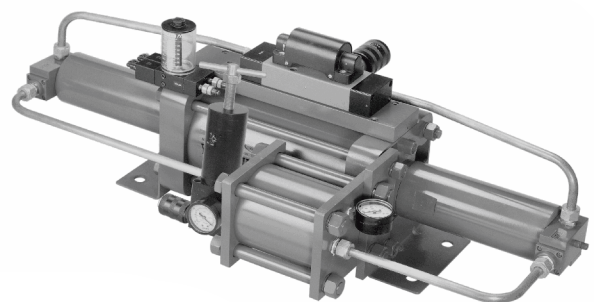
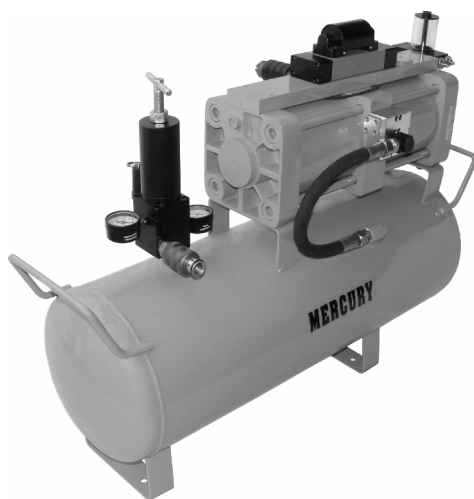
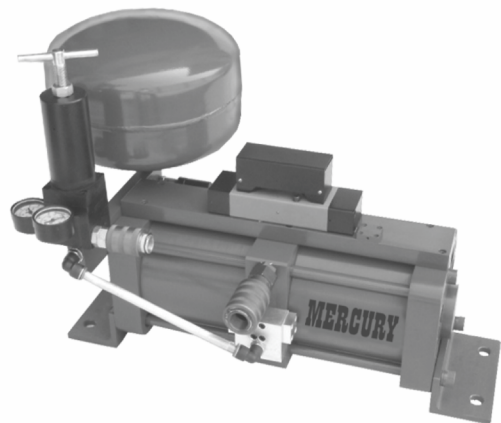
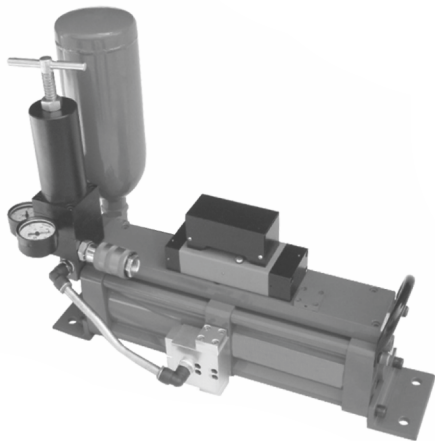




The Compact, Portable, Efficient and Economical Solution to boost Shop Compressed Air Pressure by 2 , 3 & 7 times



General Layout of Air Booster and Air Receiver

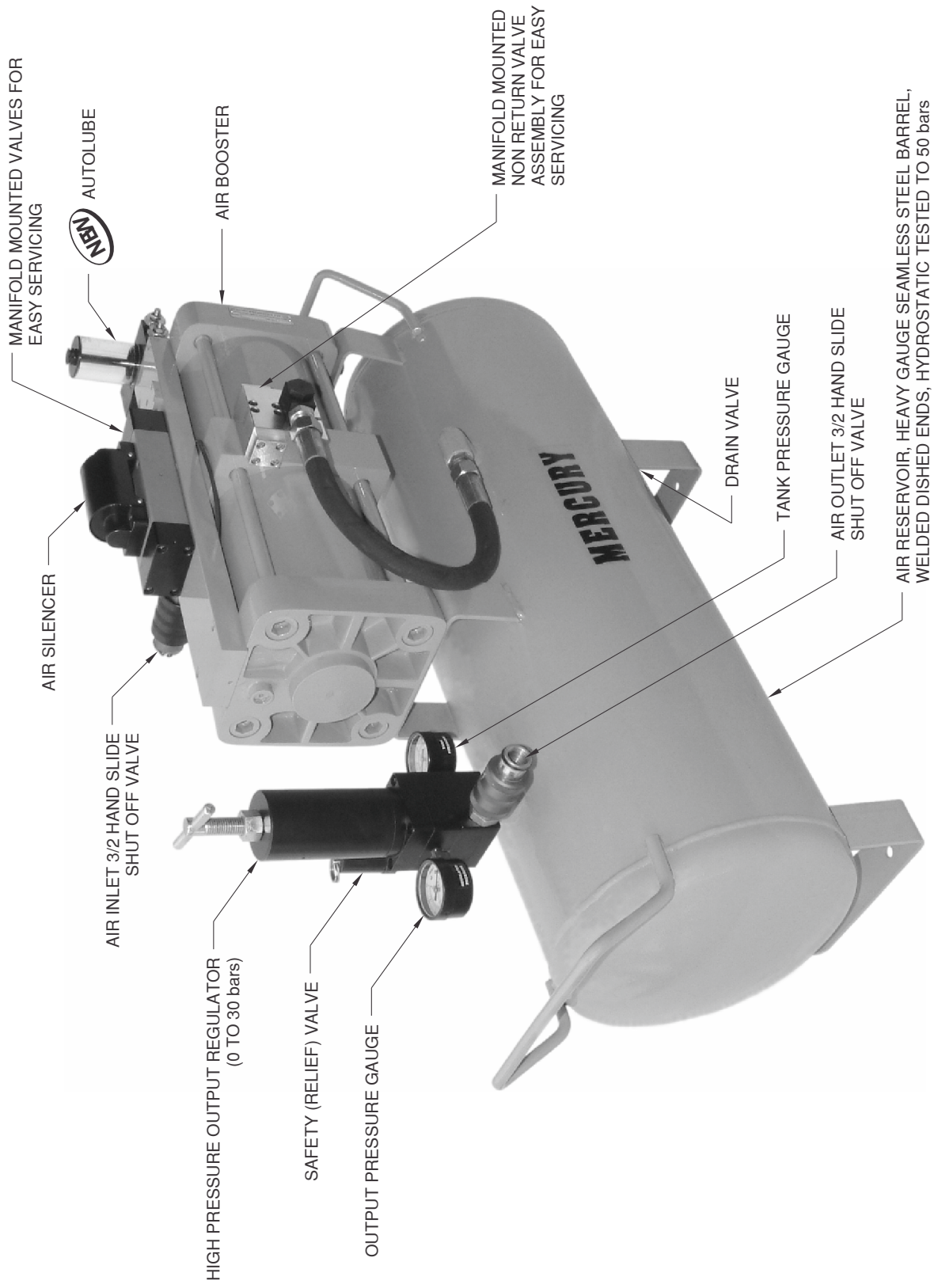


FIG. 1

4. General Description

4.1 The general layout of components of the air booster is given in **Fig. 1**.

4.2 ADVANTAGES OF MERCURY AIR TO AIR BOOSTERS

The New **MERCURY** Series **AB** air boosters are an efficient, low cost solution for boosting shop air pressure. The salient features are

- (i) Compact, lightweight and portable.
- (ii) Efficient use of plant compressed air. Once pressure has built up there is no further consumption of compressed air. The booster reciprocates in proportion to demand.
- (iii) Automatically compensates for leakages and maintains the set output pressure.
- (iv) Can be used in explosive environments as all components are pneumatically actuated.
- (v) All critical components can be accessed and serviced without opening the main booster.
- (vi) Cost saving. Eliminates the purchase of a high pressure compressor as it works using the existing shop air.
- (vii) Can be used as a stand alone, back up source of compressed air in the event of failure of main line compressed air.
- (viii) Automatic and adjustable lubrication through our unique **AUTOLUBE PUMP** .

4.3 TYPICAL APPLICATIONS

- (i) Cyclic pressure / life testing of Pressure Gauges, Pressure Switches, Hoses etc.
- (ii) Burst Strength Testing of pressurized vessels such as LPG / Nitrogen / Oxygen gas cylinders, storage tanks, hoses, pipes etc.
- (iii) Seat leakage test of Control Valves.
- (iv) Operation of pneumatic cylinders, clamps etc. for applications where limited quantity of high pressure air is required.
- (v) Portable source of compressed air at pressure higher than plant pressure.
- (vi) 'PET' blow moulding machines.
- (vii) Bag filter blowing.

AIR TO AIR BOOSTER

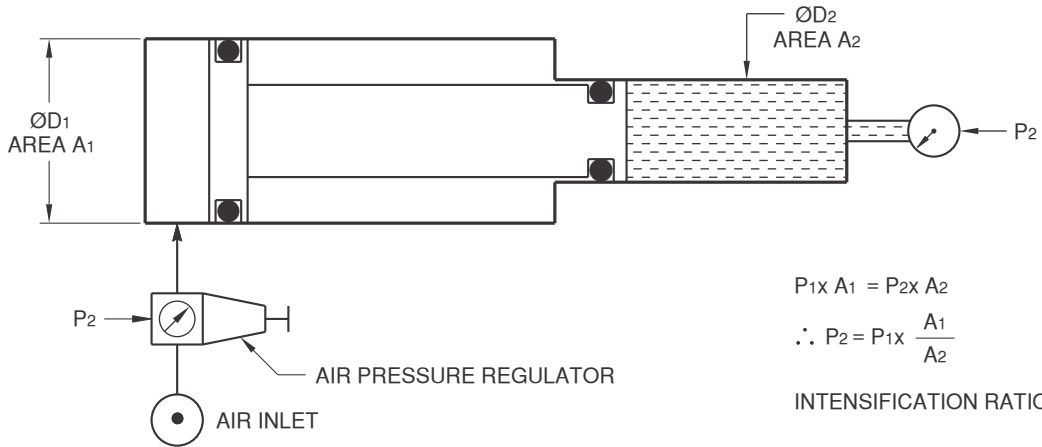


FIG. 2

PNEUMATIC CIRCUIT DIAGRAM

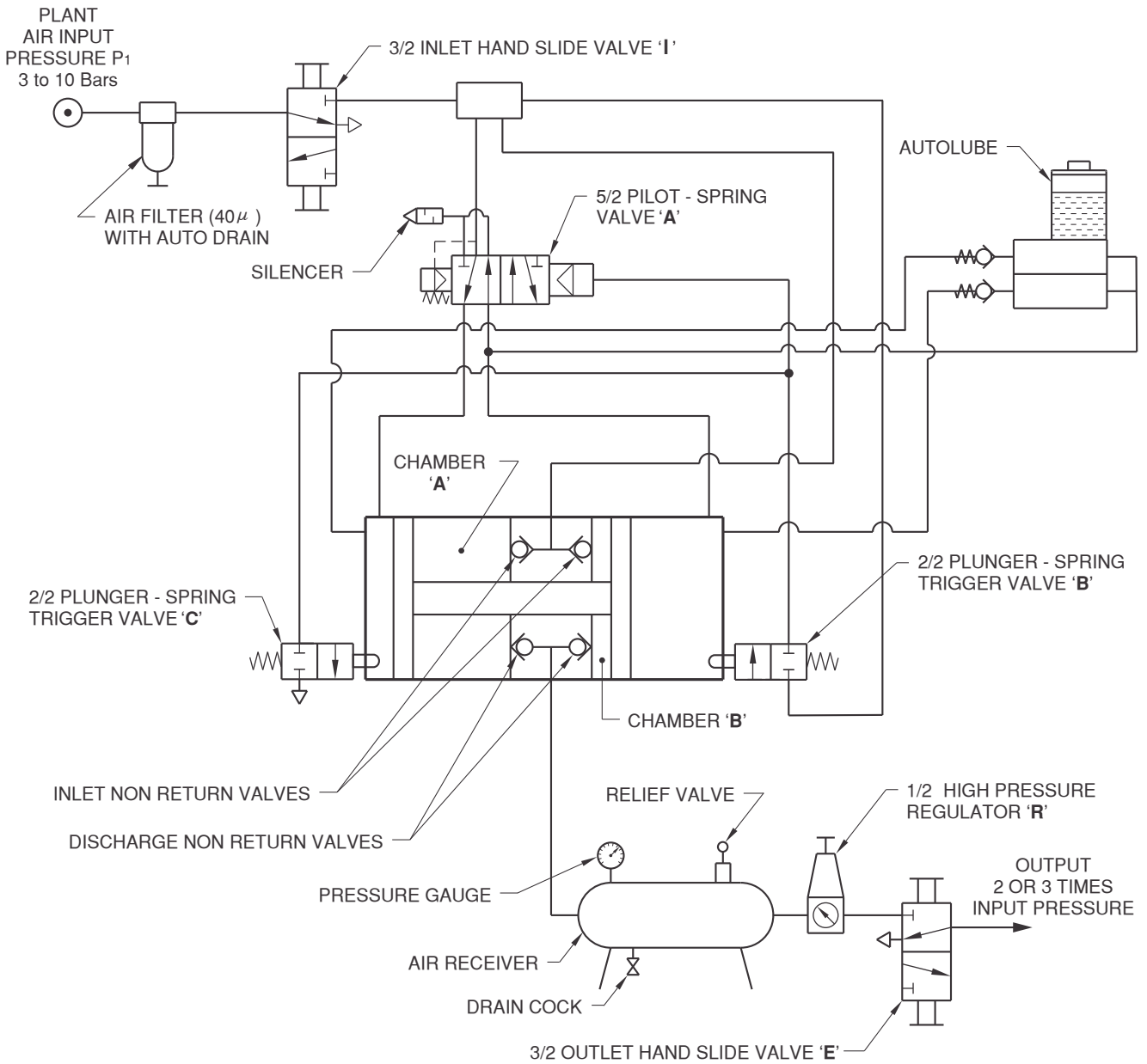


FIG. 3

4.4 Principles of Operation

4.4.1 The heart of the **MERCURY** air booster consists of an air to air intensifier which is diagrammatically shown in **Fig. 2**.

The pneumatic cylinder of large diameter **D1** is coupled to another cylinder of smaller diameter **D2**. When regulated compressed air at pressure **P1** is applied on **D1**, the output pressure **P2** increases as per Gas Laws,

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

Assuming constant temperature and same stroke length of diameters **D1** & **D2** we get

$$P_1 \times A_1 = P_2 \times A_2 \quad \text{Where } A_1 = \frac{\pi}{4} \times D_1^2 \quad \& \quad A_2 = \frac{\pi}{4} \times D_2^2$$

$$\therefore P_2 = P_1 \times \frac{A_1}{A_2}$$

The ratio $\frac{A_1}{A_2}$ is called the intensification ratio

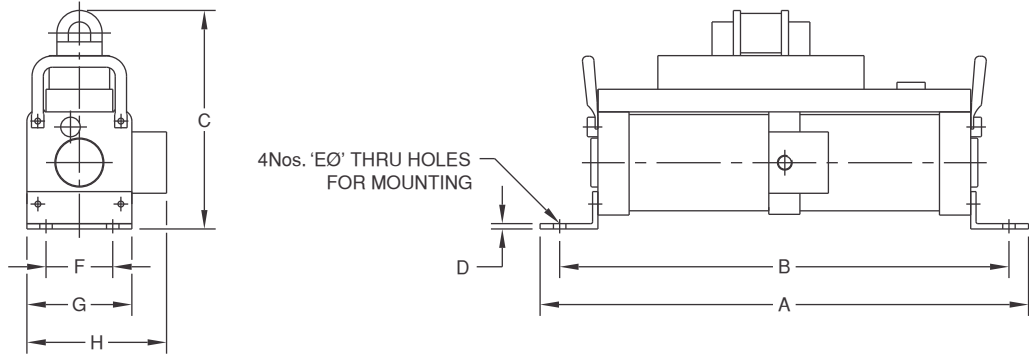
The intensifier shown in **Fig. 2** is converted into an air booster by automatically reciprocating the pneumatic cylinder by suitable valves as shown in **Fig. 3**.

When plant air at pressure **P1** is supplied through 5/2 pilot-pilot master **Valve 'A'**, the cylinder piston starts moving to the right. When the piston presses the 2/2 plunger spring **Valve 'B'**, a pilot signal is given to the right end of **Valve 'A'**, causing it to reverse and the cylinder piston starts moving to the left. When the piston presses 2/2 plunger-spring **Valve 'C'**, a pilot signal is given to left end of **Valve 'A'** causing it to reverse and the piston starts moving to the right. Hence the pneumatic cylinder piston starts reciprocating continuously as long as compressed air is supplied. Coupled to this reciprocating cylinder are two intensifier pistons with suction and discharge non return valves. When the piston moves to the left, shop air enters chamber '**A**' through INLET non return valve and boosted air comes out of chamber '**B**' through discharge non return valve. When piston moves to the right, shop air enters chamber '**B**' and boosted air comes out of chamber '**A**'. The continuous reciprocation of the cylinder causes suction and discharge of air alternately through chambers '**A**' and '**B**'. The intensified high pressure air is now stored in the air receiver. An air pressure regulator '**R**' is provided on the outlet of the reservoir to get a constant pressure output. The outlet air can be switched on / off by operating hand slide **Valve 'E'**. Booster operation can be stopped by operating hand slide **Valve 'F'**.

4.4.2 Automatic Lubricating System

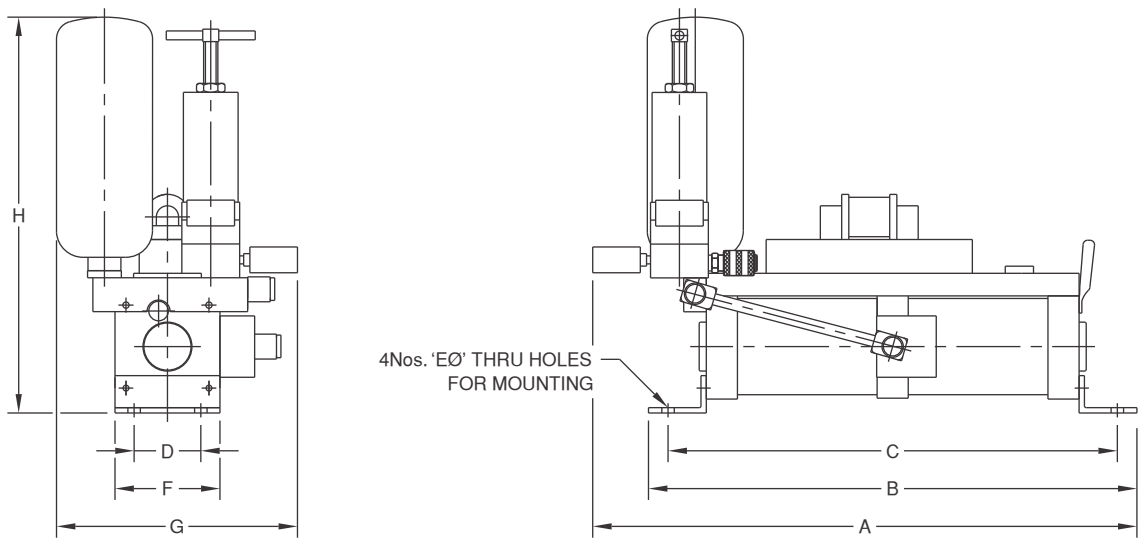
With every operation of **Valve 'A'**, an air signal is given to the **AUTOLUBE** Pump. The Pump injects oil at high pressure directly into the cylinder. This guarantees lubrication of the cylinder and valves.

Air Booster Basic Dimensions



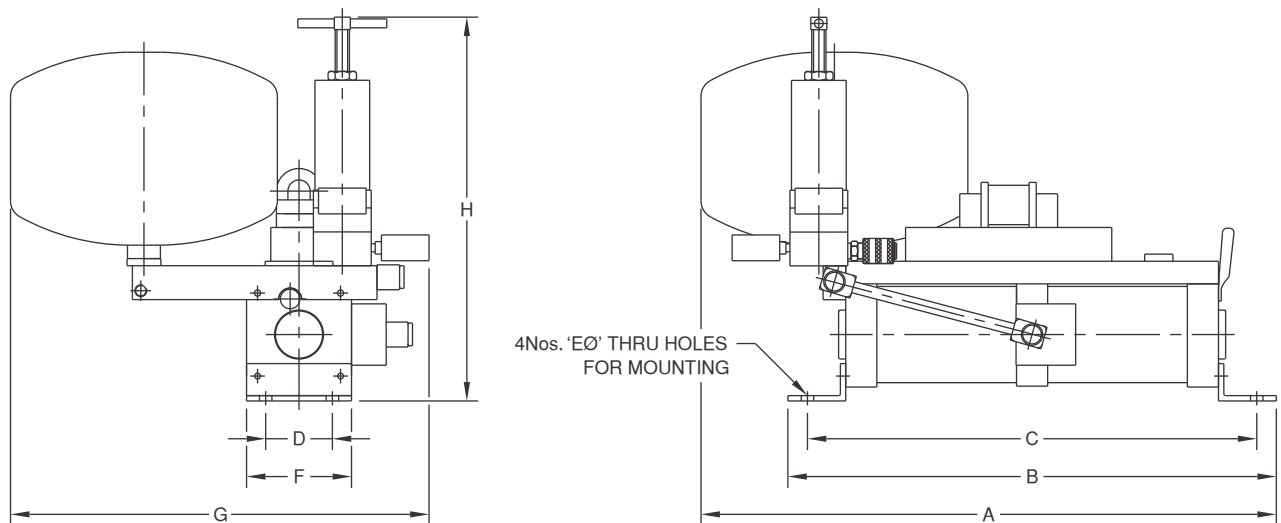
MODEL No.	A	B	C	D	ØE	F	G	H	WEIGHT (Kg.)
AB 100-2	550	505	246	6	14	75	118	157	15
AB 160-2	671	621	319	10	18	115	185	224	36
AB 160-3	671	621	319	10	18	115	185	224	40

Air Booster with 2 & 5 litre Reservoir



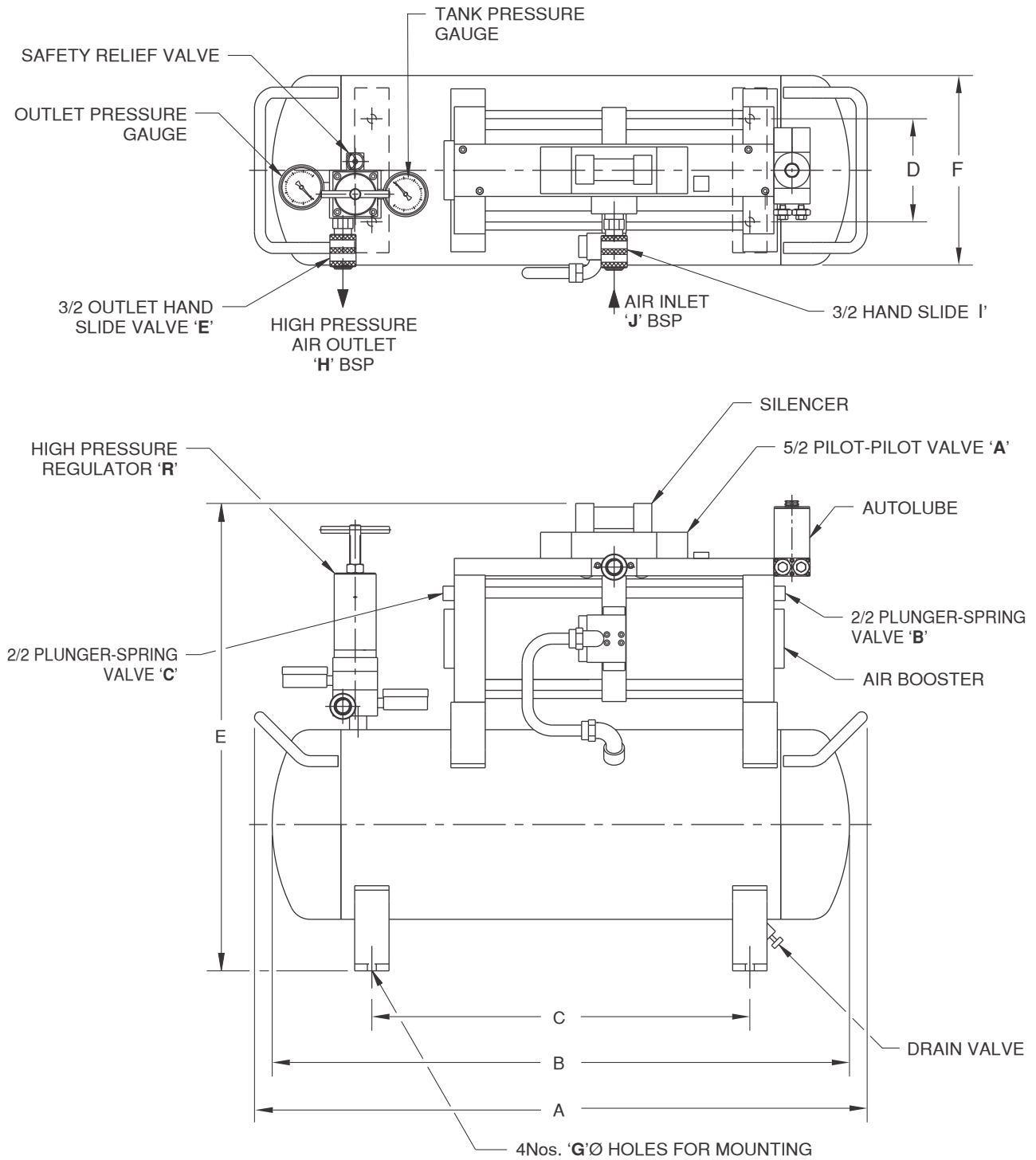
MODEL No.	A	B	C	D	ØE	F	G	H	WEIGHT (Kg.)
AB 100-2T2	613	550	505	75	14	118	271	445	22
AB 100-2T5	613	550	505	75	14	118	372	432	24

Air Booster with 10 litre Reservoir



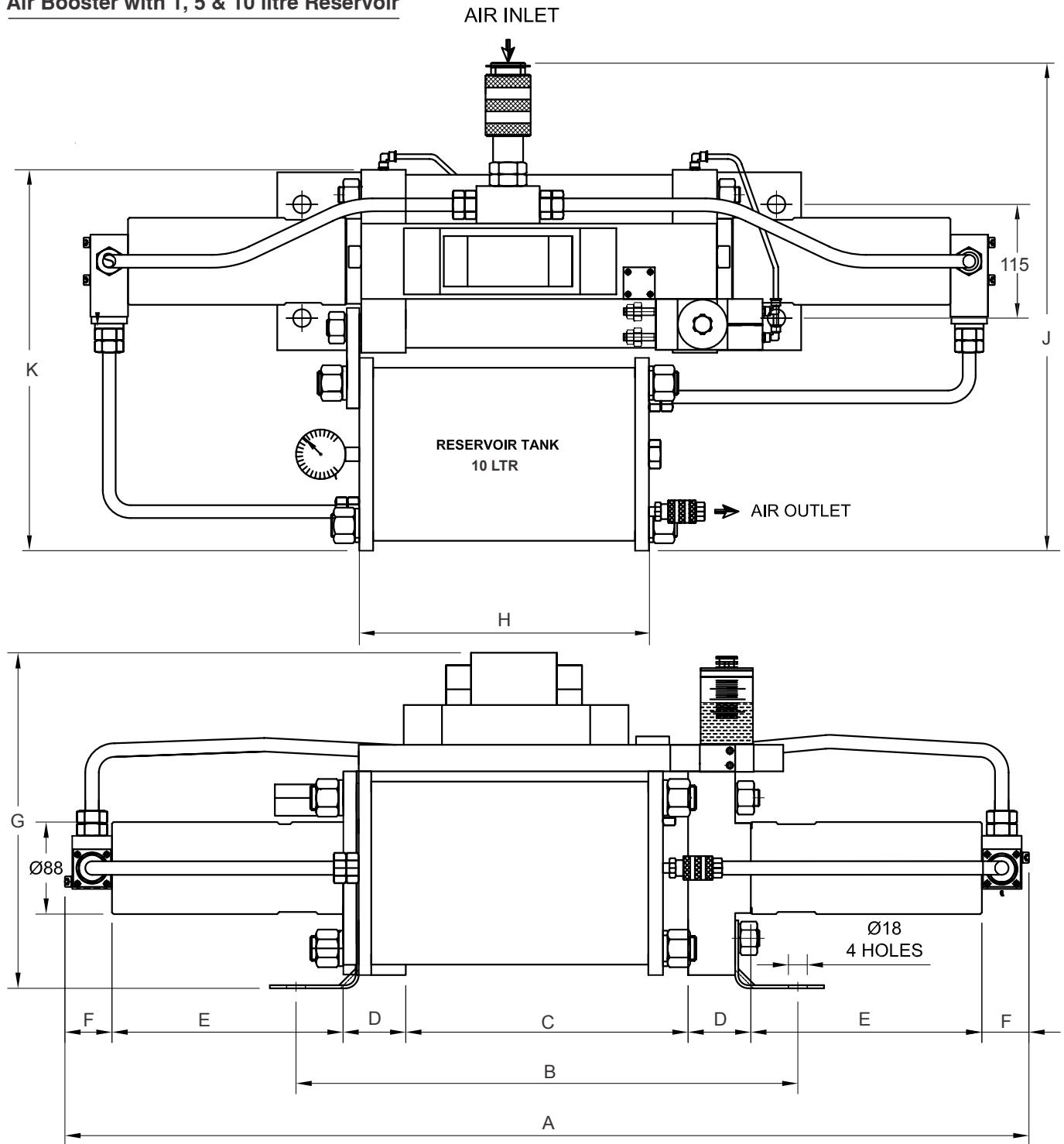
MODEL No.	A	B	C	D	ØE	F	G	H	WEIGHT (Kg.)
AB 100-2T10	648	550	505	75	14	118	471	432	25
AB 160-2T10	742	671	621	115	18	185	477	489	46

Air Booster with & 40 litre Reservoir



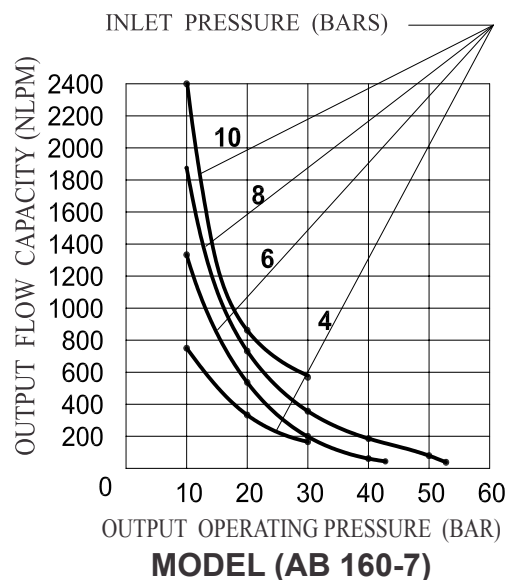
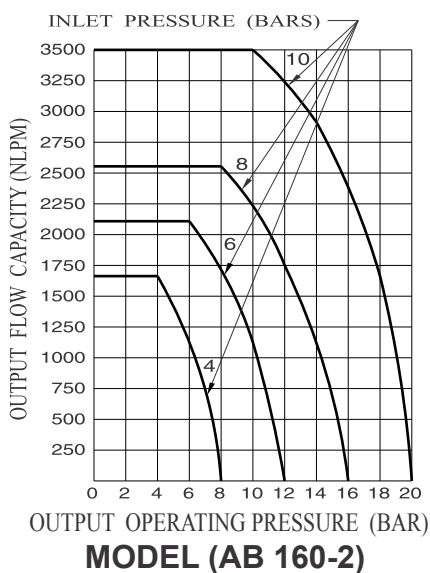
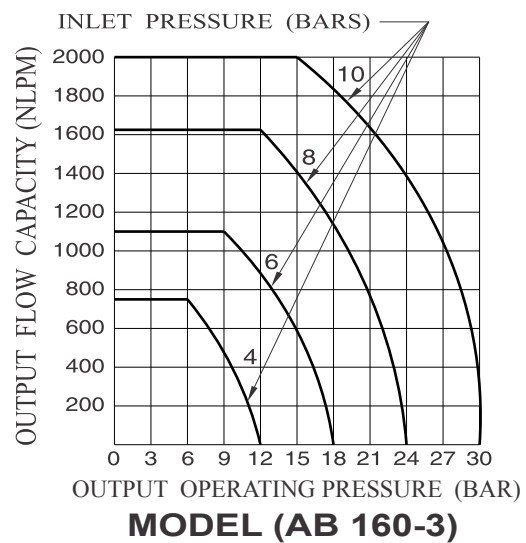
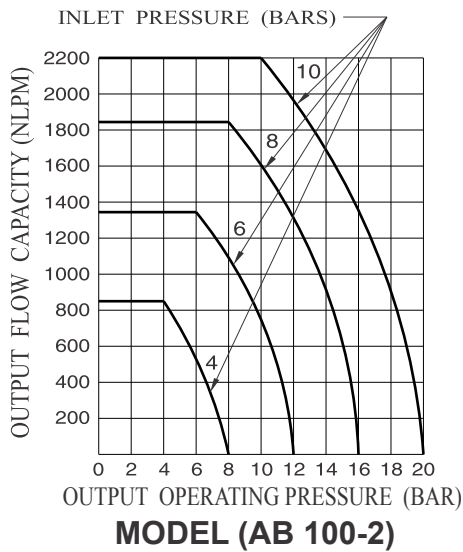
MODEL No.	TANK CAPACITY	A	B	C	D	E	F	GØ	H BSP	J BSP	WEIGHT (Kg.)
AB 100-2T20	20 Litres	800	750	445	95	605	205	14	1/2	1/2	38
AB 160-2T40	40 Litres	900	840	550	135	700	260	14	1/2	3/4	67
AB 160-3T40	40 Litres	900	840	550	135	700	260	14	1/2	3/4	71

Air Booster with 1, 5 & 10 litre Reservoir



MODEL No.	TANK CAPACITY	A	B	C	D	E	F	G	H	J	K
AB 160-7T1	1 Litres	922	480	270	45	221	45	330	158	440	330
AB 160-7T5	5 Litres	922	480	270	60	221	45	330	300	493	385
AB 160-7T10	10 Litres	922	480	270	60	221	45	330	558	493	385

Flow Charts



MAX. INLET AIR CONSUMPTION (NLPM)

MODEL No.	INLET AIR PRESSURE			
	4	6	8	10
AB 100-2	925	1500	2000	2400
AB 160-2	1800	2300	2800	3750
AB 160-3	1800	2300	2800	3750
AB 160-7	600	1000	1600	2350

Example :-

In a 'PET' Stretch Blow Moulding machine having double cavity mould, 2nos. 1500ml bottle are produced every 10 seconds. The blow pressure is 18 bars and Inlet air pressure is 8 bars.

1) Volume of 2 bottles = 3000ml.

2) Volume of hose pipes 13mm I.D. x 2500mm long = $\frac{\pi}{4} (1.3)^2 \times 250 = 332\text{cc} = 332 \text{ ml.}$

3) Total blow volume per cycle = 3000 + 332 = 3332ml.

4) Total blow volume per minute

@ 1 cycles/10 sec i.e. 6 cycles/min = 6 x 3332 = 19992 ml/min \approx 20 LPM

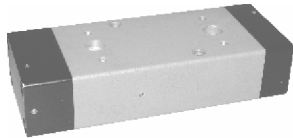
5) Converting 20 LPM at 18 bars

To atmospheric pressure (NLPM) = $20 \times \left(\frac{18+1}{1} \right) = 20 \times 19 = 380 \text{ NLPM}$

From fig. 5(c) booster model AB160-3 at an output pressure of 18 bars and inlet pressure of 8 bars, the air flow available is 1150 NPLM. Since required air flow is 380 NPLM, booster model AB160-3 is suitable.



5/2 PILOT-PILOT MASTER VALVE



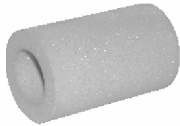
AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2	S684AB	1/2 5/2 PILOT-PILOT VALVE	SKS684AB
AB 160-2 AB 160-3	S685AB	3/4 5/2 PILOT-PILOT VALVE	SKA685AB

OUTLET HIGH PRESSURE REGULATOR



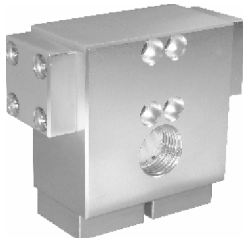
AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2 AB 160-2 AB 160-3	RH4AB	1/2 BSP HIGH PRESSURE REGULATOR WITHOUT PRESSURE GAUGE	SKRH4AB

SILENCER ELEMENT



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION
AB 100-2	55-177	SILENCER ELEMENT
AB 160-2 AB 160-3	55-166	

NON-RETURN VALVE ASSEMBLY



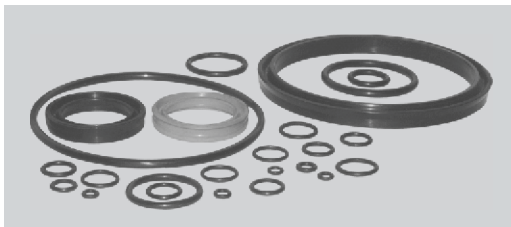
AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2 AB 160-2 AB 160-3	57-009	NON-RETURN VALVE ASSEMBLY	59-037

RELIEF VALVE



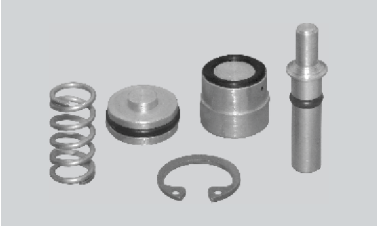
AIR BOOSTER MODEL No.	PART No.	DESCRIPTION
AB 100-2 AB 160-2	55-201	SAFETY RELIEF VALVE
AB 160-3	55-201A	

SEAL KITS



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION
AB 100-2	59-036	SEAL KIT FOR BOOSTER SECTION ONLY
AB 160-2	59-034	SEAL KIT FOR BOOSTER SECTION ONLY
AB 160-3	59-035	SEAL KIT FOR BOOSTER SECTION ONLY

2/2 PLUNGER VALVE ASSEMBLY



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2 AB 160-2 AB 160-3	57-010	2/2 PLUNGER VALVE ASSEMBLY	59-039

AUTOLUBE



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2 AB 160-2 AB 160-3	ALAD1	AUTOLUBE	59-068

PRESSURE GAUGES



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION
AB 100-2 AB 160-2	40-6253	AIR BOOSTER TANK PRESSURE GAUGE & OUTPUT PRESSURE GAUGE
AB 160-3	40-6082	

* NOTE :- 2Nos. REQUIRED PER BOOSTER

3/2 HAND SLIDE VALVES



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION	SEAL KIT No.
AB 100-2	SV4	AIR INLET 3/2 HAND SLIDE VALVE	SKSV4
AB 160-2 AB 160-3	SV5		SKSV5
AB 100-2 AB 160-2 AB 160-3	SV4	AIR OUTLET 3/2 HAND SLIDE VALVE	SKSV4

AIR RESERVOIR DRAIN VALVE



AIR BOOSTER MODEL No.	PART No.	DESCRIPTION
AB 100-2 AB 160-2 AB 160-3	DV2	TANK DRAIN VALVE

'U' SEAL FOR QUICK EXHAUST VALVE



PART No.	DESCRIPTION
U-012	'U' CUP SEAL