



OIL-FREE SCROLL COMPRESSORS

QOF 2, QOF 3, QOF 5, QOF 7.5



Instruction Manual

This manual contains important safety information and should be made available to all personnel who operate and/or maintain this product. Carefully read this manual before attempting to operate or perform maintenance on this equipment.

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Table of Contents

Section I - General Information

Safety Alert Symbols	1
Safety Precautions	2
Spare Parts Ordering Information	3
Serial/Model Identification Plate	3
Royal Blue Warranty	4-5

Section II - Description

Introduction	6
Flow diagram.....	10
Refrigerant dryer.....	12

Section III - Installation

Dimension drawings	14
Installation proposal	14
Electrical connections.....	16
Pictographs.....	17

Section IV - Operation

Initial start-up.....	19
Starting	20
During operation	21
Stopping.....	21
Taking out of operation	22

Section V - Preventive maintenance

Preventive maintenance schedule	23
Service kits.....	23
Disposal of used material	25

Section VI - Adjustments and servicing procedures

Pressure switch	26
Air filter	28
Air cooler	28
Drive motor	28
Safety valve	28
Belt replacement	29
Temperature protection.....	31
Cleaning the compressor element	31
Replacement of the outlet pipe	33
Refrigerant dryer maintenance	34

Section VII - Problem solving35-37

Section VIII - Technical data

Readings on control panel	38
Electric cable size	38
Settings for overload relay and fuses	39
Temperature protection and safety valve settings	40
Reference conditions and limitations	41
Compressor data	41

Table of Contents

Section IX - Instructions for use	43
Section X - Guidelines for inspection	44
Section XI - Pressure equipment directives	45
Section XII - Declaration of conformity	46

- Safety Alert Symbols
- Safety Precautions
- Spare Parts Ordering Information
- Serial/Model Identification Plate
- Royal Blue Warranty

Safety Alert Symbols

IMPORTANT!

Throughout this manual we have identified key hazards. The following symbols identify the level of hazard seriousness:



DANGER!

This symbol identifies immediate hazards which **will** result in severe personal injury, death or substantial property damage.



WARNING!

This symbol identifies hazards or unsafe practices which **could** result in personal injury, death or substantial property damage.



DANGER!

This symbol identifies life threatening electrical voltage levels which **will** result in severe personal injury or death. All electrical work **must** be performed by a qualified electrician.



CAUTION!

Identifies hazards or unsafe practices which **could** result in minor personal injury or property damage.



CAUTION!

This symbol identifies hot surfaces which **could** result in personal injury or property damage.

NOTICE!

Identifies important installation, operation or maintenance information which is not hazard related.

Section I - General Information

Safety Precautions

Read this manual and follow all instructions prior to installing or operating the compressor.

Listed below are some, but not all, safety precautions that must be observed with compressors and compressed air systems.



WARNING!

Failure to follow any of these precautions may result in severe personal injury, death, property damage and/or compressor damage.

- Air from this compressor will cause severe injury or death if used for breathing or food processing. Air used for these processes must meet OSHA 29 CFR 1910.134 or FDA21XDE178.3570 regulations.
- Disconnect and lockout all power supplies to the compressor plus any remote controllers prior to servicing the unit.
- Never assume it is safe to work on the compressor because it is not operating. Many installations have automatic start/stop controls and the compressor may start at any time.
- This compressor is designed for use in the compression of normal atmospheric air only. No other gases, vapors or fumes should be exposed to the compressor intake, nor processed through the compressor.
- Relieve all pressure internal to the compressor prior to servicing. Do not depend on check valves to hold system pressure.
- A properly sized pressure relief valve must be installed in the discharge piping ahead (upstream) of any shutoff valve (block valve), heat exchanger, orifice or any potential blockage point. Failure to install a pressure relief valve could result in the rupturing or explosion of some compressor component.
- Do not change the pressure setting of the pressure relief valve, restrict the function of the pressure relief valve, or replace the pressure relief valve with a plug. Over pressurization of system or compressor components can occur, resulting in death, severe personal injury or property damage.
- Never use plastic pipe, rubber hose, or soldered joints in any part of the compressed air system. Failure to ensure system compatibility with compressor piping is dangerous.
- Never use a flammable or toxic solvent for cleaning the air filter or any parts.
- Do not remove any guards or cabinet panels or attempt to service any compressor part while the compressor is operating.
- Do not operate the compressor at pressures in excess of its rating.
- Observe control panel displays daily to ensure compressor is operating properly.
- Follow all maintenance procedures and check all safety devices on schedule.
- Never disconnect or tamper with the high air temperature (HAT) sensors.
- Compressed air is dangerous, do not play with it.

- Use the correct fluid at all times.
- Do not rely on the discharge air line check valve.
- Do not override any safety or shutdown devices.
- Keep doors closed during operation. The operating temperature of some components is sufficient to burn the skin.

NOTICE!

These instructions, precautions and descriptions cover standard Quincy manufactured QSI® Series air compressors. As a service to our customers, we often modify or construct packages to the customers specifications. This manual may not be appropriate in those cases.

NOTICE!

Every effort has been taken to ensure complete and correct instructions have been included in this manual, however, possible product updates and changes may have occurred since this printing. Quincy Compressor® reserves the right to change specifications without incurring any obligation for equipment previously or subsequently sold. Not responsible for typographical errors.

Spare Parts Ordering Information

Quincy Compressor maintains replacement parts for Quincy compressors and accessories. A repair parts list is shipped with all new machines. Order parts from your Authorized Quincy distributor. Use only genuine Quincy replacement parts. Failure to do so may void warranty.

Serial/Model Identification Plate



Reference to the machine MODEL, SERIAL NUMBER and DATE OF ORIGINAL START-UP must be made in all communication relative to parts orders. A model/serial number plate is located on the frame or in the upper right corner of the control panel door.

Section I - General Information

Warranty

Quincy Compressor® Industrial Scroll Products
QOF (2-30 horsepower ONLY) Belt Drive Compressors
(Operating at 145 PSIG full load pressure or less)

Standard Warranty

Quincy Compressor (Seller) warrants products of its own manufacture against defects in workmanship and materials under normal use and service, as follows:

Packaged Compressors - Twelve (12) months from date of start-up or eighteen (18) months from date of shipment from the factory, whichever occurs first.

- Introduction
- Flow diagram
- Refrigerant dryer

Introduction

General

QOF-2, QOF-3, QOF-5, QOF-7.5 are stationary, single stage, oil-free compressors, driven by an electric motor.

The compressors are controlled by a pressure switch.

The compressors are enclosed in a sound dampening enclosure and are air cooled.

Available versions:

- The basic version (QOF) comprises the motor, the compressor element, an air cooled aftercooler and the regulation and protection components.
- The QOF with dryer is a QOF, completed with an integrated refrigerant dryer.

The basic version (referred to as the floor mounted version (FM)) does not include an air receiver. An air receiver is available as option.

Available options:

- Air receiver of 30 l (7.93 US gal), 270 l (71.3 US gal) or 500 l (132 US gal). The 30 l receiver consists of a module with three 10 l (2.64 US gal) receivers. The 30 l receiver option includes an electronic drain.
- Receiver mounted version (270 l and 500 l): electronic drain on the air receiver
- Floor mounted compressors without refrigerant dryer: water separator on the outlet
- Prefilter mats on the air inlet
- Phase sequence relay (on 3-phase units)

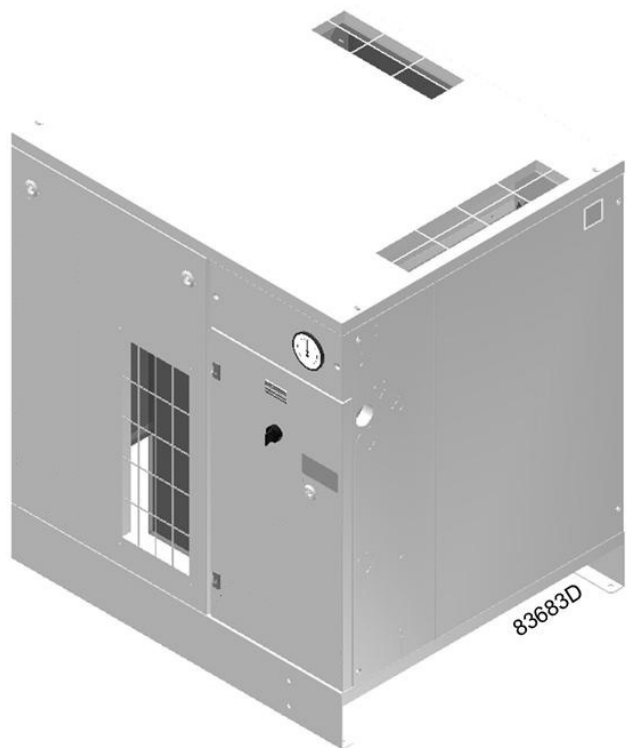
QOF

The control panel comprises a pressure gauge, an hour meter and a start button. The compressor is controlled by a pressure switch (PS).

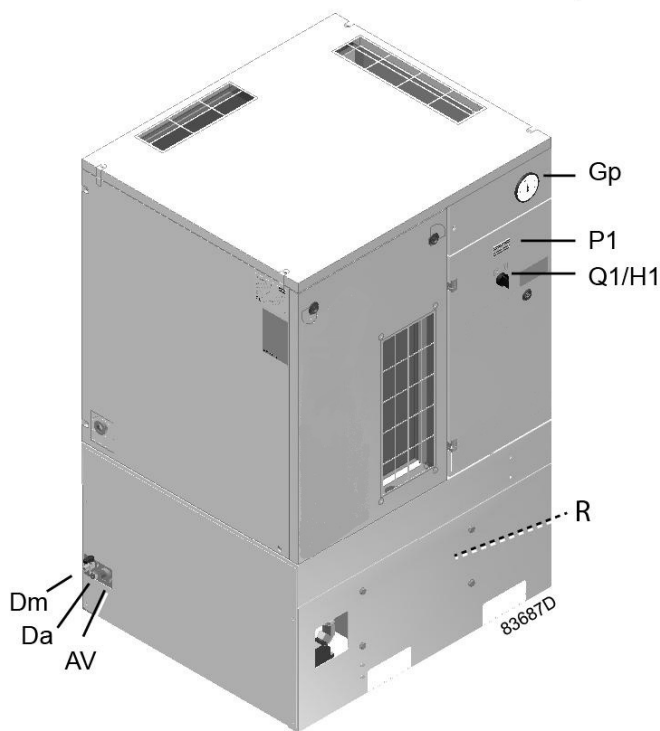
The electric components are located in the cubicle behind the front panel door.

A check valve (CV) prevents loss of compressed air when the compressor is stopped. A temperature switch and a safety valve (SV) protect the compressor element against overheating and too high pressure respectively. The compressed air is cooled by an air cooler (Ca).

Single phase units are equipped with a vent valve for easy starting.

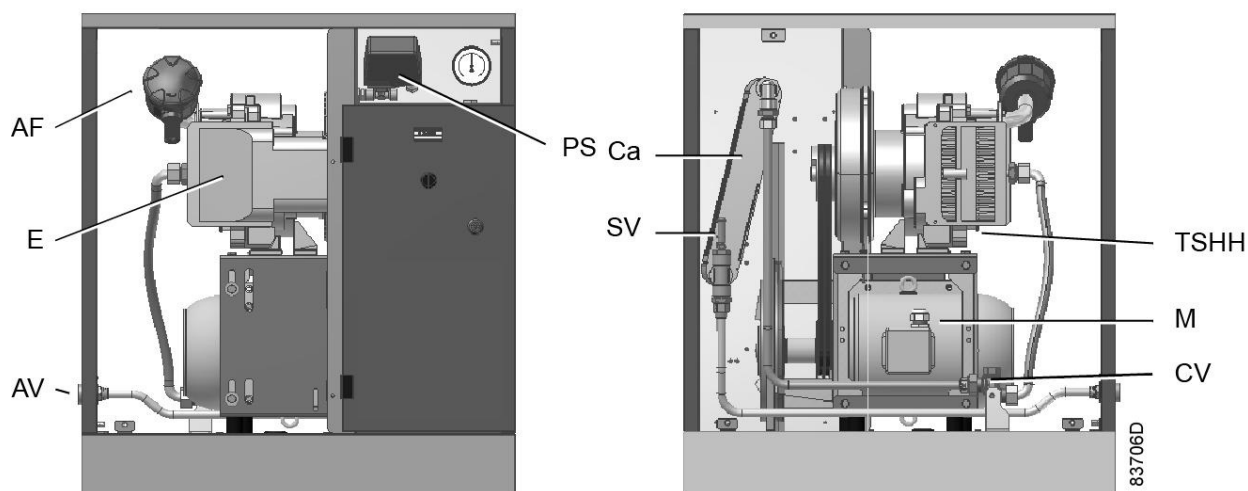


QOF 5 floor mounted - general view



*QOF 5 with integrated air receivers
(3 x 10 l)- general view*

Gp	Pressure gauge	Q1/H1	On/off switch with lamp
P1	Hour meter	AV	Outlet valve
R	Air receivers (3 x 10 l)	Dm	Manual drain valve
Da	Automatic drain outlet		



QOF 5 floor mounted - details

AF	Inlet air filter	AV	Outlet valve
Ca	Air cooler	E	Compressor element
M	Motor	PS	Pressure switch
SV	Safety valve	TSHH	Temperature switch
CV	Check valve		

QOF with dryer

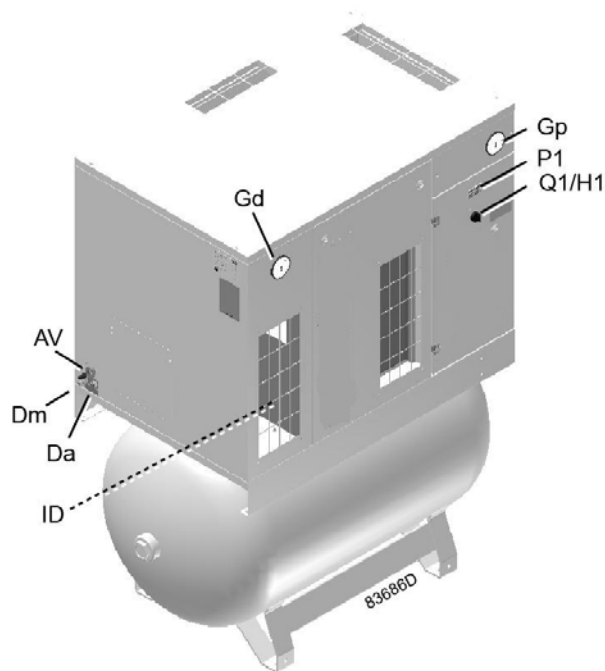
The QOF with dryer consists of an QOF, completed with an integrated refrigerant dryer.

The control panel comprises a pressure gauge, an hour meter, a start button and a temperature gauge indicating the dew point. The compressor is controlled by a pressure switch (PS).

The electric components are located in the cubicle behind the front panel door.

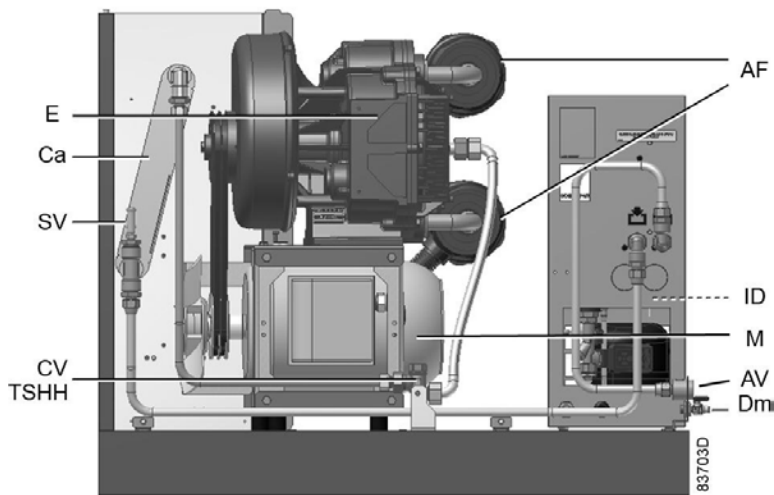
A check valve (CV) prevents loss of compressed air when the compressor is stopped. A temperature switch and a safety valve (SV) protect the compressor element against overheating and too high pressure respectively. The compressed air is cooled by an air cooler (Ca) before it enters the dryer.

Single phase units are equipped with a vent valve for easy starting.



QOF 5 with dryer on a 270 l receiver - general view

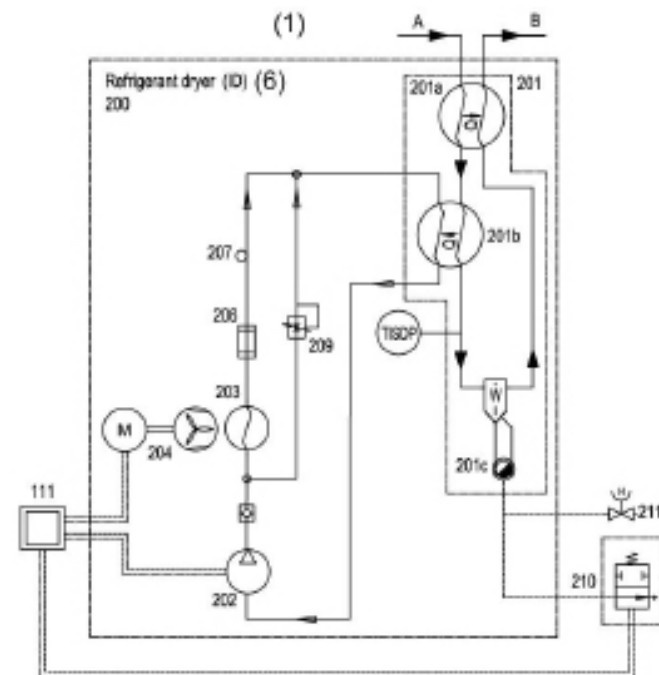
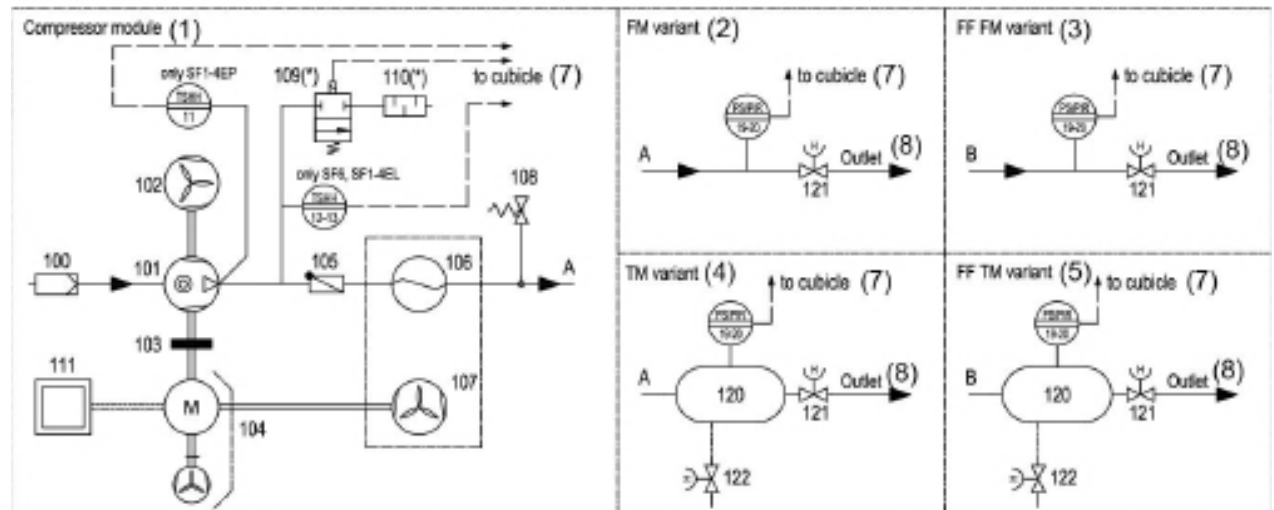
Gp	Pressure gauge	Q1/H1	On/off switch with lamp
P1	Hour meter	AV	Outlet valve
Dm	Manual drain valve	Da	Automatic drain outlet
Gd	Dew point gauge	ID	Refrigerant dryer



QOF 7.5 with dryer - details

AF	Inlet air filter	AV	Outlet valve
Ca	Air cooler	E	Compressor element
M	Motor	CV	Check valve
SV	Safety valve	Dm	Manual drain valve
ID	Refrigerant dryer	TSHH	Temperature switch

Flow diagram



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Flow diagram

Section II - Description

(1)	Compressor module	(5)	Units with dryer on air receiver
(2)	Units without dryer and air receiver	(6)	Refrigerant dryer
(3)	Units with dryer, without receiver	(7)	To cubicle
(4)	Units without dryer on air receiver	(8)	Compressed air outlet

Air flow

Air is drawn through air filter (100) and is compressed by the compressor element (101). Next, the compressed air flows through the check valve (105) and the air cooler (106).

Single phase units are equipped with a solenoid valve (109) and a silencer (110) for easy starting at low voltage.

On floor mounted versions without refrigerant dryer, the air flows then directly to the outlet valve (121). On receiver mounted units, the compressed air flows into the air receiver (120), onto which the outlet valve AV (121) is fitted.

On compressors with refrigerant dryer, the compressed air flows to the refrigerant dryer (ID), where the water vapor condensates by cooling down. The water is removed via the integrated water separator (201c) and the electronic drain (210).

For details on the operation of the ID dryer, see section Refrigerant dryer.

Cooling

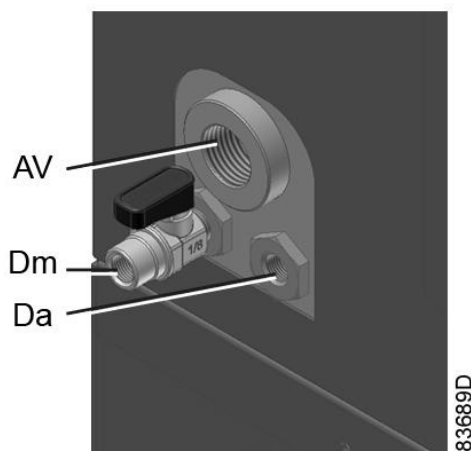
The compressor element (101) is cooled by an integrated radial fan (102). An axial fan (107) fitted on the motor shaft provides cooling air for the air cooler (106).

On compressors with integrated refrigerant dryer, a separate fan (204) delivers cooling air for the dryer.

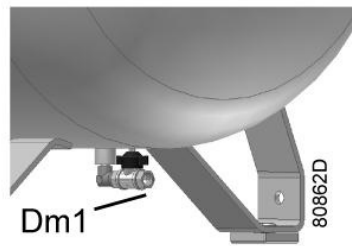
Condensate management

Floor mounted compressors without refrigerant dryer have no drain. A water separator is available as option.

The dryer of compressors equipped with a refrigerant dryer has an integrated water separator (201c) and an electronic water drain (210). The water separator has a manual drain valve (211) and a connection for the automatic drain. For more details, consult section Refrigerant dryer.



The receiver of receiver mounted compressors has a manual drain valve (122) at the bottom. An electronic



Regulating system and protection

The compressor is started and stopped automatically by a pressure switch (PS). A pressure gauge (PI) indicates the pressure. A temperature switch (TSHH) protects the compressor element from too high temperatures.

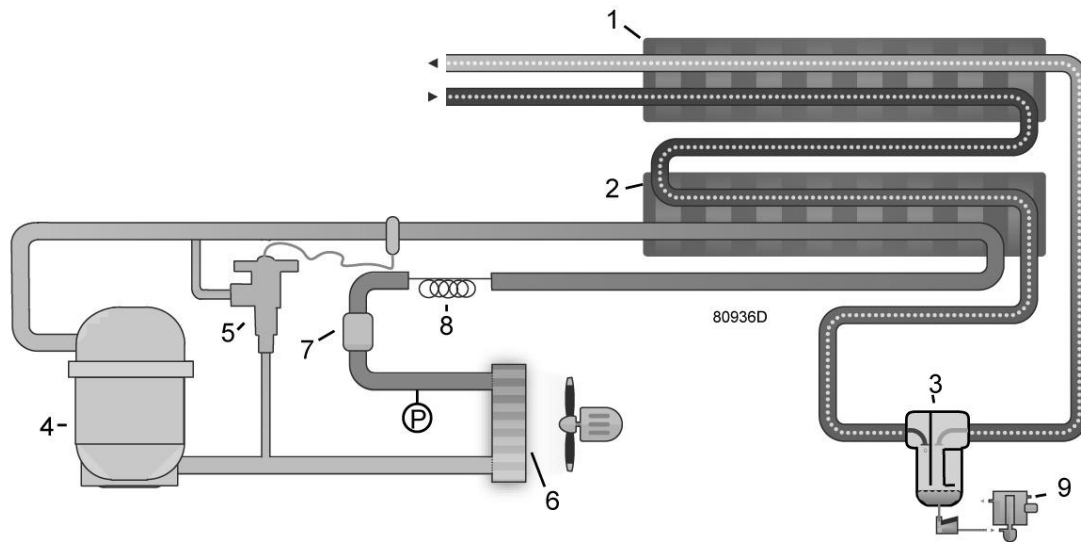
A safety valve (108) protects the compressor element against too high pressure.

Refrigerant dryer

Operation

The refrigerant dryer removes moisture from the compressed air by cooling it down to near freezing temperature. The water is removed via an automatic drain.

Compressed air circuit



Compressed air enters heat exchanger (1) and is cooled by the outgoing, cold, dried air. Water in the incoming air starts to condense. The air then flows through the evaporator heat exchanger (2) where the refrigerant evaporates, causing the compressed air to be cooled further to close to the evaporating temperature of the refrigerant. More water in the air condenses. The cold air then flows through water separator (3), where the condensate is separated from the air. The condensate is automatically drained by the electronic condensate drain (9).

The cold, dried air flows through heat exchanger (1) where it is warmed up by the incoming air.

Section II - Description

Refrigerant circuit

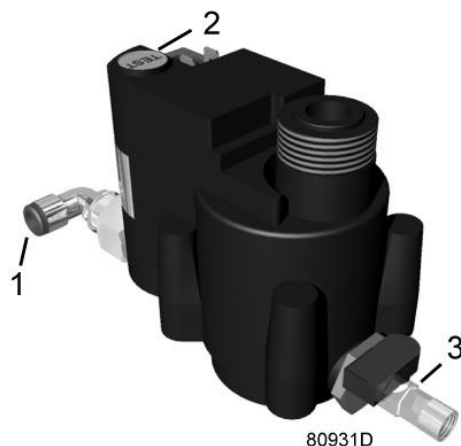
Compressor (4) delivers hot, high-pressure refrigerant gas which flows through condenser (6) where most of the refrigerant condenses.

Next, the liquid refrigerant flows through dryer/filter (7) to capillary tube (8). The refrigerant leaves the capillary tube at evaporating pressure.

The refrigerant enters evaporator (2) where it withdraws heat from the compressed air by further evaporation at constant pressure. The heated refrigerant leaves the evaporator and is sucked in again by the compressor.

The condenser (6) pressure must be kept as constant as possible to obtain stable operation. Fan control switch (P) therefore stops and starts the condenser cooling fan. If, under partial or no load, the evaporator (2) pressure drops to approximately 2.25 bar(e) (32.63 psig), the hot gas bypass valve (5) opens and hot, high-pressure gas is fed to the evaporator circuit to prevent the evaporator pressure from dropping any further.

Electronic condensate drain



The dryer is equipped with an electronic condensate drain. The condensate, separated by the condensate trap, accumulates inside the drain. Once the condensate reaches a certain level, it is discharged through the drain outlet (1).

The condensate can also be drained by pressing the test button (2).

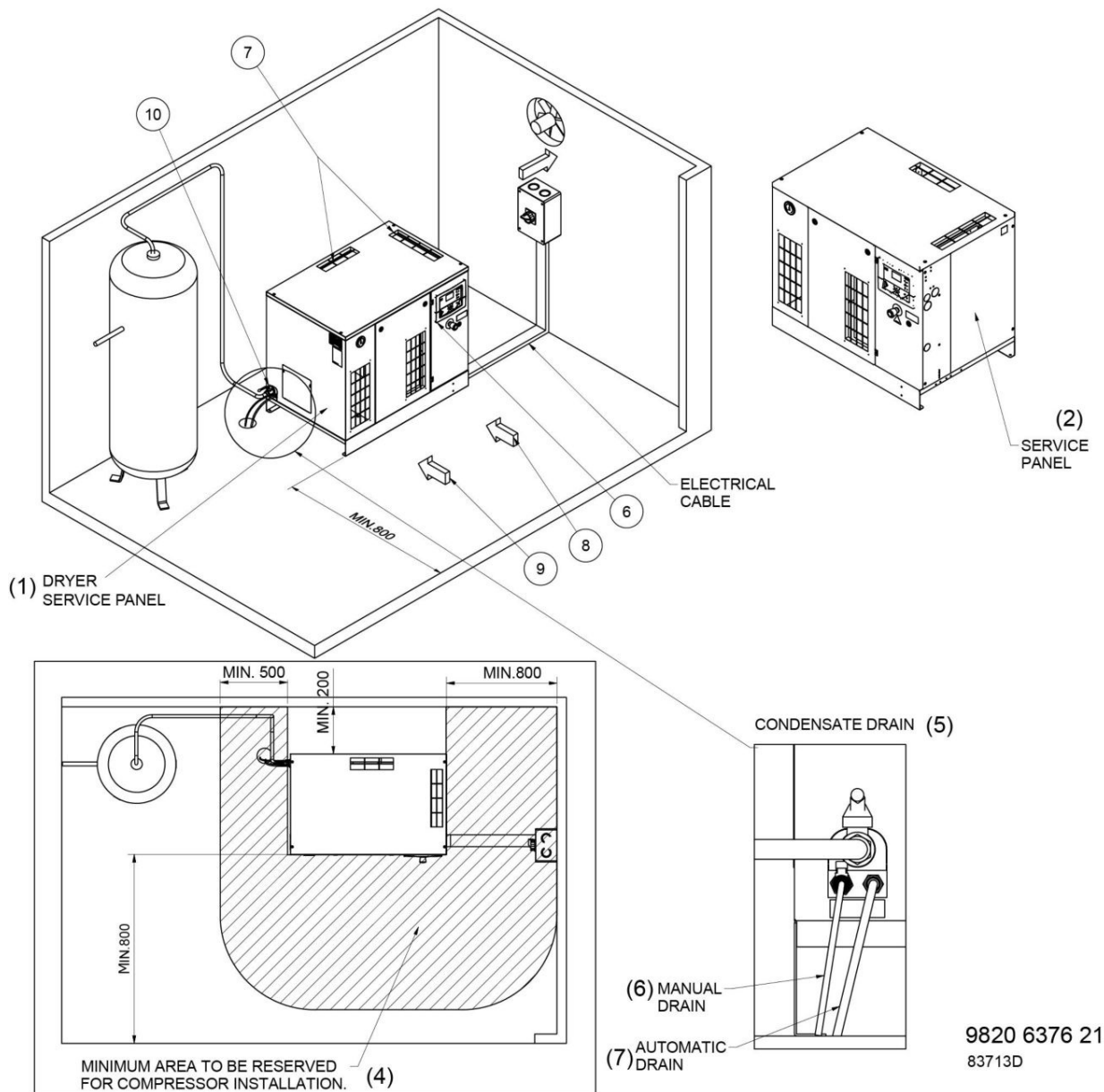
The drain filter can be cleaned by opening the manual drain valve (3), see section preventive Maintenance schedule.

- Dimension drawings
- Installation proposal
- Electrical connections
- Pictographs

Dimension drawings

The dimension drawings are available in pdf format on the CD Rom, supplied with the compressor.

Installation proposal



Section III - Installation

1	Dryer service panel	5	Condensate drain
2	Service panel	6	Manual drain
3	Supply cable	7	Automatic drain
4	Minimum area to be reserved for servicing purposes		

Recommendations

1. Install the compressor on a level horizontal industrial floor, suitable for taking the weight of the compressor. The location must be frost-free and preferably low dust location. The compressor unit must be installed on a level floor.

2. Delivery pipe. The pressure drop in the delivery pipe can be calculated from:

$$\Delta p = (L \times 450 \times Q_c^{1.85}) / (d^5 \times P), \text{ with}$$

d = inner diameter of the pipe in mm

Δp = pressure drop in bar (recommended maximum: 0.1 bar (1.5 psi))

L = length of the pipe in m

P = absolute pressure at the compressor outlet in bar

Q_c = free air delivery of the compressor in l/s

3. Ventilation: the inlet grids and ventilation fan should be installed in such a way that any recirculation of cooling air to the compressor is avoided. The maximum air velocity through the grids is 5 m/s (16.5 ft/s). The maximum allowable pressure drop over the cooling air ducts is 30 Pa (0.12 in wc). The maximum air temperature at the compressor intake opening is 40 °C (104 °F).
Take care that the temperature of the ambient air and the cooling air may never be lower than 0 °C (32 °F) to avoid freezing of condensate.

The required ventilation capacity to limit the compressor room temperature can be calculated from:

- $Q_v = 1.06 N / \Delta t$ for compressors without integrated dryer.
- $Q_v = (1.06 N + 0.2) / \Delta t$ for compressors with integrated dryer.

with

Q_v = required ventilation capacity in m³/s

N = shaft input of the compressor in kW

Δt = temperature increase in the compressor room in °C

4. Air receiver: an optional air receiver can be necessary to limit the cycle frequency. Recommended maximum is 20 starts per hour.
5. Optional filters can be installed in the pressure line downstream the air outlet valve, e.g.:
 - A DD⁺ filter for general purpose filtration. The filter traps solid particles down to 1 micron.
 - A PD⁺ filter for filtration down to 0.01 micron. A PD filter must always be installed downstream a DD filter.
6. Control cubicle with monitoring panel.
7. Compressor and dryer cooling air outlet

8. Compressor cooling air inlet
9. Refrigerant dryer cooling air inlet
10. Connect condensate drain outlet to a sewer. It is recommended to provide a funnel to allow visual inspection of the condensate flow. If the condensate piping has been led outside the compressor room where it may be exposed to freezing temperatures, the piping must be insulated. The condensate drain pipe from the compressor to the sewer must not dip into the water of the sewer.
11. All piping to be connected free of stress.

Electrical connections

Attention



The electrical installation must correspond to the applicable codes. The mains supply and earthing lines must be of suitable size.

The installation must be earthed and protected by fuses in each phase. Install an isolating switch near the compressor.

Make sure that this switch is open to isolate the compressor from the mains before carrying out any connection.

Supply cable

Consult section Cable size for the section of the power supply cable.

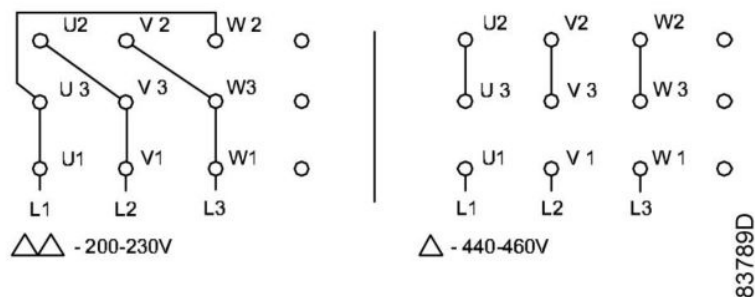
An electric cable is provided on the unit. Fit a suitable plug on the cable.

Plug in the cable.

Three voltage units

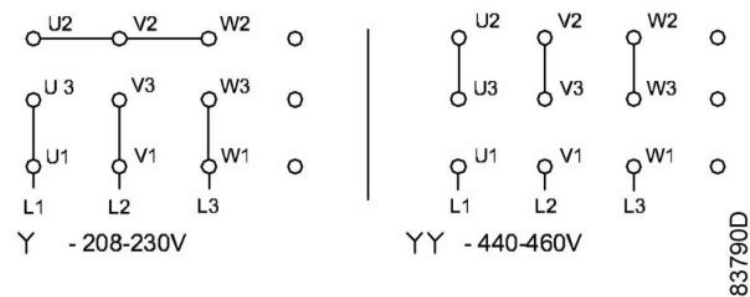
The compressors leave the factory wired for 230 V. If the compressor is to be used on 460 V, rewire the motor as follows:

1. Take all necessary precautions.
2. Change the connection in the motor terminal box according following instructions:
 - For QOF 3 and QOF 5:



Section III - Installation

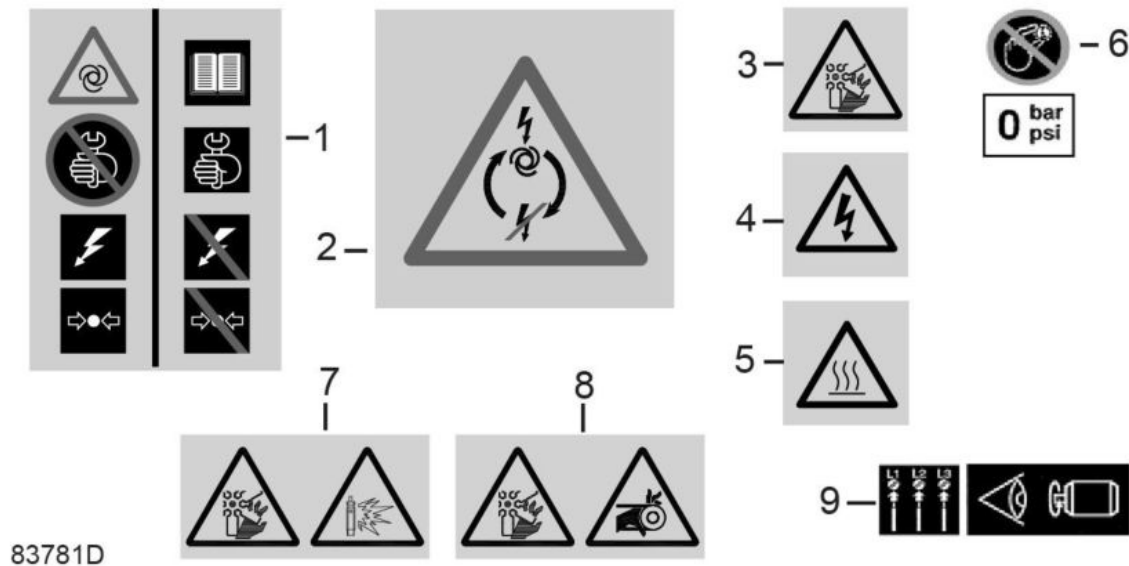
- For QOF 7.5:



3. Change also the voltage connection on auxiliary transformer T1.
4. Replace the fuses.
5. Adjust the overload relay settings (see section Settings of overload relay and fuses.

Pictographs

Pictographs



Reference	Designation
1	Warning: the compressor starts and stops automatically. Do not perform service when pressurized and when the voltage is on. Read the instruction book, switch off the power and depressurize the compressor before maintenance or repair.
2	Warning: when the voltage is on, the unit can start and stop automatically.
3	Warning: rotating fan.

4	Warning: supply voltage.
5	Warning: hot surface.
6	Do not adjust the pressure switch while it is depressurized , because this can damage the switch (only for compressors controlled by a pressure switch).
7	Warning: rotating fan. Warning: safety valve blowing.
8	Warning: rotating fan. Warning: belts.
9	Warning: before connecting compressor electrically, consult Instruction book for motor rotation direction.

Section IV - Operation

- Initial start-up
- Starting
- During operation
- Stopping
- Taking out of operation

Initial start-up

Safety



CAUTION!

The operator must apply all relevant Safety precautions during operation.

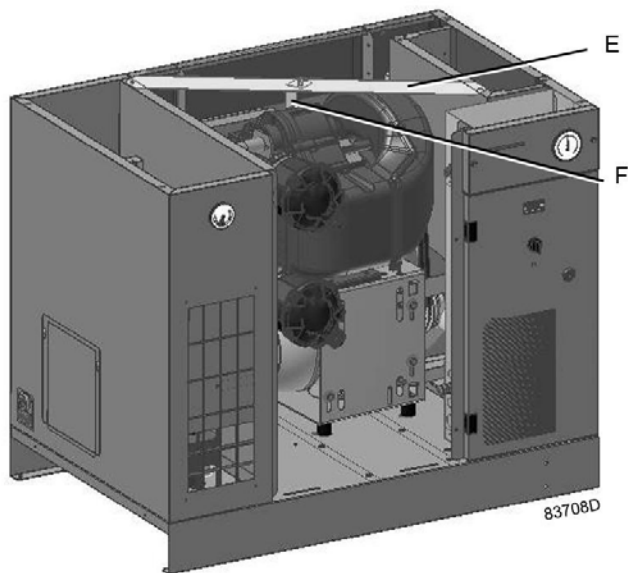


NOTICE!

The maximum recommended motor starting frequency is starts is 20 starts per hour. In order to keep the number of starts at an acceptable level, the compressor must be connected to an air receiver with a suitable size.

Initial start-up

1. Remove the yellow painted transport brackets (E, F) (if applicable)

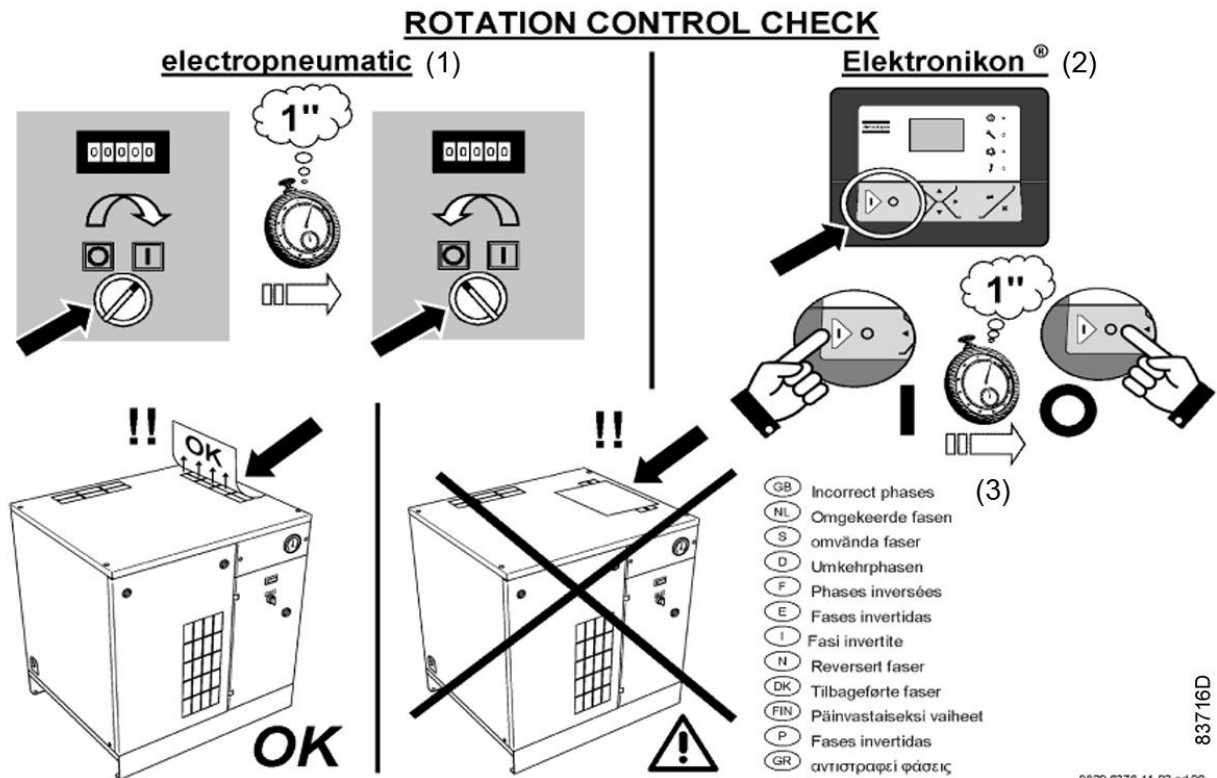


Transport brackets on QOF 7.5

2. Close the air outlet valve (AV - see section Introduction).
3. Check the settings of overload relay (F21 - see section Settings of overload relay and fuses).
Check the drive motor connections. Connect the compressor to the electricity net.
4. Close the condensate drain valve(s). See sections Introduction and Flow diagram for their location.
5. Switch on the voltage. Lamp (H1) alights.
Start the compressor and stop it immediately by means of switch Q1 (see section

Introduction).

On 3-phase units, check the rotation direction of drive motor. For this purpose, a sheet with start-up instructions is fitted to the outlet grating. When the rotation direction is correct, the paper will be blown upwards. If the direction is wrong, stop the compressor immediately and reverse two incoming electric lines.



A compressor equipped with a phase sequence relay will not start if the phase sequence is wrong. In that case, reverse two incoming electric lines to solve the issue.

Starting

Control panel



Section IV - Operation

Gp	Pressure gauge	Q1/H1	On/off switch with lamp
P1	Hour meter	Gd	Dew point gauge

Procedure

1. Close the manual condensate drain valve(s) if present.
 2. Open the air outlet valve (AV).
 3. Switch on the voltage. Lamp (H1) alights.
 4. Rotate switch (Q1) to position I.
 5. The motor starts and stops automatically depending on the air pressure.
 6. On compressors equipped with a refrigerant dryer, the dew point of the refrigerant dryer will be reached after a few minutes.
-

During operation

Procedure

1. Check the pressure gauge (Gp) on the control panel to check the pressure setting.
2. On compressors with a built-in refrigerant dryer, check also the temperature gauge (Gd) on the control panel to check the dew point.
Check that condensate is discharged regularly by the automatic drain of the dryer.
The amount of condensate depends on the operating conditions of the unit and the humidity of the air.
Open the manual drain valve from time to time to remove eventual impurities (see also section Preventive Maintenance schedule).
3. On receiver mounted compressors, open the manual drain valve of the air receiver regularly to remove the water (specially in case of compressors without dryer). See also section Preventive Maintenance schedule).

NOTICE!

The dew point will deviate from nominal when the nominal conditions are exceeded.
If the dew point remains too high or unstable, consult section Problem solving.

Stopping

Control panel



Gp	Pressure gauge	Q1/H1	On/off switch with lamp
P1	Hour meter	Gd	Dew point gauge

Procedure

1. Rotate switch (Q1) to position O. The compressor stops.
2. Switch off the voltage.
3. Close air outlet valve (AV - see section Introduction).



CAUTION!

The refrigerant air dryer and the air receiver remain under pressure. If it is necessary to depressurize, open the manual drain valve(s).

Taking out of operation

Procedure

1. Stop the compressor and close the air outlet valve.
2. Switch off the voltage and disconnect the compressor from the mains.
3. Depressurise the compressor.
On compressors with refrigerant dryer and on compressors with an air receiver, open the manual drain valve(s) (Dm / Dm1).
4. If provided, shut off and depressurize the part of the air net which is connected to the outlet valve. Disconnect the compressor from the air net.
5. If provided, disconnect the compressor condensate piping from the local condensate drain system.

Section V - Preventive maintenance

- Preventive maintenance schedule
- Service kits
- Disposal of used material

Preventive maintenance schedule



CAUTION!

Before carrying out any maintenance, repair work or adjustments, proceed as follows:

- Stop the compressor.
- Switch off the voltage and open the isolating switch.
- Close the air outlet valve.
- Depressurize the compressor by opening the manual drain valve(s).

The operator must apply all relevant Safety precautions during maintenance or repair.

Warranty - Product Liability

Use only authorized parts.

Any damage or malfunction caused by bad maintenance is not covered by Warranty or Product Liability.

General

When servicing, replace all removed gaskets, O-rings and washers.

Intervals

The local Customer Centre may overrule the specified maintenance schedule, especially the service intervals, depending on the environmental and working conditions of the compressor.



NOTICE!

The longer interval checks and actions must also include the shorter interval checks.

Preventive maintenance schedule

Period (note 1)	Running hours (note 1)	Operation
Daily	-	• Check readings on the display. • Compressors with integrated air receiver and/or compressors with integrated refrigerant dryer: Check if condensate is discharged regularly. • Receiver mounted compressors: Drain the condensate manually at the end of the day. • Compressors with integrated dryer: Check the dew point.
Every 3 months (note 2)	500	Inspect the air inlet filter(s) (AF). Inspect the prefilter mats on the cooling air intake openings (if fitted). Check for cleanness and damage. Clean if dirty, replace if damaged. Clean the compressor and check the air cooler . If necessary, clean by air jet.

Section V - Preventive maintenance

Period (note 1)	Running hours (note 1)	Operation
Every 6 months	-	• Manually operate the safety valve. • Check for any damaged wiring or loose connections. • Check for air leaks.
Every 6 months (note 2)	-	Compressors with integrated dryer: • If dirty, brush or blow off the finned surface of the dryer's condenser. • Inspect and clean the electronic drain: • Functioning of the drain can be checked by pushing the TEST button of the drain. • Cleaning of the drain filter can be done by opening the manual drain valve during a few seconds.
Yearly	2500	• Replace the air inlet filter(s) (AF) and the prefilter mats on the cooling air intake openings (if fitted) (note 2). • Test the safety valve. • Have temperature protection and motor overload tested. • Check tension and condition of the V-belt(s).
Every 2 years	5000	• Replace the V-belt(s). • Replace check valve.
Every 2 years	5000	8 bar and 116 psi compressors: Have the orbiting scroll bearing greased (see note 3).
Every 2 years	5000	10 bar and 145 psi compressors: • Replace the element outlet pipe and the plastic insert. See section Outlet pipe replacement. (Only on QOF 2, QOF 3 and QOF 5). • Clean fan (FN1 - see Flow diagram), fan duct and element cooling fins (see note 2). • Have orbiting scroll bearing and pin crank bearings greased (see note 3). • Replace tip seals and dust seal (see also note 4).
Every 4 years	10000	8 bar and 116 psi compressors: • Replace the element outlet pipe and the plastic insert. See section Outlet pipe replacement. (Only on QOF 2, QOF 3 and QOF 5). • Clean fan (FN1 - see Flow diagram), fan duct and element cooling fins (see note 2). • Have orbiting scroll bearing and pin crank bearings greased (see note 3). • Replace tip seals and dust seal (see also note 4).

Section V - Preventive maintenance

Notes:

1. Maintenance must be done according the number of running hours or according the running period, whichever comes first.
 2. More frequently in a dusty environment.
 3. **Important note:** Greasing of the bearings of the compressor element must be done with **special grease**, a **special grease gun** and according a **specific procedure**. In high ambient conditions, the bearings must be greased more frequently: for every 5 °C (9 °F) increase above 30 °C (86 °F), the maintenance interval should be reduced with 30 %.
Contact your supplier for details.
 4. In extremely dry conditions (relative humidity below 15 %), the tip seals and dust seals need to be replaced more frequently.
-

Service kits

Service kits

For overhauling and for preventive maintenance, a wide range of service kits is available. Service kits comprise all parts required for servicing the component and offer the benefits of genuine parts while keeping the maintenance budget low.

Consult the Spare Parts List for part numbers.

Disposal of used material

Used filters or any other used material (e.g. desiccant, lubricants, cleaning rags, machine parts, etc.) must be disposed of in an environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

Electronic components are subject to the EU Directive 2002/96/EC for Waste Electrical and Electronic Equipment (WEEE). As such, these parts must not be disposed of at a municipal waste collection point. Refer to local regulations for directions on how to dispose of this product in an environmental friendly manner.

- Pressure switch
- Air filter
- Air cooler
- Drive motor
- Safety valve
- Belt replacement
- Temperature protection
- Cleaning the compressor element
- Replacement of the outlet pipe
- Refrigerant dryer maintenance

Pressure switch

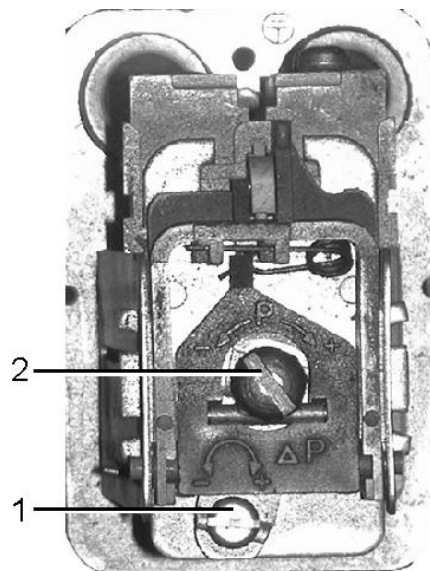
Description

The pressure switch (PS - See section Flow diagram) determines the operating pressure of the compressor. The stopping and starting pressures are the opening and closing pressures of the switch.

NOTICE!

Adjustments may only be carried out when the switch is pressurized.

Pressure switch



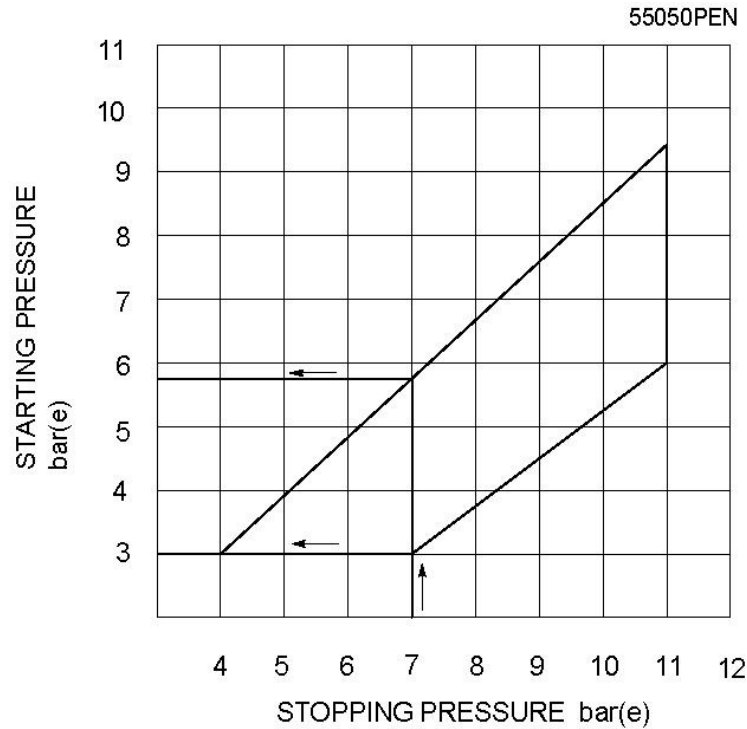
56160F

The stopping pressure is controlled by adjusting screw (2). Turn the screw clockwise to raise the stopping pressure, anti-clockwise to lower it.

The pressure difference between starting and stopping is adjusted by means of adjusting screw (1). Turn the screw anti-clockwise to reduce the pressure difference, clockwise to increase it.

Section VI - Adjustments and servicing procedures

Adjustment range



Example:

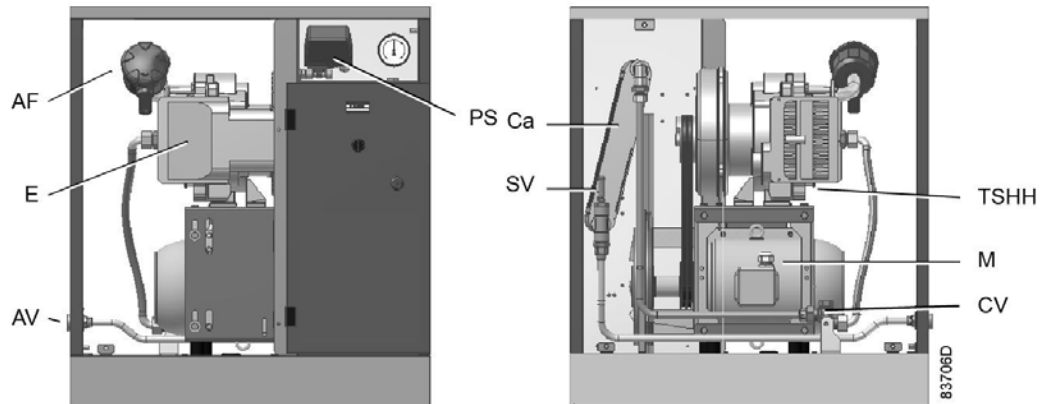
Stopping pressure: 7 bar(e) (100 psig)

Starting pressure: adjustable between 5.8 bar(e) (84 psig) and 3 bar(e) (43.5 psig)

8 bar (116 psi) units: the pressure switch is factory-adjusted to start the compressor at 6.5 bar(e) (94 psig) and to stop at 7.75 bar(e) (112 psig).

10 bar (145 psi) units: the pressure switch is factory-adjusted to start the compressor at 8 bar(e) (116 psig) and to stop at 9.75 bar(e) (141 psig).

Air filter



Location of the air filter (AF)

Procedure

1. Stop the compressor, close the air outlet valve and switch off the voltage.
2. Remove the filter cover and the filter element. Discard damaged or clogged elements. Clean the cover.
3. Fit the new element and reinstall the filter cover.

QOF 7.5 has 2 air filters.

Air cooler

Cleaning

Keep the cooler clean to maintain cooling efficiency. If necessary, remove any dirt with a fibre brush. Never use a wire brush or metal objects.

Next, clean by air jet in reverse direction of normal flow.

If it is necessary to wash the cooler with a cleansing agent, consult your supplier.

Drive motor

Instructions

The motor bearings are greased for life and do not require special attention. Keep the motor free from dust for optimal cooling.

Safety valve

Testing



Testing shall only be carried out by competent personnel

1. Stop the compressor, close the air outlet valve and switch off the voltage.

Section VI - Adjustments and servicing procedures

2. Depressurize the compressor.
3. Remove the safety valve. See section Introduction for the location of the safety valve (SV).
4. Test the safety valve on a separate compressed air circuit by gradually increasing the pressure. If the safety valve does not open at the specified pressure, it must be replaced. See section Temperature protection and safety valve settings for the opening pressure of the safety valve.



WARNING!

No adjustments are allowed.

Never run the compressor without a safety valve.

Belt replacement

Procedure

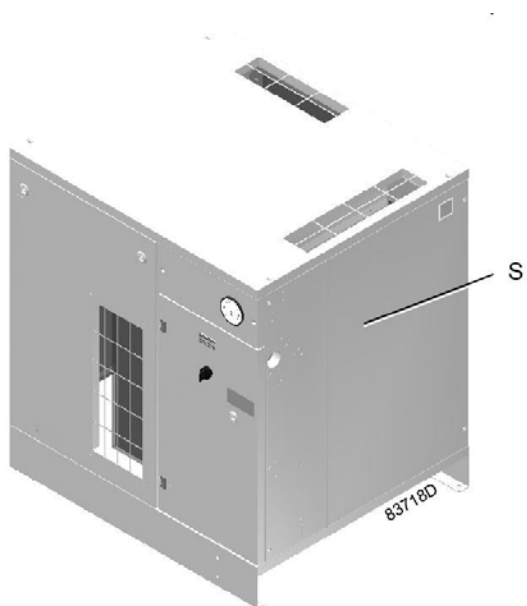


NOTICE!

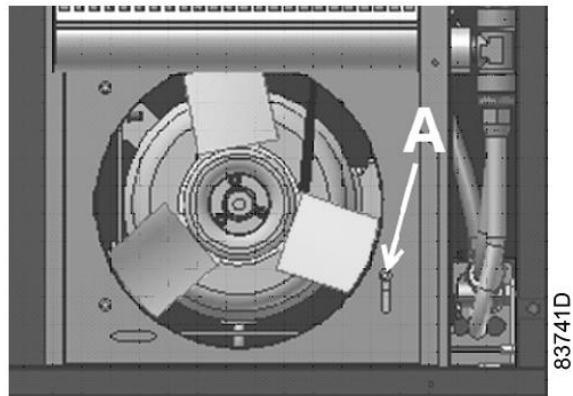
If more than one belt is used, the belts must be replaced as a set, even if only one of them seems worn.

Use genuine spare parts belts only. The number of the belt set is mentioned in the Parts list.

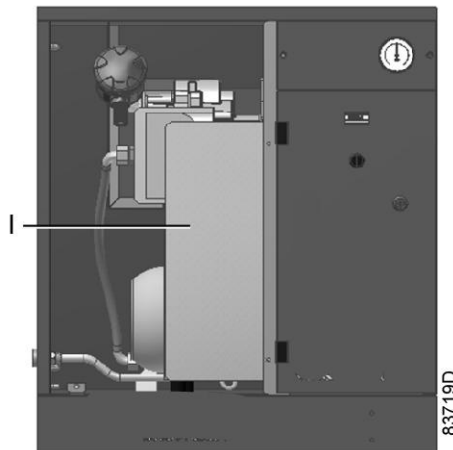
1. Remove the service panel (S).



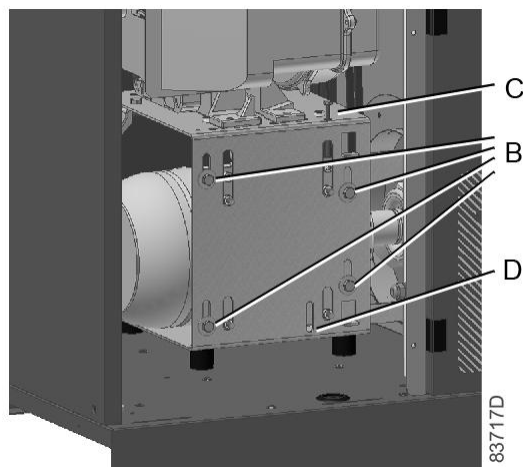
2. Loosen screw (A).



3. Remove the front panel.
4. Remove the inlet baffle (I).



5. Loosen screws (B).



6. Loosen screw (C).
7. Use slot (D) to lift the motor plate.
8. Install the new belt(s) in the pulley grooves.

Section VI - Adjustments and servicing procedures

9. Set the tension of the belt(s) by screwing bolt (C) out. Refer to the label on the motor plate for tensioning data:



10. Tighten screws (B). Reinstall the inlet baffle.
11. Check the belt tension after the first 500 running hours.

Temperature protection

Description

The scroll element is protected by a temperature switch.

The switch monitors the temperature of the compressor element.

The switch shuts down the compressor in case of overheating. After cooling down, the switch automatically resets itself.

No adjustment is possible.



- When the compressor is stopped due to overheating, be aware that the compressor will restart automatically after cooling down. **Therefore, always switch off the power before starting maintenance or repair activities.**
- Never run the compressor without temperature switch.

Cleaning the compressor element



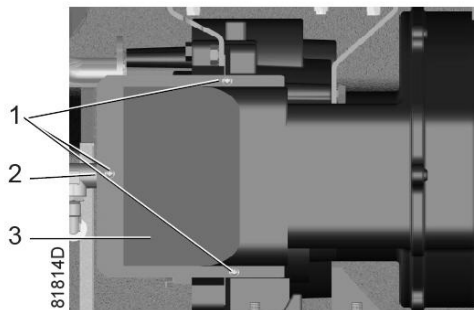
- Compressor element cooling channels can be hot when the compressor has just been turned off.
- Do not clean the cooling channels with organic solvent since this will damage the surface treatment.

Section VI - Adjustments and servicing procedures

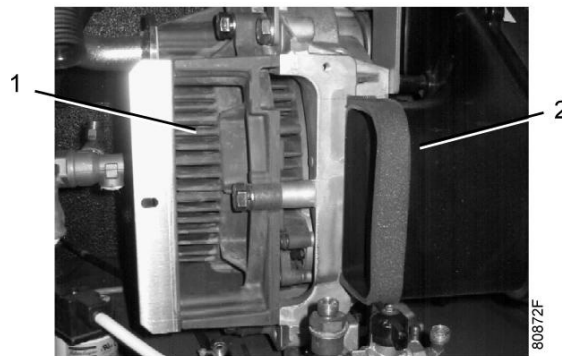
The purpose of cleaning the cooling channels of a scroll element is to prevent the cooling channels to silt up and as such reduce the cooling efficiency. A reduced cooling efficiency can lead towards a premature compressor element failure.

Procedure:

1. Stop the compressor and switch off the power.
2. Close the air outlet valve and depressurise the compressor.
3. Remove the fan duct:
 - Unscrew the 3 bolts (1).
 - Remove clip (2) (if applicable).
 - Remove fan duct (3).



4. Clean cooling channels:
 - Remove dust from the cooling channels (1) by means of air jet (see next figure).
 - Clean the fan duct (2).



5. Reassemble the fan duct:
 - Put the fan duct in place.
 - Fit the 3 bolts and the clip.

The unit is now again ready for use.

Section VI - Adjustments and servicing procedures

Replacement of the outlet pipe

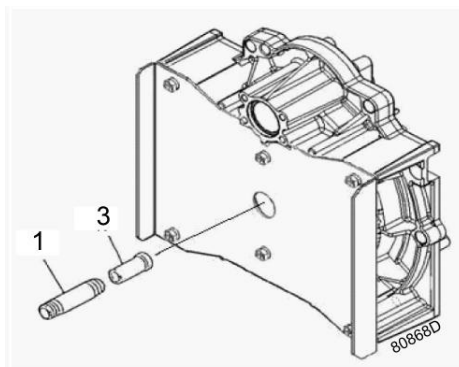
(only applicable to QOF 2, QOF 3 and QOF 5)

Description

The scroll element outlet pipe (1) contains a plastic insert (3). Due to the heat of the compressed air, the plastic insert can become brittle. Therefore it is recommended to replace the outlet pipe together with the insert when that is the case. Both parts are available as a kit (outlet pipe set). See the Spare Parts List for part number.

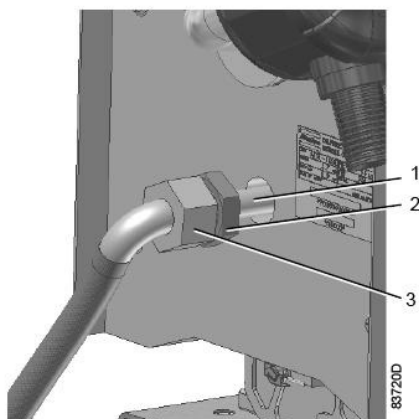
The outlet pipe set contains two parts:

- The plastic insert (3)
- The metal outlet pipe (1)



Procedure

1. Stop the compressor, depressurize and switch off the voltage.
2. Loosen the coupling (3) while fixating the nipple (2) with a spanner.



3. Remove the outlet pipe together with the nipple
4. Fit the nipple to the new outlet pipe and tighten. Use only PTFE tape.
5. Fit the plastic insert in place as indicated on the drawing and assemble the outlet pipe with a maximum torque of 10 Nm (7.4 lbf.ft) plus maximum one turn (360°).
Warning: If the outlet pipe is tightened too hard, the insert can break, resulting in overheating of the compressor element.

Refrigerant dryer maintenance

Safety precautions

The dryer circuit contains refrigerant. When handling refrigerant, all applicable Safety precautions during maintenance or repair must be observed. Specifically be aware of following points:

- Contact of liquid refrigerant with the skin can cause freezing. Wear special gloves. If contacted with the skin, the skin should be rinsed with water. On no account may clothing be removed.
- Fluid refrigerant can also cause freezing of the eyes. Wear safety glasses.
- Avoid inhalation of refrigerant vapors. Check that the working area is adequately ventilated.

Be aware that internal components of the dryer such as the pipes can reach a temperature of up to 110°C (230°F). Therefore, wait until the dryer has cooled down before removing the side panels.

Before starting any maintenance or repair work, switch off the voltage and close the air outlet valve.

Local legislation

Local legislation may stipulate that:

- Work on the refrigerant circuit of the cooling dryer or on any equipment which influences its function must be undertaken by an authorized control body.
- The installation should be checked once a year by an authorized control body.

General

The following remarks should be kept in mind:

- Keep the dryer clean.
- Brush or blow off the finned surface of condenser regularly.
- Inspect and clean the electronic condensate drain regularly.
 - a. Functioning of the drain can be checked by pushing the TEST button of the drain, consult section Air dryer.
 - b. Cleaning of the drain filter can be done by opening the manual drain valve during a few seconds.

Device settings

The regulating and safety devices are factory adjusted to obtain optimum performance of the dryer. Do not alter the setting of any of the devices.



CAUTION!

Connecting pressure measuring devices in the refrigerant circuit can change the amount of refrigerant in the system. This results in a less optimal working of the dryer.

Section VII - Problem solving

Attention

1. Before carrying out any maintenance, repair work or adjustment, switch off the voltage.
2. Open and lock the isolating switch to prevent an accidental start.
3. Isolate the compressor by closing the outlet valve.
4. Depressurize the system by opening the drain valve(s).

Compressor

Condition	Fault	Remedy
The compressor does not start.	Pressure too high.	Compressor will start again when the pressure drops to the starting pressure.
	On/off switch (Q1) malfunctioning or loose connection	Have electrical connections checked. Test switch. Replace if necessary.
	Thermal overload of switch (Q1)	Restart after cooling down.
	Switch (TSHH) open or motor protection relay (F21) tripped	Wait for switch to cool down. Replace switch if necessary. Reset overload relay (F21).
	Air pressure switch (PS) out of order	Test switch, replace if necessary.
The compressor does not stop and/or safety valve blows.	Air pressure switch (PS) opens too late or not at all.	Readjust switch, replace if necessary.
	Safety valve (SV) opens too soon.	Have valve replaced.
Pressure difference between stopping and starting cannot be adjusted	Air pressure switch (PS) out of order	Replace if necessary.
Compressor capacity or pressure below normal	Air consumption exceeds capacity of compressor.	Check equipment connected.
	Choked air filter	Remove and check filter. Replace if necessary.
	Safety valve leaking	Replace valve.
	Drive belts slipping.	Check condition of belts and belt tension. Correct or replace as required.
	Compressor element out of order	Consult the supplier.

Condition	Fault	Remedy
Compressor overheating and/or shut-down by air temperature switch (TSHH)	Insufficient compressor cooling	Clean compressor element fins and fan, see section Cleaning. Improve ventilation of compressor room, see section Installation proposal . Reset overload relay (F21) if necessary.
	Cooling fans (FN1 and FN2) out of order.	Check and correct, reset overload relay (F21) if necessary.
	Temperature shutdown switch out of order.	Replace switch.

Refrigerant dryer

For compressors with a built-in refrigerant dryer also:

Condition	Fault	Remedy
Dew point too high	Air inlet temperature too high	Check and correct; see section Reference conditions and limitations
	Fuses blown	Check fuses and remedy the cause.
	Shortage of refrigerant	Have circuit repaired or recharged.
	Refrigerant compressor does not run	See below
	Evaporator pressure is too high	See below
	Condenser pressure is too high	See below
Condenser pressure too high or too low	Fan control switch out of order	Have switch replaced
	Condenser fan motor out of order	Have fan motor inspected
	Ambient temperature too high	Improve ventilation of compressor room, see section Installation proposal
	Condenser externally clogged	Clean condenser
Motor of refrigerant compressor stops or does not start	The internal thermal protection of the motor has tripped	Compressor will restart when the motor windings have cooled down.
	Electric power supply to refrigerant compressor interrupted	Check and correct as necessary
Evaporator pressure is too high or too low	Condenser pressure too high or too low	See below
	Shortage of refrigerant	Have circuit repaired or recharged
	Hot gas bypass valve incorrectly set or out of order	Have the valve adjusted or replaced

Section VII - Problem solving

Condition	Fault	Remedy
Condensate trap continuously discharging air and water	Automatic drain out of order	Have the drain checked. Replace as necessary
Electronic condensate drain inoperative	Drain system clogged	Clean the filter of the automatic drain by opening the manual drain valve. Check functioning of the drain by pushing the test button.

- Readings on control panel
- Electric cable size
- Settings for overload relay and fuses
- Temperature protection and safety valve settings
- Reference conditions and limitations
- Compressor data

Readings on control panel

Description

NOTICE!

The readings mentioned below are valid under the reference conditions (see section Reference conditions and limitations).



Gp	Air outlet pressure Reading: modulates between preset starting pressure and stopping pressure. See section Pressure switch
Gd	Dew point temperature Reading: approx. 2 - 5 °C (35 - 41 °F). See section Compressor data.
P1	Hour meter Reading: total running time
Q1/H1	On/off switch with lamp

Electric cable size

Attention



Warning!

Local regulations remain applicable if they are stricter than the values proposed below.

The voltage drop must not exceed 5% of the nominal voltage. It may be necessary to use cables of a larger size than those stated to comply with this requirement.

Cable size

		QOF 2	QOF 3	QOF 5	QOF 7.5
Frequency	Voltage	Cable size	Cable size	Cable size	Cable size
IEC					
50 Hz	200 V 3~	-	-	6 mm ²	6 mm ²
50 Hz	230 V 1~	4 mm ²	6 mm ²	-	-

Section VIII - Technical data

		QOF 2	QOF 3	QOF 5	QOF 7.5
Frequency	Voltage	Cable size	Cable size	Cable size	Cable size
50 Hz	230 V 3~	-	4 mm ²	6 mm ²	6 mm ²
50 Hz	400 V 3~	-	1.5 mm ²	1.5 mm ²	2.5 mm ²
50 Hz	400 V 3~ + N	-	1.5 mm ²	1.5 mm ²	2.5 mm ²
UL/CUL					
60 Hz	200 V 3~	--	AWG 12	AWG 10	AWG 8
60 Hz	230 V 1~	AWG 10	-	-	-
60 Hz	230 V 3~	-	AWG 12	AWG 10	AWG 8
60 Hz	460 V 3~	-	AWG 12	AWG 10	AWG 8

Settings for overload relay and fuses

Attention



Warning!

The indicated fuse value is the maximum value with regard to the short circuit protection of the starter. The cable size used may specify fuses of a lower value.

Fuse specifications IEC: gL/gG

Fuse specifications CSA: HRC Form II - UL: Class 5

Settings

		QOF 2	QOF 2	QOF 3	QOF 3
Frequency	Voltage	Overload relay	Maximum fuse	Overload relay	Maximum fuse
IEC					
50 Hz	230 V 1~	12.6 A	25 A	16.2 A	25 A
	230 V 3~	-	-	9.7 A	40 A
	400 V 3~	-	-	5.6 A	10 A
	400 V + N 3~	-	-	5.6 A	10 A
UL/CUL					
60 Hz	200 V 3~	-		10.1 A	15/15/20 A*
	230 V 1~	10.6A	15/15/20 A*	16.3 A	25/25/30 A *
	230 V 3~	-	-	9.1 A	15/15/15 A*
	460 V 3~	-	-	4.6 A	8/8/8 A*

*: Maximum fuses according HRCII-C, according Class K5 for units without refrigerant dryer and according Class K5 for units with refrigerant dryer respectively.

		QOF 5	QOF 5	QOF 7.5	QOF 7.5
Frequency	Voltage	Overload relay	Maximum fuse	Overload relay	Maximum fuse
IEC					
50 Hz	200 V 3~	17.3 A	50A	25.7A	50 A
50 Hz	230 V 3~	15.0 A	40 A	22.3 A	40 A
50 Hz	400 V 3~	8.7 A	16 A	12.8 A	25 A
50 Hz	400 V + N 3~	8.7 A	16 A	12.8 A	25 A
UL/CUL					
60 Hz	200 V 3~	16.6 A	25/25/30 A*	25.2 A	40/40/45 A*
60 Hz	208 V	--	--	24.3 A	40/40/45 A*
60 Hz	230 V 3~	15.2 A	25/25/30 A*	24.0 A	40/40/45 A*
60 Hz	460 V 3~	7.6 A	10/10/15 A*	12.0 A	20/20/20 A*

*: Maximum fuses according HRCII-C, according Class K5 for units without refrigerant dryer and according Class K5 for units with refrigerant dryer respectively.

Temperature protection and safety valve settings

Temperature shut-down switch settings

Compressor element outlet temperature	Opens at	Reference
QOF 2 (8 bar / 116 psi)	70 °C (158 °F)	TDS1
QOF 2 (10 bar / 145 psi)	80° C (176 °F)	TSD1
QOF 3 (8 bar and 10 bar / 116 and 145 psi)	70 °C (158 °F)	TSD1
QOF 5 (8 bar and 10 bar / 116 and 145 psi)	70 °C (158 °F)	TSD1
QOF 7.5 (8 bar and 10 bar / 116 and 145 psi)	200 °C (392 °F)	TSD2

Safety valve

Pressure version	Set pressure	Unit	Reference
8 bar compressors	8.8	bar(e)	SV
116 psi compressors	135	psi(g)	SV
10 bar compressors	11	bar(e)	SV
145 psi compressors	160	psi(g)	SV

Section VIII - Technical data

Reference conditions and limitations

Reference conditions

Air inlet pressure (absolute)	bar	1
Air inlet pressure (absolute)	psi	14.5
Air inlet temperature	°C	20
Air inlet temperature	°F	68
Relative humidity	%	0
Working pressure		See section Compressor data.

Limits

Maximum working pressure		See section Compressor data.
Maximum air inlet temperature	°C	40
Maximum air inlet temperature	°F	104
Minimum ambient temperature	°C	0
Minimum ambient temperature	°F	32

Compressor data



NOTICE!

All data specified below apply under reference conditions, see section Reference conditions and limitations.

Compressor type		QOF 2	QOF 2	QOF 3	QOF 3
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Maximum working pressure (Pack)	bar(e)	8	10	8	10
Maximum working pressure (Pack)	psi(g)	116	145	116	145
Maximum working pressure (Full-Feature)	bar(e)	7.75	9.75	7.75	9.75
Maximum working pressure (Full-Feature)	psi(g)	112	141	112	141
Reference working pressure	bar(e)	7	10	7	10
Reference working pressure	psi(g)	100	145	100	145
Air temperature at outlet valve (QOF), approx.	°C	25	25	25	25
Air temperature at outlet valve (QOF), approx.	°F	77	77	77	77
Air temperature at outlet valve (QOF with dryer), approx.	°C	20	20	20	20
Air temperature at outlet valve (QOF with dryer), approx.	°F	68	68	68	68
Motor shaft speed (50 Hz)	r/min	1445	1445	2885	2885
Motor shaft speed (60 Hz)	r/min	1740	1740	3520	3520

Section VIII - Technical data

Compressor type		QOF 2	QOF 2	QOF 3	QOF 3
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Nominal motor power	kW	1.5	1.5	2.2	2.2
Nominal motor power	hp	2	2	3	3
Sound pressure level	dB(A)	52	52	56	56
Refrigerant type (Full-Feature)		R134a	R134a	R134a	R134a
Dew point (refrigerant dryer)	°C	2	2	4	4
Dew point (refrigerant dryer)	°F	36	36	39	39

Compressor type		QOF 5	QOF 5	QOF 7.5	QOF 7.5
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Maximum working pressure (Pack)	bar(e)	8	10	8	10
Maximum working pressure (Pack)	psi(g)	116	145	116	145
Maximum working pressure (Full-Feature)	bar(e)	7.75	9.75	7.75	9.75
Maximum working pressure (Full-Feature)	psi(g)	112	141	112	141
Reference working pressure	bar(e)	7	10	7	10
Reference working pressure	psi(g)	100	145	100	145
Air temperature at outlet valve (QOF), approx.	°C	32	32	35	35
Air temperature at outlet valve (QOF), approx.	°F	90	90	95	95
Air temperature at outlet valve (QOF with dryer), approx.	°C	21	21	22	22
Air temperature at outlet valve (QOF with dryer), approx.	°F	70	70	72	72
Motor shaft speed (50 Hz)	r/min	2900	2900	2905	2905
Motor shaft speed (60 Hz)	r/min	3510	3510	3515	3515
Nominal motor power	kW	3.7	3.7	5.5	5.5
Nominal motor power	hp	5	5	7.5	7.5
Sound pressure level	dB(A)	58	58	59	59
Refrigerant type (Full-Feature)		R134a	R134a	R134a	R134a
Dew point (refrigerant dryer)	°C	3	3	3	3
Dew point (refrigerant dryer)	°F	37	37	37	37

Section IX - Instructions for use

Air receiver

This section applies to compressors including air receiver(s).

-	The vessel can contain pressurized air; this can be potentially dangerous if the equipment is misused.
-	The vessel shall only be used to store compressed air and shall not be subject to rapid fluctuation of pressure.
-	The vessel shall only be used within the pressure and temperature limits stated on the data plate and the testing report, which should be kept in a safe place.
-	No alterations must be made to this vessel by welding, drilling or other mechanical methods without the written permission of the manufacturer.
-	Make sure that the vessel is equipped with suitable and appropriate safety and control fittings and replace them with new ones if necessary (consult the Parts list). The discharge capacity of the safety valve used must be higher than the capacity of the compressor.
-	Do not store the vessel near heating sources and inflammable substances and avoid storing the vessel in badly ventilated rooms.

-	Depending on the conditions of use and the configuration of the equipment, condensate may accumulate inside the tank and must be drained every day to prevent corrosion. This may be done manually, by opening the drain valve, or by means of the automatic drain, if fitted to the vessel. Nevertheless, a weekly check of correct functioning of the automatic valve is needed. This has to be done by opening the manual drain valve and check for condensate.
-	Yearly service inspection of the air receiver is needed, as internal corrosion can reduce the steel wall thickness with the consequent risk of bursting. Local rules need to be respected, if applicable. The use of the air receiver is forbidden once the wall thickness reaches the minimum value as indicated in the service manual of the air receiver (part of the documentation delivered with the unit).
-	Lifetime of the air receiver mainly depends on the working environment. Avoid installing the compressor in a dirty and corrosive environment, as this can reduce the vessel lifetime dramatically.
-	Do not anchor the vessel or attached components directly to the ground or fixed structures. Fit the pressure vessel with vibration dampers to avoid possible fatigue failure caused by vibration of the vessel during use.
-	Use the vessel within the pressure and temperature limits stated on the nameplate and the testing report.
-	No alterations must be made to this vessel by welding, drilling or other mechanical methods.

Guidelines

On the Declaration of Conformity / Declaration by the Manufacturer, the harmonised and/or other standards that have been used for the design are shown and/or referred to.

The Declaration of Conformity / Declaration by the Manufacturer is part of the documentation that is supplied with this compressor.

Local legal requirements and/or use outside the limits and/or conditions as specified by the manufacturer may require other inspection periods as mentioned below.

Section XI - Pressure equipment directives

Components subject to 97/23/EC Pressure Equipment Directive

Components subject to 97/23/EC Pressure Equipment Directive greater than or equal to category II

Pressure version	Part number	Description	PED Class
8 bar	0830 1008 54	Safety valve	IV
116 psi	0830 1008 49	Safety valve	IV
10 bar	0830 1007 68	Safety valve	IV
145 psi	0830 1008 35	Safety valve	IV

Overall rating

The compressors conform to PED smaller than category I.

EC DECLARATION OF CONFORMITY

(1)
We,, declare under our sole responsibility, that the product
Machine name
Machine type
Serial number

Which falls under the provisions of article 12.2 of the EC Directive 2006/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with the relevant Essential Health and Safety Requirements of this directive.

The machinery complies also with the requirements of the following directives and their amendments as indicated.

Directive on the approximation of laws of the Member States relating to		Harmonized and/or Technical Standards used	Att' mnt
a.	Pressure equipment	97/23/EC	
b.	Machinery safety	2006/42/EC EN ISO 12100 – 1 EN ISO 12100 – 2 EN 1012 – 1	
c.	Simple pressure vessel	2009/105/EC	
d.	Electromagnetic compatibility	2004/108/EC EN 61000-6-2 EN 61000-6-4	
e.	Low voltage equipment	2006/95/EC EN 60034 EN 60204-1 EN 60439	
f.	Outdoor noise emission	2000/14/EC	
g.	Equipment and protective systems in potentially explosive atmospheres	94/9/EC	
h.	Medical devices General	93/42/EEC EN ISO 13845 EN ISO 14971 EN 737-3	
i.			

The harmonized and the technical standards used are identified in the attachments hereafter

(Product company) is authorized to compile the technical file.

	Conformity of the specification to the directives	Conformity of the product to the specification and by implication to the directives
Issued by	Product engineering	Manufacturing
Name		
Signature		
Date		

Typical example of a Declaration of Conformity document

(1): Contact address:
International Compressor Distribution NV
Boomsesteenweg 957
B-2610 Wilrijk (Antwerp)
Belgium

81679D

Section XII - Declaration of conformity

On the Declaration of Conformity / Declaration by the Manufacturer, the harmonised and/or other standards that have been used for the design are shown and/or referred to. The Declaration of Conformity / Declaration by the Manufacturer is part of the documentation that is supplied with this device.

STANDARD TERMS AND CONDITIONS

QUINCY COMPRESSOR AND ORTMAN FLUID POWER DIVISIONS

LEGAL EFFECT: Except as expressly otherwise agreed to in writing by an authorized representative of Seller, the following terms and conditions shall apply to and form a part of this order and any additional and/or different terms of Buyer's purchase order or other form of acceptance are rejected in advance and shall not become a part of this order.

The rights of Buyer hereunder shall be neither assignable nor transferable except with the written consent of Seller.

This order may not be canceled or altered except with the written consent of Seller and upon terms which will indemnify Seller against all loss occasioned thereby. All additional costs incurred by Seller due to changes in design or specifications, modification of this order or revision of product must be paid for by Buyer.

In addition to the rights and remedies conferred upon Seller by this order, Seller shall have all rights and remedies conferred at law and in equity and shall not be required to proceed with the performance of this order if Buyer is in default in the performance of such order or of any other contract or order with seller.

TERMS OF PAYMENT: Unless otherwise specified in the order acknowledgment, the terms of payment shall be net cash within thirty (30) days after shipment. These terms shall apply to partial as well as complete shipments. If any proceeding be initiated by or against Buyer under any bankruptcy or insolvency law, or in the judgment of Seller the financial condition of Buyer, at the time the equipment is ready for shipment, does not justify the terms of payment specified, Seller reserves the right to require full payment in cash prior to making shipment. If such payment is not received within fifteen (15) days after notification of readiness for shipment, Seller may cancel the order as to any unshipped item and require payment of its reasonable cancellation charges.

If Buyer delays shipment, payments based on date of shipment shall become due as of the date when ready for shipment. If Buyer delays completion of manufacture, Seller may elect to require payment according to percentage of completion. Equipment held for Buyer shall be at Buyer's risk and storage charges may be applied at the discretion of Seller.

Accounts past due shall bear interest at the highest rate lawful to contract for but if there is no limit set by law, such interest shall be eighteen percent (18%). Buyer shall pay all cost and expenses, including reasonable attorney's fees, incurred in collecting the same, and no claim, except claims within Seller's warranty of material or workmanship, as stated below, will be recognized unless delivered in writing to Seller within thirty (30) days after date of shipment.

TAXES: All prices exclude present and future sales, use, occupation, license, excise, and other taxes in respect of manufacture, sales or delivery, all of which shall be paid by Buyer unless included in the purchase price at the proper rate or a proper exemption certificate is furnished.

ACCEPTANCE: All offers to purchase, quotations and contracts of sales are subject to final acceptance by an authorized representative at Seller's plant.

DELIVERY: Except as otherwise specified in this quotation, delivery will be F. O. B. point of shipment. In the absence of exact shipping instruction, Seller will use its discretion regarding best means of insured shipment. No liability will be accepted by Seller for so doing. All transportation charges are at Buyer's expense. Time of delivery is an estimate only and is based upon the receipt of all information and necessary approvals. The shipping schedule shall not be construed to limit seller in making commitments for materials or in fabricating articles under this order in accordance with Seller's normal and reasonable production schedules.

Seller shall in no event be liable for delays caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control. No provision for liquidated damages for any cause shall apply under this order. Buyer shall accept delivery within thirty (30) days after receipt of notification of readiness for shipment. Claims for shortages will be deemed to have been waived if not made in writing within ten (10) days after the receipt of the material in respect of which any such shortage is claimed. Seller is not responsible for loss or damage in transit after having received "In Good Order" receipt from the carrier. All claims for loss or damage in transit should be made to the carrier.

STANDARD TERMS AND CONDITIONS

QUINCY COMPRESSOR AND ORTMAN FLUID POWER DIVISIONS

TITLE & LIEN RIGHTS: The equipment shall remain personal property, regardless of how affixed to any realty or structure. Until the price (including any notes given therefore) of the equipment has been fully paid in cash, Seller shall, in the event of Buyer's default, have the right to repossess such equipment.

PATENT INFRINGEMENT: If properly notified and given an opportunity to do so with friendly assistance, Seller will defend Buyer and the ultimate user of the equipment from any actual or alleged infringement of any published United States patent by the equipment or any part thereof furnished pursuant hereto (other than parts of special design, construction, or manufacture specified by and originating with Buyer), and will pay all damages and costs awarded by competent court in any suit thus defended or of which it may have had notice and opportunity to defend as aforesaid.

STANDARD WARRANTY: Seller warrants that products of its own manufacture will be free from defects in workmanship and materials under normal use and service for the period specified in the product instruction manual. Warranty for service parts will be ninety (90) days from date of factory shipment. Electric Motors, gasoline and diesel engines, electrical apparatus and all other accessories, components and parts not manufactured by Seller are warranted only to the extent of the original manufacturer's warranty.

Notice of the alleged defect must be given to the Seller, in writing with all identifying details including serial number, type of equipment and date of purchase within thirty (30) days of the discovery of the same during the warranty period.

Seller's sole obligation on this warranty shall be, at its option, to repair or replace or refund the purchase price of any product or part thereof which proves to be defective. If requested by Seller, such product or part thereof must be promptly returned to seller, freight prepaid, for inspection.

Seller warrants repaired or replaced parts of its own manufacture against defects in materials and workmanship under normal use and service for ninety (90) days or for the remainder of the warranty on the product being repaired.

This warranty shall not apply and Seller shall not be responsible or liable for:

- (a) Consequential, collateral or special losses or damages;
- (b) Equipment conditions caused by fair wear and tear, abnormal conditions of use, accident, neglect or misuse of equipment, improper storage or damage resulting during shipping;
- (c) Deviation from operating instructions, specifications or other special terms of sale;
- (d) Labor charges, loss or damage resulting from improper operation, maintenance or repairs made by person(s) other than Seller or Seller's authorized service station.

In no event shall Seller be liable for any claims whether arising from breach of contract or warranty or claims of negligence or negligent manufacture in excess of the purchase price.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLERS AND ANY OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE ARE HEREBY SPECIFICALLY EXCLUDED.

LIABILITY LIMITATIONS: Under no circumstances shall the Seller have any liability for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, whether resulting from delays in delivery or performance, breach of warranty, negligent manufacture or otherwise.

ENVIRONMENTAL AND OSHA REQUIREMENTS: At the time of shipment of the equipment from the factory, Quincy Compressor / Ortman Fluid Power will comply with the various Federal, State and local laws and regulations concerning occupational health and safety and pollution. However, in the installation and operation of the equipment and other matters over which the seller has no control, the Seller assumes no responsibility for compliance with those laws and regulations, whether by the way of indemnity, warranty or otherwise.

This image shows a full page of blank, lined paper. It features approximately 28 evenly spaced horizontal grey lines across its entire surface, providing a template for writing or drawing. The margins are consistent on all sides.

Notes



Quincy Compressor Products: 251.937.5900

E-mail: info@quincycompressor.com

Website: www.quincycompressor.com



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