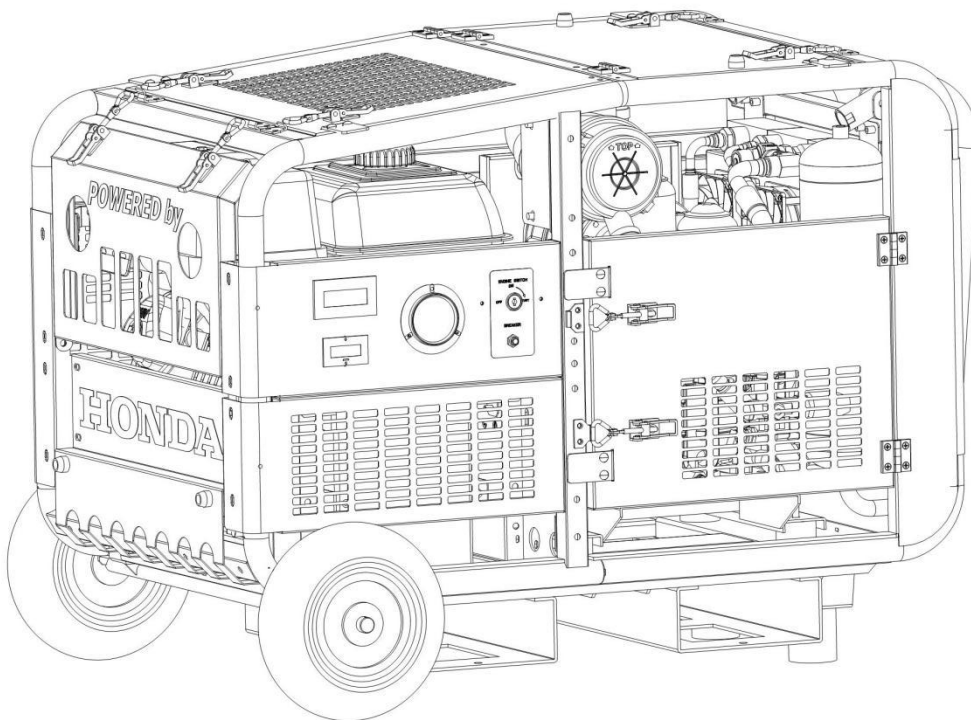


# Operating instructions for **Petrol driven screw compressor**



CAREFULLY READ THESE INSTRUCTIONS BEFORE OPERATING THIS COMPRESSOR

# **1. Notices and safety instruction**

Please read this manual carefully before using the air compressor to avoid accident and damage to the machine.

## **1.1 Notices for high temperature and pressure**

For part of pipelines or elements that may produce high temperature, it is forbidden to touch it in case of a scald accident before cooling down completely.

Any element of the machine may hold high pressure air flow, it is necessary to confirm complete discharge before dismantling and installing. Avoid pointing high pressure air flow to any person. It can cause serious injury.

Compressed air provided by this machine is for industrial use only. It can not be used for respiration.

## **1.2 Safety notices for drainage of machine**

To avoid oil emulsification in the compressor and consequent seizing of rotors, please do open the drain valve to drain out condensation water in the air-oil separating tank of the system before running the machine.

To ensure proper functioning of the system, remember to check drainage function of the air processing equipment and the drain equipment.

## **1.3 Rules of safety operation**

The operator should establish the rules of safety operation in details to avoid injury, accidents, and machine damage. The following are suggestions for reference:

- (1)The operator should receive strict training beforehand and read up and understand specifications;
- (2)Strictly prohibit the structure of the assembly and the control method from being changed, without written permission of the manufacturer;
- (3)The operator should stop the machine if he finds any abnormal situation;
- (4)There should not be flammable, combustible, poisonous and mordant gas in the surrounding area;
- (5)The operator must stop, unload the compressor before the maintenance and regulation of the assembly.

## 2. Specifications

### 2.1 Model No., description

PSP-30 portable petrol driven screw compressor

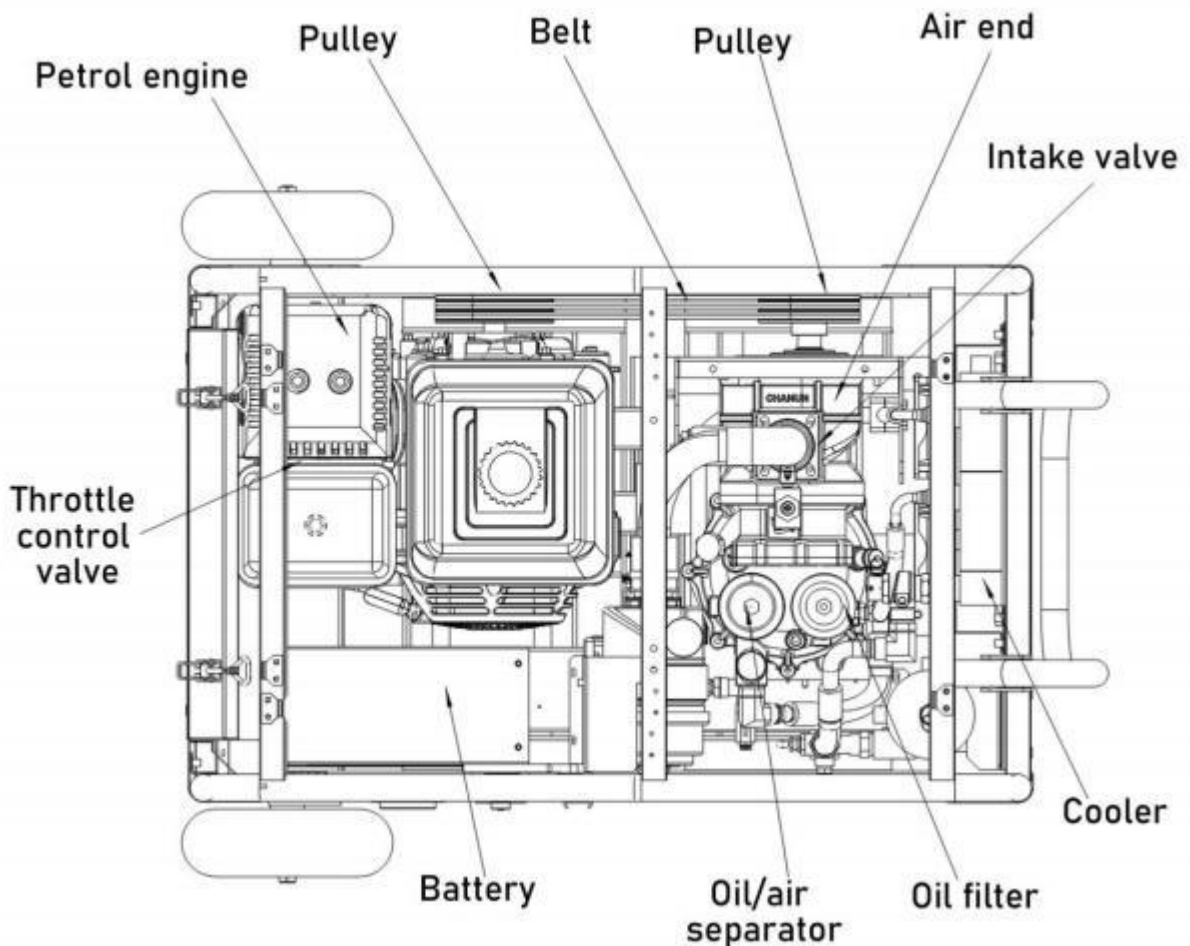
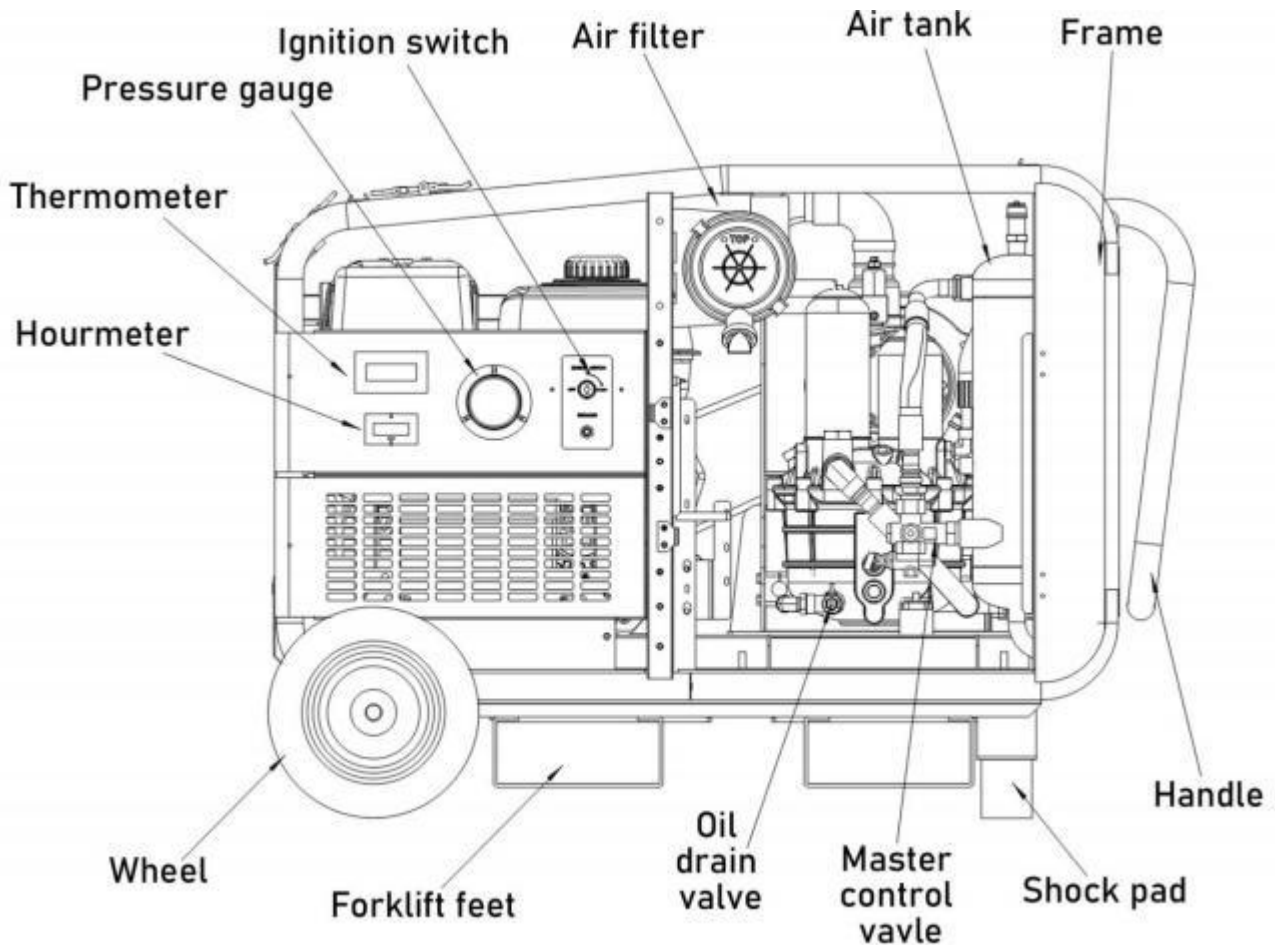
### 2.2 Main specification

Model No.	C10PG
Type	Single stage, air cooled, oil injection, portable screw compressor
Air delivery	35CFM
Working pressure	8bar、 10bar
Speed	3600rpm
Oil capacity	2.5L
Intake temperature	=45 °C
Discharge temperature	=110 °C
Safety valve blow pressure	1.3Mpa
Machine pulling speed	=5Km/h
Dimension	1100mm×824mm×725mm
Weight	260Kg

### Gasoline engine

Model No.	GX390
Type	Air cooled
Power	13Hp
Speed	3600rpm
Start method	Electric start & recoil start

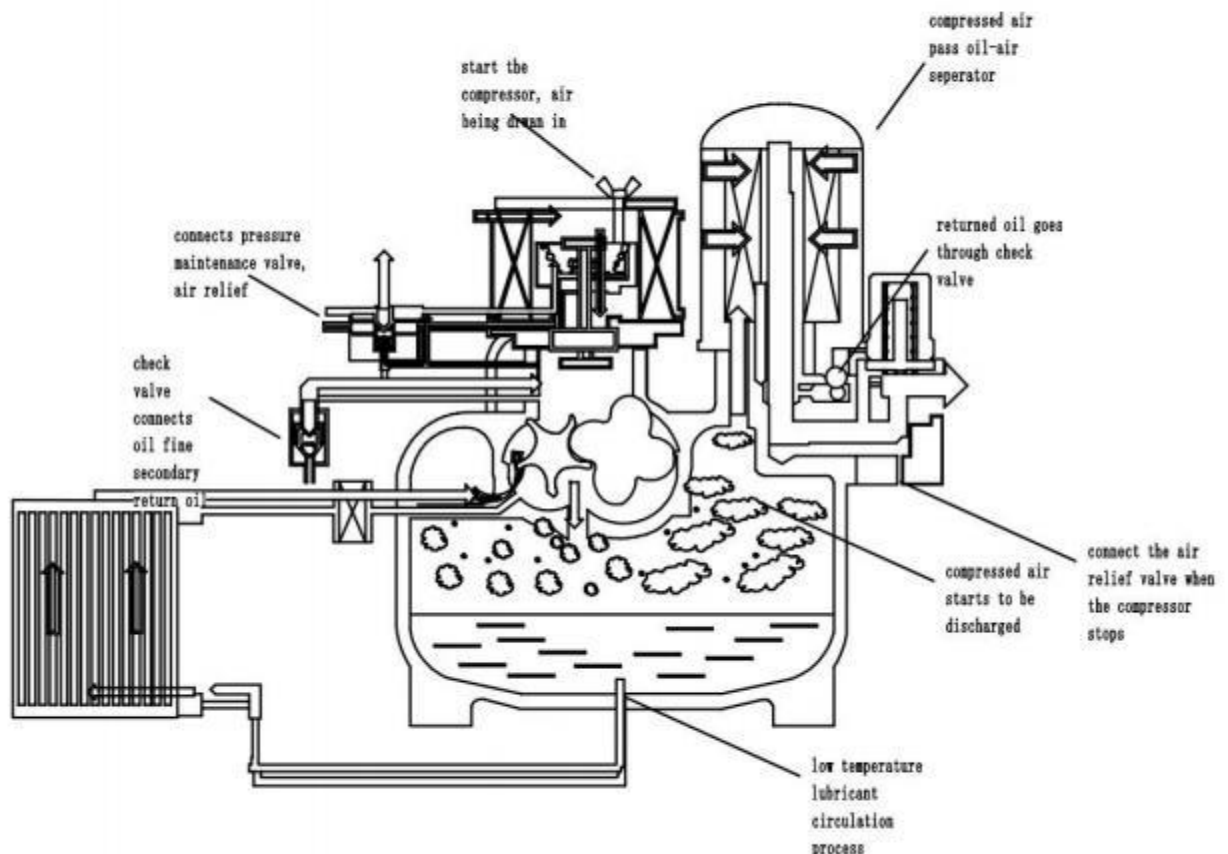
### 3. Structure and working principle



### 3.1 Working principle

After dust is removed from the air by the air filter, the air enters into the intake valve to be compressed and mixed with the lubrication oil. The mixed oil and compressed air enters into an air / oil separator tank, then passes through an oil fine separator, a minimum pressure valve, a rear-part cooler and then a water separator and enters into the usable air flow.

## Working Principle



### 3.2 Air flow system

Air enters the air compressor, and then passes through air filter as well as intake valve. Compression of the screw air compressor is done by a pair of rotor (a male and a female). Two rotors are installed on two parallel axes respectively in high intensity cast iron chamber. Air inlet and outlet are positioned at either side of the chamber respectively.

Groove of the female rotor is joggled with and driven by the male rotator. Bearings are used at the discharge side to resist axial force. Oil-air mixture is discharged and enters the oil separating system. This system separates most of the lubricant. The lubricant will be returned to the

system after cooling, and only several PPM of lubricant is carried to the air-cooling system with the compressed air. The after-cooling system includes heat exchanger and drainage device. After cooling, most of moisture in the discharged air will be condensed and drained via rear piping of the machine sets.

Intake valve is a piston type valve. By using of air flow which enters piston via its bottom, amount of inlet air can be controlled by movement of piston. The more amount of air enters the bottom of piston, the more the piston moves. The amount of air inlet will decrease because the opening of the suction control valve decreases. In adverse condition, the amount of air inlet increases.

The minimum pressure check valve performs the oil lubrication of the air end. This minimum pressure check valve allows back pressure for the air / oil separator tank the back pressure is needed for proper circulation and lubrication of the oil to the air end. The minimum pressure check valve also slows the air flowing through the air separator filter, this is necessary to prevent damage to the separator filter element. Air flow is dependent on a minimum pressure within the air / oil separator tank and will only start after the pressure reaches over 43.5 PSI / 3 bar.

When the compressor runs abnormally or the pressure sensor is malfunction, the pressure in the oil separator may increase continuously. When the pressure increases to the setting value of the safety valve, the safety valve will actuate to release pressure and to avoid accident. Actuated pressure of relief valve has been calibrated before product delivered from the factory, please do not modify it

This compressor is equipped with a discharge ball valve as air outlet, it is RP3/4(DN19).

### **3.2 Oil injection system**

Because the pressure in the oil / air separator, the lubrication oil is pressed into the oil cooler. After the lubrication oil is cooled in the cooler, the particles of impurities in the lubrication are removed via an oil filter, and then the lubrication oil is divided into two parts. One part of the lubrication is injected into the compression chamber from the lower end of the engine body. The compressed air is cooled. And the other part of the lubrication oil is passed through the two ends of the engine body and is used to lubricate a bearing unit and a driver gear. The two parts of the lubrication oil meets at the bottom of the compression chamber again and be drained out with the compressed air. The oil mixed compressed

air enters into the oil / air separator together with the lubrication oil. Most of the oil is initially separated. The remaining air containing oil mist is passed through the oil fine separator again, and the remaining oil is removed. The compressed air enters into the rear-part cooler through the minimum pressure valve, is cooled and then can be sent for use.

The oil/air separator is made of dual-layered glass fiber and can catch oil molecule in compressed air. The filtered oil is kept in the central groove, and flows back to the air compressor via an oil return pipe. Oil content in air can be controlled under 3PPM when it works at rating pressure.

Thermal control valve keeps discharge temperature above dew point to avoid moisture being condensed in oil separator which may cause deterioration and emulsification of lubricant. It also protects the compressor from extremely high discharge temperature (cut out at 105 ° C), which may cause damage on mechanical elements and deterioration of lubricant.

Oil filter is a paper filter that can capture the debris which will damage the bearings and other moving parts in the oil. If the filter is blocked, the lubricant supply will be insufficient and discharge temperature will increase. This will cause damage in moving parts or in worst case the screw rotor will lock.

Oil cooler is made from aluminum plate fin, it is directly cooled by the fan driven by petrol engine, it is used to cool the lubricant. If the cooler is blocked, the discharge temperature will increase. The cleanliness of the cooler should be taken care of in periodical maintenance.

### **3.2 Air flow regulation and control system**

The output air flow is automatically adjusted by compressor itself through adjusting the air intake volume and engine running speed based on the air consumption, in general case, air flow regulation and control system is preset in the factory, no need to change.

## 4. Operation

### 4.1 Preparation and check before operation.

1. The compressor must be placed on the even and horizontal ground (slope less than 5°).
2. Check the oil sight glass to make sure the oil level between 1/2~2/3.
3. The first use, please feed around 0.3L of oil into the suction valve to lubricate the rotor and bearing.
4. Open the discharge ball valve and release valve on the control panel to enable the compressor start easily.

### 4.2 Operation

1. Check if the petrol engine works normally, no abnormal sound, no overspeed and so on.
2. Check if the output pressure is correct as the plate stated.
3. Check the compressor unloading status. The compressor starts unloading and petrol engine's running speed slow down when the actual output pressure higher than rated pressure, in reverse, the compressor starts loading and petrol engine's running speed increase.
4. Check if there is oil or air leakage with the compressor, if so, shut down the compressor immediately and fix the problem.

### 4.3 Shut down

1. Close the discharge ball valve, allow the petrol engine to run at idle speed for around 3~5 minutes to cool the engine down.
2. Turn off the petrol engine, open the discharge ball valve and release valve to release all pressure inside compressor.

### 4.4 Proportion valve adjustment

The proportion valve is preset in the factory, no need to adjust before operation. In special cases, if need to adjust the output pressure, please pull out the handwheel, turn it clockwise to increase the output pressure, and turn it anticlockwise to decrease the output pressure.

**Warning: Never set the output pressure higher than rated pressure.**

## 5. Maintenance and repair

### 5.1 Safety inspection

Before maintenance or repair, please confirm the engine have already been stopped completely. During maintenance or repair, a signal “under maintenance, switch on is forbidden” must be put at the startup key. All pressure must be released during any maintenance.

**5.2 The compressor oil contains rust-proof, antioxidant, antifoam additive, please always use factory authorized oil.**

Ambient temperature	Oil type
$\geq 25^{\circ}\text{C}$	Shell S3/S4
$-10 \sim 25^{\circ}\text{C}$	Shell S3/S4

**Or use compressor oil complying with ISO VG46 grade.**

### 5.3 Maintenance guidelines

Period	Working hours	Items
Daily		Check oil level on oil/air separator Check fuel level of petrol engine Check air output pressure Check voltage of battery Check oil and air leakage
Weekly		Drain the water inside oil/air separator Check solid rubber wheel Check battery and wiring Check oil/air separate element

Three months	500	Clean oil return pipe Change oil filter (first change 100h) Clean cooler and fan Change air filter element Check all gauges Check belt
Six months	1000	Change oil/air separate element Change air filter element Change oil (first change 100h) Change belt Check compressor shaft seal
Yearly		Check intake valve Clean oil cooler Check safety valve

#### 5.4 Oil/air separator change

After using for a period of time, the filter will be blocked gradually, which causes some pressure drop. Cleanliness oil fine separator will affect its efficiency. Too much blockage will result in higher oil content in outlet air and higher power consumption. Fine separator can be changed as follows: The fine separation is a screw in type. It can be dismantled by special tools. Please check that the O- ring and gasket are normal or not. Apply lubricant on the surface of gasket before installing it.

#### 5.5 Oil change

1. To ensure that water is not present in oil, the oil temperature must be increased to avoid condensation. A good operation temperature for the oil is 160-180 degrees F.
2. Allow a few minutes after shutdown to change oil, this will ease pressure and allow for a more efficient oil change.
3. After the lubrication oil is drained completely, the oil drain valve should be closed. The oil filling port should be opened, and new oil should be injected into the oil filling port. Note: all the lubrication oil in the system should be drained completely, such as the lubrication oil in the pipeline, the lubrication oil in the cooler and the lubrication oil in the oil / air separator tank.
4. New oil should be added.

## 6. Trouble shooting

Problem	Trouble shoot	Corrective action
Compressor can't build pressure	Intake valve doesn't open	Adjust, repair or change
	Proportion valve is not preset properly	Adjust
	Servo cylinder is not working	Repair or change
Discharge pressure higher than rated pressure, compressor doesn't unload	Proportion valve is not preset properly	Adjust
	Servo cylinder is not working	Repair or change
Oil level rise	Condensed water precipitates out	Drain out the condensed water
Oil content in the air is too high Oil consumption is too much	Too much oil inside air end	Check oil level, drain out oil
	Oil return pipe is blocked	Check all elements in oil return pipe
	Wrong oil is used	Change oil
	The oil fine separator has been damage	Check and change
	A spring of the minimum valve has fatigued.	Check, repair or change
Air flow or air pressure lower than rated value	Proportion valve is not preset properly	Adjust
	Air consumption too high	Check leakage of pipe line
	Air filter blocked	Clean or change
	Intake valve failure or not open completely	Repair or change
Oil thrown out after compressor stops	Intake valve failure	Repair or change
Discharge temperature too high	Compressor is not cooling properly	Get better ventilation
	Oil cooler blocked	Clear or change
	Lack of oil	Check and add more oil
	Oil/air separator blocked	Check and change
	Oil filter blocked	Check and change
	Thermal control valve failure	Check and change
	Mini pressure valve failure	Check, repair or change
The safety valve blow up after closing the discharge ball valve	Safety valve failure	Check and change
	Intake valve failure	Check, repair or change
	Proportion valve is not preset properly	Adjust
	Servo cylinder is not working	Repair or change
Compressor shut down abnormally	Lack of fuel	Check, add fuel
	Petrol engine oil pressure too low	Check oil level and oil filter