

PNEUMATIC ROTARY ACTUATORS IVR 270 IVR 271

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DICHIARAZIONE DI CONFORMITÀ UE

Oggetto della dichiarazione: ATTUATORE PNEUMATICO

Questa dichiarazione di conformità è emessa sotto la responsabilità del Fabbricante

Oggetto della dichiarazione: “Attuatori Pneumatici”

Avente la marcatura:

CE II2G Ex h IIC T6 Gb

II2D Ex h IIIC T85° Db

Temperatura ambiente: -25°C ÷ 60°C

Soddisfa i requisiti essenziali di sicurezza e salute ad essa applicabili dalla Direttiva 2014/34/UE.

Riferimento alle norme armonizzate utilizzate:

- UNI EN ISO 80079-36:2016 «Apparecchi non elettrici destinati alle atmosfere esplosive - Metodo e requisiti di base»
- UNI EN ISO 80079-37:2016 «Apparecchi non elettrici destinati alle atmosfere esplosive - Tipo di protezione non elettrica per sicurezza costruttiva "c", per controllo della sorgente di accensione "b", per immersione in liquido "k"»

L'apparecchiatura summenzionata è soggetta al modulo “*controllo interno di fabbricazione*” (allegato VIII direttiva Atex):

1 Technical Characteristics

AT series pneumatic actuators, with the integrated use of advanced precision machining equipment, high-quality materials and industrial art design technology. After rigorous testing and optimization of production line, ARC series pneumatic actuators have lots of advantages like smooth and reliable operation, long working life, high corrosion resistance, flexible selection, competitive price and so on.

Piston

The teeth of piston machined by CNC machining center, makes the operation smoother and performance more reliable. Anodized treatment improves the corrosion and wear resistance.



End cap

The function of 95° position limit is optimally designed on the end cap, instead of extra limit screw. This design improves the safety and reliability.

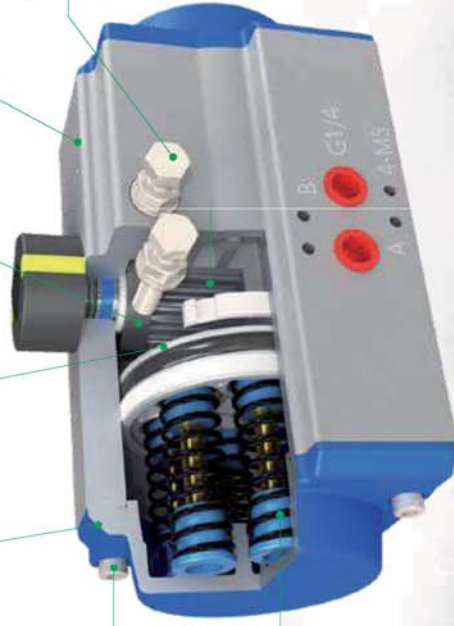


Fasteners

The stainless steel fasteners, are safe and beautiful with high corrosion resistance.

Spring

Preloaded and coated springs are made from high quality material for higher corrosion resistance and longer service life, which can be demounted safely and conveniently to satisfy different requirements of torque by changing quantity of springs.



Cam

Cam with lock function*, when the actuator is required to be locked in full open (90°) or fully closed (0°) position, the actuator can be equipped with special bolts and locking device, the actuator position can be locked, and prevent misuse.



AT40-AT125 are available at this time

Body

According to different requirements, the surface of aluminum body can be treated with hard anodizing, powder polyester coating in colors (like black, blue, orange, red etc.), PTFE coating or Nickel plated.

Adjust screw

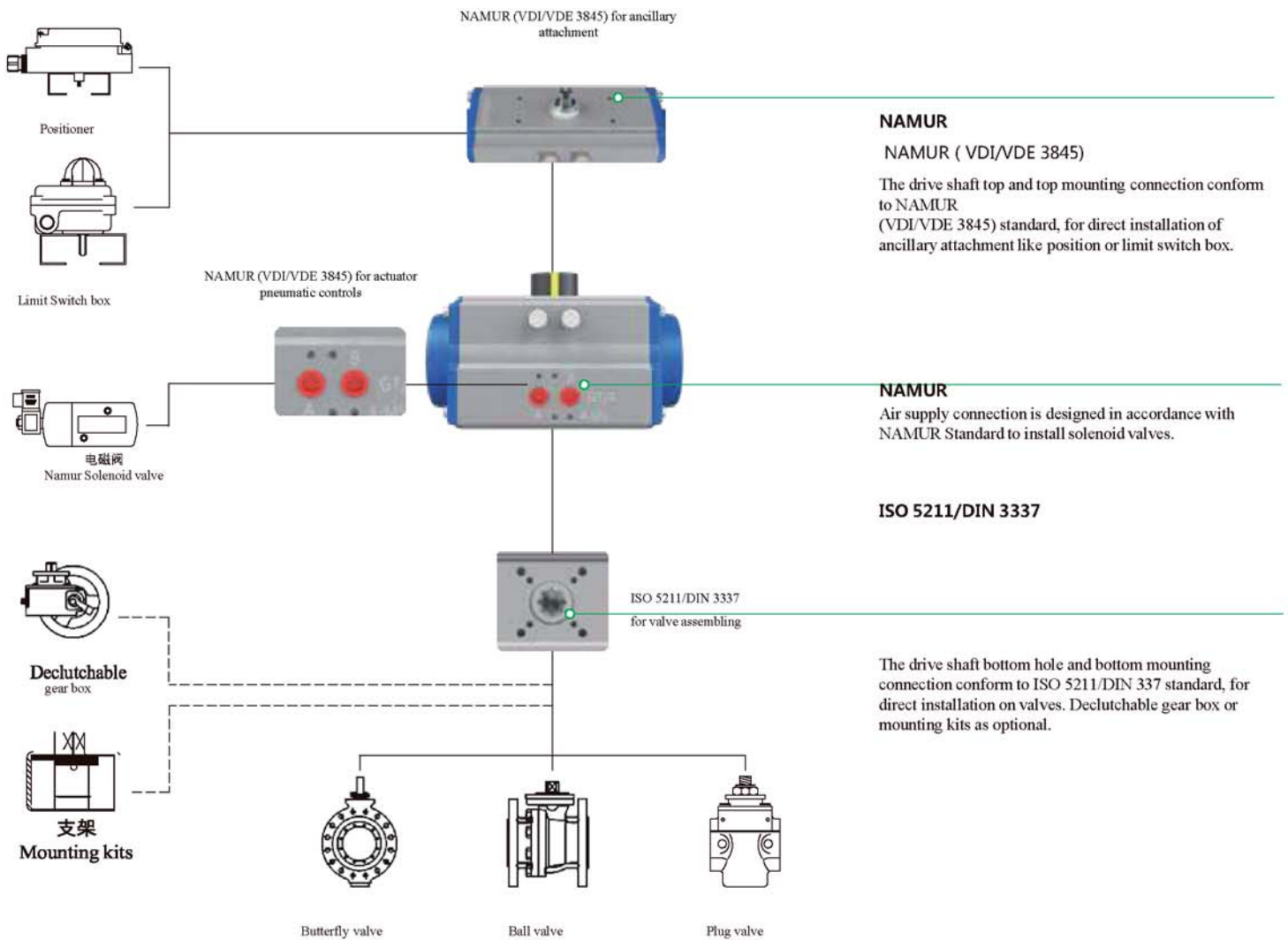
The two independent external travel stop adjust screws can adjust $\pm 5^\circ$ at both open and close positions easily and precisely.

Drive shaft

The drive shaft is high-precision and integrative, made from nickel plated alloy steel, full conform to the latest standards of ISO5211, DIN3337, NAMUR. The dimensions can be customized and the stainless steel is available.



2 Installation Specification



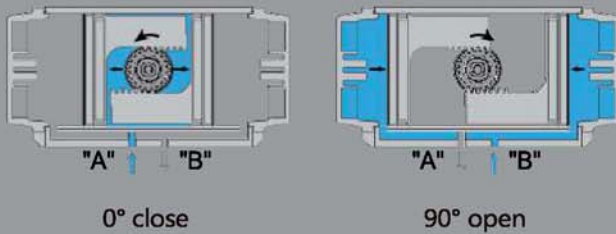
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3 Operating Principle

Double Acting Actuators

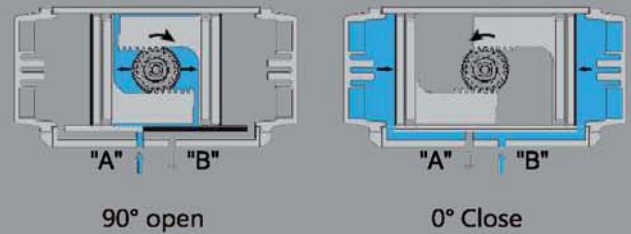
IVR 270

CCW (Standard)



Air to Port A forces the pistons outwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from Port B. Air to Port B forces the pistons inwards, causing the drive shaft to turn clockwise while the air is being exhausted from Port A.

CW

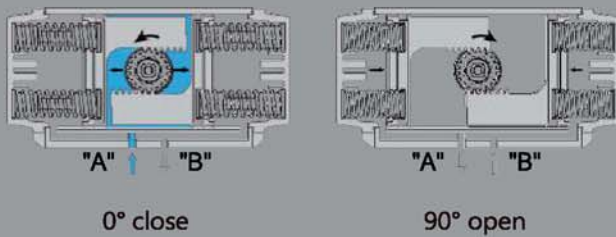


Air to Port A forces the pistons outwards, causing the drive shaft to turn clockwise while the air is being exhausted from Port B. Air to Port B forces the pistons inwards, causing the drive shaft to turn counterclockwise while the air is being exhausted from Port A.

Spring Return Actuators

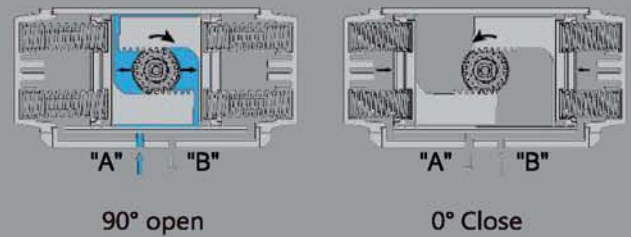
IVR 271

FC-CCW (Standard)



Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns counterclockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns clockwise while air is being exhausted from port A.

FO-CW



Air to port A forces the pistons outwards, causing the springs to compress. The drive shaft turns clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The drive shaft turns counterclockwise while air is being exhausted from port A.

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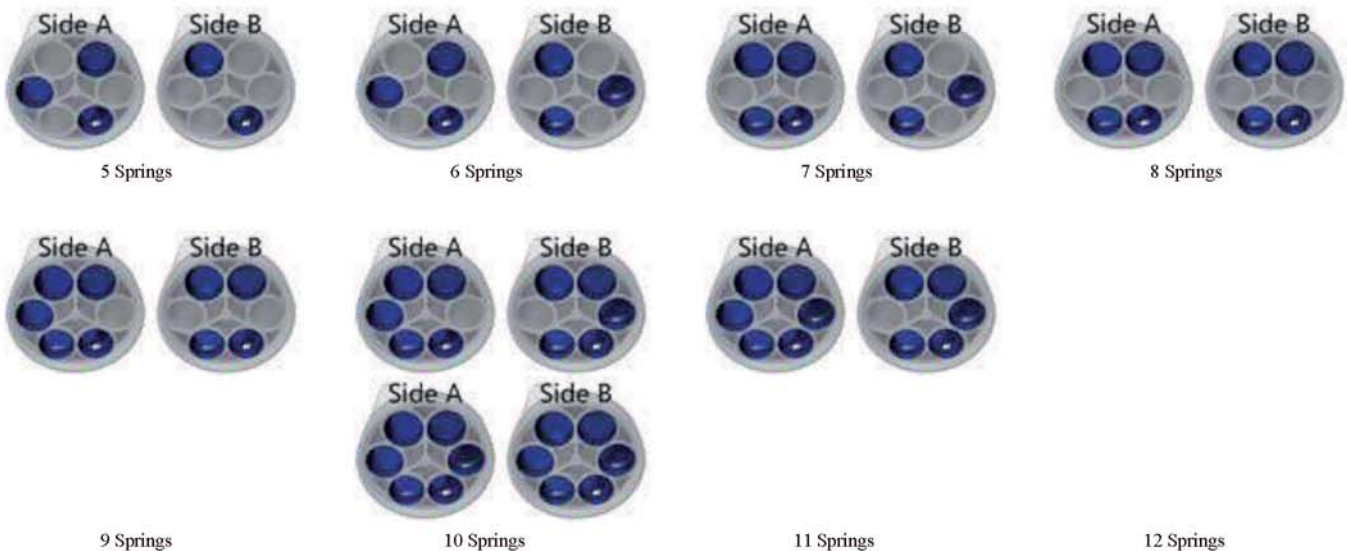
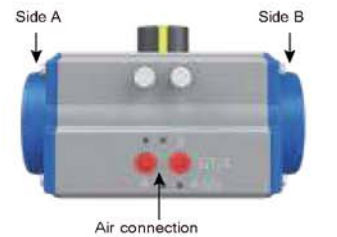
4 Operating Conditions

- Operating media**
 Dry or lubricated air, or the non-corrosive gases . The maximum particle diameter must be less than 30 µm
- Air supply pressure**
 The minimum supply pressure is 2 Bar, the maximum supply pressure is 8 Bar
- Operating temperature**
 Standard (NBR O-rings): -20°C ~ +80°C
 High temperature (Viton O-rings): -20°C ~ +150°C
 Low temperature (LTNBR O-rings): -40°C ~ +120°C
- Travel adjustment**
 Have adjustment range of $\pm 5^\circ$ for the rotation at 0° and 90°
- Lubrication**
 Actuators are factory lubrication located. Under normal operating condition, need not to add lubricant
- Application**
 Either indoor or outdoor

5 Spring Set Configuration

Spring mounting form for spring return actuators

During selecting the spring return actuators, we can choose the more reasonable and more economical actuators, if we know the different torques of the valve at opening, operating and closing.



6 Weight

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
DA	0.80	0.97	1.22	2.02	2.60	3.23	4.58	5.92	8.18	8.68	14.1	20.6	33.2	39.7	57.0	78.7	121.	210.2	280
SR12	-	1.10	1.35	2.19	2.86	3.64	5.35	6.76	9.30	10.0	16.5	24.4	40.2	49.2	70.0	100.	149.1	259.3	325

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7 Operation Time

Air Pressure: 5 bar

Double Acting			Spring Return (Spring Qty.)														
			Size	3+3		3+4		4+4		4+5		5+5		5+6		6+6	
0°-90°	90°-0°	Size	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	0°-90°	90°-0°	
32DA	0.5	0.5	32SR	-	-	-	-	-	-	-	-	-	-	-	-	-	
40DA	0.5	0.5	40SR	-	-	-	-	-	-	-	-	-	-	-	-	-	
52DA	0.6	0.6	52SR	2.46	0.48	2.48	0.46	2.5	0.44	2.52	0.42	2.54	0.4	2.56	0.38	2.58	0.36
63DA	0.7	0.7	63SR	2.54	0.56	2.56	0.54	2.58	0.52	2.6	0.5	2.62	0.48	2.64	0.46	2.66	0.44
75DA	0.8	0.7	75SR	2.62	0.64	2.64	0.62	2.66	0.6	2.68	0.58	2.7	0.56	2.72	0.54	2.74	0.52
83DA	0.9	0.8	83SR	2.71	0.73	2.73	0.71	2.75	0.69	2.77	0.67	2.79	0.65	2.81	0.63	2.83	0.61
92DA	1.0	1.0	92SR	2.89	0.86	2.91	0.84	2.93	0.82	2.95	0.8	2.97	0.78	2.99	0.76	3.01	0.74
105DA	1.5	1.5	105SR	3.14	0.91	3.16	0.89	3.18	0.87	3.2	0.85	3.22	0.83	3.24	0.81	3.26	0.79
115DA	1.7	1.7	115SR	3.59	1.02	3.61	1.00	3.62	0.98	3.64	0.96	3.66	0.95	3.67	0.93	3.69	0.91
125DA	2	2	125SR	4.24	1.2	4.26	1.18	4.28	1.16	4.3	1.14	4.32	1.12	4.34	1.1	4.36	1.08
140DA	2.5	2.5	140SR	4.4	1.35	4.4	1.33	4.62	1.31	4.64	1.29	4.66	1.27	4.68	1.25	4.68	1.22
160DA	4	3	160SR	4.74	1.77	4.76	1.75	4.78	1.73	4.8	1.71	4.82	1.69	4.82	1.67	4.84	1.65
190DA	5	4	190SR	5.75	3.7	5.77	3.5	5.75	3.48	5.77	3.46	5.79	3.44	5.8	3.42	5.83	3.4
210DA	5	4	210SR	8.25	4.8	8.4	4.6	8.42	4.58	8.44	4.56	8.46	4.54	8.48	4.52	8.5	4.5
240DA	6	6	240SR	16.2	5.14	16.4	5.12	16.42	5.1	16.44	4.9	16.6	4.98	16.8	4.86	17	4.84
270DA	8	8	270SR	17.6	6.28	17.8	6.26	17.6	6.24	17.8	6.2	18	6.18	18.2	6.16	18.4	6.14
300DA	12	12	300SR	24	13.2	24.5	13	24.4	12.8	24.3	12.6	24.5	12.58	24.7	12.56	24.9	12.54
350DA	14	14	350SR	31	17.3	31.5	17	31.3	16.8	31	16.6	31.2	16.58	31.4	16.56	31.6	16.54
400DA	15	15	400SR	45	27	51	27	51.3	26.8	51.5	26.8	51.7	26.6	51.9	26.4	52.1	26.2

* The operation time of the actuator depends on the CV values of the solenoid valves, filter regulator and pipes, it also depends on the air pressure, operating load and so on.

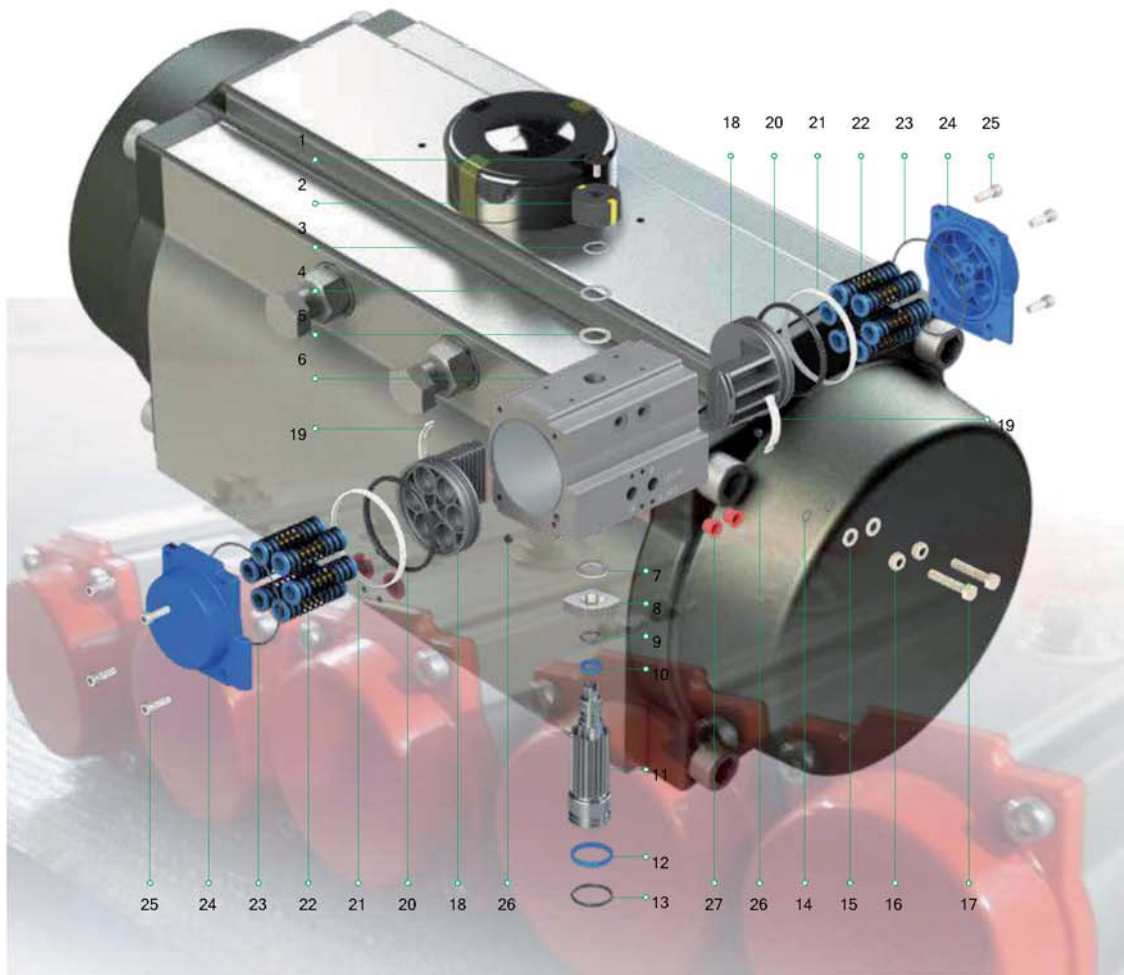
8 Air Consumption

Model	Air volume opening	Air volume closing	Model	Air volume opening	Air volume closing
AT-32	0.04	0.05	AT-140	2.5	2.2
AT-40	0.08	0.11	AT-160	3.7	3.2
AT-52	0.12	0.16	AT-190	5.9	5.4
AT-63	0.21	0.23	AT-210	7.5	7.5
AT-75	0.30	0.34	AT-240	11.0	9.0
AT-83	0.43	0.47	AT-270	17.0	14.0
AT-92	0.64	0.73	AT-300	23.8	29.7
AT-105	0.95	0.88	AT-350	35.1	46.3
AT-115	1.3	1.2	AT-400	52.6	56.0
AT-125	1.6	1.4			

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9. Parts and Material



No	Description	Qty	Standard Material	Protection	Optional Material
1	Indicator screw	1	Plastic+Stainless steel		
2	Indicator	1	ABS Plastic		
3	Spring clip	1	Stainless steel		
4	Thrust washer	1	Stainless steel		
5	Outside washer	1	Polyformaldehyde		
6	Body	1	Extruded aluminum(6005-T5)	Hard anodized	
7	Inside washer	1	Polyformaldehyde		
8	Cam	1	45# steel		
9	O-ring (Shaft top)	1	NBR		Viton / LITNBR
10	Bearing (Shaft top)	1	Polyformaldehyde		
11	Drive Shaft	1	Alloy steel	Nickel plated	Stainless steel
12	Bearing (Shaft bottom)	1	Polyformaldehyde		
13	O-ring (Shaft bottom)	1	NBR		Viton / LITNBR
14	O-ring (Adjust screw)	2	NBR		Viton / LITNBR
15	Gasket	2	Stainless steel		
16	Nut	2	Stainless steel		
17	Adjust screw	2	Stainless steel		
18	Piston	2	Cast aluminum	Anodized	
19	Guide (Piston)	2	Nylon 66		
20	O-ring (Piston)	2	NBR		Viton / LITNBR
21	Bearing (Piston)	2	Polyformaldehyde		
22	Spring	0~12	Spring steel	Electrophoretic paint	
23	O-ring (End cap)	2	NBR		Viton / LITNBR
24	End cap	2	Cast aluminum	Powder polyester painted etc	
25	Cap screw	8	Stainless steel		
26	Plug	2	NBR		
27	Dustproof plug	2	Plastic		

10 Dimensions



	FRONT VIEW	SIDE VIEW	TOP VIEW
AT-32			
AT-40			
AT-52~270			
AT-300~400			

Dimensions

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
A	114	120	147	165	182	208	262	270	298	301	395	454	528	536	608	721	769	909	925
B	55	65	71.5	83	95	103	108.5	121.5	134	142	152.5	174	206	226	260	294	406	460	516
C	49	60	72	88	99.5	109	116.5	133	144	155	172	197	230	255	289	328	348	408	480
D	69	80	92	108	119.5	129	136.5	153	164	175	192	217	260	285	319	358	378	438	510
E	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø40	Ø55	Ø55	Ø55	Ø55	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80	Ø80
F	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8
G	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
H	80	80	80	80	80	80	80	80	80	80	80	80	130	130	130	130	130	130	130

Connection

Air connection NAMUR	Bottom view ISO 5211/DIN 3337	Shaft top NAMUR
<p>ARC32-240 ARC270-400</p>	<p>标准/Standard 可选/Options</p> <p>ARC 32系列/Except ARC-32</p>	<p>M6</p>

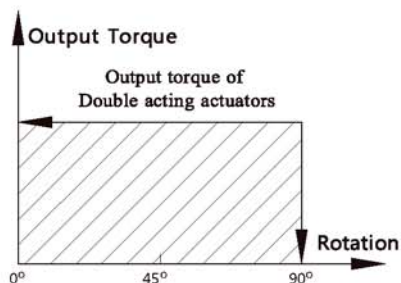
Connection

Model	32	40	52	63	75	83	92	105	115	125	140	160	190	210	240	270	300	350	400
M	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	45	45	45	45
N	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	40	40	40	40
O	G1/8"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/4"	G1/2"	G1/2"	G1/2"	G1/2"
P	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M6x10	M6x10	M6x10	M6x10
Q	/	F03	F03	F05	F05	F05	F05	F07	F07	F10	F10	F10	F10	/	/	/	/	F16	F16
Q1	F03	F05	F05	F07	F07	F07	F07	F10	F10	F10	F12	F12	F14	F14	F16	F16	Ø215	F25	F25
R	/	M5x8	M5x8	M6x10	M6x10	M6x10	M6x10	M8x13	M8x13	M8x13	M10x16	M10x16	/	/	/	/	M20x25	M20x25	M20x25
R1	M5x8	M6x9	M6x9	M8x13	M8x13	M8x13	M8x13	M10x16	M10x16	M12x19	M12x19	M12x19	M16x24	M16x24	M20x25	M20x25	M16x24	M16x24	M16x24
S	9x11	11x14	11x14	14x18	14x18	17x21	17x21	22x26	22x26	22x26	27x31	27x31	36x40	36x40	46x50	46x50	46x60	46x60	55x60
T	10	10	10	10	10	10	14	14	22	22	22	22	32	32	32	32	32	32	32
U	12	12	12	12	12	12	12	12	10	10	10	10	12	12	12	12	12	12	12

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11. Output Torque

For Double Acting Actuator



/ Torque Unit: Nm

Model	Air supply pressure (Unit: bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
AT-32DA	3	4	5	6	7	8	8	9	11	12
AT-40DA	5	6	7	10	11	12	13	14	17	19
AT-52DA	8	10	12	16	18	20	22	24	28	32
AT-63DA	15	18	22	29	33	36	40	44	51	58
AT-75DA	20	25	30	40	45	50	55	60	70	80
AT-83DA	31	39	47	63	70	78	86	94	110	125
AT-92DA	45	56	68	90	102	113	124	135	158	181
AT-105DA	66	83	99	132	149	165	182	198	231	264
AT-115DA	86	108	130	173	194	216	238	259	302	346
AT-125DA	100	125	150	200	226	251	276	301	351	401
AT-140DA	171	214	256	342	385	427	470	513	598	684
AT-160DA	266	332	399	532	598	665	731	798	931	1064
AT-190DA	426	532	638	851	958	1064	1170	1277	1490	1702
AT-210DA	532	665	798	1064	1197	1330	1463	1596	1862	2128
AT-240DA	769	962	1154	1539	1731	1924	2116	2308	2693	3078
AT-270DA	1170	1462	1754	2339	2632	2924	3216	3509	4094	4679
AT-300DA	1526	1908	2289	3052	3434	3815	4197	4578	5341	6104
AT-350DA	2285	2856	3427	4570	5141	5712	6283	6854	7997	9139
AT-400DA	3256	4070	4884	6512	7326	8140	8954	9768	11396	13024

*



Sizing: Double Acting Actuator

The suggested safety factor for double acting actuators under normal working conditions is 20%-30%

Example:

The torque needed by valve=100N.m

The torque considered safety factor (1+30%)=130N.m

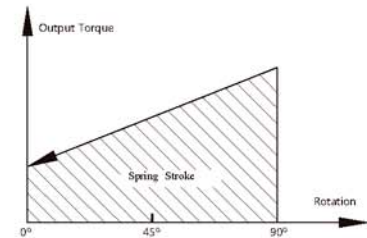
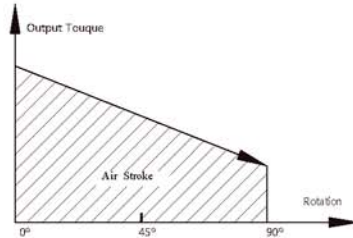
Air Supply=5Bar

According to the above table, we can select the model ARC105-DA.

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For Spring Return Actuator



		Output torque of air to springs														Spring's output	
Air	Spring Qty.	2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar		90°	0°
Model		0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90°	0°
AT-40	SR2					5.6	3.4	7.6	5.4	9.6	7.4	12.6	10.4	14.6	12.4	6.6	4.4
AT-52	SR5	5.7	3.8	7.6	5.7											6.2	4.3
	SR6	4.9	2.5	6.9	4.5	10.9	8.5									7.4	5.0
	SR7	4.0	1.3	6.0	3.3	9.8	7.3	14.0	10.4							8.6	5.9
	SR8			5.2	2.0	9.2	6.0	13.2	9.1	17.2	14.1					9.9	6.7
	SR9			4.3	0.8	8.3	4.8	12.3	7.9	16.3	12.8	20.3	16.8			11.1	7.6
	SR10					7.4	3.6	11.5	6.7	15.5	11.6	19.5	15.6			12.4	8.5
	SR11					6.6	2.3	10.6	5.4	14.6	10.4	18.6	14.3	22.6	18.3	13.6	9.3
	SR12							9.7	4.2	13.8	9.1	17.8	12.2	21.8	17.1	14.8	10.2
AT-63	SR5	11.4	7.7	15.0	11.4	22.3	14.9									10.4	6.8
	SR6	10.1	5.7	13.6	9.3	20.9	16.6	28.3	23.9							12.5	8.2
	SR7	8.6	3.6	12.5	7.2	19.5	14.5	26.8	21.9							14.6	9.6
	SR8			10.9	5.1	18.2	12.4	25.5	19.8	32.8	27.0	40.1	34.3			16.7	10.9
	SR9					16.8	10.4	24.1	17.7	31.4	24.9	38.7	32.2			18.8	12.3
	SR10					1.4	8.2	22.8	15.6	30.0	22.8	37.3	30.1	44.7	37.4	20.9	13.7
	SR11							21.5	13.5	28.7	20.7	36.0	28.0	43.3	35.3	22.9	15.0
	SR12							20.0	11.4	27.3	18.6	34.6	25.9	41.9	33.3	25.0	16.4
AT-75	SR5	14.5	10.6	19.4	15.5	29.5	25.7									14.5	10.5
	SR6	12.4	7.6	17.3	12.6	27.4	22.7	37.5	32.8							17.4	12.7
	SR7	10.4	4.8	15.2	9.7	25.3	19.9	35.4	29.9							20.3	14.8
	SR8			13.1	6.8	23.1	16.9	33.3	27.0	43.2	37.0	53.3	47.0			23.2	16.9
	SR9					21.0	14.1	31.2	24.1	41.1	34.1	51.2	44.2			26.1	19.0
	SR10					19.0	11.1	28.8	21.2	39.0	31.2	49.1	41.2	59.1	51.2	29.0	21.1
	SR11							27.0	18.3	37.0	28.3	47.0	38.4	57.0	48.4	31.9	23.2
	SR12							24.9	15.4	34.9	25.4	44.9	35.4	54.9	45.4	34.7	25.3
AT-83	SR5	23.3	16.1	31.1	24.0	46.8	39.7									23.0	15.8
	SR6	20.1	11.5	28.0	19.3	43.7	35.1	59.4	50.7							27.6	19.0
	SR7	17.0	6.9	24.8	14.8	40.5	30.5	56.2	46.2							32.2	22.1
	SR8			21.7	10.1	37.4	25.8	53.1	41.5	68.8	57.2	84.5	72.9			36.8	25.3
	SR9					34.2	21.3	49.9	37.0	65.6	52.6	81.2	68.3			41.4	28.5
	SR10					31.0	16.6	46.7	32.3	62.4	48.0	78.1	63.7	93.8	79.3	46.0	31.6
	SR11							43.6	27.7	59.3	43.4	75.0	59.1	90.6	74.8	50.6	34.8
	SR12							40.4	23.2	56.1	38.9	71.7	54.5	87.4	70.2	55.2	38.0

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Output torque of air to springs																		
Air pressure		2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar		Spring's output		
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	
AT-92	SR5	33.1	22.0	44.2	33.2	66.8	55.9										34.4	23.3
	SR6	28.4	15.2	39.6	26.4	62.2	49.0	84.8	71.6								41.2	28.0
	SR7	23.8	8.2	34.9	19.4	57.5	42.1	80.2	64.7								48.1	32.7
	SR8			31.3	12.6	52.9	35.2	75.5	57.9	98.1	80.5	120.7	103.0				55.0	37.3
	SR9					48.2	28.4	70.9	51.0	93.5	73.6	116.0	96.1				61.9	42.0
	SR10					43.6	21.5	66.2	44.1	88.8	66.7	111.3	89.2	134.0	111.8		68.7	46.7
	SR11							61.5	37.2	84.1	59.9	106.6	82.4	129.2	105.0		75.6	51.4
	SR12							56.8	30.4	79.4	53.0	101.9	75.5	124.5	98.1		82.5	56.0
AT-105	SR5	51.0	33.4	67.5	49.9	100.6	83.0										49.2	31.6
	SR6	44.7	23.5	61.1	40.0	94.2	73.2	127.3	106.2								59.1	38.0
	SR7	38.4	13.7	54.9	30.3	87.9	63.4	121.0	96.4								68.9	44.3
	SR8			48.5	20.4	81.6	53.5	114.7	86.5	147.7	119.6	180.8	152.7				78.7	50.6
	SR9					75.3	43.7	108.4	76.8	141.5	109.8	174.5	142.9				88.6	56.9
	SR10					68.9	33.4	102.0	66.5	135.1	99.6	168.2	132.6	201.2	165.7		98.4	63.3
	SR11							95.7	57.0	128.7	90.1	161.8	123.1	194.8	156.2		108.3	69.6
	SR12							89.4	47.5	122.5	80.6	155.5	113.6	188.6	146.7		118.1	75.9
AT115	SR5	65	43	87	65	130	108										65	43
	SR6	56	30	78	52	121	95	164	138								78	52
	SR7	47	17	69	39	112	82	155	125								91	61
	SR8			61	26	104	69	147	112	190	155	233	198				104	69
	SR9					95	56	138	99	181	142	224	185				117	78
	SR10					86	43	129	86	172	129	215	172	259	216		130	87
	SR11							121	73	164	116	207	159	251	203		143	95
	SR12							112	60	156	104	198	146	242	190		156	104
AT-125	SR5	73	47	98	72	148	122										79	52
	SR6	63	31	88	56	138	107	188	157								94	63
	SR7	52	15	77	40	127	90	178	141								110	73
	SR8			67	25	117	75	167	125	217	176	268	226				125	84
	SR9					107	59	157	109	207	159	257	210				141	94
	SR10					96	44	146	94	196	144	247	194	297	245		157	105
	SR11							136	78	186	128	236	178	286	228		173	115
	SR12							125	63	176	113	226	163	276	213		188	125
AT-140	SR5	128	85	171	127	256	213										129	86
	SR6	111	59	154	102	239	187	325	273								155	103
	SR7	94	33	137	76	222	162	308	247								181	120
	SR8			120	50	205	136	291	221	376	307	462	392				206	137
	SR9					187	110	273	196	358	281	444	367				232	155
	SR10					170	84	256	169	341	255	427	340	512	426		258	172
	SR11							238	143	324	229	409	314	495	400		284	189
	SR12							221	118	307	203	392	289	478	374		310	206
AT-160	SR5	193	124	259	191	392	324										208	140
	SR6	165	83	232	149	365	282	498	415								250	168
	SR7	137	41	203	107	336	240	469	373								292	196
	SR8			176	66	309	199	442	237	575	465	708	598				333	223
	SR9					280	157	413	290	546	423	679	556				375	251
	SR10					253	115	386	248	519	381	652	514	785	647		417	279
	SR11							358	207	491	340	624	473	757	606		458	307
	SR12							330	165	463	298	596	431	729	564		500	335
AT-190	SR5	332	222	438	329	651	542										309	200
	SR6	292	161	398	267	611	480	824	693								371	240
	SR7	252	99	358	205	571	418	784	631								433	280
	SR8			318	143	531	356	744	569	957	782	1169	995				495	320
	SR9					491	295	704	507	917	720	1130	933				557	360
	SR10					451	233	664	446	877	658	1090	871	1302	1084		618	400
	SR11							624	384	837	579	1050	809	1263	1022		680	440
	SR12							584	322	797	535	1010	748	1223	960		742	480

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Output torque of air to springs																	
Air pressure		2.5 Bar		3 Bar		4 Bar		5 Bar		6 Bar		7 Bar		8 Bar		Spring's output	
Model	Spring Qty.	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
AT-210	SR5	390	285	523	418	789	684									380	275
	SR6	335	209	468	342	734	608	1000	874							456	330
	SR7	280	133	413	266	679	532	945	798							532	385
	SR8			358	190	624	456	890	722	1156	988	1422	1254			608	440
	SR9					569	380	835	646	1101	912	1367	1178			684	495
	SR10					514	304	780	570	1046	836	1312	1102	1578	1368	760	550
	SR11							725	494	991	760	1257	1026	1523	1292	836	605
	SR12							670	418	936	684	1202	950	1468	1216	912	660
AT-240	SR5	552	109	744	600	1129	985									554	410
	SR6	470	297	662	489	1047	874	1432	1259							665	492
	SR7	388	187	580	379	964	764	1349	1149							775	575
	SR8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656
	SR9					800	542	1185	926	1569	1311	1954	1696			998	739
	SR10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821
	SR11							1021	705	1406	1090	1791	1474	2176	1859	1219	903
	SR12							939	594	1323	979	1708	1363	2093	1748	1330	985
AT-270	SR5	903	675	1195	968	1779	1552									787	560
	SR6	790	519	1083	811	1667	1396	2252	1981							943	672
	SR7	679	316	972	654	1556	1238	2141	1823							1101	783
	SR8			860	497	1444	1081	2029	1666	2614	2252	3199	2836			1258	895
	SR9					1332	923	1917	1509	2502	2094	3087	2678			1416	1007
	SR10					1220	767	1805	1352	2390	1937	2974	2521	3560	3107	1572	1119
	SR11							1693	1194	2278	1779	2862	2364	3448	2949	1730	1231
	SR12							1582	1037	2167	1623	2751	2207	3336	2792	1887	1342
AT-300	SR5	1097	729													1061	730
	SR6	935	494	1316	875											1273	876
	SR7	772	258	1153	639	1916	1402									1485	1022
	SR8			991	403	1754	1166	2517	1929							1697	1168
	SR9					1592	930	2355	1693	3118	2456					1909	1314
	SR10					1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	SR11							2030	1222	2793	1985	3556	2748	4319	3511	2334	1606
	SR12							1868	986	2631	1749	3394	2512	4157	3275	2546	1752
AT-350	SR5	1553	964													1702	1173
	SR6	1292	586	1863	1157											2043	1408
	SR7	1031	208	1602	779	2745	1922									2383	1642
	SR8			1341	401	2484	1544	3626	2686							2724	1877
	SR9					2224	1165	3336	2307	4508	3449					3064	2112
	SR10					1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	SR11							2844	1551	3986	2693	5129	3836	6271	4978	3745	2581
	SR12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816
AT-400	SR7	2028	869													2880	1837
	SR8	1736	411	2550	1225											3292	2100
	SR9			2259	768	3887	2396									3703	2362
	SR10			1967	311	3595	1939	5223	3567							4115	2624
	SR11					3303	1482	4931	3110	6559	4738					4526	2887
	SR12					3012	1025	4640	2653	6268	4281	7895	5908	9523	7536	4938	3149
	SR13							4348	2195	5976	3823	7603	5450	9231	7078	5349	3412
	SR14							4057	1738	5685	3366	7312	4993	8940	6621	5761	3674
SR15							3765	1281	5393	2909	7020	4536	8648	6164	6172	3937	
	SR16									5101	2452	6728	4079	8356	5707	6584	4199

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LIMIT SWITCH BOX IVR 796



FEATURES AND BENEFITS

- Powder Coated Aluminium Switchbox to IP67 fitted with 2 x SPDT switches for indication of gully open and fully closed positions.
- Solid and compact design with high visibility beacon indicator.
- Captive cover bolts are safely retained during installation and maintenance.
- The spring loaded splined cams are easily adjustable with no tools required.
- Dual cable entries are provided.
- The switchbox is mounted to the actuator using a NAMUR

OPTIONS:

- Proximity Sensors
- 3-Way Indication
- Various Colours
- IP68

MATERIAL

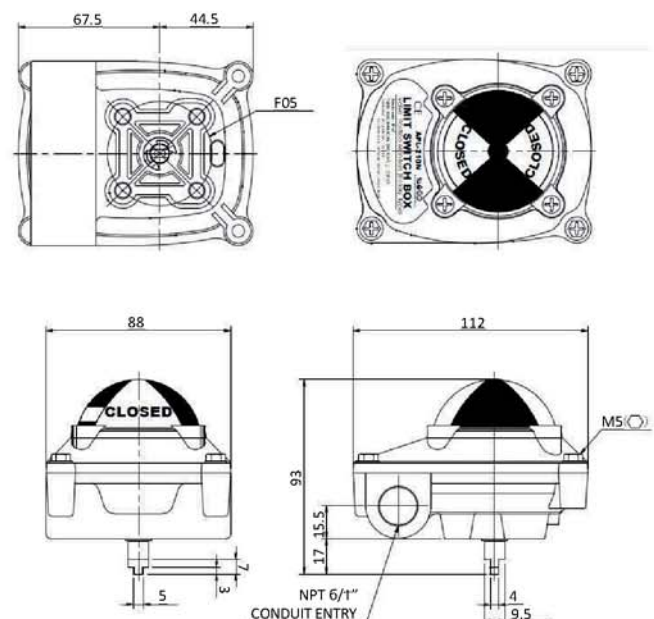
ITEM	COMPONENT	MATERIAL
1	Housing Cover & Body	Aluminium Die-Casting
2	Shaft	Stainless Steel
3	Indicator Cover	Polycarbonate
4	Cam	Polycarbonate
5	Spring	Stainless Steel
6	Housing Cover Bolt	Stainless Steel
7	O-Ring	NBR
8	Bushing	Bronze
9	E-Ring (Shaft)	Stainless Steel
10	Earth Lug	Stainless Steel
11	Indicator	ABS/Polycarbonate
12	Bracket	iron



TECHNICAL SPECIFICATION

- **Enclosure:** Weatherproof IP67
- **Cable Entries:** Two NPT 1/2"
- **Ambient Temperature:** -20°C - 80°C
- **Terminal Strips:** 8 points (0.08-2.5mm²)
- **Position Indicator:** 0-90°
(90° turn free join close: red & open: yellow)
- **Switches:** Mechanical Switch x 2
Proximity Sensor x 2
- **Painting:** Chromate Polyester Powder Coating

DIMENSIONS [MM]



APPLICATIONS

Challenger Valves and Actuators are the **öRight Choice for Valves and Actuation** when quality matters.

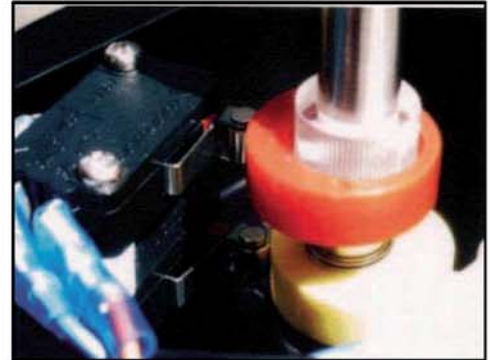
Servicing industries such as : Water & Waste Water, Mining, Desalination, Pumping, Industrial Processing, Irrigation, Materials Handling and Chemical Services.

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STANDARD SWITCHES - MECHANICAL

- 2SPDT Switches
- Contact Arrangement:
 - 250V AC/16A
 - 250V DC/0.3A
 - 125V DC/0.6A
 - 30V DC/10A
- Operating Frequency:
 - 600 Operating per minute max (Mechanically)
 - 60 Operating per minute max (Electrical)



PROXIMITY SWITCHES NJ2-V3-N P&F

- Intrinsically Safe
- Inductive Proximity Sensor
- Voltage Range - 8V DC
- Operating Distance



ADJUSTMENTS

Challenger limit switch boxes are factory set, and should not require any adjustment, however if final adjustment in the field is required the following procedures must be followed.

Adjustment Mechanical Switch

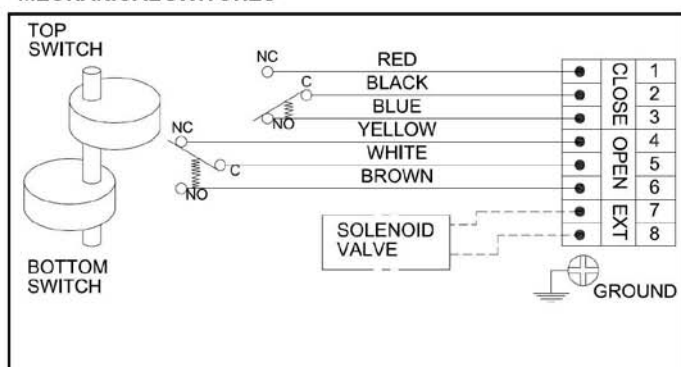
1. Isolate Electrical Supply
2. Unscrew captive bolts
3. Remove the top cover, be careful not to damage the O-ring seal.
4. You will find two coloured quick set cams (1) & (2), one cam for each limit switch
5. Gently press down and rotate each spring loaded cam, against the mechanical switch lever until the desired contact is made and release. The cam is now set in the desired position.

Adjustment Proximity Sensor

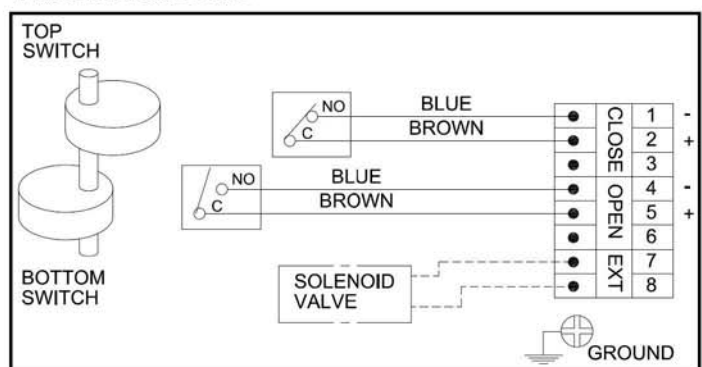
1. Isolate Electrical Supply
2. Unscrew captive bolts
3. Remove the top cover, being careful not to damage the O-ring seal.
4. You will find two coloured quick set cams (1) & (2), one cam for each sensor.
5. The proximity cams have a target indicators fitted, one for each cam, simply press down and rotate each spring loaded cam to the target marked on the proximity sensor and release the cam.

WIRING DIAGRAM

MECHANICAL SWITCHES



PROXIMITY SWITCHES



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NAMUR IVR 797



4M Series 2positions/5ways Plate Type Solenoid Valve :



1. Ordering Code :

4M - **2** - **10** - **08** - **AC220V**

Solenoid Valve Type

ate type solenoid valve

Body size

2: 200 series(G1/8,G1/4)

3: 300 series(G1/4,G3/8)

Connecting port size

10: Single-head 20: for two positions

DC5V DC12V DC24V AC24V 50/60Hz

AC110V 50/60Hz AC220V 50/60Hz AC380V 50/60Hz

Connecting port size

06: G1/8

08: G1/4

M5: M5x0.8

10: G3/8

15: G1/2

Voltage

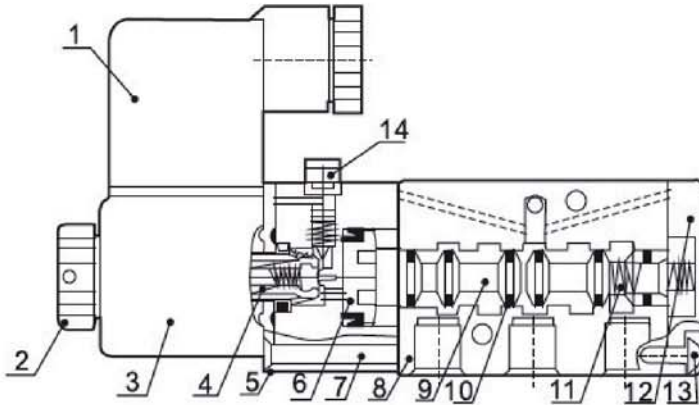
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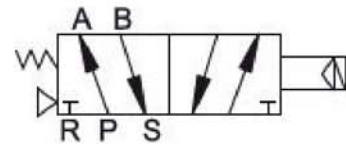
2.Characteristics:

- 1) The protection grade for this series solenoid valve is IP65.
- 2) Different voltages are available for coils.
- 3) Pressure unit: $1\text{kgf/cm}^2=1\text{bar}=0.1\text{MPa}=100\text{KPa}=14.5\text{psi}$
- 4) Lead wire type is available, please remind when you order.
- 5) Different thread types can be offered according to customers' requirements, e.g.: PT, NPT etc.

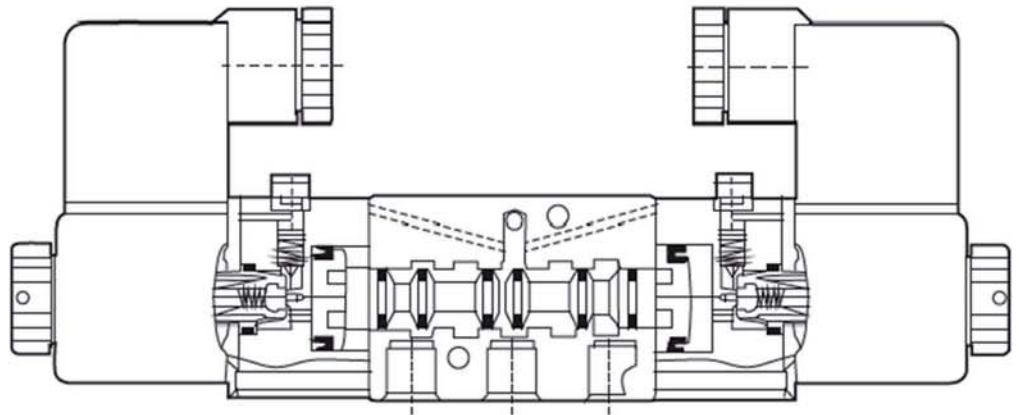
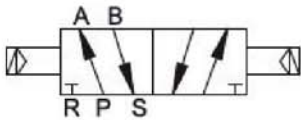
3.Internal Structure:



Single-Head Type
(4M310)



Double-Head Type
(4M320)



No.:	Designation	No.:	Designation	No.:	Designation
1.	Connector	6.	Piston	11.	Spring
2.	Nut	7.	Screw	12.	Rear cover
3.	Coil	8.	Valve body	13.	Screw
4.	Pilot units	9.	Spool	14.	Manual pin
5.	Plate	10.	O ring		

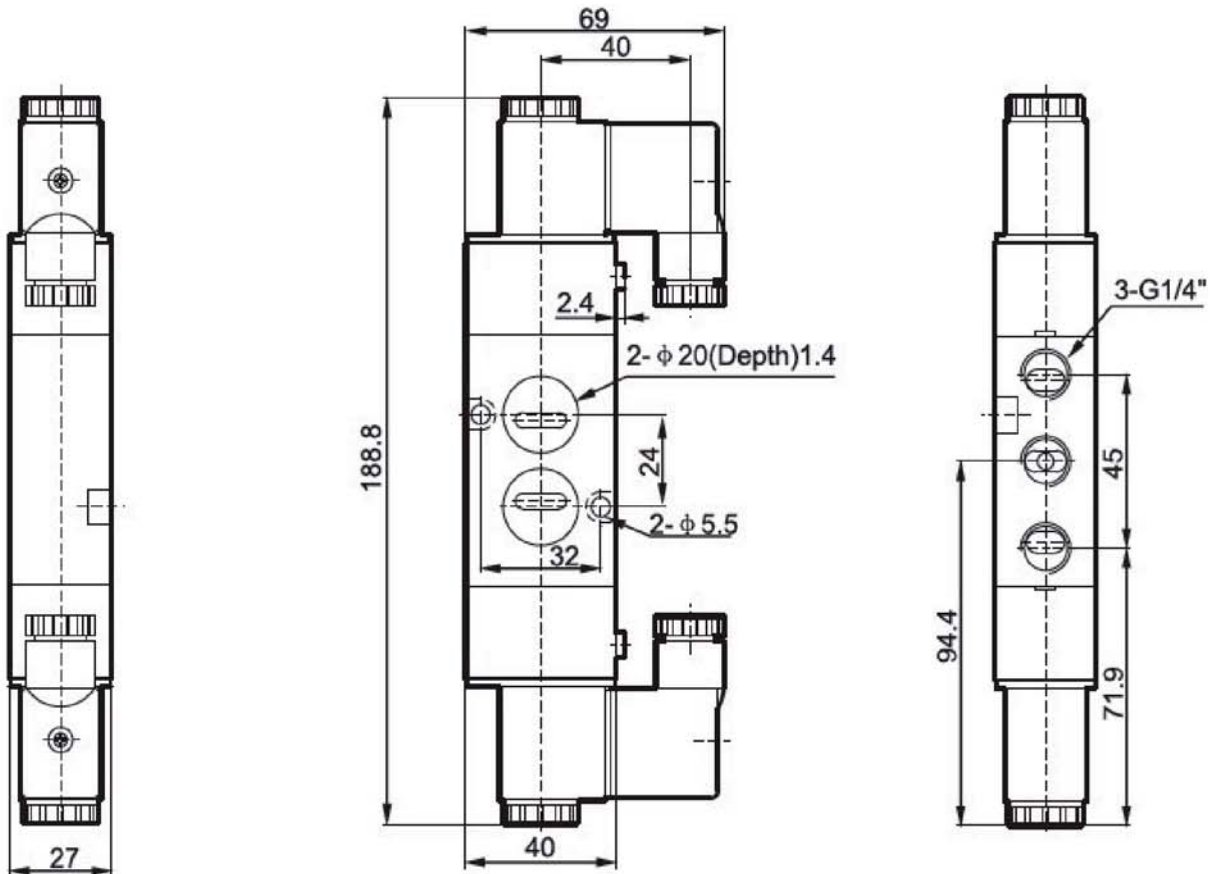
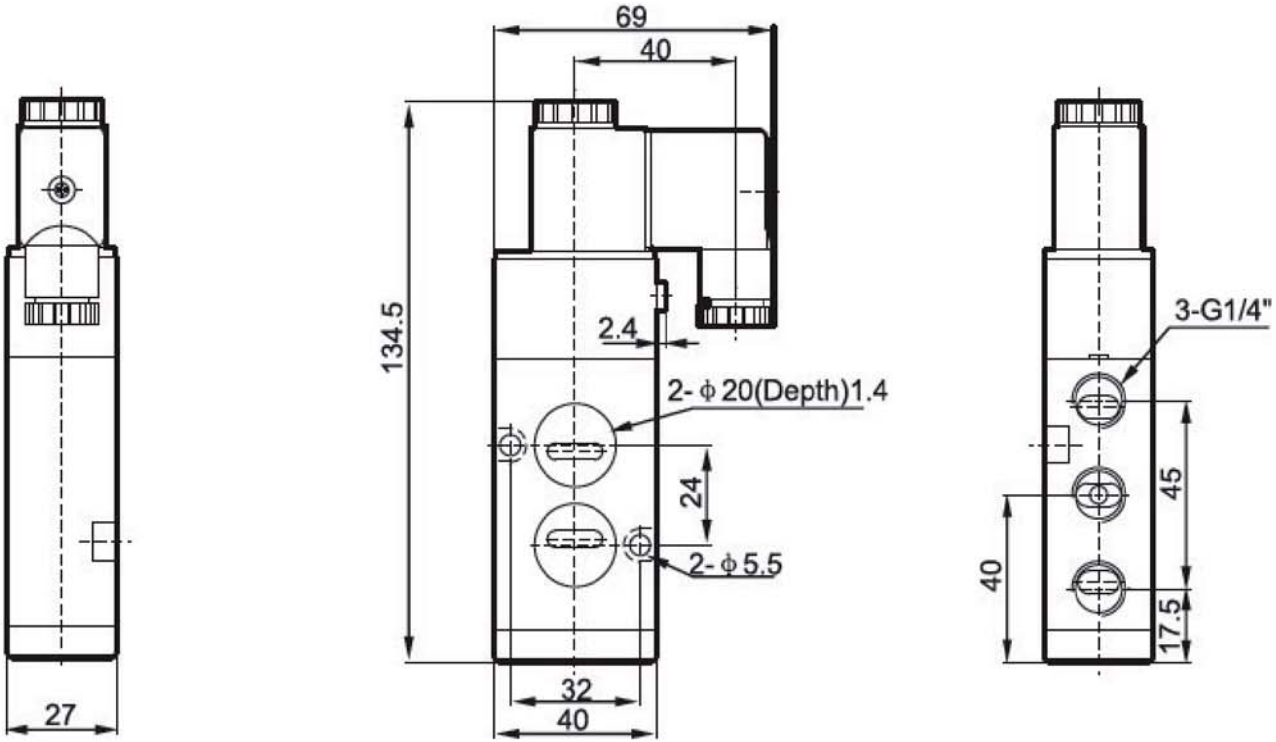
4. Specification:

Model	4M210-06	4M220-06	4M210-08	4M220-08	4M310-08	4M320-08	4M310-10	4M320-10
Applicable medium	≤40μ Filtered Air							
Motion pattern	Inner guide type							
Working pressure	0.15~0.8 MPa							
Proof Pressure	1.2MPa							
Temperature range	NBR: -10°C~60°C							
Port size	G1/8		G1/4		G1/4		G3/8	
Effective section area (mm ²)	14		16		25		30	
Cv Value	0.78		0.89		1.39		1.67	
Available Voltage	DC5, DC12V,DC24V,AC24V, AC110V,AC220V,AC380V							
Power consumption	AC220V:2W, AC110V:2.5W,AC24V:3.5W,DC24V:3W,DC12V:2.5W							
Voltage range	-15%~+10%							
Material of body	Aluminum alloy							
Highest action frequency	5 cycles/second							
Shortest excitation time	0.05 s							
Sealing material	NBR or VITON							

* 1 kgf/cm² = 1 bar = 0.1 Mpa = 100KPa = 14.5psi

5. Overall and Dimension Sheet:

4M310-08 -4M320-08



Tutte le caratteristiche tecniche dei prodotti sono soggette a modifiche senza preavviso - All product's technical specifications are subject to modification without prior notice