

Soft Start-up Valve

AV2000/3000/4000/5000



New

Series **AV5000** introduced!

A start-up valve that gradually increases supply pressure during start up and rapidly exhausts system air when the supply air is shut off

Large effective area (mm²)

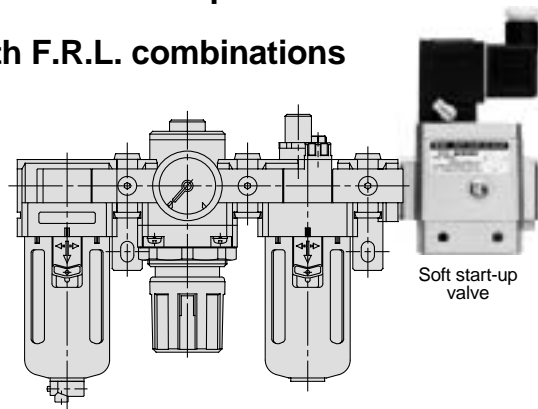
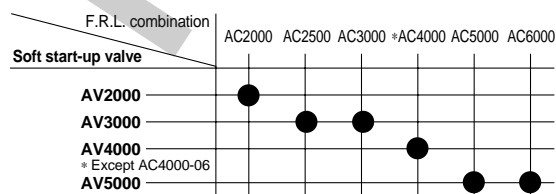
- AV2000/ 20 (Body size: 1/4)
- AV3000/ 37 (Body size: 3/8)
- AV4000/ 61 (Body size: 1/2)
- AV5000/113 (Body size: 3/4)
- AV5000/122 (Body size: 1)

Manual supply/exhaust function

Low power consumption

Modular with F.R.L. combinations

F.R.L. combinations



F.R.L. combination

Soft Start-up Valve

AV2000/3000/4000/5000

How to Order

AV 20 00 — F 02 — 1 G — C

Soft start-up valve

Body size

20	1/4
30	3/8
40	1/2
50	3/4, 1

Thread type

Nil	Rc
F	G
N	NPT

Port size

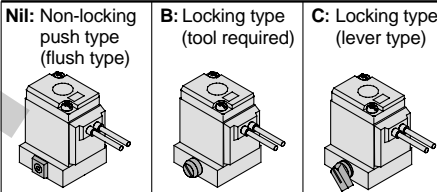
02	1/4 (AV2000 only)
03	3/8 (AV3000 only)
04	1/2 (AV4000 only)
06	3/4 (AV5000 only)
10	1 (AV5000 only)

Option

Nil	None
G	With pressure gauge

Manual override

Nil: Non-locking push type (flush type)	B: Locking type (tool required)	C: Locking type (lever type)
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Indicator light/Surge voltage suppressor

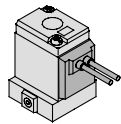
Nil	None
S	With surge voltage suppressor (grommet type only)
Z	With indicator light/surge voltage suppressor (not possible with grommet type)

Rated coil voltage

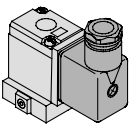
1	100VAC (50/60Hz)
2	200VAC (50/60Hz)
3	110 to 120VAC (50/60Hz)
4	220VAC (50/60Hz)
5	24VDC
6	12VDC
9	Other

Electrical entry

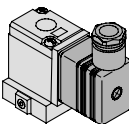
G: Grommet



D: Type D DIN terminal



Y: Type Y DIN terminal



How to Order Pilot Valve Assemblies

SF4 — 1 G — 80

For soft start-up valve

Rated coil voltage

1	100VAC (50/60Hz)
2	200VAC (50/60Hz)
3	110 to 120VAC (50/60Hz)
4	220VAC (50/60Hz)
5	24VDC
6	12VDC
9	Other

Manual override

Nil	Non-locking push type (flush type)
B	Locking type (tool required)
C	Locking type (lever type)

Indicator light

Surge voltage suppressor


Nil	None
S	With surge voltage suppressor (grommet type only)
Z	With indicator light/surge voltage suppressor (not possible with grommet type)

Electrical entry

G	Grommet
D	Type D DIN terminal
Y	Type Y DIN terminal

TÜV approved product

(Conforms to standards necessary to satisfy EC directives.)



Series AV has received approval from TÜV Rheinland, an EC Notified Body (EC authorization number 0197), for conformity to DIN VDE0580: 1994 Standards.

Consult Power Aire for details when ordering TÜV approved products because of restrictions regarding product model, voltage specification, and electrical entry, etc.

Soft Start-up Valve AV2000/3000/4000/5000

Specifications



Type D DIN terminal



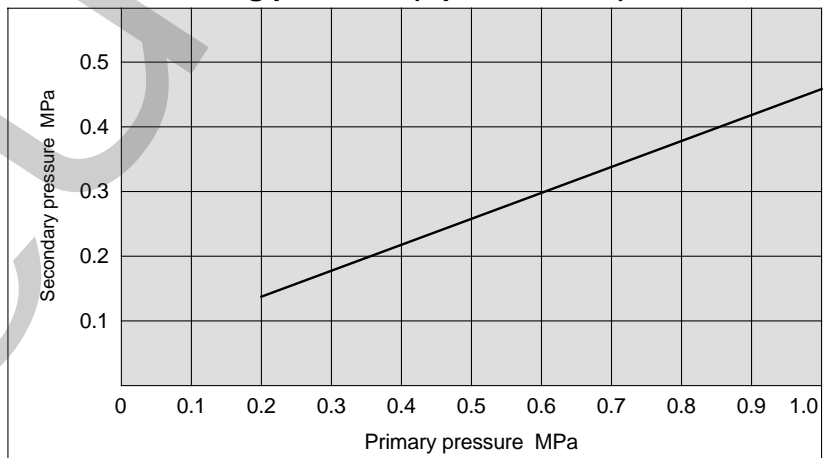
Type Y DIN terminal

Model		AV2000	AV3000	AV4000	AV5000		
Port size		1/4	3/8	1/2	3/4	1	
Proof pressure		1.5MPa					
Operating pressure range		0.2 to 1MPa					
Pressure gauge port size		1/8					
Ambient and fluid temperature		0 to 60°C Note 1)					
Effective area (mm ²)	1(P)→2(A)	20	37	61	113	122	
	2(A)→3(R)	24	49	76	132	141	
Weight (kg)		0.27	0.48	0.74	1.60	1.54	
Electrical specifications	Rated coil voltage	100, 200, 110 to 120, 220VAC (50/60Hz), 12, 24VDC					
	Allowable voltage fluctuation	-15% to +10% of rated voltage					
	Coil insulation type	Equivalent to B type (130°C)					
	Apparent power (current consumption)	AC Inrush	5.6VA (50Hz), 5.0VA (60Hz)				
		Energized	3.4VA (2.1W)/50Hz, 2.3VA (1.5W)/60Hz				
	Current consumption DC	1.8W					
Electrical entry	Grommet, Type D DIN terminal, Type Y DIN terminal						
Optional specification	Indicator light/Surge voltage suppressor Note 2)						
Pilot valve manual override	Non-locking push type (flush type), Locking type (tool required), Locking type (lever type)						

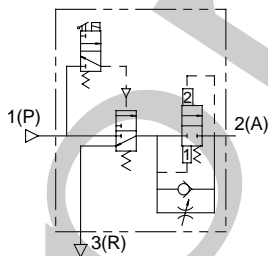
Note 1) Use dry air when operating at a low temperature.

Note 2) The grommet type can have a surge voltage suppressor (direct coupling type lead wire), but without indicator light.

Piston B switching pressure (Open→Closed)



Symbol

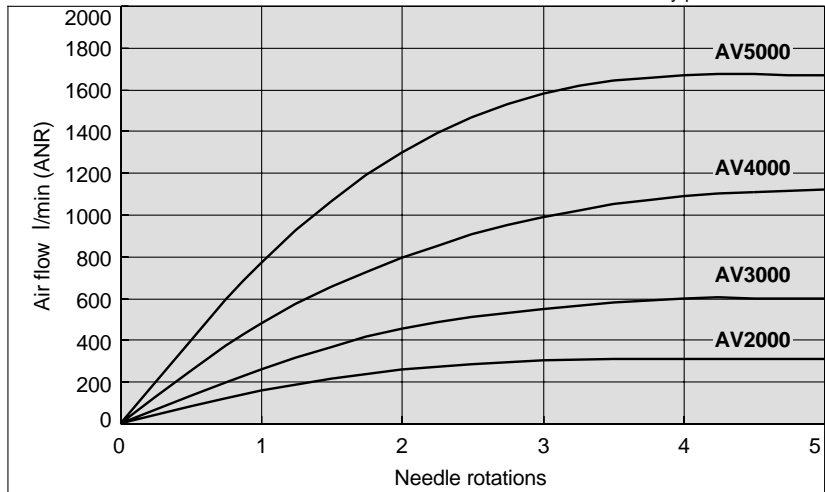


Accessories/Pressure gauge

Description	Pressure gauge
Part no.	G36-10-01
Pressure range	1MPa

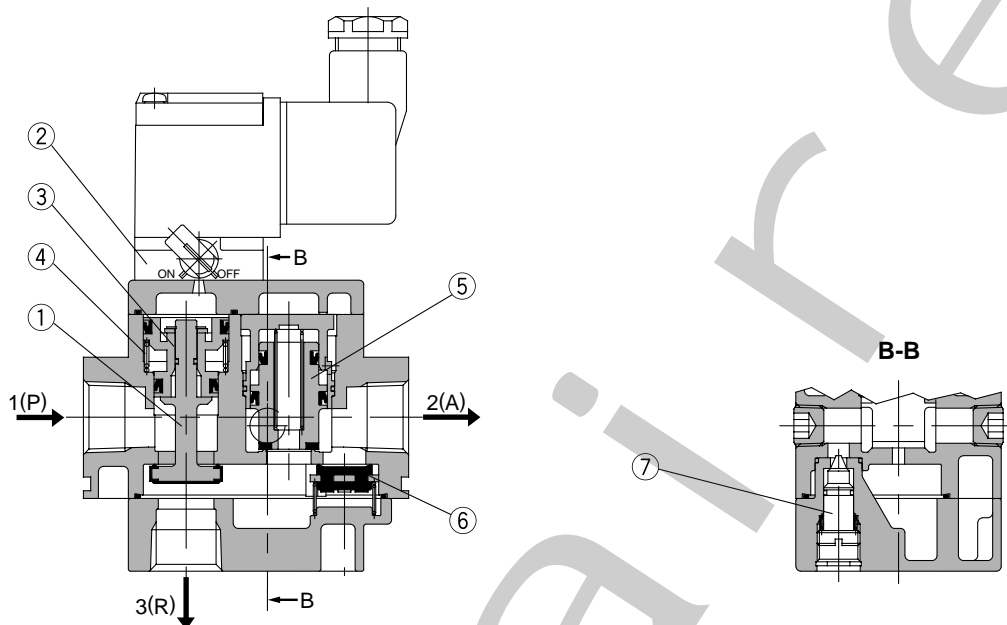
Needle valve flow characteristics

Conditions: Primary pressure 0.5MPa



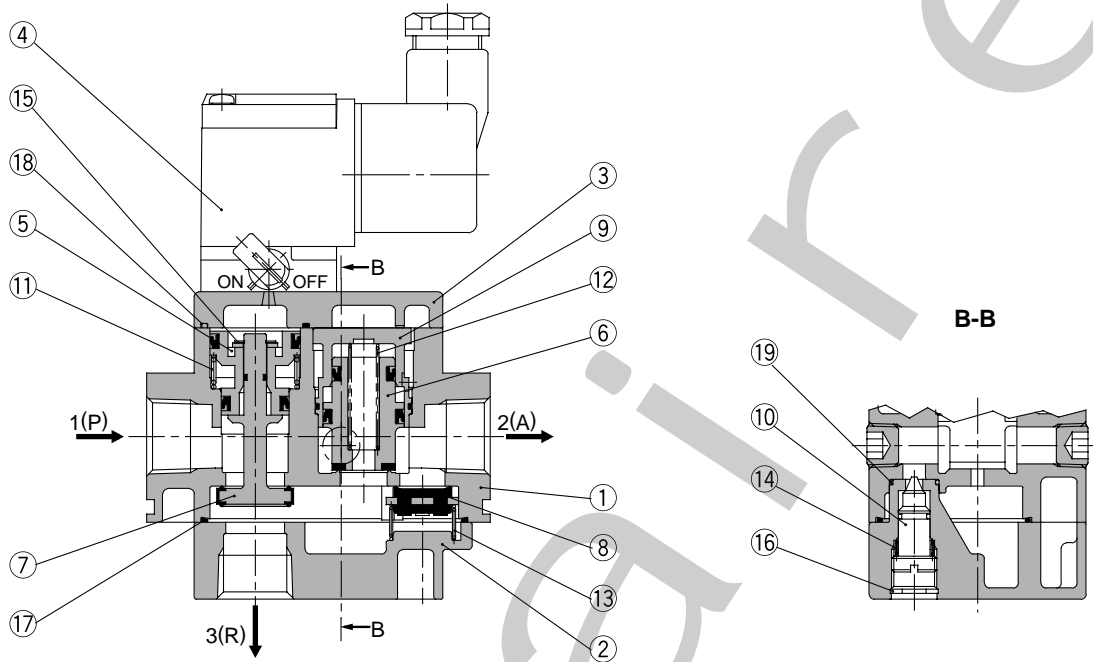
AV2000/3000/4000/5000

Working Principle



Working condition	Pilot valve	Pressure conditions	Working description	Pressure time chart (meter-out control) example	Cylinder drive circuit (meter-out control) example
Low speed supply	ON	$1/2 PP > PA$	When pilot valve ② is turned ON by energization or manual override, the pilot air pushes piston A ③ and main valve ① downward and opens main valve ① while R port closes simultaneously. The air from P port moves to needle valve ⑦, where its flow is adjusted, and flows to A port. The meter-in control of needle valve ⑦ slowly moves the cylinder from A to B.	<p>Initial operation return stroke</p>	
High speed supply		$1/2 PP \leq PA$	When $1/2 PP \leq PA$ after the cylinder reaches B, piston B ⑤ fully opens and PA increases rapidly as shown from C to D and becomes the same pressure as PP.		
Normal operation		$1/2 PP = \text{approx. } PA$	Since piston B ⑤ holds the fully open condition, during normal operation the cylinder's speed will be controlled by the usual meter-out control.		
Quick exhaust	OFF	—	When pilot valve ② is turned OFF, spring ④ pushes piston A ③ and main valve ① upward and opens R port while shutting off the air supply from P port. The pressure difference generated at this time opens check valve ⑥ and the residual pressure on the A port side is quickly exhausted from R port.		

Construction



Parts list

No.	Description	Material
1	Body	ADC
2	Cap	ADC
3	Cover	ADC

Replacement parts

No.	Description	Material	Part no.			
			AV2000	AV3000	AV4000	AV5000
4	Pilot valve assembly	—	SF4-□-80*			
5	Piston A assembly	POM, NBR	P424204A	P424304A	P424404A	P424504A
6	Piston B assembly	Brass, NBR (HNBR)	P424205A	P424305A	P424405A	P424505A
7	Main valve assembly	Brass, NBR (HNBR)	P424206A	P424306A	P424406A	P424506A
8	Check valve	Brass, NBR (HNBR)	P424207	P424307	P424407	P424507
9	Piston guide assembly	POM, NBR	P424208A	P424308A	P424408A	P424508A
10	Needle assembly	Brass, NBR	P424209A	P424309A	P424409A	P424509A
11	Valve spring	Steel wire	P424211	P424311	P424411	P424511
12	Piston spring	Stainless steel	P424212	P424312	P424412	P424512
13	Check spring	Stainless steel	P424213	P424313	P424413	P424513
14	Needle spring	Steel wire	P424214	P424314	P424414	—
15	C type snap ring for shaft	Tool steel	G-5	STW-5	STW-8	STW-10
16	C type snap ring for hole	Tool steel	0-9	0-10	RTW-12	RTW-15
17	Seal	NBR	P424210	P424310	P424410	P424510
18	Seal	NBR	P424218	P424315	P424415	P424514
19	O-ring	NBR	10 x 8 x 1	11 x 9 x 1	12.5 x 9.5 x 1.5	16.5 x 12.5 x 2

* Refer to page 1 for pilot valve assembly part number designations.

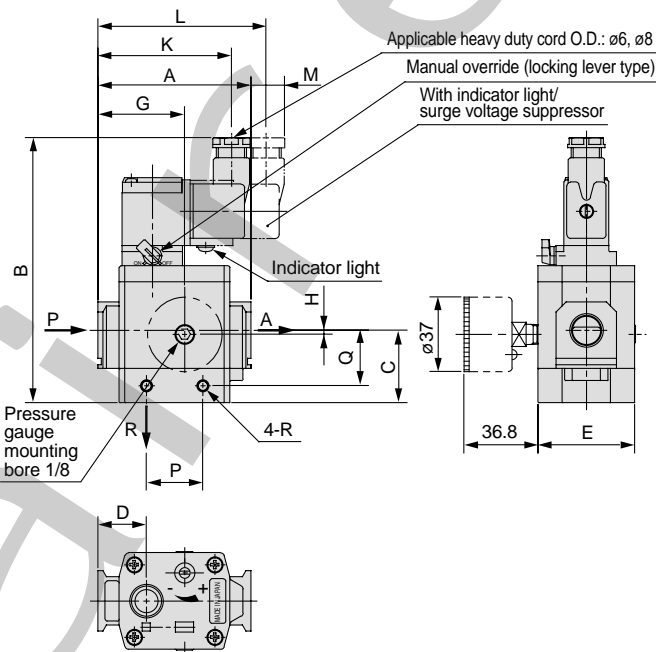
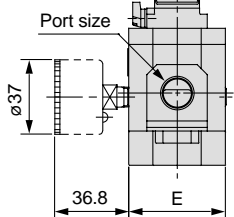
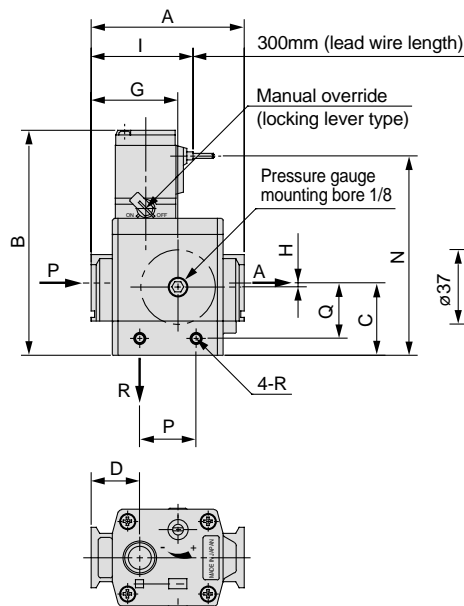
AV2000/3000/4000/5000

Dimensions

Grommet: AV□00-□-□G, GS

DIN terminal: AV□00-□-□D, DZ

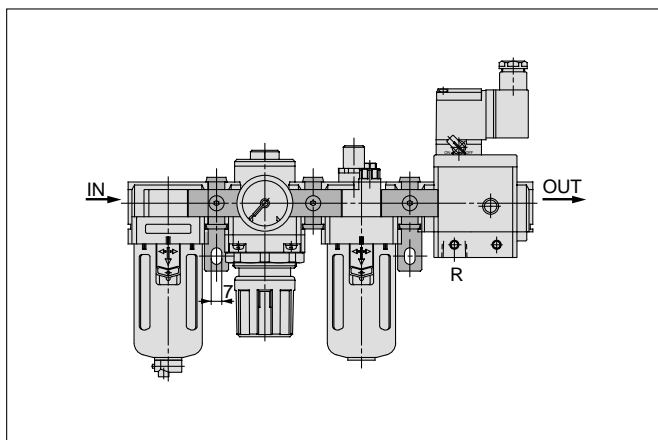
DIN terminal for European use: AV□00-□-□Y, YZ



Model	Port size	A	B	C	D	E	G	H	I	K	L	M	N	P	Q	R
AV2000-□02-□G□	1/4	66	105	31	22	40	38	0	47.5	—	—	—	93	29	23.5	M4 x 0.7 Depth 4.5
AV2000-□02-□GS□																
AV2000-□02-□D□	1/4	66	125	31	22	40	38	0	—	65.5	—	6	—	29	23.5	M4 x 0.7 Depth 4.5
AV2000-□02-□DZ□										—	82.5	23				
AV2000-□02-□Y□	1/4	66	125	31	22	40	38	0	—	67.5	—	10.5	—	29	23.5	M4 x 0.7 Depth 4.5
AV2000-□02-□YZ□										—	84.5	27.5				
AV3000-□03-□G□	3/8	76	112	36	24	48	43	2	50.5	—	—	—	100	28	27.5	M5 x 0.8 Depth 5
AV3000-□03-□GS□																
AV3000-□03-□D□	3/8	76	132	36	24	48	43	2	—	68.5	—	—	—	28	27.5	M5 x 0.8 Depth 5
AV3000-□03-□DZ□										—	85.5	16				
AV3000-□03-□Y□	3/8	76	132	36	24	48	43	2	—	70.5	—	3.5	—	28	27.5	M5 x 0.8 Depth 5
AV3000-□03-□YZ□										—	87.5	20.5				
AV4000-□04-□G□	1/2	98	127	47	32	52	57	3	62.5	—	—	—	115	42	37	M6 x 1 Depth 6
AV4000-□04-□GS□																
AV4000-□04-□D□	1/2	98	147	47	32	52	57	3	—	80.5	—	—	—	42	37	M6 x 1 Depth 6
AV4000-□04-□DZ□										—	97.5	6				
AV4000-□04-□Y□	1/2	98	147	47	32	52	57	3	—	82.5	—	—	—	42	37	M6 x 1 Depth 6
AV4000-□04-□YZ□										—	99.5	10.5				
AV5000-□06-□G□	3/4, 1	128	155	59	39	74	77	0	74	—	—	—	143	50	46	M6 x 1 Depth 7.5
AV5000-□06-□GS□																
AV5000-□06-□D□	3/4, 1	128	175	59	39	74	77	0	—	90	—	—	—	50	46	M6 x 1 Depth 7.5
AV5000-□06-□DZ□										—	107	—				
AV5000-□06-□Y□	3/4, 1	128	175	59	39	74	77	0	—	94	—	—	—	50	46	M6 x 1 Depth 7.5
AV5000-□06-□YZ□										—	111	—				

Modular F.R.L. Combination Spacer

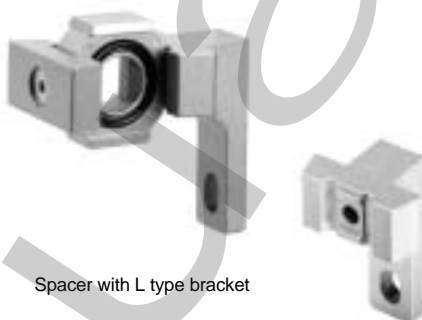
Select one of the spacers below when connecting to an F.R.L. combination unit (AC2000 to AC6000).
(Spacers must be ordered separately.)



Spacer



**L type bracket
Spacer with L type bracket**



Spacer with L type bracket

L type bracket

**T type bracket
Spacer with T type bracket**



Spacer with T type bracket

T type bracket

Model	Applicable model	L type bracket	Spacer with L type bracket	Applicable model
Y20	AV2000	B210L	Y20L	AV2000
Y30	AV3000	B310L	Y30L	AV3000
Y40	AV4000	B410L	Y40L	AV4000
Y60	AV5000	B610L	Y60L	AV5000

T type bracket	Spacer with T type bracket	Applicable model
B210T	Y20T	AV2000
B310T	Y30T	AV3000
B410T	Y40T	AV4000
B610T	Y60T	AV5000