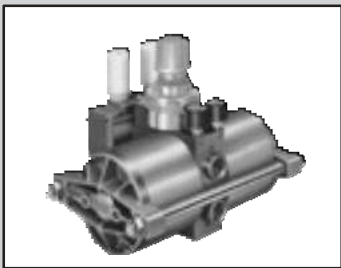
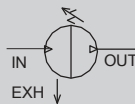


Air booster ABP Series



JIS symbol



F.R.L.
F.R.
F
(Filtr)
R
(Reg)
L
(Lub)
Drain
Separ
Mech
Press
SW
Res
press
exh
valve
Sw
Sat
Anti-
bac/B
ac-
remov
e Filt
Fim
Resist
FR
OP
dR
Med
Press
FR
No Cu/
PTFE
FRL
Outdr
s FRL
Adapt
er
Joiner
Press
Gauge
Comp
R
Lg
FRL
Precs
R
Vad
FR
Clean
FR
Ea
Pr
R
Ai
Boost
Spee
d Ctr
Silncr
Check/
other
Fit
Tube
Nozzle
Air
Unit
Res
Compn
Electro
Press
SW
Cool
SW
Air
Sens
Pres
SW
Cool
Air
Flo
Exh
Air
FRL
Vad
FR
(Total
Air)

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.

Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	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
How to order	5 million (nominal)



Air booster

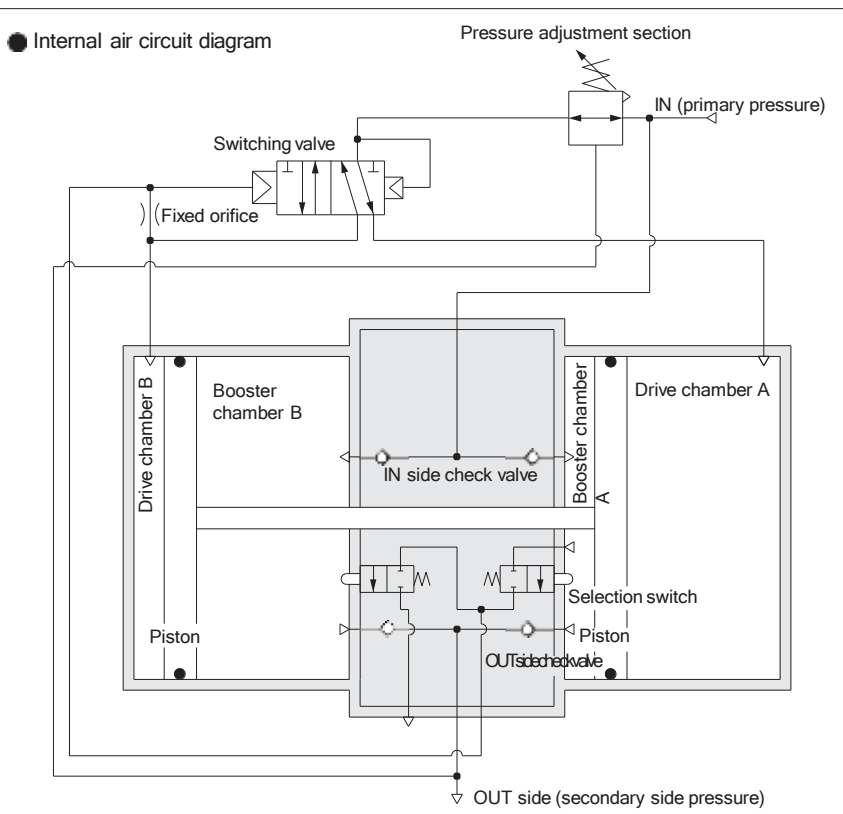
A OUT port position

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

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.



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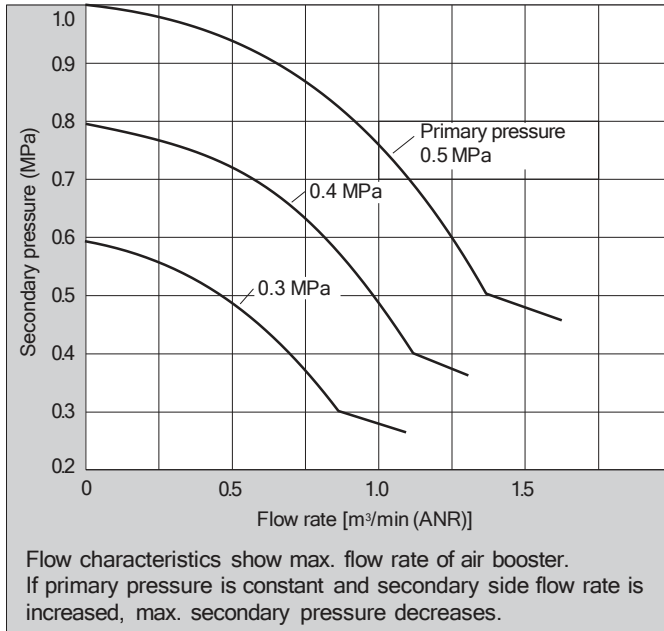
sales@gentle.com.my

www.gentle.com.my

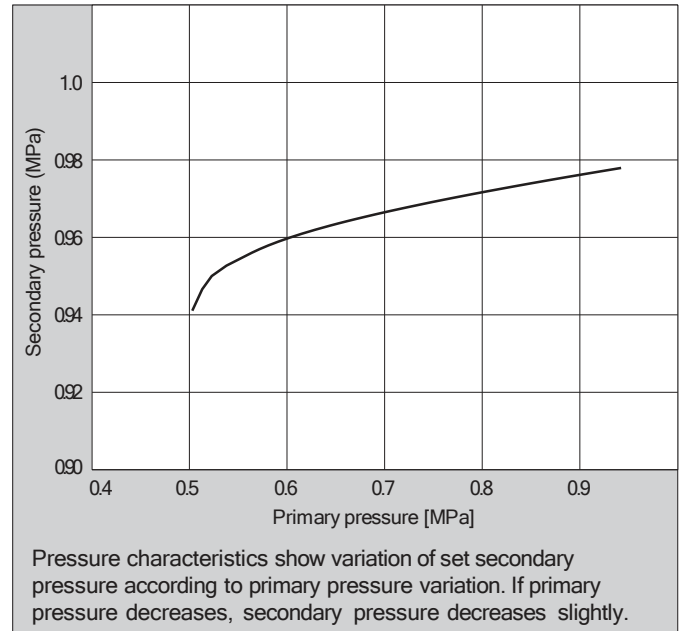
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Flow characteristics (with AT-24 air tank, twice the pressure)

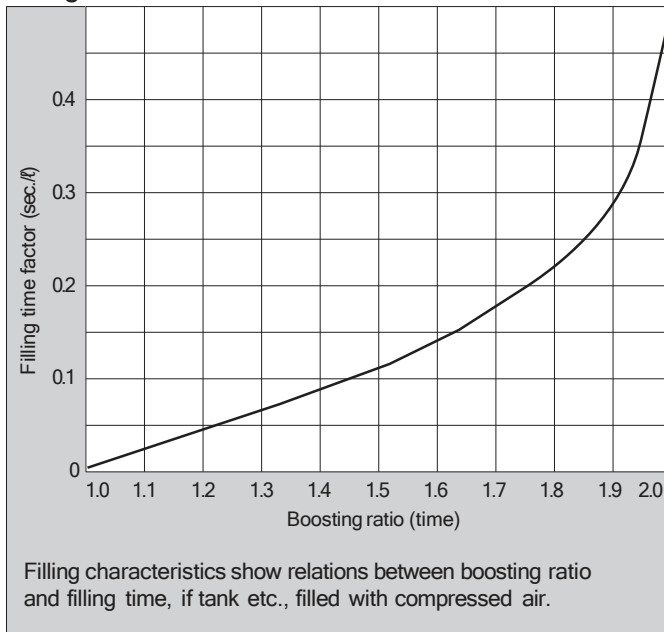


Pressure characteristics (with AT-24 air tank, twice the pressure)



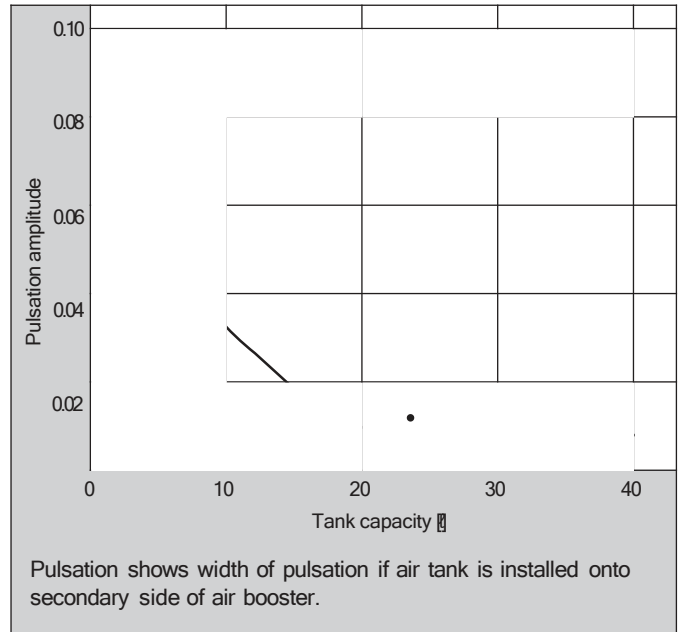
Note) Air booster needs approx. twice secondary side flow rate (max.) for primary side due to structure. Confirm that the instantaneous flow rate is within the curve.

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

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

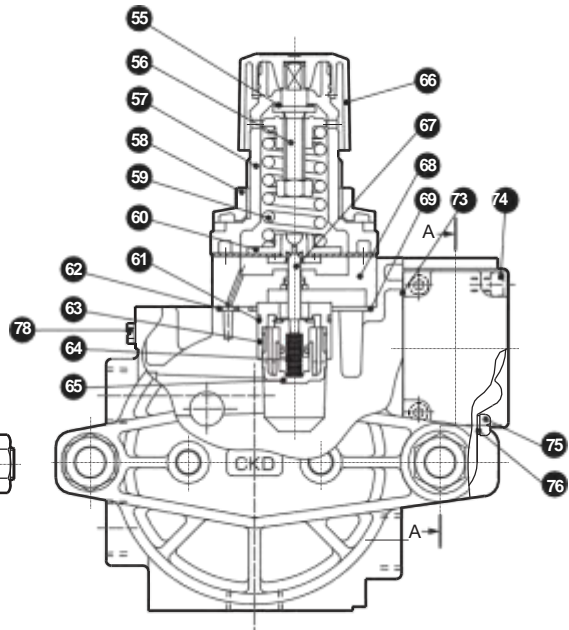
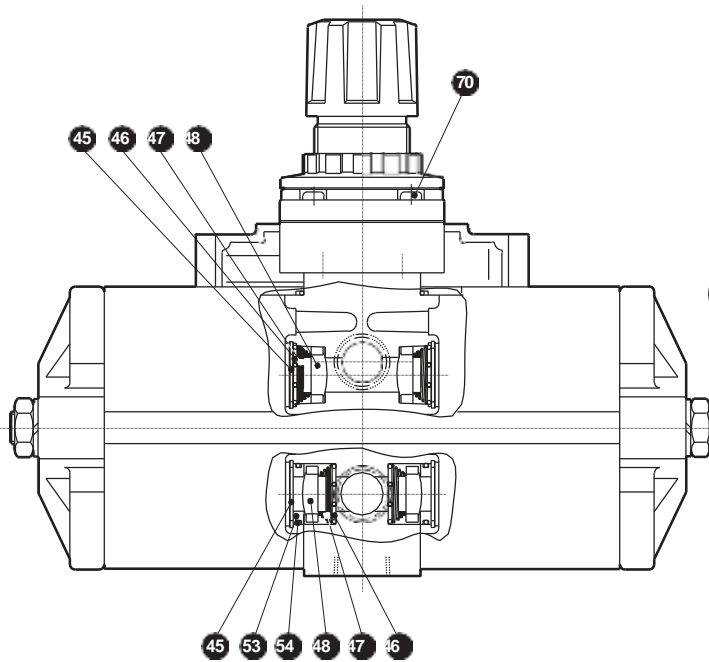
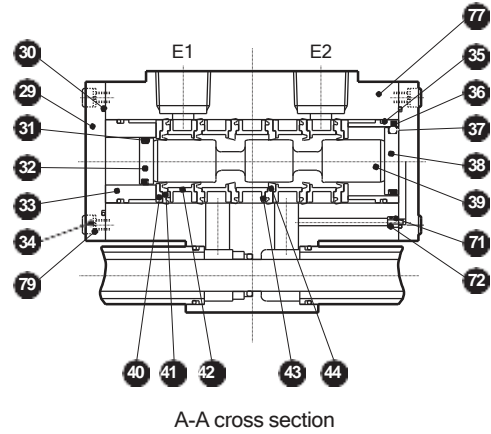
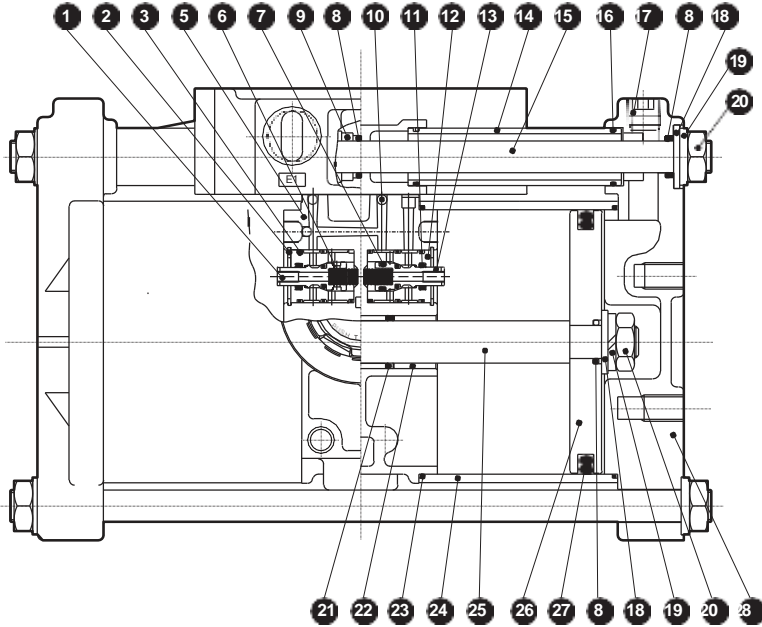
$$T = \frac{5,000,000}{N \times 60}$$

T: Service life (hours)

- F.R.L.
- F.R.
- F (Filtr)
- R (Reg)
- L (Lub)
- Drain Separ
- Med Press SW
- Res press exh valve
- Shut Stat
- Anti-bac/Bac remov eFilt
- Flm Resist FR
- OPdrR
- Med Press FR
- No Cu/PTFE FRL
- Outdrrs FRL
- Adapt er Joiner Press Gauge
- CompFRL
- LgFRL
- PrecsR
- VacFR
- Clean FR
- EstPreR
- AirBoost
- Speed Ctrl
- Silncr
- CheckV/ other
- FitTube
- Nozzle
- Air Unit
- ResConn
- Electro Press SW
- ContSW
- AirSens
- PresSW Cool
- Air Flo Sens/Ctrl
- Valves To Air Sys (Total Air)
- Extinguisher (Gamma)
- generator

F.R.L Internal structure





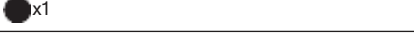









- F.R.L
- F.R.
- F (Filtr)
- R (Reg)
- L (Lub)
- Drain Separ
- Med Press SW
- Res press exh valve
- SubStat
- Anti-bac/Bac remove Filt
- Film Resist FR
- OPdR
- Med Press FR
- No Cu/PTFE FRL
- Outdr s FRL
- Adapt er Joiner Press Gauge
- CompFRL
- LgFRL
- PrecsR
- VadFR
- Clean FR
- EstFR
- AIBoost
- Speed Ctrl
- Silncr
- Check V/ other
- Fitube
- Nozzle
- Air Unit
- ResComp
- Ebdro Press SW
- CortaSV
- AiSens
- PresS W Cool
- Ardrty Sens/
- Ctrl
- 680
- Water
- TotAir



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-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-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	Aluminum alloy	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	Nitrile rubber	1
26	Piston	Aluminum alloy	2	69	O-ring	Steel	4
27	Piston packing	Nitrile rubber	2	70	Cross-recessed tapping screw	Copper alloy	1
28	Head cover	Aluminum alloy	2	71	Fixed orifice	Nitrile rubber	1
29	Cap	Aluminum alloy	2	72	O-ring	Nitrile rubber	1
30	Gasket	Nitrile rubber	2	73	Master valve gasket	Steel	2
31	Lip packing	Nitrile rubber	1	74	Hexagon socket head cap screw	Steel	1
32	Piston	Polyacetal resin	1	75	Cross-recessed pan-head machine screw	Nitrile rubber	1
33	Cylinder	Aluminum alloy	1	76	Gasket	Aluminum alloy	1
34	Hexagon socket head cap screw	Steel	8	77	Valve body	Copper alloy	1
35	O-ring	Nitrile rubber	2	78	Plug	Steel	8
36	Cylinder	Aluminum alloy	1	79	Spring washer		
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

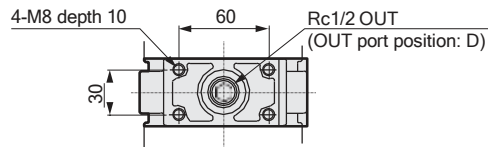
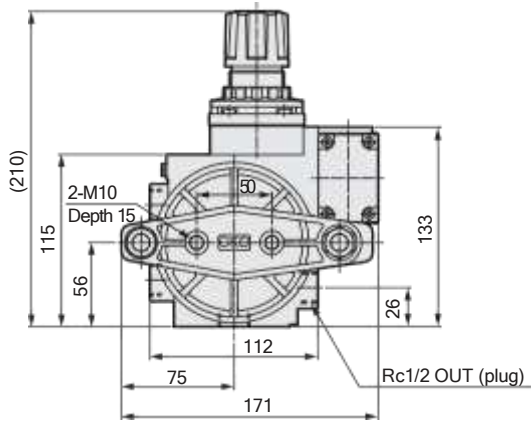
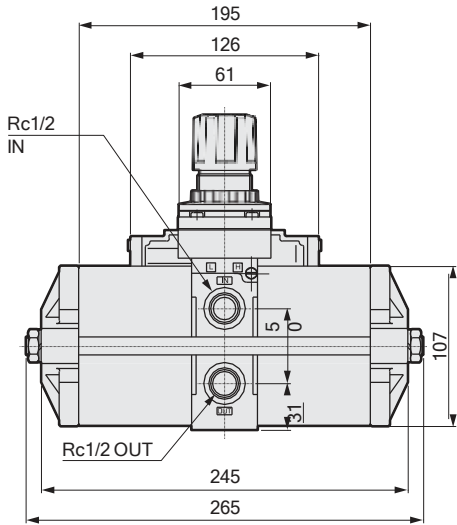
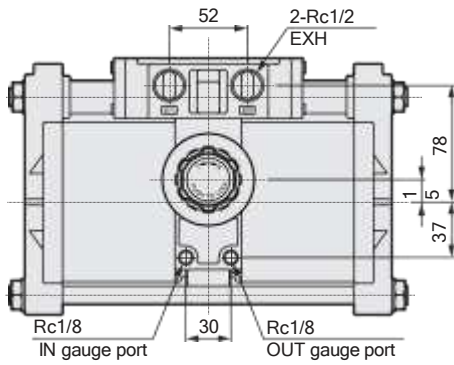
Part name	Model No.	Part No.	
Changeover switch packing set	ABP-K1	 x1,  x5,  x2,  x2,  x2,  x1,  x1	
Cylinder packing set	ABP-K2	 x5,  x4,  x2,  x4,  x2	
Switching valve piston assembly	ABP-K3	 x1,  x1, x1, x1	
Switching valve seal assembly	ABP-K4	x2, x4, x4, x1, x2	
Diaphragm assembly	ABP-K6	x1	
Pressure adjustment section valve assembly	ABP-K7	x1, x1, x1, x1	
Check valve assembly	ABP-K8	x4, x2, x2	
Bracket	ABP-B		Qty per unit
Pressure gauge	ABP-GAUGE		Pressure gauge x 1
Silencer	SLW-15A		Silencer x 1

F.R.L.
F.R.
F
(Filtr)
R
(Reg)
L
(Lub)
Drain
Separ
Mech
Press
SW
Res
press
exh
valve
Svst
Anti-
bac/B
ac-
remov
e Filt
Film
Resist
FR
OPdR
Med
Press
FR
No Cu/
PTFE
FRL
Outdr
s FRL
Adapt
er
Joiner
Press
Gauge
CompFRL
LgFRL
PecR
VacFR
Clean
FR
EstPrR
AirBoost
Spee
d Ctr
Silncr
Check/
other
FitTube
Nozzle
Air
Unit
ResComp
Electro
Press
SW
OutSW
AirSens
PresSW
Cool
Air Flo
Exh
VAF
TAS
(Total
Air)

Dimensions



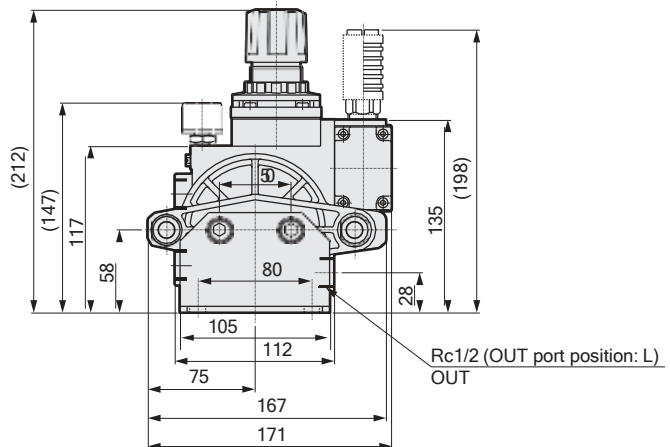
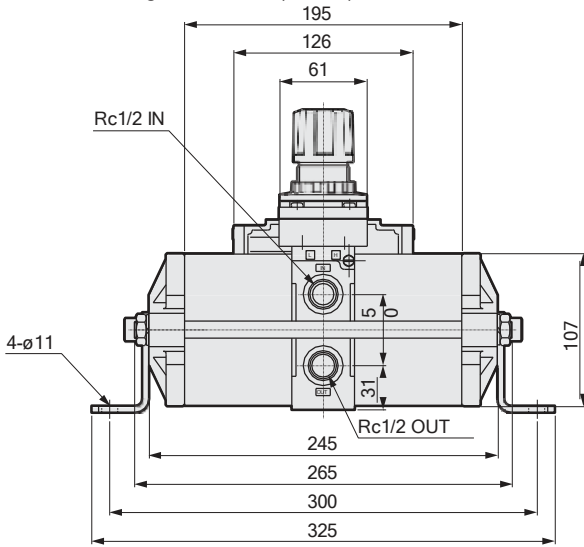
● ABP-12



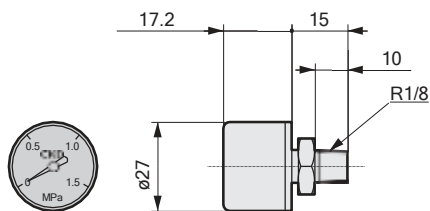
Optional dimensions

● When mounting the bracket (ABP-B)

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

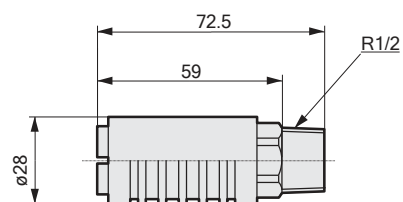


● Pressure gauge (ABP-GAUGE)



Weight: 32g

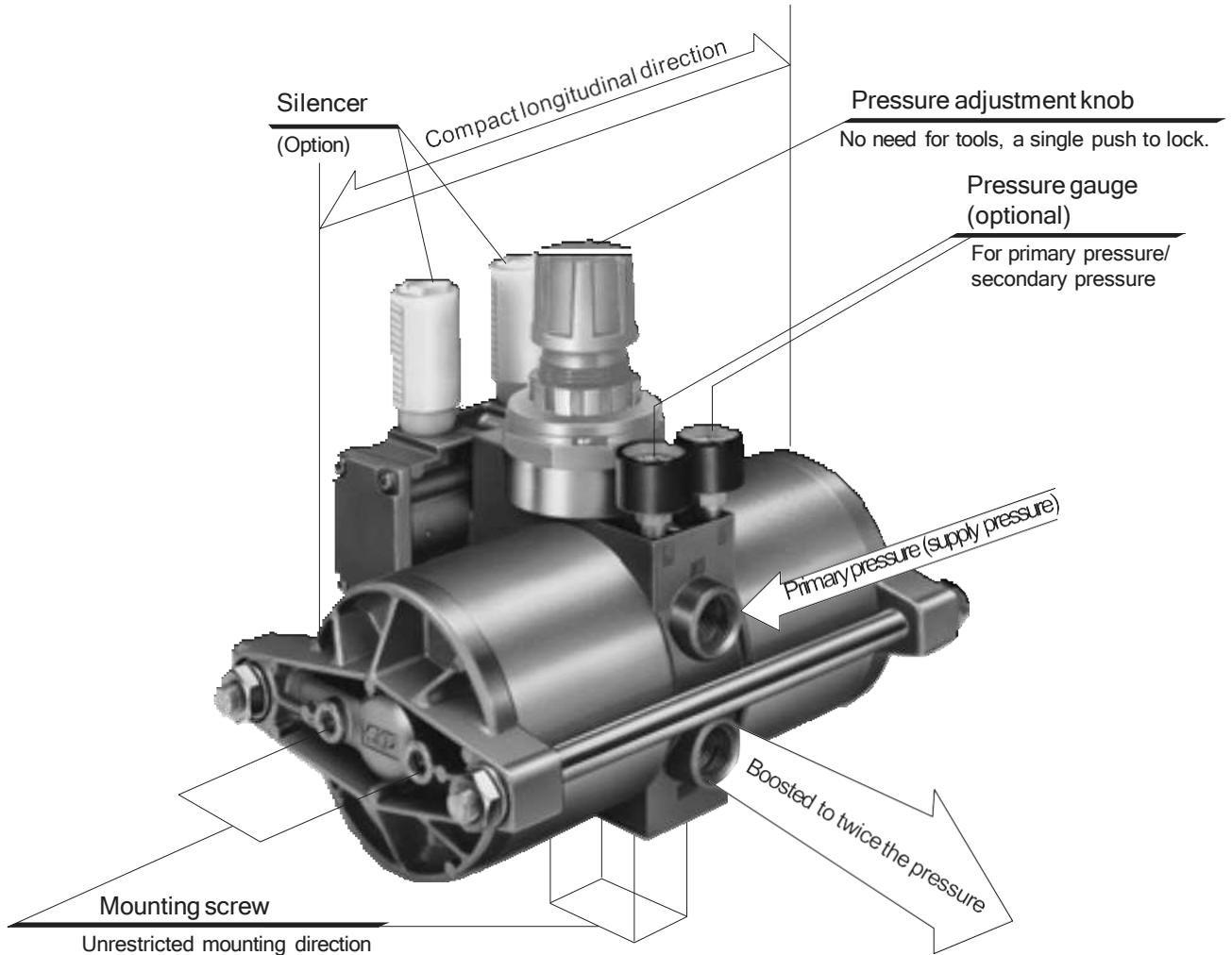
● Silencer (SLW-15A)



Weight: 21g

Obtain twice as much high pressure air

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



Compact design and flexible installation

! Be sure to read the precautions on page 684 before use.

Gentle Automatic Solution Sdn Bhd

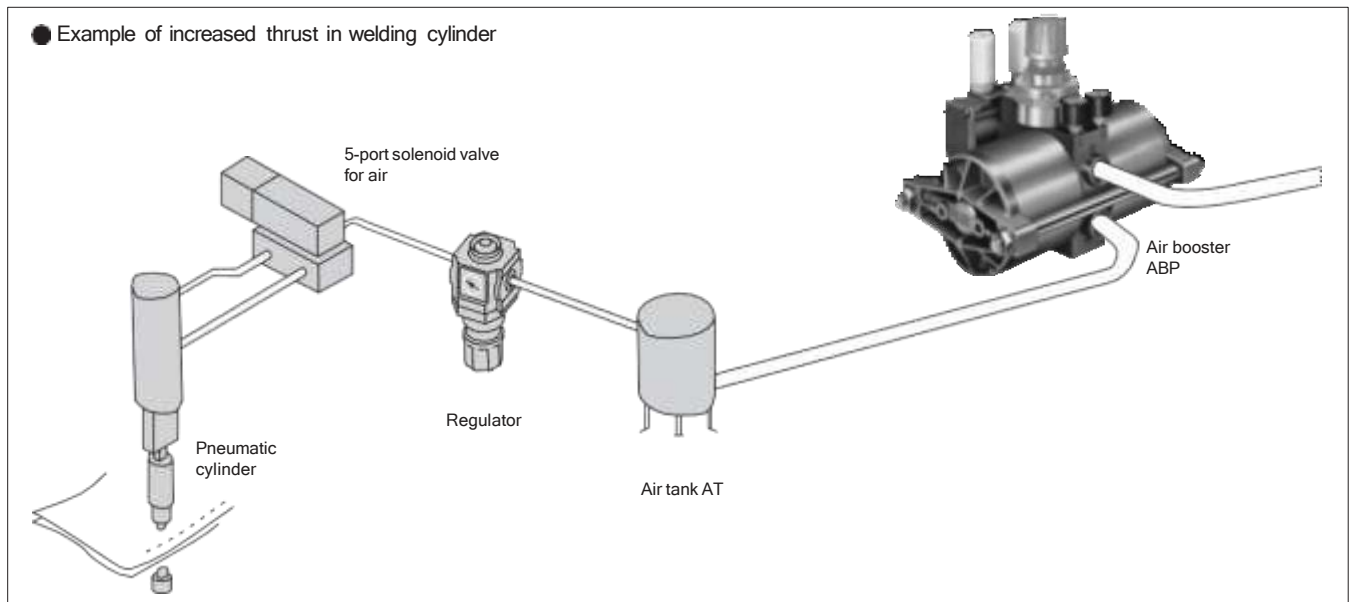
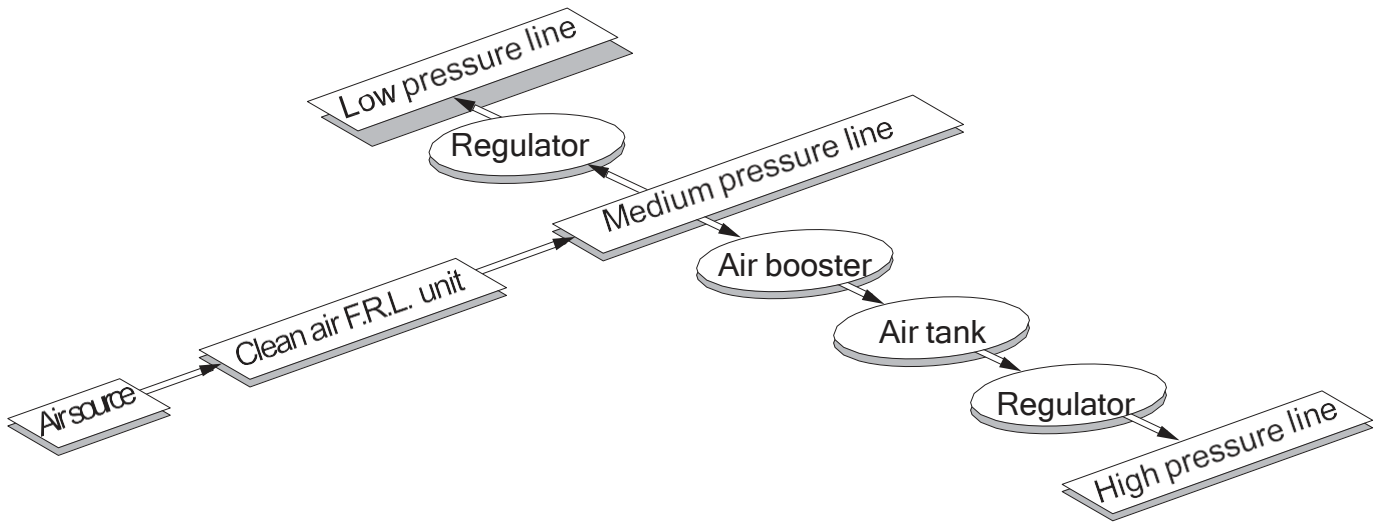
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 TEL: 603-8023 7743 / 8743 FAX: 603-8023 9743

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 www.gentle.com.my

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 waze.to/ir/hw28325k63

F.R.L.
 F.R.
 F
 (Filtr)
 R
 (Reg)
 L
 (Lub)
 Drain
 Separ
 Mech
 Press
 SW
 Res
 press
 exh
 valve
Sw&at
 Anti-
 bac/B
 ac-
 remov
 e Filt
 Film
 Resist
 FR
OP&R
 Med
 Press
 FR
 No Cu/
 PTFE
 FRL
 Outdr
 s FRL
 Adapt
 er
 Joiner
 Press
 Gauge
CompFRL
 LgFRL
 PrecsR
 VadFR
 Clean
 FR
EstPreR
AiBoost
 Spee
 d Ctrl
 Silncr
 Check//
 other
FitTube
 Nozzle
 Air
 Unit
ResComp
 Electro
 Press
 SW
ContSW
 AiSens
 PresSW
 Cool
 Air Flo
EnclG
W&FCas
 Total
 6,76
 (Total
 Air)

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.R.
- F (Filtr)
- R (Reg)
- L (Lub)
- Drain Separ
- Med Press SW
- Res press exh valve
- SwStat
- Anti-bac/Bac-remov eFilt
- Flm Resist FR
- OPdr
- Med Press FR
- No Cu/PTFE FRL
- Outdrs FRL
- Adapt er Joiner Press Gauge
- CompFRL
- LgFRL
- PrecsR
- VacFR
- Clean FR
- EstPreR
- AiBoost
- Speed Ctrl
- Silncr
- CheckV/ other
- FITube
- Nozzle
- Air Unit
- ResComp
- Electro Press SW
- ContSW
- AiSens
- PresSW Cool
- Air Flo Sens/Ctrl
- WaFes
- Total Air (Total Air)
- Equip (Gamma)
- generator
- RefDry



Pneumatic components

Safety Precautions

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

F.R.L.
F.R.
F
(Filtr)
R
(Reg)
L
(Lub)
Drain
Separ
Meth
Press
SW
Res
press
exh
valve
Substat
Anti-
bac/B
ac-
remov
eFilt
FR
Resist
FR
OPdrR
Med
Press
FR
No Cu/
PTFE
FRL
Outdr
sFRL
Adapt
er
Joiner
Press
Gauge
CompFRL
LgFRL
PrecsR
VacFR
Clean
FR
EaPrR
AiBoost
Spee
dCtrl
Silncr
Check
V/
other
Fitube
Nozzle
Air
Unit
ResComp
Electro
Press
SW
CtraSW
AiSens
PresS
W
Cool
Anti-
dirtg
Sens/
Ctra
684
WAFRS
TotAir

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 679 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.
- AT-24 is an air tank made of steel sheets. Periphery: Coating and interior surface are manganese phosphate treated, but in accordance with pressure vessel structure standards, the design tolerates some corrosion. When clean air is required, install an oil mist filter, clean filter, etc., beyond AT-24.

Mounting, installation and adjustment

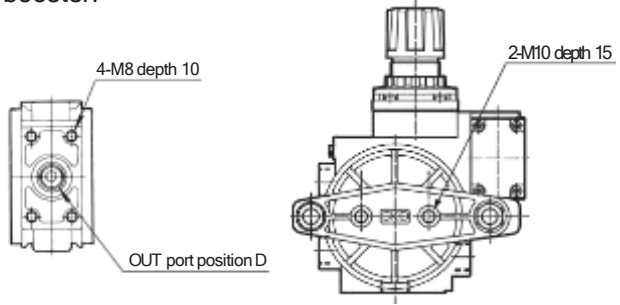
WARNING

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.

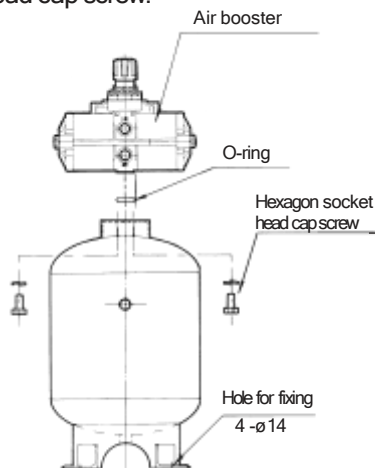
- There are no set regulations regarding the air booster's mounting orientation: it should optimally be horizontally installed on a flat surface.
- Install the air booster using 4-M8 depth 10 screw holes on the bottom or 2-M10 depth 15 screw holes on both sides. Only use these screw holes for installing the air booster.



Air booster bottom (air tank mountable surface) Side view of 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- $\varnothing 14$ 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 attached with the air tank on the air booster. Then, fix to the top of the air tank with a hexagon socket head cap screw.



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

Use/maintenance

⚠ WARNING

- Maintenance and inspection of air booster, Stop the primary pressure and release the secondary pressure before starting repair.

⚠ 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 consumable parts and must be replaced regularly.

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

F.R.L.
F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain Separ
Mech Press SW Res press exh valve
SwStat
Anti-bac/B ac-remov eFilt
Fim Resist FR
OPdrR
Med Press FR
No Cu/ PTFE FRL
Outdrs FRL
Adapt er Joiner Press Gauge
CompR
LgFRL
PrecsR
VacFR
Clean FR
EstPreR
AiBoost
Speed Ctrl
Silncr
CheckV/ other
FiTube
Nozzle
Air Unit
ResComp
Electro Press SW
ContSW
AiSens
PresSW Cool
Air Flo Sens/Ctl
WaFRas
TotAirSys (Total Air)
Equipm bAsys (Gamma)
generator
RefiDry