

**Instruction Manual
for Portable Compressors**

**XRV 10 OEM
XRV 12 OEM
XRX 10 OEM
XRX 12 OEM**

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Jahan Compressor
Since 1983

Atlas Copco

ATLAS COPCO - PORTABLE AIR DIVISION
www.atlascopco.com

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Follow the instructions in this booklet and we guarantee you years of troublefree operation. Please read the following instructions carefully before starting to use your machine.

Always keep the manual available near the machine.

In all correspondence always mention the compressor type and serial number, shown on the data plate.

The company reserves the right to make changes without prior notice.

Always use this manual in conjunction with the operating manual of the driving mechanism!

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1. SAFETY PRECAUTIONS

To be read attentively and acted accordingly before lifting, operating, performing maintenance or repairing the compressor.

1.1 INTRODUCTION

The policy of Atlas Copco is to provide the users of their equipment with safe, reliable and efficient products. Factors taken into account are among others:

- the intended and predictable future use of the products, and the environments in which they are expected to operate,
- applicable rules, codes and regulations,
- the expected useful product life, assuming proper service and maintenance,
- providing the manual with up-to-date information.

Before handling any product, take time to read the relevant instruction manual. Besides giving detailed operating instructions, it also gives specific information about safety, preventive maintenance, etc.

Keep the manual always at the unit location, easy accessible to the operating personnel.

See also the safety precautions of the other equipment, which are separately sent along or are mentioned on the equipment or parts of the unit.

These safety precautions are general and some statements will therefore not always apply to a particular unit.

Only people that have the right skills should be allowed to operate, adjust, perform maintenance or repair on Atlas Copco equipment. It is the responsibility of management to appoint operators with the appropriate training and skill for each category of job.

Skill level 1: Operator

An operator is trained in all aspects of operating the unit with the push-buttons, and is trained to know the safety aspects.

Skill level 2: Mechanical technician

A mechanical technician is trained to operate the unit the same as the operator. In addition, the mechanical technician is also trained to perform maintenance and repair, as described in the instruction manual, and is allowed to change settings of the control and safety system. A mechanical technician does not work on live electrical components.

Skill level 3: Electrical technician

An electrical technician is trained and has the same qualifications as both the operator and the mechanical technician. In addition, the electrical technician may carry out electrical repairs within the various enclosures of the unit. This includes work on live electrical components.

Skill level 4: Specialist from the manufacturer

This is a skilled specialist sent by the manufacturer or its agent to perform complex repairs or modifications to the equipment.

In general it is recommended that not more than two people operate the unit, more operators could lead to unsafe operating conditions. Take necessary steps to keep unauthorized persons away from the unit and eliminate all possible sources of danger at the unit.

When handling, operating, overhauling and/or performing maintenance or repair on Atlas Copco equipment, the mechanics are expected to use safe engineering practices and to observe all relevant local safety requirements and ordinances. The following list is a reminder of special safety directives and precautions mainly applicable to Atlas Copco equipment.

These safety precautions apply to machinery processing or consuming air. Processing of any other gas requires additional safety precautions typical to the application and are not included herein.

Neglecting the safety precautions may endanger people as well as environment and machinery:

- endanger people due to electrical, mechanical or chemical influences,
- endanger the environment due to leakage of oil, solvents or other substances,
- endanger the machinery due to function failures.

All responsibility for any damage or injury resulting from neglecting these precautions or by non-observance of ordinary caution and due care required in handling, operating, maintenance or repair, also if not expressly mentioned in this instruction manual, is disclaimed by Atlas Copco.

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

If any statement in this manual does not comply with local legislation, the stricter of the two shall be applied.

Statements in these safety precautions should not be interpreted as suggestions, recommendations or inducements that it should be used in violation of any applicable laws or regulations.

1.2 GENERAL SAFETY PRECAUTIONS

- 1 The owner is responsible for maintaining the unit in a safe operating condition. Unit parts and accessories must be replaced if missing or unsuitable for safe operation.
- 2 The supervisor, or the responsible person, shall at all times make sure that all instructions regarding machinery and equipment operation and maintenance are strictly followed and that the machines with all accessories and safety devices, as well as the consuming devices, are in good repair, free of abnormal wear or abuse, and are not tampered with.
- 3 Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of oil vapour when air is admitted.
- 4 Normal ratings (pressures, temperatures, speeds, etc.) shall be durably marked.
- 5 Operate the unit only for the intended purpose and within its rated limits (pressure, temperature, speeds, etc.).
- 6 The machinery and equipment shall be kept clean, i.e. as free as possible from oil, dust or other deposits.
- 7 To prevent an increase in working temperature, inspect and clean heat transfer surfaces (cooler fins, intercoolers, water jackets, etc.) regularly. See the **4.1 Preventive maintenance schedule for the compressor**
- 8 All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
- 9 Care shall be taken to avoid damage to safety valves and other pressure-relief devices, especially to avoid plugging by paint, oil coke or dirt accumulation, which could interfere with the functioning of the device.
- 10 Pressure and temperature gauges shall be checked regularly with regard to their accuracy. They shall be replaced whenever outside acceptable tolerances.
- 11 Safety devices shall be tested as described in the maintenance schedule of the instruction manual to determine that they are in good operating condition. See the **4.1 Preventive maintenance schedule for the compressor**.
- 12 Mind the markings and information labels on the unit.
- 13 In the event the safety labels are damaged or destroyed, they must be replaced to ensure operator safety.
- 14 Keep the work area neat. Lack of order will increase the risk of accidents.
- 15 When working on the unit, wear safety clothing. Depending on the kind of activities these are: safety glasses, ear protection, safety helmet (including visor), safety gloves, protective clothing, safety shoes. Do not wear the hair long and loose (protect long hair with a hairnet), or wear loose clothing or jewelry.
- 16 Take precautions against fire. Handle oil with care because it is an inflammable substance. Do not smoke or approach with naked flame when handling such substances. Keep a fire-extinguisher in the vicinity.

1.3 SAFETY DURING TRANSPORT AND INSTALLATION

To lift a unit, all loose or pivoting parts, e.g. doors, shall first be securely fastened.

Use a fork lift truck with forks equal to or longer than the unit.

Helicopter lifting is not allowed.

It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Never lift the unit over people or residential areas. Lifting acceleration and retardation shall be kept within safe limits.

- 1 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.
- 2 Lifting hooks, eyes, shackles, etc., shall never be bent and shall only have stress in line with their design load axis. The capacity of a lifting device diminishes when the lifting force is applied at an angle to its load axis.
- 3 For maximum safety and efficiency of the lifting apparatus all lifting members shall be applied as near to perpendicular as possible. If required, a lifting beam shall be applied between hoist and load.
- 4 Never leave a load hanging on a hoist.
- 5 A hoist has to be installed in such a way that the object will be lifted perpendicular. If that is not possible, the necessary precautions must be taken to prevent load-swinging, e.g. by using two hoists, each at approximately the same angle not exceeding 30° from the vertical.
- 6 Locate the unit away from walls. Take all precautions to ensure that hot air exhausted from an engine and driven machine cooling systems cannot be recirculated. If such hot air is taken in, this may cause overheating of the unit.
- 7 Before moving the compressor, switch it off.

1.4 SAFETY DURING USE AND OPERATION

- 1 When operating in a dust-laden atmosphere, place the unit so that dust is not carried towards it by the wind. Operation in clean surroundings considerably extends the intervals for cleaning the air intake filters and the cores of the coolers.
- 2 Close the compressor air outlet valve before connecting or disconnecting a hose. Ascertain that a hose is fully depressurized before disconnecting it. Before blowing compressed air through a hose or air line, ensure that the open end is held securely, so that it cannot whip and cause injury.
- 3 The air line end connected to the outlet valve must be safeguarded with a safety cable, attached next to the valve.
- 4 No external force may be exerted on the air outlet valves, e.g. by pulling on hoses or by installing auxiliary equipment directly to a valve, e.g. a water separator, a lubricator, etc. Do not step on the air outlet valves.
- 5 Never move a unit when external lines or hoses are connected to the outlet valves, to avoid damage to valves, manifold and hoses.
- 6 Do not use compressed air from any type of compressor, without taking extra measures, for breathing purposes as this may result in injury or death. For breathing air quality, the compressed air must be adequately purified according to local legislation and standards. Breathing air must always be supplied at stable, suitable pressure.
- 7 Distribution pipework and air hoses must be of correct diameter and suitable for the working pressure. Never use frayed, damaged or deteriorated hoses. Replace hoses and flexibles before the lifetime expires. Use only the correct type and size of hose end fittings and connections.
- 8 If the compressor is to be used for sand-blasting or will be connected to a common compressed-air system, fit an appropriate non-return valve (check valve) between compressor outlet and the connected sand-blasting or compressed-air system. Observe the right mounting position/direction.
- 9 Before removing the oil filler plug, ensure that the pressure is released by opening an air outlet valve.
- 10 Never spill nor leave oil or cleansing agent in or around the unit.

- 11 All doors shall be shut during operation so as not to disturb the cooling air flow inside the bodywork and/or render the silencing less effective. A door should be kept open for a short period only e.g. for inspection or adjustment.
- 12 Periodically carry out maintenance works according to the maintenance schedule.
- 13 Stationary housing guards are provided on all rotating or reciprocating parts not otherwise protected and which may be hazardous to personnel. Machinery shall never be put into operation, when such guards have been removed, before the guards are securely reinstalled.
- 14 Noise, even at reasonable levels, can cause irritation and disturbance which, over a long period of time, may cause severe injuries to the nervous system of human beings. When the sound pressure level, at any point where personnel normally has to attend, is:
 - below 70 dB(A): no action needs to be taken,
 - above 70 dB(A): noise-protective devices should be provided for people continuously being present in the room,
 - below 85 dB(A): no action needs to be taken for occasional visitors staying a limited time only,
 - above 85 dB(A): room to be classified as a noise-hazardous area and an obvious warning shall be placed permanently at each entrance to alert people entering the room, for even relatively short times, about the need to wear ear protectors,
 - above 95 dB(A): the warning(s) at the entrance(s) shall be completed with the recommendation that also occasional visitors shall wear ear protectors,
 - above 105 dB(A): special ear protectors that are adequate for this noise level and the spectral composition of the noise shall be provided and a special warning to that effect shall be placed at each entrance.
- 15 The unit has parts, which may be accidentally touched by personnel, of which the temperature can be in excess of 80 °C (176 °F). The insulation or safety guard, protecting these parts shall not be removed before the parts have cooled down to room temperature.
- 16 Never operate the unit in surroundings where there is a possibility of taking in flammable or toxic fumes.
- 17 If the working process produces fumes, dust or vibration hazards, etc., take the necessary steps to eliminate the risk of personnel injury.
- 18 When using compressed air or inert gas to clean down equipment, do so with caution and use the appropriate protection, at least safety glasses, for the operator as well as for any bystander. Do not apply compressed air or inert gas to your skin or direct an air or gas stream at people. Never use it to clean dirt from your clothes.
- 19 When washing parts in or with a cleaning solvent, provide the required ventilation and use appropriate protection such as a breathing filter, safety glasses, rubber apron and gloves, etc.
- 20 Safety shoes should be compulsory in any workshop and if there is a risk, however small, of falling objects, wearing of a safety helmet should be included.
- 21 If there is a risk of inhaling hazardous gases, fumes or dust, the respiratory organs must be protected and depending on the nature of the hazard, so must the eyes and skin.
- 22 Remember that where there is visible dust, the finer, invisible particles will almost certainly be present too; but the fact that no dust can be seen is not a reliable indication that dangerous, invisible dust is not present in the air.
- 23 Never operate the unit at pressures or speeds below or in excess of its limits as indicated in the technical specifications.

1.5 SAFETY DURING MAINTENANCE AND REPAIR

Maintenance, overhaul and repair work shall only be carried out by adequately trained personnel; if required, under supervision of someone qualified for the job.

- 1 Use only the correct tools for maintenance and repair work, and only tools which are in good condition.
- 2 Parts shall only be replaced by genuine Atlas Copco replacement parts.
- 3 All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped. Steps shall be taken to prevent inadvertent starting. In addition, a warning sign bearing a legend such as "work in progress; do not start" shall be attached to the starting equipment. On engine-driven units the battery shall be disconnected and removed or the terminals covered by insulating caps. On electrically driven units the main switch shall be locked in open position and the fuses shall be taken out. A warning sign bearing a legend such as "work in progress; do not supply voltage" shall be attached to the fuse box or main switch.
- 4 Before dismantling any pressurized component, the compressor or equipment shall be effectively isolated from all sources of pressure and the entire system shall be relieved of pressure. Do not rely on non-return valves (check valves) to isolate pressure systems. In addition, a warning sign bearing a legend such as "work in progress; do not open" shall be attached to each of the outlet valves.
- 5 Prior to stripping an engine or other machine or undertaking major overhaul on it, prevent all movable parts from rolling over or moving.
- 6 Make sure that no tools, loose parts or rags are left in or on the machine. Never leave rags or loose clothing near the compressor air intake.
- 7 Never use flammable solvents for cleaning (fire-risk).
- 8 Take safety precautions against toxic vapours of cleaning liquids.
- 9 Never use machine parts as a climbing aid.
- 10 Observe scrupulous cleanliness during maintenance and repair. Keep away dirt, cover the parts and exposed openings with a clean cloth, paper or tape.
- 11 Never weld on or perform any operation involving heat near the oil system. Oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels. Disconnect the alternator cables during arc welding on the unit.
- 12 Use only lubricating oils and greases recommended or approved by Atlas Copco or the machine manufacturer. Ascertain that the selected lubricants comply with all applicable safety regulations, especially with regard to explosion or fire-risk and the possibility of decomposition or generation of hazardous gases. Never mix synthetic with mineral oil.
- 13 Protect the air intake filter, electrical and regulating components, etc., to prevent moisture ingress, e.g. when steam-cleaning.
- 14 When performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.
- 15 Never use a light source with open flame for inspecting the interior of a machine.

- 16 Disconnect –battery-clamp before starting electrical servicing or welding (evt. turn battery-switch in "off" position).
- 17 When repair has been completed, the machine shall be barred over at least one revolution for reciprocating machines, several revolutions for rotary ones to ensure that there is no mechanical interference within the machine or driver. Check the direction of rotation of electric motors when starting up the machine initially and after any alteration to the electrical connection(s) or switch gear, to check that the oil pump and the fan function properly.
- 18 Maintenance and repair work should be recorded in an operator's logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.
- 19 When hot parts have to be handled, e.g. shrink fitting, special heat-resistant gloves shall be used and, if required, other body protection shall be applied.
- 20 When using cartridge type breathing filter equipment, ascertain that the correct type of cartridge is used and that its useful service life is not surpassed.
- 21 Make sure that oil, solvents and other substances likely to pollute the environment are properly disposed of.
- 22 Before clearing the unit for use after maintenance or overhaul, check that operating pressures, temperatures and speeds are correct and that the control and shutdown devices function correctly.

1.6 TOOL APPLICATIONS SAFETY

Apply the proper tool for each job. With the knowledge of correct tool use and knowing the limitations of tools, along with some common sense, many accidents can be prevented.

Special service tools are available for specific jobs and should be used when recommended. The use of these tools will save time and prevent damage to parts.

1.7 SPECIFIC SAFETY PRECAUTIONS

Batteries

When servicing batteries, always wear protecting clothing and glasses.

- 1 The electrolyte in batteries is a sulphuric acid solution which is fatal if it hits your eyes, and which can cause burns if it contacts your skin. Therefore, be careful when handling batteries, e.g. when checking the charge condition.
- 2 Install a sign prohibiting fire, open flame and smoking at the post where batteries are being charged.
- 3 When batteries are being charged, an explosive gas mixture forms in the cells and might escape through the vent holes in the plugs. Thus an explosive atmosphere may form around the battery if ventilation is poor, and can remain in and around the battery for several hours after it has been charged. Therefore:
 - never smoke near batteries being, or having recently been, charged,
 - never break live circuits at battery terminals, because a spark usually occurs.
- 4 When connecting an auxiliary battery (AB) in parallel to the unit battery (CB) with booster cables: connect the + pole of AB to the + pole of CB, then connect the - pole of CB to the mass of the unit. Disconnect in the reverse order.

Pressure vessels

Maintenance/installation requirements:

- The vessel can be used as pressure vessel or as separator and is designed to hold compressed air for the following application:
 - pressure vessel for compressor,
 - medium AIR/OIL, and operates as detailed on the data plate of the vessel:
 - the maximum working pressure ps in bar (psi),
 - the maximum working temperature Tmax in °C (°F),
 - the minimum working temperature Tmin in °C (°F),
 - the capacity of the vessel V in l (US gal, Imp gal, cu.ft).
- The pressure vessel is only to be used for the applications as specified above and in accordance with the technical specifications. Safety reasons prohibit any other applications.
- National legislation requirements with respect to re-inspection must be complied with.
- No welding or heat treatment of any kind is permitted to those vessel walls which are exposed to pressure.
- The vessel is provided and may only be used with the required safety equipment such as manometer, overpressure control devices, safety valve, etc.
- Draining of condensate shall be performed daily when vessel is in use.
- Installation, design and connections should not be changed.
- Bolts of cover and flanges may not be used for extra fixation.

Safety valves

Potential hazards exist with the operation and maintenance of safety valves. Hazards can include catastrophic failure of the protected pressurised system resulting in death or serious injury or the emission of pressure medium, which may be noisy, hot, poisonous or aggressive. Inappropriate handling may present a risk of injury due to weight or sharp edges. Your attention is drawn to our joint responsibility to ensure that all statutory National regulations concerning Health and Safety including the Pressure Equipment Directive 97/23/EC are not contravened by incorrect installation, commissioning or servicing. Refer also to ISO 4126 or contact Seetru if you require further information regarding the use of safety valves.

Operating & Maintenance

Only trained and technically competent personnel should consider overhaul, re-set or performance testing of safety valves.

The safety valve is supplied with either a lead security seal or crimped cover

to deter unauthorised access to the pressure regulation device.

Under no circumstances should the set pressure of the safety valve be altered to a different pressure than that stamped on the valve without the permission of the installation designer.

If the set pressure must be altered then use only correct parts supplied by Seetru and in accordance with the instructions available for the valve type.

Safety valves must be frequently tested and regularly maintained.

The set pressure should be periodically checked for accuracy.

When fitted, the lifting device should be operated at pressures not less than 75% of the set pressure to ensure free and easy movement of internal parts.

The frequency of tests is influenced by factors such as the severity of the operating environment and aggressiveness of the pressurised medium.

Soft seals and springs should be replaced as part of the maintenance procedure.

Do not paint or coat the installed safety valve.

(see also 4.1 Preventive maintenance schedule for the compressor).

Valve Outlet

The outlet of the discharge holes or pipe-work must not terminate in a position where discharged gas will cause a hazard.

Outlet pipe-work should be as short and straight as possible and not allow an accumulated back pressure to build up from a discharging safety valve of greater than 10% of the set pressure.

Superimposed back pressure must not be allowed.

Outlet pipe-work should be supported to prevent mechanical loading of the safety valve. A drain should be fitted to the lowest point of the outlet pipe-work, which must be kept dry and clean to prevent blockage.

Control of Substances Hazardous to Health (COSHH) Data

A small quantity of synthetic rubber components may be present in the safety valve. Synthetic rubber represents a hazard to health when subject to elevated temperature (315°C) such as fire. It will show physical signs such as charring or black sticky deposits, toxic and or corrosive fumes will also be given off. Treat with extreme caution if it has been subject to fire. Allow to cool before inspection. Avoid contact. Inform fire fighters of the presence of fluoroelastomer material. Compliance with Environmental Protection Act is essential when disposing of residue.

Air supply respirators and acid resistant gloves must be worn if the above conditions apply.

Synthetic Component Material	Hydrogen Cyanide [HCN]	Cyanogen [C2N2]	Hydrochloric Acid [HCL Gas]	Hydrochloric Acid [HF]	Carbon Monoxide [CO]	Divided Silica [SiO2]	Monomeric Acrylic	Residual Ash	
								Corrosive	Non Corrosive
Nitrile	X	X							X
Neoprene			X					X	
Viton				X				X	
Butyl					X				X
Silicon						X			X
Fluoro Silicon				X		X		X	
Other			X		X		X	X	

2. LEADING PARTICULARS

2.1 DESCRIPTION OF SAFETY PICTOGRAMS USED IN THIS MANUAL



This symbol draws your attention to dangerous situations. The operation concerned may endanger persons and cause injuries.



This symbol is followed by supplementary information.

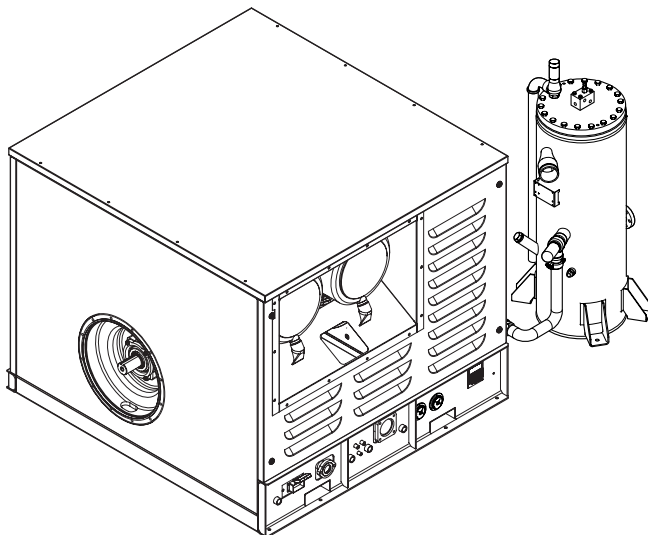


Fig. 2.1 General view XRV/XRX OEM

2.2 GENERAL DESCRIPTION

The XRV/XRX OEM is a double-stage, oil-injected screw compressor designed for power take-off application. The unit is built for a normal effective working pressure of 16-25 bar(e) (XRV) or 19-30 bar(e) (XRX). The power from the prime mover is transmitted to the compressor elements through a gear casing.

A large range of gears is available for many different input speeds and different air outputs (FAD).

– Compressor

The compressor has one low-pressure and one high-pressure compressor element. Each compressor element houses two screw-type rotors, mounted on ball and roller bearings. The male rotor, driven by the engine, drives the female rotor. The elements deliver pulsation-free air.

Injected oil is used for sealing, cooling and lubricating purposes.

– Compressor oil system

The oil is boosted by air pressure. The system has no oil pump.

The oil is removed from the air, in the air/oil vessel first by centrifugal force, second through the oil separator element.

The vessel is provided with an oil level indicator.

– Regulation

The compressor is provided with a continuous regulating system and a blow-down valve. The valve is closed during operation by outlet pressure of the high-pressure compressor element and opens by air receiver pressure when the compressor is stopped.

When the air consumption increases, the air receiver pressure will decrease and vice versa.

This receiver pressure variation is sensed by the regulating valve which, by means of control air to the unloader, matches the air output to the air consumption. The air receiver pressure is maintained between the pre-selected working pressure and the corresponding unloading pressure.

– Cooling system

The compressor is provided with an oil cooler.

The cooling air is generated by a fan.

– Safety devices

Two thermal shutdown switches protect the compressor against overheating. The air receiver is provided with a safety valve.

A minimum loading pressure switch prevents the compressor from loading when the receiver pressure is too low.

A start prevention pressure switch prevents the compressor from starting when the receiver pressure is too high.

– Bodywork

The compressor elements, air and oil filters, oil cooler and regulating components are enclosed in a simple, weather-proof canopy. The side panels are easily detachable by four quick fasteners. All fittings to interconnect the two modules are centralized on a connecting panel, situated at the left side of the compressor module.

The air filters may be serviced without removing a side panel.

All drain plugs are on the outside of the canopy to facilitate oil change.

Transport beams are integrated in the frame for installation with a fork-lift truck.

– Data plate

The compressor is furnished with a data plate showing the type, serial number and normal working pressure (see chapter 8).

2.3 MAIN PARTS

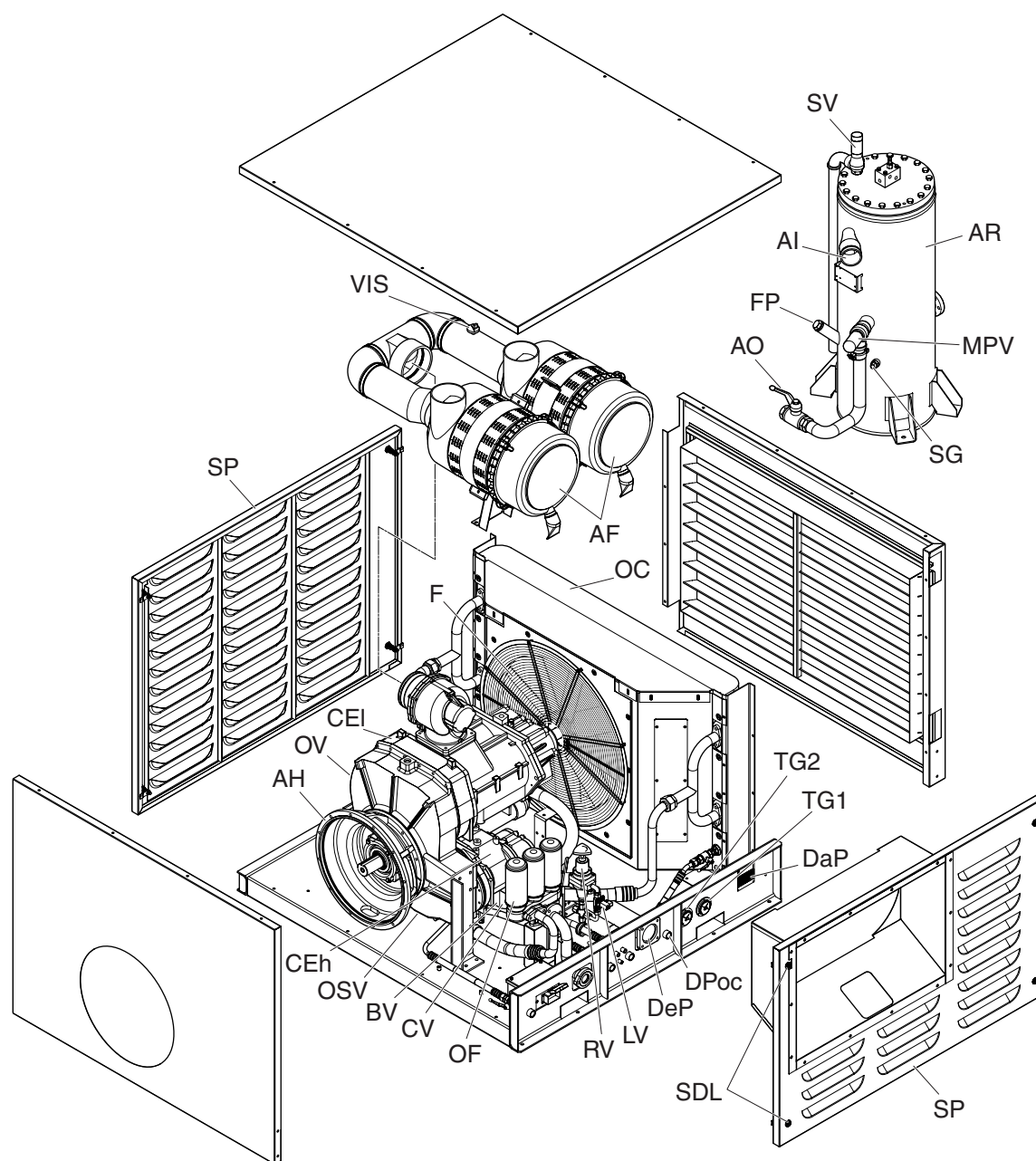


Fig. 2.2 Main parts of XRV/XRX OEM

1: Compressor module

AF	Air filter
AH	Adapter housing (gear casing to prime mover)
BV	By-pass valve
CEH	HP compressor element
CEL	LP compressor element
CV	Check valve
DaP	Data plate
DeP	Delivery pipe
DP _{OC}	Drain plug oil cooler
F	Fan
LV	Loading solenoid valve
OC	Oil cooler

OF	Oil filter
OSV	Oil stop valve
OV	Overpressure valve
PG ₁	Interstage pressure gauge
PG ₂	Working pressure gauge
RV	Regulating valve
SDL	Service door lock (4 on each side panel)
SP	Detachable side panel
TG ₁	Temperature gauge, LP compressor element
TG ₂	Temperature gauge, HP compressor element
VIS	Vacuum indicator switch

2: Receiver module

AI	Air inlet (air receiver)
AO	Air outlet (air receiver)
AR	Air receiver
FP	Filler plug (compressor oil)
MPV	Minimum pressure valve
SG	Sight glass
SV	Safety valve

2.4 CONTROLS AND INDICATORS

Controls

- Safety valve (SV).
Releases air when the air receiver pressure is 30 bar(e) (XRV), 34 bar(e) (XRX).
- Check valve (CV).
Prevents blow-back of compressed air when the compressor is stopped.
- By-pass valve (BV).
Protects the LP compressor element (CEL) in case the interstage pressure should rise above the working pressure.
- Minimum pressure valve (MPV).
Prevents the air receiver pressure from dropping below 15 bar(e) (XRV), 18 bar(e) (XRX).
- Blow-down valve (BDV).
Depressurizes the air receiver (AR).
- Oil filter by-pass valve.
Opens when the pressure drop over the oil filter (OF) is above normal due to clogging of the element. The oil then by-passes the element without being filtered. For this reason, it is imperative to replace the oil filter at regular intervals.
- Oil stop valve (OSV).
Lets the oil run from the air receiver (AR) to the compressor element. Opens when the unit is started. Closes when the unit is stopped to prevent the compressor element from flooding with oil.
- Flow restrictor (FR).
Manages the oil flow from the air receiver/oil separator (AR/OS) to the compressor element, to minimize the leaking of air to the compressor element.
- Thermostatic by-pass valve (TBV).
Opens when oil temperature is above 70 °C. Oil then flows through the oil cooler (OC).
- Overpressure valve (OV).
Releases air when the pressure in the gear casing is too high.
- Start prevention switch.
The switch prevents the compressor from starting when the receiver pressure is above 1.5 bar(e).

Indicators

- Temperature gauge (TG₁).
Indicates the air outlet temperature of the LP compressor element (CEL).
- Temperature gauge (TG₂).
Indicates the air outlet temperature of the HP compressor element (CEH).
- Interstage pressure gauge (PG₁).
Indicates the interstage pressure, i.e. the pressure between the LP compressor element (CEL) and the HP compressor element (CEH).
- Working pressure gauge (PG₂).
Indicates the air receiver pressure.
- Sight glass (SG).
Indicates the oil level in the air receiver.

COMPRESSOR REGULATING SYSTEM (LOAD CONDITION)

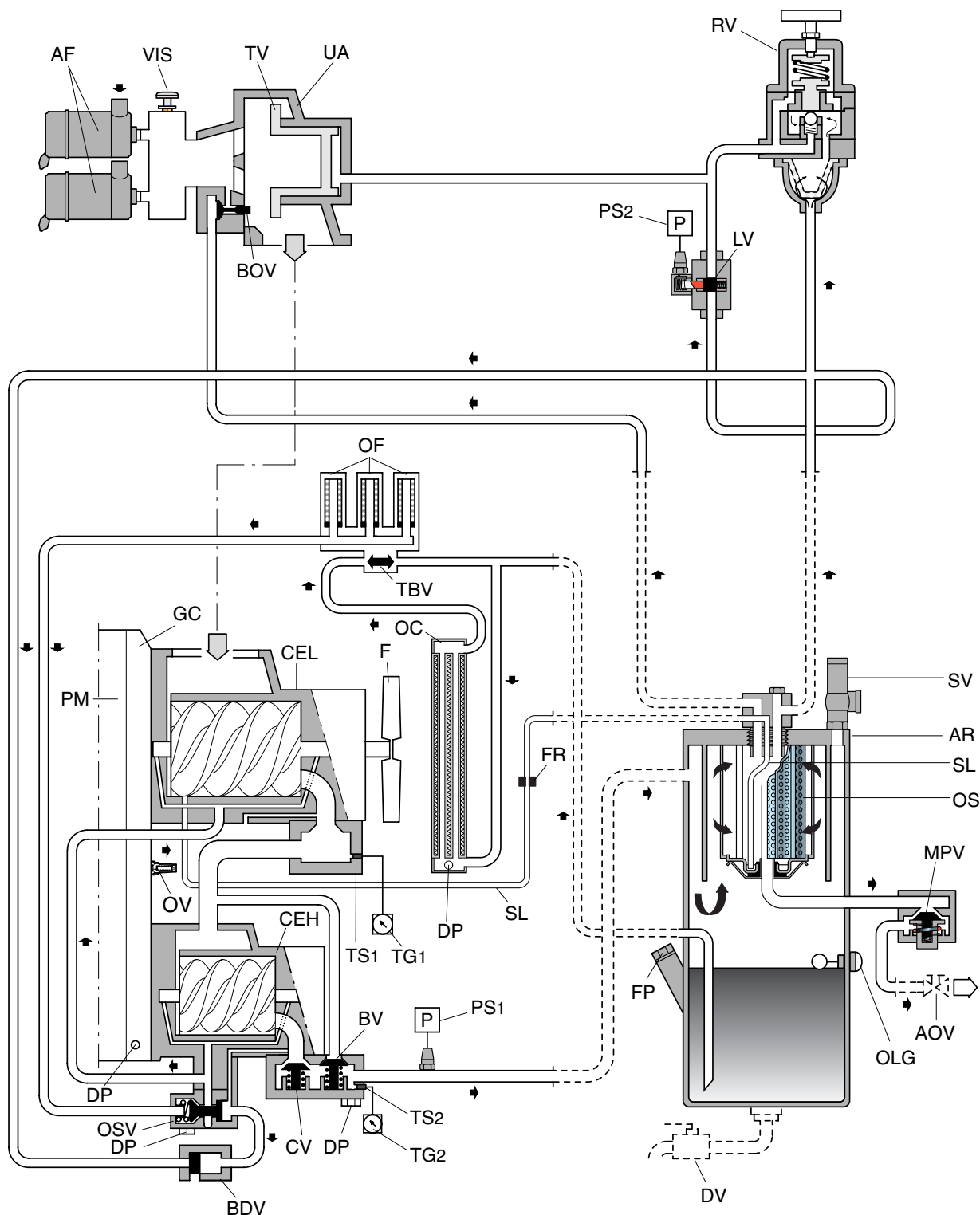


Fig. 2.3

AF	Air filter	DP	Drain plug	OS	Oil separator	TG ₁	Temperature gauge, LP compressor element
AOV	Air outlet valve (local installation)	DV	Drain valve	OSV	Oil stop valve	TG ₂	Temperature gauge, HP compressor element
AR	Air receiver	F	Fan	OV	Overpressure valve	TS ₁	Temperature switch, LP compressor element
BDV	Blow-down valve	FP	Filler plug (compressor oil)	PM	Prime mover	TS ₂	Temperature switch, HP compressor element
BOV	Bleed-off valve	FR	Flow restrictor	PS ₁	Maximum loading pressure switch		
BV	By-pass valve, HP compressor element	GC	Gear casing	PS ₂	Minimum loading pressure switch		
CEH	HP compressor element	LV	Loading solenoid valve	RV	Regulating valve		
CEL	LP compressor element	MPV	Minimum pressure valve	SL	Scavenge line		
CV	Check valve	OC	Oil cooler	SV	Safety valve		
		OF	Oil filter	TBV	Thermostatic by-pass valve		
		OLG	Oil level gauge				

2.5 AIR FLOW (SEE FIG. 2.3)

Air drawn through the air filters (AF) into the LP compressor element (CEL) is compressed. The air then enters the HP compressor element (CEH) where it is further compressed. At the element outlet, compressed air and oil pass into the air receiver/oil separator (AR/OS).

The check valve (CV) prevents blow-back of compressed air when the compressor is stopped. In the air receiver/oil separator (AR/OS), most of the oil is removed from the air/oil mixture; the remaining oil is removed by the separator element.

The oil collects in the receiver and on the bottom of the separator element.

The air leaves the receiver via a minimum pressure valve (MPV) which prevents the receiver pressure from dropping below the minimum working pressure (specified in section 7.3), even when the air outlet valve is open. This ensures adequate oil injection and prevents oil consumption.

Two temperature switches (TS₁ and TS₂) are comprised in the system.

A blow-down valve (BDV) automatically depressurizes the air receiver (AR) when the compressor is stopped.

2.6 OIL SYSTEM (SEE FIG. 2.3)

The lower part of the air receiver (AR) serves as oil tank.

Air pressure forces the oil from the air receiver/oil separator (AR/OS) through the oil filters (OF) and oil stop valve (OSV) to the compressor element.

The thermostatic by-pass valve (TBV) opens when the oil temperature is above 70 °C. Then the oil flows through the oil cooler (OC) before it is filtered.

Each compressor element has an oil gallery in the bottom of its casing. The oil for rotor lubrication, cooling and sealing is injected through holes in the gallery.

Lubrication of the bearings is ensured by oil injected into the bearing housings.

The injected oil, mixed with the compressed air, leaves the compressor element and re-enters the air receiver, where it is separated from the air as described in section 2.6. The oil that collects in the bottom of the oil separator element is returned to the system through scavenging line (SL), which is provided with a flow restrictor (FR).

The oil filter by-pass valve opens when the pressure drop over the filter is above normal because of a clogged filter. The oil then by-passes the filter without being filtered. For this reason, the oil filter must be replaced at regular intervals (see section 4.1).

2.7 CONTINUOUS REGULATING SYSTEM (SEE FIG. 2.3)

The compressor is provided with a continuous regulating system. This system is provided with a blow-down valve (BDV). The valve is closed during operation by outlet pressure of the compressor element and opens by air receiver pressure when the compressor is stopped.

When the air consumption increases, the air receiver pressure will decrease and vice versa. This receiver pressure variation is sensed by the regulating valve which, by means of control air to the unloader, matches the air output to the air consumption. The air receiver pressure is maintained between the pre-selected working pressure and the corresponding unloading pressure.

When starting the compressor, the throttle valve (TV) is closed. The compressor elements take in air and pressure builds up in the receiver. The throttle valve is closed.

The air output is controlled from maximum output (100%) to no output (0%) by air inlet throttling.

If the air consumption is equal to or exceeds the maximum air output, the throttle valve is fully open.

If the air consumption is less than the maximum air output, the regulating valve supplies control air to the throttle valve to reduce the air output and holds air receiver pressure between the normal working pressure and the corresponding unloading pressure of approx. 1.5 bar above the normal working pressure.

When the air consumption is resumed, the throttle valve gradually opens the air intake.

The construction of the regulating valve is such that any increase (decrease) of the air receiver pressure above the pre-set valve opening pressure results in a proportional increase (decrease) of the control pressure to the throttle valve.

Part of the control air is vented to atmosphere, and any condensate discharged, through the vent holes.

2.8 ELECTRICAL SYSTEM

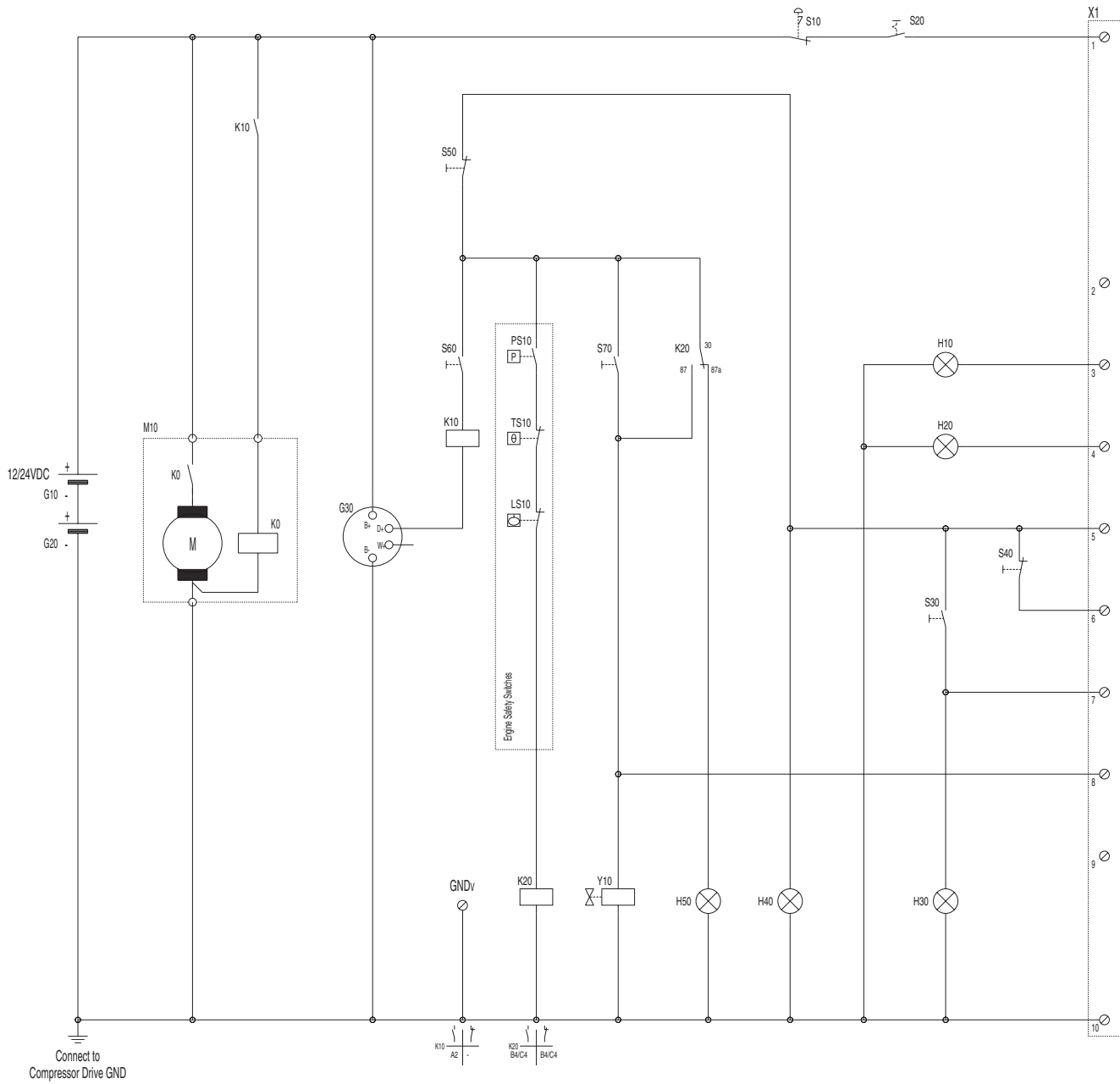


Fig. 2.4 Typical Customer Installation for mechanically controlled diesel engine

G10: Battery (C1)	M10: Starter Motor (C1 / D2)
G20: Battery (C1 / D1)	PS10: Pressure Switch - Oil Pressure Protection (B3 / C4)
G30: Alternator (C2 / D3)	S10: Switch - Emergency Stop (A5)
GND _v : Connection Vessel GND	S20: Switch - Main Power ON/OFF (A6)
H10: Lamp - Airfilter Warning Indicator (B6 / C6)	S30: Switch - Compressor Load Signal (D6)
H20: Lamp - Element Temperature Shutdown Indicator (C6)	S40: Switch - Compressor Noload Signal (D6)
H30: Lamp - Compressor Loaded Indicator (E6)	S50: Switch - Engine Stop Signal (A3 / B3)
H40: Lamp - Ready To Start Indicator (E5)	S60: Switch - Engine Start Signal (B3 / C3)
H50: Lamp - Engine Shutdown Indicator / Override Indicator (E4 / E5)	S70: Switch - Override Switch (B4 / C4)
K10: Relay - Starter Motor Activation (C3)	X1: OEM Connector (A7 / F7)
K20: Relay - Engine Shutdown (E3 / E4)	Y10: Solenoid Valve - Engine Fuel Stop Solenoid (E4)
LS10: Level Switch - Coolant Level Protection (C3 / C4)	

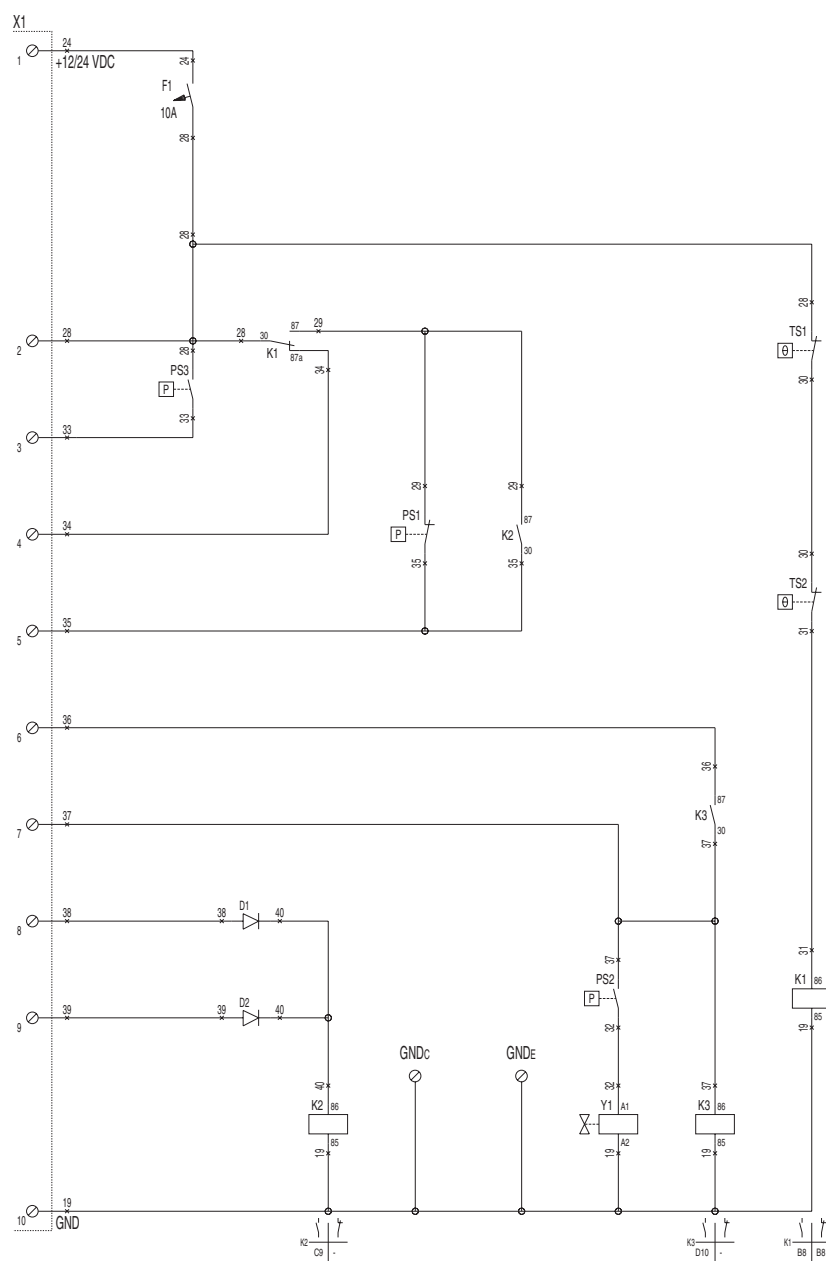
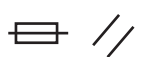


Fig. 2.5 Atlas Copco Installation

D1:	Diode - max current 1A (E8)	X1	
D2:	Diode - max current 1A (E8)	-1:	+12/24 VDC
F1:	Fuse 10A (A7)	-2:	Power After Contact
GND _C :	Connection Canopy GND	-3:	Air Filter Warning
GND _E :	Connection Element GND	-4:	Element Temperature Shutdown
K1:	Relay - Element Temperature Shutdown (E10)	-5:	Compressor Drive Enable
K2:	Relay - Compressor Drive Enable (F8)	-6:	Noload Signal
K3:	Relay - Load Signal Overtake (F10)	-7:	Load Signal
PS1:	Pressure Switch - Start Prevention (C8)	-8:	Compressor Drive Start Signal
PS2:	Pressure Switch - Load Prevention (E9)	-9:	Compressor Drive Running Signal
PS3:	Vacuum Switch - Airfilter Warning (B7)	-10:	GND
TS1:	Temperature Switch - LP Element Temperature Shutdown (B10)		
TS2:	Temperature Switch - HP Element Temperature Shutdown (C10)		
X1:	OEM Connector (A7 / F7)		
Y1:	Loading Valve (F9)		

2.9 MARKINGS AND INFORMATION LABELS

	Compressor outlet temperature too high.
	Compressor outlet temperature.
	Compressor outlet pressure.
	Danger, heat flat.
	Electrocution hazard.
	Atlas Copco synthetic compressor oil.
	Atlas Copco synthetic compressor oil.
	Manual.
	Reset fuse.
	Prohibition to open air valves without connected hoses.
	Compressor loaded.
	Airfilter.
	Compressor temperature too high.
	Rotation direction.
	Inlet.
	Outlet.
	Compressor oil drain.
	Read the instruction manual before starting.
	Service every 24 hours.
	Warning! Part under pressure.

3. OPERATING INSTRUCTIONS

3.1 TRANSPORT INSTRUCTIONS

Strong, integrated beams (1) within the framework of the unit mean that installation can be easily performed with use of a fork-lift truck.

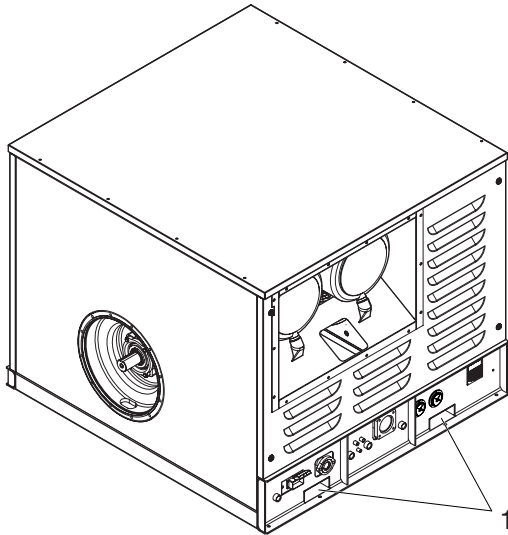


Fig. 3.1 Integrated beams

Connecting the compressor to the prime mover is done by Atlas Copco technicians. The same applies to any disconnecting.

Leave the cover in place during transport.



Avoid knocks and violent shaking during transport.

3.2 BEFORE STARTING

1. Remove the air receiver drain plug and open the drain valve (Fig. 2.3, DV) to drain possible condensate. Close the valve when all condensate has been drained or when oil comes out. Reinstall the drain plug. The interval between draining operations may be determined by experience, as the amount of condensate depends on the operating conditions. It may be necessary to keep the side panel(s) removed during operation to decrease the amount of condensate.



Before draining the air receiver, ensure that the pressure is released by opening the air outlet valve(s) (Fig. 2.3, AOV).

2. Check the level of the compressor oil. The pointer of the oil level gauge must register in the upper extremity of the green range. Add oil if necessary. See section 4.2 for the oil to be used.



Before removing the oil filler plug (Fig. 2.3, FP), ensure that the pressure is released by opening the air outlet valve(s) (Fig. 2.3, AOV).

Normally, there is no need to add oil between two oil changes; if there is, check the source of oil consumption.

3. Empty the dust trap of each air filter (Fig. 2.3, AF). See section 5.1.

4. Attach the air line(s) to the closed air outlet valve(s).



No external force may be applied to the air outlet valve(s), e.g. by pulling hoses or by connecting equipment directly to the valve(s) (e.g. a water separator, a lubricator, pipe extensions, etc.).

3.3 STARTING

Ascertain that the air receiver pressure is fully released before starting.

Close the main switch and start the prime mover (Fig. 2.3, PM) according to the instructions of the manufacturer.

3.4 COMPRESSION STARTING

1. When the prime mover is running smoothly, energize the loading solenoid valve (Fig. 2.3, LV) by pressing the loading push button.
2. As soon as the unloading pressure registers on working pressure gauge, the unit runs unloaded.
3. Open the outlet valve(s) (Fig. 2.3, AOV).

3.5 DURING OPERATION

Regularly carry out following checks:

1. If the vacuum indicator switch (Fig. 2.3, VIS) gives a warning signal, stop the unit and service the air filters (Fig. 2.3, AF). See section 5.1.
2. Check the compressor oil level. The pointer of the oil level gauge must register in the upper extremity of the green range (Fig. 2.3, SG). If the level is too low, stop the unit and wait approx. 10 minutes to allow the air to escape from the oil. Add oil if necessary. See section 4.2 for the oil to be used.



Before removing the oil filler plug (Fig. 2.3, FP) ensure that the pressure is released by opening the air outlet valve(s) (Fig. 2.3, AOV).

3. Check that the regulating valve (Fig. 2.3, RV) is correctly adjusted.
4. Check the air outlet temperatures of the compressor elements, which are shown on the temperature gauges (Fig. 2.3, TG₁ and TG₂). Reinstall the side panel after checking.

3.6 STOPPING

1. Close the air outlet valve(s) (Fig. 2.3, AOV) and run the unit unloaded for some minutes.
2. Stop the prime mover (Fig. 2.3, PM) and open the main switch.

4. MAINTENANCE AND SERVICE

4.1 PREVENTIVE MAINTENANCE SCHEDULE FOR THE COMPRESSOR

The schedule contains a summary of the maintenance instructions. Read the respective section before taking maintenance measures.

When servicing, replace all disengaged packings, e.g. gaskets, O-rings, washers.

The maintenance schedule has to be seen as a guideline for units operating in a duty environment typical to compressor applications. Maintenance schedule can be adapted depending on application environment and quality of maintenance.

MAINTENANCE SCHEDULE	Daily	6 months or every 500 hours	Yearly or every 1000 hours	Remarks
Compressor oil level	Check	Check	Check	
Interstage pressure	Check	Check	Check	
Air filter dust traps	Empty	Empty	Empty	
Air filter elements ¹⁾			Replace	
Oil cooler		Clean	Clean	
Air filter vacuum indicator switch			Test	
Temperature shutdown switches			Test	
Minimum loading pressure switch			Test	
Start preventing pressure switch			Test	
Temperature shutdown switches			Test	
Compressor oil filters		Replace	Replace	
Compressor oil		Change	Change	
Restriction in oil scavenging line			Clean	
Regulating valve and unloader			Check	
Pressure drop over oil separator element ²⁾			Measure	
Safety valve			Test	
Leaks in air- or oil system		Check	Check	
Inspection by Atlas Copco Service technician				

Notes:

- ¹⁾ More frequently when operating in a dusty environment.
²⁾ Replace the element when the pressure drop exceeds 0.8 bar.

4.2 LUBRICATION OILS



Use only synthetic oil.

It is strongly recommended to use Atlas Copco branded lubrication oils for the compressor.

Temperature range	Oil type
between -25°C and 30°C	PAROIL S
between 0°C and 50°C	PAROIL S 68

Synthetic compressor oil PAROIL S

Oil container	Liter	Order number
can	5	1615 5950 01
can	20	1615 5951 01
barrel	210	1615 5952 01

Synthetic compressor oil PAROIL S 68

Oil container	Liter	Order number
can	20	1604 7136 00
barrel	210	1604 7137 00



Never mix synthetic with mineral oil.



If you want to use another brand of oil, consult Atlas Copco for more information concerning the recommended oil and service intervals.

4.3 OIL LEVEL CHECK



Never mix oils of different brands, viscosity grades or types.

Use only non-toxic oils where there is a risk of inhaling delivered air.

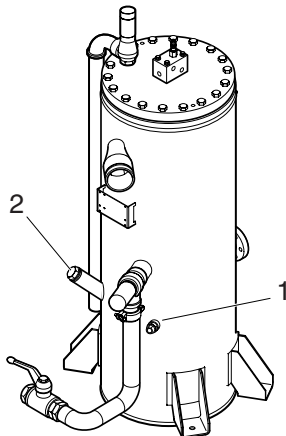


Fig. 4.1 Check compressor oil level

With the unit standing level, check the level of the compressor oil. The pointer of the oil level gauge (1) must register in the upper extremity of the green range. Add oil if necessary. See section 4.2 for the oil to be used.



Before removing oil filler plug (2), ensure that the pressure is released by opening the air outlet valve(s).

4.4 OIL AND OIL FILTER CHANGE

The quality and the temperature of the oil determine the oil change interval.

The prescribed interval (see section 4.1) is based on an oil temperature of up to 100 °C and normal operating conditions.

When operating in high ambient temperatures, in very dusty or high humidity conditions, it is recommended to change the oil more frequently.



In this case, contact Atlas Copco.

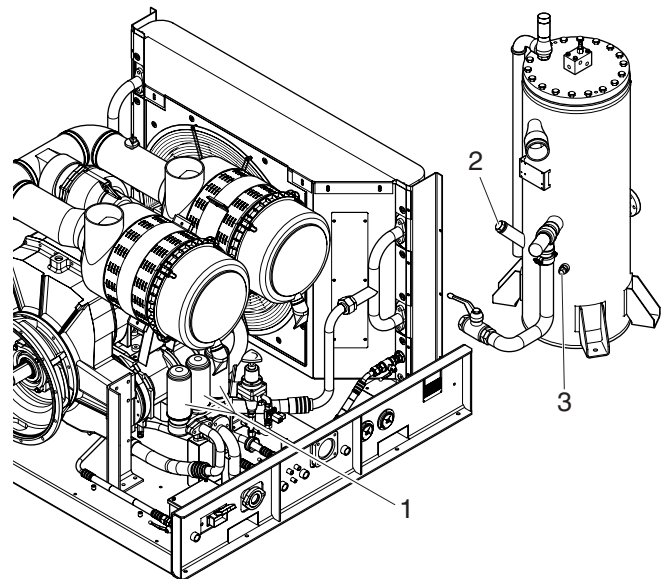


Fig. 4.2 Oil filters

1. Run the compressor until warm. Close the outlet valve(s) and stop the compressor. Wait until the pressure is released through the automatic blow-down valve. Unscrew the oil filler plug (2) one turn. This uncovers a vent hole, which permits any pressure in the system to escape.
2. Drain the oil by removing all drain plugs and open the air receiver drain valve. Drain plugs are located at the air receiver, check valve, oil stop valve, gear casing and oil cooler (see Fig. 2.3). Catch the oil in a drain pan. Screw out the filler plug to speed up draining. Tighten the plugs after draining. Close the air receiver drain valve.
3. Remove the oil filters (1), e.g. by means of a special tool. Catch the oil in a drain pan.
4. Clean the filter seats on the manifold, taking care that no dirt drops into the system. Oil the gaskets of the new filter elements. Screw the elements into place until the gaskets contact their seats, then tighten one half turn only.
5. Fill the air receiver until the oil level reaches the filler pipe. The pointer of the oil level gauge (3) must register in the upper extremity of the green range. Take care that no dirt drops into the system. Reinstall and tighten the filler plug.
6. Run the unit at no load for a few minutes to circulate the oil and to evacuate the air trapped in the oil system.
7. Stop the compressor. Let the oil settle for a few minutes. Check that the pressure is released by opening the air outlet valve(s). Screw out the filler plug (2) and add oil until the oil level gauge (3) is in the upper part of the green area. Reinstall and tighten the filler plug.



Never add more oil. Overfilling results in oil consumption.

4.5 CLEANING OIL COOLER

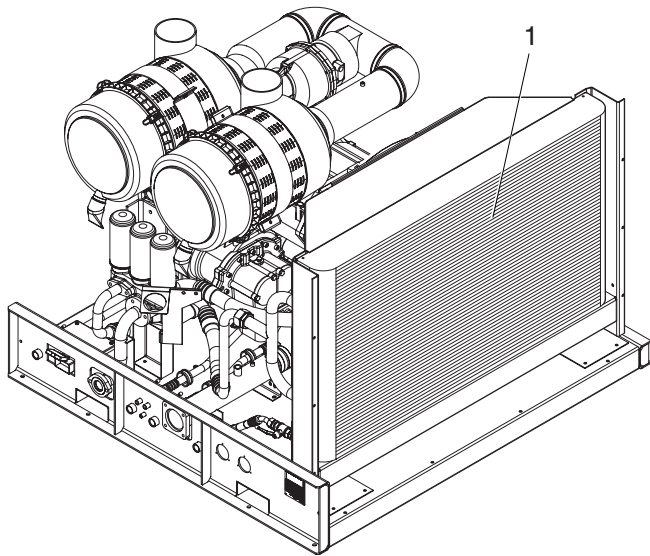


Fig. 4.3 Compressor oil cooler

Keep the compressor oil cooler (1) clean to maintain the cooling efficiency.

Steam cleaning in combination with a cleansing agent may be applied.

The fan side surface of the cooler is accessible by removing the side panels.



To avoid damaging the coolers, angle between jet and coolers should be approx. 90° (do not use jet at max. power).

Install the side panels.



Never leave spilled liquids such as oil, water and cleansing agents in or around the compressor.

4.6 STORAGE

Run the compressor regularly, e.g. twice a week, until warm.

Load and unload the compressor a few times to operate the unloading and regulating components. Close the air outlet valve(s) after stopping.



If the compressor is going to be stored without running from time to time, protective measures must be taken.

4.7 SERVICE KITS

A service kit is a collection of parts to fit a specific repair or rebuilding task.

It guarantees that all necessary parts are replaced at the same time which improves the uptime of the unit.

The order numbers of the Service Kits are listed in the Atlas Copco Parts List (ASL).



Contact Atlas Copco.

4.8 COMPRESSOR ELEMENT OVERHAUL

When a compressor element is due for overhaul, it is recommended to have it done by Atlas Copco. This guarantees the use of genuine parts and correct tools with care and precision.

4.9 LIABILITY

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

5. ADJUSTMENTS AND SERVICING PROCEDURES

5.1 AIR FILTER

5.1.1 MAIN PARTS

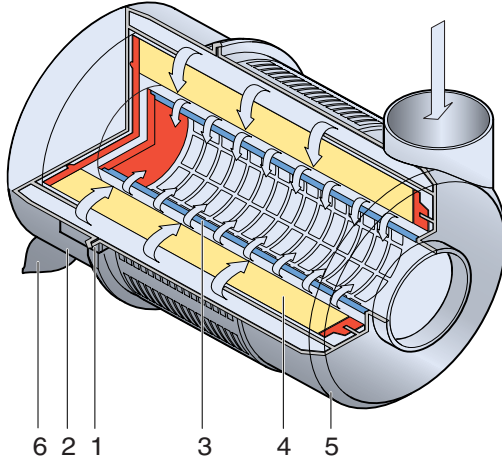


Fig. 5.1 Air filter

- 1 Snap clips (4x)
- 2 Dust trap cover
- 3 Safety cartridge
- 4 Filter element
- 5 Filter housing
- 6 Vacuator valve

5.1.2 RECOMMENDATIONS



The Atlas Copco air filters are specially designed for the application. The use of non-genuine air filters may lead to severe damage of the compressor element.

Never run the compressor without air filter element.

New elements must also be inspected for tears or punctures before installation.

Discard the element (4) when damaged.

A dirty safety cartridge (3) is an indication of a mal-functioning air filter element. Replace the element and the safety cartridge in this case.

5.1.3 CLEANING THE DUST TRAP

1. To remove dust from the dust trap pinch the vacuator valve (6) several times.

5.1.4 REPLACING THE FILTER ELEMENT AND THE SAFETY CARTRIDGE

The instructions apply to one air filter and should be repeated for both air filters of the compressor.

1. Release the snap clips (1) and remove the dust trap cover (2). Clean the inside of the cover.
2. Withdraw the filter element (4) and the safety cartridge (3) from the housing (5).
Discard the filter element when damaged.
A dirty safety cartridge (3) is an indication of a malfunctioning filter element.



Replace the filter element and the safety cartridge at the same time. New elements should be inspected for tears and punctures before installation.



The safety cartridge cannot be cleaned.

3. Reassemble in reverse order of dismantling.
4. Inspect and tighten all air intake connections.

5.2 AIR RECEIVER

The air receiver is tested according to official standards. Regularly have inspections carried out in conformity with local regulations.



Daily drain condensate.

5.3 SAFETY VALVE



All adjustments or repairs are to be done by an authorized representative of the valve supplier, see section 1.7 Specific safety precautions.

Following checks must be carried out:

- a check of the opening of the lifting gear, twice a year.
This can be done by screwing the cap of the valve anti-clockwise.
- a check of the set pressure once a year according to the local regulations. This check cannot be done on the compressor and must be carried out on a proper test bench.

5.4 TEMPERATURE SHUTDOWN SWITCHES

The instructions apply to both shutdown switches.

The mechanical condition of the compressor temperature shutdown switch can be tested by immersing its sensing element in hot oil.

The contact of the compressor temperature switch (Fig. 2.3, TS1 and TS2) should open at the pre-set temperature (see section 8.2). Test by means of an ohmmeter, or a test lamp with battery, and a thermometer. Stir the oil during testing.

5.5 AIR FILTER VACUUM INDICATOR SWITCH

1. Stop the compressor. Disconnect the wires from the switch and remove the switch with its coupling from the air intake manifold.
2. Fit the switch to a tee with a female leg of M10x1.5.
Connect a vacuum gauge and a hose or pipe to the other legs.
3. Connect an ohmmeter or a test lamp with battery to the switch.
4. Create a vacuum with the mouth through the hose, while observing the vacuum gauge and the ohmmeter or test lamp. The lamp should light up when the vacuum has reached 47-53 mbar.
Change the switch if it does not respond correctly.
5. Reinstall the switch and reconnect the wire.

5.6 START PREVENTING PRESSURE SWITCH AND MINIMUM LOADING PRESSURE SWITCH

The switches can be tested on a compressed air line by means of a pressure-reducing valve, small air receiver, pressure gauge and ohmmeter or test lamp with battery. The contacts of the switches should trip at pressures specified in section 8.2.

6. PROBLEM SOLVING

The trouble-shooting chart helps to solve mechanical problems.

It is assumed that the prime mover is in good condition.



An electrical fault must be traced by an electrician.

Make sure that the wires are not damaged and that they are clamped tight to their terminals.

Problem	Possible faults	Corrective actions
1. Compressor loaded automatically to full capacity after starting.	a. Loading solenoid valve (LV) stuck in loaded position. b. Air intake throttle valve (TV) stuck in opened position. c. Air leaks in regulating system. d. Loading solenoid valve (LV) defective.	a. Remove and check loading solenoid valve. Replace valve if necessary. b. Remove air filters, air intake manifold and throttle valve spring seat. Withdraw throttle valve and inspect. Replace parts where necessary. Caution: the spring seat is fixed with 4 short and 2 long setscrews: first remove short screws, then release spring tension by alternately unscrewing the long ones. c. Check hoses and their fittings. Stop leaks; replace leaking hoses. d. Check loading solenoid valve; correct or replace if necessary.
2. Compressor does not deliver air immediately after loading solenoid valve has been energized.	a. Membrane of regulating valve (RV) cracked. b. Air intake throttle valve (TV) stuck in closed position. c. Loading solenoid valve (LV) defective.	a. If air blows from venting device, remove and dismantle regulating valve. Replace membrane. b. See corrective action 1b. c. Check loading solenoid valve; correct or replace if necessary.
3. Excessive compressor oil consumption. Oil mist being discharged from air outlet valve(s).	a. Oil level too high. b. Flow restrictor (FR) in scavenge line (SL) clogged. c. Oil separator element defective. d. Minimum loading pressure switch (PS) stuck in opened position or set incorrectly.	a. Release pressure, wait approx. 10 minutes and drain oil to the correct level. b. Remove hoses and clean flow restrictor. c. Have element removed and inspected by an Atlas Copco Service representative. d. Inspect. Switch prevents loading as long as receiver pressure is below 5 bar(e). See section 5.6 to adjust the pressure switch.
4. Compressor capacity or pressure below normal.	a. Air consumption exceeds capacity of compressor. b. Choked air filter elements. c. Regulating valve (RV) opens too soon or it is defective. d. Prime mover (PM) not up to max. load speed.	a. Check equipment connected. b. Remove and inspect air filter elements. Clean or replace, if necessary. c. Adjust regulating valve. Dismantle and inspect parts if valve does not respond. Replace where necessary. d. Check prime mover and correct if necessary.

Problem	Possible faults	Corrective actions
4. (continuation)	e. Loading solenoid valve (LV) leakage. f. Oil separator element clogged. g. Air intake throttle valve (TV) remains partially closed. h. Safety valve (SV) leaking. i. Bleed-off valve (BOV) leaking.	e. With unit running at max. load speed, disconnect hose leading to venting device from valve. If air leaks, remove and inspect valve. Replace damaged or worn O-rings. f. Replace oil separator element. g. Remove air filters, air intake manifold and throttle valve spring seat. Withdraw throttle valve and inspect. Replace parts where necessary. Caution: the spring seat is fixed with 4 short and 2 long setscrews: first remove short screws, then release spring tension by alternately unscrewing the long ones. h. Remove and inspect safety valve. Replace valve if not airtight after reinstallation. i. Remove and inspect bleed-off valve. Replace valve if necessary.
5. Pressure in air receiver (AR) rises above maximum and causes safety valve (SV) to blow.	a. Regulating valve (RV) opens too late or its ball valve spring is broken. b. Air leaks in regulating system. c. Air intake throttle valve (TV) does not close for some reason. d. Minimum pressure valve (MPV) malfunctioning. e. Bleed-off valve (BOV) malfunctioning.	a. Adjust regulating valve. Dismantle and inspect parts if valve does not respond. Replace where necessary. b. Check hoses and their fittings. Stop leaks; replace leaking hoses. c. See corrective action 4g. d. Remove and inspect minimum pressure valve. Replace if necessary. e. Remove and inspect bleed-off valve. Replace if necessary.
6. Air and oil mist expelled from air filters (AF) and also from overpressure valve (OV) on gear casing (GC) after stopping.	a. If mainly air: check valve (CV) or by-pass valve (BV) excessively leaking or defective. b. If mainly oil: plunger of oil stop valve (OSV) jammed or oil stop valve defective.	a. Remove valve and inspect. Replace valve if necessary. Replace air filter elements and safety cartridges. Check the oil level and add oil if necessary. Run the unit for a few minutes, stop and recheck the oil level. b. See corrective action 6a.

Problem	Possible faults	Corrective actions
7. Compressor overheating.	a. Insufficient compressor cooling. b. Oil cooler (OC) clogged externally. c. Oil cooler (OC) clogged internally. d. Oil filters (OF) clogged. e. Oil level too low. f. Thermostatic by-pass valve (TBV) remains stuck in closed position. g. Cooling fan (F) defective. h. Oil stop valve (OSV) malfunctioning. i. Oil separator element clogged. j. By-pass valve (BV) leaking.	a. Locate unit away from walls; when banked with other units, leave space between them. b. Clean oil cooler. c. Consult Atlas Copco. d. Replace oil filters. e. Before checking oil level, wait approx. 10 minutes after unit has stopped. Add oil if necessary. f. Remove and check thermostatic by-pass valve for proper opening and closing temperatures. Replace valve if out of order. g. Replace fan. h. Remove and inspect oil stop valve. Replace if necessary. i. Replace oil separator element. j. Remove and inspect by-pass valve. Replace if necessary.
(LP air outlet temperature and interstage pressure above normal value)	k. LP compressor element (CEL) not in order.	k. Consult Atlas Copco.
(HP air outlet temperature above normal value)	l. HP compressor element (CEH) not in order.	l. Consult Atlas Copco.
8. Interstage pressure below normal.	a. Choked air filter elements. b. Leak between LP and HP compressor elements. c. LP compressor element (CEL) not in order.	a. Clean or renew air filter elements. b. Remove interconnecting pipe and inspect O-rings. Replace if necessary. c. Consult Atlas Copco.
9. Interstage pressure above normal.	a. By-pass valve (BV) leaking. b. LP compressor element (CEL) not in order.	a. Remove and inspect by-pass valve. Replace if necessary. b. Consult Atlas Copco.

7. TECHNICAL SPECIFICATIONS

7.1 READINGS ON GAUGES

Gauge	Reading	Unit
Working pressure (PG2)	between unloading and working pressure below 6.5	bar bar
LP compressor element air outlet temperature (TG1)	below 130	°C
HP compressor element air outlet temperature (TG2)	below 130	°C

7.2 SETTINGS OF SWITCHES AND SAFETY VALVE

Switch	Makes at	Breaks at
Shutdown switch		
LP compressor element air outlet temperature (TS1), adjustable up to 1)	-	130 °C
HP compressor element air outlet temperature (TS2), adjustable up to 1)	-	130 °C
Alarm switch		
Air filter vacuum indicator switch (VIS)	-	50 mbar
Start preventing pressure switch		
	0.5 +/- 0.4	1.5 +/- 0.3 bar(e)
Safety valve (SV)		
Opening pressure		30 bar(e) (XRV) 34 bar(e) (XRX)
Minimum loading pressure switch		
	2.5 +/- 1	4.5 +/- 0.5 bar

7.3 COMPRESSOR SPECIFICATIONS

Unit to be specified as follows:

	OEM XR-	***	PTO	**
standard gear ratios				vessel approval
i =	1.385	139		EC for EC
	1.471	147		AS for AS1210 and ASME
	1.604	160		
	1.909	191		
	2.195	220		
	2.405	241		

Compressor type		XRV 10	XRX 10	XRV 12	XRX 12
Designation	Unit	Value	Value	Value	Value
1. Absolute inlet pressure	bar(e)	1	1	1	1
2. Relative air humidity	%	0	0	0	0
3. Air inlet temperature	°C	20	20	20	20
4. Nominal effective working pressure					
- Lower limit	bar(e)	16	19	16	19
- Upper limit	bar(e)	25	30	25	30
The inlet conditions are specified at the air inlet grating outside the canopy					
Limitations 2)					
1. Maximum allowable inlet temperature at sealevel	°C	50	50	50	50
2. Minimum allowable inlet temperature	°C	-25	-25	-25	-25
Performance data 2) 3)					
1. Free air delivery at reference conditions 4)	l/s	see diagram	see diagram	see diagram	see diagram
2. Shaft input at reference conditions 4)	kW	see diagram	see diagram	see diagram	see diagram
3. Compressed air temperature at minimum pressure valve (approx.)	°C	100	100	100	100

1) 100°C for compressors for Germany.

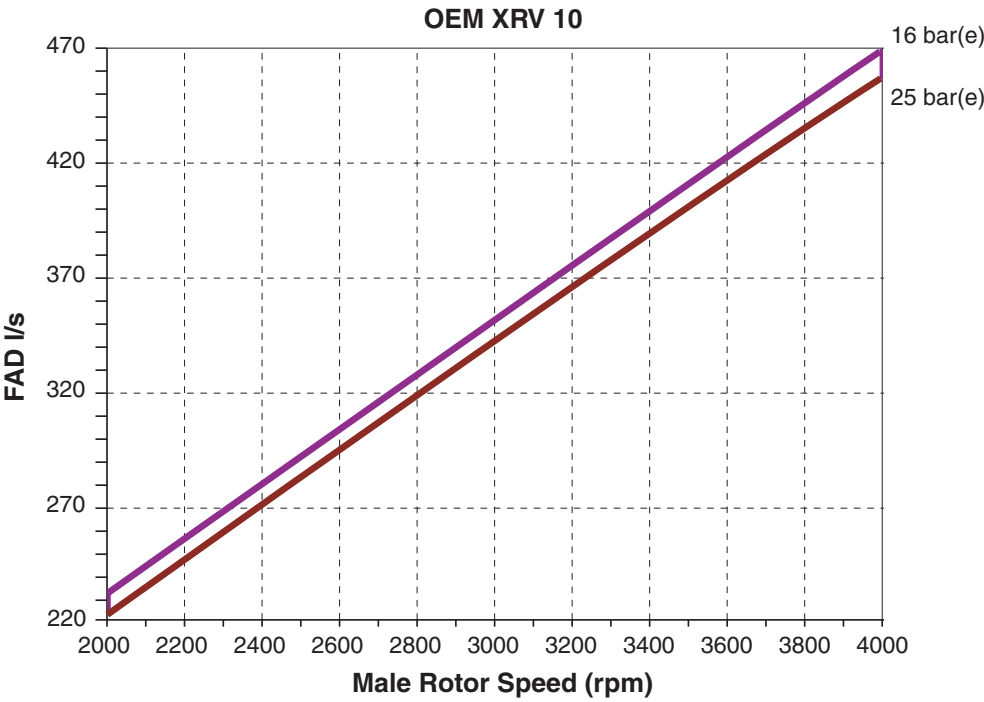
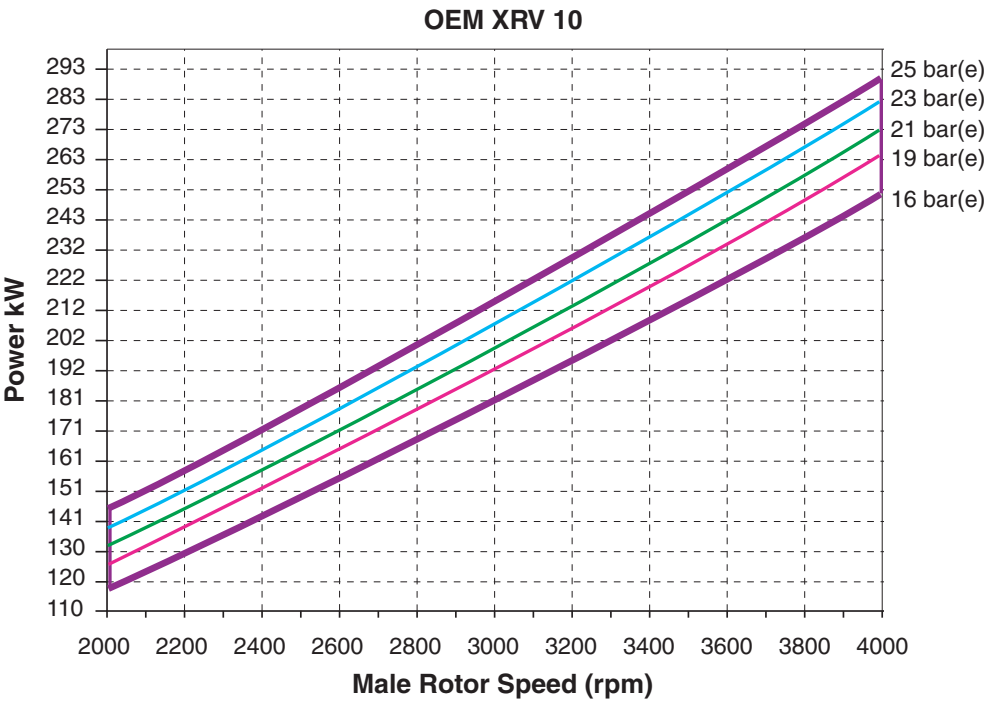
2) Unless otherwise stated, at reference conditions.

Data	Measured according to	Tolerance
Free air delivery	ISO 1217 ed.3 1996 annex D	+/- 5% 25 l/s <FAD<250 l/s +/- 4% 250 l/s <FAD
The international standard ISO 1217 corresponds to following national standards:		
- British BSI 1571 part 1		
- German DIN 1945 Part 1		
- Swedish SS-ISO 1217		
- American ANSI PTC9		
Free air delivery = volume flow rate		

4) Effect of enviromental conditions.

- Power derates with approximately 6.3 kW per 1000 m above sealevel at 2000 MRS derates with approximately 16.3 kW per 1000 m above sealevel at 4000 MRS derates with 1% per 10 °C above 20 °C
- Free air delivery derates with approximately 1.7 l/s per 1000 m at 16 bar eff. working pressure derates with approximately 2.6 l/s per 1000 m at 25 bar eff. working pressure.

Performance data



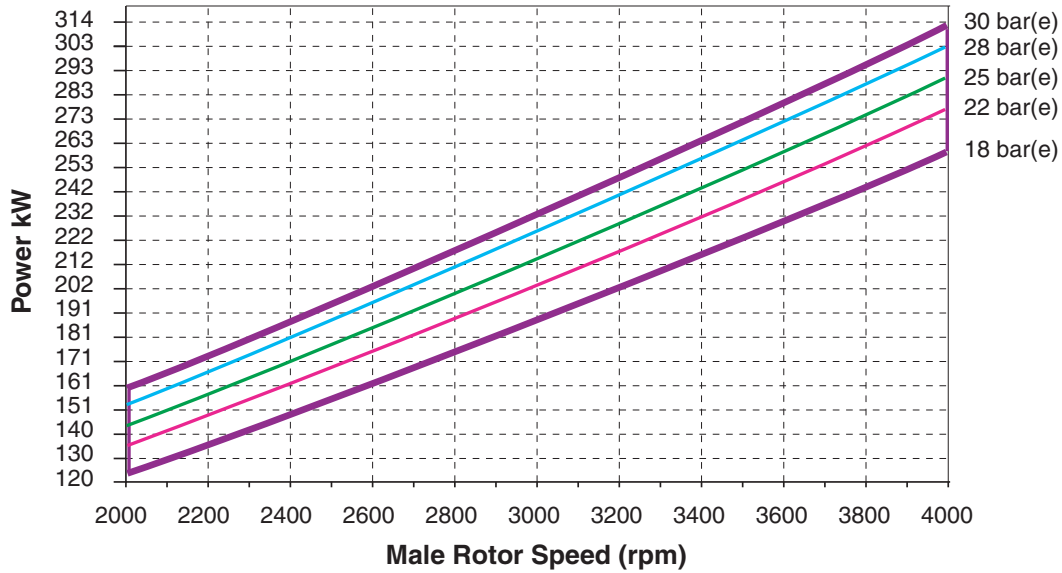
MRS (Male Rotor Speed) = input speed x gear ration

Boundaries of the working area are marked with thick lines

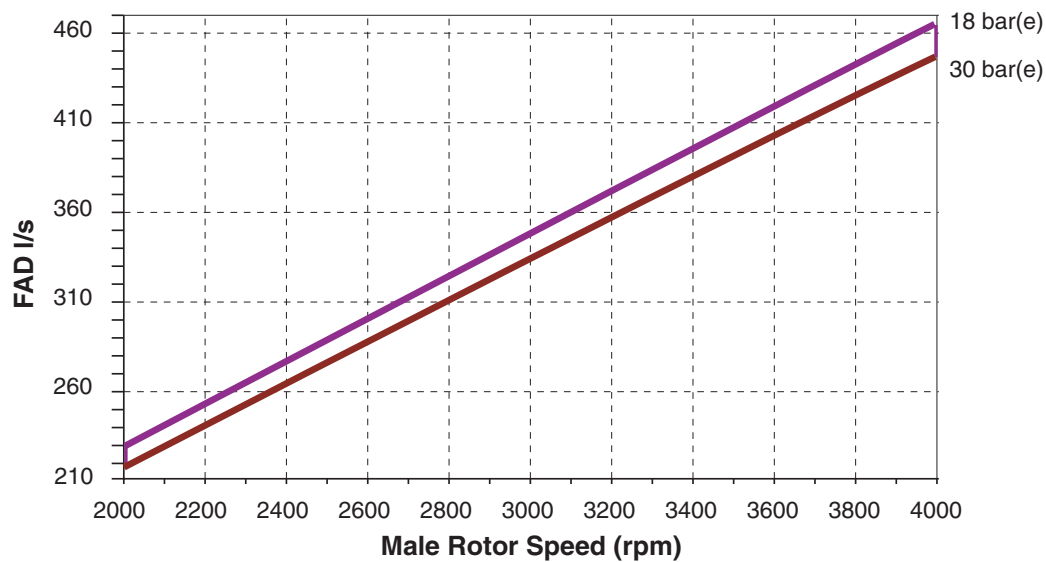
For example see AML specification sheet

Performance data

OEM XRX 10



OEM XRX 10



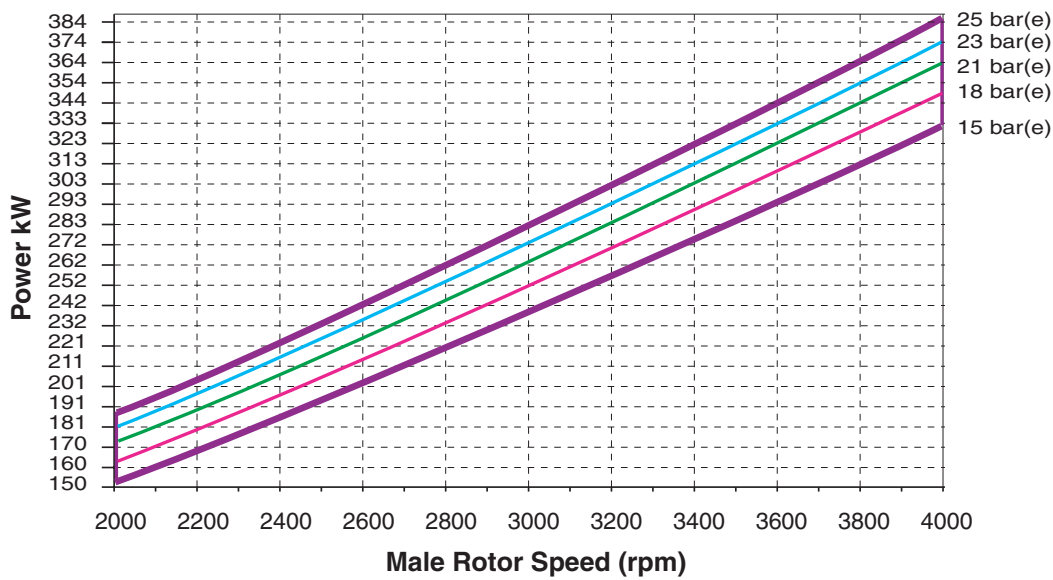
MRS (Male Rotor Speed) = input speed x gear ration

Boundaries of the working area are marked with thick lines

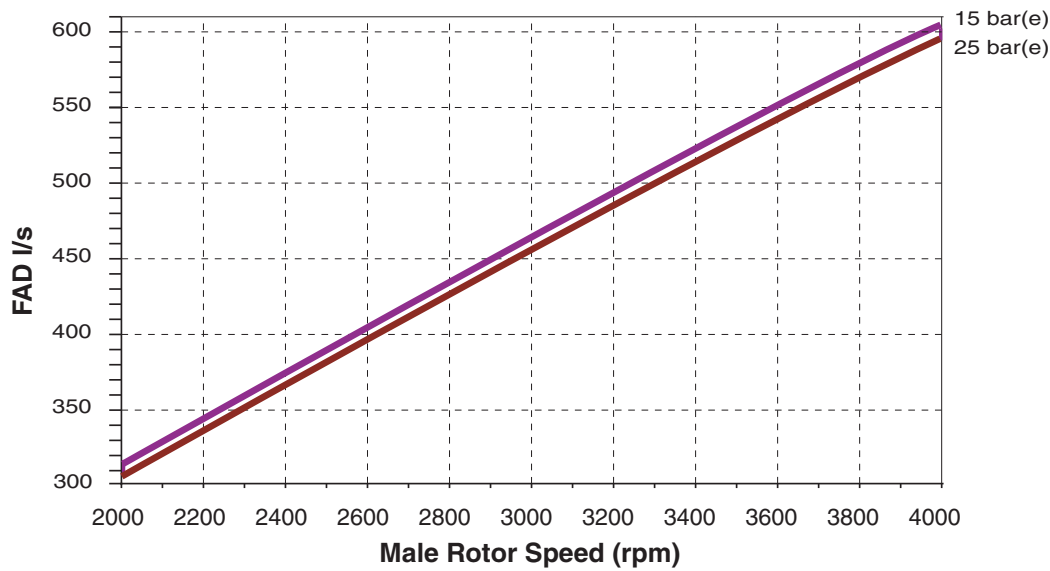
For example see AML specification sheet

Performance data

OEM XRV 12



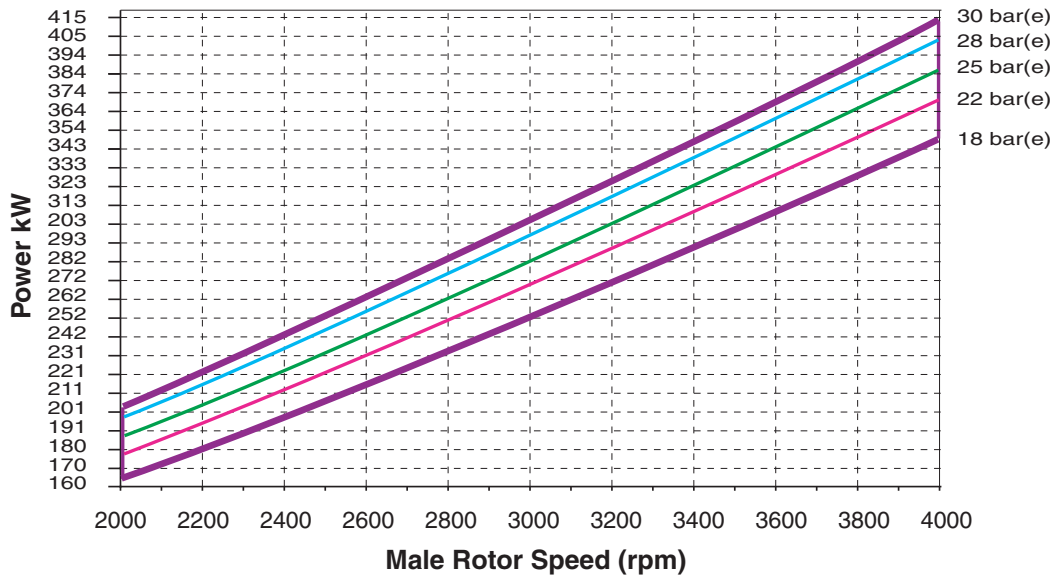
OEM XRV 12



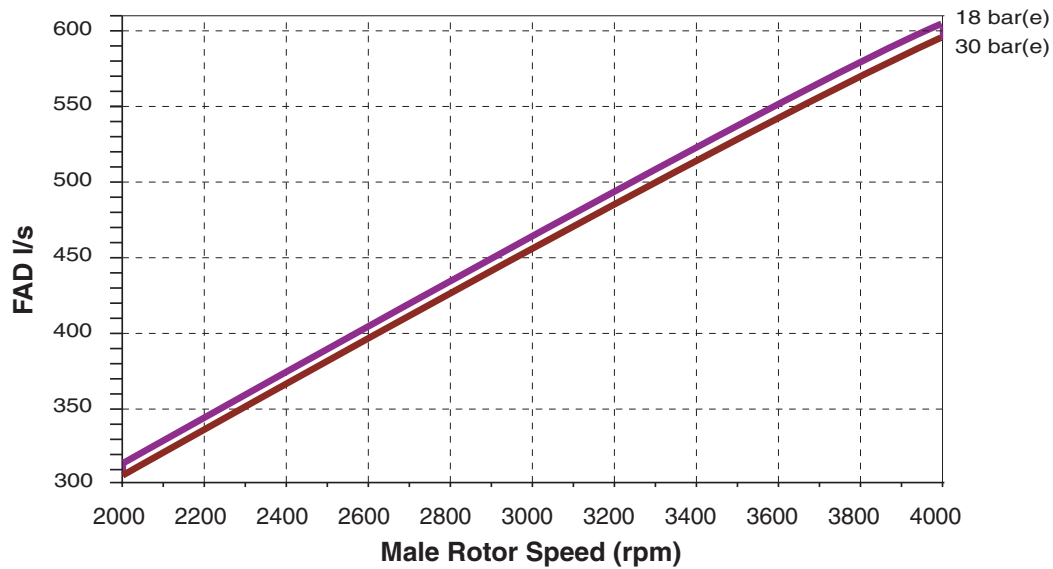
MRS (Male Rotor Speed) = input speed x gear ration
Boundaries of the working area are marked with thick lines
For example see AML specification sheet

Performance data

OEM XRX 12



OEM XRX 12



MRS (Male Rotor Speed) = input speed x gear ration

Boundaries of the working area are marked with thick lines

For example see AML specification sheet

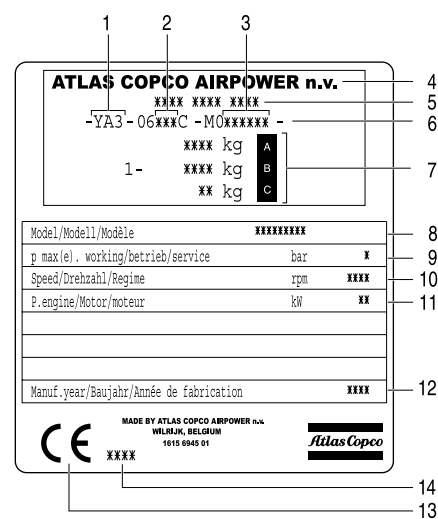
Design data		OEM XR10	OEM XR10	OEM XR12	OEM XR12
Compressor					
1. Number of compression stages				2	
2. Gear ratios				1.385 1.471 1.604 1.909 2.195 2.405	
other ratios on request					
3. Net mass without oil (approx.)	kg	1350	1380	1400	1430
Oil tank separator module (OSM)					
1. Oil capacity	l			47	
2. Net capacity of air receiver	l			143	
3. Net mass without oil (Approx.)	kg			260	
4. Net mass with oil (approx.)	kg			300	
5. Dimensions (LxWxH)	mm			600 x 410 x 1250	
OEM package					
1. Total oil capacity of unit ready to operate (approx.)	l	77	77	77	77
2. Total mass of unit ready to operate (approx.)	kg	1675	1705	1725	1755
Dimensions compressor module					
Overall length	mm	1590	1590	1590	1590
Overall width	mm	1700	1700	1700	1700
Overall height	mm	1365	1365	1365	1365

7.4 CONVERSION LIST OF SI UNITS INTO BRITISH UNITS

1 bar	=	14.504 psi
1 g	=	0.035 oz
1 kg	=	2.205 lb
1 km/h	=	0.621 mile/h
1 kW	=	1.341 hp (UK and US)
1 l	=	0.264 US gal
1 l	=	0.220 Imp gal (UK)
1 l	=	0.035 cu.ft
1 m	=	3.281 ft
1 mm	=	0.039 in
1 m ³ /min	=	35.315 cfm
1 mbar	=	0.401 in wc
1 N	=	0.225 lbf
1 Nm	=	0.738 lbf.ft
t °F	=	32 + (1.8 x t °C)
t °C	=	(t °F - 32)/1.8

– A difference of 1 °C = a difference of 1.8 °F

8. DATA PLATE



1. Company code

2. Product code

3. Unit serial number

4. Name of manufacturer

5. EEC or national type approval number

6. Vehicle identification number

7. Weight of unit

8. Model

9. Working pressure

10. Speed

11. Engine power

12. Manufacturing year

13. CE-mark in accordance with Machine Directive 89/392 EEC

14. Register number or number of notified body

- Company code
- Product code
- Unit serial number
- Name of manufacturer
- EEC or national type approval number
- Vehicle identification number
- Weight of unit
- Model
- Working pressure
- Speed
- Engine power
- Manufacturing year
- CE-mark in accordance with Machine Directive 89/392 EEC
- Register number or number of notified body

9. LEGISLATION

9.1 PARTS, SUBJECTED TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC, CAT. II AND ABOVE

Safety valve: cat. IV

		XRV 10 OEM XRV 12 OEM	XRX 10 OEM XRX 12 OEM
Set pressure	bar(e)	30	34
Design temperature	°C	130	130

9.2 PARTS, SUBJECTED TO SIMPLE PRESSURE VESSEL DIRECTIVE 87/404/EC

Air Oil separator (XRV)

		Standard	Cold start equipment
Design pressure	bar(e)	30	30
Design temperature max.	°C	130	130
Design temperature min.	°C	-10	-25
Volume	l	143	143

9.3 PARTS, SUBJECTED TO SIMPLE PRESSURE VESSEL DIRECTIVE 87/404/EC

Air Oil separator (XRX)

		Standard	Cold start equipment
Design pressure	bar(e)	34	34
Design temperature max.	°C	130	130
Design temperature min.	°C	-10	-25
Volume	l	143	143

9.4 PARTS, SUBJECTED TO CAT. I AND COVERED BY THE MACHINE DIRECTIVE 89/392/EC

All other parts

9.5 PARTS, SUBJECTED TO ART. I, PARAGRAPH 3.3

All other parts

**Instruction Manual
for Portable Compressors**

XRV 10 OEM

XRV 12 OEM

XRX 10 OEM

XRX 12 OEM

