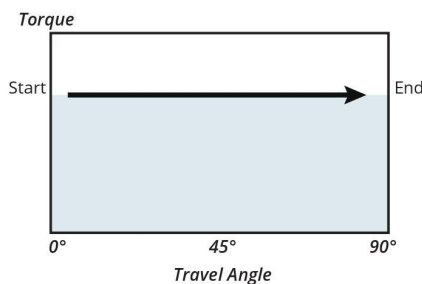
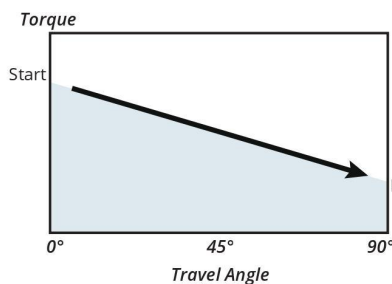


Rack & Pinion Design

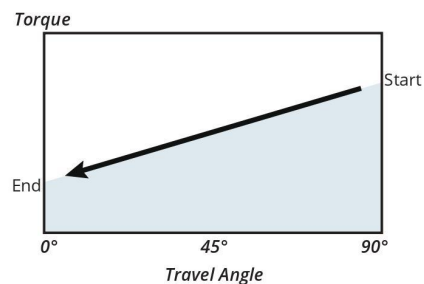
Torque diagram (HP-035 - HP-210)



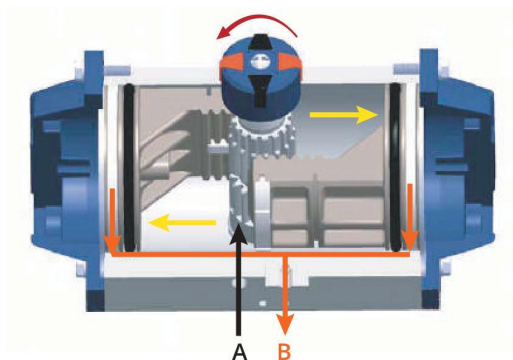
Double acting



Single acting

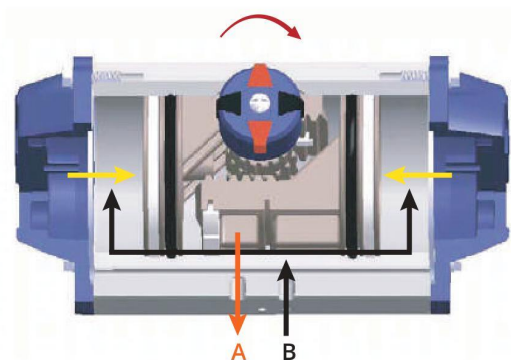


Double acting operation



Counterclockwise

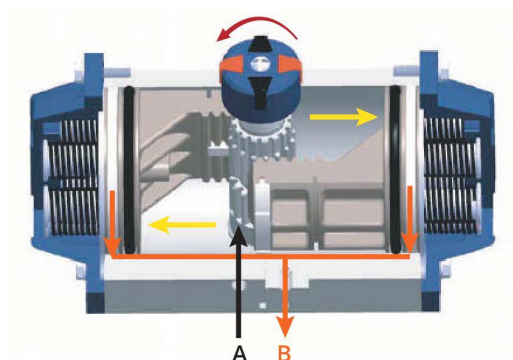
1. Apply an air pressure to port A.
2. Then as the pistons move apart, the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



Clockwise

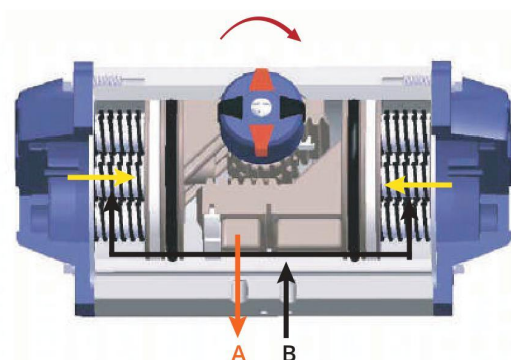
1. Apply an air pressure to port B.
2. Then as the pistons move inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A.

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.

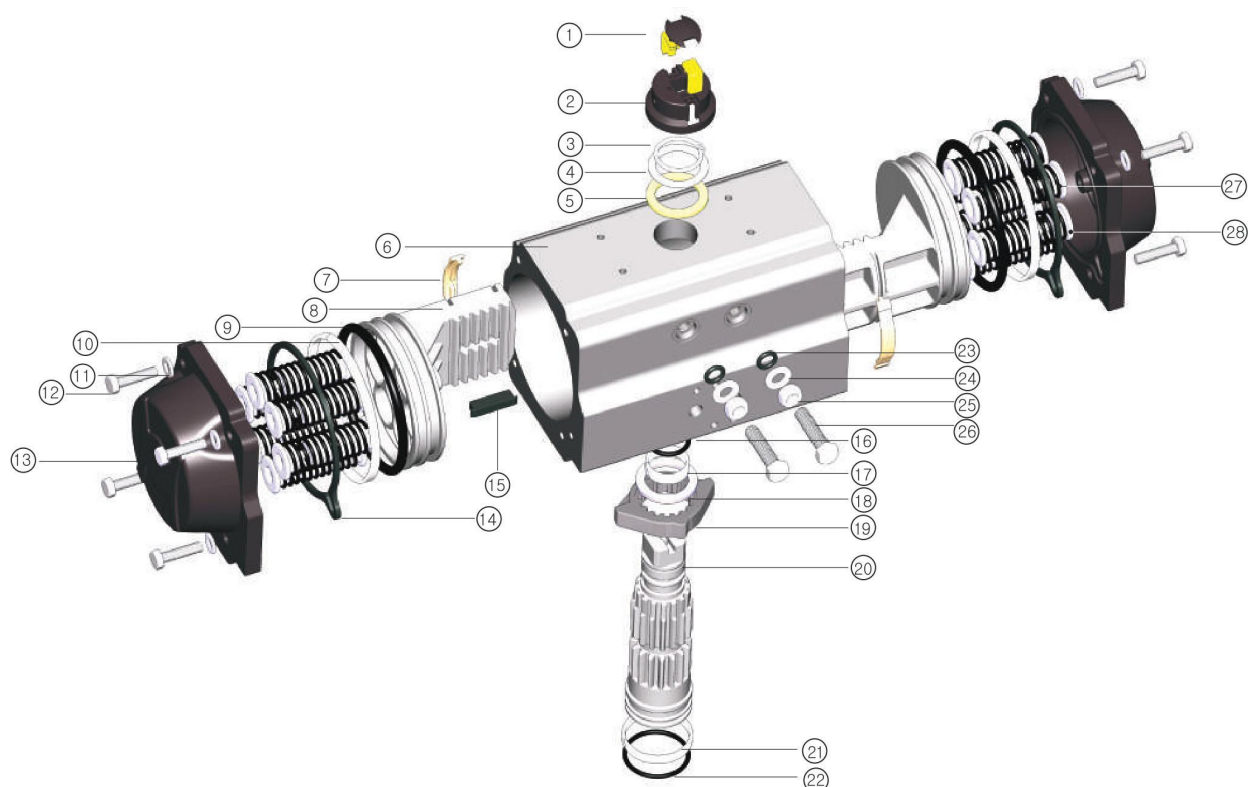


Clockwise (on air failure)

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.

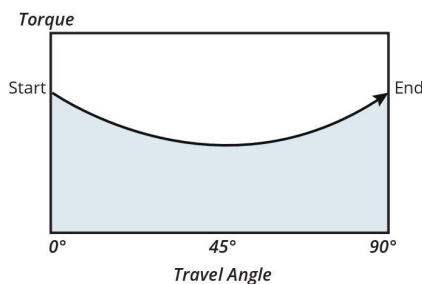
■ Bill of Materials



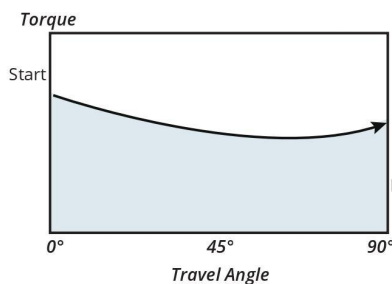
Part No.	Unit Q'ty	Part Description	Material	Corrosion Protection	Optional Material
1	2	Position indicator	Polypropylene + GF	-	-
2	1	Position indicator holder	Polypropylene + GF	-	-
3	1	Spring clip (pinion)	Stainless steel	Nickel plated (HP-160, HP-200)	-
4	1	Thrust washer (pinion)	Stainless steel	-	-
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	-	-

Scotch Yoke Design

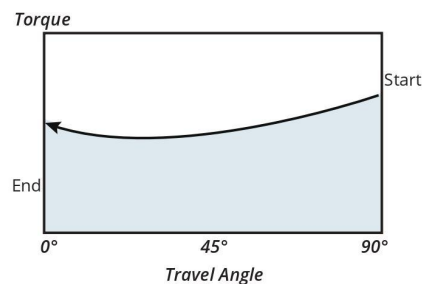
Torque diagram (HP-211 - HP-212)



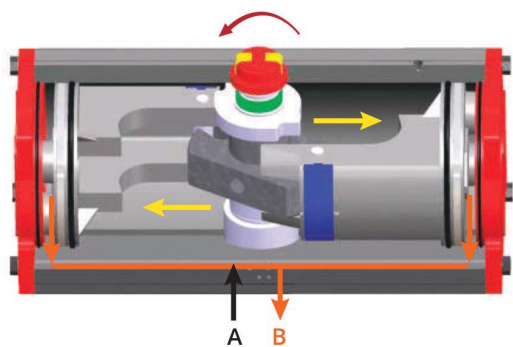
Double acting



Single acting

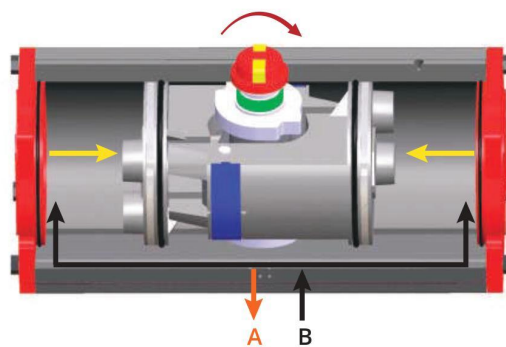


Double acting operation



Counterclockwise

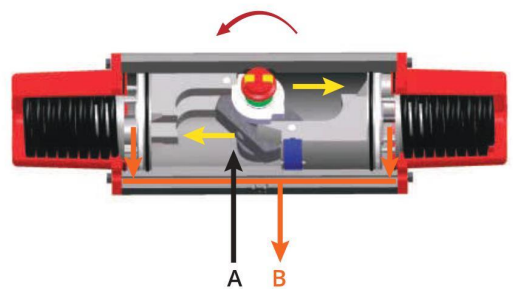
1. Apply an air pressure to port A.
2. Then as the pistons move apart, the drive shaft turns counterclockwise.
3. Air volume exhausts through port B.



Clockwise

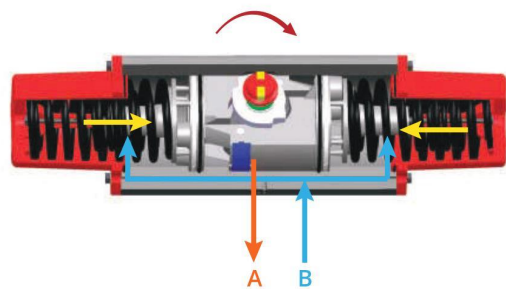
1. Apply an air pressure to port B.
2. Then as the pistons move inwards, the drive shaft turns clockwise.
3. Air volume exhausts through port A.

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.

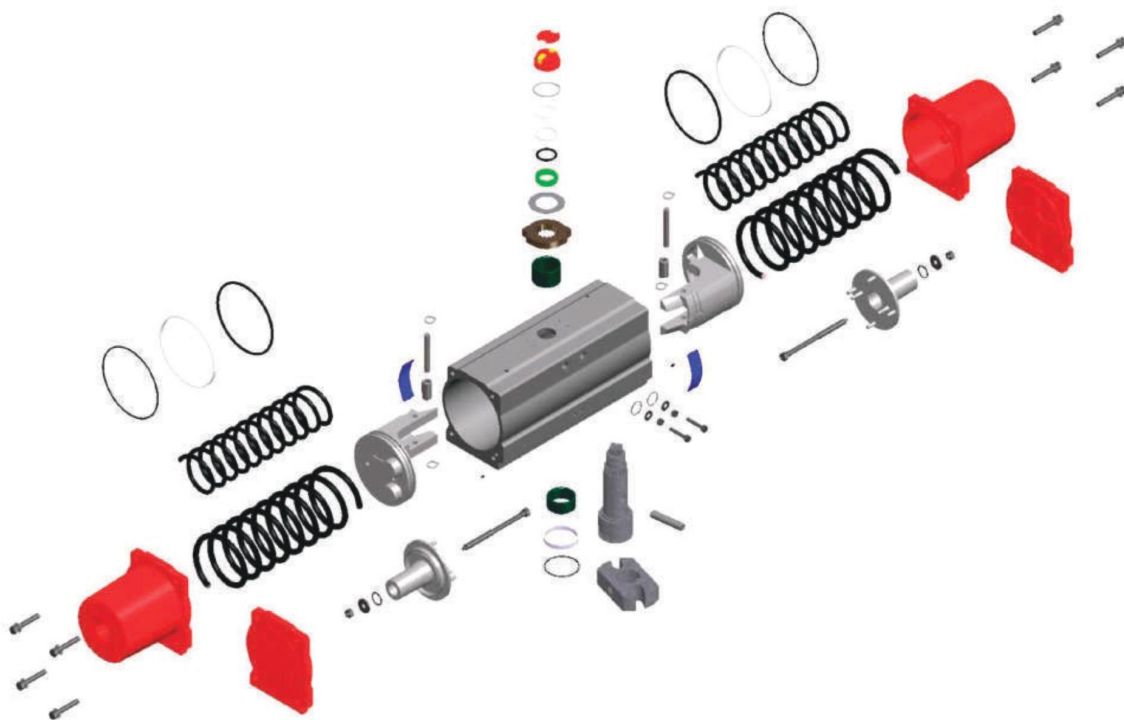


Clockwise (on air failure)

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.

■ Bill of Materials



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

Performance Data (Rack & Pinion)

■ Double Acting (Torque: Nm)

Model	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-035	3.8	4.5	5.3	6	6.8	7.5	8.3	9	10.5	12
HP-050	8.3	10	11.7	13.3	15	16.6	18.3	20	23.3	26.6
HP-063	15	17.9	20.9	23.9	26.9	29.9	32.9	35.9	41.9	47
HP-066	20.9	25.1	29.3	33.5	37.7	41.9	46.1	50.3	58.6	67
HP-075	28.7	34.5	40.2	45.9	51.7	57.4	63.2	68.9	80.4	92
HP-088	46.1	55.3	64.5	73.7	83	92.2	101.4	110.6	129	147
HP-100	68.2	81.9	95.5	109.2	122.8	136.5	150.1	163.8	191.1	214
HP-115	107.5	129	150.5	172	193.5	215	236.5	258	301	344
HP-125	138.5	166.2	194	221.7	249.4	277.1	304.8	332.5	387.9	443.3
HP-145	217.5	261	304.5	348	391.5	435	478.5	522	609	696
HP-160	283.7	340.5	397.2	454	510.7	567.4	624.2	680.9	794.4	908
HP-180	382.8	459.4	536	612.5	689.1	765.7	842.2	918.8	1071.9	1225
HP-200	531.7	638	744.4	850.7	957.1	1063.4	1169.8	1276.1	1488.8	1701.5
HP-210	586.9	704.3	821.6	939	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	
Actuator	Spring	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90
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	8.1
	D.ATORQUE		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	13.3
	D.ATORQUE		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	18.2
	D.ATORQUE		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	26.5
	D.ATORQUE		28.7		34.5		40.2		45.9		51.7		57.4		63.2		68.9		80.4		92		
HP 088S	S 05	27.8	17.2	37	26.4	46.2	35.6	55.4	44.8	64.7	54.1	73.9	63.3	83.1	72.5							28.9	18.3
	S 06	24.1	11.4	33.3	20.6	42.5	29.8	51.7	39	61	48.3	70.2	57.5	79.4	66.7	88.6	75.9					34.7	22
	S 07	20.4	5.7	29.6	14.9	38.8	24.1	48	33.3	57.3	42.6	66.5	51.8	75.7	61	84.9	70.2	103.3	88.6			40.4	25.7
	S 08			26	9.1	35.2	18.3	44.4	27.5	53.7	36.8	62.9	46	72.1	55.2	81.3	64.4	99.7	82.8			46.2	29.3
	S 09					31.5	12.5	40.7	21.7	50	31	59.2	40.2	68.4	49.4	77.6	58.6	96	77	114	95	52	33
	S 10							37	15.9	46.3	25.2	55.5	34.4	64.7	43.6	73.9	52.8	92.3	71.2	110.3	89.2	57.8	36.7
	S 11									42.7	19.5	51.9	28.7	61.1	37.9	70.3	47.1	88.7	65.5	106.7	83.5	63.5	40.3
	S 12													57.4	32.1	66.6	41.3	85	59.7	103	77.7	69.3	44
	D.ATORQUE		46.1		55.3		64.5		73.7		83		92.2		101.4		110.6		129		147		

■ 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	
Actuator Spring		0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	90	0	0
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 100S	S 05	42.9	28.8	56.6	42.5	70.2	56.1	83.9	69.8	97.5	83.4	111.2	97.1	124.8	110.7							39.4	25.3
	S 06	37.8	20.9	51.5	34.6	65.1	48.2	78.8	61.9	92.4	75.5	106.1	89.2	119.7	102.8	133.4	116.5					47.3	30.4
	S 07	32.7	13.1	46.4	26.8	60	40.4	73.7	54.1	87.3	67.7	101	81.4	114.6	95	128.3	108.7	155.6	136			55.1	35.5
	S 08			41.4	18.9	55	32.5	68.7	46.2	82.3	59.8	96	73.5	109.6	87.1	123.3	100.8	150.6	128.1			63	40.5
	S 09					49.9	24.6	63.6	38.3	77.2	51.9	90.9	65.6	104.5	79.2	118.2	92.9	145.5	120.2	168.4	143.1	70.9	45.6
	S 10							58.5	30.4	72.1	44	85.8	57.7	99.4	71.3	113.1	85	140.4	112.3	163.3	135.2	78.8	50.7
	S 11									67.1	36.1	80.8	49.8	94.4	63.4	108.1	77.1	135.4	104.4	158.3	127.3	86.7	55.7
	S 12													89.3	55.6	103	69.3	130.3	96.6	153.2	119.5	94.5	60.8
	D.A.TORQUE	68.2		81.9		95.5		109.2		122.8		136.5		150.1		163.8		191.1		214			
	S 05	66.5	42	88	63.5	109.5	85	131	106.5	152.5	128	174	149.5	195.5	171							65.5	41
HP 115S	S 06	58.3	28.9	79.8	50.4	101.3	71.9	122.8	93.4	144.3	114.9	165.8	136.4	187.3	157.9	208.8	179.4					78.6	49.2
	S 07	50.1	15.8	71.6	37.3	93.1	58.8	114.6	80.3	136.1	101.8	157.6	123.3	179.1	144.8	200.6	166.3	243.6	209.3			91.7	57.4
	S 08			63.4	24	84.9	45.5	106.4	67	127.9	88.5	149.4	110	170.9	131.5	192.4	153	235.4	196			105	65.6
	S 09					76.7	32.5	98.2	54	119.7	75.5	141.2	97	162.7	118.5	184.2	140	227.2	183	270.2	226	118	73.8
	S 10							90	41	111.5	62.5	133	84	154.5	105.5	176	127	219	170	262	213	131	82
	S 11									103.3	49.5	124.8	71	146.3	92.5	167.8	114	210.8	157	253.8	200	144	90.2
	S 12													138.1	79.5	159.6	101	202.6	144	245.6	187	157	98.4
	D.A.TORQUE	107.5		129		150.5		172		193.5		215		236.5		258		301		344			
	S 05	86	56.5	113.7	84.2	141.5	112	169.2	139.7	196.9	167.4	224.6	195.1	252.3	222.8							82	52.5
	HP 125S	S 06	75.5	39.5	103.2	67.2	131	95	158.7	122.7	186.4	150.4	214.1	178.1	241.8	205.8	269.5	233.5					99
S 07		65	23.5	92.7	51.2	125.5	79	148.2	106.7	175.9	134.4	203.6	162.1	231.3	189.8	259	217.5	314.4	272.9			115	73.5
S 08				82.2	34.2	110	62	137.7	89.7	165.4	117.4	193.1	145.1	220.8	172.8	248.5	200.5	303.9	255.9			132	84
S 09						99.5	46	127.2	73.7	154.9	101.4	182.6	129.1	210.3	156.8	238	184.5	293.4	239.9	348.8	295.3	148	94.5
S 10								116.7	56.7	144.4	84.4	172.1	112.1	199.8	139.8	227.5	167.5	282.9	222.9	338.3	278.3	165	105
S 11										133.4	68.4	161.1	96.1	188.8	123.8	216.5	151.5	271.9	206.9	327.3	262.3	181	116
S 12														178.8	106.8	206.5	134.5	261.9	189.9	317.3	245.3	198	126
D.A.TORQUE		138.5		166.2		194		221.7		249.4		277.1		304.8		332.5		387.9		443.3			
S 05		135.5	88.5	135.5	88.5	222.5	175.5	266	219	309.5	262.5	353	306	396.5	349.5							129	82
HP 145S		S 06	118.5	62.5	118.5	62.5	205.5	149.5	249	193	292.5	236.5	336	280	379.5	323.5	423	367					155
	S 07	102.5	37.5	102.5	37.5	189.5	124.5	233	168	276.5	211.5	320	255	363.5	298.5	407	342	494	429			180	115
	S 08			85.5	11.5	172.5	98.5	216	142	259.5	185.5	303	229	346.5	272.5	390	316	477	403			206	132
	S 09					156.5	72.5	200	116	243.5	159.5	287	203	330.5	246.5	374	290	461	377	548	464	232	148
	S 10							183	90	226.5	133.5	270	177	313.5	220.5	357	264	444	351	531	438	258	165
	S 11									210.5	108.5	254	152	297.5	195.5	341	239	428	326	515	413	283	181
	S 12													280.5	169.5	324	213	411	300	498	387	309	198
	D.A.TORQUE	217.5		261		304.5		348		391.5		435		478.5		522		609		696			
	S 05	171.7	117.7	228.5	174.5	285.2	231.2	342	288	398.7	344.7	455.4	401.4	512.2	458.2							166	112
	HP 160S	S 06	148.7	84.7	205.5	141.5	262.2	198.2	319	255	375.7	311.7	432.4	368.4	489.2	425.2	545.9	481.9					199
S 07		126.7	50.7	183.5	107.5	240.2	164.2	297	221	353.7	277.7	410.4	334.4	467.2	391.2	523.9	447.9	637.4	561.4			233	157
S 08				160.5	74.5	217.2	131.2	274	188	330.7	244.7	387.4	301.4	444.2	358.2	500.9	414.9	614.4	528.4			266	180
S 09						195.2	98.2	252	155	308.7	211.7	365.4	268.4	422.2	325.2	478.9	381.9	592.4	495.4	706	609	299	202
S 10								230	122	286.7	178.7	343.4	235.4	400.2	292.2	456.9	348.9	570.4	462.4	684	576	332	224
S 11										263.7	145.7	320.4	202.4	377.2	259.2	433.9	315.9	547.4	429.4	661	543	365	247
S 12														355.2	225.2	411.9	281.9	525.4	395.4	639	509	399	269
D.A.TORQUE		283.7		340.5		397.2		454		510.7		567.4		624.2		680.9		794.4		908			
S 05		224.8	145.8	301.4	222.4	378	299	454.5	375.5	531.1	452.1	607.7	528.7	684.2	605.2							237	158
HP 180S		S 06	192.8	98.8	269.4	175.4	346	252	422.5	328.5	499.1	405.1	575.7	481.7	652.2	558.2	728.8	634.8					284
	S 07	161.8	50.8	238.4	127.4	315	204	391.5	280.5	468.1	357.1	544.7	433.7	621.2	510.2	697.8	586.8	850.9	739.9			332	221
	S 08			206.4	80.4	283	157	359.5	233.5	436.1	310.1	512.7	386.7	589.2	463.2	665.8	539.8	818.9	692.9			379	253
	S 09					251	110	327.5	186.5	404.1	263.1	480.7	339.7	557.2	416.2	633.8	492.8	786.9	645.9	940	799	426	285
	S 10							296.5	138.5	373.1	215.1	449.7	291.7	526.2	368.2	602.8	444.8	755.9	597.9	909	751	474	316
	S 11									341.1	168.1	417.7	244.7	494.2	321.2	570.8	397.8	723.9	550.9	877	704	521	348
	S 12													463.2	274.2	539.8	350.8	692.9	503.9	846	657	568	379
	D.A.TORQUE	382.8		459.4		536		612.5		689.1		765.7		842.2		918.8		1071.9		1225			
	S 05	318.7	216.7	425	323	531.4	429.4	637.7	535.7	744.1	642.1	850.4	748.4	956.8	854.8							315	213
	HP 200S	S 06	276.7	153.7	383	260	489.4	366.4	595.7	472.7	702.1	579.1	808.4	685.4	914.8	791.8	1021	898.1					378
S 07		233.7	90.7	340	197	446.4	303.4	552.7	409.7	659.1	516.1	765.4	622.4	871.8	728.8	978.1	835.1	1191	1048			441	298
S 08				298	134	404.4	240.4	510.7	346.7	617.1	453.1	723.4	559.4	829.8	665.8	936.1	772.1	1149	984.8			504	340
S 09																							

Performance Data (Scotch Yoke)

■ Double Acting (Torque: Nm)

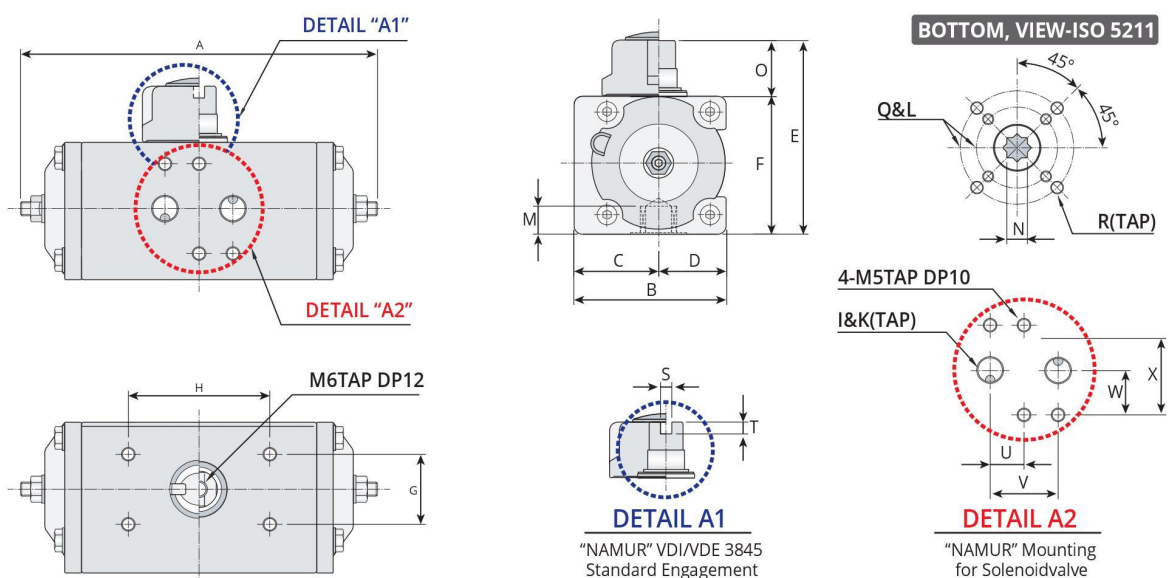
HP-211	Start	Run	End	HP-212	Start	Run	End
4.2 bar	1,507	753	1,312	4.2 Bar	3,011	1,506	2,622
5.6 bar	2,009	1,005	1,750	5.6 Bar	4,017	2,006	3,498
7 bar	2,511	1,255	2,187	7 Bar	5,022	2,509	4,373

■ 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

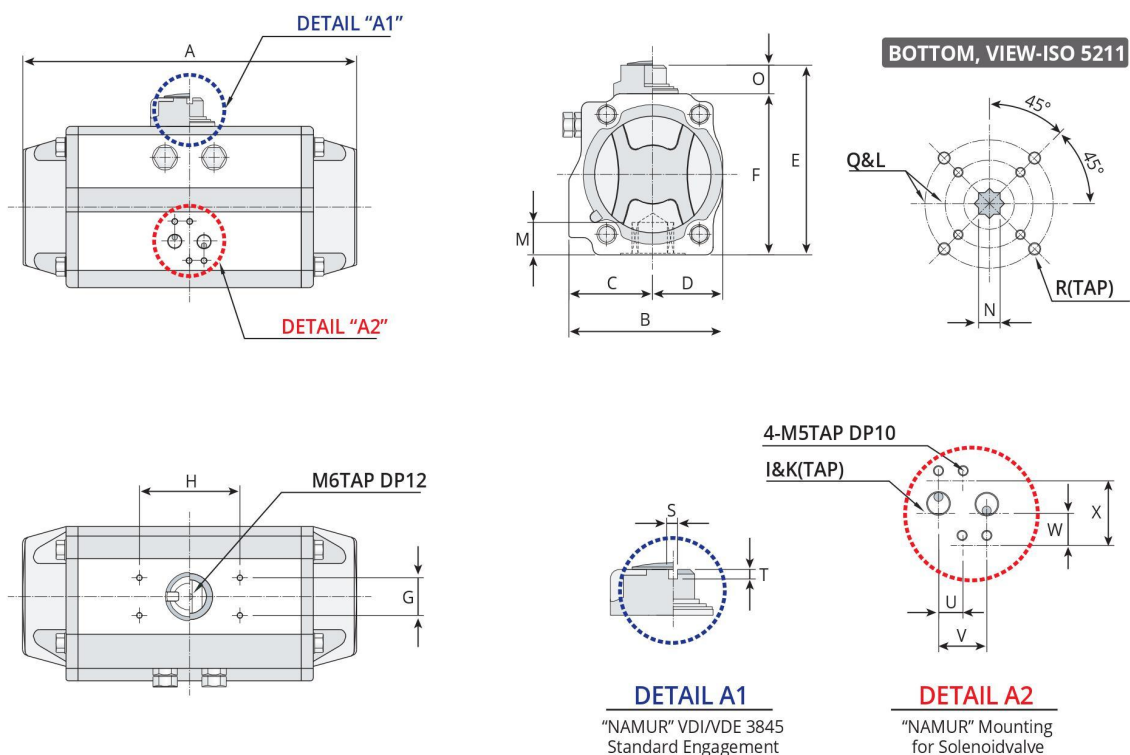
HP-212S	AIR TORQUE			SPRING TORQUE		
	Start	Run	End	Start	Run	End
4.2 bar	2,226	904	1,266	1,356	565	780
5.6 bar	2,769	1,074	1,446	2,045	883	1,243

Dimensional Drawing (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	126	54	30	24	69	49	25	50	PF	1/8"	20	4	4	12	24	16	32
	Ø36/Ø50	10/9																	

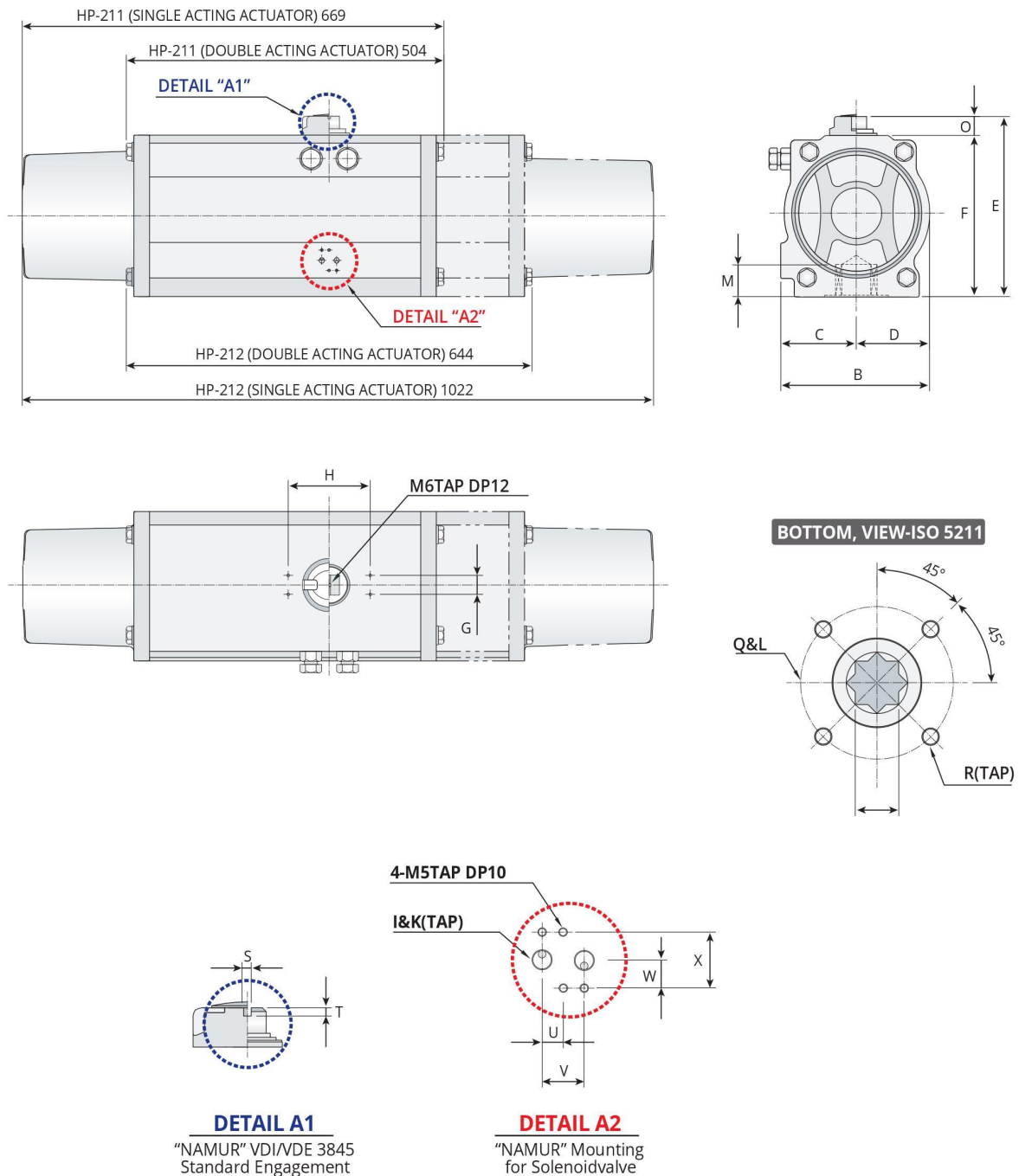
■ HP-050 - HP-210



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

Dimensional Drawing

■ HP-211 / 212



Unit: mm

Model	Flange L (ISO 5211)		R																
	Q	M/N(min)	B	C	D	E	F	G	H	I	K	O	S	T	U	V	W	X	
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

Unit: liter (ℓ)

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

■ Single Acting

Unit: liter (ℓ)

Model	Volume	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	15.0	15.9	17.2	19.6	22.1
HP-160s	3.1	11.1	12.7	14.3	15.8	17.4	19.0	20.6	22.2	25.3	28.5
HP-180s	4.3	15.4	17.6	19.8	22.0	24.2	26.4	28.6	30.8	35.1	39.5
HP-200s	5.9	21.1	24.1	27.2	30.2	33.2	36.2	39.2	42.2	48.2	54.2
HP-210s	7.8	27.9	31.9	35.9	39.9	43.8	47.8	51.8	55.8	63.7	71.7
HP-211s	5.1	18.3	20.9	23.5	26.1	28.7	31.3	33.9	36.5	41.7	46.9
HP-212s	9.6	34.4	39.3	44.2	49.1	54.0	58.9	63.8	68.7	78.4	88.2

Weight

Unit: kg

Model	HP-035	HP-050	HP-063	HP-066	HP-075	HP-088	HP-100	HP-115
Weight	0.54	1.16	1.68	2.4	3	4.3	6	9
Spring (1 ea)	NA	0.009	0.017	0.021	0.033	0.056	0.078	0.121

Model	HP-125	HP-145	HP-160	HP-180	HP-200	HP-210	HP-211	HP-212
Weight	11.3	14.1	22	26.5	38.4	46	46	71
Spring (1 ea)	0.165	0.202	0.359	0.521	0.752	0.882	14.1	28.2