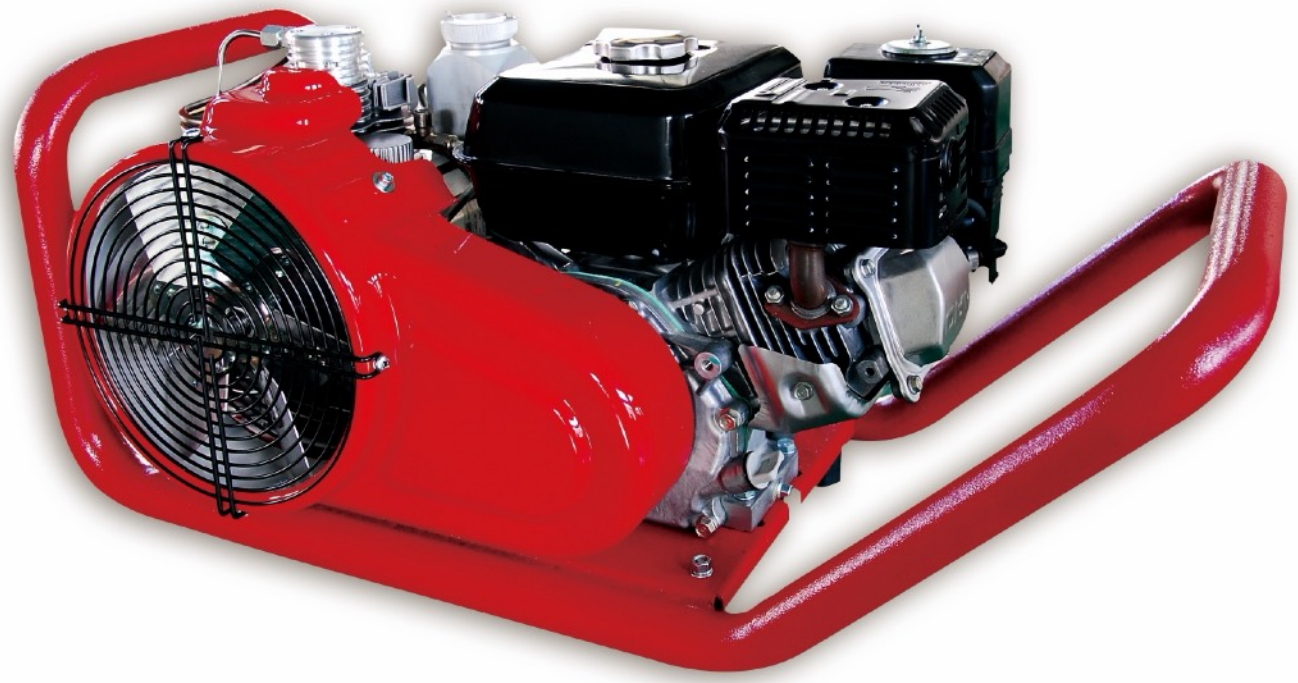


This manual contains the operating instructions and Maintenance schedules for high pressure helium compressors. The operator must read and understand all the information in the manual.

ATTENTION. 

This machine only be used after a careful reading of this instruction manual by skilled and trained operator. The machine may only used to compress helium gas. Other use is strictly prohibited. The manufacturer and the supplier void all responsibility for damage or injury resulting from failure to follow these instructions.

1. GENERAL INFORMATION:

Before using the machine please put your attention to this general information:

1. Personnel engaged to operate the machine must have read the instruction manual before beginning work, especially the safety notices chapter.
2. Personnel may not wear long hair loose, loose clothing or jewellery, including rings.
3. Keep all safety and danger notices on the unit complete and in readable condition.
4. No modifications may be made to the unit which could impair safety without first obtaining permission from the suppliers.
5. Piping must be thoroughly checked (pressure and visual inspection) by the operator at appropriate time intervals, even if no safety related faults have been noticed.
6. Intervals stipulated or given in the instruction manual for recurring checks/inspections must be adhered to.
7. It is absolutely essential that the workplace is appropriately equipped for Maintenance measures.
8. Work on/with the unit may only be carried out by reliable personnel. Observe the legal minimum age permissible.
9.Operator must be trained and have experience on compressor

Remember that your machine is not a ‘toy’, but a highly Efficient internal-combustion machine whose power is Capable of harming you, or others, if it is misused of abused.As ower,you,alone,are responsible for the safe operation Of your machine, so act with discretion and care at all time.If at some future date,your machine is acquired by another Person ,we would respectfully request that these instructions are also passed on to its new owner.

2. PRESENTAZIONE GENERALE:

The EN-100L High pressure helium gas recovery compressor can only be used for helium recovery work.The max pressure is 150 bar depending on unit.

The compressor unit comprises the following major assemblies:

Il compressore è composto da:

. Compressor block
. Petrol Engine
. Filters
. Filling Assembly
. Protection and anti-vibration frame
. Automatic condensate drain*
. Electric control system**
. Automatic switch on/off*
. ALUMINUM frame

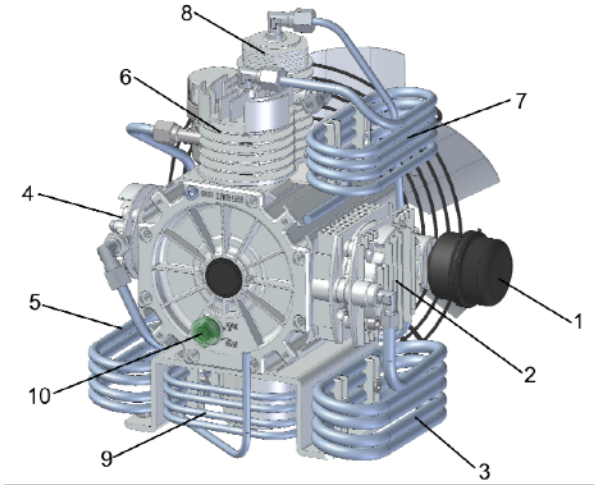
(*) Optional extra according to order

3. GROUP COMPRESSOR

The compressor block is used to compress helium in the high pressure range up to 165bar. The compressor block is of a four stage, four cylinders design. The cylinders are arranged in the 1st stage on the left, 2nd stage on the right, 3rd and 4th stage on the centre side looking from the filter side. The compressor blocks are particularly suitable for continuous operation because of their rugged design and the corrosion resistant intermediate filter and cooler assemblies. Smooth running is a particular feature of this design. The moving parts of the driving gear are all equally balanced. This results in a vibration-free running. The driving gear is fitted with energy saving cylinder roller bearings. The upper and lower connecting rod bearings are also roller bearings. Crankcase, cylinders and heads are obtained from the gravity dies. Connecting rod is extracted from casting dies. Cylinder is in cast iron inside an aluminium pipe.

DESCRIPTION

1. Intake Filter
2. 1st stage
3. Inter-cooler 1st stage
4. 2nd stage
5. Inter-cooler 2nd stage
6. 3rd stage
7. Inter-cooler 3rd stage
8. 4th stage
9. Inter-cooler 4th stage
10. Oil indicator



4.TECHNICAL DATA

Compressor unit	EN-100L 15Mpa
Operating pressure	15 Mpa
Delivery *	100 L/min.
Final pressure safety valve	15 Mpa
Compressor Block	EN-100L 15Mpa
Number of stages	4
Number of piston	4
Cylinder	

Cylinder bore stage 1	60 mm
Cylinder bore stage 2	38 mm
Cylinder bore stage 3	19 mm
Cylinder bore stage 4	9.5 mm
Piston stroke	23 mm
Oil capacity	0.35 L
Max permissible ambient temp.	-5°C Min. +45°C Max. (+25°F Min. +113°F Max.)
Max permissible inclination of compressor	20°
Max dampness	80%
Max sea level	2000 m sea level
Weight	50 kgs
Drive Engine	Gasoline Engine
Power	4 HP
Brand	Honda
Type of enclosure	IP 55

5. SAFETY MEASURE

5.1. Fundamental safety notices:

Important instructions concerning the endangerment of personnel, technical safety and operating safety will be specially emphasized by special marks placing on the machine.
For safety reasons you can find some components mounted on the compressors in order to prevent damages. These parts must not be changed or removed in any case. Before please consult our technician.

5.2. Authorized use :

The unit is built according to state of the art technology and established safety technical regulations. Nevertheless, its use can cause danger to life and limb of the operator or third parties or damage to the machine and other equipment. Operate the unit only in technically perfect condition in accordance with regulations and safety danger notices detailed in the instruction manual. The manufacturer/supplier is not responsible for damage resulting from a wrong utilisation of the machine. The user alone is responsible for this risk.

5.3. Safety notices for operation :

- Ensure that only trained personnel work with the machine.
- Filling hoses must be in satisfactory condition and threads undamaged.
- Ensure intake air is free from noxious gas, exhaust fumes and solvent vapour.
- The use of petrol and diesel compressors is forbidden in indoor place.
- Check the unit externally for damage and faults periodically. Inform the department/person responsible immediately if anything is not as is should be (including operation). If necessary, shut the machine down immediately and make it safe.
- Observe switching on and off processes and monitoring indications according to the instructions manual.
- Use only Nardi original parts and equipments.

- Drain the valve regularly if manual drain valve. Check every ten minutes the valve if automatic drain valve.
- Switch off the machine when do not use it.
- Clean oil, fuel or care products from, the machine, in particular the connections and screw joints, before carrying out Maintenance/repair work. Do not use aggressive cleaning fluid. Use a fibre-free cleaning cloth.
- Completely remove all covers/seals after cleaning.
- Use only original fuses with specified current rating. If there is a failure in the electric energy supply, shut the machine/unit down immediately.
- Work on electric units or operating equipment may only carried out by a qualified electrician or by a person under the instruction and supervision of qualified electrician according to electric technical regulations.
- The electrical equipment of a unit must be regularly checked.
- When working in small rooms, observe any national regulations.
- Depressurize system and pressure lines before commencing repair work.
- With regard to oil, grease and other chemical substances, observe the relevant safety rules for the product.
- When switching on the machine, check the arrow to ensure correct direction of rotation of the drive motor.
- The machine needs to be stoped every 1- 2 hours and cooling half hour in order to keep machine work longer

6. STARTING THE MACHINE

Starting the unit(option):

1.) Unit with electric engine without compressor control system:

The motor is switched on manually by pressing the start button. Machine does not be left alone during working. Check continuosly the right function.

On units without automatic condensate drain, the manual condensate drain valves have to be opened before starting the unit, as soon as the unit is running the valves can be closed again. Every 8/10 min drain the valves.

2.Units with electric engine with automatic control system:

This model is delivered with an automatic control system.

Before starting check point 6.1 and then press ON button. Switch off the machine pressing STOP button.

3. Units with petrol engine:

Open condensate drain valves on the filters to release pressure, so that motor start without load. Set choke to position START. Start engine with recoil starter or crank handle. As soon as motor runs smoothly return choke to normal operating position.

For all units:

Close condensate drain valves tightly and run unit to final pressure. Check final pressure safety valve and pressure gauge. As soon as final pressure is reached and final pressure safety valve blows off, open condensate drain valves and drain condensate - unit is ready for filling operation.

7. OPERATION

7.1. Connecting:

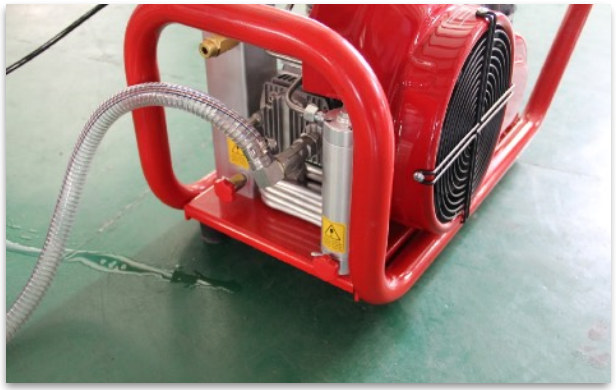
Warnig

Filling hoses must be in satisfactory condition and threads undamaged. Pay particular attention to damage on the interface from hose fitting to hose. If the rubber is scored, hose must be discarded otherwise water can enter and attack wire gauze causing it to rust.

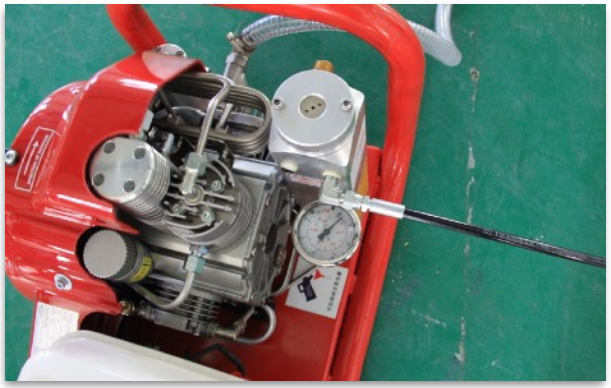
Normally connectors are allowed for pressures up to 15 Mpa (2150psi).

Please follow the process below:

7.1.1. Connect Air Pipe to Balloon or Blimp



7.1.2. Connect Air Fill Pipe to Cylinder

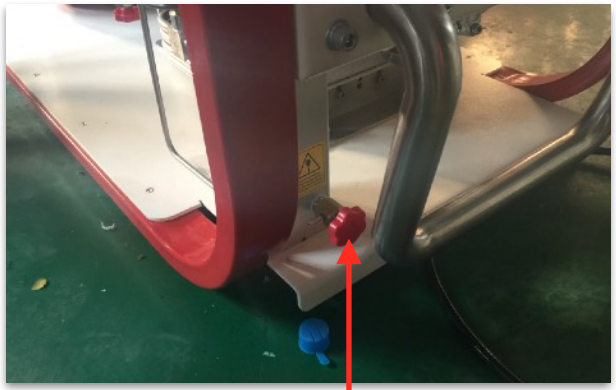


7.2. Pre-start machine： Very important

7.2.1 Valves Closed - Before you start the machine, you need to make sure Valves of Cylinder,Oil-Water Seperator,Voltage-stabiliziing are closed

Cylinder Valve Closed

Oil-Water Seperator Valve Closed



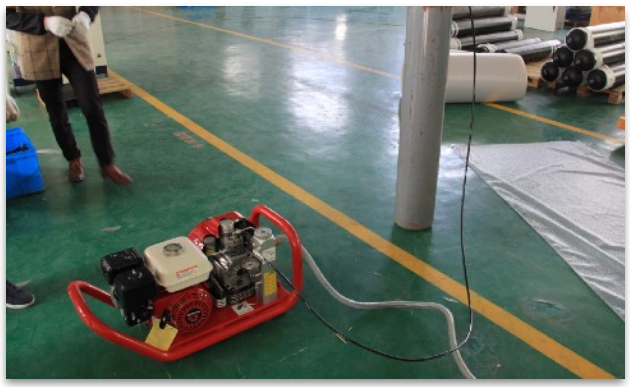
Voltage-stabilizing valve Closed

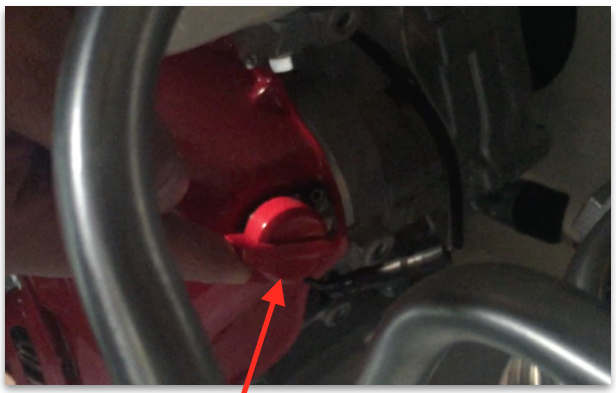
7.2.2 Valves Open

- Air Release Valve must be open

7.3. Starting the machine:

7.3.1 Fill petrol to tank,then to start the petrol engine.Turn on the switch

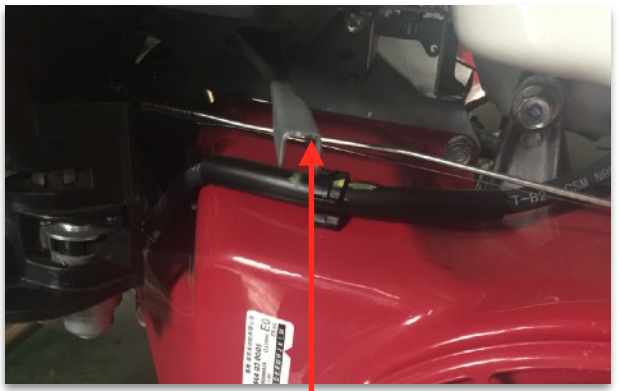




7.3.2 Open oil vent,air thottle and oil thottle

Oil-Switch

Air Thottle



Oil Thottle

7.3.3 Turn Oil Thottle to 1/2 position,pull to start petrol engine

Turn Oil Thottle to 1/2 postion

Pull to start petrol

Pull to start petrol

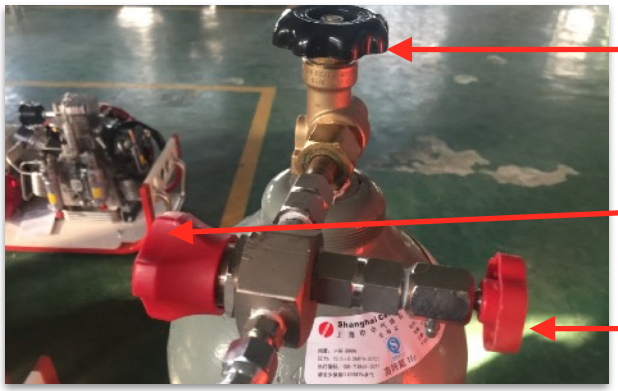
7.3.4 Make the oil thottle Maximum,adjust the air thottle to let engine running well.To adjust air thottle depends on temperature.

Max Oil Thottle

Max Oil Thottle

Adjust Air Thottle

7.3.5 After 10 second running machine,Closed the air secape valve and open the cylinder valve to let helium compress to cylinder.



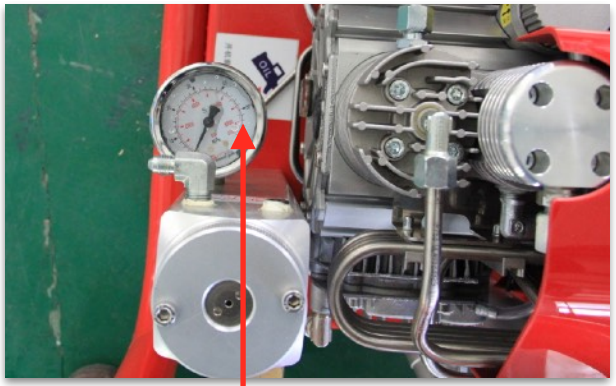
Cylinder Valve must open

Globe Valve must open

Air Release Valve must close

7.3.6 Keep watching the Dashboard of High Air Pressure,when reach 13 Mpa around to change another cylinder.When change another cylinder,must closed the cylinder vavle and open the air release Valve.
New cylinder repeat previous steps

Very important



Air Pressure Dashboard

Globe Valve must open

Cylinder Valve must be closed

Air Release Valve must open

7.3.7 When finish job or machine keeps running 1-2 hours,need to rest or stop the machine for cooling 30 minutes .Must close the cylinder valve and open the air releasue valve. Then turn oil thottle to minium and turn off petrol. - **Remind**

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