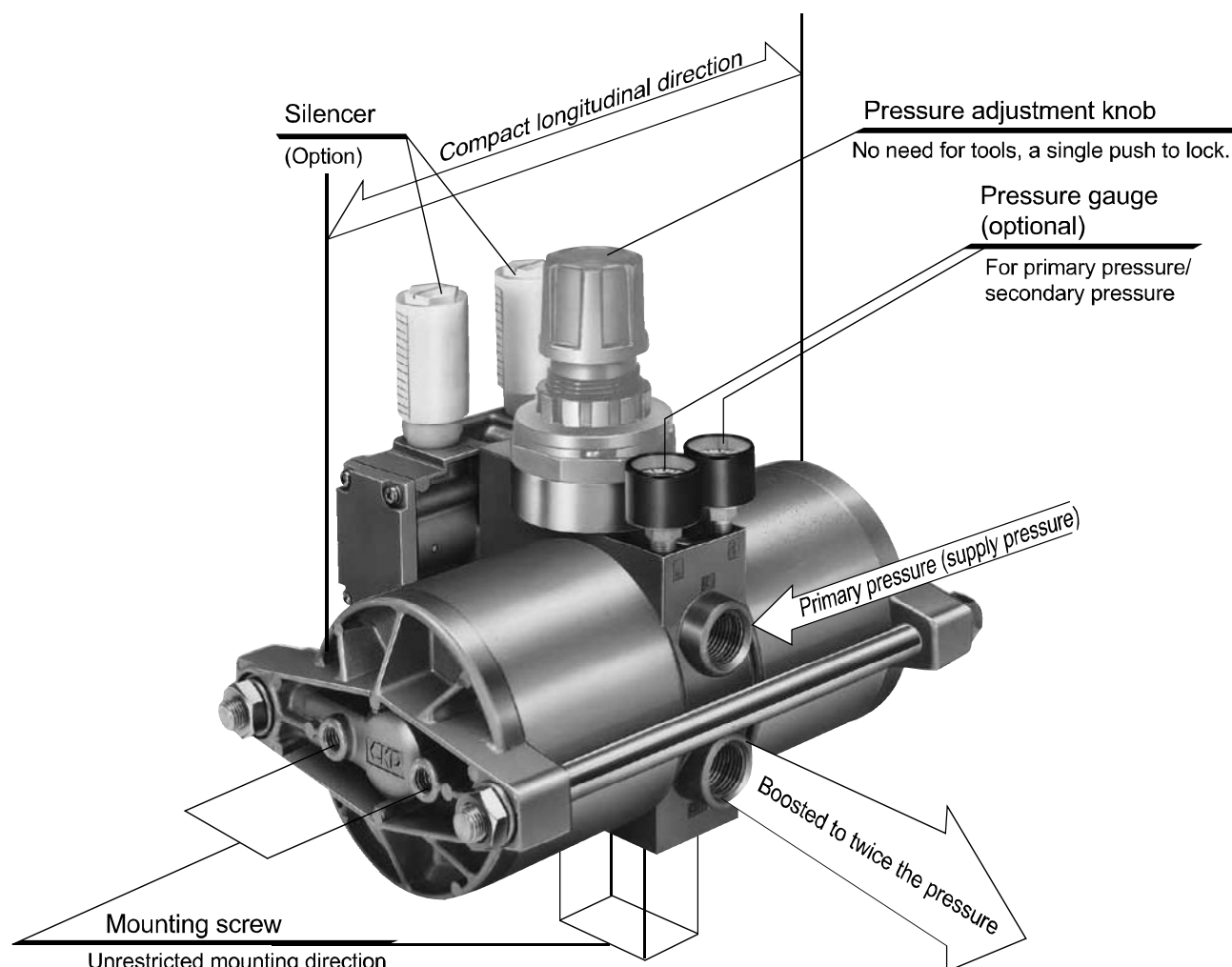


Obtain twice as much high pressure air

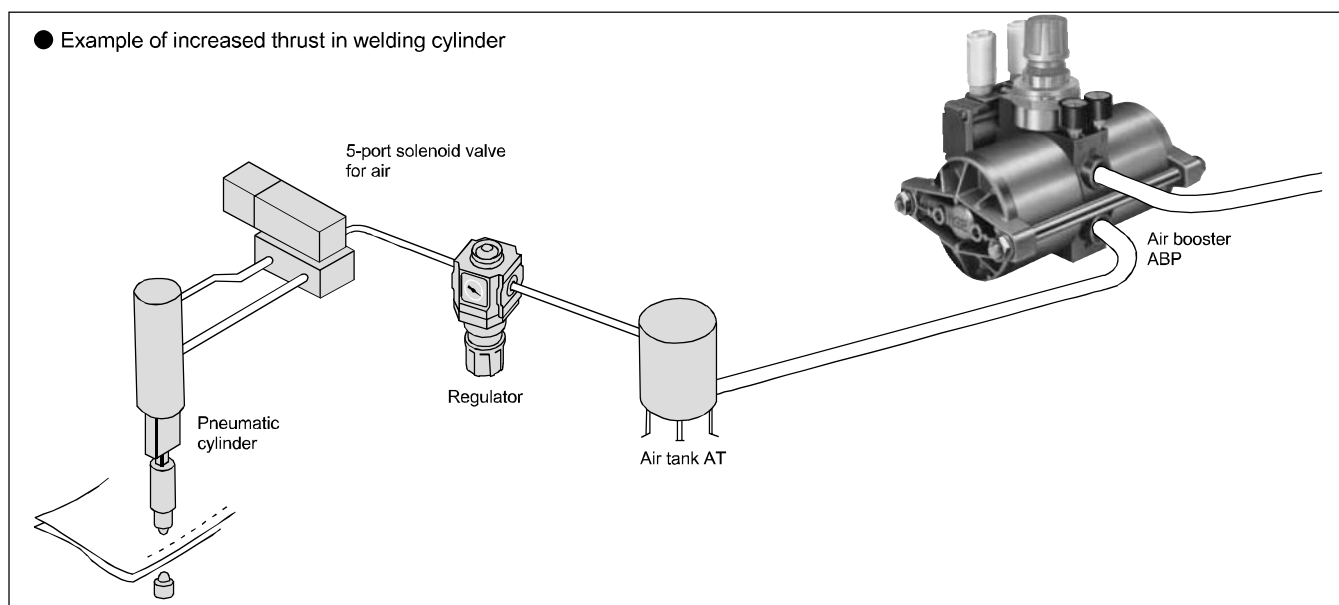
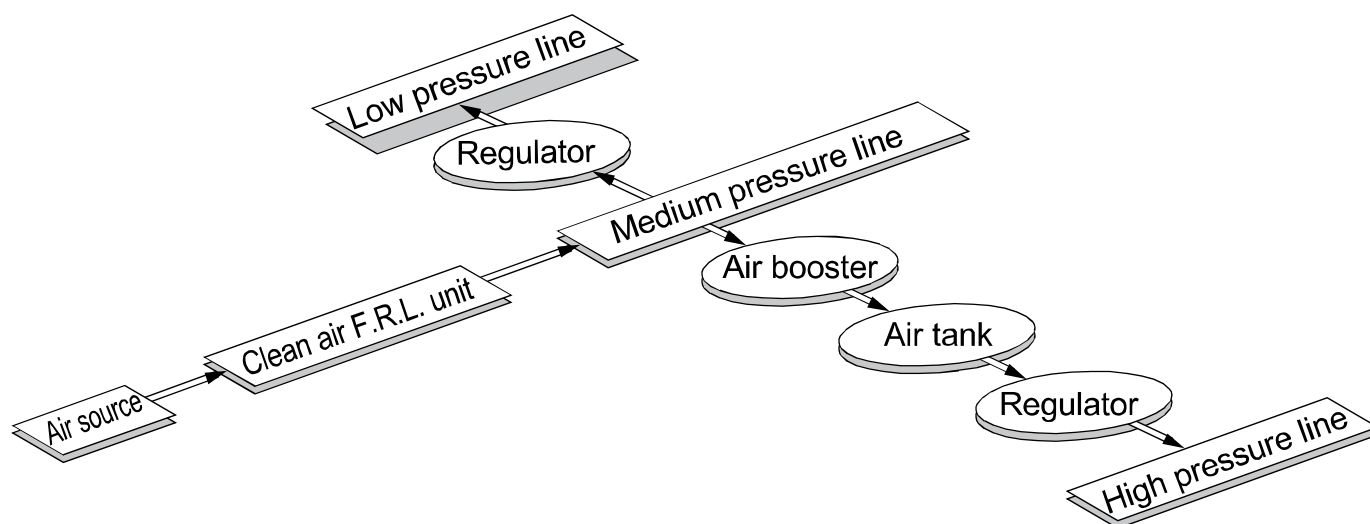
ABP Air Booster that needs no electricity
Produce highly compressed air (Max 0.99 MPa)
up to twice the primary pressure (equivalent).



Compact design and flexible installation

⚠ Be sure to read the precautions on page 610 before use.

□ Plant-wide total cost reductions are possible.



● Other applications

1. Reducing the footprint of the air cylinder.
2. Improving output capacity of driving components (air cylinder, air motor, etc.)
3. Quick filling of high-pressure air to air tanks
4. Boosting in explosion-proof atmospheres
5. Countering pressure changes in factory lines (fall in air pressure of lines, etc.)

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/ PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/ other
Jnt/tube
AirUnt
PresCompn
Mech/ ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/ Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

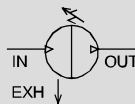
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LgFRL
PrecsR
VacF/R
Clean FR
ElecPneR
AirBoost
SpdContr
Silncr
CheckV/
other
Jnt/tube
AirUnt
PrecsCompn
Mech/
ElecPresSw
ContactSW
AirSens
PresSW
Cool
AirFloSens/
Contr
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending



Air booster

ABP Series

JIS symbol



Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions		ABP
Working fluid		Compressed air
Max. working pressure	MPa	0.99 (≈140 psi, 9.9 bar)
Min. working pressure	MPa	0.2 (≈29 psi, 2 bar)
Set pressure	MPa	From a primary pressure of +0.1 MPa to twice the primary pressure (max. 0.99 MPa)
Proof pressure	MPa	1.5 (≈220 psi, 15 bar)
Flow rate	m ³ /min(ANR)	Refer to the flow characteristics in the graph on the right
Boosting ratio		Max. twice (or equivalent)
Ambient temperature	°C	0 (32°F) to 50 (122°F) (no freezing)
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)
Port size		Rc1/2
Weight	kg	4.6
Durability		5 million (nominal)

How to order



Air booster

A OUT port position

Blank	Same side as IN port
D	Bottom (direct connection to air tank)
L	Back side of IN port

B Option

G	Pressure gauge
S	Silencer
B	Foot bracket

Note) Option G (pressure gauge) is installed onto air booster at shipment. B (foot bracket) and S (silencer) are enclosed products.

Functions

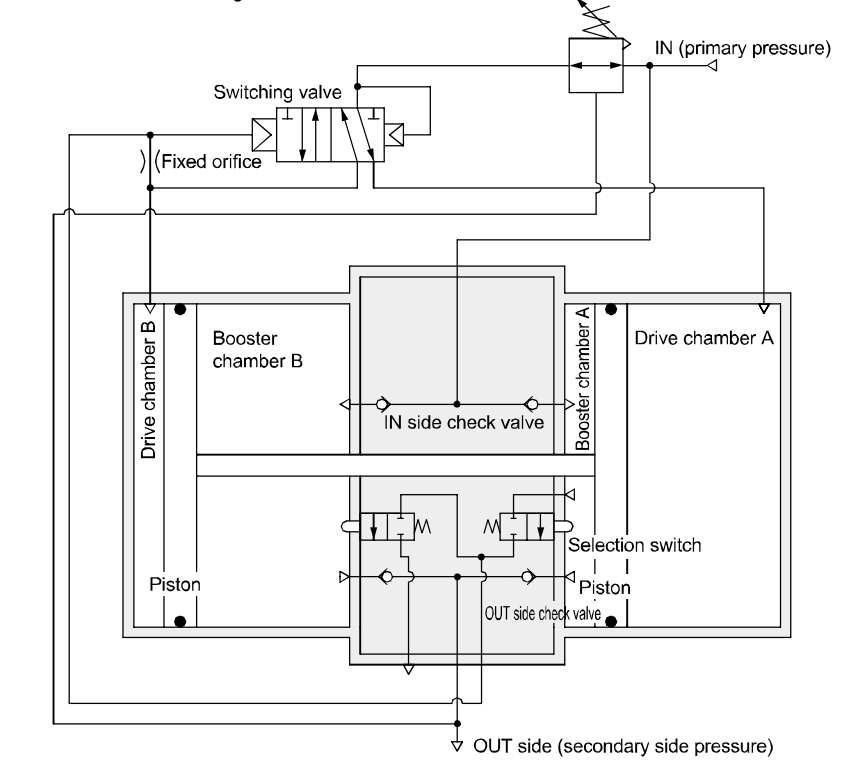
● Primary pressure flowing from IN passes through the check valve on the IN side, and flows into the booster chambers A and B. The primary pressure passes through the pressure adjustment section and switching valve, and flows into the driving chamber A. The piston moves to the left due to the pressure of the driving chamber A. Air in booster chamber A is compressed, passes through the check valve on the OUT side, and goes to the OUT side.

● When the piston reaches the stroke end, the changeover switch will be pushed, causing compressed air to be supplied to the switching valve pilot chamber and causing the switching valve to change over. Then the air in drive chamber A is exhausted, and the air is delivered to drive chamber B.

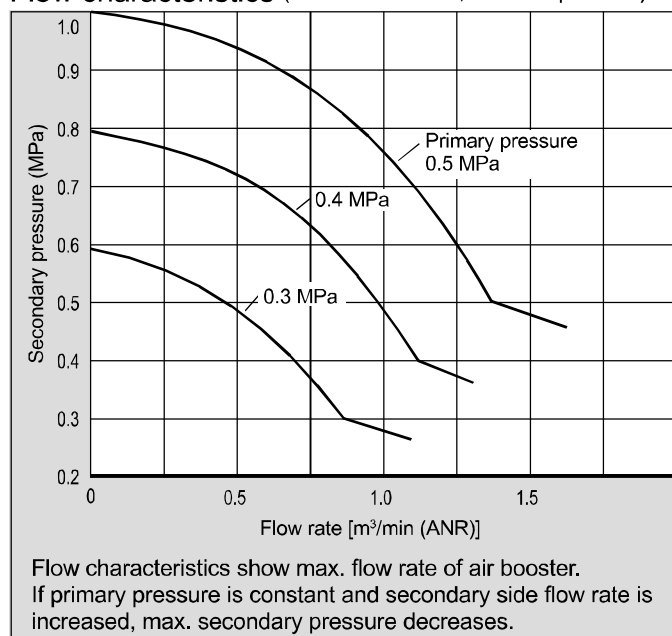
● Therefore, the piston moves to the right and air in booster chamber B is compressed, passes through the check valve at the OUT side and moves OUT.

● Boosting on the OUT side is compressed if the operations above are repeated. Feedback pressure is transmitted to the pressure adjustment section due to the OUT side pressure, and boosting is continued until the pressure adjustment spring pressure is balanced.

Internal air circuit diagram

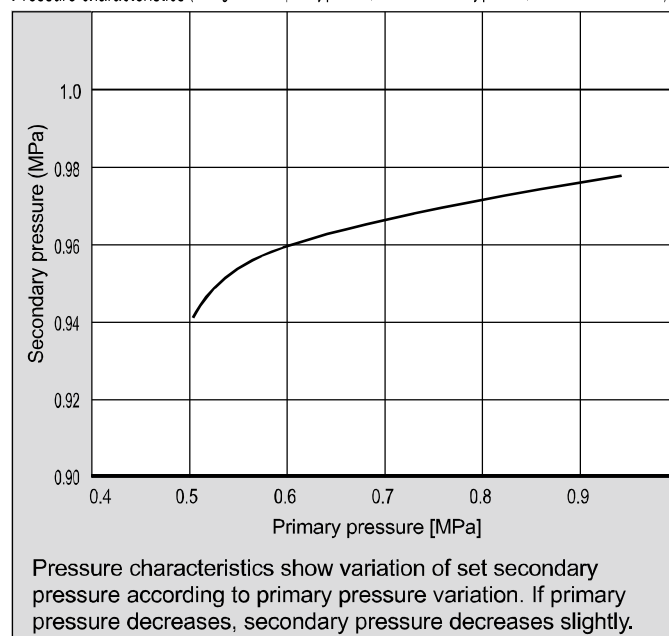


Flow characteristics (with AT-24 air tank, twice the pressure)

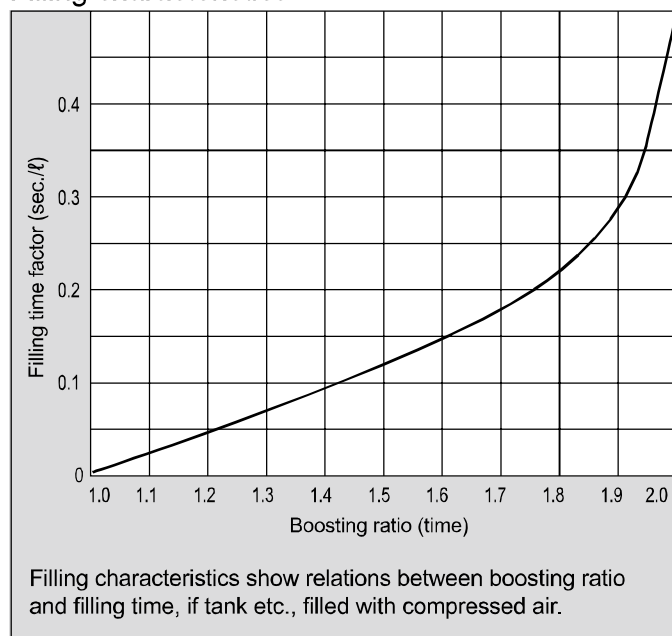


Note) Air booster needs approx. twice secondary side flow rate (max.) for primary side due to structure.
Confirm that the instantaneous flow rate is within the curve.

Pressure characteristics (Setting: 0.69 MPa primary pressure, 0.97 MPa secondary pressure, 0.02 m³/min ANR flow rate)

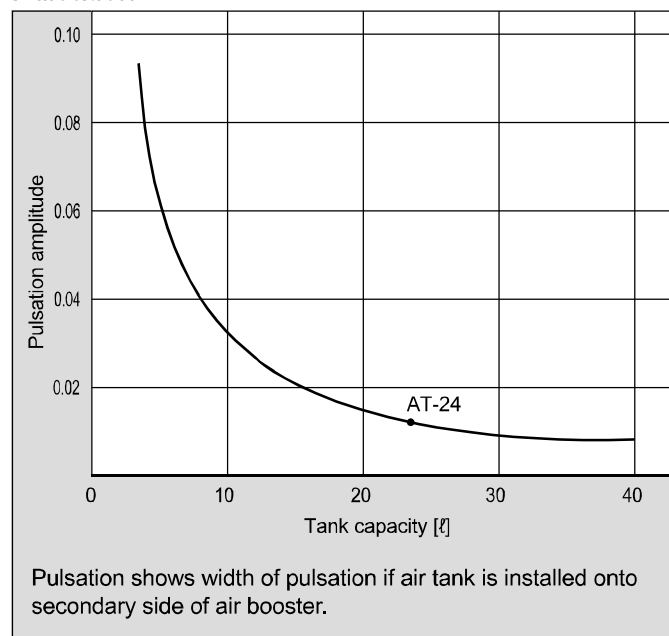


Filling characteristics



The time required to fill the tank with air can be calculated as follows. With the primary side pressure P_0 , inner tank pressure before filling P_1 , inner tank pressure after filling P_2 , pre-filling ratio between primary side pressure and inner tank pressure k_1 , and post-filling ratio between primary side pressure and inner tank pressure k_2 , the formula will be $k_1 = \frac{P_1}{P_0}$, $k_2 = \frac{P_2}{P_0}$. Calculate k_1 and k_2 , find the filling time factors t_1 and t_2 at the boosting ratio points k_1 and k_2 in the graph and substitute the values into $t = (t_2 - t_1) A$ to obtain the filling time t of the tank capacity A (t).

Pulsation



Formula for air booster operational cycle

$$N = \frac{Q \times 10^3}{7.55P + 0.76}$$

N: Operational cycle
Q: Required flow rate [m³/min (ANR)]
P: Primary side pressure [MPa]

Formula for air booster service life

Nominal life of operational cycle is 5 million times

$$T = \frac{5,000,000}{N \times 60}$$

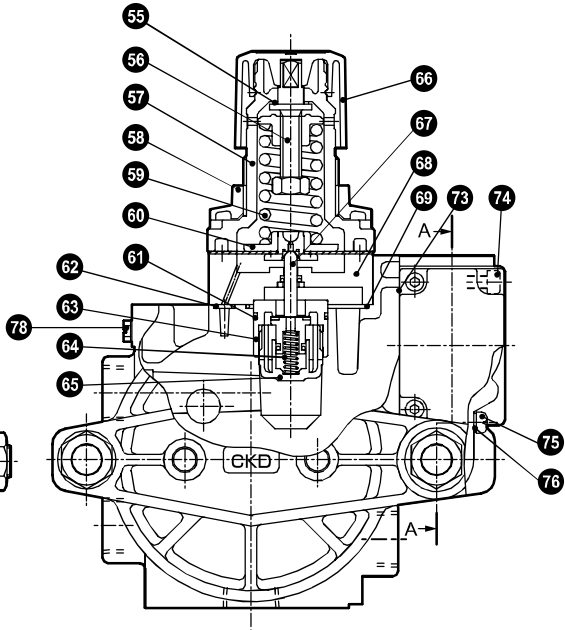
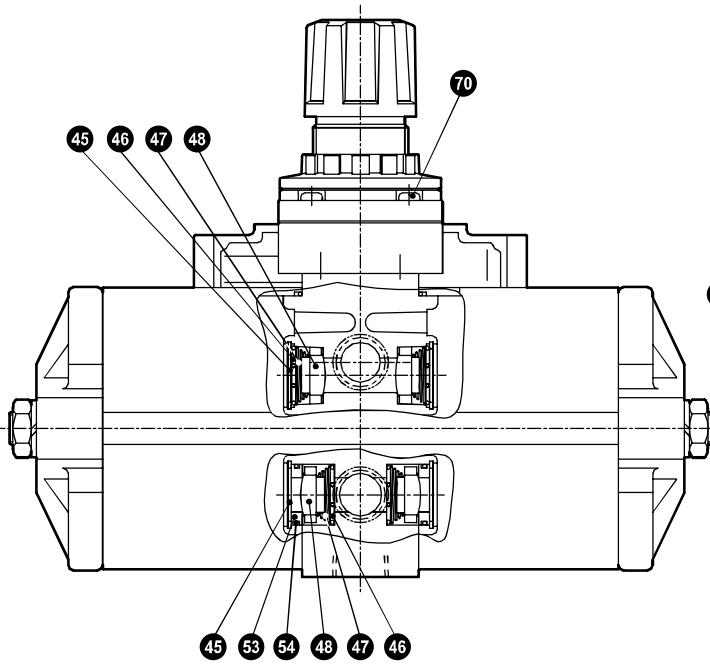
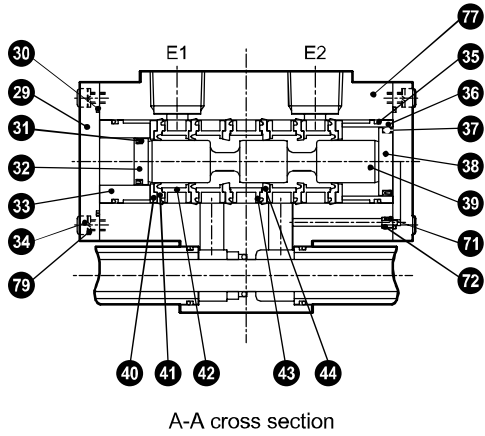
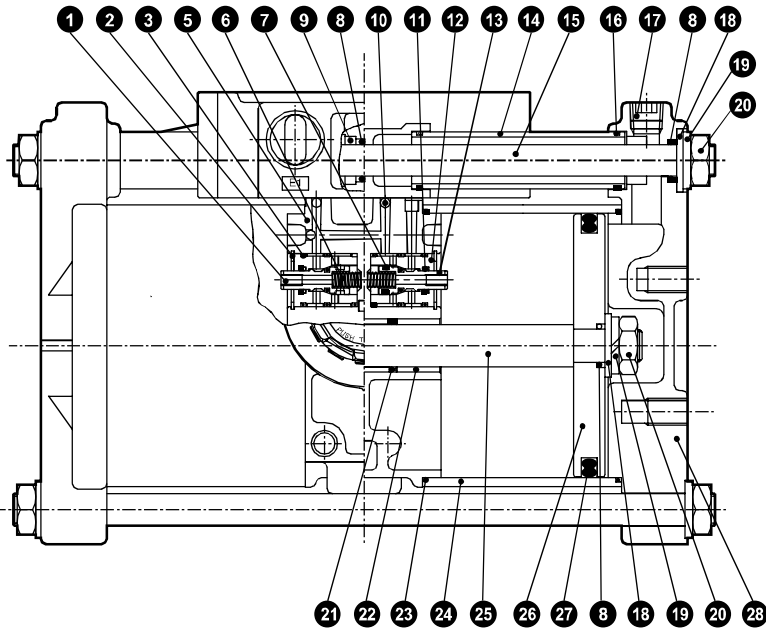
T: Service life (hours)

The characteristics above are typical examples, not guaranteed values.

F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
SlowStart
FmResistFR
Oil-ProhR
MedPresFR
No Cu/PTFE FRL
Outdrs FR
F.R.L (Related)
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
SpdContr
Silncr
CheckV/other
Jnt/tube
AirUnt
PresCompn
Mech/ElecPresSw
ContactSW
AirSens
PresSW Cool
AirFloSens/Contr
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

F.R.L Internal structure

- F (Filtr)
- R (Reg)
- L (Lub)
- PresSW
- Shutoff
- SlowStart
- AmResistFR
- Oil-ProhR
- MedPresFR
- No Cu/PTFE FRL
- Outdrs FR
- F.R.L (Related)
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneuR
- AirBoost
- SpdContr
- SiIncr
- CheckV/other
- Jnt/tube
- AirUnt
- PrecsCompn
- Mech/ElecPresSw
- ContactSW
- AirSens
- PresSW Cool
- AirFloSens/Contr
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending



Parts list

No.	Part name	Material	Quantity	No.	Part name	Material	Quantity
1	Valve bar (A)	Stainless steel	1	41	Soft packing	Urethane rubber	4
2	C type snap ring for hole	Stainless steel	2	42	Spacer	Aluminum alloy	4
3	O-ring	Nitrile rubber	5	43	Spacer	Polyacetal resin	1
5	Body block assembly	Aluminum alloy	1	44	Soft packing	Urethane rubber	2
6	Spring	Stainless steel	2	45	C type snap ring for hole	Stainless steel	4
7	O-ring	Nitrile rubber	1	46	Spring seat	Stainless steel	4
8	O-ring	Nitrile rubber	5	47	Spring	Stainless steel	4
9	Spacer	Stainless steel	1	48	Check valve	Nitrile rubber	4
10	Steel ball	Steel	3	53	Valve seat	Aluminum alloy	2
11	Packing	Nitrile rubber	2	54	O-ring	Nitrile rubber	1
12	Detection valve body	Copper alloy	2	55	Slip ring	Polyacetal resin	4
13	Bar (B)	Stainless steel	1	56	Adjusting assembly		1
14	Pipe	Stainless steel	2	57	Cover	PBT resin	1
15	Tie rod	Steel	2	58	Mounting nut	Polyacetal resin	1
16	O-ring	Nitrile rubber	4	59	Adjusting spring	Steel	1
17	Hexagon socket head cap plug	Steel	2	60	Diaphragm assembly		1
18	Plain washer	Steel	4	61	O-ring	Nitrile rubber	1
19	Spring washer	Steel	6	62	O-ring	Nitrile rubber	1
20	Hexagon nut	Steel	6	63	Valve seat	Copper alloy	1
21	MY packing	Nitrile rubber	2	64	Bottom spring	Stainless steel	1
22	Rod metal	Oil impregnated bearing alloy	3	65	Stud	Polyacetal resin	1
23	O-ring	Nitrile rubber	4	66	Knob	Polyacetal resin	1
24	Cylinder tube	Aluminum alloy	2	67	Valve assembly		1
25	Piston rod	Steel	1	68	Regulator body assembly		1
26	Piston	Aluminum alloy	2	69	O-ring	Nitrile rubber	1
27	Piston packing	Nitrile rubber	2	70	Cross-recessed tapping screw	Steel	4
28	Head cover	Aluminum alloy	2	71	Fixed orifice	Copper alloy	1
29	Cap	Aluminum alloy	2	72	O-ring	Nitrile rubber	1
30	Gasket	Nitrile rubber	2	73	Master valve gasket	Nitrile rubber	1
31	Lip packing	Nitrile rubber	1	74	Hexagon socket head cap screw	Steel	2
32	Piston	Polyacetal resin	1	75	Cross-recessed pan head machine screw	Steel	1
33	Cylinder	Aluminum alloy	1	76	Gasket	Nitrile rubber	1
34	Hexagon socket head cap screw	Steel	8	77	Valve body	Aluminum alloy	1
35	O-ring	Nitrile rubber	2	78	Plug	Copper alloy	1
36	Cylinder	Aluminum alloy	1	79	Spring washer	Steel	8
37	Lip packing	Nitrile rubber	1				
38	Piston	Polyacetal resin	1				
39	Spool	Aluminum alloy	1				
40	Stopper	Polyacetal resin	2				

Single unit repair parts and options list

Part name	Model No.	Part No.	Remarks
Changeover switch packing set	ABP-K1	①×1, ③×5, ⑥×2, ⑪×2, ⑫×2, ⑬×1, ⑦×1	
Cylinder packing set	ABP-K2	⑧×5, ⑬×4, ⑫×2, ⑫×4, ⑫×2	
Switching valve piston assembly	ABP-K3	③①×1, ③②×1, ③⑦×1, ③⑧×1	
Switching valve seal assembly	ABP-K4	④①×2, ④①×4, ④②×4, ④③×1, ④④×2	
Diaphragm assembly	ABP-K6	⑥①×1	
Pressure adjustment section valve assembly	ABP-K7	⑥①×1, ⑥②×1, ⑥⑦×1, ⑥⑨×1	
Check valve assembly	ABP-K8	④⑧×4, ⑤③×2, ⑤④×2	
Bracket	ABP-B		Qty per unit
Pressure gauge	ABP-GAUGE		Pressure gauge x 1
Silencer	SLW-15A		Silencer x 1

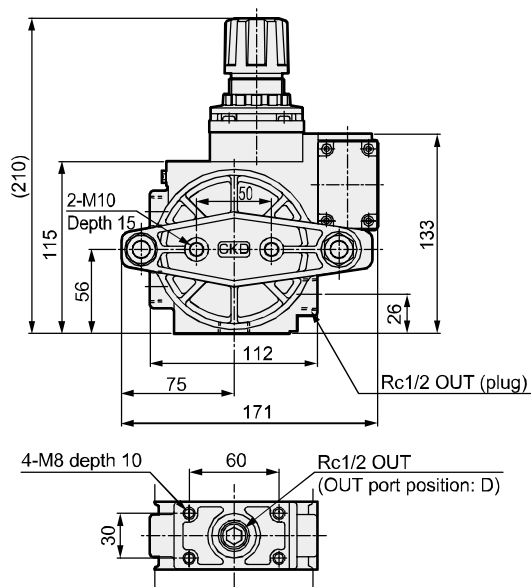
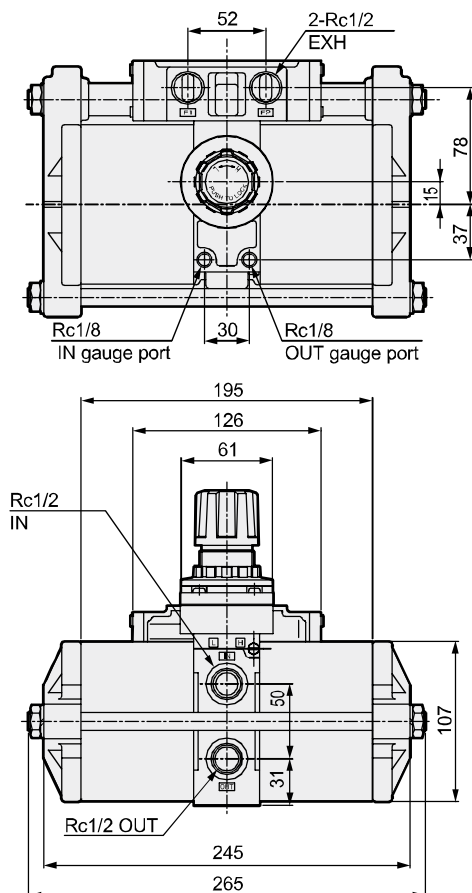
F.R.L
F (Filtr)
R (Reg)
L (Lub)
PresSW
Shutoff
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MainFiltr
Dischrg etc
Ending

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PresSW
Shutoff
SlowStart
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MedPresFR
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Outdrs FR
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LgFRL
PrecsR
VacF/R
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ElecPneuR
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SpdContr
SiIncr
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Jnt/tube
AirUnt
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ContactSW
AirSens
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AirFloSens/ Contr
WaterRtSens
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TotAirSys (Gamma)
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

Dimensions

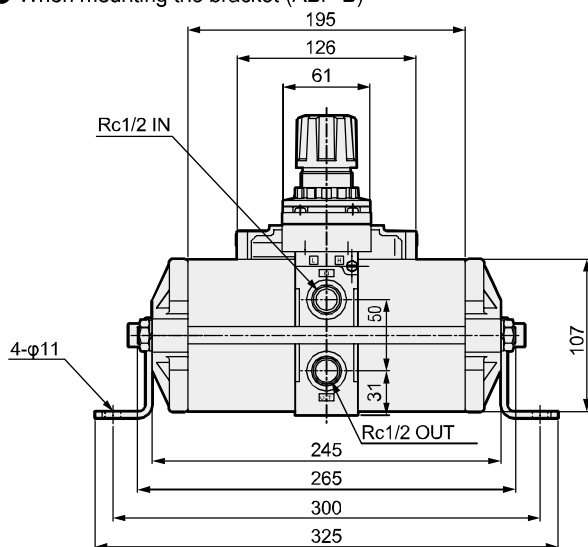


● ABP-12

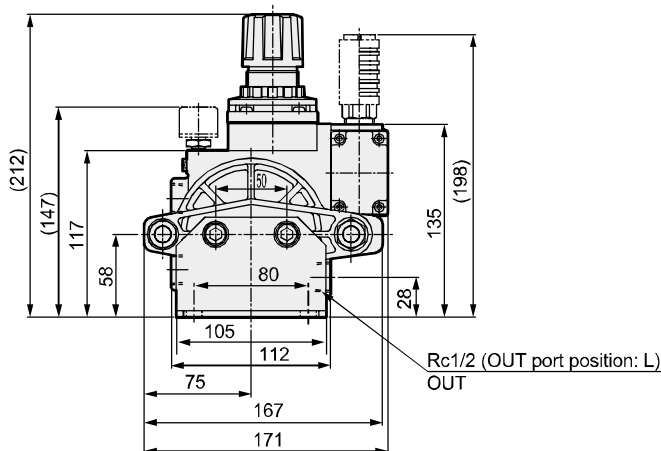


Optional dimensions

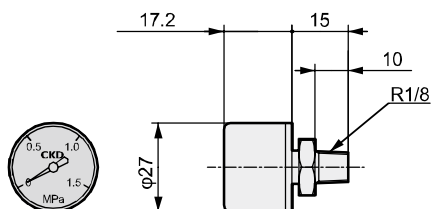
● When mounting the bracket (ABP-B)



Weight: 792 g (excluding ABP body and including bracket/bolt/spring washer)

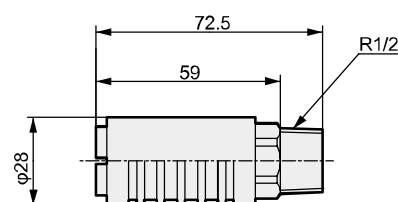


● Pressure gauge (ABP-GAUGE)



Weight: 32g

● Silencer (SLW-15A)



Weight: 21g



Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 63 for general precautions.

Product-specific cautions: Air booster ABP Series

Design/selection

⚠ WARNING

- Do not use the air booster for continuous operation such as in a compressor.

The air booster is designed for partial boosting in the factory, etc. Life is shortened if used for high frequency continuous operation, such as in a compressor. (The air booster's nominal life is approximately 5,000,000 uses when used under normal conditions)

Refer to page 605 for the estimated service life calculation.

⚠ CAUTION

- Do not use this product if vibration exceeds 50 m/s² or impact exceeds 300 m/s².

- Pressure is raised by air pressure, so half of the air is discharged during boosting.

If the secondary side flow rate must be 1, the primary side requires a flow rate of 1 + 1 = 2.

- Because the inside is cylindrical, a noise level of 60 to 80 dB (primary side 0.49 MPa and secondary side 0.95 MPa for measurement of 1 m) is generated during boosting.

* This is when a silencer is used.

- When the air booster is not used, stop the primary pressure. Stop unnecessary operation and prevent air consumption.

Mounting, installation and adjustment

⚠ WARNING

- Do not supply pressure exceeding 0.99 MPa onto the primary side.

- Check that set pressure does not exceed 0.99 MPa.

⚠ CAUTION

- Install a filter on the primary side to remove rust, foreign matter and drainage. The air booster compresses compressed air so drain is discharged easily from the secondary side. Installation of a filter is recommended to remove any moisture from the piping.

- Install primary side piping at 1/2B or more to attain sufficient flow.

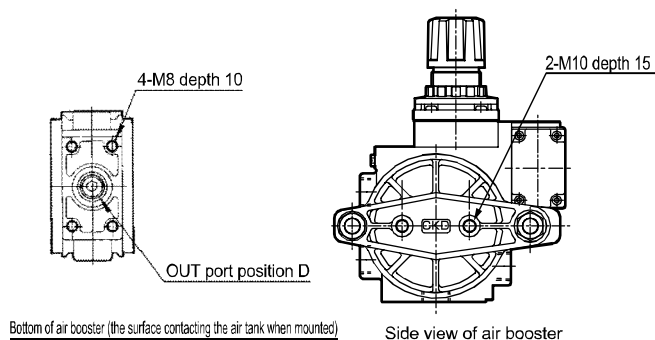
- Install a silencer (SLW-15A, SL-15) or exhaust cleaner (FA430-15A) on the exhaust port of the air booster. When using the exhaust cleaner, common porting of the exhaust port is recommended.

- Use piping with a stop valve at the air tank's drain port.
Regularly discharge drain from the tank.

- There are no set regulations regarding the air booster's mounting orientation: it should optimally be horizontally installed on a flat surface.

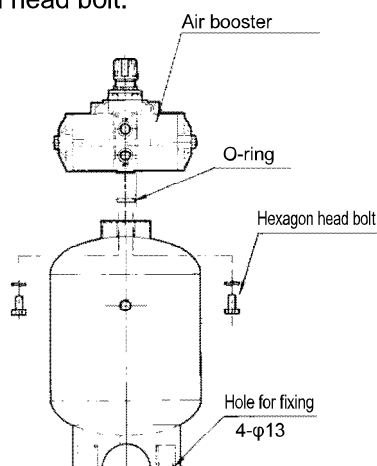
- Install the air booster using 4-M8 depth 10 screw holes on the bottom or 2-M10 depth 15 screw holes on both sides.

Only use these screw holes for installing the air booster.



- The bolt used to install the air booster must not exceed the screw hole depth.
Forcibly tightening a long bolt could damage the screw hole and cause air leakage.

- A foot bracket installed on both ends is available as an option.
(Model No. ABP-12-B)
- Fix the air tank with the 4- ϕ 13 anchor bolt hole on the bottom.
- When directly connecting the air booster to the air tank (AT-24), use OUT port position D, and mount the O-ring enclosed with the air tank on the air booster. Then, fix to the top of the air tank with a hexagon head bolt.



- Installation of an air tank and regulator after the air booster is recommended for attaining stable secondary pressure.

Use/maintenance

⚠ WARNING

- Stop the primary side pressure and release the secondary side pressure before servicing, inspecting, or repairing the air booster.

⚠ CAUTION

- When setting pressure, lift the pressure adjustment knob to release the lock, and then turn the pressure adjustment knob.
Secondary pressure increases when the pressure adjustment knob is turned clockwise. The pressure adjustment knob must be locked after use.
- If primary pressure exceeds the set pressure due to fluctuations in pressure, etc., air is released from the pressure adjustment knob.
Set a regulator on the primary side, and adjust the pressure at least 0.1 MPa lower from the set pressure.
- The silencer and pressure gauge are repair parts and must be replaced regularly.

* Refer to the separate Maintenance Manual (ST-130606) for the maintenance procedures.

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WaterRtSens
TotAirSys (Total Air)
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RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending