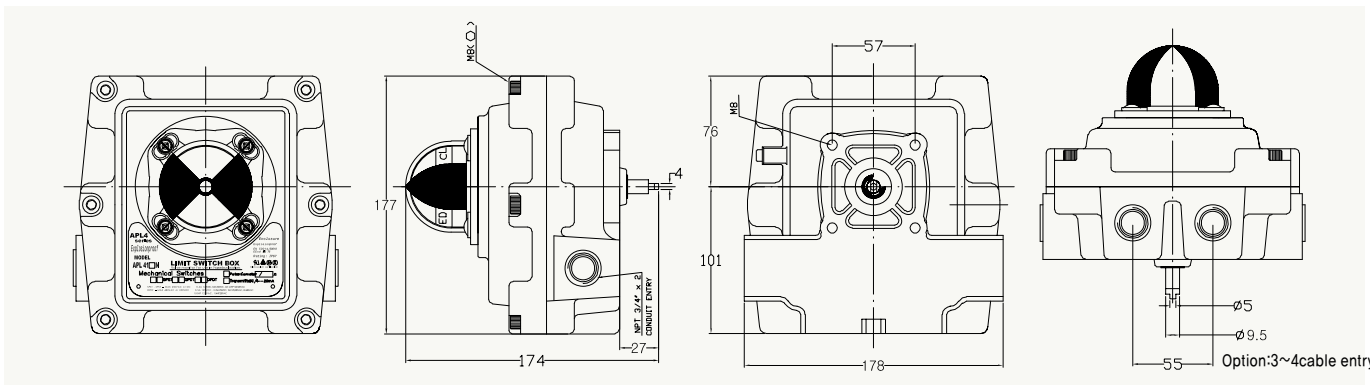
STANDARD NAMUR SHAFT

### APL 3N SERIES



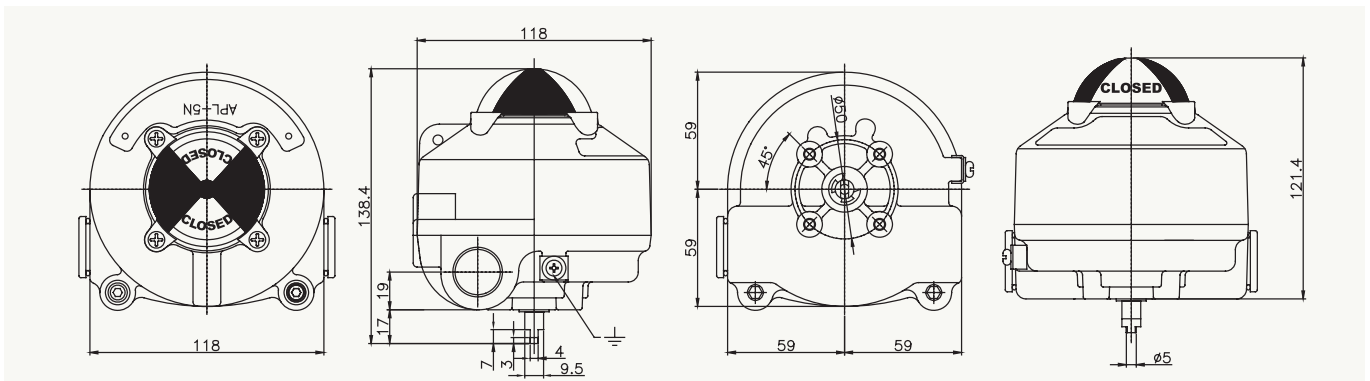
STANDARD NAMUR SHAFT

### APL 4N SERIES






STANDARD NAMUR SHAFT

### APL 5N SERIES



STANDARD NAMUR SHAFT

## BRACKET NAMUR STANDARD

<b>Shape</b>			
<b>Size</b>	25 × 50 H:20 30 × 80 H:20 30 × 80(130) H:30(50)	30 × 80 H:20 30 × 80 H:30	30 × 130 H:30 30 × 130 H:50
<b>Model</b>	MBP-50 MBP-100 MBP-200 MBP-300 MBP-400	MB-P-O-1C MB-P-O-1S MB-P-O-2C MB-P-O-2S	MB-P-O-3C MB-P-O-3S MB-P-O-4C MB-P-O-4S

● Last alphabet in model, C means plate steel, S means stainless steel

## ORDERING INFORMATION

APL - 3 10 N

Enclosure

- 2. Enclosure
- 3. Weather proof
- 4. Explosion proof(E Exd IIB T6)
- 5. Explosion proof(E Exd IIC T6)

Switch type

Bolt on  
Position Indicator

Mechanical switch	Proximity sensor	Reed type proximity sensor
10 2-SPDT	20 P & F NJ2-V3-N	30 General type
11 3-SPDT	21 Autonics. PS17-5DNU	
12 4-SPDT	22 P & F NJ4-12GM-N	
13 2-SPST	23 NBB2- V3	
14 2-DPDT		
15 2-SPDT + Potentiometer		
16 2-SPDT + Signal unit (4-20mA)		