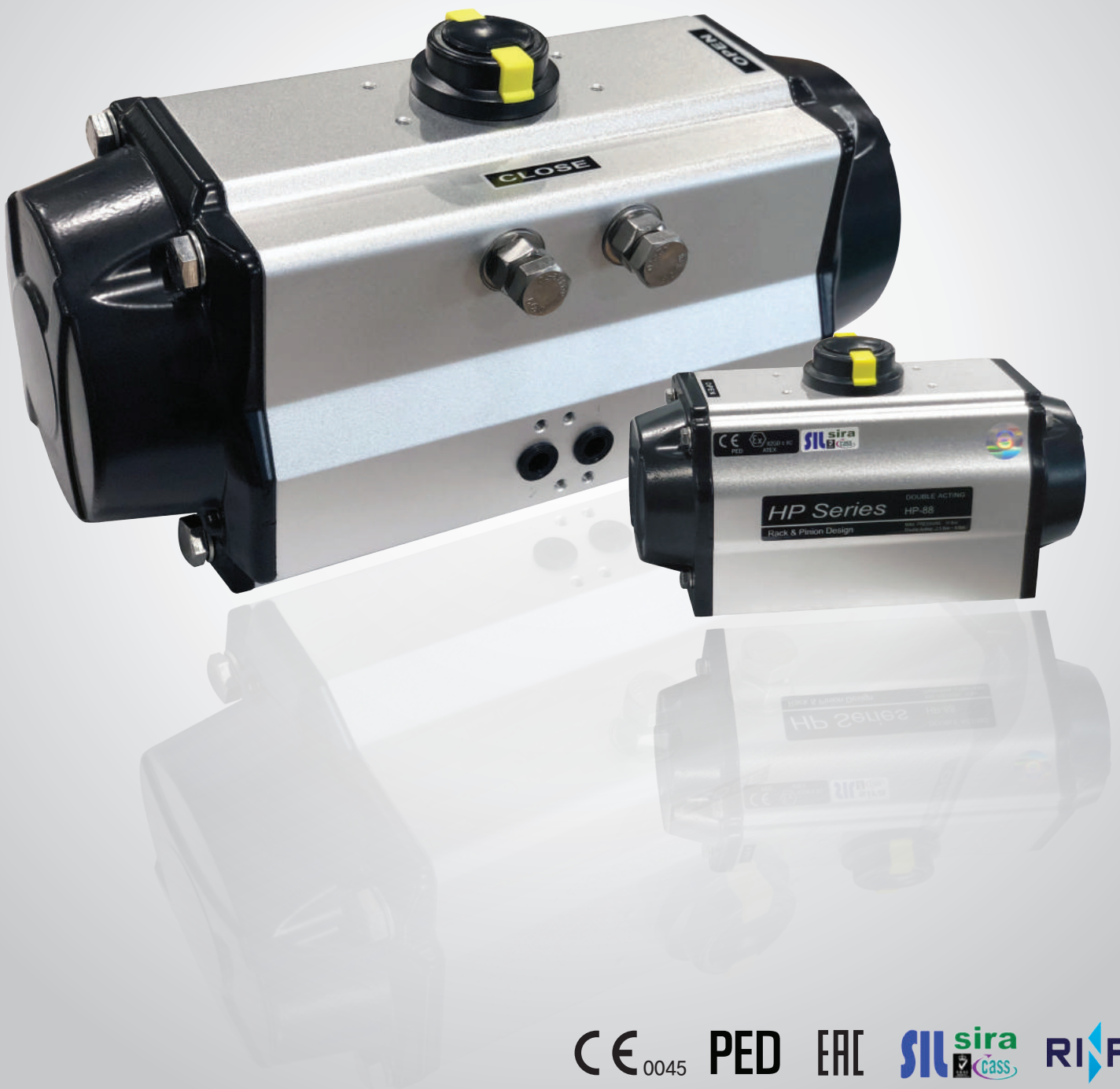




# PNEUMATIC ACTUATOR HP-SERIES



CE 0045 PED EAC   

Valve automation leader **HKC**

HCAG-HP-18 Rev.0



## Introduction

HP-series pneumatic actuators are specifically designed to respond to customers' needs on the valve automation market. It provides a wide range of torque outputs to suit quarter turn ball, butterfly, plug valves and dampers for complete valve automation solutions. The latest manufacturing technologies have been used to ensure high quality and long life-cycle of the HP-series. Moreover, our extensive inventory & engineering capabilities allow us to provide reliable and safe product to our customer with satisfaction.



## Specification

- Rack & pinion design: HP-035 to HP-210  
Scotch yoke design: HP-211, 212
- Single acting or double acting
- Wide range of torque outputs
- Pressure range
  - Max. operating pressure: 8 bar
- Temperature range
  - Standard: -20 to +80 °C
  - Option: -35 to +80 °C (low temp.)  
-20 to +150 °C (high temp.)
- Travel angle
  - Standard: 90 ±5°
  - Option: 135°
  - Other travel angles (60°, etc.) with travel adjustment
- Lubrication: All moving parts are lubricated at the factory for long-life cycle of the actuator
- Mounting standard
  - Top/side: VDI/VDE 3845 NAMUR standard
  - Bottom: ISO 5211 standard



# Features

## ■ Body

Extruded aluminum alloy body is anodized inside/outside for corrosion resistance and to reduce friction with the pistons for a long life cycle.

## ■ Indicator

A disc open / close indicator is standard on all models.

## ■ Travel Stoppers

External  $\pm 5^\circ$  adjustable travel stops in both open and close positions.

## ■ End Caps

Aluminum die-casting end caps are chromate coated and then polyester powder coated to maximize resistance against potentially corrosive elements.

## ■ Spring

High tensile spring sets are consisted of high strength alloy steel to provide high performance in fail safe and emergency shut down operations.

## ■ Pinion Shaft

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

## ■ Piston Guides

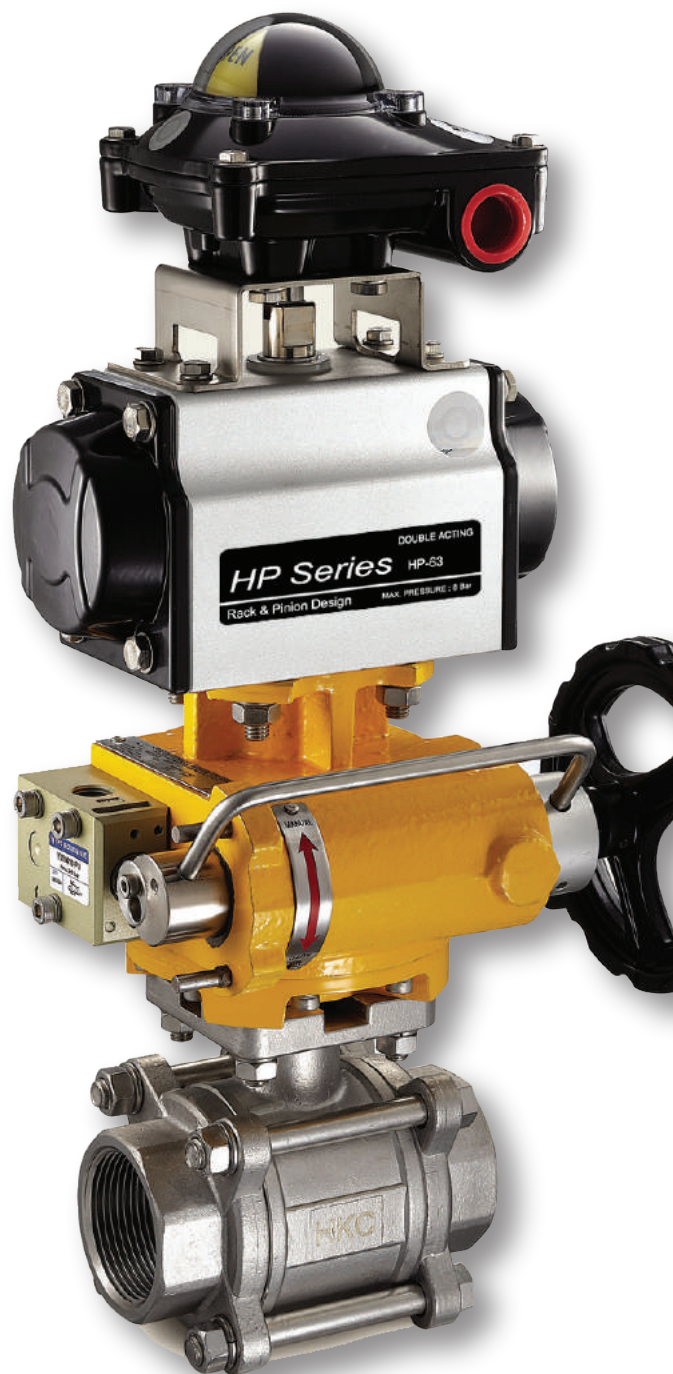
Self-lubricating (polypropylene + GF) piston guides provide high reliability and stability.

## ■ Piston Seals

NBR rubber pinion seals provide trouble free operation at standard temperature ranges. Optional viton seals are available for higher temperature range and silicon seals are available for lower temperature range.

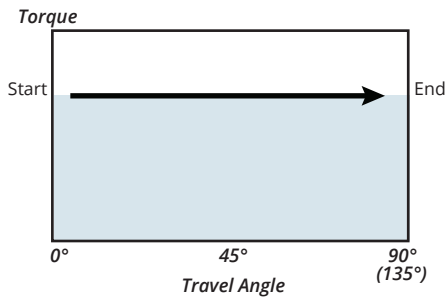
## ■ Piston

Die-casted aluminum dual pistons are fitted with high quality piston seals and guides, providing high ratio of output torque to input air pressure. All HP-series actuators are designed to provide constant output torque

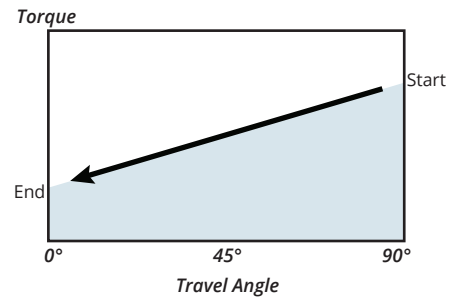
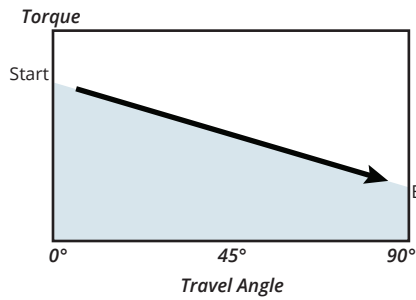


# Rack & Pinion Design

## ■ Torque diagram

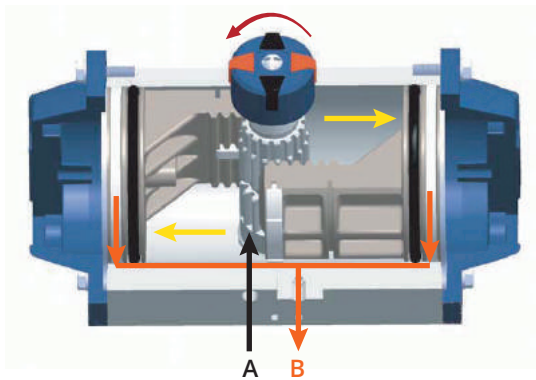


**Double acting**



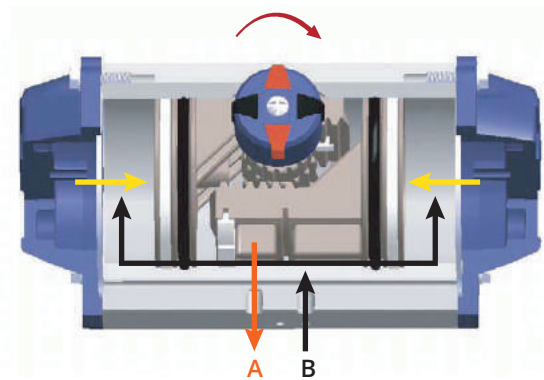
**Single acting**

## ■ Double acting operation



**Counterclockwise**

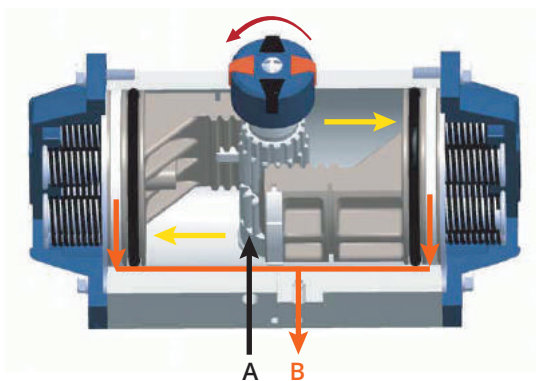
1. Apply an air pressure to port A.
2. Then as the pistons move apart, the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



**Clockwise**

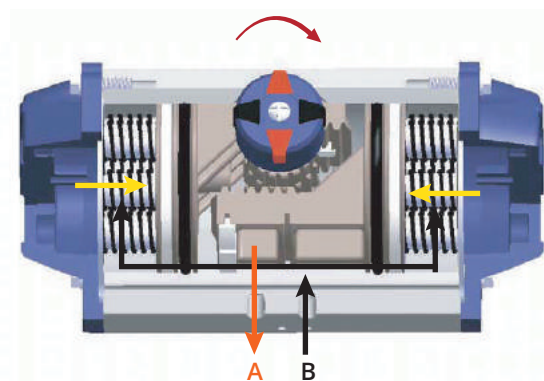
1. Apply an air pressure to port B.
2. Then as the pistons move inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A.

## ■ Single acting operation



**Counterclockwise**

1. Apply an air pressure to port A.
2. Then as the pistons move apart, the springs are compressed and the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



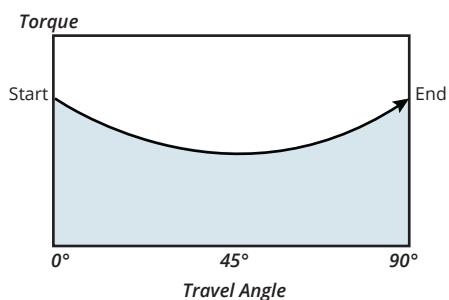
**Clockwise (on air failure)**

1. In the event of an air failure
2. As the compressed springs push the pistons inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A and comes in through port B..

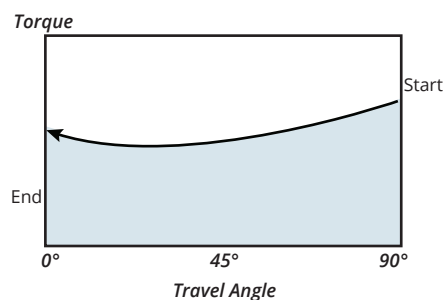
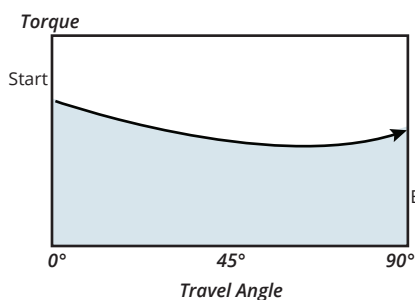
*Note: If air fail to counterclockwise is required, the pistons must be inverted.*

# Scotch yoke design

## ■ Torque diagram

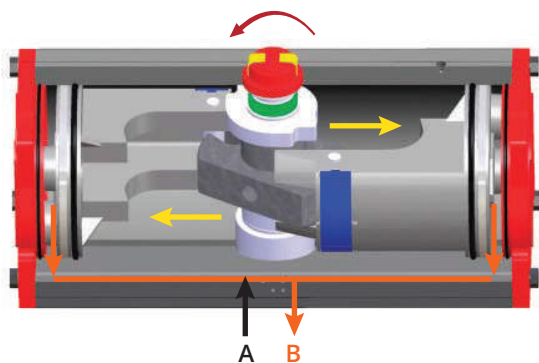


**Double acting**



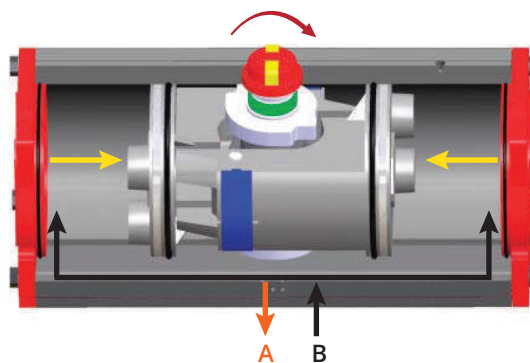
**Single acting**

## ■ Double acting operation



**Counterclockwise**

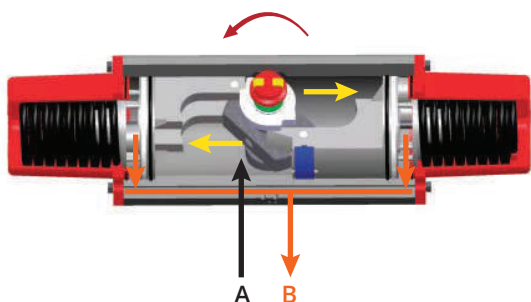
1. Apply an air pressure to port A.
2. Then as the pistons move apart, the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



**Clockwise**

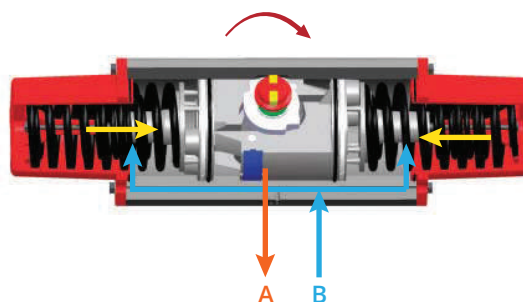
1. Apply an air pressure to port B.
2. Then as the pistons move inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A.

## ■ Single acting operation



**Counterclockwise**

1. Apply an air pressure to port A.
2. Then as the pistons move apart, the springs are compressed and the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



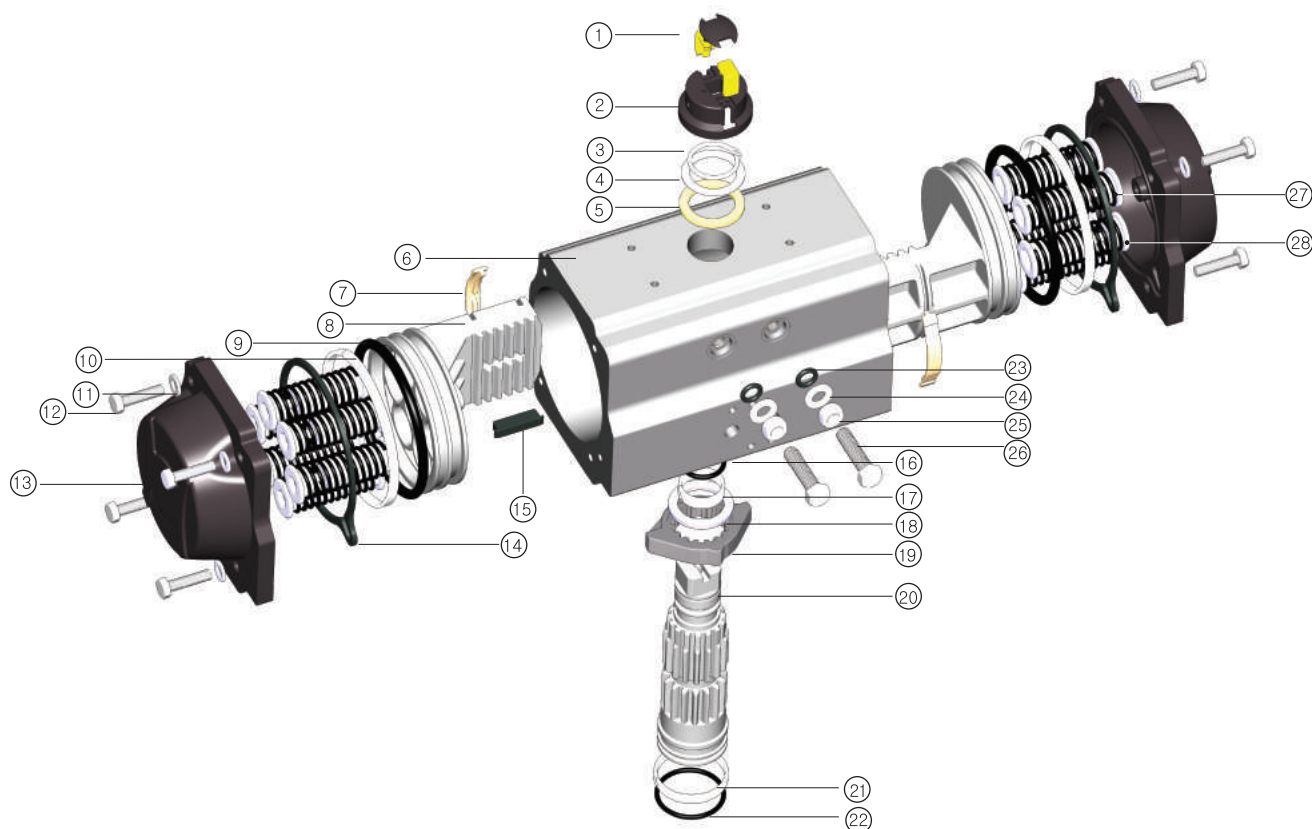
**Clockwise (on air failure)**

1. In the event of an air failure
2. As the compressed springs push the pistons inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A and comes in through port B.

*Note: If air fail to counterclockwise is required, the pistons must be inverted.*

# Parts and Materials

## ■ Rack & Pinion Design

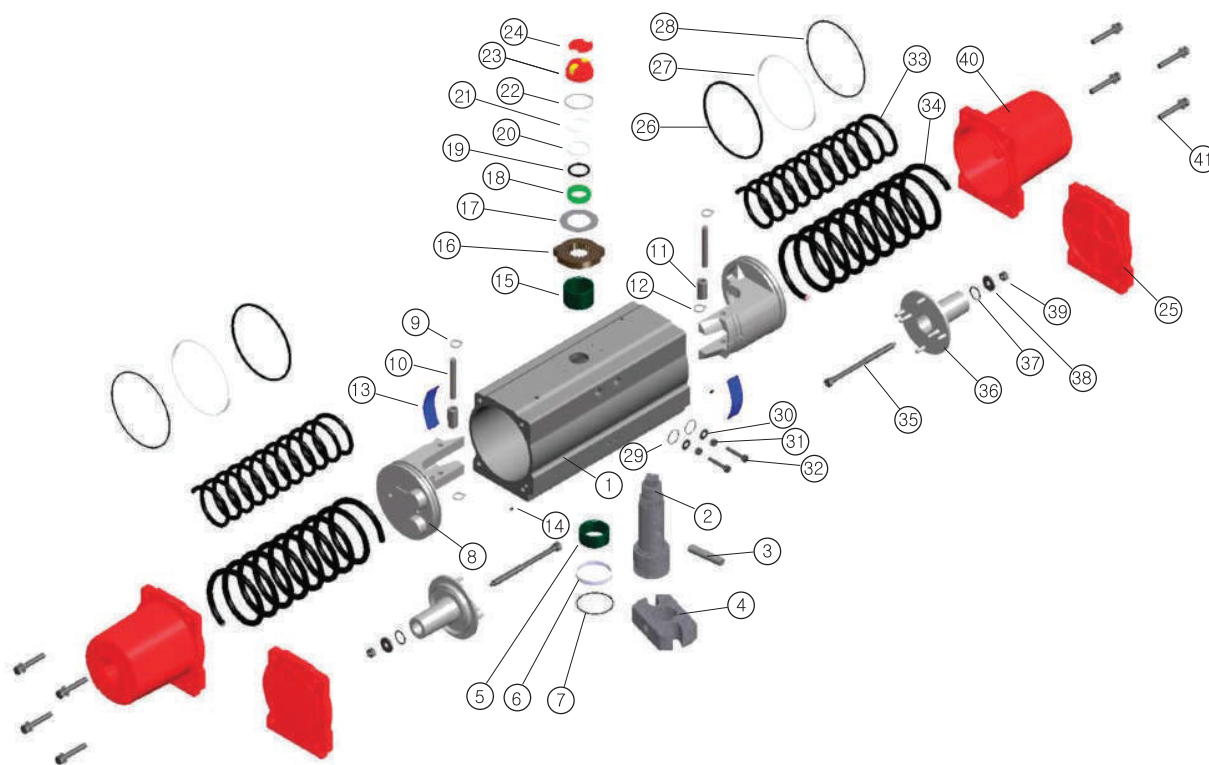


Part No.	Unit Q'ty	Part Description	Material	Corrosion Protection	Optional Material
1	2	Position indicator	Polypropylene + GF	-	-
2	1	Position indicator holder	Polypropylene + GF	-	-
3	1	Spring clip (pinion)	Stainless steel	Nickel plated (HP-160, HP-200)	-
4	1	Thrust washer (pinion)	Stainless steel	-	-
5	1	Thrust bearing (pinion)	Polyphthalamide	-	-
6	1	Body	Extruded aluminium alloy	Anodized / hard-anodized	-
7	2	Bearing (piston back)	Polyphthalamide	-	-
8	2	Piston	Die cast aluminium	Anodized / hard-anodized	-
* 9	2	O-ring (piston)	Nitrile (NBR70)	-	FKM, VMQ
* 10	2	Bearing (piston head)	Polyphthalamide	-	-
11	8	Cover bolt washer	Stainless steel	-	-
12	2	Cover bolt (end cover)	Stainless steel	-	-
13	2	Right and left end cover	Die cast aluminium	Chromate + polyester coated	-
* 14	2	O-ring (end cover)	Nitrile (NBR70)	-	FKM, VMQ
* 15	2	Piston guide	Polyphthalamide	-	-
* 16	1	O-ring (pinion top)	Nitrile (NBR70)	-	FKM, VMQ
* 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)	-	FKM, VMQ
* 23	1	O-ring (stop screw)	Nitrile (NBR70)	-	FKM, VMQ
24	2	Stop bolt washer	Stainless steel	-	-
25	2	Stop nut	Stainless steel	-	-
26	2	Stop bolt	Stainless steel	-	-
27	5 - 12	Spring	High alloy spring steel	Epoxy coated	-
28	1	Spring holder	Polypropylene + GF	-	-

\* Recommended spare parts



## ■ Scotch Yoke Design



Part No.	Unit Q'ty	Part Description	Material
1	1	Cylinder body	Aluminum alloy
2	1	Drive shaft	Steel alloy
3	1	Yoke pin	Steel
4	1	Yoke	Steel
5	1	Bottom spacer	Nylon
* 6	1	Stem bottom bearing	Stainless steel
* 7	1	Stem bottom O-ring	NBR
8	2	Piston	Aluminum
9	2	Snap ring	Stainless steel
10	1	Roller pin	Steel
11	1	Shaft	Steel
12	2	Snap ring	Stainless steel
13	3	Piston back bearing	PTFE
14	2	Hole sealant	NBR
15	1	Top spacer	Nylon
16	1	OCT cam	Steel
* 17	1	Stem thrust bearing	Stainless steel
* 18	1	Stem top bearing	Stainless steel
* 19	1	Stem top O-ring	NBR
* 20	1	Teflon washer	PTFE
* 21	1	Stem thrust washer	Stainless steel

Part No.	Unit Q'ty	Part Description	Material
22	5	Snap ring	Stainless Steel
23	1	Indicator	ABS
24	1	Indicator holder cover	ABS
25	2	Double acting cover	Aluminum
* 26	2	Piston O-ring	NBR
* 27	3	Piston head bearing	PTFE
* 28	2	Cover O-ring	NBR
* 29	2	Stop bolt O-ring	NBR
30	2	Stop bolt washer	Stainless steel
31	2	Stop bolt nut	Stainless steel
32	2	Stop bolt	Stainless steel
33	1 - 2	Inner spring	Spring steel
34	1 - 2	Outer spring	Spring steel
35	1 - 2	Spring bolt	Stainless steel
36	1 - 2	Spring retainer	Aluminum
37	1 - 2	Spring O-ring	NBR
38	1 - 2	Spring washer	Steel
39	1 - 2	Spring nut	Stainless steel
40	2	Spring retainer cover	Aluminum
41	8	Cover bolt	Stainless steel

\* Recommended spare parts

# Performance Data (Rack & Pinion)

## ■ Double Acting (Torque: Nm)

Model	135° turn	AIR SUPPLY									
		2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.6 bar	6 bar	7 bar	8 bar
HP-035D		3.8	4.5	5.3	6.0	6.8	7.5	8.3	9.0	10.5	12.0
HP-050D		8.3	10.0	11.7	13.3	15.0	16.6	18.3	20.0	23.3	26.6
HP-063D		15.0	17.9	20.9	23.9	26.9	29.9	32.9	35.9	41.9	47.0
HP-066D		20.9	25.1	29.3	33.5	37.7	41.9	46.1	50.3	58.6	67.0
HP-075D	O	28.7	34.5	40.2	45.9	51.7	57.4	63.2	68.9	80.4	92.0
HP-088D		46.1	55.3	64.5	73.7	83.0	92.2	101.4	110.6	129.0	147.0
HP-100D	O	68.2	81.9	95.5	109.2	122.8	136.5	150.1	163.8	191.1	214.0
HP-115D		107.5	129.0	150.5	172.0	193.5	215.0	236.5	258.0	301.0	344.0
HP-125D	O	138.5	166.2	194.0	221.7	249.4	277.1	304.8	332.5	387.9	443.3
HP-145D	O	217.5	261.0	304.5	348.0	391.5	435.0	478.5	522.0	609.0	696.0
HP-160D		283.7	340.5	397.2	454.0	510.7	567.4	624.2	680.9	794.4	908.0
HP-180D	O	382.8	459.4	536.0	612.5	689.1	765.7	842.2	918.8	1071.9	1225.0
HP-200D	O	531.7	638.0	744.4	850.7	957.1	1063.4	1169.8	1276.1	1488.8	1701.5
HP-210D		586.9	704.3	821.6	939.0	1056.4	1173.8	1291.2	1408.5	1643.3	1878.1

## ■ Single Acting (Torque: Nm)

AIR SUPPLY		2.5 bar		3 bar		3.5 bar		4 bar		4.5 bar		5 bar		5.6 bar		6 bar		7 bar		8 bar		Spring	
Model	Set	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
HP 050S	S 05	4.9	3.4	6.6	5.1	8.3	6.8	9.9	8.4	11.6	10.1	13.2	11.7	14.9	13.4							4.9	3.4
	S 06	4.3	2.5	6	4.2	7.7	5.9	9.3	7.5	11	9.2	12.6	10.8	14.3	12.5	16	14.2					5.8	4
	S 07	3.6	1.5	5.3	3.2	7	4.9	8.6	6.5	10.3	8.2	11.9	9.8	13.6	11.5	15.3	13.2	18.6	16.5			6.8	4.7
	S 08			4.6	2.2	6.3	3.9	7.9	5.5	9.6	7.2	11.2	8.8	12.9	10.5	14.6	12.2	17.9	15.5			7.8	5.4
	S 09					5.6	2.9	7.2	4.5	8.9	6.2	10.5	7.8	12.2	9.5	13.9	11.2	17.2	14.5	20.5	17.8	8.8	6.1
	S 10							6.6	3.6	8.3	5.3	9.9	6.9	11.6	8.6	13.3	10.3	16.6	13.6	19.9	16.9	9.7	6.7
	S 11									7.6	4.3	9.2	5.9	10.9	7.6	12.6	9.3	15.9	12.6	19.2	15.9	10.7	7.4
	S 12														10.2	6.6	11.9	8.3	15.2	11.6	18.5	14.9	11.7
D.A.TORQUE		8.3		10		11.7		13.3		15		16.6		18.3		20		23.3		26.6			
HP 063S	S 05	9.5	6.6	12.4	9.5	15.4	12.5	18.4	15.5	21.4	18.5	24.4	21.5	27.4	24.5							8.4	5.5
	S 06	8.3	4.9	11.2	7.8	14.2	10.8	17.2	13.8	20.2	16.8	23.2	19.8	26.2	22.8	29.2	25.8					10.1	6.7
	S 07	7.2	3.2	10.1	6.1	13.1	9.1	16.1	12.1	19.1	15.1	22.1	18.1	25.1	21.1	28.1	24.1	34.1	30.1			11.8	7.8
	S 08			9	4.4	12	7.4	15	10.4	18	13.4	21	16.4	24	19.4	27	22.4	33	28.4			13.5	8.9
	S 09					10.9	5.7	13.9	8.7	16.9	11.7	19.9	14.7	22.9	17.7	25.9	20.7	31.9	26.7	37	31.8	15.2	10
	S 10							12.8	7	15.8	10	18.8	13	21.8	16	24.8	19	30.8	25	35.9	30.1	16.9	11.1
	S 11									14.7	8.3	17.7	11.3	20.7	14.3	23.7	17.3	29.7	23.3	34.8	28.4	18.6	12.2
	S 12														19.6	12.7	22.6	15.7	28.6	21.7	33.7	26.8	20.2
D.A.TORQUE		15		17.9		20.9		23.9		26.9		29.9		32.9		35.9		41.9		47			
HP 066S	S 05	13.3	8.9	17.5	13.1	21.7	17.3	25.9	21.5	30.1	25.7	34.3	29.9	38.5	34.1							12	7.6
	S 06	11.8	6.5	16	10.7	20.2	14.9	24.4	19.1	28.6	23.3	32.8	27.5	37	31.7	41.2	35.9					14.4	9.1
	S 07			14.5	8.3	18.7	12.5	22.9	16.7	27.1	20.9	31.3	25.1	35.5	29.3	39.7	33.5	48	41.8			16.8	10.6
	S 08			13	5.9	17.2	10.1	21.4	14.3	25.6	18.5	29.8	22.7	34	26.9	38.2	31.1	46.5	39.4			19.2	12.1
	S 09					15.6	7.7	19.8	11.9	24	16.1	38.2	20.3	32.4	24.5	36.6	28.7	44.9	37	53.3	45.4	21.6	13.7
	S 10							18.3	9.5	22.5	13.7	26.7	17.9	30.9	22.1	35.1	26.3	43.4	34.6	51.8	43	24	15.2
	S 11									21	11.3	25.2	15.5	29.4	19.7	33.6	23.9	41.9	32.2	50.3	40.6	26.4	16.7
	S 12														27.9	17.3	32.1	21.5	40.4	29.8	48.8	38.2	28.8
D.A.TORQUE		20.9		25.1		29.3		33.5		37.7		41.9		46.1		50.3		58.6		67			
HP 075S	S 05	17.6	11.4	23.4	17.2	29.1	22.9	34.8	28.6	40.6	34.4	46.3	40.1	52.1	45.9							17.3	11.1
	S 06	15.4	7.9	21.2	13.7	26.9	19.4	32.6	25.1	38.4	30.9	44.1	36.6	49.9	42.4	55.6	48.1					20.8	13.3
	S 07	13.2	4.5	19	10.3	24.7	16	30.4	21.7	36.2	27.5	41.9	33.2	47.7	39	53.4	44.7	64.9	56.2			24.2	15.5
	S 08			16.8	6.8	22.5	12.5	28.2	18.2	34	24	39.7	29.7	45.5	35.5	51.2	41.2	62.7	52.7			27.7	17.7
	S 09					20.3	9	26	14.7	31.8	20.5	37.5	26.2	43.3	32	49	37.7	60.5	49.2	72.1	60.8	31.2	19.9
	S 10							23.8	11.3	29.6	17.1	35.3	22.8	41.1	28.6	46.8	34.3	58.3	45.8	69.9	57.4	34.6	22.1
	S 11									27.4	13.6	33.1	19.3	38.9	25.1	44.6	30.8	56.1	42.3	67.7	53.9	38.1	24.3
	S 12														36.7	21.7	42.4	27.4	53.9	38.9	65.5	50.5	41.5
D.A.TORQUE		28.7		34.5		40.2		45.9		51.7		57.4		63.2		68.9		80.4		92			





# Performance Data (Scotch Yoke)

## ■ Double Acting (Torque: Nm)

HP-211D	Start	Run	End
4.2 bar	1,507	753	1,312
5.6 bar	2,009	1,005	1,750
7 bar	2,511	1,255	2,187

HP-212D	Start	Run	End
4.2 Bar	3,011	1,506	2,622
5.6 Bar	4,017	2,006	3,498
7 Bar	5,022	2,509	4,373

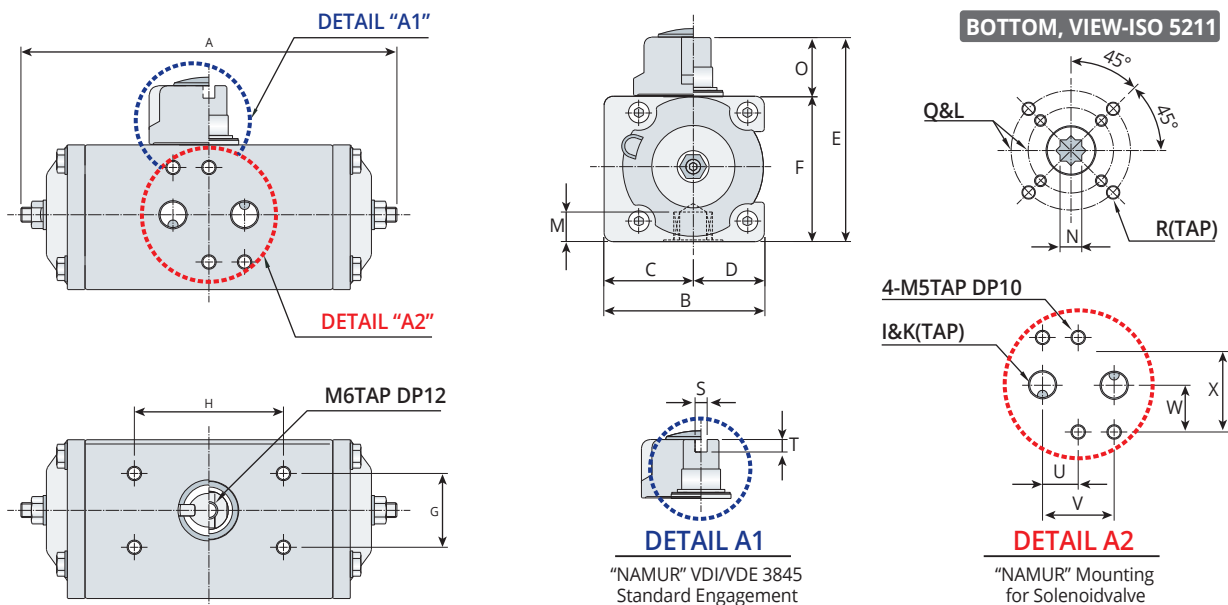
## ■ Single Acting (Torque: Nm)

HP-211S	AIR TORQUE			SPRING TORQUE		
	Start	Run	End	Start	Run	End
4.2 bar	1,114	452	634	678	283	393
5.6 bar	1,385	537	724	1,026	446	624

HP-212S	AIR TORQUE			SPRING TORQUE		
	Start	Run	End	Start	Run	End
4.2 bar	2,226	904	1,266	1,356	565	780
5.6 bar	2,769	1,074	1,446	2,045	883	1,243

# Dimensional Drawing (Rack & Pinion)

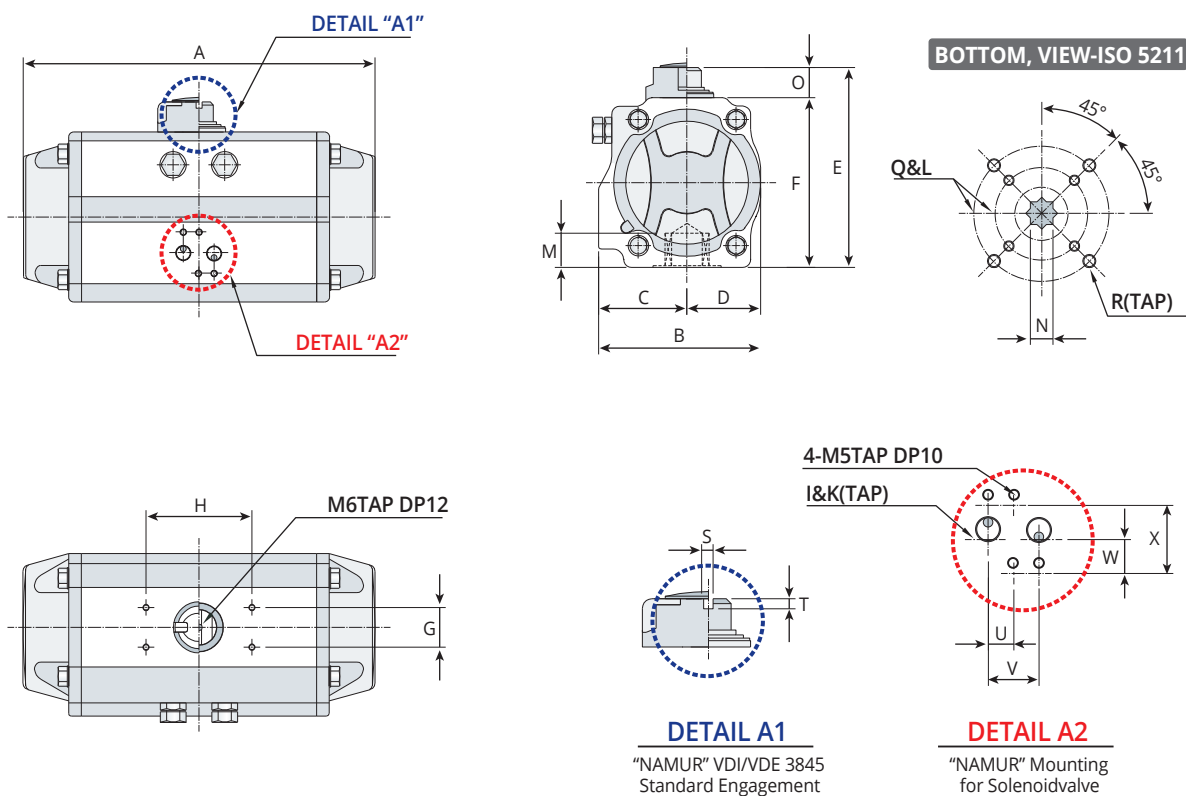
## ■ HP-035



Unit: mm

Model	Flange L (ISO 5211)		R	A	B	C	D	E	F	G	H	I	K	O	S	T	U	V	W	X
	Q	M/N(min)																		
HP-035	F03/F05	M5/M6	10/9	126	54	30	24	69	49	25	50	PF	1/8"	20	4	4	12	24	16	32
	Ø36/Ø50	10/9																		

## ■ HP-050 to HP-210



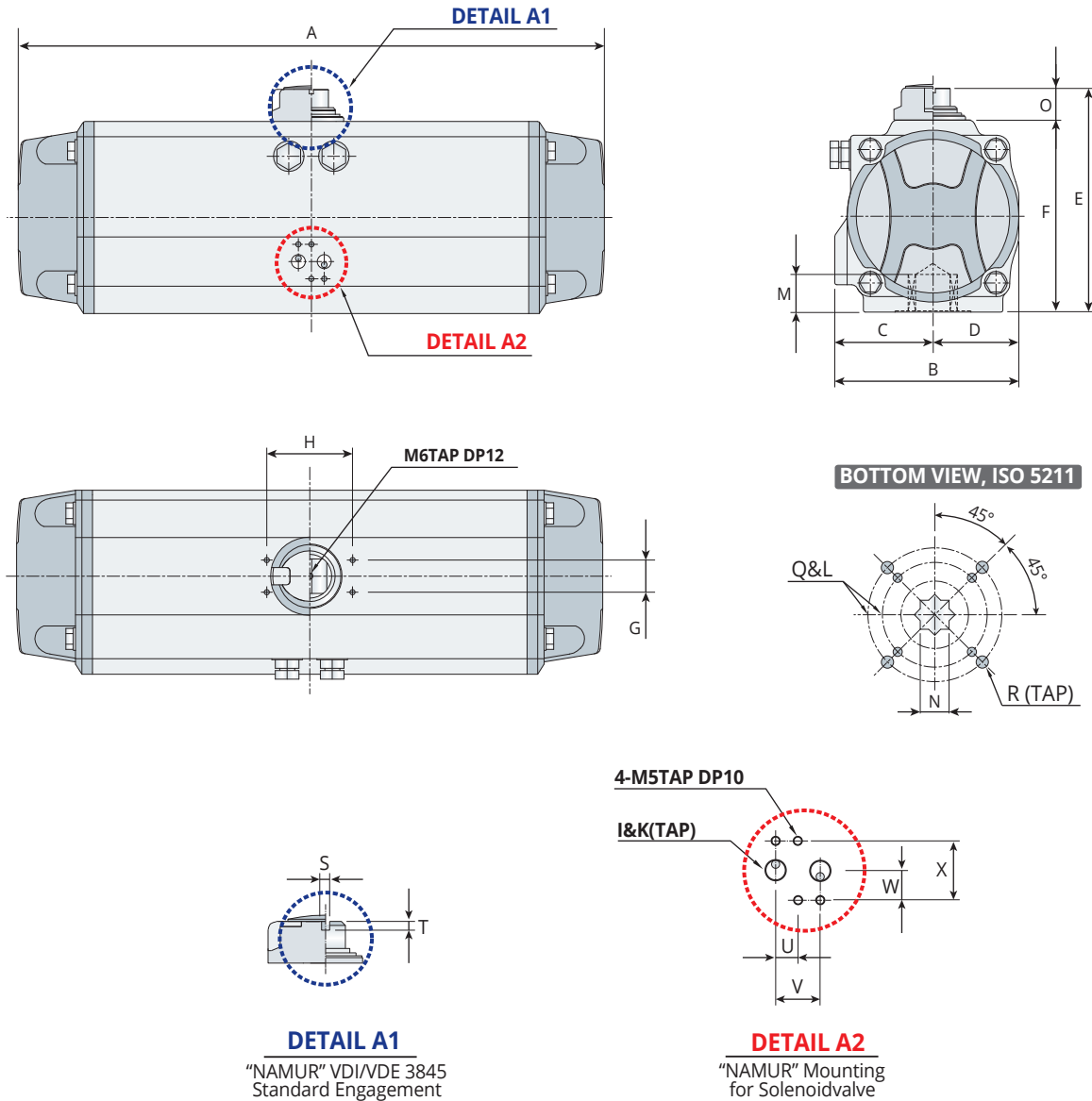
Unit: mm

Model	Flange L (ISO 5211)		R																
	Q	M/N(min)	A	B	C	D	E	F	G	H	I	K	O	S	T	U	V	W	X
HP-050	F03/F05	M5/M6	144	72	42	30	93	73	30	80	PF	1/8"	20	4	4	12	24	16	32
	Ø36/Ø50	14/11																	
HP-063	F05/F07	M6/M8	163	85	47	38	107	87	30	80	PF	1/8"	20	4	4	12	24	16	32
	Ø50/Ø70	18/14																	
HP-066	F05/F07	M6/M8	202	85	47	38	107	87	30	80	PF	1/8"	20	4	4	12	24	16	32
	Ø50/Ø70	18/14																	
HP-075	F05/F07	M6/M8	210	96	53.5	42.5	124	104	30	80	PF	1/8"	20	4	4	12	24	16	32
	Ø50/Ø70	22/17																	
HP-088	F05/F07/F10	M6/M8/M10	247	108	58.5	49.5	136	116	30	80	PF	1/8"	20	4	4	12	24	16	32
	Ø50/Ø70/Ø102	22/17																	
HP-100	F05/F07/F10	M6/M8/M10	268	123	67	56	148	128	30	80	PF	1/4"	20	4	4	12	24	16	32
	Ø50/Ø70/Ø102	22/17																	
HP-115	F07/F10	M8/M10	316	141	77	64	166	146	30	80	PF	1/4"	20	4	4	12	24	16	32
	Ø70/Ø102	32/22																	
HP-125	F07/F10/F12	M8/M10/M12	347	151	82	69	179	159	30	80	PF	1/4"	20	4	4	12	24	16	32
	Ø70/Ø102/Ø125	32/22																	
HP-145	F10/F12	M10/M12	414	172	92	80	209	179	30	130	PF	1/4"	30	4	4	12	24	16	32
	Ø102/Ø125	36/27																	
HP-160	F10/F12	M10/M12	467	190	101	89	226	196	30	130	PF	1/4"	30	4	4	12	24	16	32
	Ø102/Ø125	36/27																	
HP-180	F10/F12	M10/M12	497	206	107	99	251	221	30	130	PF	1/4"	30	4	4	12	24	16	32
	Ø102/Ø125	39/36																	
HP-200	F14	M16	555	227	116	111	277	247	30	130	PF	1/4"	30	4	4	12	24	16	32
	Ø140	39/36																	
HP-210	F14	M16	628	236	120	116	286	256	30	130	PF	1/4"	30	4	4	12	24	16	32
	Ø140	43/36																	



# Dimensional Drawing (Rack & Pinion 135° turn)

■ HP-075D, HP-100D, HP-125D, HP-145D, HP-180D, HP-200D

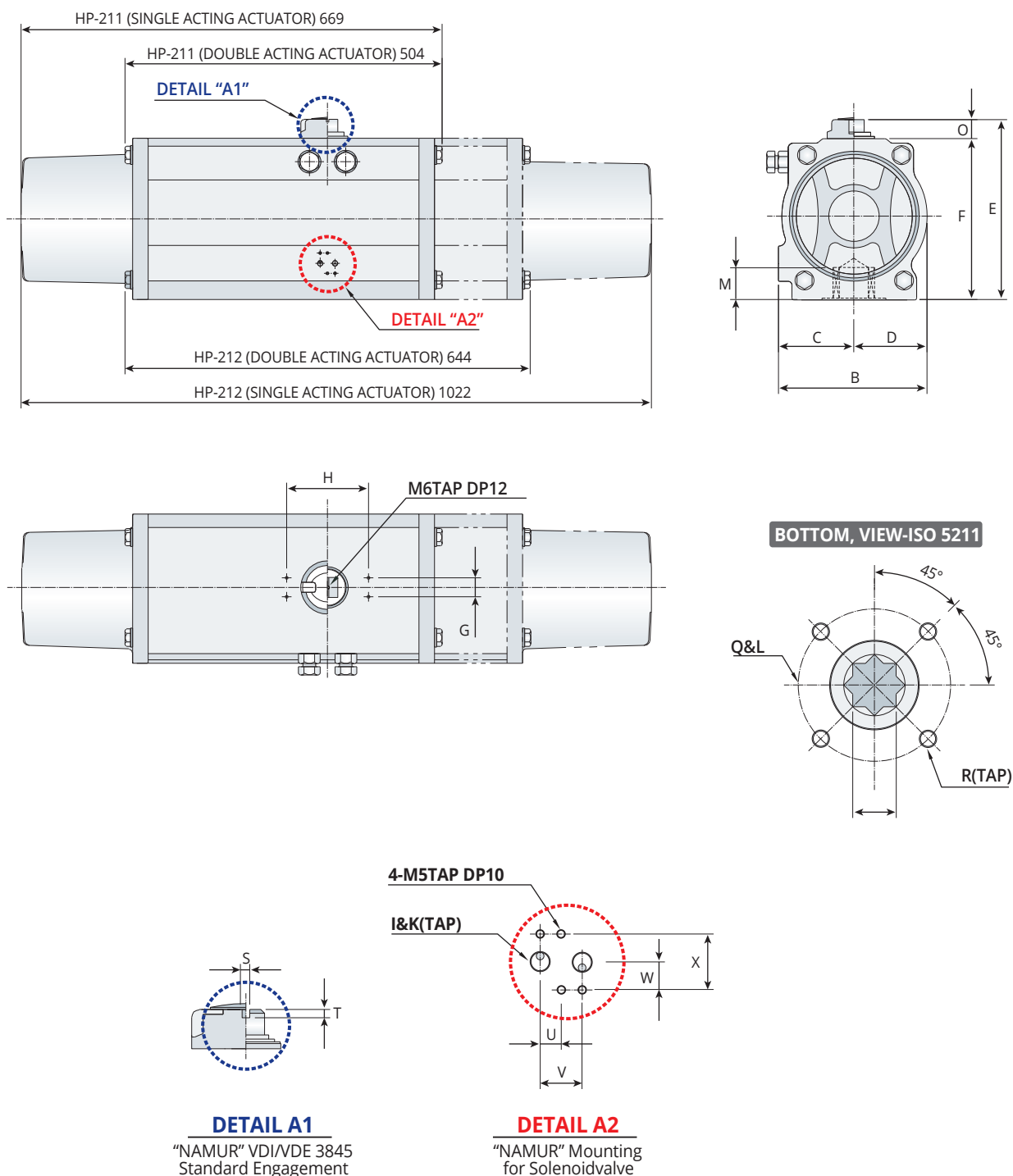


Unit: mm

Model	Flange L (ISO 5211)		A	B	C	D	E	F	G	H	I	K	O	S	T	U	V	W	X
	Q	R M/N(min)																	
HP-075D(135°)	F05/F07 Ø50/Ø70	M6/M8 22/17	272	96	53.5	42.5	124	104	30	80	PF	1/8"	20	4	4	12	24	16	32
HP-100D(135°)	F05/F07/F10 Ø50/Ø70/Ø102	M6/M8/M10 22/17	346	123	67	56	148	128	30	80	PF	1/4"	20	4	4	12	24	16	32
HP-125D(135°)	F07/F10/F12 Ø70/Ø102/Ø125	M8/M10/M12 32/22	453	151	82	69	179	159	30	80	PF	1/4"	20	4	4	12	24	16	32
HP-145D(135°)	F10/F12 Ø102/Ø125	M10/M12 36/27	545	172	92	80	209	179	30	130	PF	1/4"	30	4	4	12	24	16	32
HP-180D(135°)	F10/F12 Ø102/Ø125	M10/M12 39/36	704	206	107	99	251	221	30	130	PF	1/4"	30	4	4	12	24	16	32
HP-200D(135°)	F14 Ø140	M16 43/36	727	227	116	111	277	247	30	130	PF	1/4"	30	4	4	12	24	16	32

# Dimensional Drawing (Scotch Yoke)

## ■ HP-211 & 212



Unit: mm

Model	Flange L (ISO 5211)		R	B	C	D	E	F	G	H	I	K	O	S	T	U	V	W	X
	Q	M/N(min)																	
HP-211	F16	M20	236	120	116	286	256	30	130	PF	1/4"	30	4	4	12	24	16	32	
	Ø165	54/46																	
HP-212	F16	M20	236	120	116	286	256	30	130	PF	1/4"	30	4	4	12	24	16	32	
	Ø165	54/46																	

# Air Consumption

## ■ Double Acting (90° turn)

Unit: liter (ℓ)

Model	Volume	AIR SUPPLY									
		2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.6 bar	6 bar	7 bar	8 bar
HP-035D	0.2	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.8
HP-050D	0.3	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.5	2.8
HP-063D	0.5	1.8	2.0	2.3	2.6	2.8	3.1	3.3	3.6	4.1	4.6
HP-066D	0.5	2.1	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.9	5.5
HP-075D	0.8	2.9	3.3	3.7	4.1	4.5	4.9	5.3	5.7	6.5	7.4
HP-088D	1.3	4.7	5.3	6.0	6.6	7.3	8.0	8.6	9.3	10.6	11.9
HP-100D	1.8	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	14.7	16.5
HP-115D	3.0	10.7	12.3	13.8	15.3	16.9	18.4	19.9	21.5	24.5	27.6
HP-125D	3.8	13.6	15.6	17.5	19.4	21.4	23.3	25.2	27.2	31.0	34.9
HP-145D	6.2	22.2	25.4	28.5	31.7	34.9	38.0	41.2	44.3	50.7	57.0
HP-160D	7.3	26.2	29.9	33.6	37.3	41.0	44.8	48.5	52.2	59.6	67.1
HP-180D	11.2	40.1	45.8	51.5	57.3	63.0	68.7	74.4	80.1	91.5	102.9
HP-200D	15.4	55.2	63.0	70.9	78.7	86.6	94.4	102.3	110.1	125.8	141.5
HP-210D	16.0	57.3	65.5	73.6	81.8	89.9	98.1	106.3	114.4	130.7	147.1
HP-211D	13.7	49.1	56.1	63.0	70.0	77.0	84.0	91.0	98.0	111.9	125.9
HP-212D	20.3	72.7	83.1	93.4	103.8	114.1	124.5	134.8	145.2	165.9	186.6

## ■ Double Acting (135° turn)

Unit: liter (ℓ)

Model	Volume	AIR SUPPLY									
		2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.6 bar	6 bar	7 bar	8 bar
HP-075D	1.2	4.2	4.8	5.3	5.9	6.5	7.1	7.7	8.3	9.5	10.7
HP-100D	2.6	9.3	10.7	12.0	13.3	14.6	16.0	17.3	18.6	21.3	23.9
HP-125D	5.5	19.9	22.7	25.5	28.3	31.2	34.0	36.8	39.6	45.3	50.9
HP-145D	9.2	32.9	37.6	42.3	47.0	51.7	56.4	61.1	65.8	75.2	84.5
HP-180D	16.4	58.6	67.0	75.3	83.7	92.0	100.3	108.7	117.0	133.7	150.4
HP-200D	22.9	82.2	93.9	105.6	117.3	129.0	140.7	152.4	164.1	187.5	210.9

## ■ Single Acting (90° turn)

Unit: liter (ℓ)

Model	Volume	AIR SUPPLY									
		2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.6 bar	6 bar	7 bar	8 bar
HP-050S	0.1	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9
HP-063S	0.2	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.8
HP-066S	0.2	0.9	1.0	1.2	1.3	1.4	1.5	1.7	1.8	2.0	2.3
HP-075S	0.3	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.5	2.8
HP-088S	0.5	1.8	2.0	2.3	2.6	2.8	3.1	3.3	3.6	4.1	4.6
HP-100S	0.7	2.5	2.9	3.2	3.6	3.9	4.3	4.6	5.0	5.7	6.4
HP-115S	1.2	4.3	4.9	5.5	6.1	6.7	7.3	8.0	8.6	9.8	11.0
HP-125S	1.5	5.4	6.1	6.9	7.7	8.4	9.1	10.0	10.7	12.3	13.8
HP-145S	2.4	8.6	9.8	11.0	12.3	13.5	14.6	15.9	17.2	19.6	22.1
HP-160S	3.1	11.1	12.7	14.3	15.8	17.4	18.9	20.6	22.2	25.3	28.5
HP-180S	4.3	15.4	17.6	19.8	22.0	24.2	26.2	28.6	30.8	35.1	39.5
HP-200S	5.9	21.1	24.1	27.2	30.2	33.2	36.0	39.2	42.2	48.2	54.2
HP-210S	7.8	27.9	31.9	35.9	39.9	43.8	47.6	51.8	55.8	63.7	71.7
HP-211S	5.1	18.3	20.9	23.5	26.1	28.7	31.1	33.9	36.5	41.7	46.9
HP-212S	9.6	34.4	39.3	44.2	49.1	54.0	58.5	63.8	68.7	78.4	88.2



# Weight

## ■ Rack & Pinion (90° turn)

Unit: kg

Model	Weight	Spring (1ea)
HP-035	0.5	N/A
HP-050	1.2	0.009
HP-063	1.7	0.017
HP-066	2.4	0.021
HP-075	3.1	0.033
HP-088	4.3	0.056
HP-100	6.1	0.078
HP-115	9.0	0.121
HP-125	11.3	0.165
HP-145	14.1	0.202
HP-160	22.0	0.359
HP-180	26.5	0.521
HP-200	38.4	0.752
HP-210	46.0	0.882

## ■ Rack & Pinion (Double Acting, 135° turn)

Unit: kg

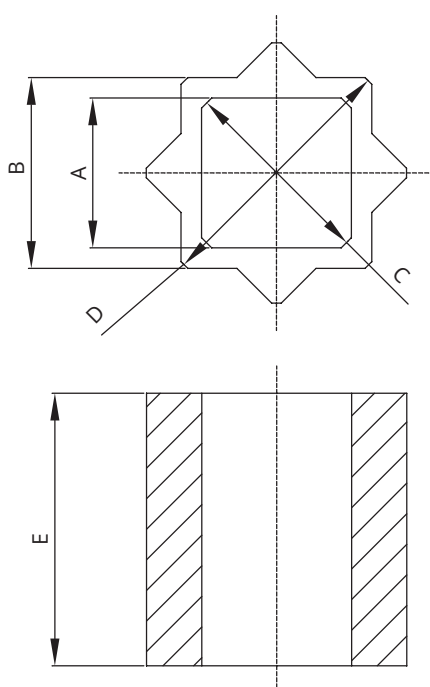
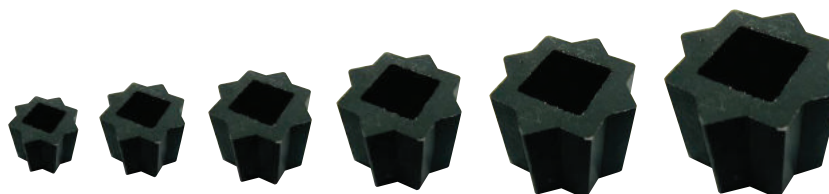
Model	Weight
HP-075D(135°)	4.1
HP-100D(135°)	8.8
HP-125D(135°)	15.3
HP-145D(135°)	22.9
HP-180D(135°)	36.7
HP-200D(135°)	49.7

## ■ Scotch Yoke

Unit: kg

Model	Weight
HP-211D	46.1
HP-211S(4.2 bar)	59.8
HP-211S(5.6 bar)	64.0
HP-212D	71.1
HP-212S(4.2 bar)	85.9
HP-212S(5.6 bar)	95.3

# Pinion Shaft Star Adapter



Unit: mm

Model	A	B	C	D	E
HP-050	9	11	12.5	15	13.5
HP-063	9	14	12.5	19.1	17.5
HP-066	11	14	14	19.1	20
HP-075	11	17	15	23.1	21.5
HP-088	14	17	19	23.1	21.5
HP-100	14	17	19	23.1	21.5
HP-115	14	22	19	29.6	31.5
HP-125	17	22	23	29.6	31.5
HP-145	17	27	23	36	35.5
HP-160	22	27	30	36	35.5
HP-180	27	36	37	48	39
HP-200	27	36	37	48	39
HP-210	27	36	37	48	43

# Ordering Code

## ■ Double Acting Actuator

HP-□□□D

Double Acting Configuration

Model / Cylinder Diameter

035 / 050 / 063 / 066 / 075 / 085 / 100 / 115 /  
125 / 145 / 160 / 180 / 200 / 210 / 211 / 212

## ■ Single Acting Actuator

HP-□□□S(□□)□□

Fail Position

FC : Fail Close  
FO: Fail Open

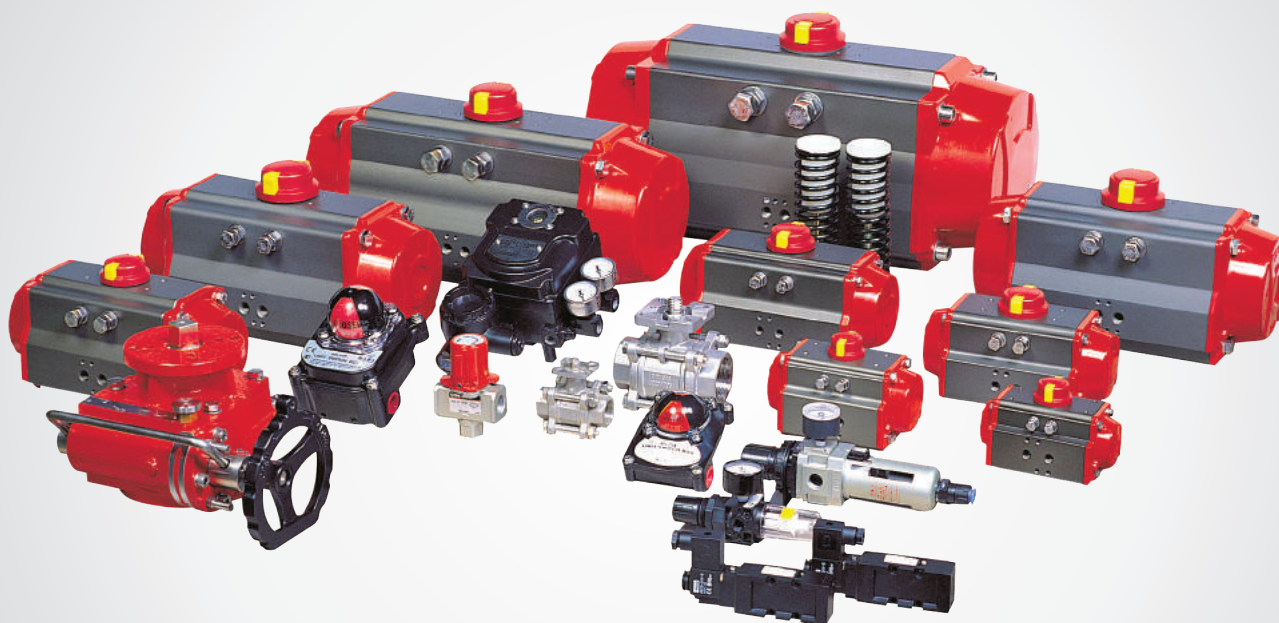
Number of spring

05 / 06 / 07 / 08 / 09 / 10 / 11 / 12

Single Acting Configuration

Model / Cylinder Diameter

035 / 050 / 063 / 066 / 075 / 085 / 100 / 115 /  
125 / 145 / 160 / 180 / 200 / 210 / 211 / 212



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# Valve automation leader HKC