

## GROUP 3 COMPONENTS SPECIFICATION AND FUNCTION

### 1. BRAKE VALVE

#### 1) USE AND STRUCTURE

As a main device of foot brake, this unit adopts high technology and can be applied to single circuit braking system of machines.

#### 2) WORKING PRINCIPLE

When the brake pedal (2) is pressed, the rod (3) presses the equalizing spring (4) to produce a pressure, which then pushes the piston (6) to move down to make intake valve (7) to open allowing compressed air to flow from inlet to outlet port. When brake pedal (2) is released, return spring (5) pushes the piston (6) to move up to make intake valve to return to original position to close air flow between inlet and outlet. Remaining pressure at outlet is vented through exhaust port.

#### 3) TECHNICAL DATA

- (1) Operating air pressure : 784 kPa
- (2) Working temperature : -30 ~ +80°C
- (3) Working medium : air

#### 4) MOUNTING AND CONNECTION SIZE

- (1) Connection screw : M22 × 1.5 (3EA)
- (2) Mounting : 4- φ9
- (3) Dimensions : 136 × 136 × 335

#### 5) CORRECT USE AND MAINTENANCE

##### (1) Notes in using

- ① Before mounting, remove the plugs for inlet and outlet, and be sure to have the pedal and valve body are securely assembled. Valve clearance should be adjusted properly with adjusting screw (pressure of surplus for the roller to press the rod should be less than 0.5 mm) and fasten up the nut.
- ② Insert M8 bolts through 4- φ9 holes to make secure assembly.
- ③ When connecting with piping, distinguish inlet port from outlet. Marking “1” means, inlet, “2” means outlet and “3” exhaust port.

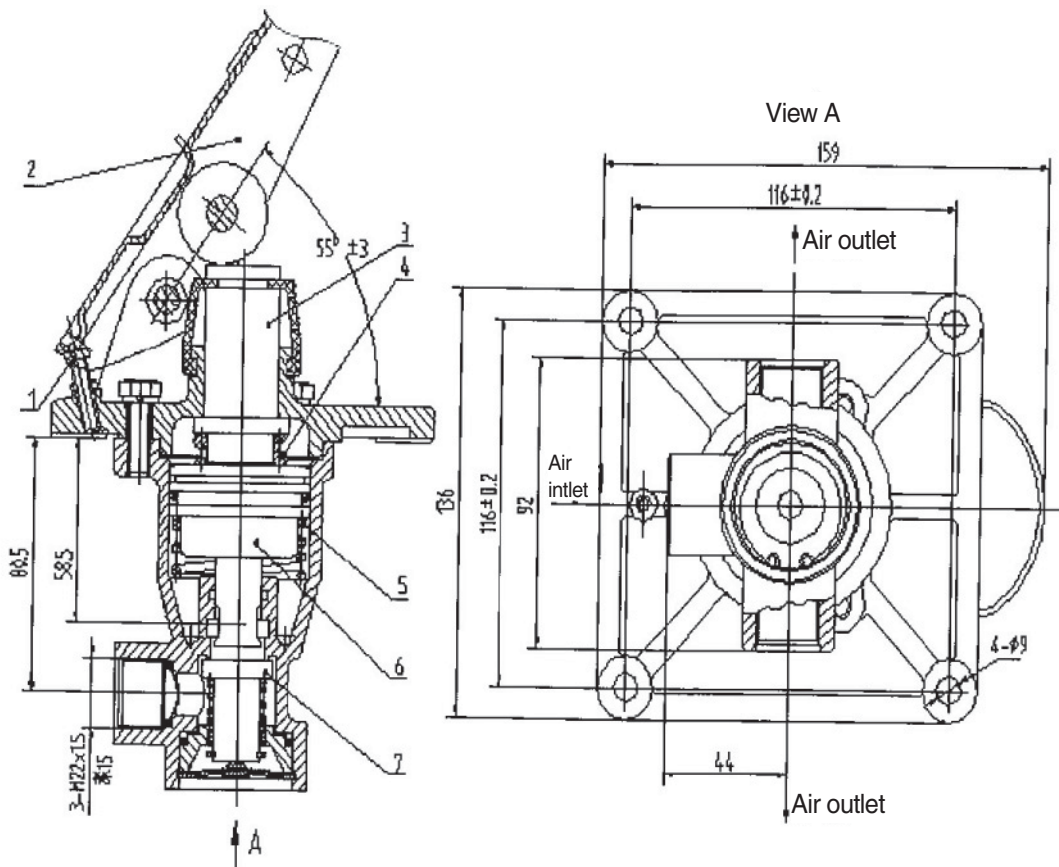
##### (2) Notes in Maintenance

- ① There should be water draining and filtering devices in air circuit to secure a clean air source. Anti-rust process is required for the brake tubes and air cylinder.
- ② A space should be secured for freely moving of the pedal.
- ③ When replacing a wearing part, use a part same with the worn, the damaged fastening pieces (such as stop ring, bolt) must also be replaced. All parts should be assembled in correct position securely and no other part be damaged. After replacing, do not assemble to the machine before completing test.
- ④ The moving part of air brake valve should be served grease. If the brake doesn't grip properly or grips weakly, check the wearing parts of air brake valve and braking system.

## 6) TROUBLESHOOTING

Trouble	Cause	Remedy
Air leaks under no work.	Worn rubber.	Replace rubber or assembly.
Air leaks under work.	Worn rubber.	Replace rubber or assembly.
Unsmooth exhaust.	Seizing of piston.	Replace the assembly.
	Improper adjustment of pedal roller and rod.	Adjust the adjusting screw manually to the extent that pedal roller is just contacting the rod. (Pressure of surplus for the roller to press the rod should be less than 0.5 mm)

## 7) STRUCTURE AND MOUNTING SIZE



850KBS10

- |         |                     |                |
|---------|---------------------|----------------|
| 1 Bolt  | 4 Equalizing spring | 7 Intake valve |
| 2 Pedal | 5 Spring            |                |
| 3 Rod   | 6 Piston            |                |

## 2. PARKING BRAKE CYLINDER

### 1) STRUCTURE

The unit is mainly applied for supporting localization and also for the emergency brake system of other middle and small size loaders remodeled for the purpose.

### 2) WORKING PRINCIPLE

Working principle of the unit is to make braking by exhaust. That is, when the pressure of the air line reaches 390 kPa, or tube is broken, the manual control brake valve is triggered to cut off the clutch and, at the same time, relieve the pressure inside the unit to cause the energy stored spring to actuate emergency braking. When emergency situation occurs or stopping the vehicle on a slope, the driver may press a button to make operation as above to stop machine firmly. This unit provides safety with exhaust braking.

### 3) TECHNICAL DATA

- (1) Rated operating air pressure : 784 kPa
- (2) Opening pressure : 400 kPa
- (3) Rod stroke :  $60 \pm 1$  mm
- (4) Brake power :  $\geq 5100$ N
- (5) Weight : 7 kg

### 4) MOUNTING AND CONNECTION SIZE

- (1) Mount : 2-M16  $\times$  38
- (2) Air inlet : M12  $\times$  1.25

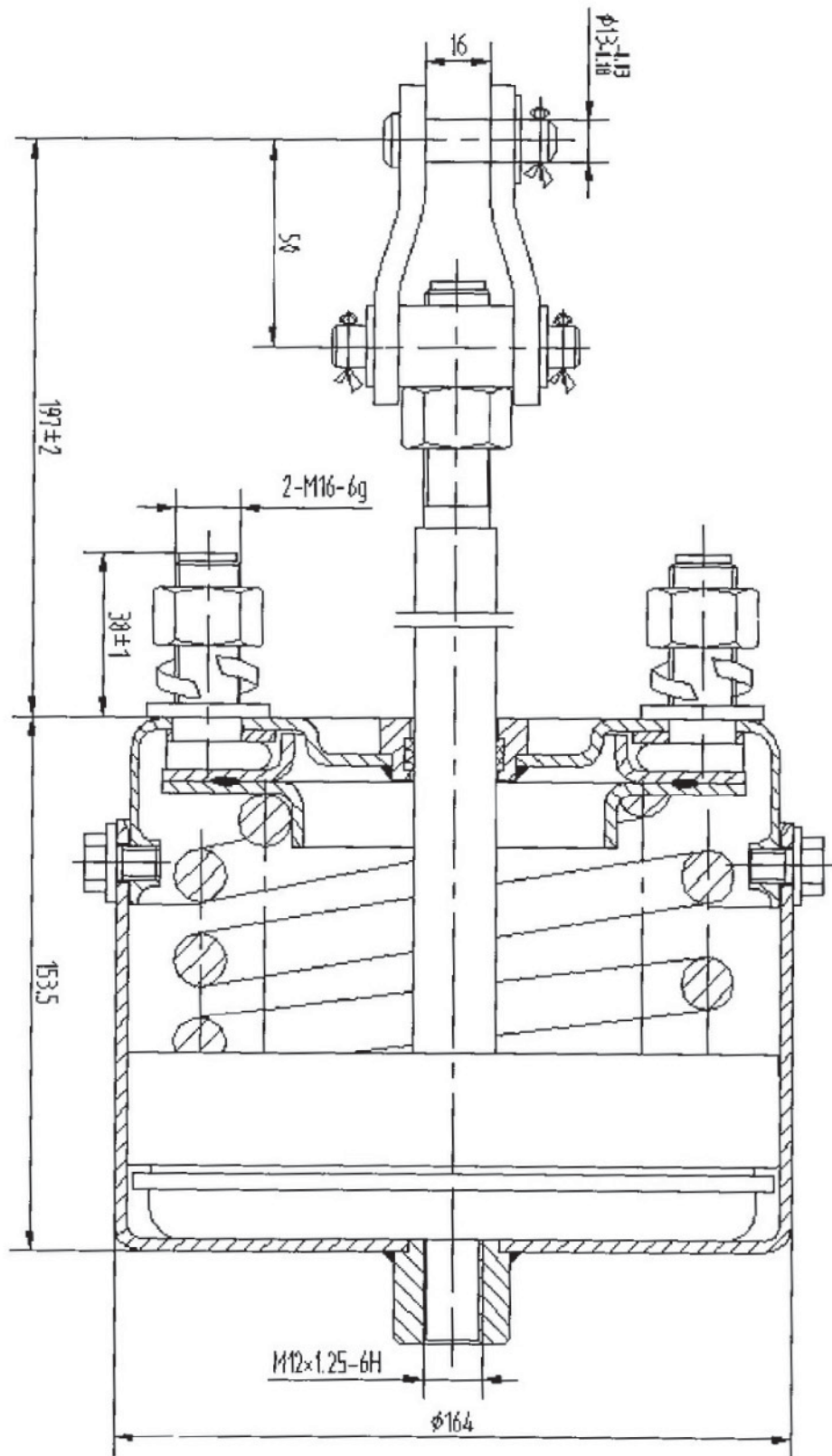
### 5) CORRECT USE AND MAINTENANCE:

- (1) Notes in Using
  - ① Remove the thread protector plug before mounting operation.
  - ② Fix 2-M16 bolts on the working frame and connect pin to brake arm.
  - ③ Never try to disassemble the assembly by yourself. Use specialized equipment for disassembly if repair is required.
- (2) Notes in Maintenance
  - ① There should be water draining and filtering devices in air circuit to secure a clean air source. Anti-pollution and rust process is required for the brake tubes and air cylinder.
  - ② When replacing a wearing part, use a part same with the worn, and the damaged fastening pieces (such as stop ring, bolt) must also be replaced. All parts should be assembled in correct position securely and no other part be damaged. After replacing, do not assemble to the machine before completing test.

### 6) TROUBLESHOOTING

Problem	Cause	Remedy
Air leaks at piston rod	Worn O-ring.	Replace the wearing part or assembly.
Air leaks at cylinder	Worn piston cup.	

## 7) STRUCTURE AND MOUNTING SIZE



850KBS11

### 3. PARKING BRAKE LEVER

#### 1) USE AND STRUCTURE

The unit is mainly applied for the emergency brake system of other middle and small size loaders remodeled for the purpose.

#### 2) WORKING PRINCIPLE

Working principle of the unit is to make braking by exhaust. That is, when the pressure of the air line reaches 240~310 kPa, or tube is broken, the manual control brake valve is triggered to cut off the clutch and, at the same time, relieve the air pressure inside the energy stored spring brake chamber to actuate emergency braking. When emergency situation occurs or stopping the vehicle on a slope, the driver may press a button to make operation as above to stop vehicle firmly. This unit provides safety with exhaust brake.

#### 3) TECHNICAL DATA

- (1) Rated operating air pressure : 784 kPa
- (2) Protecting pressure : 240~310 kPa
- (3) Weight : 0.34 kg

#### 4) MOUNTING AND CONNECTION SIZE

- (1) M22 × 1.5
- (2) Air inlet : PT1/8"
- (3) Air outlet : 2-PT1/4"

#### 5) CORRECT USE AND MAINTENANCE:

##### (1) Notes in using

- ① Remove the thread protector plug before mounting operation.
- ② When mounting, unscrew the sealing nut of M22×1.5 thread, fit the mounting plate and then recover the sealing nut and fasten up.  
When connecting, discriminate each port. Marking "1" means, inlet, "2" means outlet and "3" exhaust port.

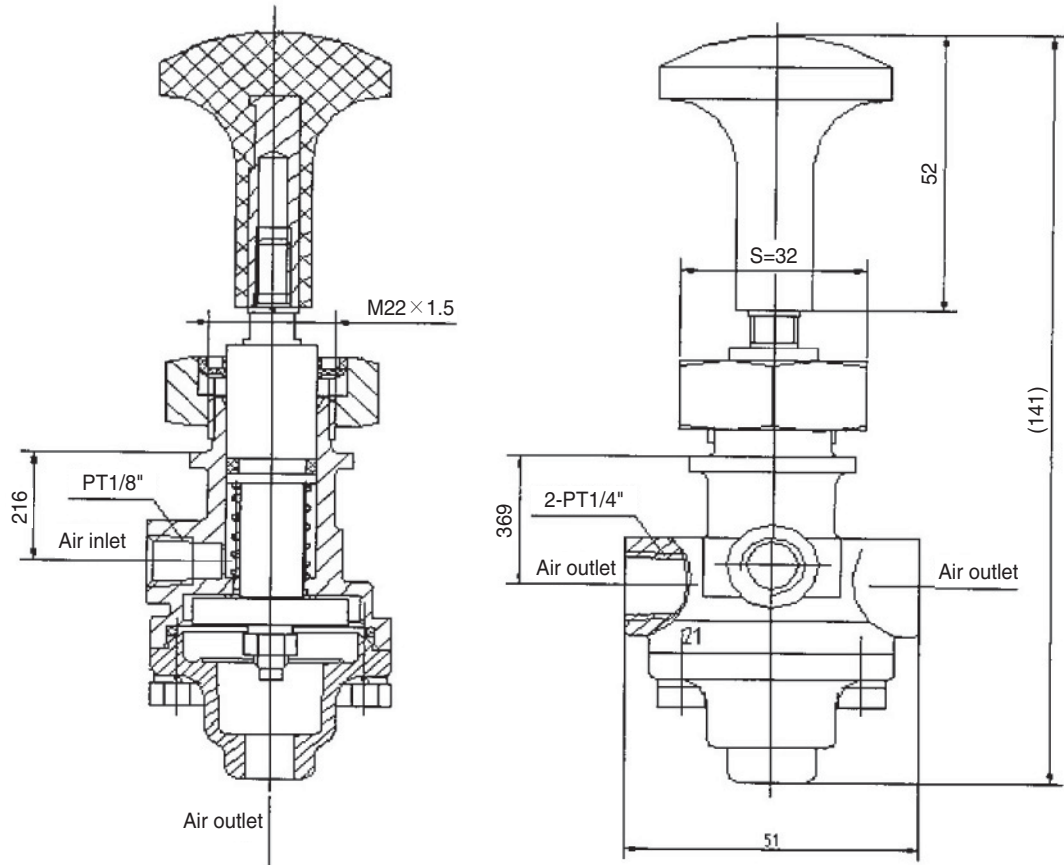
##### (2) Notes in maintenance

- ① There should be water draining and filtering devices in piping to secure a clean air source. Anti-pollution and rust process is required for the brake tubes and air cylinder.
- ② When replacing a wearing part, use a part same with the worn, the damaged fastening pieces (such as stop ring, bolt) must also be replaced. All parts should be assembled in correct position securely and no other part be damaged. After replacing, do not assemble to the machine before completing test.
- ③ The moving part of air brake valve should be served grease. If the brake doesn't grip properly or grips weakly, check the wearing parts of braking system and emergency brake valve.

## 6) TROUBLESHOOTING

Problem	Cause	Remedy
Air leaks under no work	Worn rubber.	Replace wearing part or assembly.
Air leaks under work		Replace wearing part or assembly.

## 7) STRUCTURE AND MOUNTING SIZE



850KBS12

## 4. SAFETY RELIEF VALVE

### 1) USE AND STRUCTURE

Safety relief valve automatically drains condensate inside the air cylinder of brake line and manual drainage is also available.

### 2) WORKING PRINCIPLE

Safety relief valve is used to automatically drain condensate inside the air cylinder of brake line by variation of air pressure (air pressure drops 0.03~0.1 MPa) and manual drainage is also available after parking for fast drainage.

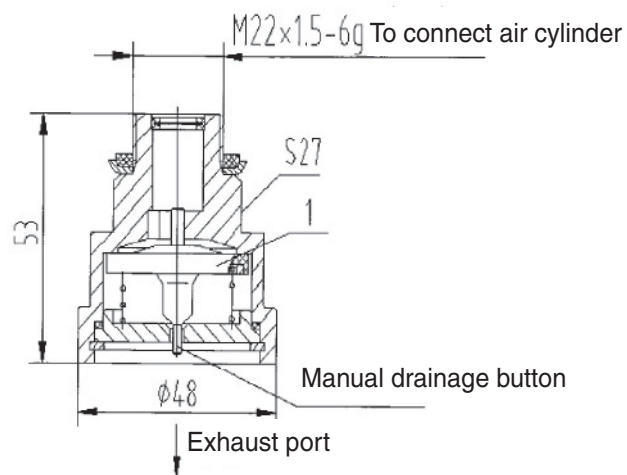
### 3) TECHNICAL DATA

- (1) Rated operating air pressure : 800 kPa
- (2) Working temperature : -30 ~ +80°C
- (3) Weight : 0.1 kg

### 4) MOUNTING AND CONNECTION SIZE

- (1) M22×1.5
- (2) Exhaust port down.

### 5) STRUCTURE AND MOUNTING SIZE



850KBS13

## 5. SAFETY VALVE

### 1) USE AND STRUCTURE

Safety valve is used to ensure that charge pressure of air brake line does not exceed 900 kPa.

### 2) WORKING PRINCIPLE

Compressed air flows in through air inlet and, when the pressure at inlet exceeds 850 kPa, the safety valve A is actuated for air relief to protect the air brake line.

### 3) TECHNICAL DATA

- (1) Safety operating pressure : 850~900 kPa
- (2) Working temperature : -40 ~ +80°C

### 4) MOUNTING AND CONNECTION SIZE

Inlet M16×1.5 is connecting screw.

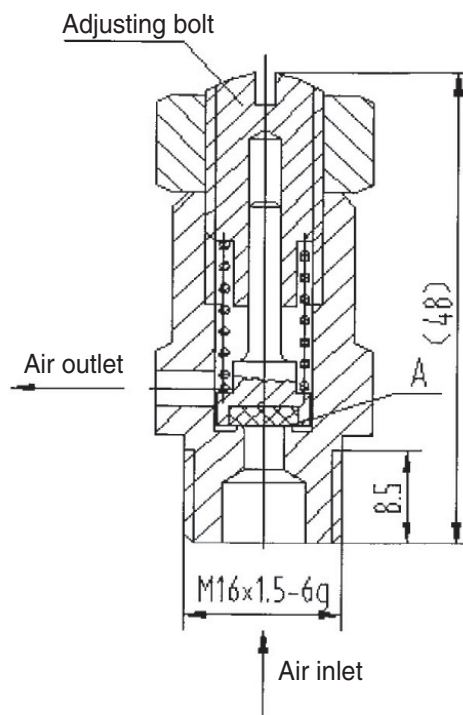
### 5) NOTES IN USING

Adjusting bolt of safety valve has been already set as delivery and user is not permitted to adjust or remove the part as his/her wish.

### 6) TROUBLESHOOTING

Problem	Cause	Remedy
Leaks at valve port	Damaged rubber of safety valve stem assy.	Replace safety valve assy

### 7) STRUCTURE AND MOUNTING SIZE



850KBS14



## 6. OIL AND WATER SEPARATOR

### 1) STRUCTURE

Oil and water separator combined valve is applicable to brake system. This device features automatic control of working pressure in brake system and auto drainage of oil and water after filtering. Since the unit has a built-in protector, safe pressures can be guaranteed.

### 2) WORKING PRINCIPLE

Air under pressure from compressor flows into the valve through air inlet and water and impurities can be filtered off through a strainer. After filtering, the compressed air reaches the outlet through one-way valve to charge the cylinder. When the pressure inside cylinder reaches opening pressure, air that enters into top head overcomes resistance of pressure spring to push control valve assy to move upward to open the exhaust valve at the lower part to discharge the air along with filtered impurities and water into atmosphere and compressor becomes idle state. When the pressure inside air cylinder drops to exhaust stop value and the air inside cavity of top head can not overcome the pressure spring, control valve moves down, and the exhaust valve moves up by the action of spring to stop exhaust valve and air supply to cylinder is restarted.

### 3) TECHNICAL DATA

- (1) Opening pressure :  $784 \pm 20$  kPa
- (2) Exhaust stop pressure : 685 ~ 750 kPa
- (3) Working temperatures :  $-30 \sim +100^{\circ}\text{C}$
- (4) Weight : 1.8 kg

### 4) MOUNTING AND CONNECTION SIZE

- (1) Mounting size : 2-M8 $\times$ 40 double end stud
- (2) Connection size : Inlet (M22 $\times$ 1.5), outlet (M22 $\times$ 1.5)
- (3) Dimensions : 150.5 $\times$ 128.5 $\times$ 220

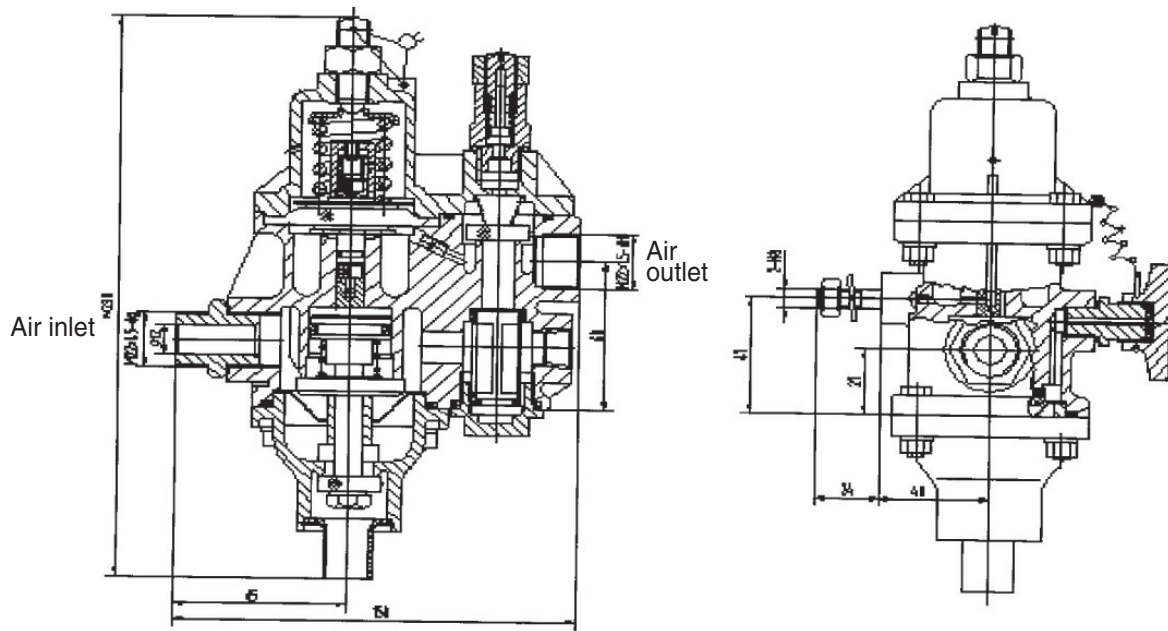
### 5) CORRECT USE AND MAINTENANCE

- (1) Notes in using
  - ① Before mounting, remove the plugs for inlet and outlet.
  - ② Mount the unit on the mount plate with outlet down.
  - ③ Pressure regulator screw and safety valve have been set as delivery and user is not permitted to adjust or remove by his/her self.
- (2) Notes in maintenance
  - ① The length of pipe from air compressor to combined valve should not be less than 2 m, aperture not less than  $\phi 12$  to ensure fully cooling of hot air and condensing moisture in air.
  - ② If severely worn wearing part or air leaks is found, immediately replace the wearing part.
  - ③ When replacing a wearing part, use a part same with the worn, the damaged fastening pieces (such as bolt and nut) must also be replaced. All parts should be assembled in correct position securely and no other part be damaged. After replacing, do not assemble to the machine before completing test.

## 6) TROUBLESHOOTING

Problem	Cause	Remedy
Leaks at exhaust port.	Polluted exhaust valve.	Clean pipe line.
	Damaged exhaust valve.	Replace exhaust valve.
Leaks at top head vent	Damaged diaphragm.	Clean pipe line.
	Damaged control piston O-ring.	Replace control piston O-ring.

## 7) STRUCTURE AND MOUNTING SIZE



850KBS16