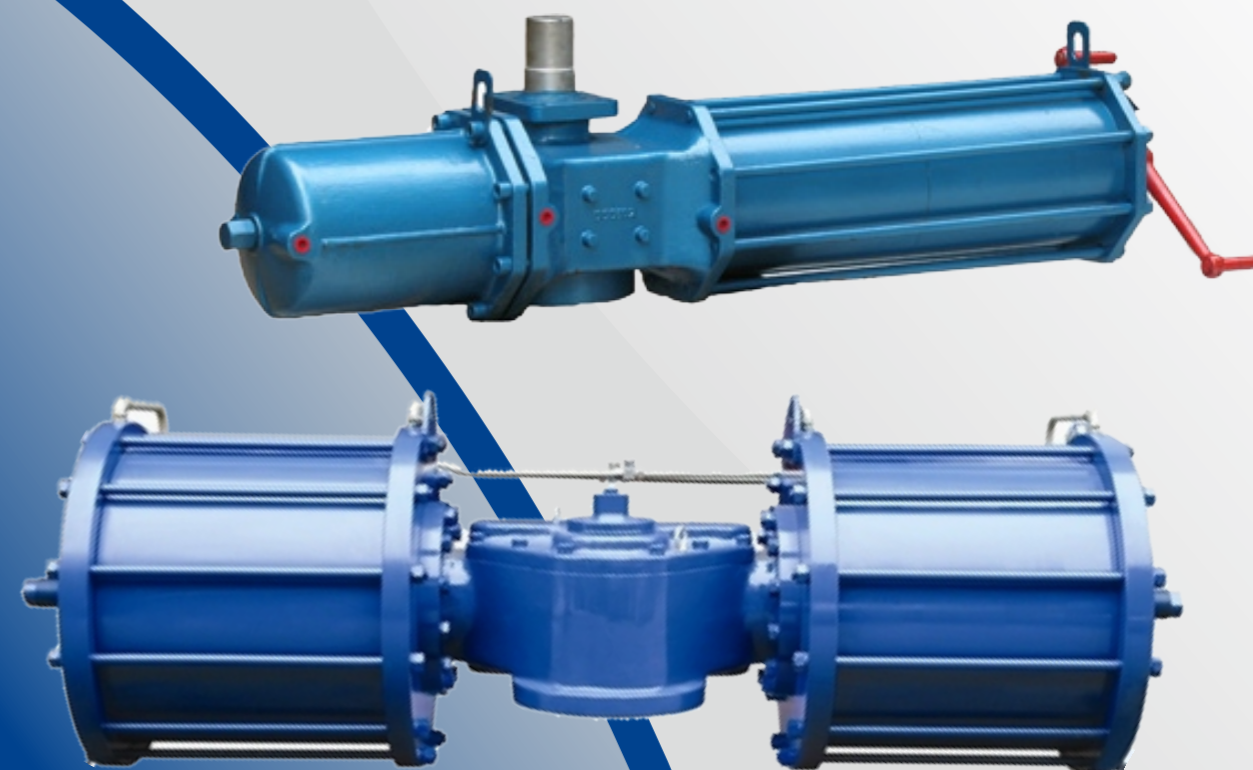


TANA[®]
WENZHOU TOPNOTCH MACHINE CO.,LTD.

AW SERIES PNEUMATIC ACTUATORS

www.tanamachine.com

TANA



WENZHOU TOPNOTCH MACHINE CO.,LTD.

Add:Heyi Industrial Zone, Oubei Town,Yongjia,Wenzhou,Zhejiang,China 325105

Tel:+86-577-67318591

Fax:+86-577-67328591

Mobile:+86-18906638592

E-mail:market@tanamachine.com

Website:www.tanamachine.com

Catalogue

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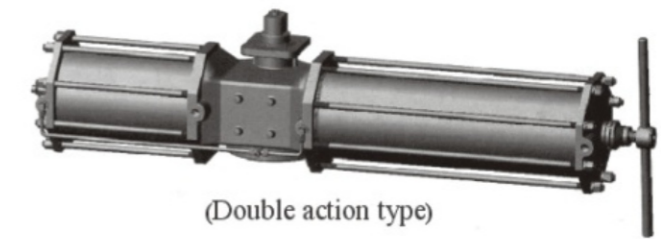
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General and characters

AW pneumatic performer consists of double action type and single action type (spring replacement), 2 separated cylinders, double piston, shifting fork type driving system, easy made cylinder of big size, big output torque, flexible and stable action, the inner wall of cylinder and coated hard chrome on shaft of piston are in good resistance of abrasion, there are non-oil lubricated bearing and guide ring to reduce friction coefficient and prolong the service life. The U shaped curve output torque of the AW pneumatic performer is more applicable to the ball valve with big caliber and the switching and adjustment of butterfly valve, also can be used for the other circumstance of 90-degree turning.



(Double action type)

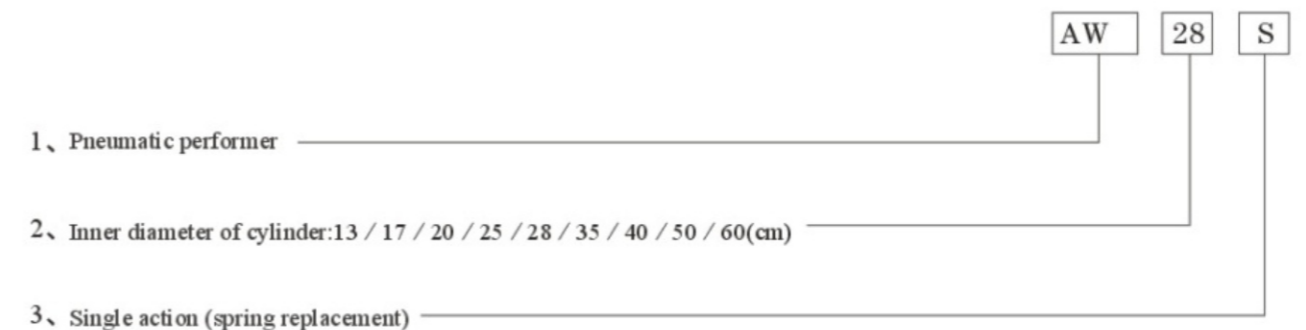


(Double action type)

Standard parameter

Basic design	Pneumatic double cylinder double piston shifting fork type driving system; Model AWxx=double action Model AWxxs=single action (spring replacement)
Turning angle	Double action: 90° ; Single action: 90° ; Adjustable angle from both ends: -5° ~ +5° .
Temperature of working environment	-20° C ~ 90° C。
Pressure of air source	0.2 ~ 0.8Mpa (maximum 1.0Mpa)

Organization of model



Choosing and installation of the performer

Confirm the torque of the valve and consider the medium of pipe before using AW pneumatic actuator. Vapor or non-lubrication medium should add the safety value by 25%. Dry air medium of non-lubrication medium should add the safety value by 60%. The grain or powder material of non-lubricated medium transported by air should add the safety value by 100%. The lubricated clean medium without abrasion should add the safety value by 20%, and find the correct model of performer in the torque table of double action or single action type according to the working pressure of the air source.

The precision of installation of pneumatic performer and valve directly influence the safe operation and service life of the actuator. Central axis performer and valve stem is coaxial and right connected means appropriate installation. Measure the torque of valve before assembly of the valve actuator, the torque should not exceed the required torque. Test the pneumatic and valve at same time after assembly, increasing the pressure to the valve to rated sealed pressure, the performer perform switching air input to the two air inlets with the air source pressure of 0.4-0.7Mpa or required air source pressure by customer, observe the opening and closing of the pneumatic valve, there should be no stop or creeping, the switching should be turned flexibly. Repeat tests should be performed.

Action and purpose of the performer and accessories

Double action pneumatic actuator: two-digit control of opening and closing of the valve

Spring replacement type: the valve automatically open or close when the air passage and electricity is cut or malfunctioned.

Single control solenoid valve: the valve open or close during electricity supply or break (anti-explode type can be provided).

Double control solenoid valve: the valve opens when a loop gets electricity, the valve closes when another loop gets electricity. There is action of memory (anti-explode type can be provided).

Limit switch signal responder: transport the signal of switching position of the valve in far distance (anti-explode type can be provided).

Electricity localizer: adjust the medium flow of the valve according to the signal of electricity (standard 4-20mA).

Electricity converter: convert the electricity signal into air source signal, matching the pneumatic localizer (anti-explode type can be provided).

Three connected component of air source treatment: include air pressure reducer, filter, atomized lubricator, lubricating action to the voltage stabilizing of air source, clean and moving parts.

Manual operated system: manual operation during malaction of autAWtically control.

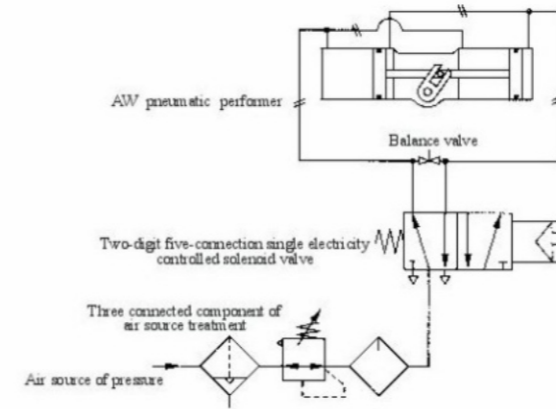
Notice of order

Pneumatic valve is the complicated automatically controlled instrument, consists of many pneumatic components. The users can choose following accessories according to needs and noted clearly in the technical agreement.

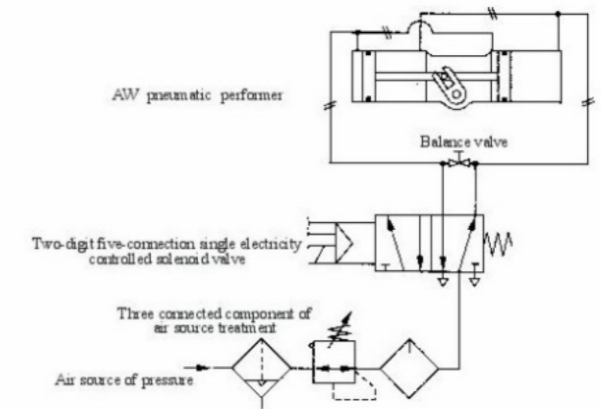
- 1 Pneumatic actuator: ① double action type, ② single action type, ③ model and specification, ④ action time
- 2 solenoid valve: ① single action pneumatic performer, ② double action pneumatic performer, ③ using voltage, ④ anti-explode type
- 3 signal feedback: ① mechanical switch, ② proximity switch, ③ output electricity signal, ④ using voltage, ⑤ anti-explode
- 4 localizer: ① electricity localizer, ② pneumatic localizer, ③ electricity signal, ④ air pressure signal, ⑤ electricity converter, ⑥ anti-exploder type
- 5 Three connected component of air source treatment: ① filtering pressure reducer, ② atomized lubricator
- 6 Manual operation system
- 7 Size of special joint
- 8 Special made to order

Piping principle of double action type

■ Normal close type (electrically started type)

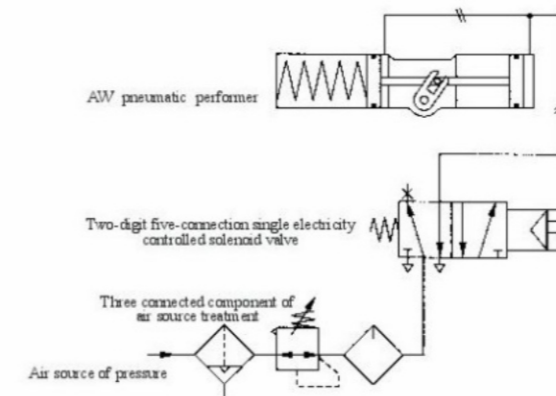


■ Normal open type (electrically started type)

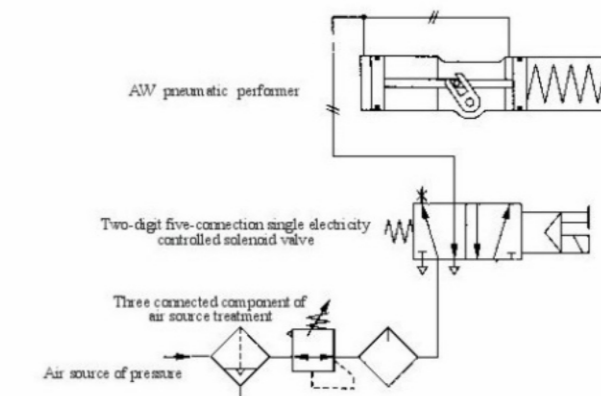


Piping principle of single action type

■ Normal close type (electrically started type)

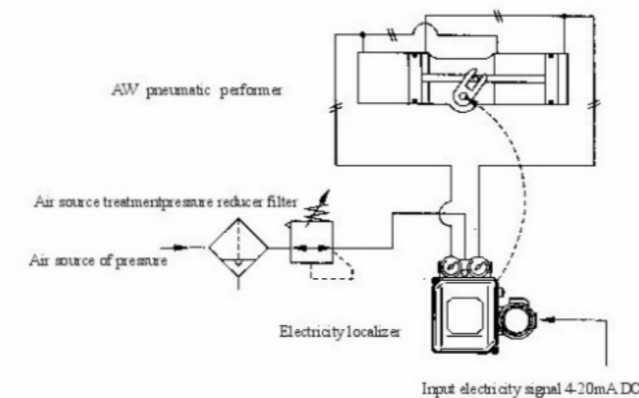


■ Normal open type (electrically started type)

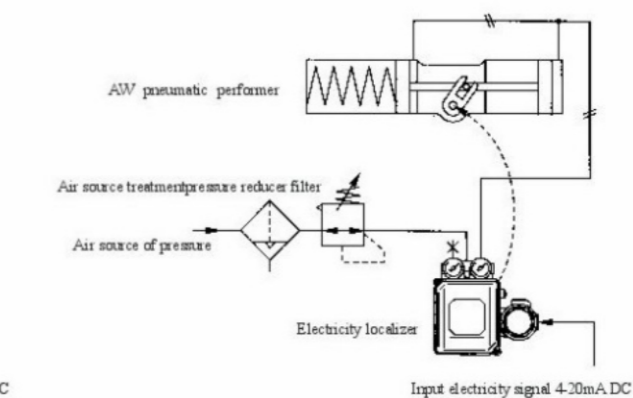


Piping principle of adjustable type (provided with electricity localizer)

■ Double action type



■ Single action type



VALVE PNEUMATIC ACTUATOR

Input torque of double action type

Unit:N.m

Model and specification	Air source pressure (Mpa)				
	0.3	0.4	0.5	0.6	0.7
AW13	515	620	770	930	1080
AW17	950	1270	1590	1910	2230
AW20	2150	2870	3580	4300	5020
AW25	3360	4480	5600	6720	7850
AW28	5150	6860	8580	10300	12020
AW35	10120	13500	16870	20250	23620
AW40	13220	17630	22040	26450	30860
AW50	22460	29950	37440	44930	52420
AW60	47300	63070	78840	94610	110380

Input torque of single action type

Unit:N.m

Model and specification	Spring torque		Air source pressure (Mpa)					
			0.4		0.5		0.6	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
AW13S	230	430	185	340	340	545	490	700
AW17S	330	670	600	930	920	1290	1230	1573
AW20S	1190	1980	880	1670	1600	2390	2320	3110
AW25S	1600	2510	1970	2880	3090	4000	4210	5120
AW28S	2900	5610	1250	3960	2970	5685	4680	7400
AW35S	5520	10740	2760	7970	6130	11340	9510	14720
AW40S	8770	16140	1480	8860	5900	13260	10300	17670
AW50S	13110	27490	6370	20750	14840	29220	23310	37700

Measurement of cubage of cylinder and air consumption

Model and specification		AW13	AW17	AW20	AW25	AW28	AW35	AW40	AW50	AW60
Cubage of cylinder (L)	Double action type A+B	6.5	14.3	30.8	48.5	73.0	148.2	193.2	350	630
	Single action type B	3.25	7.15	15.4	24.2	36.5	74.1	96.1	175	315
Weight (kg)	Double action type	48	82	170	195	325	600	800	1070	1580
	Single action type	65	116	223	280	450	845	1070	1400	

Calculation formula of double action type $V=(A+B)\{(P+101.2) \div 98\}M$

V: air consumption

Calculation formula of single action type $V=A\{(P+101.2) \div 98\}M$

P: air source pressure

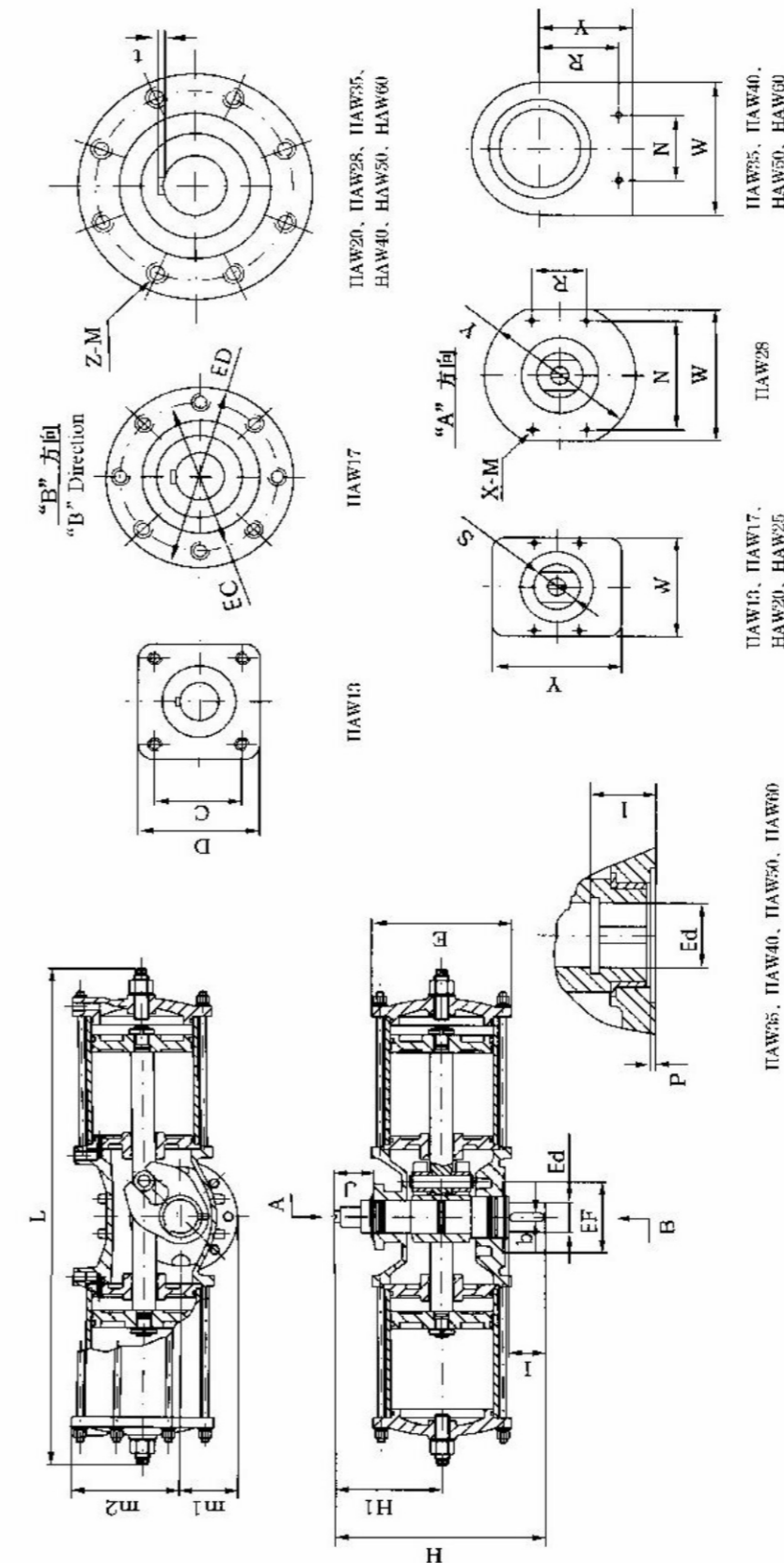
M: repeating time per minute of the piston

Note: convert the MPa into Kpa and multiply by 1000

A, B: cubage of cylinder (see table)

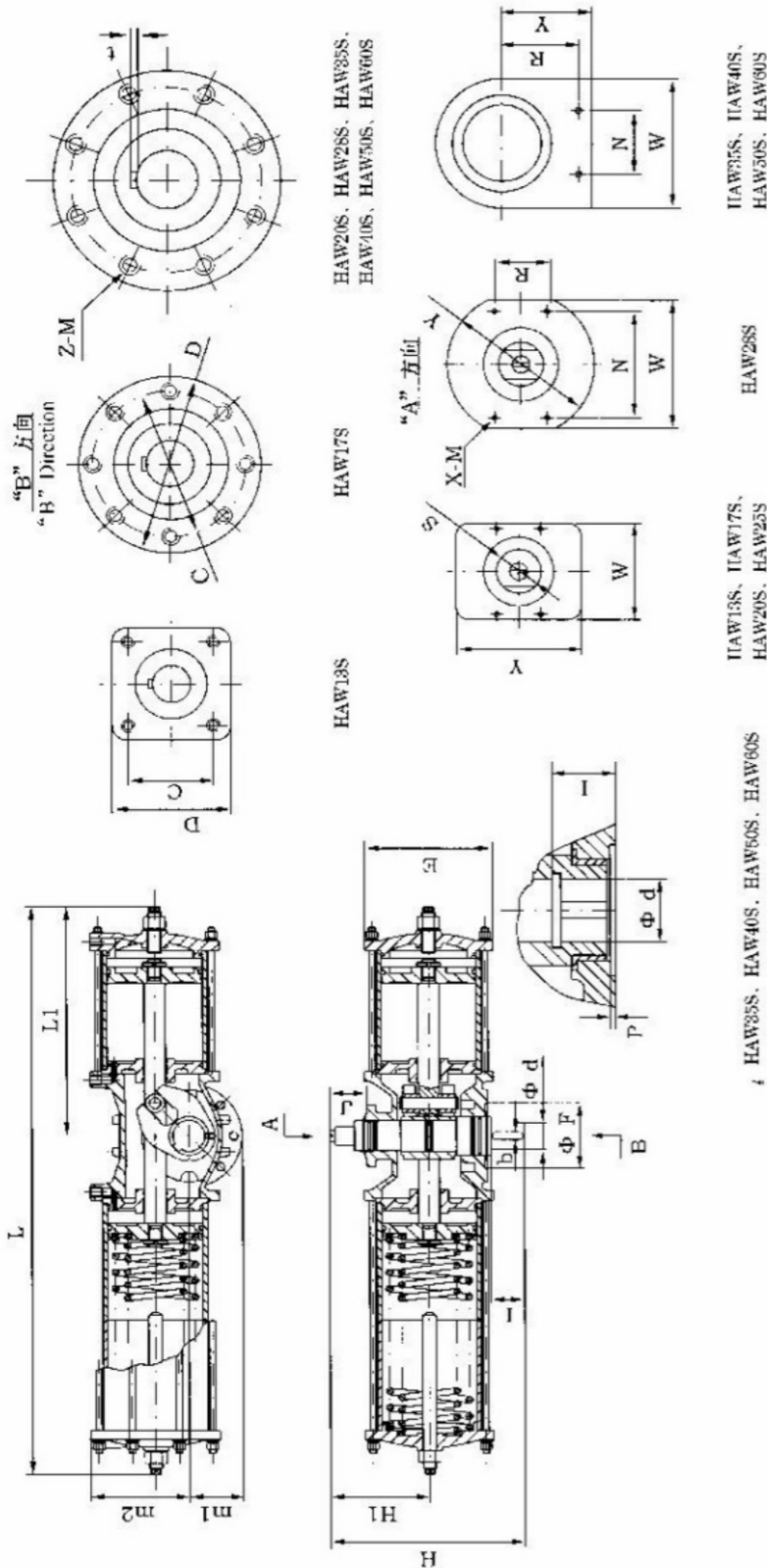
VALVE PNEUMATIC ACTUATOR

Dimension of appearance of double action type



Model	L	H	H1	m1	m2	E	EC	ED	Z-M	Ed	I	EF	P	b	t	J	Y	S	W	N	R	X-M	Joint of air source		
																							G1/4	G3/8	G1/2
AW13	640	266	138	66	134	168	100	132	4-M16	42	37	80	4	12	3	54	95	45	85	70	35	4-M6	G1/4		
AW17	827	348	177	95	175	230	160	190	8-M16	50	60	120	4	14	3.5	66	143	55	112	100	50	4-M6	G3/8		
AW20	1162	425	212	116	233	270	200	232	8-M16	64	74	140	4	18	4	78	157	70	137	120	50	4-M6	G1/2		
AW25	1162	425	212	118	258	320	200	235	8-M20	85	100	220	4	18	4	78	157	70	137	120	50	4-M6	G1/2		
AW28	1380	527	252	118	300	362	280	318	8-M24	105	136	220	4	25	5	84	E25.5	90	227	180	60	4-M6	G1/2		
AW35	1860	820	335	175	370	440	300	350	8-M24	105	136	220	10	28X2	6.4	20	150	-	203	60	130	2-M8	G1/2		
AW40	1860	820	335	175	370	490	300	350	8-M24	105	136	220	10	28X2	6.4	20	150	-	203	60	130	2-M8	G1/2		
AW50	2350	1035	415	200	480	600	350	400	12-M24	120	164	280	10	32	7.4	20	180	-	230	60	160	2-M8	G1/2		
AW60	2800	1276	506	250	570	700	450	500	12-M24	140	192	360	10	36	8.5	20	220	-	256	60	160	2-M8	G1/2		

Dimension of appearance of single action type



HAW35S, HAW40S, HAW50S, HAW60S

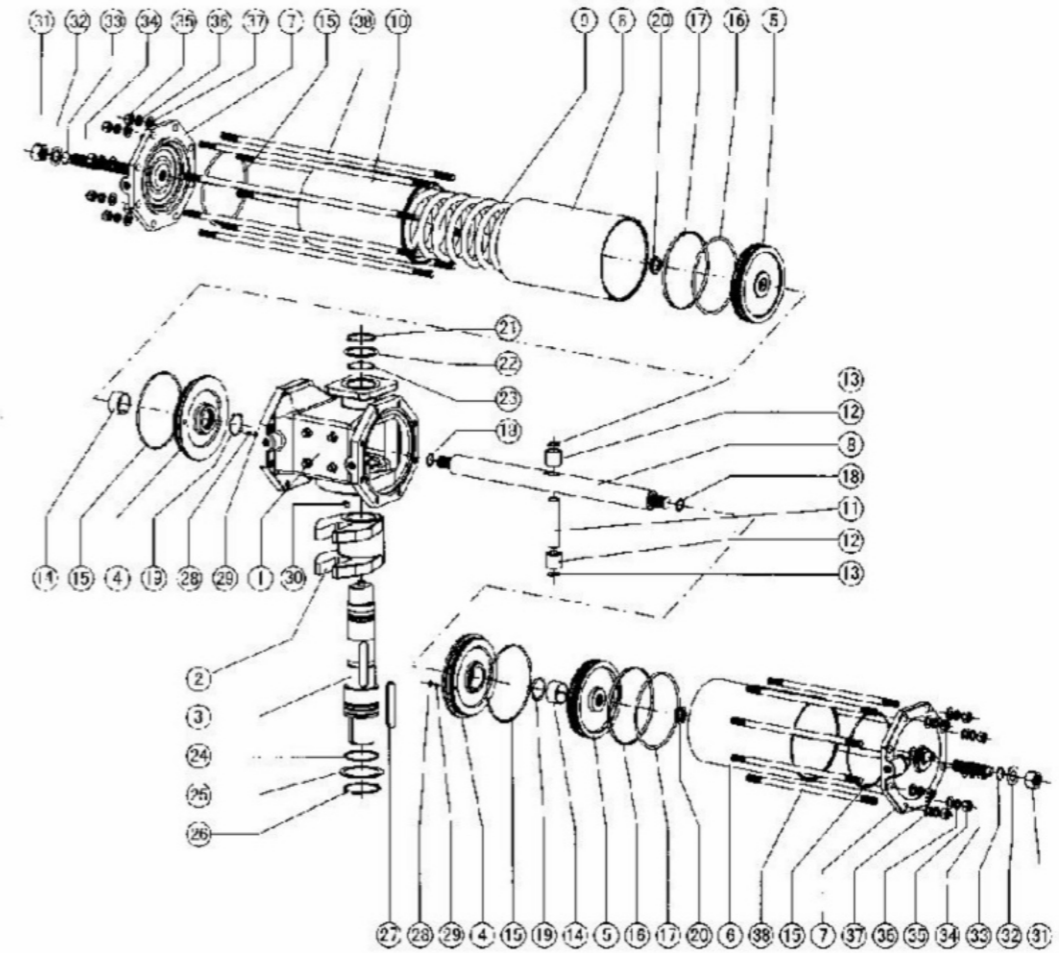
HAW28S

HAW13S, HAW17S, HAW20S, HAW25S

HAW35S, HAW40S, HAW50S, HAW60S

Model	L	L1	H	H1	H1	m1	m2	E	C	D	Z-M	Φd	I	ΦF	P	b	t	J	Y	S	W	N	R	X-M	Joint of air source		
																									G1/4	G3/8	G1/2
AW13S	858	320	266	138	66	134	168	100	132	42	4-M16	37	80	4	12	3	54	95	45	85	70	35	4-M6	G1/4			
AW17S	1090	413	348	177	95	175	230	160	190	50	8-M16	60	120	4	14	3.5	66	143	55	112	100	50	4-M6	G3/8			
AW20S	1430	581	425	212	116	233	270	200	232	64	8-M16	74	140	4	18	4	78	157	70	137	120	50	4-M6	G1/2			
AW25S	1620	581	425	212	116	258	320	200	235	64	8-M16	74	140	4	18	4	78	157	70	137	120	50	4-M6	G1/2			
AW28S	1845	690	527	252	159	300	362	280	318	85	8-M20	100	220	4	25	5	84	227	90	227	180	60	4-M6	G1/2			
AW35S	2500	930	280	135	175	370	440	300	350	105	8-M24	136	220	10	28X2	6.4	20	150	-	203	60	130	2-M8	G1/2			
AW40S	2500	930	280	135	175	395	490	300	350	105	8-M24	136	220	10	28X2	6.4	20	150	-	203	60	130	2-M8	G1/2			
AW50S	3280	1200	335	171	200	480	600	350	400	120	12-M24	164	280	10	32	7.4	20	180	-	230	60	160	2-M8	G1/2			
AW60S																											

AW pneumatic performer exploded view



Spare parts table

No.	Name	Quantity	No.	Name	Quantity	No.	Name	Quantity	No.	Name	Quantity
1	Case body	1	11	Pintle	1	21	Flexible retainer	1	31	Lock nut	2
2	Shifting fork	1	12	Rolling cover	2	22	Abrasion reducing washer	1	32	Plain washer	2
3	Rotating shaft	1	13	Flexible retainer	2	23	O shaped loop	1	33	O shaped loop	2
4	Baffle plate	2	14	Non-oil bearing	2	24	O shaped loop	1	34	Adjust screw	2
5	Piston	2	15	O shaped loop	2	25	Abrasion reducing washer	1	35	Nut	8
6	Cylinder body	2/3	16	Guide ring	2	26	Flexible retainer	1	36	Flexible washer	8
7	Cylinder cover	2	17	O shaped loop	2	27	Flay key	1	37	Plain washer	8
8	Piston stem	1	18	O shaped loop	2	28	O shaped loop	2	38	Stud	8
9	Spring	1/2/4	19	O shaped loop	2	29	Location pin	2	39		
10	Spring cylinder	1	20	Lock nut	2	30	Fasten screw	1	40		

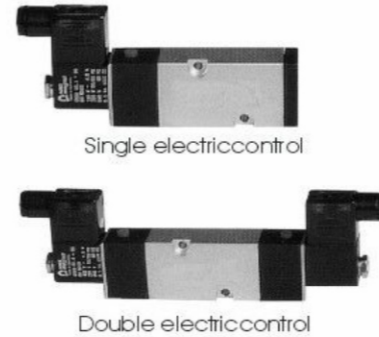
VALVE PNEUMATIC ACTUATOR

Accessory: solenoid valve

General

4CV-210 type solenoid valve is used for electric control operation of opening or closing of pneumatic valve. It complies with NAMUR connection standard, directly installed on the side pneumatic actuator, no need of pipe connection. The two-digit five-connection solenoid valve matches the double action type actuator, and two-digit three-connection solenoid valve matches the single action type actuator. The whole machine is simple, compact, small-sized and with long service life. The product has basic type (IP67) and anti-explode type, the class of anti-explode is Exm II Bt4, and the class of anti-explode is applicable for the explosive circumstance such as factory.

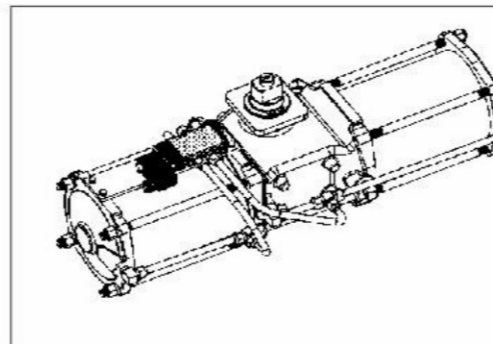
4CV-210 type solenoid valve



Organization of model

D 1 1 2 - 210 HMS 4V

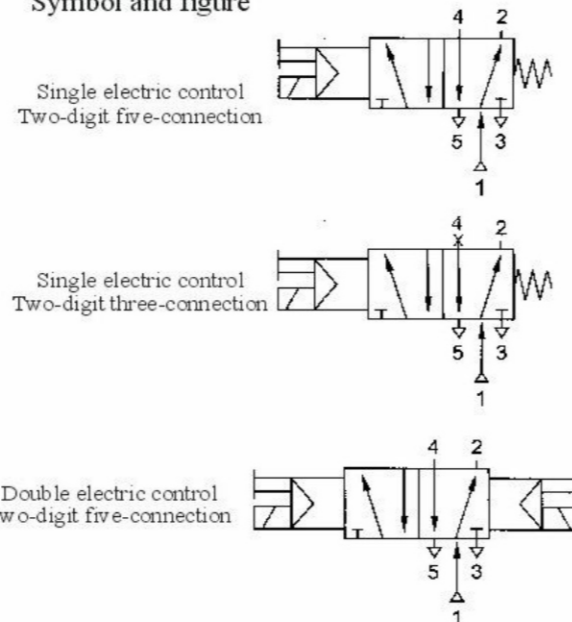
- 1. Solenoid valve
- 2. Two-digit five-connection
- 3. Pipe connection method: 1=single connection, 2=plate connection
- 4. Control method: 1=single electric control, 2=double electric control
- 5. Voltage: 1=AC220V, 2=DC24V
- 6. Wiring mode: D=DIN basic type, R=direct wire leading type



Main technical parameter

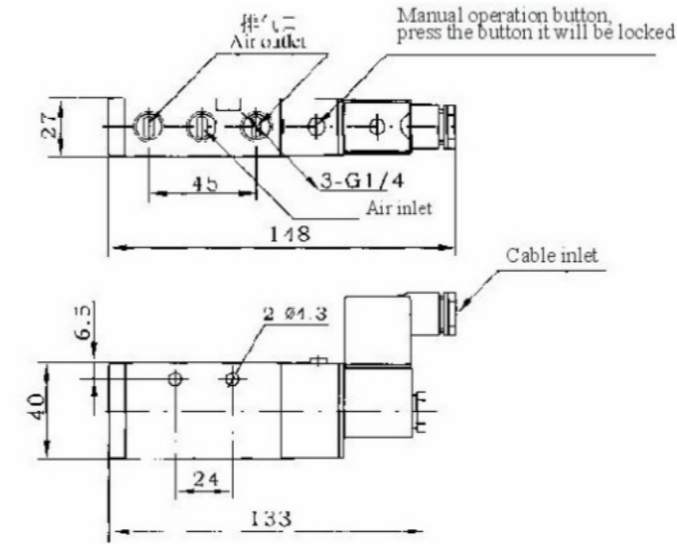
Working medium	Air (filtered by filter net of 40 micron)
Joint	Air inlet G1/4 r outlet G1/4
Valid sectional area	35
Lubrication	No need (also can add oil)
Working pressure	0.15 ~ 0.8
Working temperature	0-50 (use under the condition of non-frozen)
Range of voltage	15%
Electricity consumption	AC220V: 3.9VA, 6.0VA, 8.5VA DC24V: 2.5W, 4.8W
Turing time (s)	0.05
Manual mode	Press turning (press rotate can self locking)
Basic type	IP65
Anti-explode type	Exd II BT4

Symbol and figure

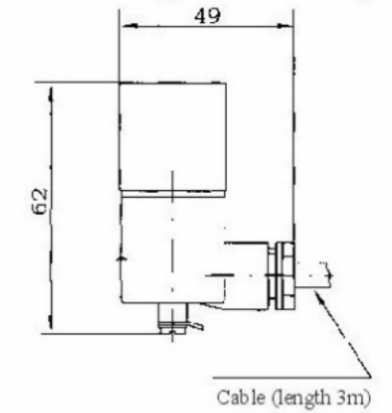


VALVE PNEUMATIC ACTUATOR

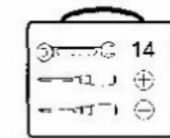
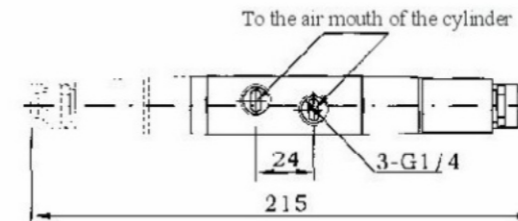
Dimension of appearance of Solenoid valve



Dimension of appearance of the anti-explode loop

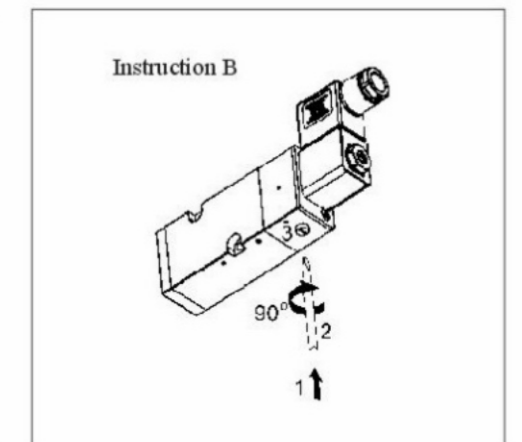
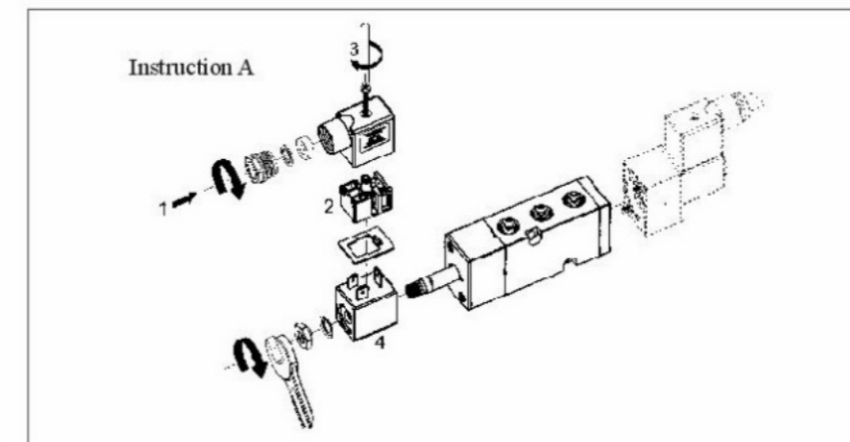


The basic and anti-explode type loop are manufactured by NASS Company of Germany. The user can choose others.

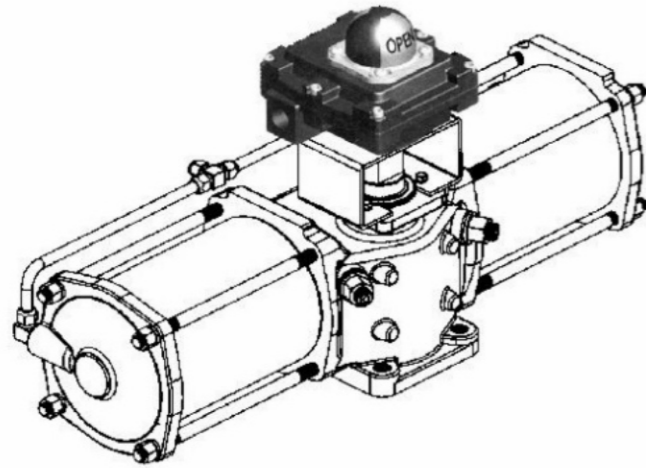


Instruction of operation

- Instruction A:** the power cable connected into terminal post 2 through junction box cover 1, use cross screwdriver to fasten the junction box cover 1, screw down the nuts of junction box to seal. The loop 4 can be disassembled and easy replaced.
- Instruction B:** single electric control: use I shaped screwdriver 1 push the button 3 when operation is needed, then the Solenoid valve will change direction. Let it go and it will replace automatically. Push button 3 and rotate 90° when lock is needed, the solenoid valve will lock after turning. Replace the button during replacement, then it will replace.
- Double electric control:** there are 2 manual button 3, push button 3, the solenoid valve begin to change direction, push another button it will replace; it has memory function, push it and then let it go.



Accessory: limit travel switch box



General

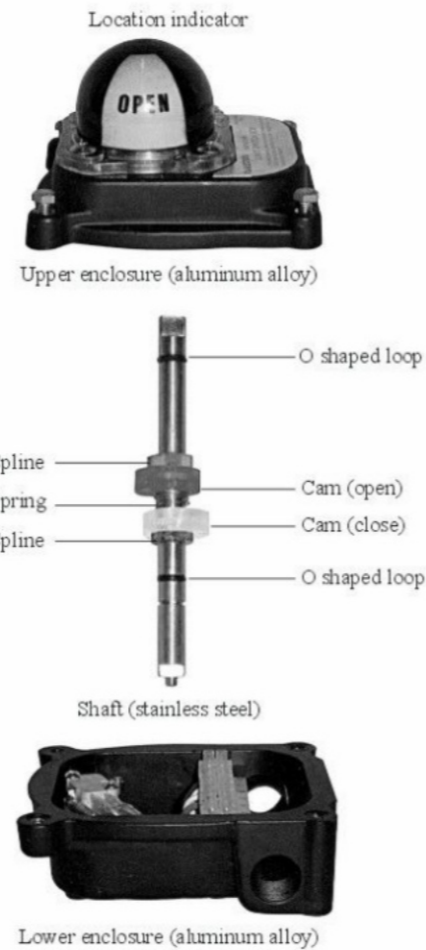
HMPL-310N and HMPL-410N type limit travel switch box is to transport the location signal of performer and valve to the site and remote control site. It can be directly installed on upper part of performer according to standard VDI/VDE3845. It has site view location indicator, adjusting the location cam fast, the adjustable cam installed through spline and spring. The required location can be obtained by turning the switch owing to deviation of switch cam from spline. The inner travel switch have pre-installed 8 terminal posts, which can be used for connection of solenoid valve.

Main technical parameter

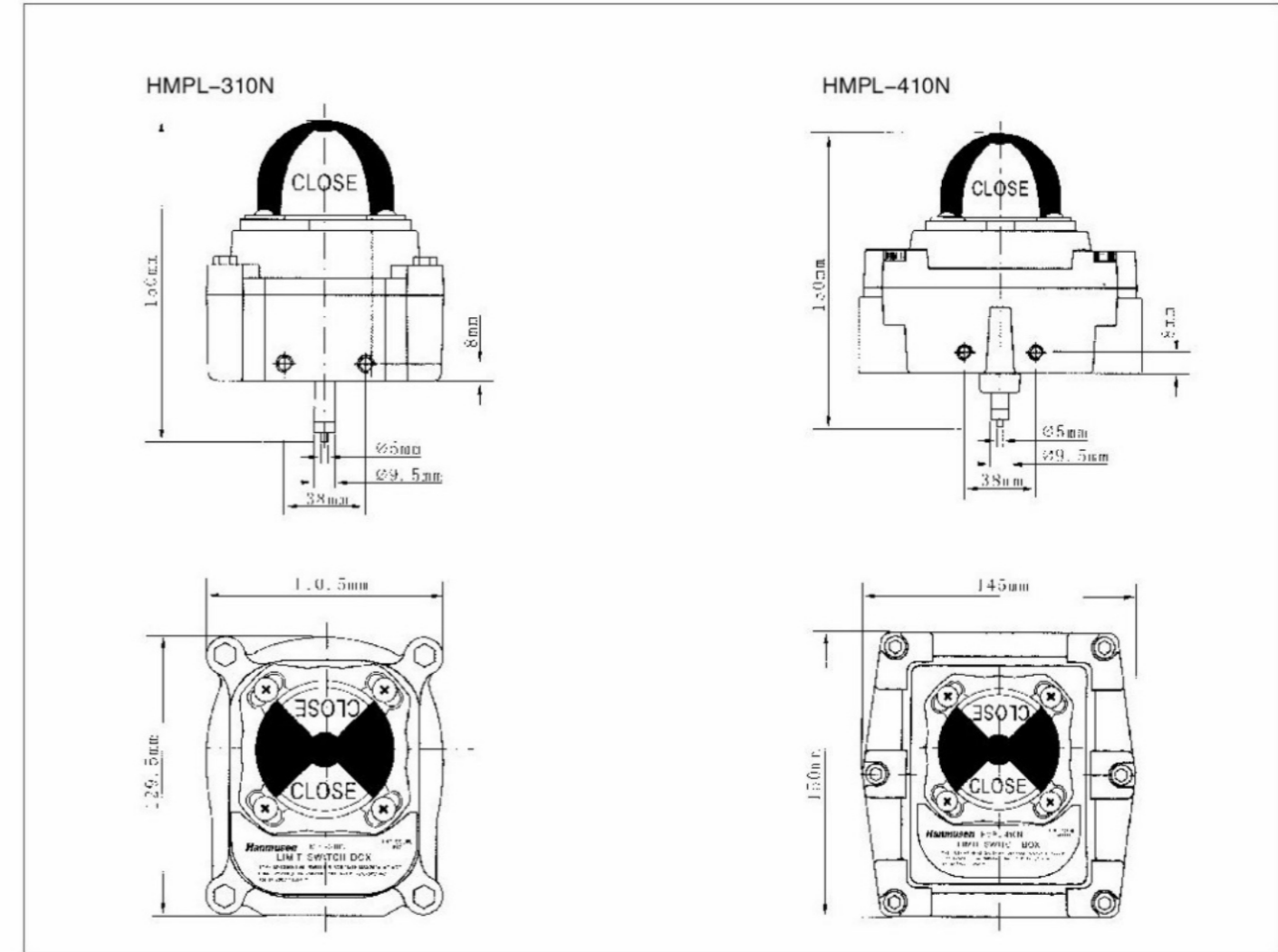
HMPL-310N	HMPL-410N
Enclosure protection type (IP67)	Anti-explode type (Exd II BT4)
Mechanical micro switch	
Voltage: maximum AC250V or DC	
Current: 0.6A 125VDC, 0.3A 250VDC, 16A 1/2HP125, 250V AC 16(3)A 250V-T105 μ	

Alternation: Transporting current input signal
Proximity switch, resistive potentiometer input signal

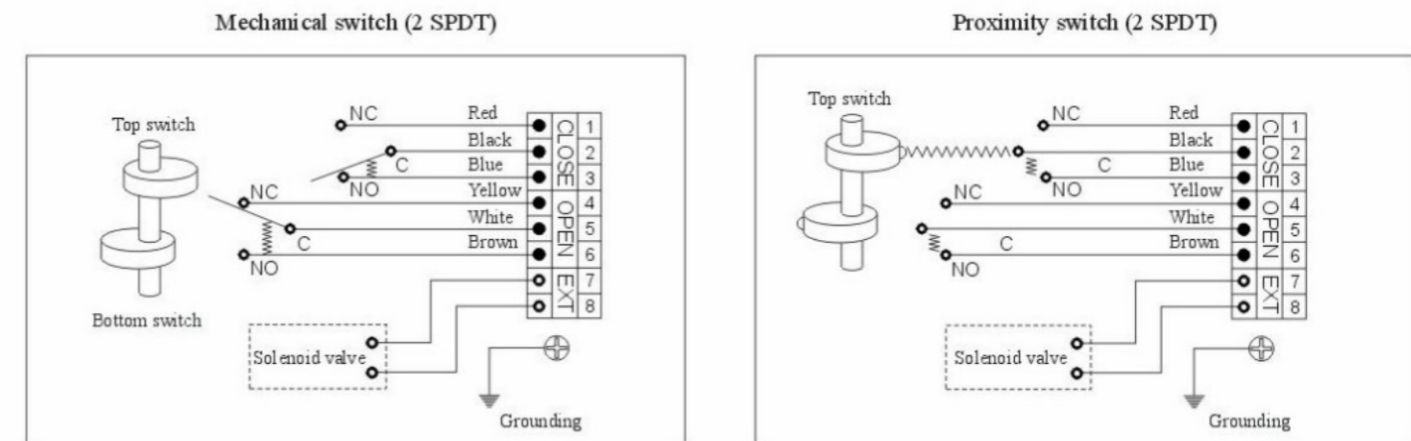
Structure figure



Dimension of appearance

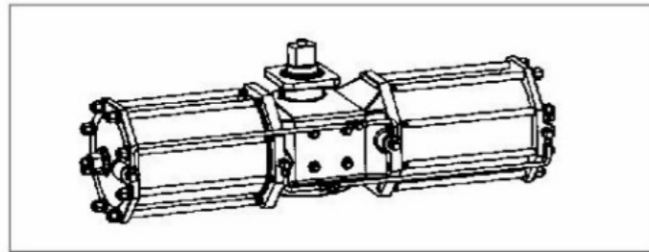


Wiring figure

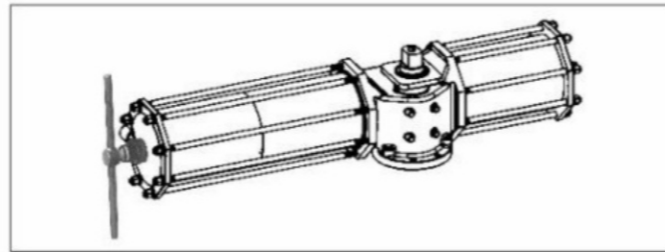


VALVE PNEUMATIC ACTUATOR

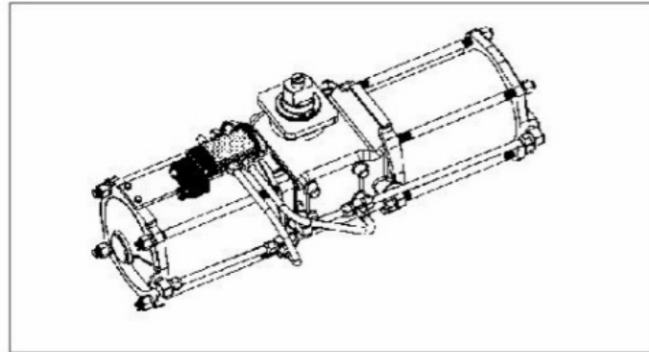
Sample



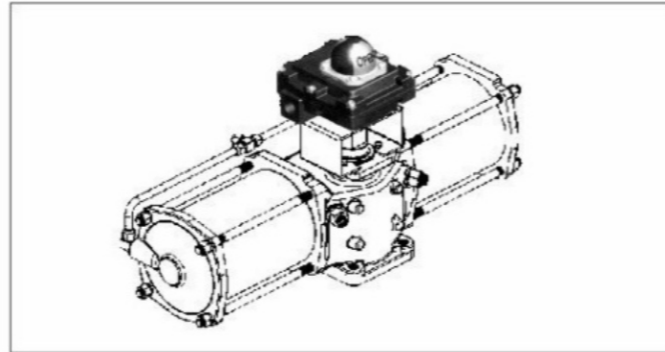
(Double Action)



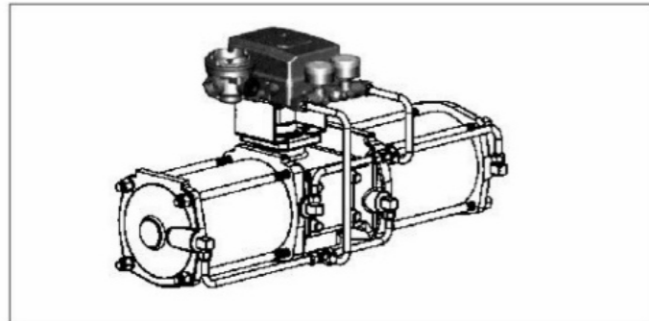
(Single Action with manual)



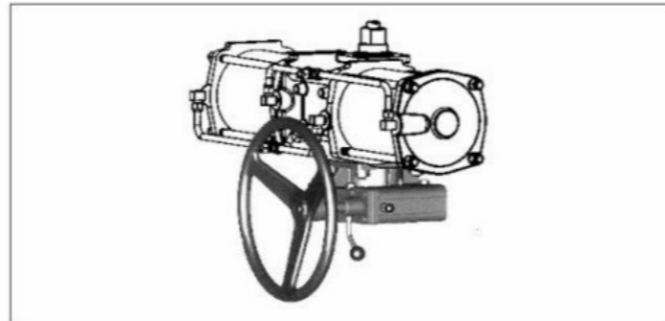
(Solenoid valve)



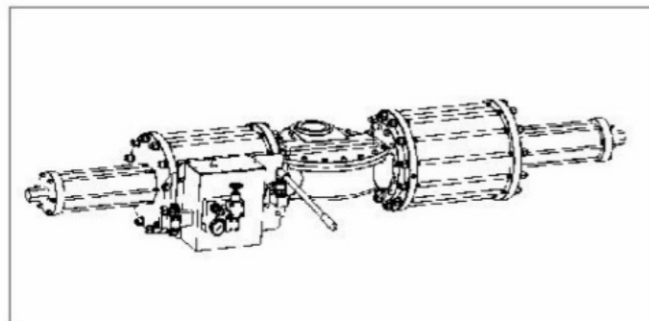
(Answer machine with single)



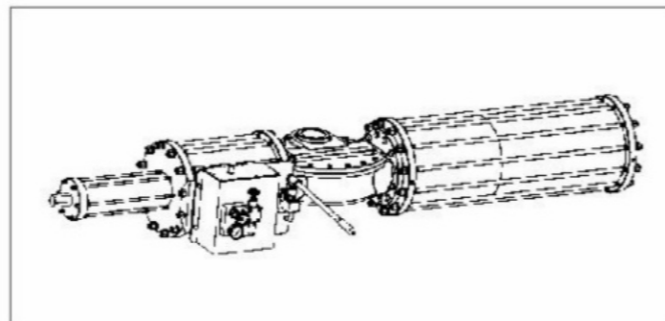
(Localizer with electric)



(operating structure with manual)



(Double action manual hydraulic operation structure)



(Single action manual hydraulic operation structure)

VALVE PNEUMATIC ACTUATOR

Sample

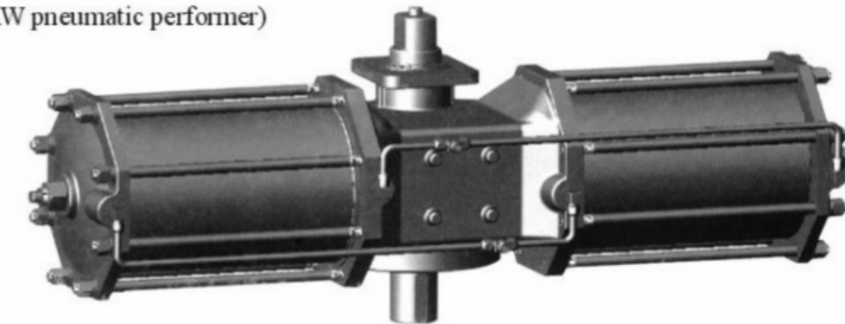
(Answer machine)



(localizer)



(AW pneumatic performer)



(Manual operation structure)



(Butterfly valve)

(Ball valve)

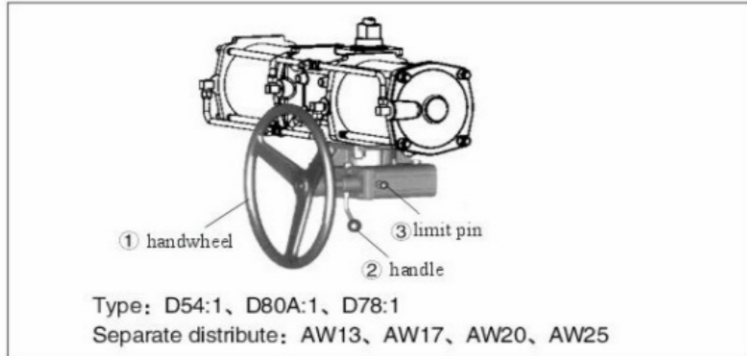


VALVE PNEUMATIC ACTUATOR

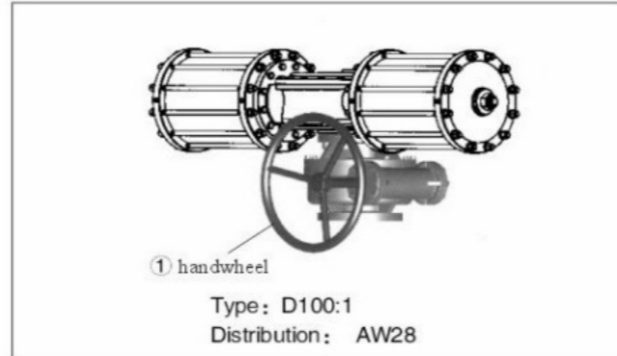
First: Accessories: Manual operation structure

Manual operation structure is a kind of affiliated operation tools of pneumatic valve, when the pneumatic instrument shows abnormal condition or source failure, make use of manual operation structure to open or close, shift to automatic operation after the automatic control system recovers to normal. (When pneumatic and manual can't use at the same time)

Second: Double action type manual operation structure

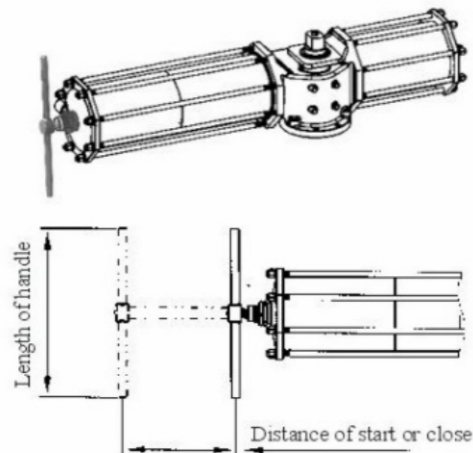


1. When need manual operation, cut off or close the air source, open the balance valve in the performer or cut off air pipe to make the air balance when the piston in the cylinder do reciprocating, don't close the air or the operation will be harder.
 2. Pull out the limit pin (3), rotary the handle (2) to revolve the prejudicial setting for 180 degree, when rotate the handle (2) to close the worm, there may exist peak tooth phenomenon, rotary the handwheel (1) to close for certain degree, the limit pin will be replaced automatically depending on spring when closing. Then rotate the handwheel to do open or close manual operation directly.
 3. When need pneumatic manual operation, close the balance valve in the performer, connect the air pipe and pull out the air resource, pull out the limit pin (3), rotary the handle (2) to revolve the prejudicial setting for 180 degree, make sure the limit pin (3) and then do automatic operation.



1. When need manual operation, cut off or close the air source, open the balance valve in the performer or cut off air pipe to make the air in the cylinder balance. Then rotate the handwheel to do open or close manual operation.
 2. When need pneumatic manual operation, please note the sign of open or close in the performer. If it is on close location, rotate the handwheel anticlockwise to the middle axle of performer until innervations, if it is on ON location rotate the handwheel anticlockwise to the middle axle of performer until innervations, then close the balance valve in the performer and connect to the air pipe, open the air source to do automatic operation.

Three: Single action manual operation structure

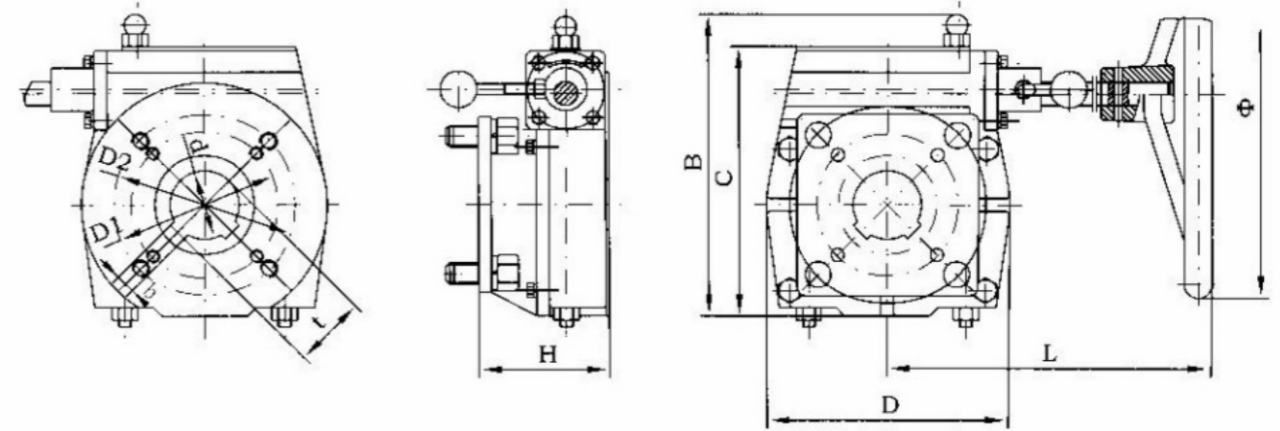


Operation instruction 1. When need manual operation, cut off or close the air source, open the balance valve in the performer or cut off the air pipe to make the piston in the cylinder to reach air balance when make the air balance when the piston in the cylinder do reciprocating. 2. Ever-close valve: rotate the handwheel, clockwise is close and anticlockwise is open. Ever-open valve: clockwise is open and anticlockwise is close. 3. When need pneumatic automatic operation, close the balance valve in the performer, connect the air pipe and open the air source to do automatic operation.

Type	Distance of start	Length of handle
AW13S	125	300
AW17S	153	400
AW20S	230	500
AW25S	230	600
AW28S	300	700

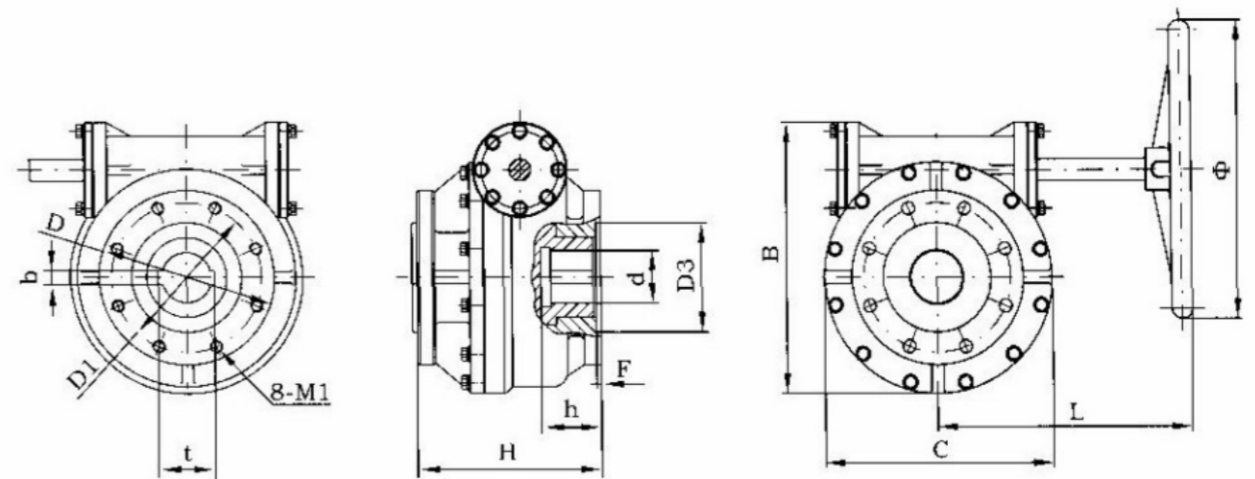
VALVE PNEUMATIC ACTUATOR

Four: Outline and dimension



Type	d	b	t	D1	4-M1	D2	4-M2	H	Φ	B	D	C	L
D54:1	48	14	51.8	102	4-M10	140	4-M16	95	300	234	175	199	223
D80A:1	60	18	64.4	165	4-M20	-	-	114	400	311	234	279	277
D78:1	78	19.05	85.7	165	4-M20	-	-	117	600	359	276	322	323

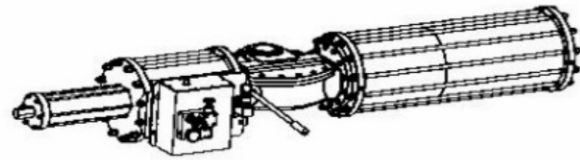
Outline and dimension



Type	d	b	t	D1	8-M1	D3	H	Φ	B	D	C	L
D100:1	85	25	90.4	280	8-M20	220	288	550	440	318	370	320

VALVE PNEUMATIC ACTUATOR

First: Accessories: Manual hydraulic pump operation

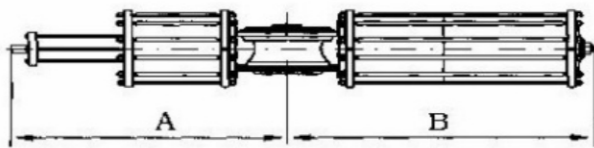


Single action manual hydraulic operation structure

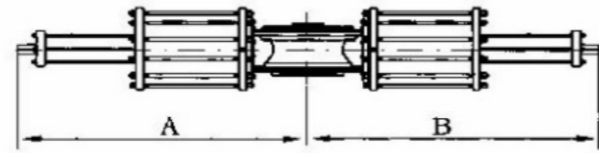


Double action manual hydraulic operation structure

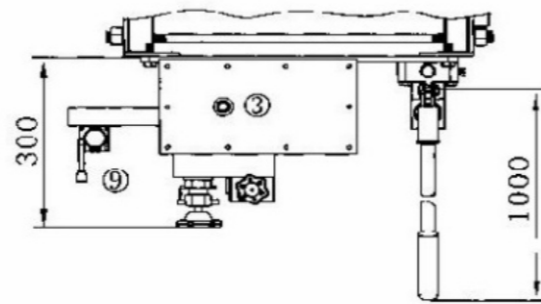
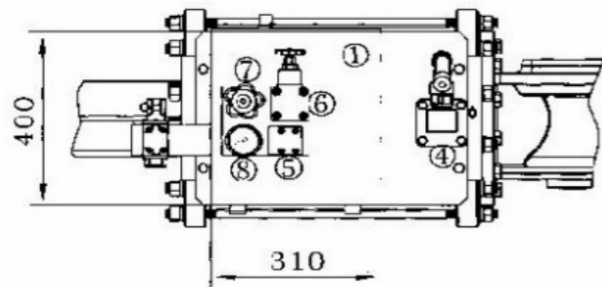
Outline and dimension



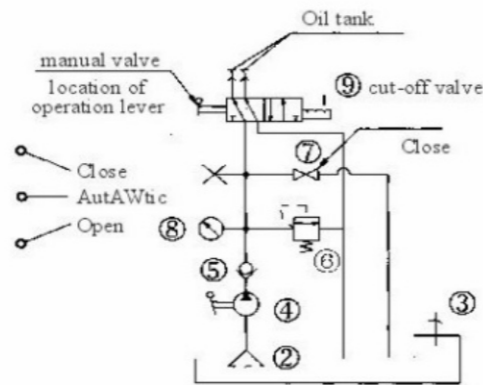
Type	A	B
AW35S	1418	1600
AW40S	1418	1600
AW50S	1715	2105



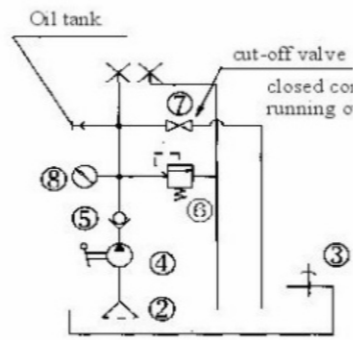
Type	A	B
AW35	1418	1418
AW40	1418	1418
AW50	1715	1715
AW60	2010	2010



No.	Name
1	Oil tank
2	Filter mesh
3	Breath port
4	Manual pump
5	Check valve
6	Flow-over valve
7	Cut-off valve
8	Pressure meter
9	Manual commutated valve
10	Block head



Principle diagram of double action manual pump setting



Principle diagram of single action manual pump setting

VALVE PNEUMATIC ACTUATOR

The maintenance for products

Pneumatic valve is spot instrument, for the purpose of maintenance in the running course please do periodic maintenance, so as to keep the products clean, good lubricate, completed accessories and normal running state for whole year.

The daily maintenance for pneumatic performer keep the air source dry and clean, do periodic drain and discharge to the air filter that matched with performer to avoid dirty enters into solenoid and performer so as to effect the normal working. Keep the outline of performer clean and dirty-less, the performer can't be polluted by steam, water and smeary. Keep the performer in good airproof, every seal face and point should be in firm connection, airproof and lossless. The air connection head of intake and outtake of cylinder is not allowed damage, do careful examination to every department of cylinder and air pipe to keep the pressure of air source normal. The pipe is not allowed hollow and should be kept smooth, is not allowed leakage that effect use performance. The air source pipe connection of solenoid, air source treatment three combiners or localizer should be perfect without any leakage. The power signal of electric department or the signal of adjusting current should be no phase-less, short circuit or open circuit failure. The protected tie-in of shell should be in tight connection to avoid water entering, damp and dust corroding to keep solenoid or localizer in normal work. The signal answer machine should be in good state to ensure signal transmission on valve switch location, the manual operation structure should be in good lubricated and flexible state.

The outer surface of pneumatic performer should be kept clean, often remove the dust, oil and medium left-over. The active department of valve should be clean to avoid damage and corrosion. The valve should be good without any leakage in the running, the start and close is flexible. Every valve component should be completed and perfect. The screw in the flange and bracket can't be lacked, the screw thread should be perfect without any damage or loosen, if it is loosen you should tighten it in time to avoid the damage connection causing wrong location of start and close, and result in leakage. The filling cover is not allow incline to avoid dead that caused by friction between valve pole, so bring inflexible or abnormal working to performer.

So the maintenance to pneumatic valve is important, it is important to keep the whole pneumatic instrument control system in normal working state. The examination under normal working condition can't be less than 1 time every month, 1 time maintenance every year.

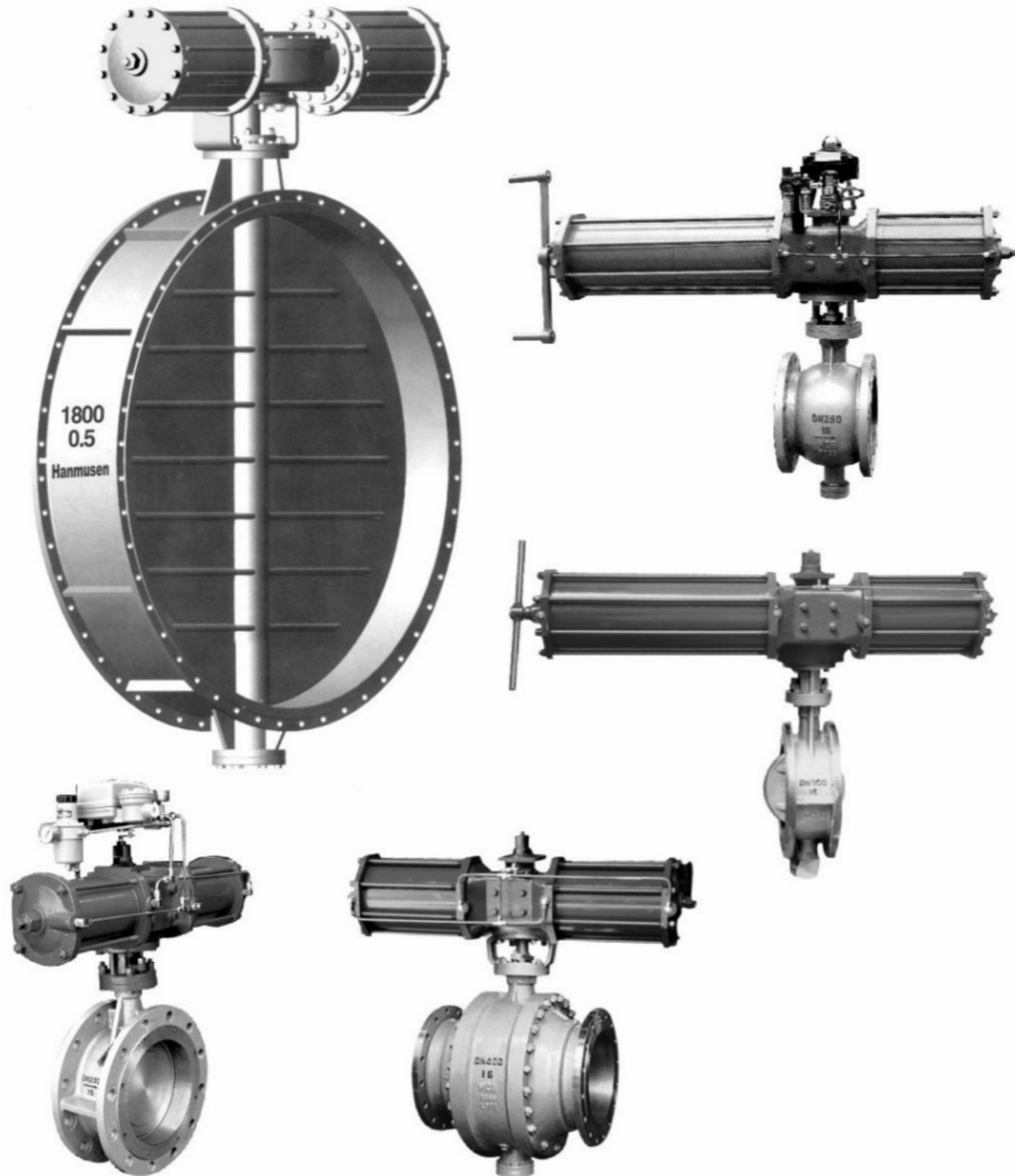
Guide of resolution to common problems.

Failure	Examine subject	Resolve method
The pneumatic valve can't work	1. The solenoid is whether normal, the loop is whether burnt and the solenoid core is whether locked by dirty	1. Replace solenoid, loop and remove dirty.
	2. Do examination to single air supplying of performer and is whether in normal work, if the cylinder can't work normally, disassemble the performer check the airproof is whether damaged, the surface of cylinder is whether damaged.	2. Replace the damaged airproof loop and cylinder
	3. The impurity in the valve was locked by core of ball	3. Remove the impurity and replace damaged valve.
	4. The handle of manual operating structure is on manual location	4. Turn the handle to pneumatic automatic location
The pneumatic valve works slowly	1. The pressure of air source is not enough	1. Increase the pressure of air source. Common trial < 0.4MPa, using 0.4-0.7 MPa.
	2. The torque of pneumatic is too small.	2. Increase the specification and type of performer.
	3. The valve core or other valve setting are too tight.	3. Repair and assemble again, adjust the torque of valve.
	4. The pipe of air source is blocked, the flow is too small.	4. Exclude block.
No answer machine or signal	1. The circuit of signal power is short or open.	1. repair the power circuit.
	2. The location of cam is not accurate	2. adjust the cam again to right location.
	3. Jiggle switch is damaged.	3. Replace jiggle switch.

VALVE PNEUMATIC ACTUATOR

VALVE PNEUMATIC ACTUATOR

Sample



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