

## Technical Write up with Specification

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### Air Power Blaster System

Model no. CAB with Piston type

Air Power Blaster is an Air Vessel which is manufactured from IS 2002-2A and designed with  $8 \text{ kgf/cm}^2$  working pressure of vessel Under Specification of Un fired Pressure Vessel Code IS 2825 Class-3, in which compressed Air pressure  $7 \text{ kgf/cm}^2$  is stored and releases within Mille Seconds through Jet Nozzle to achieve Impact force on Raw materials by actuating 3/2 way Solenoid Valve and Quick Exhaust valve with pre-determined time programmed in Micro-Process type sequential controller.

The Air Power blaster should be with suitable capacity with No. of quantity to make sure the continuous free flow and prevent the problems of Rat-Holing, Funneling, Arching and Bridging which are frequently occurring in storage equipments due to Geometry of equipments, Wall friction with raw material, Material characteristics and Method of feeding and discharging.

### Construction of Air Power Blaster

#### Air Vessel

Air Power Blaster is an Air Vessel which is manufactured from IS 2002-2A Under Specification Un fired Pressure Vessel Code IS 2825 Class-3.

**The Vessel capacity is available 50 ltrs, 70 ltrs., 100 ltrs., 135 ltrs. 150 ltrs, 200 ltrs. & 350 ltrs.**

The Blaster is designed in such a way the Inlet of vessel assembly (Piston with 'O' rings and its accessories Piston Housing, Spring, Impact Seal & Labyrinth type leak proof Seating Seal) and Outlet of vessel assembly (Nozzles and connecting accessories) are just opposite to each other to prevent Raw material dust entry, Heat transfer and provision for easy maintenance without dismantling vessel assembly.

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Air vessel is complete with Pressure relief Valve (Safety valve), Pressure Gauge, Drain Valve arrangement, Mounting Hook and required mounting Flanges.

Air Vessel is provided with by-pass arrangement air input to fast buildup for blasting.

Air vessel is provided drain plug to empty out the water contents accumulated in the vessel.

### **The Inlet of Air Power Blaster assembly.**

Its consist of Spring Loaded Aluminum hollow Piston with Rubber O-Ring, Helical compression spring, Hard Chrome Plated piston Housing, Labyrinth type Seating Inner Seal with Exhaust assembly and Impact seal.

Piston Housing and its Piston assembly with accessories should be easily maintainable and replaceable by just opening top of the flange after ensuring the inlet air supply is shutoff and vessel is empty and without dismantling Air vessel.

The inlet air vessel flange is connected with Outlet exhaust cup assembly flange, Piston housing flange, Inlet flange cover and aligned & fastened together thereby ensuring seating arrangement labyrinth seal with outlet exhaust cup is perfect; hence there is no chance of air leakage from the air sealing arrangement.

### **The Onlet (Exhaust) of Air Power Blaster assembly.**

The outlet air vessel flange is connected with connecting pipe (i.e. intermediate pipe of vessel to nozzle) flange and Outlet exhaust cup assembly flange and Nozzle flange. And Nozzle is mounted with fixing pipe provide with flange arrangement. Hence the installation, maintenance and replacement of nozzles become very easy without dismantling the air vessel.

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### **Air Power Blaster system accessories.**

The Air Power blaster system consists of the following accessories.

Air vessel	:-	Pressure Gauge, Safety Valve, Drain valve.
Piping compressor to	:-	Piping provided between Air source  Flow Control unit with Isolating Ball valves, Moisture separator.
Filter & Lubricator	:	1 Unit provided before the Flow Control Unit.
Flow Control Unit Valve	:-	Ball Valve, Non-return Valve and Solenoid  Which are duly mounted in weather proof box provided with wall mounting facilities.
Stainless Steel tubing valve.	:-	Between Solenoid valve and Quick Exhaust
Quick Exhaust Valve	:-	Mounted near the air vessel inlet assembly with 100mm length pipe (Inlet Pipe).

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### **Air Power Blaster – Principle of operation**

The Air Power Blaster system in which compressed Air (pressure 8 kgf/cm<sup>2</sup>) is stored and discharged within Mille Seconds through Jet Nozzle to achieve Impact force on Raw materials which is stored in storage equipments by actuating 3/2 way Normally open type Solenoid Valve and 3/2 way Quick Exhaust valve with pre-determined time programmed in Micro-Process type sequential controller.

The compressed air coming from Air Compressor, passes through the moisture separator for removing the water contents before getting in to main pipe line.

From main pipe line there may be no. of pipe headers depending upon the no. of Flow Control Unit / application equipments.

Before flow control unit the incoming compressed air is filtered and lubricated by filter and lubricator unit.

The Flow Activation Unit (FAU) is nothing but solenoid valve enclosure box where 1 no. each Ball valve, Non Return Valve and solenoid valve are provided for 1 no. Air Power Blaster System. The Flow Control Unit shall be suitable for 4 nos. blaster system or 6 nos. blaster systems or 8 nos. blaster system.

The 3/2 way Normally Opened type Electrical operated 1/4" solenoid valve (in non active position) and 3/2 way 3/4" Quick Exhaust Valve diaphragm (self operated type when there is a differential of air pressure) connected with stainless tube tubing.

3/2 way Normally Opened type Electrical operated 1/4" size solenoid valve configuration is 1 no. Inlet Port, 1 no. Outlet Port and 1 no. Exhaust Port.



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### **Function of Solenoid Valve: -**

In non active position the inlet and outlet port will be through & through and exhaust port will be closed. When solenoid valve is activated by electrical supply voltage (24V DC / 110 V or 240 V AC) inlet will be closed and outlet port and exhaust port will be through.

3/2 way  $\frac{3}{4}$ " size Quick Exhaust Valve configuration is 1 no. Inlet Port, 1 no. Outlet Port and 1 no. Exhaust Port.

### **Function of Quick Exhaust valve : -**

When pressurized compressed air supply enters in to inlet port, the exhaust port will be closed and inlet port , outlet port will be through.

When pressurized compressed air supply inlet will be closed and outlet port and exhaust port will be through.

Note that the air vessel piston assembly with leak proof labyrinth seal is seated with exhaust cup assembly seating arrangement with help of compressed helical spring hence the exhaust port 4" diameter of air vessel is closed.

With the above configured system, the compressed air with pressure of (say 8 bar) enters in to the solenoid valve through quick exhaust valve and in to the vessel through 2 nos. orifice holes provided in the piston.

Depending upon the capacity of compressed air and vessel capacity, the provided capacity vessel may take 60 to 90 seconds to get filled indicated by the pressure gauge mounted in to the vessel. Once the incoming pipe line pressure and vessel air pressure is same there will not be further air supply in to the vessel.

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### **Now the vessel is ready for operation.**

The 3/2 way normally open type solenoid valve get activated through provided electrical supply to solenoid valve electromagnetic coil for a 1 second. Immediately the Inlet Port gets closed, gets open exhaust port thereby compressed air entrapped between the pipe line (SS Tubing) (pressure and volume of air) till quick exhaust valve will pass through exhaust port of solenoid valve in a fraction of seconds, at the same time the quick exhaust valve inlet port gets closed, get exhaust port opened due to pressure differential between atmosphere and compressed air pressure. As soon as the inlet pipe (3/4" x 100mm length) pressure and volume of air till Hollow piston will passes through exhaust port of solenoid valve in a fraction of seconds, Creating negative pressure on hollow piston and the pressurized (8 bar with volume of air vessel) compressed air push the piston up wards due to piston bottom exposing the holes provided in the bottom of exhaust cup assembly seating arrangement. And when the piston goes up the entire compressed pressurized volume capacity passes through cup assembly free flow area (4 nos. slot) and exhaust pipe assembly and the provided Jet nozzles.

The entire above operation takes place simultaneously in a mille seconds.

With effect of compressed air Impact force on the Raw materials which is stored in storage equipments get push downwards and the entire in to the raw materials gets fluidized as well.

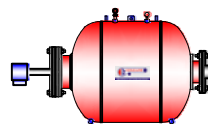
Control Panel with Micro Processed Sequential Timer is provided for each storage equipment. The ON time for fixed for operation / activation of solenoid coil is 1 second (One second) and OFF time is depends on no. of operation required per hour and no. of Air Power Blaster provided in the storage equipments.

The operation of Air Power Blaster System is always sequential starting from bottom blaster to Upward Blaster.

# AIR BLASTER SYSTEM

## Air Power Blaster MODEL : CAB

Promote Flow of Raw Materials  
with **CONCARE** Air Blaster



Concare Air-Power Blaster is a FLOW PROMOTING DEVICE used to remove and to prevent the material Jammings in Bulk Solids Handling Storage equipments.

Air Power Blaster is an Air Vessel which is manufactured from IS 2062 Under Specification Un fired Pressure Vessel Code IS 2825 Class-3, in which compressed Air pressure 6 to 8 bar is stored and releases within Mille Seconds through Jet Nozzle to achieve Impact force on Raw materials by actuating 3/2 way Solenoid Valve and Quick Exhaust valve with pre-determined time programmed in Micro-Process type sequential controller.

### Advantages

Production Increases.

No Manual Poking.

No Equipment Damages.

Plant Efficiency Increases.

### Salient Features

Spring Loaded type Aluminum Piston.

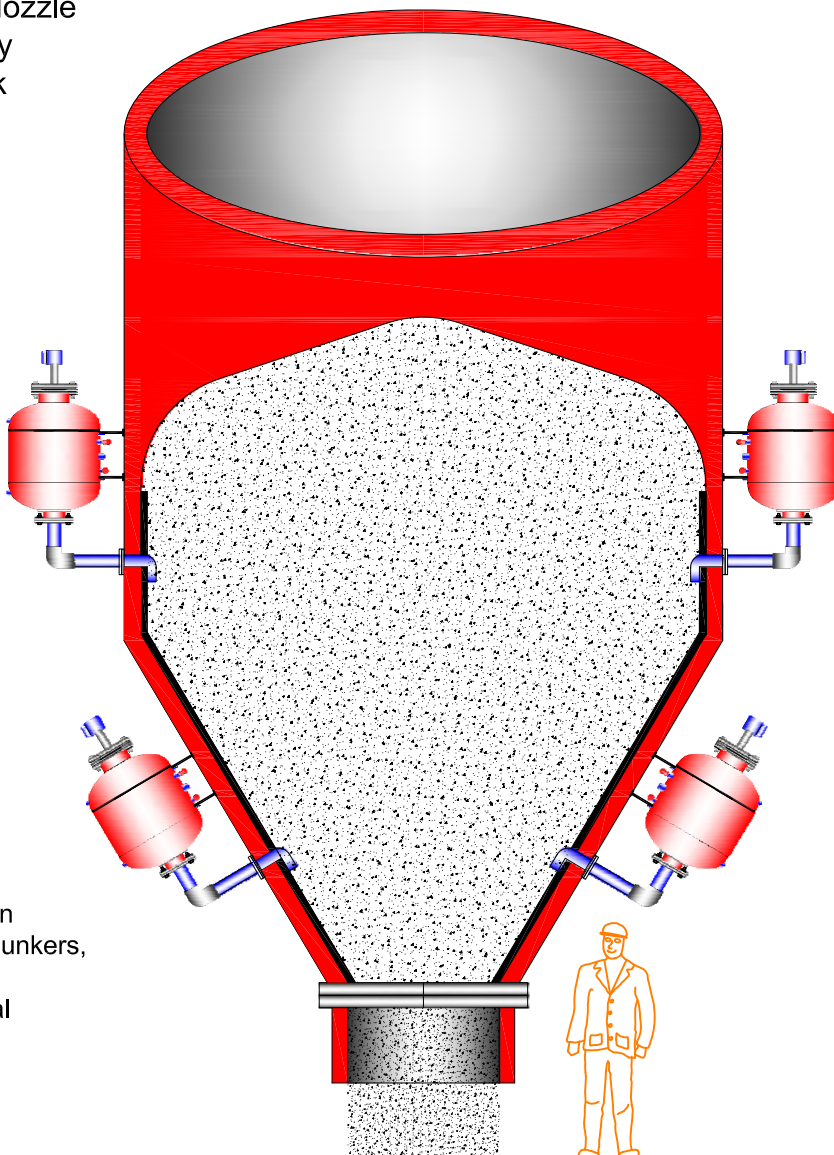
Inlet and Outlet at opposite side.

Maintenance Free without dismantling Vessel.

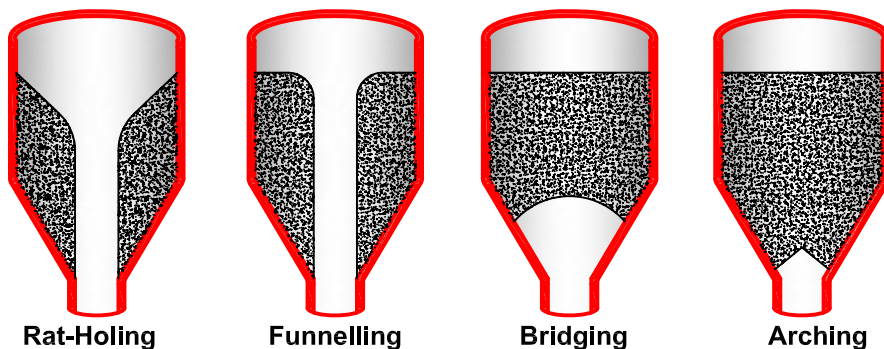
No Air Leakage.

Better Air sealing with Labrynth type seal.

Flow Problems of Bulk solids like Rat holing, Funneling, Arching and Bridging frequently occur in storage handling equipments like Bins, Hoppers, Bunkers, Silos and Chutes. Due to Geometry of equipments, Wall friction with raw material, Material characteristics, Methods of Material feeding and discharging.



### Basic Raw Material Flow Problems in Storage Equipments



### Disadvantages due to Flow Problems of Bulk solids

Production Loss.

Manual Poking.

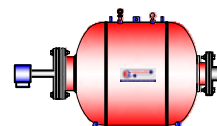
Equipment Damages.

Plant Efficiency reduction.

# AIR BLASTER SYSTEM

## Air Power Blaster MODEL : CAB

Promote Flow of Raw Materials  
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The Air Power Blaster system in which compressed Air (pressure 8 kgf/cm<sup>2</sup>) is stored and discharged within Mille Seconds through Jet Nozzle to achieve Impact force on Raw materials which is stored in storage equipments by actuating 3/2 way Normally open type Solenoid Valve and 3/2 way Quick Exhaust valve with pre-determined time programmed in Micro-Process type sequential controller.

Model No.	Capacity
CAB-50	50 Ltrs.
CAB-70	70 Ltrs.
CAB-100	100 Ltrs.
CAB-135	135 Ltrs.
CAB-150	150 Ltrs.
CAB-200	200 Ltrs.
CAB-350	350 Ltrs.

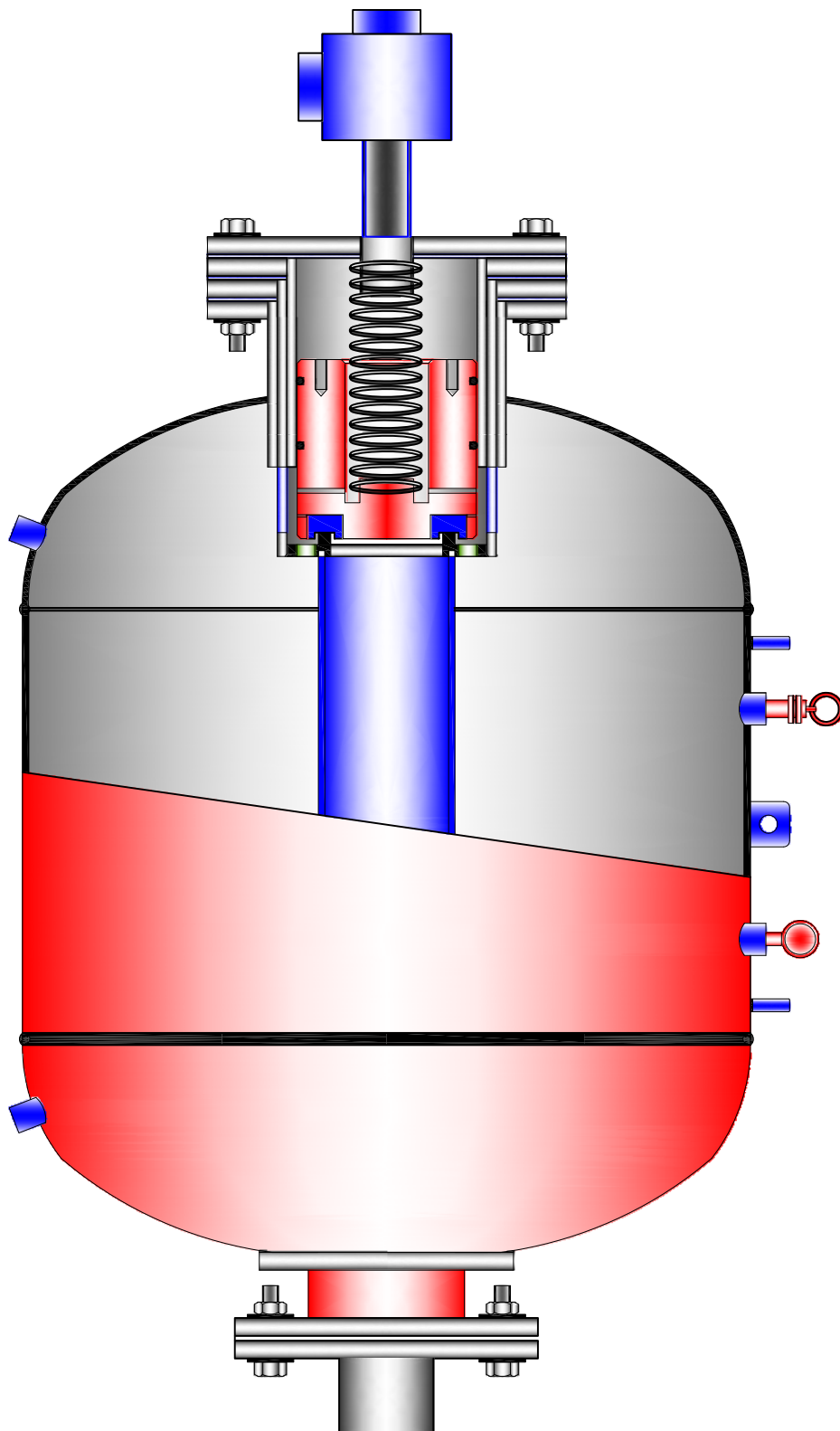
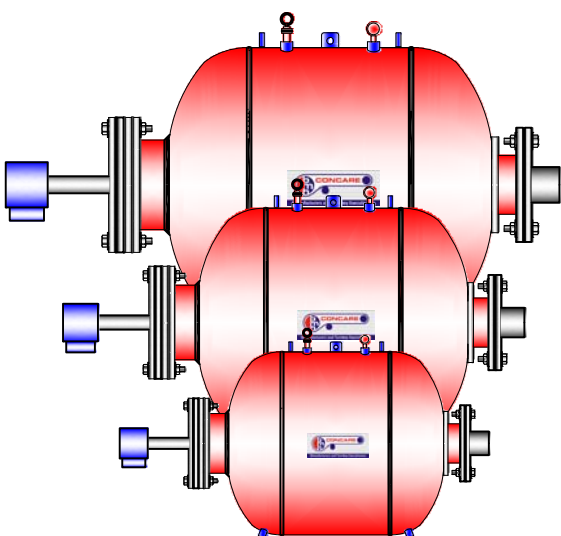
Air Blaster consists of Vessel Assembly with

Valves & accessories, Piping Network,

Mounting accessories,

Flow Activation station

Nozzles, Control Panel.



Head Office & Works

Caress Belt Conveyors by **BMH CONCARE TECHNOLOGY INC.**

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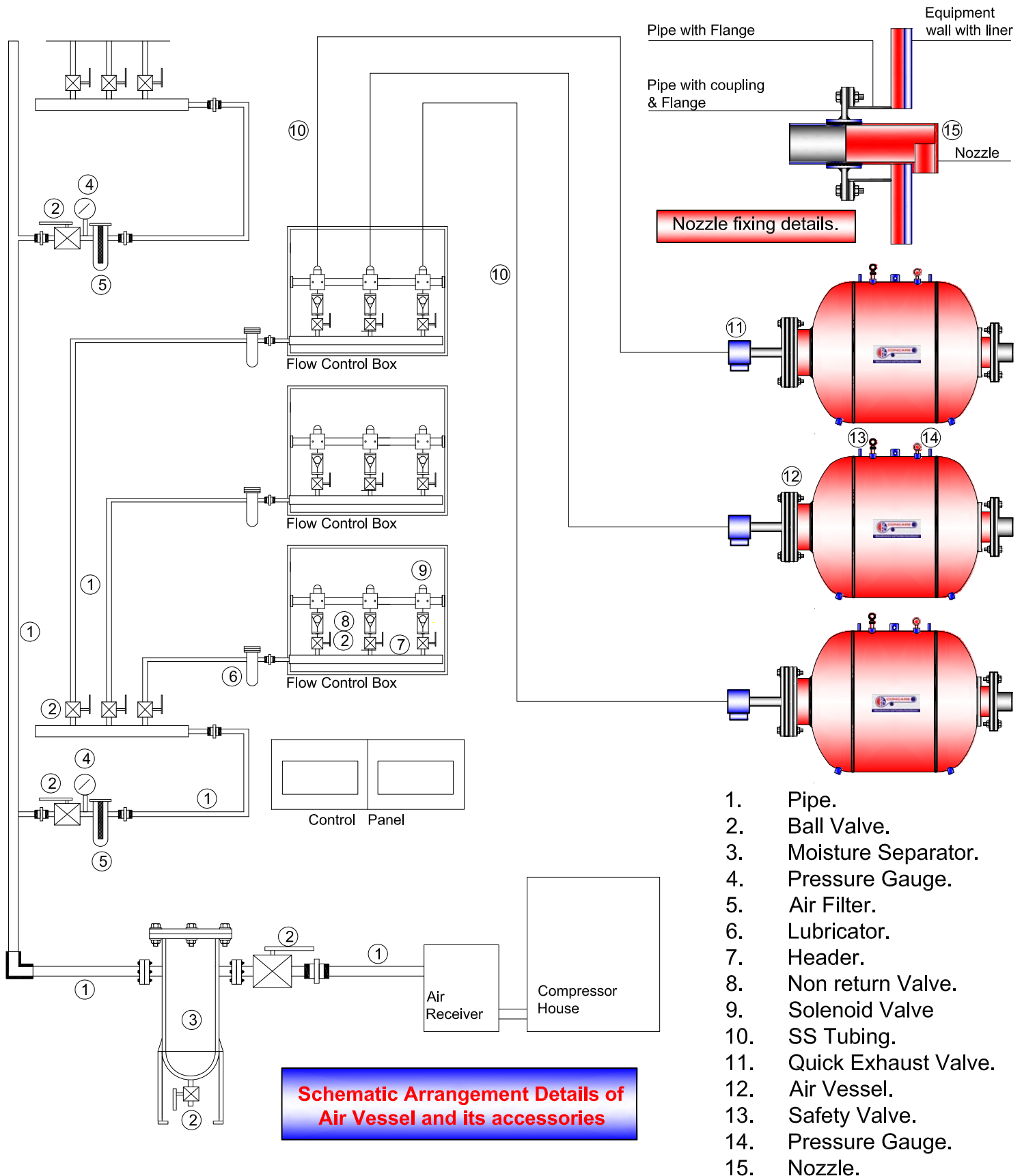
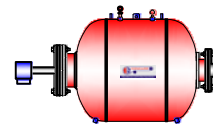
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**BMH / CAB-CAPB/018**

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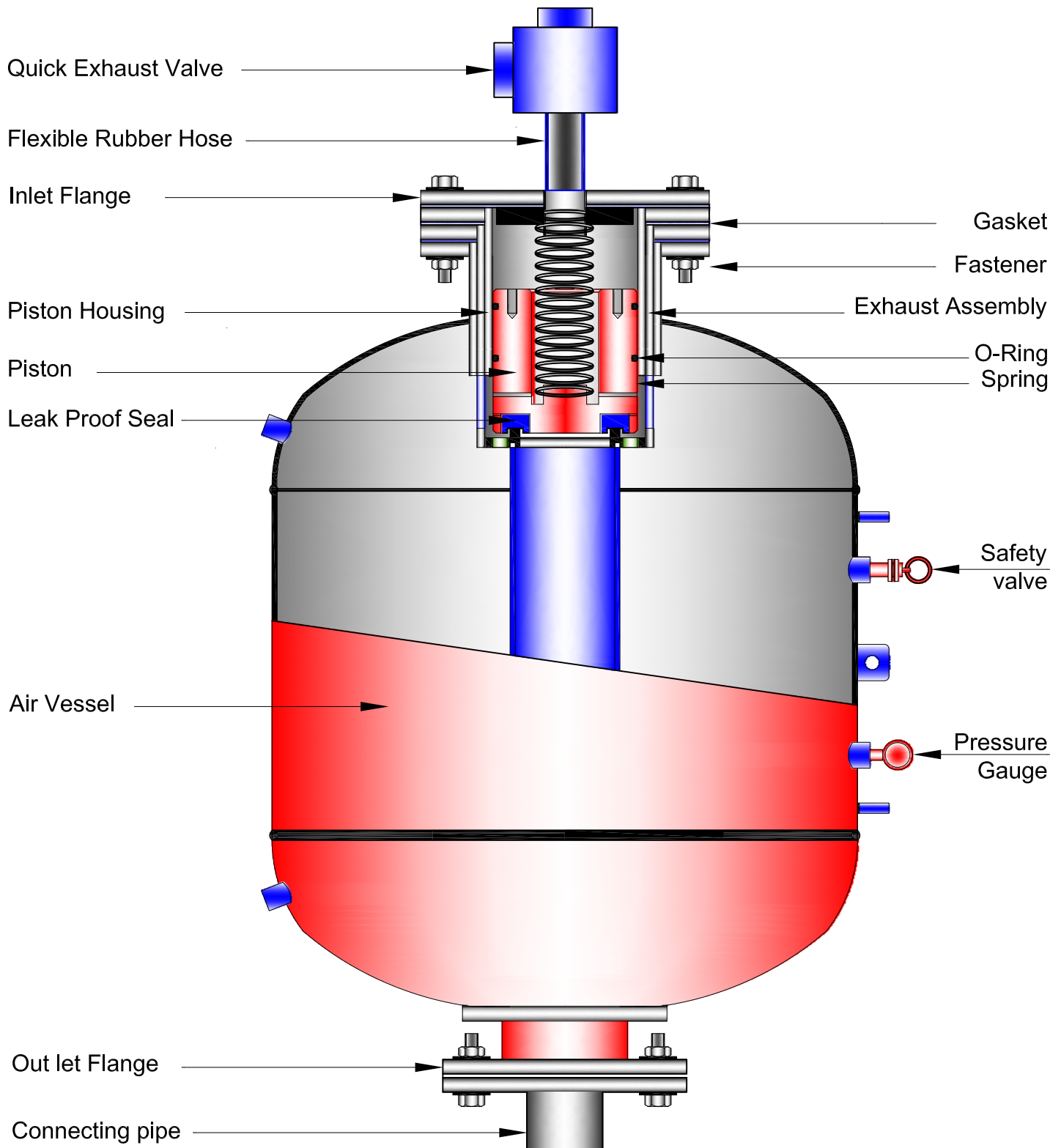
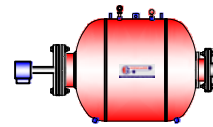
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