QGS 40, QGS 50, QGS 60
QGS 75, QGS 100

Oil-flooded rotary screw compressors

Instruction book

Quincy Compressor
Oil-flooded rotary screw compressors

QGS 40, QGS 50, QGS 60, QGS 75, QGS 100

From following serial No. onwards: API 100 000

Instruction book

Original instructions

This instruction book is valid for CE as well as non-CE labelled machines. It meets the requirements for instructions specified by the applicable European directives as identified in the Declaration of Conformity.

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General precautions

1. The operator must employ safe working practices and observe all related work safety requirements and regulations.
2. If any of the following statements does not comply with the applicable legislation, the stricter of the two shall apply.
3. Installation, operation, maintenance and repair work must only be performed by authorized, trained, specialized personnel.
4. The compressor is not considered capable of producing air of breathing quality. For air of breathing quality, the compressed air must be adequately purified according to the applicable legislation and standards.
5. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the compressor, press the emergency stop button, switch off the voltage and depressurize the compressor. In addition, the power isolating switch must be opened and locked.
   On units powered by a frequency converter, wait six minutes before starting any electrical repair.

	If the machine is equipped with an automatic restart after voltage failure function and if this function is active, be aware that the machine will restart automatically when the power is restored if it was running when the power was interrupted!

6. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.
7. The owner is responsible for maintaining the unit in safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.
8. It is not allowed to walk or stand on the unit or on its components.

1.3 Safety precautions during installation

	All responsibility for any damage or injury resulting from neglecting these precautions, or non observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

Precautions during installation

1. The machine must only be lifted using suitable equipment in accordance with the applicable safety regulations. Loose or pivoting parts must be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and deceleration must be kept within safe limits. Wear a safety helmet when working in the area of overhead or lifting equipment.
2. The unit is designed for indoor use. If the unit is installed outdoors, special precautions must be taken; consult your supplier.
3. Place the machine where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care must be taken to minimize the entry of moisture at the inlet air.
4. Any blanking flanges, plugs, caps and desiccant bags must be removed before connecting the pipes.
5. Air hoses must be of correct size and suitable for the working pressure. Never use frayed, damaged or worn hoses. Distribution pipes and connections must be of the correct size and suitable for the working pressure.
6. The aspirated air must be free of flammable fumes, vapors and particles, e.g. paint solvents, that can lead to internal fire or explosion.
7. Arrange the air intake so that loose clothing worn by people cannot be sucked in.
8. Ensure that the discharge pipe from the compressor to the aftercooler or air net is free to expand under heat and that it is not in contact with or close to flammable materials.
9. No external force may be exerted on the air outlet valve; the connected pipe must be free of strain.
10. If remote control is installed, the machine must bear a clear sign stating: DANGER: This machine is remotely controlled and may start without warning.
    The operator has to make sure that the machine is stopped and depressurized and that the electrical isolating switch is open, locked and labelled with a temporary warning before any maintenance or repair. As a further safeguard, persons switching on or off remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
11. Air-cooled machines must be installed in such a way that an adequate flow of cooling air is available and that the exhausted air does not recirculate to the compressor air inlet or cooling air inlet.
12. The electrical connections must correspond to the applicable codes. The machines must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the compressor.
13. On machines with automatic start/stop system or if the automatic restart function after voltage failure is activated, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
14. In multiple compressor systems, manual valves must be installed to isolate each compressor. Non-return valves (check valves) must not be relied upon for isolating pressure systems.
15. Never remove or tamper with the safety devices, guards or insulation fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure must be protected by a pressure relieving device or devices as required.
16. Piping or other parts with a temperature in excess of 70˚C (158˚F) and which may be accidentally touched by personnel in normal operation must be guarded or insulated. Other high temperature piping must be clearly marked.

17. For water-cooled machines, the cooling water system installed outside the machine has to be protected by a safety device with set pressure according to the maximum cooling water inlet pressure.
18. If the ground is not level or can be subject to variable inclination, consult the manufacturer.

	Also consult following safety precautions: Safety precautions during operation and Safety precautions during maintenance. These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein. Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

1.4 Safety precautions during operation

	All responsibility for any damage or injury resulting from neglecting these precautions, or non observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

Precautions during operation

1. Never touch any piping or components of the compressor during operation.
2. Use only the correct type and size of hose end fittings and connections. When blowing through a hose or air line, ensure that the open end is held securely. A free end will whip and may cause injury. Make sure that a hose is fully depressurized before disconnecting it.
3. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
4. Never operate the machine when there is a possibility of taking in flammable or toxic fumes, vapors or particles.
5. Never operate the machine below or in excess of its limit ratings.
6. Keep all bodywork doors shut during operation. The doors may be opened for short periods only, e.g. to carry out routine checks. Wear ear protectors when opening a door.
   On compressors without bodywork, wear ear protection in the vicinity of the machine.
7. People staying in environments or rooms where the sound pressure level reaches or exceeds 80 dB(A) shall wear ear protectors.
8. Periodically check that:
   - All guards are in place and securely fastened
   - All hoses and/or pipes inside the machine are in good condition, secure and not rubbing
   - No leaks occur
   - All fasteners are tight
   - All electrical leads are secure and in good order
   - Safety valves and other pressure relief devices are not obstructed by dirt or paint
   - Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good repair, free of wear or abuse
   - Air cooling filters of the electrical cabinet are not clogged
9. If warm cooling air from compressors is used in air heating systems, e.g. to warm up a workroom, take precautions against air pollution and possible contamination of the breathing air.
10. On water-cooled compressors using open circuit cooling towers, protective measures must be taken to avoid the growth of harmful bacteria such as Legionella pneumophila bacteria.

11. Do not remove any of, or tamper with, the sound-damping material.
12. Never remove or tamper with the safety devices, guards or insulations fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure shall be protected by a pressure relieving device or devices as required.

	Also consult following safety precautions: Safety precautions during installation and Safety precautions during maintenance. These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein. Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

1.5 Safety precautions during maintenance or repair

	All responsibility for any damage or injury resulting from neglecting these precautions, or non observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

Precautions during maintenance or repair

1. Always use the correct safety equipment (such as safety glasses, gloves, safety shoes, etc.).
2. Use only the correct tools for maintenance and repair work.
3. Use only genuine spare parts.
4. All maintenance work shall only be undertaken when the machine has cooled down.
5. A warning sign bearing a legend such as "Work in progress; do not start" shall be attached to the starting equipment.
6. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
7. Close the compressor air outlet valve and depressurize the compressor before connecting or disconnecting a pipe.
8. Before removing any pressurized component, effectively isolate the machine from all sources of pressure and relieve the entire system of pressure.
9. Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapours of cleaning liquids.
10. Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.
11. Never weld 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.
12. 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 the oil vapour when air is admitted.
13. Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
14. Make sure that no tools, loose parts or rags are left in or on the machine.
15. 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.

16. Before clearing the machine for use after maintenance or overhaul, check that operating pressures, temperatures and time settings are correct. Check that all control and shut-down devices are fitted and that they function correctly. If removed, check that the coupling guard of the compressor drive shaft has been reinstalled.
17. Every time the separator element is renewed, examine the discharge pipe and the inside of the oil separator vessel for carbon deposits; if excessive, the deposits should be removed.
18. Protect the motor, air filter, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam cleaning.
19. Make sure that all sound-damping material and vibration dampers, e.g. damping material on the bodywork and in the air inlet and outlet systems of the compressor, is in good condition. If damaged, replace it by genuine material from the manufacturer to prevent the sound pressure level from increasing.
20. Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.
21. **The following safety precautions are stressed when handling refrigerant:**
    - Never inhale refrigerant vapours. Check that the working area is adequately ventilated; if required, use breathing protection.
    - Always wear special gloves. In case of refrigerant contact with the skin, rinse the skin with water. If liquid refrigerant contacts the skin through clothing, never tear off or remove the latter; flush abundantly with fresh water over the clothing until all refrigerant is flushed away; then seek medical first aid.

	Also consult following safety precautions: Safety precautions during installation and Safety precautions during operation. These precautions apply to machinery processing or consuming air or inert gas. Processing of any other gas requires additional safety precautions typical to the application which are not included herein. Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

2 General description

2.1 Introduction

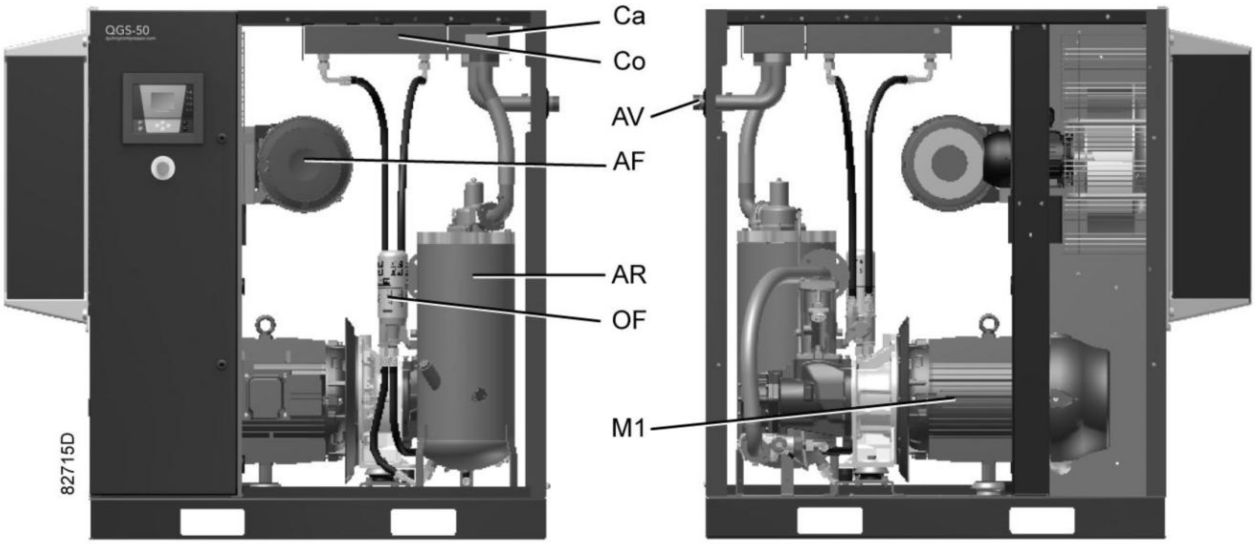
General

QGS 40 up to QGS 100 are single-stage, oil-flooded screw compressors, gearbox driven by an electric motor. The compressors are available in air-cooled version. The compressors are enclosed in sound-insulated bodywork.

The compressors are controlled by the AIRLOGIC² controller.

The AIRLOGIC² controller and the emergency stop button are integrated in the door panel of the electric cubicle. An electric cabinet comprising the motor starter is located behind this panel.

Front view

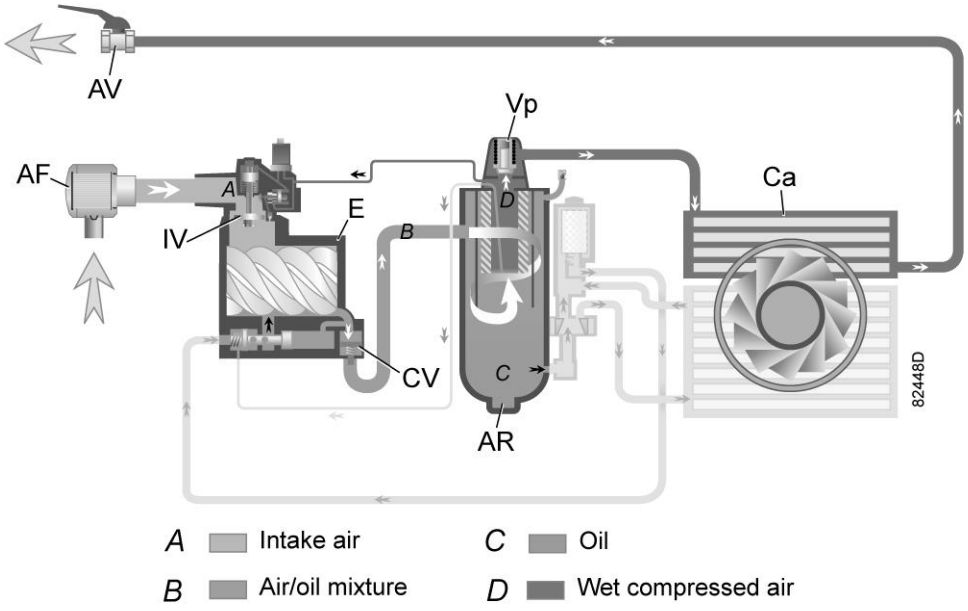


Main components

Ref.	Name
AF	Air filter
AR	Air receiver
AV	Location of air outlet valve
Ca	Air cooler
Co	Oil cooler
ER	Controller
M1	Drive motor
OF	Oil filter
S3	Emergency stop button

2.2 Air and oil circuit

Air circuit



Flow diagram, air circuit

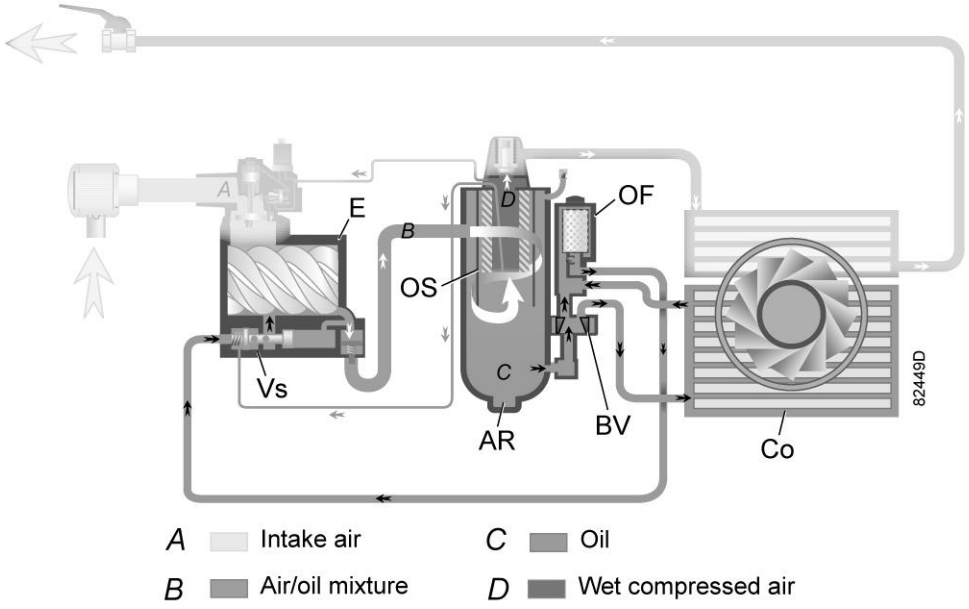
Reference	Description
A	Intake air
B	Air/oil mixture
C	Oil
D	Wet compressed air

Description

Air drawn through filter (AF) and open inlet valve (IV) into compressor element (E) is compressed. A mix of compressed air and oil flows into the air receiver/oil separator (AR) via check valve (CV). The air is discharged through outlet valve (AV) via minimum pressure valve (Vp) and air cooler (Ca).

During loaded operation, minimum pressure valve (Vp) keeps the pressure in the separator tank (AR) above a minimum value, required for lubrication. An integrated check valve prevents the compressed air downstream the valve from being vented to atmosphere during unloaded operation. When the compressor is stopped, check valve (CV) and inlet valve (IV) close, preventing compressed air (and oil) to be vented into the air filter.

Oil circuit



Flow diagram, oil circuit

Description

In air receiver/oil separator (AR), most of the oil is removed from the air/oil mixture by centrifugal action. The remaining oil is removed by oil separator (OS). The oil collects in the lower part of air receiver/oil separator (AR), which serves as an oil tank.

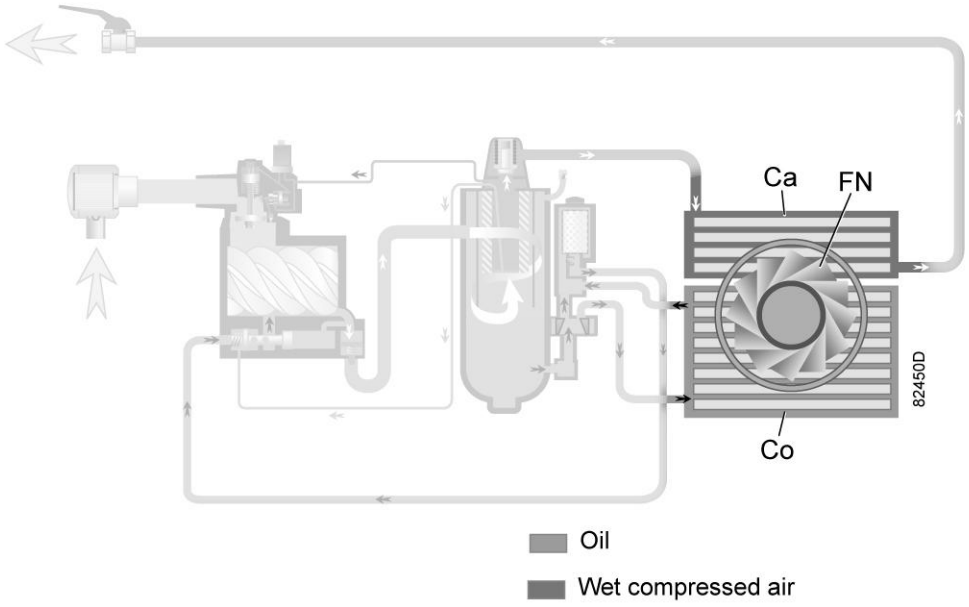
The oil system is provided with a thermostatic bypass valve (BV). When the oil temperature is below its set point, bypass valve (BV) shuts off the supply to oil cooler (Co) and the oil cooler is bypassed.

Air pressure forces the oil from air receiver/oil separator (AR) through oil filter (OF) and oil stop valve (Vs) to compressor element (E).

Bypass valve (BV) starts opening the supply from cooler (Co) when the oil temperature has increased to the set point. At approx. 15 ˚C (27 ˚F) above the set point, all the oil flows through the oil cooler.

Oil stop valve (Vs) prevents the compressor element from flooding with oil when the compressor is stopped. The valve is opened by element outlet pressure when the compressor is started.

Cooling system



Cooling system air-cooled compressors

The cooling system comprises air cooler (Ca) and oil cooler (Co).

On air-cooled compressors, the cooling air flow is generated by a fan (FN).

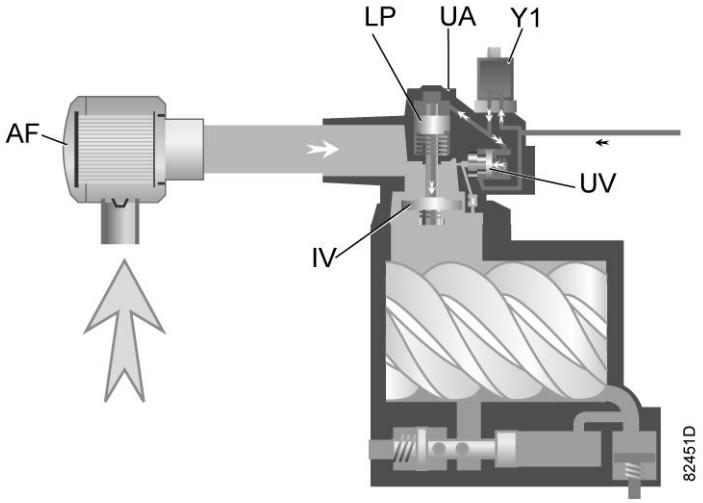
2.3 Regulating system

Unloading

If the air consumption is less than the air output of the compressor, the net pressure increases. When the net pressure reaches the unloading pressure, solenoid valve (Y1) is de-energised. The plunger of the valve returns by spring force.

- The control pressure present in the chambers of loading plunger (LP) and unloading valve (UV) is vented to atmosphere via solenoid valve (Y1).
- Loading plunger (LP) moves upwards and causes inlet valve (IV) to close the air inlet opening.
- Unloading valve (UV) is opened by the pressure in the oil separator vessel. The pressure from the oil separator vessel is released into atmosphere through the unloader (UA).
- The pressure in the oil separator vessel stabilises at low value. A reduced amount of air is compressed to guarantee a minimal pressure, required for lubrication during unloaded operation.

Air output is stopped (0%), the compressor runs unloaded.



Regulating system (loaded condition)

Loading

When the net pressure decreases to the loading pressure, solenoid valve (Y1) is energised.

- Control pressure is fed from the oil separator vessel via solenoid valve (Y1) to loading plunger (LP) and unloading valve (UV).
- Unloading valve (UV) closes the air blow-off opening. Loading plunger (LP) moves downwards and causes inlet valve (IV) to open fully.

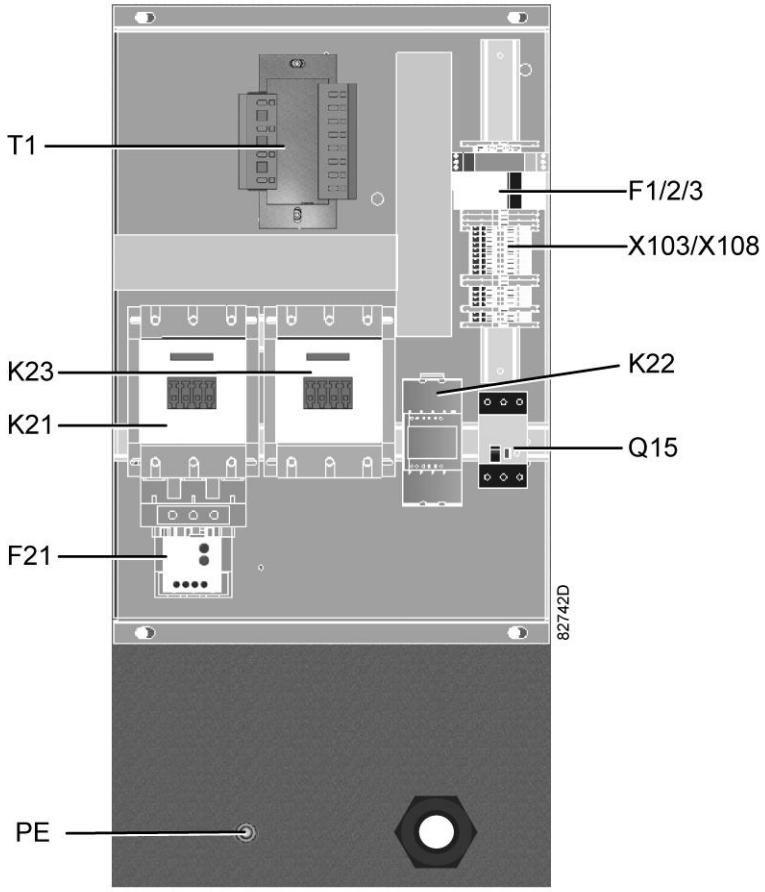
Air delivery is resumed (100%), the compressor runs loaded.

2.4 Electrical system

General

Electrical components

The electrical system comprises following components:



Electric cubicle, typical example

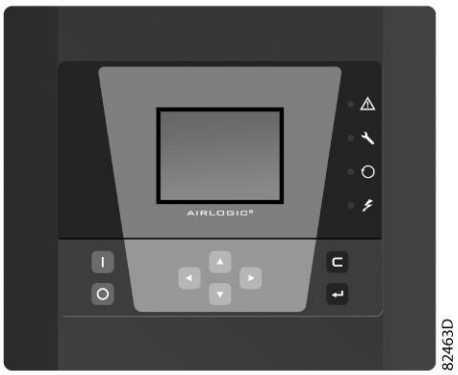
Reference	Designation
F1/2/3	Fuses (F3 is only provided in case a phase sequence relay is provided)
F21	Overload relay, compressor motor
Q15	Circuit breaker, fan motor (on air-cooled compressors)
K21	Line contactor
K22	Star contactor
K23	Delta contactor
T1	Transformer
X103/X108	Connectors
PE	Earth terminal

Electrical diagram

There is a copy of the electrical diagram inside the electrical cubicle.

3 Graphic controller

3.1 Controller



View of the AIRLOGIC² controller

Introduction

The electronic controller has following functions:

- Controlling the compressor
- Protecting the compressor
- Monitoring components subject to service
- Automatic restart after voltage failure

Automatic control of the compressor

The controller maintains the net pressure between programmable limits by automatically loading and unloading the compressor (fixed speed compressors) or by adapting the motor speed (compressors with frequency converter). A number of programmable settings, e.g. the unloading and loading pressures (for fixed speed compressors), the setpoint (for compressors with frequency converter), the minimum stop time and the maximum number of motor starts and several other parameters are taken into account.

The controller stops the compressor whenever possible to reduce the power consumption and restarts it automatically when the net pressure decreases. If the expected unloading period is to short, the compressor is kept running to prevent too short stand-still periods.

⚠	A number of time based automatic start/stop commands may be programmed. Take into account that a start command will be executed (if programmed and activated), even after manually stopping the compressor.

Protecting the compressor

Shut-down

Several sensors are provided on the compressor. If one of the measured signals exceeds the programmed shutdown level, the compressor will be stopped.

Example: If the compressor element outlet temperature exceeds the programmed shut-down level, the compressor will be stopped. This will be indicated on the display of the controller. The compressor will also be stopped in case of overload of the drive motor.

Air-cooled compressors will also be stopped in the event of overload of the fan motor.

⚠	Before remedying, consult the Safety precautions.

Shut-down warning

A shut-down warning level is a programmable level below the shut-down level.

If one of the measurements exceeds the programmed shut-down warning level, this will also be indicated to warn the operator before the shut-down level is reached.

Service warning

If the service timer exceeds a programmed value, this will be indicated on the display to warn the operator to carry out some service actions.

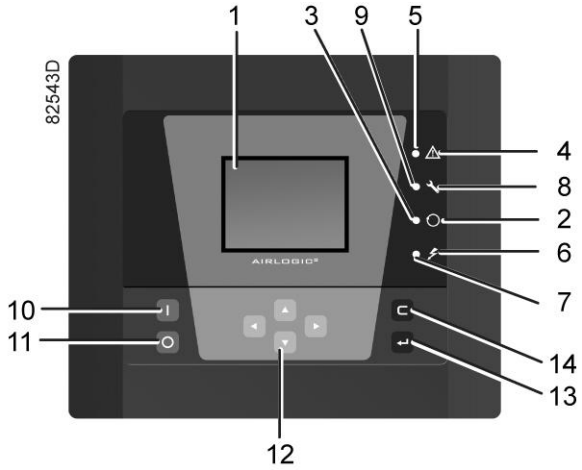
Automatic restart after voltage failure

The controller has a built-in function to automatically restart the compressor when the voltage is restored after voltage failure. For compressors leaving the factory, this function is made inactive. If desired, the function can be activated.

⚠	If the function is activated and provided the regulator was in the automatic operation mode, the compressor will automatically restart if the supply voltage to the module is restored.

3.2 Control panel

Detailed description



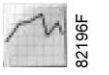
Function keys of the controller

Reference	Designation	Function
1	Display	Shows icons and operating conditions.
2	Automatic operation symbol	
3	LED, Automatic operation	Indicates that the regulator is automatically controlling the compressor: the compressor is loaded, unloaded, stopped and restarted depending on the air consumption and the limitations programmed in the regulator.
4	Warning symbol	
5	LED, Warning	Flashes in case of a shut-down, is lit in case of a warning condition.
6	Voltage symbol	
7	LED, Voltage on	Indicates that the voltage is switched on.
8	Service symbol	
9	LED, Service	Is lit when service is needed.
10	Start button	This button starts the compressor. Automatic operation LED (3) lights up. The controller is operative.
11	Stop button	This button is used to stop the compressor. Automatic operation LED (3) goes out.
12	Scroll buttons	Use these buttons to scroll through the menu.
13	Enter button	Use this button to confirm the last action.
14	Escape button	Use this button to go to previous screen or to end the current action.

3.3 Icons used

Status icons

Name	Icon	Description
Stopped / Running	 57786F	When the compressor is stopped, the icon stands still. When the compressor is running, the icon is rotating.
Compressor status	 57787F	Motor stopped
	 57788F	Running unloaded
	 57789F	Running loaded

Name	Icon	Description
Machine control mode	 57790F or  59161F	Local start / stop
	 57791F	Remote start / stop
	 57792F	Network control
Automatic restart after voltage failure	 57793F	Automatic restart after voltage failure is active
Week timer	 57794F	Week timer is active
Active protection functions	 57795F	Emergency stop
	 57796F	Shutdown
	 57797F	Warning
Service	 57798F	Service required
Main screen display	 59162F	Value lines display icon
	 82196F	Chart display icon
General icons	 81105D	No communication / network problem

Name	Icon	Description
	 82418D	Not valid

Input icons

Icon	Description
 57799F	Pressure
 57800F	Temperature
 57801F	Digital input
 57802F	Special protection

System icons

Icon	Description
 57803F	Compressor element (LP, HP, ...)
 57804F	Dryer
 57805F	Fan
 57806F	Frequency converter
 57807F	Drain
 57808F	Filter
 57809F	Motor
 57810F	Failure expansion module
 81105D	Network problem

Icon	Description
	General alarm

Menu icons

Icon	Description
	Inputs
	Outputs
	Protections (Warnings, shutdowns)
	Counters
	Test
	Regulation (Settings)
	Service
	Event history (saved data)
	Access key / User password
	Network
	Setpoint
	Information
	Week Timer
	General

Navigation arrows

Icon	Description
 57821F	Up
 57822F	Down

3.4 Main screen

Function

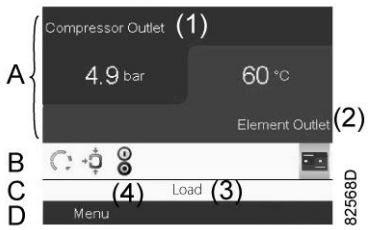
The Main screen is the screen that is shown automatically when the voltage is switched on and one of the keys is pushed. It is switched off automatically after a few minutes when no keys are pushed.

Typically, 5 different main screen views can be chosen:

1. Two value lines
2. Four value lines
3. Chart (High resolution)
4. Chart (Medium resolution)
5. Chart (Low resolution)

Two and four value lines screens

This type of Main screen shows the value of 2 or 4 parameters (see section Inputs menu).

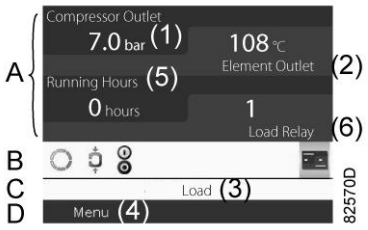


Typical Main screen (2 value lines), fixed speed compressors

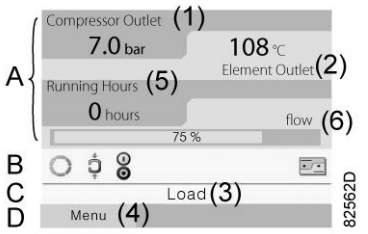
Typical Main screen (2 value lines), compressors with frequency converter

Text on figures

(1)	Compressor Outlet
(2)	Element Outlet (fixed speed compressors) Flow (compressors with frequency converter)
(3)	Load, shutdown, ... (text varies upon the compressors actual condition)
(4)	Menu



Typical Main screen (4 value lines), fixed speed compressors



Typical Main screen (4 value lines), compressors with frequency converter

Text on figures

(1)	Compressor Outlet
(2)	Element outlet
(3)	Load, ... (text varies upon the compressors actual condition)
(4)	Menu
(5)	Running hours
(6)	Load relay (one of the input signals of fixed speed compressors) Flow (compressors with frequency converter)

- **Section A** shows information regarding the compressor operation (e.g. the outlet pressure or the temperature at the compressor outlet). On compressors with a frequency converter, the load degree (flow) is given in % of the maximum flow.
- **Section B** shows Status icons. Following icon types are shown in this field:
  - Fixed icons
    These icons are always shown in the main screen and cannot be selected by the cursor (e.g. Compressor stopped or running, Compressor status (running, running unloaded or motor stopped).
  - Optional icons
    These icons are only shown if their corresponding function is activated (e.g. week timer, automatic restart after voltage failure , etc.)
  - Pop up icons
    These icons pop up if an abnormal condition occurs (warnings, shutdowns, service,...)

To call up more information about the icons shown, select the icon concerned using the scroll keys and press the enter key.

- **Section C** is called the Status bar
  This bar shows the text that corresponds to the selected icon.
- **Section D** shows the Action buttons. These buttons are used:
  - To call up or program settings
  - To reset a motor overload, service message or emergency stop
  - To have access to all data collected by the regulator

  The function of the buttons depends on the displayed menu. The most common functions are:

Designation	Function
Menu	To go to the menu
Modify	To modify programmable settings
Reset	To reset a timer or message

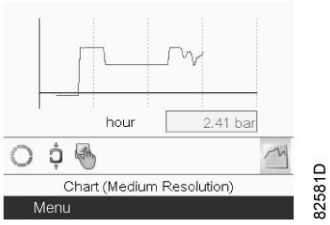
To activate an action button, highlight the button by using the Scroll keys and press the Enter key.
To go back to the previous menu, press the Escape key.

Chart views

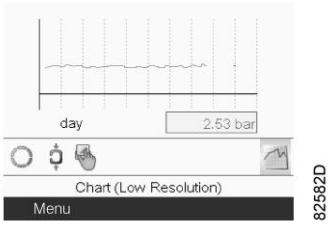
Instead of viewing values, it is also possible to view a graph of one of the input signals (see section Inputs menu) in function of the time.

When Chart (High Resolution) is selected, the chart shows the variation of the selected input (in this case the pressure) per minute. Also the instantaneous value is displayed. The screen shows the last 4 minutes.

The switch button (icon) for selecting other screens is changed into a small Chart and is highlighted (active).



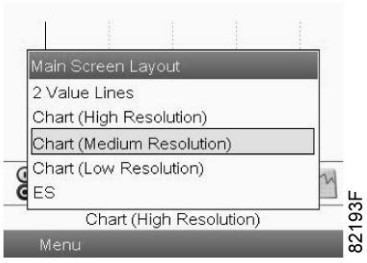
When the Chart (Medium Resolution) is selected, the chart shows the variation of the selected input per hour. The screen shows the last 4 hours.



When the Chart (Low Resolution) is selected, the chart shows the variation of the selected input per day. The screen shows the evolution over the last 10 days.

Selection of a main screen view

To change between the different screen layouts, select the far right icon in the control icons line (see value lines display icon or chart display icon in section Used icons) and press the Enter key. A screen similar to the one below opens:

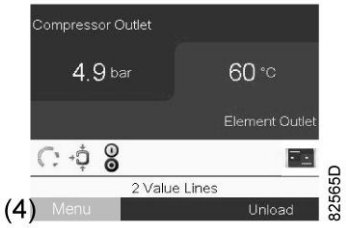


Select the layout required and press the Enter key. See also section Inputs menu.

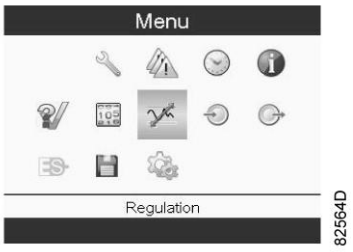
3.5 Calling up menus

Description

When the voltage is switched on, the main screen is shown automatically:



- To go to the Menu screen, highlight the Menu button (4), using the Scroll keys.
- Press the Enter key to select the menu. Following screen appears:



- The screen shows a number of icons. Each icon indicates a menu item. By default, the Pressure Settings (Regulation) icon is selected. The status bar shows the name of the menu that corresponds with the selected icon.
- Use the Scroll keys to select an icon.
- Press the Escape key to return to the Main screen.

3.6 Inputs menu

Menu icon, Inputs

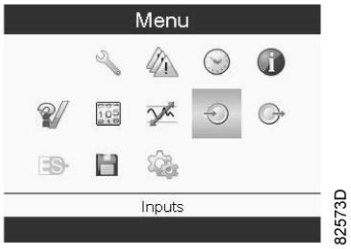
Function

- To display the actual value of the measured data (analog inputs) and the status of the digital inputs (e.g. emergency stop contact, motor overload relay, etc.).
- To select the digital input to be shown on the chart in the main screen.

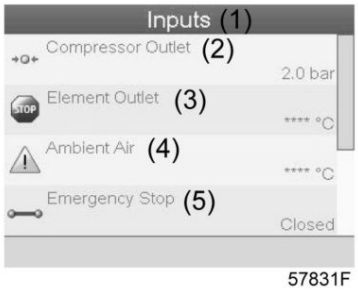
Procedure

Starting from the main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Inputs icon, as shown in the following screen:



- Press the Enter key. A screen similar to the one below appears:



Text on image

(1)	Inputs
(2)	Compressor outlet
(3)	Element outlet
(4)	Ambient air
(5)	Emergency stop

- The screen shows a list of all inputs with their corresponding icons and readings.
- If an input is in warning or shutdown, the original icon is replaced by the warning or shutdown icon respectively (i.e. the Stop icon and the Warning icon in the screen shown above).

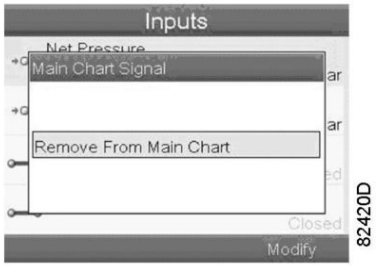
A small chart icon, shown below an item in the list means this input signal is shown on the chart at the main screen. Any analog input can be selected.

Selecting another input signal as main chart signal

With the Modify button active (light grey background in above screen), press the Enter button on the controller. A screen similar to the one below appears:

The first item in the list is highlighted. In this example, the Net Pressure is selected (chart icon).

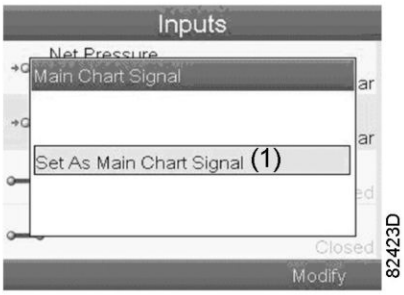
To change, press the Enter button again: a pop-up window opens:



Press Enter again to remove this input from the chart. Another confirmation pop-up opens:

Select Yes to remove or No to quit the current action.

In a similar way, another input signal can be highlighted and selected as Main Chart signal:



(1): Set as main chart signal

3.7 Outputs menu

Menu icon, Outputs

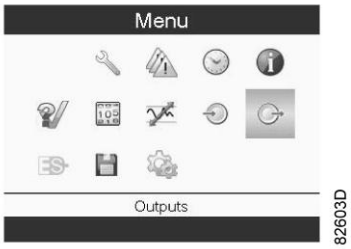
Function

To call up information regarding the actual status of some outputs such as the condition of the Fan overload contact (on air cooled compressors), the Emergency stop contact, etc.

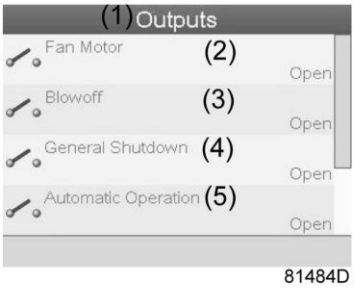
Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Move the cursor to the Outputs icon (see below).



- Press the Enter key. A screen similar to the one below appears:



Outputs screen (typical)

Text on image

(1)	Outputs
(2)	Fan motor contact
(3)	Blow-off contact
(4)	General shutdown
(5)	Automatic operation

- The screen shows a list of all outputs with their corresponding icons and readings.
  If an output is in warning or shutdown, the original icon is replaced by the warning or shutdown icon respectively.

3.8 Counters

Menu icon, Counters

Function

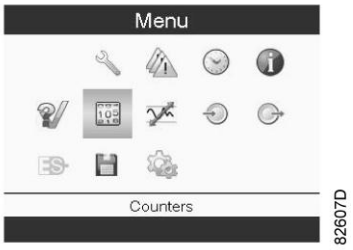
To call up:

- The running hours
- The loaded hours
- The number of motor starts
- The number of hours that the regulator has been powered
- The number of load cycles

Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Counters icon (see below)



- Press the Enter key. A screen similar to the one below appears:

Text on image

(1)	Counters
(2)	Running hours
(3)	Motor starts
(4)	Load relay
(5)	VSD 1-20 % rpm in % (the percentage of the time during which the motor speed was between 1 and 20 %) (compressors with frequency converter)

The screen shows a list of all counters with their actual readings.

Note: the example above is for a frequency converter driven compressor. For a fixed speed compressor, the actual screen will be somewhat different.

3.9 Control mode selection

Function

To select the control mode, i.e. whether the compressor is in local control, remote control or controlled via a local area network (LAN).

Procedure

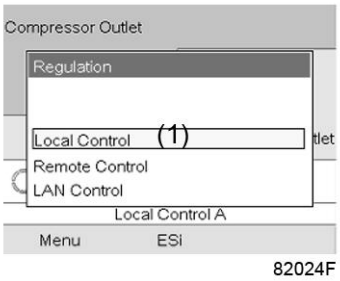
Starting from the main screen, make sure the action button Menu (1) is selected:

Next, use the scroll buttons to go to the Status icons (see section Main screen) and select the Regulation icon (2). When the icon is active, this icon is highlighted with a grey background colour.

Press the enter button:

There are 3 possibilities:

- Local control
- Remote control
- LAN (network) control



After selecting the required regulation mode, press the enter button on the controller to confirm your selection. The new setting is now visible on the main screen. See section Used icons for the meaning of the icons.

3.10 Service menu

Menu icon, Service

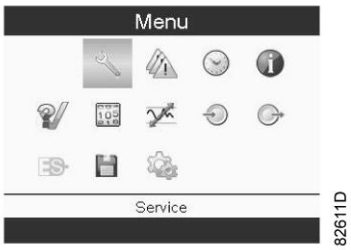
Function

- To reset the service plans which are carried out.
- To check when the next service plans are to be carried out.
- To find out which service plans were carried out in the past.
- To modify the programmed service intervals.

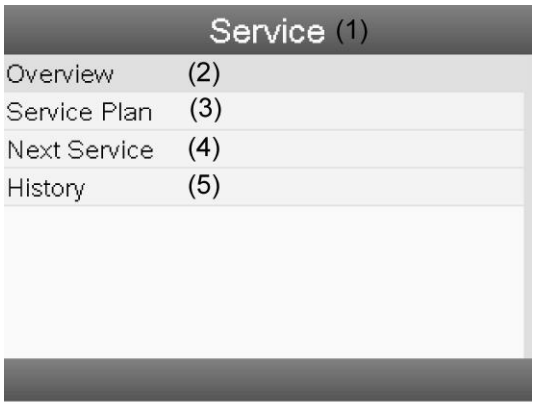
Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Service icon (see below).



- Press the Enter key. Following screen appears:



Text on image

(1)	Service
(2)	Overview
(3)	Service plan
(4)	Next service
(5)	History

- Scroll through the items to select the desired item and press the Enter key to see the details as explained below.

Overview

Text on image

(1)	Overview
(2)	Running Hours
(3)	Real Time hours
(4)	Reset

Example for service level (A):

The figures at the left are the programmed service intervals. For Service interval A, the programmed number of running hours is 4000 hours (upper row) and the programmed number of real time hours is 8760 hours, which corresponds to one year (second row). This means that the controller will launch a service warning when either 4000 running hours or 8760 real hours are reached, whichever comes first. Note that the real time hours counter keeps counting, also when the controller is not powered.

The figures at the end of the bars are the number of hours to go till the next service intervention. In the example above, the compressor was just started up, which means it still has 4000 running hours or 8299 hours to go before the next Service intervention.

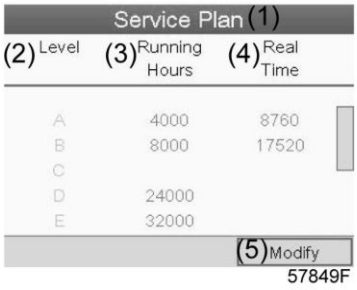
Service plans

A number of service operations are grouped (called Level A, Level B, etc...). Each level stands for a number of service actions to be carried out at the time intervals programmed in the controller.

When a service plan interval is reached, a message will appear on the screen.

After carrying out the service actions related to the indicated levels, the timers must be reset.

From the Service menu above, select Service plan (3) and press Enter. Following screen appears:

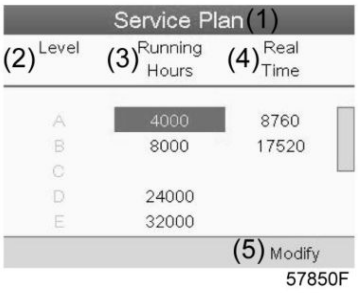


Text on image

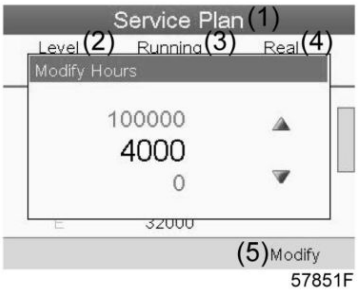
(1)	Service plan
(2)	Level
(3)	Running hours
(4)	Real time hours
(5)	Modify

Modifying a service plan

Dependant on the operating conditions, it can be necessary to modify the service intervals. To do so, use the Scroll keys to select the value to be modified. A screen similar to the one below appears:



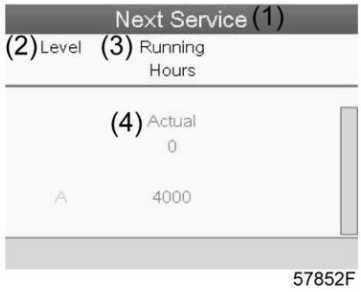
Press the Enter key. Following screen appears:



Modify the value as required using the ↑ or ↓ scroll key and press the Enter key to confirm.

Note: Running hours can be modified in steps of 100 hours, real time hours can be modified in steps of 1 hour.

Next Service



Text on image

(1)	Next service
(2)	Level
(3)	Running hours
(4)	Actual

In the example above, the A Service level is programmed at 4000 running hours, of which 0 hours have passed.

History

The History screen shows a list of all service actions done in the past, sorted by date. The date at the top is the most recent service action. To see the details of a completed service action (e.g. Service level, Running hours or Real time hours), use the Scroll keys to select the desired action and press the Enter key.

3.11 Regulation menu

Menu icon, Setpoint

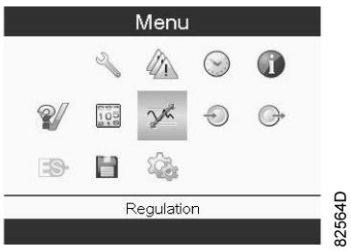
Function

On fixed speed compressors , the operator can program two different pressure bands. This menu is also used to select the active pressure band.

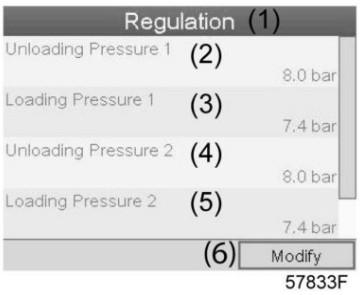
Procedure

Starting from the Main screen (see Main screen),

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Setpoint icon (see below).



- Press the Enter key. Following screen appears:

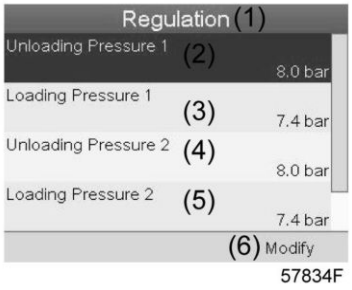


Text on figure

(1)	Regulation
(2)	Unloading pressure 1
(3)	Loading pressure 1
(4)	Unloading pressure 2
(5)	Loading pressure 2

(6)	Modify

- The screen shows the actual unloading and loading pressure settings for both pressure bands.
  To modify the settings, move the cursor to the action button Modify and press the Enter key. Following screen appears:



- The first line of the screen is highlighted. Use the Scroll keys to highlight the setting to be modified and press the Enter key. Following screen appears:

- The upper and lower limit of the setting is shown in grey, the actual setting is shown in black. Use the ↑ or ↓ key of the Scroll keys to modify the settings as required and press the Enter key to accept.

If necessary, change the other settings as required in the same way as described above.

3.12 Modifying the setpoint

Menu icon, Setpoint

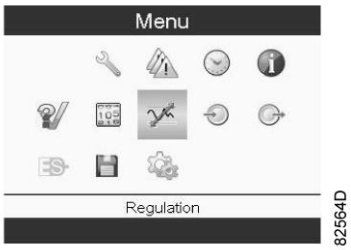
Function

On compressors with a frequency converter driven main motor, it is possible to program two different setpoints. This menu is also used to select the active setpoint.

Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Highlight the action key Menu using the Scroll keys. Following screen appears:



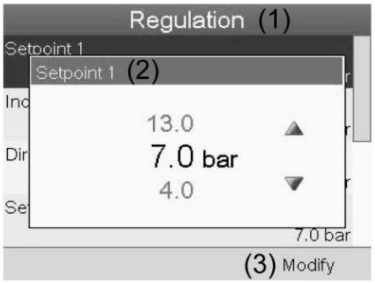
- Activate the menu by pressing the enter key. A screen similar to the one below appears:

Text on image

(1)	Regulation
(2)	Setpoint 1
(3)	Indirect stop level 1
(4)	Direct stop level 1
(5)	Setpoint 2
(6)	Modify

- The screen shows the actual settings.
  To modify the settings, move the cursor to the action button Modify and press the Enter key. Following screen appears:

- The first line of the screen is highlighted. Use the Scroll keys to highlight the setting to be modified and press the Enter key (2). Following screen appears:



The upper and lower limit of the setting is shown in grey, the actual setting is shown in black. Use the ↑ or ↓ key of the Scroll keys to modify the settings as required and press the Enter key to accept.

If necessary, change the other settings as required in the same way as described above.

Indirect stop: occurs when the pressure rises to the pre-set Indirect stop setpoint (= setpoint plus Indirect stop level). The motor will decelerate to minimum speed and the compressor will switch to unloaded condition.

Direct stop: occurs when the compressor runs at a speed between minimum and maximum and the net pressure rises above the direct stop setpoint (= setpoint plus Direct stop level).

Both settings (Indirect stop level and Direct stop level) are programmable, see section Programmable settings.

3.13 Event history menu

Menu icon, Event History

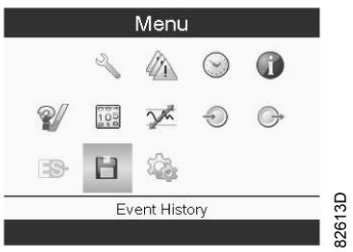
Function

To call up the last shut-down and last emergency stop data.

Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Event History icon (see below).



- Press the Enter key.
  The list of last shut-down and emergency stop cases is shown.

Example of Event History screen

- Scroll through the items to select the desired shut-down or emergency stop event.
- Press the Enter key to find the date, time and other data reflecting the status of the compressor when that shut-down or emergency stop occurred.

3.14 Week timer menu

Menu icon, Week timer

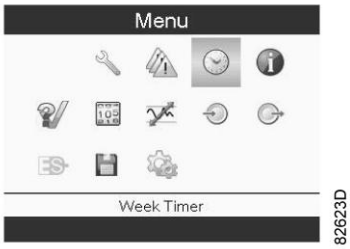
Function

- To program time-based start/stop commands for the compressor
- To program time-based change-over commands for the net pressure band
- Four different week schemes can be programmed.
- A week cycle can be programmed, a week cycle is a sequence of 10 weeks. For each week in the cycle, one of the four programmed week schemes can be chosen.

Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Use the Scroll buttons to select the Timer icon. (see below)



- Press the Enter key. Following screen appears:

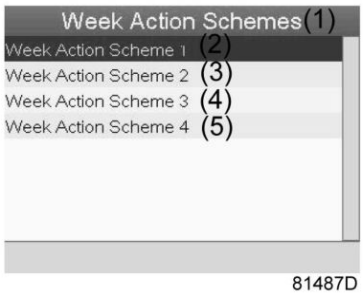
Text on image

(1)	Week Timer
(2)	Week Action Schemes
(3)	Week Cycle
(4)	Status
(5)	Week Timer Inactive
(6)	Remaining Running Time

The first item in this list is highlighted. Select the item requested and press the Enter key on the controller to modify.

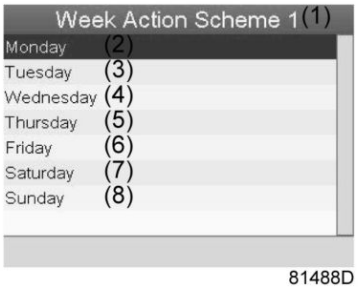
Programming week schemes

- Select Week action schemes and press Enter. A new window opens. The first item in the list is highlighted in red. Press the Enter key on the controller to modify Week Action Scheme 1.



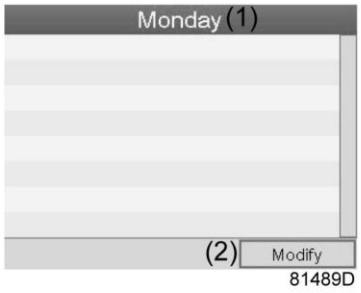
(1)	Week Action Schemes
(2)	Week Action Scheme 1
(3)	Week Action Scheme 2
(4)	Week Action Scheme 3
(5)	Week Action Scheme 4

- A weekly list is shown. Monday is automatically selected and highlighted in red. Press the Enter key on the controller to set an action for this day.



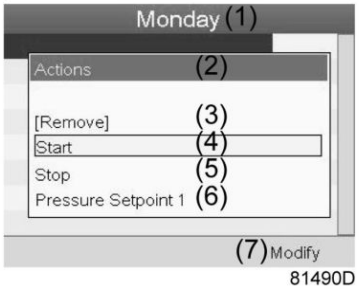
(1)	Week Action Scheme 1
(2)	Monday
(3)	Tuesday
(4)	Wednesday
(5)	Thursday
(6)	Friday
(7)	Saturday
(8)	Sunday

- A new window opens. The Modify action button is selected. Press the enter button on the controller to create an action.



(1)	Monday
(2)	Modify

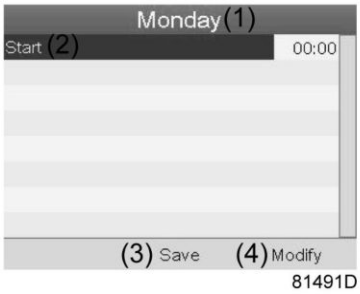
- A new pop-up window opens. Select an action from this list by using the Scroll keys on the controller. When ready press the Enter key to confirm.



(1)	Monday
(2)	Actions

(3)	Remove
(4)	Start
(5)	Stop
(6)	Pressure Setpoint 1
(7)	Modify

- A new window opens. The action is now visible in the first day of the week.



(1)	Monday
(2)	Start
(3)	Save
(4)	Modify

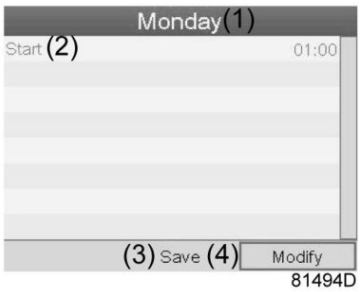
- To adjust the time, use the Scroll keys on the controller and press the Enter key to confirm.

(1)	Monday
(2)	Start
(3)	Save
(4)	Modify

- A pop-up window opens. Use the ↑ or ↓ key of Scroll keys to modify the values of the hours. Use the ← or → Scroll keys to modify the minutes.

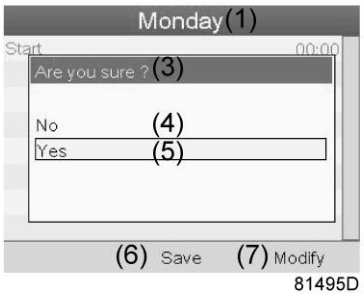
(1)	Monday
(2)	Time
(3)	Save
(4)	Modify

- Press the Escape key on the controller. The action button Modify is selected. Use the Scroll keys to select the action Save.



(1)	Monday
(2)	Start
(3)	Save
(4)	Modify

- A new pop-up window opens. Use the Scroll keys on the controller to select the correct actions. Press the Enter key to confirm.

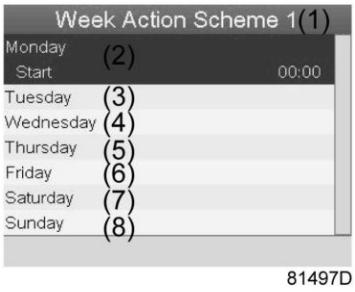


(1)	Monday
(3)	Are you sure?
(4)	No

(5)	Yes
(6)	Save
(7)	Modify

Press the Escape key to leave this window.

- The action is shown below the day the action is planned.



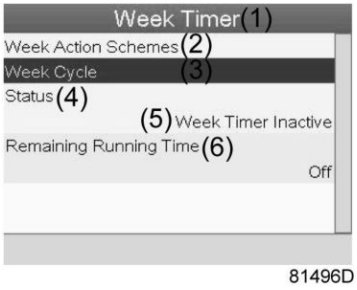
(1)	Week Action Scheme 1
(2)	Monday - Start
(3)	Tuesday
(4)	Wednesday
(5)	Thursday
(6)	Friday
(7)	Saturday
(8)	Sunday

Press the Escape key on the controller to leave this screen.

Programming the week cycle

A week cycle is a sequence of 10 weeks. For each week in the cycle, one of the four programmed week schemes can be chosen.

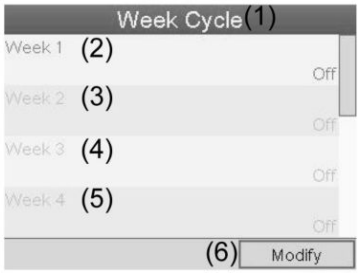
- Select Week Cycle from the main Week Timer menu list.



(1)	Week Timer
(2)	Week Action Schemes
(3)	Week Cycle
(4)	Status

(5)	Week Timer Inactive
(6)	Remaining Running Time

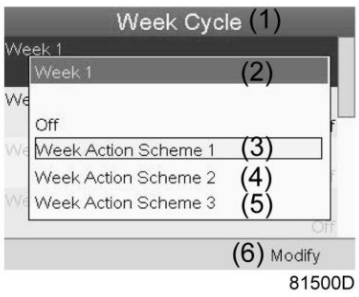
- A list of 10 weeks is shown.



(1)	Week Cycle
(2)	Week 1
(3)	Week 2
(4)	Week 3
(5)	Week 4
(6)	Modify

Press twice the Enter key on the controller to modify the first week.

- A new window opens. Select the action, example: Week Action Scheme 1

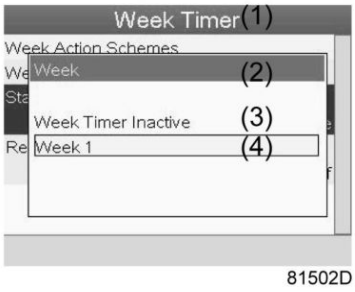


(1)	Week Cycle
(2)	Week 1
(3)	Week Action Scheme 1
(4)	Week Action Scheme 2
(5)	Week Action Scheme 3
(6)	Modify

- Check the status of the Week Timer
  Use the Escape key on the controller to go back to the main Week Timer menu. Select the status of the Week Timer.

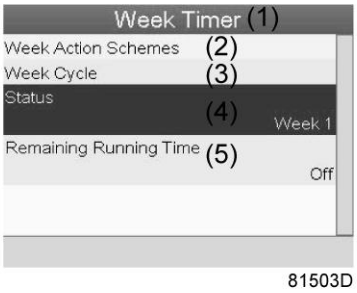
(1)	Week Timer
(2)	Week Action Schemes
(3)	Week Cycle
(4)	Status
(5)	Week Timer Inactive
(6)	Remaining Running Time

- A new window opens. Select Week 1 to set the Week Timer active.



(1)	Week Timer
(2)	Week
(3)	Week Timer Inactive
(4)	Week 1

- Press the Escape key on the controller to leave this window. The status shows that week 1 is active.



(1)	Week Timer
(2)	Week Action Schemes
(3)	Week Cycle
(4)	Status
(5)	Remaining Running Time

- Press the Escape key on the controller to go to the main Week Timer menu. Select Remaining Running Time from the list and press the Enter key on the controller to Modify.

(1)	Week Timer
(2)	Week Action Schemes
(3)	Week Cycle
(4)	Status
(5)	Remaining Running Time

- This timer is used when the week timer is set and for certain reasons the compressor must continue working, for example, 1 hour, it can be set in this screen. This timer is prior to the Week Timer action.

(1)	Week Timer
(2)	Week action schemes
(3)	Remaining Running Time

3.15 Test menu

Menu icon, Test

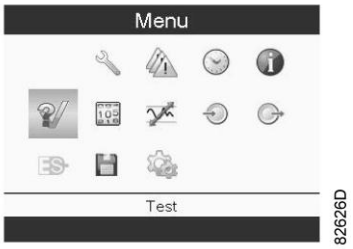
Function

- To carry out a display test, i.e. to check whether the display and LEDs are still intact.

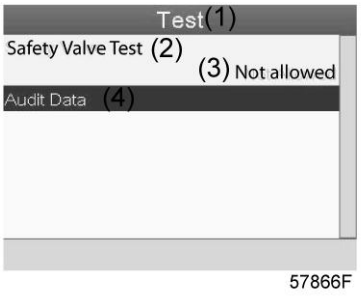
Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the scroll keys, move the cursor to the Test icon (see below).



- Press the Enter key, following screen appears:



Text on image

(1)	Test
(2)	Safety Valve Test
(3)	Not allowed
(4)	Audit Date

- The safety valve test can only be performed by authorized personnel and is protected by a security code.
- Select the item display test and press the enter key. A screen is shown to inspect the display, at the same time all LED's are lit.

3.16 Modifying general settings

Menu icon, Settings

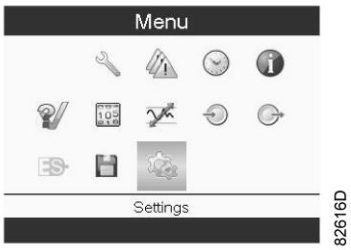
Function

To display and modify a number of settings.

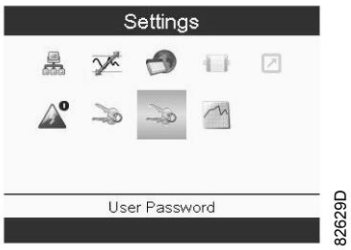
Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key.
- Using the Scroll keys, move the cursor to the Settings icon (see below).



- Press the Enter key. A second menu screen appears:

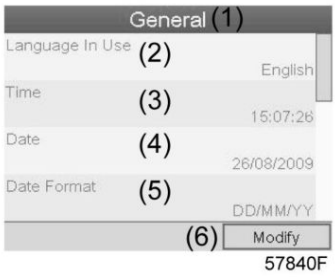


This screen shows again a number of icons. By default, the User Password icon is selected. The status bar shows the description that corresponds with the selected icon. Each icon covers one or more items (depending on the configuration), such as

- Access level
- Elements
- Dryer
- Fan
- Converter(s)
- Filter(s)
- Motor/Starter
- General
- Automatic restart after voltage failure (ARAF)
- Network
- Regulation
- Remote

For adapting certain parameters, a password may be necessary.

Example: Selecting the General Settings icon gives the possibility to change e.g. the language, the date, the date format, etc.:



Text on image

(1)	General
(2)	Language used
(3)	Time
(4)	Date
(5)	Date format
(6)	Modify

- To modify, select the Modify button using the Scroll keys and press the Enter key.
- A screen similar to the one above is shown, the first item (Language) is highlighted. Use the ↓ key of the Scroll keys to select the setting to be modified and press the Enter key.
- A pop-up screen appears. Use the ↑ or ↓ key to select the required value and press the Enter key to confirm.

3.17 General menu

Menu icon, General

Function

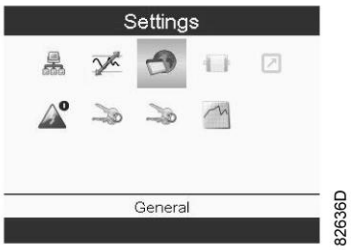
This menu covers a list of general settings:

- Language
- Time
- Date
- Date Format
- Units

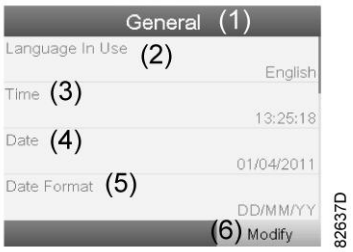
Procedure

Starting from the submenu screen (see Modifying general settings),

- Using the Scroll keys, move the cursor to the General icon (see below).



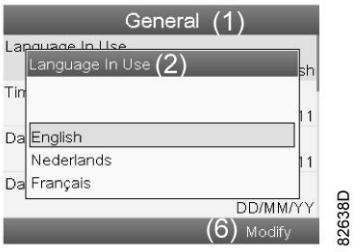
- Press the Enter key. A screen similar to the one below appears:



Text on figure

(1)	General
(2)	Language in use
(3)	Time
(4)	Date
(5)	Date format
(6)	Modify

- A screen similar to the one above is shown, a selection bar is covering the first item (Language). Use the ↓ key of the Scroll keys to select the setting to be modified and press the Enter key.
- To modify, select the Modify button using the Scroll keys and press the Enter key.
- A pop-up screen appears. Use the ↑ or ↓ key to select the required parameter and press the Enter key to confirm.



3.18 User password menu

Menu icon, Password

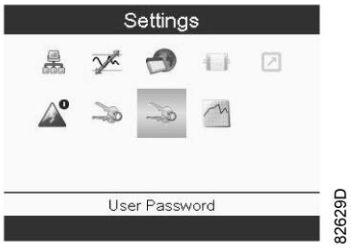
Function

The end customer can activate and choose a personal password. Once the password option activated, it is impossible for not authorized persons to modify any setting.

Procedure

Starting from the submenu screen (see Modifying general settings),

- Using the Scroll keys, move the cursor to the User Password icon (see below)



- Press the Enter key. Next screen appears.

- Select the Activate button and press the Enter key.
- Next, fill in the User Password and press the Enter key, a confirmation window opens.
- Fill in the password again and press the enter key to confirm.

Text on figure

(1)	User Password
(2)	Not activated
(3)	Activate

3.19 Access key menu

Menu icon, Access Key

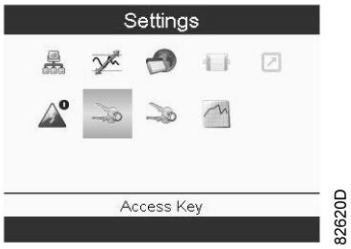
Function

Only a number of basic Icons will be displayed in the Menu screen. Using the Access Key with the proper access code allows the user to see more Icons, or have access to more parameters.

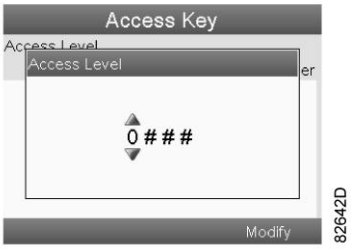
Procedure

Starting from the submenu screen (see Modifying general settings),

- Using the Scroll keys, move the cursor to the Access Key icon (see below)



- Three Access levels are possible.
  - **0** : A basic set of parameters is visualized, no password is required.
  - **1** : A basic set of parameters can be modified.
  - **2** : Extra parameters will be visualized and can be modified.
- Changing the Access level can be done through the Modify button. A new pop-up window will be activated asking to enter an Access Key.



3.20 Programmable settings

Parameters: unloading/loading pressures

	Minimum setting	Factory setting	Maximum setting
Unloading/loading pressures	see Compressor data	see Compressor data	see Compressor data

Parameters fix speed drive

		Minimum setting	Factory setting	Maximum setting
Motor running time in star	sec	5	10	10
Load delay time (star-delta)	sec	0	0	10
Number of motor starts	starts/day	0	240	480
Minimum stop time	sec	10	20	30
Programmed stop time	sec			
Power recovery time (ARAVF)	sec	15	15	3600
Restart delay	sec	0	0	1200
Communication time-out	sec	10	30	60

Protections

		Minimum setting	Factory setting	Maximum setting
Compressor element outlet temperature (shut-down warning level)	˚C	50	113	119
	˚F	122	235	246
Compressor element outlet temperature (shut-down level)	˚C	111	120	120
	˚F	232	248	248

Service plan

The built-in service timer will give a Service warning message after a preprogrammed time interval has elapsed.

Also see section Maintenance schedule.

Consult your supplier if a timer setting has to be changed. See section Modifying general settings. The intervals must not exceed the nominal intervals and must coincide logically.

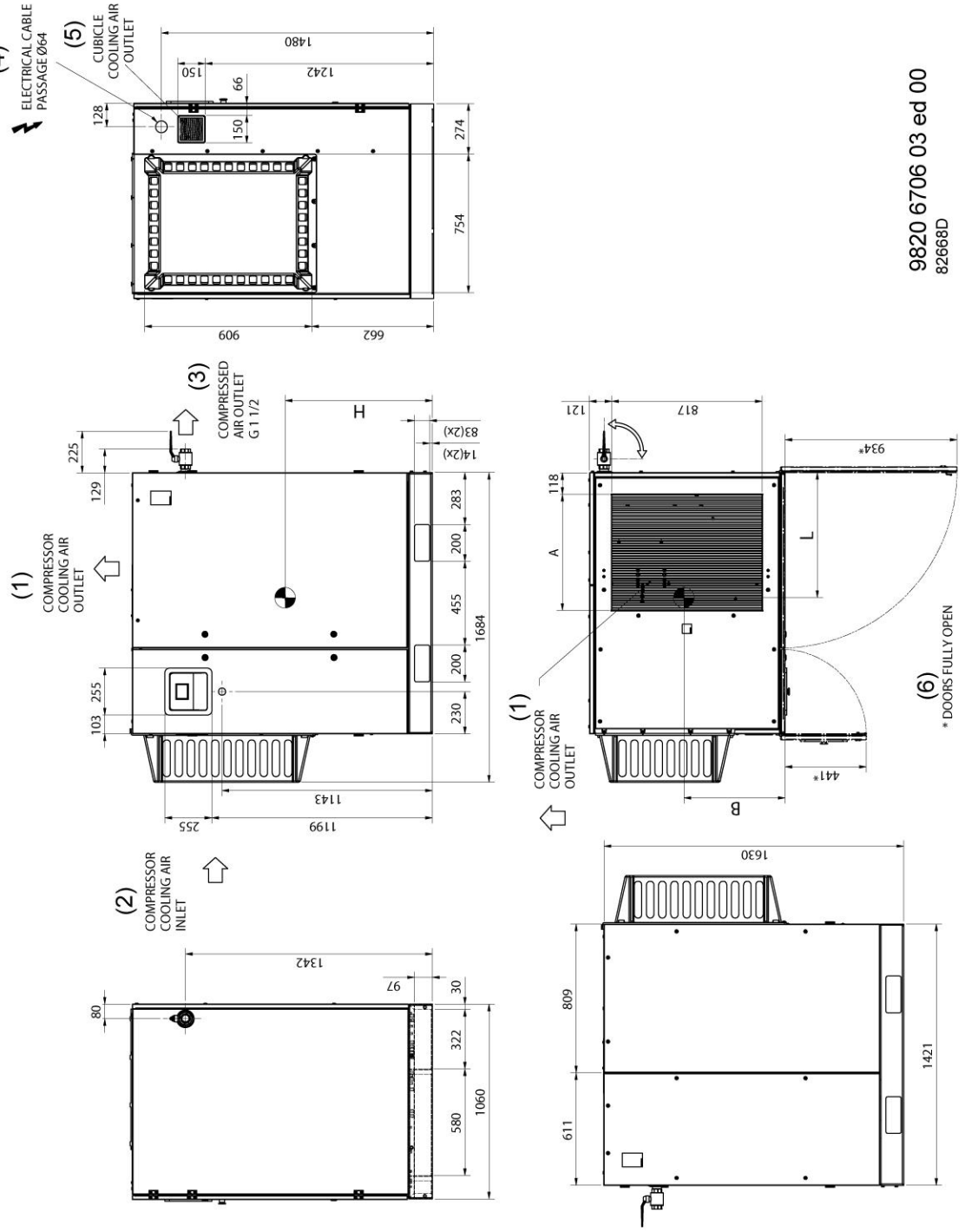
Terminology

Term	Explanation
ARAVF	Automatic restart after voltage failure. See section Controller and .
Power recovery time	Is the period within which the voltage must be restored to have an automatic restart. Is accessible if the automatic restart is activated. To activate the automatic restart function, consult your supplier.
Restart delay	This parameter allows to programme that not all compressors are restarted at the same time after a power failure (ARAVF active).
Compressor element outlet	The regulator does not accept inconsistent settings, e.g. if the warning level is programmed at 95 ˚C (203 ˚F), the minimum limit for the shut-down level changes to 96 ˚C (204 ˚F). The recommended difference between the warning level and shut-down level is 10 ˚C (18 ˚F).
Delay at shut-down signal	Is the time for which the signal must exist before the compressor is shut down. If it is required to program this setting to another value, consult your supplier.

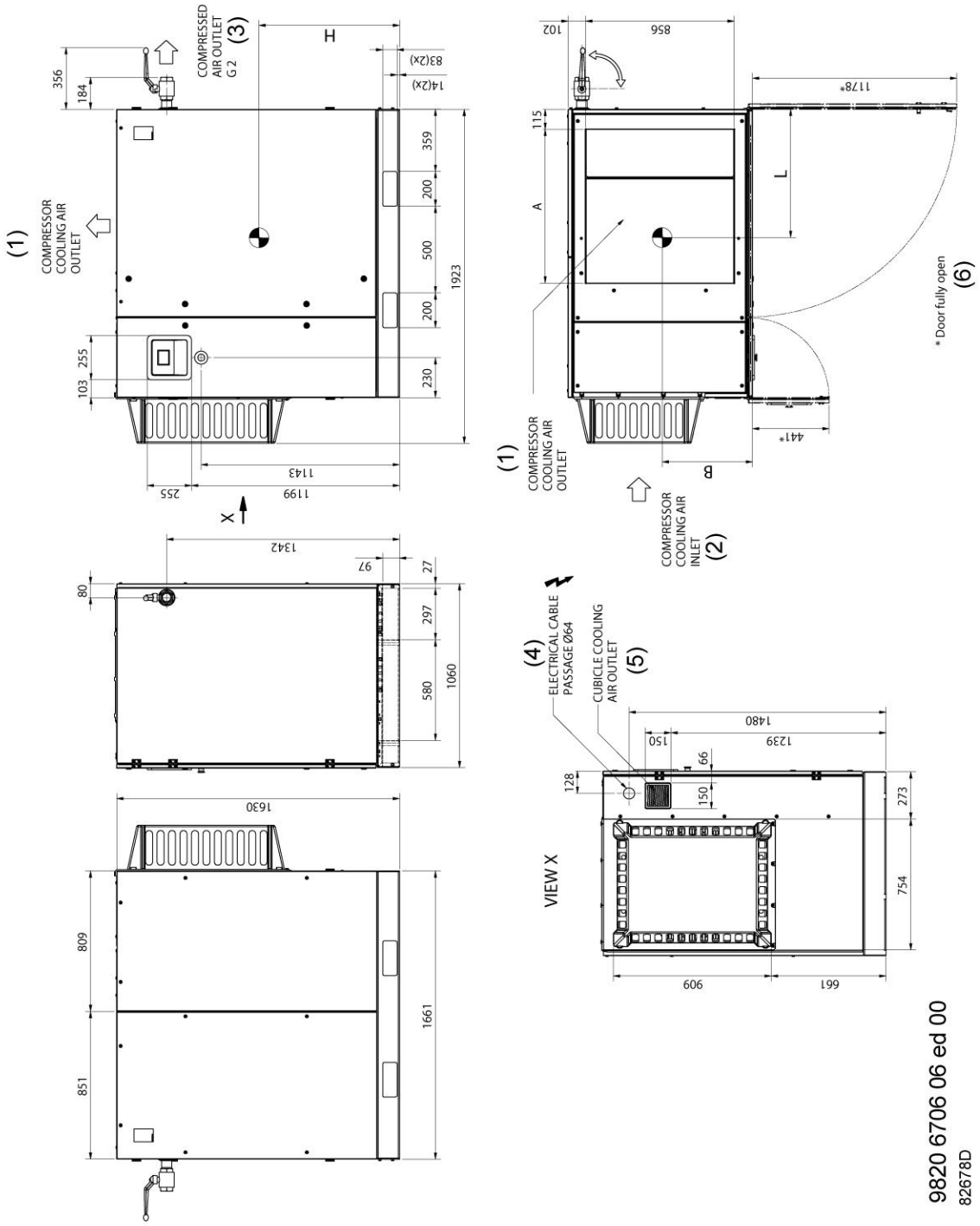
Term	Explanation
Minimum stop time	Once the compressor has automatically stopped, it will remain stopped for the minimum stop time, whatever happens with the net air pressure. Consult your supplier if a setting lower than 20 seconds is required.
Unloading/ Loading pressure	The regulator does not accept illogical settings, e.g. if the unloading pressure is programmed at 7.0 bar(e) (101 psi(g)), the maximum limit for the loading pressure changes to 6.9 bar(e) (100 psi(g)). The recommended minimum pressure difference between loading and unloading is 0.6 bar (9 psi(g)).

4 Installation

4.1 Dimension drawings



QGS 40 up to QGS 60 air-cooled compressors



QGS 75 and QGS 100 air-cooled compressors

Reference	Designation
1	Compressor cooling air outlet
2	Compressor cooling air inlet
3	Compressed air outlet
4	Electrical cable passage
5	Cubicle cooling air outlet

Reference	Designation
6	Doors fully open

	For the dimensions A, L, B and H , contact your supplier.

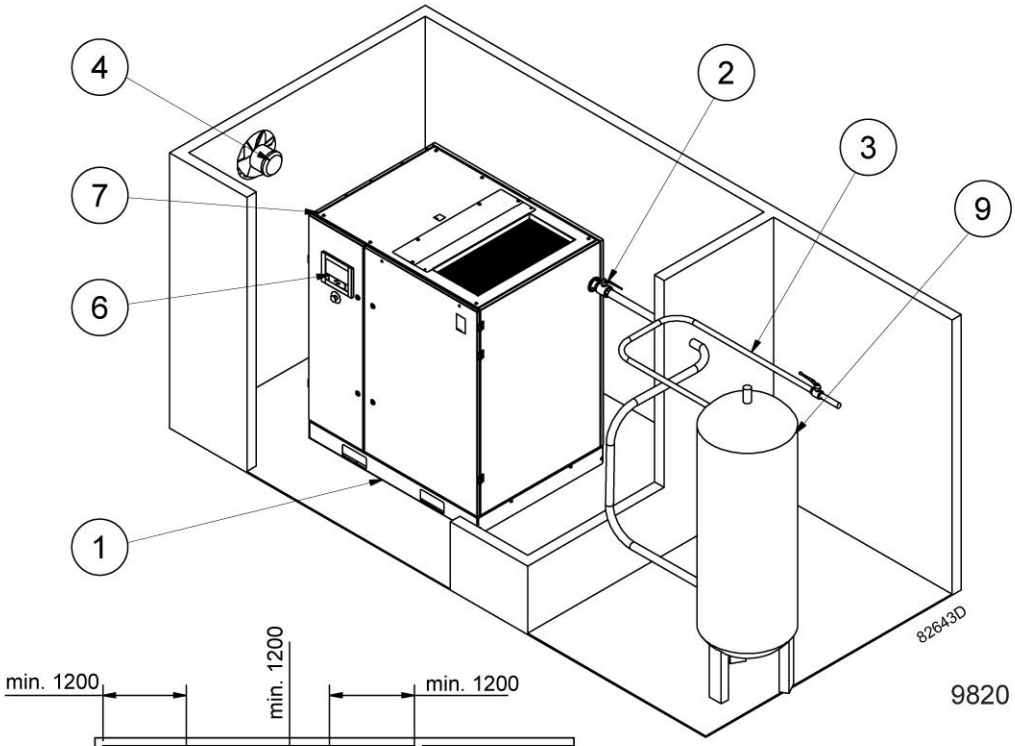
4.2 Installation proposal

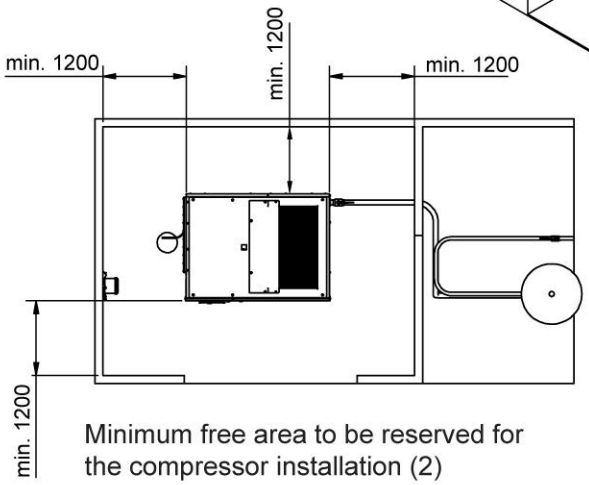
Outdoor/altitude operation

	The compressor is not designed for installation outdoors. Also, if the ambient temperature can fall down below 0 ˚C (32 ˚F), and if operating above 1000 m (3300 ft) precautions must be taken. In this case, , consult your supplier.

Moving/lifting

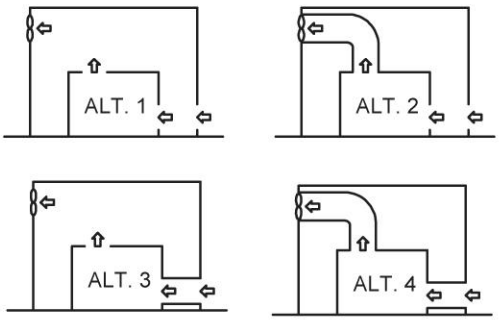
	The compressor can be moved by a lift truck using the slots in the frame. Take care not to damage the bodywork during lifting or transport. Make sure that the forks protrude from the other side of the frame. The compressor can also be lifted after inserting beams in the slots. Make sure that the beams cannot slide and that they protrude from the frame equally. The chains must be held parallel to the bodywork by chain spreaders in order not to damage the compressor. The lifting equipment must be placed in such a way that the compressor is lifted perpendicularly. Lift gently and avoid twisting.





Minimum free area to be reserved for the compressor installation (2)

9820 6706 25 / ed00



Ventilation proposals (1)

Text on drawing

Reference	Designation
(1)	Ventilation proposals
(2)	Minimum free area to be reserved for the compressor installation

	All piping to be connected stress free to the compressor.

Installation guidelines

1. Install the compressor unit on a solid, level floor suitable for taking its weight.
2. Position of the compressed air outlet valve.
3. The pressure drop over the air delivery pipe can be calculated from:

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

- Δp = Pressure drop in bar (recommended maximum: 0.1 bar (1.5 psi))
- L = Length of the pipe in m
- Q_c= Free air delivery of the compressor in l/s
- d = Inner diameter of the pipe in mm
- P = Absolute pressure at the compressor outlet in bar

It is recommended that the connection of the compressor air outlet pipe is made on top of the main air net pipe in order to minimise carry-over of possible condensate residue.

4. Ventilation: the inlet grids and ventilation fan should be installed in such a way that any re-circulation 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 air temperature at the compressor intake is 46 °C (115 °F) for gear driven units and 43 °C (109 °F) for belt driven units. (minimum 0 °C / 32 °F).
   The required ventilation capacity to limit the compressor room temperature can be calculated as follows:

Q_v = 1.06 N/ΔT for versions without dryer

- Q_v = Required ventilation capacity in m^3/s
- N = Shaft input of compressor in kW
- ΔT = Temperature increase in the compressor room in °C

5. The drain pipes to the drain collector must not dip into the water of the drain collector. Any flow back must be avoided. Oil/water separators to separate the major part of the oil from the condensate to ensure that the condensate meets the requirements of the environmental codes are available.
6. Control module with monitoring panel.
7. Position of the main cable entry. Power supply cable to be sized and installed by a qualified electrician.

	To preserve the protection degree of the electric cubicle and to protect its components from dust from the environment, it is mandatory to use a proper cable gland when connecting the supply cable to the compressor.

8. Provision for inlet and outlet of the energy recovery system (system is optional).
9. The air receiver (optional) should be installed in a frost-free room on a solid, level floor For normal air consumption, the volume of the air net (receiver and piping) can be calculated as follows:

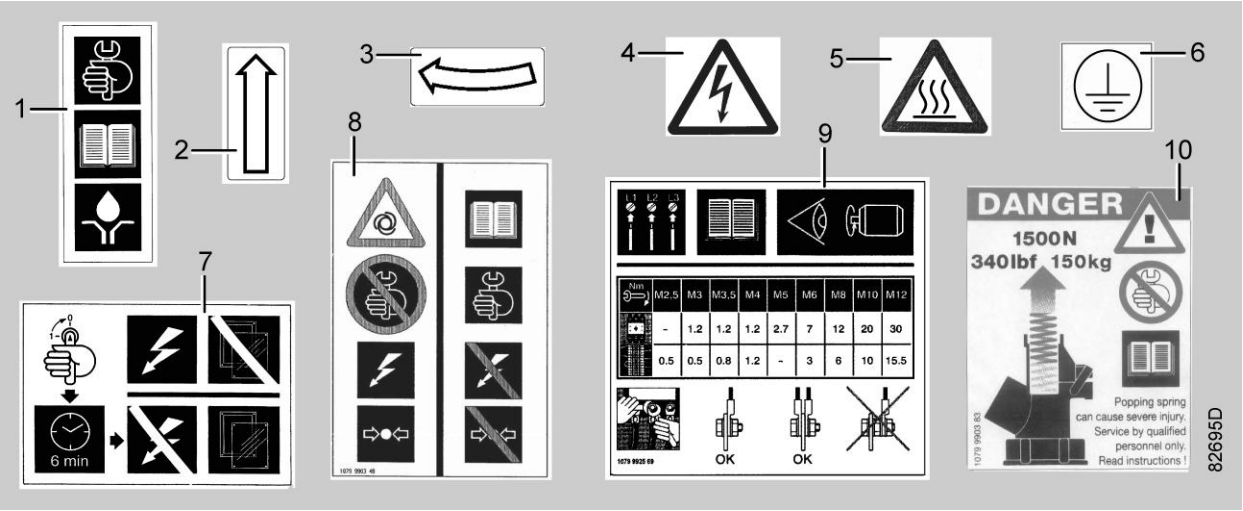
V=(0.25 x Qc x P1 x To)/(fmax x ΔP xT1)

- V= Volume of the air net in l.
- Qc= Free air delivery of the compressor in l/s
- P1= Compressor air inlet pressure in bar absolute
- fmax= Cycle frequency =1 cycle/30s
- ΔP= P unload - P load in bar
- T1= Compressor air inlet temperature in K
- To= Air receiver temperature K

10. To prevent feedback of exhaust air to the cooling inlet, sufficient space should be foreseen above the unit to evacuate the exhaust air.

4.3 Pictographs

Description



Pictographs

Reference	Designation
1	Read manual before service
2	Rotation arrow
3	Rotation arrow
4	Warning: Voltage
5	Warning: Hot surface
6	Earth connection
7	Take care of voltage, wait 6 min. before removing panel
8	Warning: Automatic start, read the instruction manual, no service with voltage and pressure on
9	Before connecting compressor electrically, consult instruction book for motor rotation direction Torque instruction
10	Dangerous spring, read manual before use

5 Operating instructions

5.1 Initial start-up

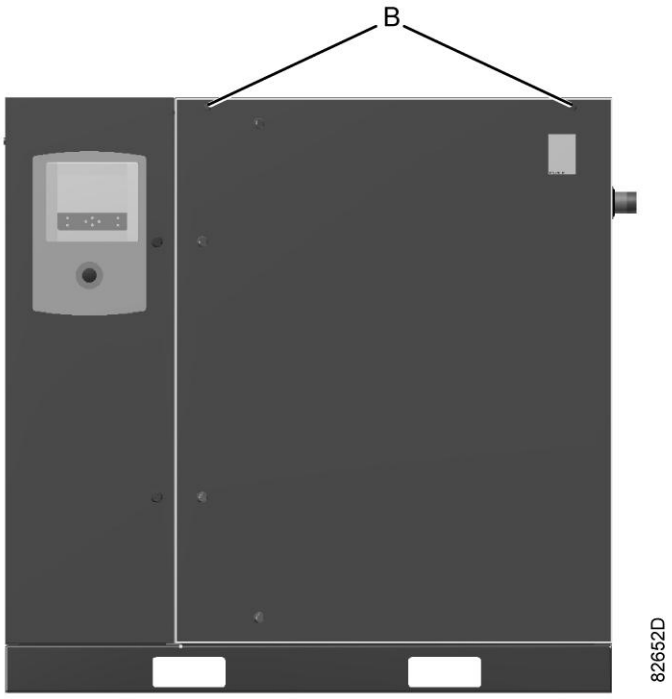
Safety

	The operator must apply all relevant Safety precautions.

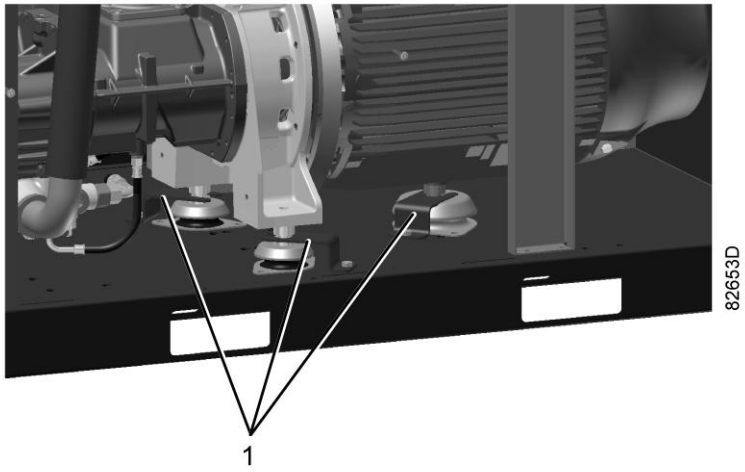
Procedure

	For the position of the air outlet valve and the drain connections, see sections Introduction.

1. Consult the sections Electric cable size, Installation proposal and Dimension drawings
2. **The following transport fixtures, painted red, must be removed:**
   - Bolts on service door (B)

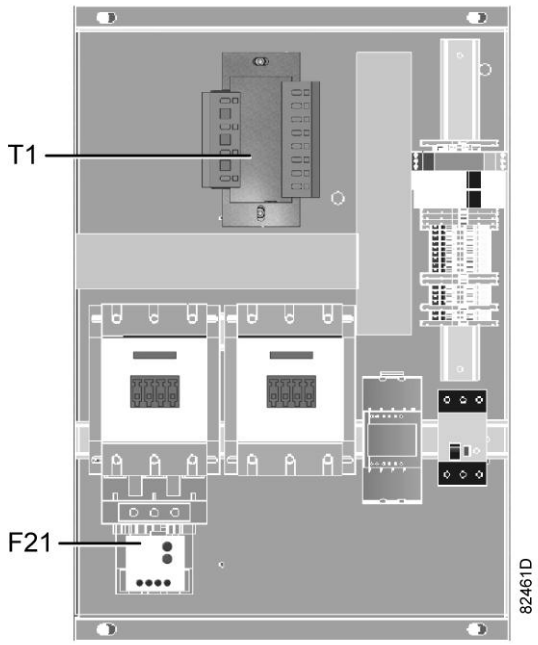


   - Supports (1)



Transport fixtures

3. Check that the electrical connections correspond to the local codes and that all wires are clamped tight to their terminals.
   The installation must be earthed and protected against short circuits by fuses of the inert type in all phases.
   An isolating switch must be installed near the compressor.
4. Check transformer (T1) for correct connection.
   Check the settings of drive motor overload relay (F21).
   Check that the motor overload relay is set for manual resetting.

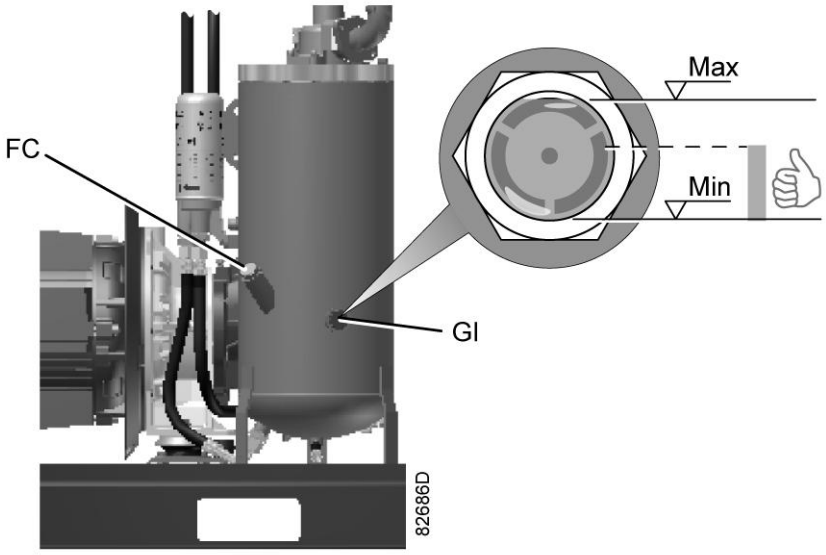


Electric cubicle, typical example

5. Fit the air outlet valve (AV); see section Introduction for the position of the valve.
   Close the valve.
   Connect the air net to the valve.
6. Connect the automatic drain outlet (Da) to a drain collector.

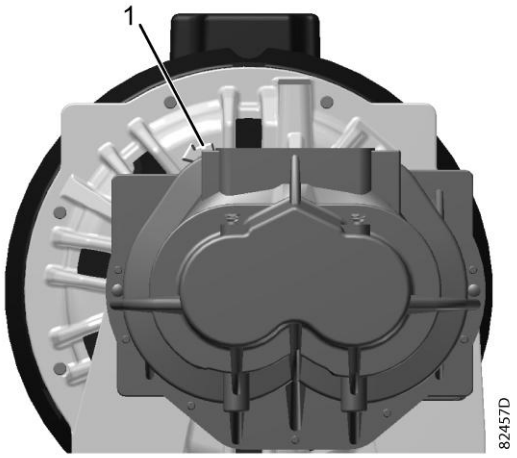
The drain pipes to the drain collector must not dip into the water. If the pipes have been fitted outside the room where freezing is possible, they must be insulated.

7. Check the oil level.
   The oil level should be between the lower region and the middle in the sight glass.



Position of oil level sight-glass

8. **Provide labels, warning the operator that:**
   - The compressor may automatically restart after voltage failure.
   - The compressor is automatically controlled and may be restarted automatically.
9. Check the voltage between the three phases before using the unit for the first time.

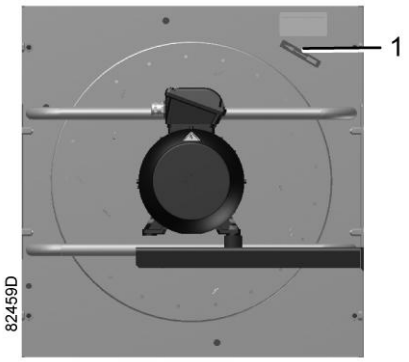


Motor direction arrow

Check the direction of rotation (following the arrow on the coupling housing (1) by pressing the "Start" button, followed immediately by the emergency stop button.
If it does not spin in the right direction reverse two mains cables. When it rotates in the correct direction, the oil level should drop after 4 or 5 seconds of operation

	Incorrect rotation of the drive motor can cause damage to the compressor.

10.



Fan direction arrow

It is very important to remember to check the direction of rotation of the fan (shown by an arrow on the fan (1)).

5.2 Before starting

Remarks

	• If the compressor has not run for the past 6 months, it is strongly recommended to improve the lubrication of the compressor element at starting. Disconnect the inlet hose, remove the unloader (UA) and pour 0.75 l (0.20 US gal, 0.17 Imp gal) of oil into the compressor element. Reinstall the unloader and reconnect the inlet hose. Make sure that all connections are tight.

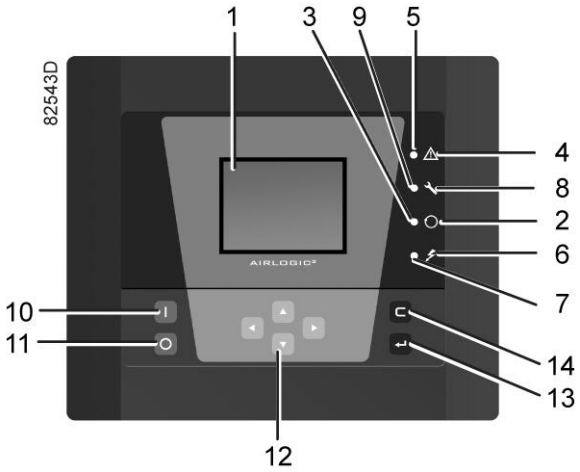
Procedure

-	Check the oil level, top up if necessary. See section Initial start-up

5.3 Starting

Procedure

	For the position of the air outlet valve and the drain connections, see sections Introduction.



Airlogic² control panel

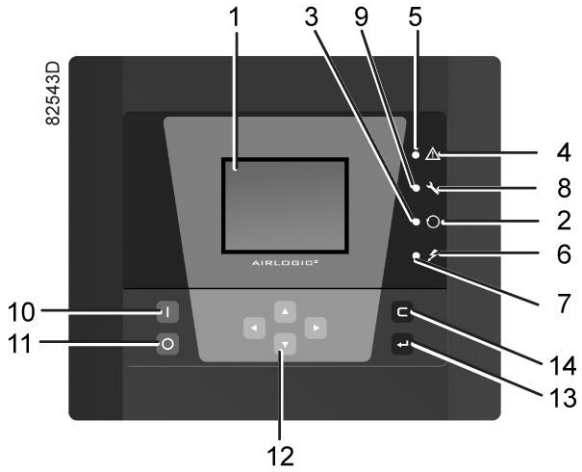
Step	Action
-	Switch on the voltage. Check that voltage on LED (7) lights up.
-	Open the air outlet valve.
-	Press start button (10) on the control panel. The compressor starts running and the automatic operation LED (3) lights up. After the motor running time in star (Y-time, see Parameters in section Programmable settings) has elapsed, the drive motor switches over from star to delta and the compressor starts running loaded.

5.4 During operation

Warnings

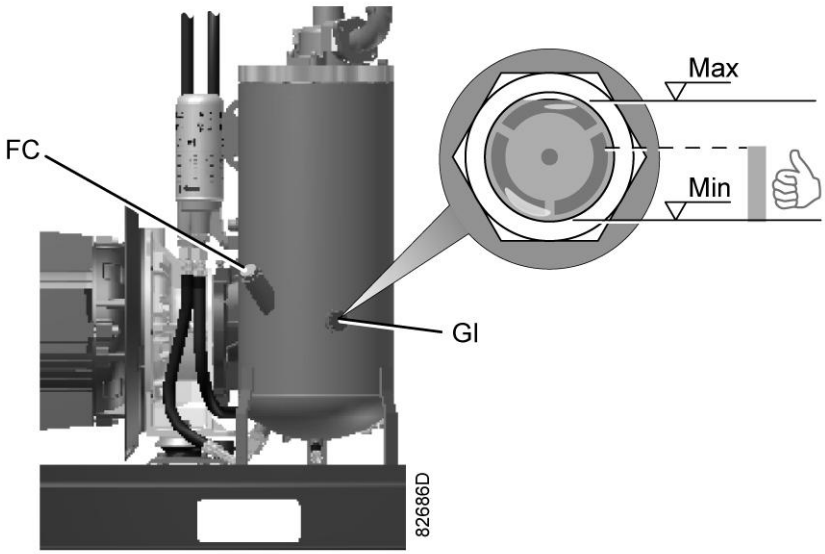
	The operator must apply all relevant Safety precautions. Also consult section Problem solving.
	Removing the front panel (service panel) during operation will lead to an automatic shutdown of the unit after a certain time depending of the compressor version.
	Keep the doors closed during operation; they may be opened for short periods only to carry out checks.
	When the motors are stopped and LED (3) (automatic operation) is alight, the motors may start automatically.

Regulator



Airlogic² control panel

Checking the oil level



Position of oil level sight-glass

Regularly check the oil level. During operation, the oil level should be between the lower region and the centre in the sight glass (Gl). If the level is too low: stop the compressor, wait until the compressor has stopped, depressurise the oil system by unscrewing oil filler plug (FC) one turn and wait a few minutes. Remove the plug and top up oil, until the sight-glass is full. Fit and tighten the plug (FC).

5.5 Automatic restarting

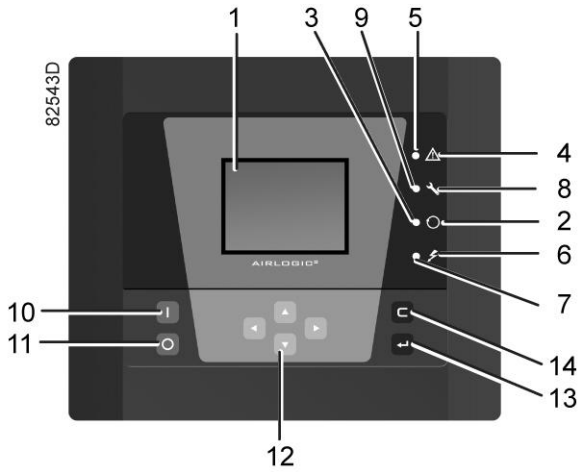
Description

The electronic controller has a built-in function to automatically restart the compressor when the voltage is restored after voltage failure.

	Whenever the compressor is shut down, the emergency push-button must be pressed or the electricity isolating switch opened.

5.6 Stopping

Regulator



Airlogic² control panel

Procedure

Step	Action
-	Press stop button (11). Automatic operation LED (3) goes out and the compressor stops after 30 seconds of unloaded operation.
-	**To stop the compressor in the event of an emergency,** press emergency stop button. Alarm LED flashes (5). • Remedy the problem cause and unlock the button by pulling it out. • Navigate to the Stop icon on the display by means of the navigation keys (12) and press the Select key. Press reset. **Do not use emergency stop button for normal stopping!**
-	Close the air outlet valve (AV).
-	Press the test button on the top of the electronic water drain(s) until the air system between the air system receiver and the outlet valve is fully depressurised. See section Automatic drain Switch off the voltage.
-	If available, open the condensate drain valve of the compressor (Dm) to drain the water trap completely.

5.7 Taking out of operation

Procedure

Step	Action
-	Stop the compressor and close the air outlet valve.
-	Switch off the voltage and disconnect the compressor from the mains.
-	If available, open the condensate drain valve(s) (Dm).
-	Shut off and depressurise the part of the air net which is connected to the outlet valve. Disconnect the compressor air outlet pipe from the air net.
-	Drain the oil.
-	Drain the condensate circuit and disconnect the condensate piping from the condensate net.

6 Maintenance

6.1 Preventive maintenance schedule

Warning

	**Before carrying out any maintenance, repair work or adjustments, proceed as follows:** • Stop the compressor. • Press the emergency stop button. • Switch off the voltage. • Close the air outlet valve and open, if provided, the manual condensate drain valve. • Depressurise the compressor. For detailed instructions, see section Problem solving. The operator must apply all relevant Safety precautions.

Warranty - Product Liability

Use only authorised parts. Any damage or malfunction caused by the use of unauthorised parts is not covered by Warranty or Product Liability.

Service kits

For overhauling or carrying out preventive maintenance, service kits are available (see section Service kits).

Service contracts

.QUINCY offers several types of service contracts, relieving you of all preventive maintenance work. Consult your Customer Center.

General

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

Intervals

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

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

Preventive maintenance schedule

Period	Operation
Daily	Check oil level. Check readings on display. Check that condensate is discharged during loaded operation of the compressor.
3-monthly (1)	Check coolers, clean if necessary. Remove the air filter element and inspect. If necessary, clean using an air jet. Replace damaged or heavily contaminated elements. Check the filter element of the electric cabinet (if applicable). Replace if necessary Press the test button on top of the electronic water drain (EWD). Open the manual drain valve(s) (Dm, Dm1) to clean the filter inside the EWD.

(1): More frequently when operating in a dusty atmosphere.

Interval operations

	Interval (hours)	**500**	**2000 4000 8000 10000 14000 16000 20000 22000**	**6000 18000**	**12000**	**24000**
	Operations to be carried out		Visit A	Visit B	Visit C	Visit D
1	Control measured parameters	x	x	x	x	x
2	Change the oil filter	x	x	x	x	x
3	Change the lubricant	x	x	x	x	x
4	Clean the filtermats	x	x	x	x	x
5	Change the air filter		x	x	x	x
6	Re-grease the drive motor bearings, according to use		x	x	x	x
7	Change the inverter filter (*) and the cubicle filter			x	x	x
8	Change the air inlet filters			x	x	x
9	Change the oil separator element			x	x	x
10	Unloader valve kit				x	x
11	Oil-stop- and check-valve kit				x	x
12	Minimum pressure valve kit				x	x
13	Thermostatic valve kit				x	x
14	Hoses kit					x
15	Overhaul compressor element (use exchange element)					x
16	Replace the shaft seal					x
17	Overhaul the main drive motor					x
18	Overhaul the gearbox					x

(*) If available

The indicated oil exchange intervals are valid for standard operating conditions (see section Reference conditions and limitations) and nominal operating pressure (see section Compressor data). Exposure of the compressor to external pollutants, operation at high humidity combined with low duty cycles or operation at higher temperatures may require a shorter oil exchange interval. Contact your supplier if in doubt.

Important

	• Always consult your supplier if a service timer setting has to be changed. • For the change interval of oil and oil filter in extreme conditions, consult your Customer Centre. • Any leakage should be attended to immediately. Damaged hoses or flexible joints must be replaced.

6.2 Storage after installation

Procedure

Run the compressor regularly, e.g. twice a week, until warm. Load and unload the compressor a few times.

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

6.3 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.

6.4 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.

7 Adjustments and servicing procedures

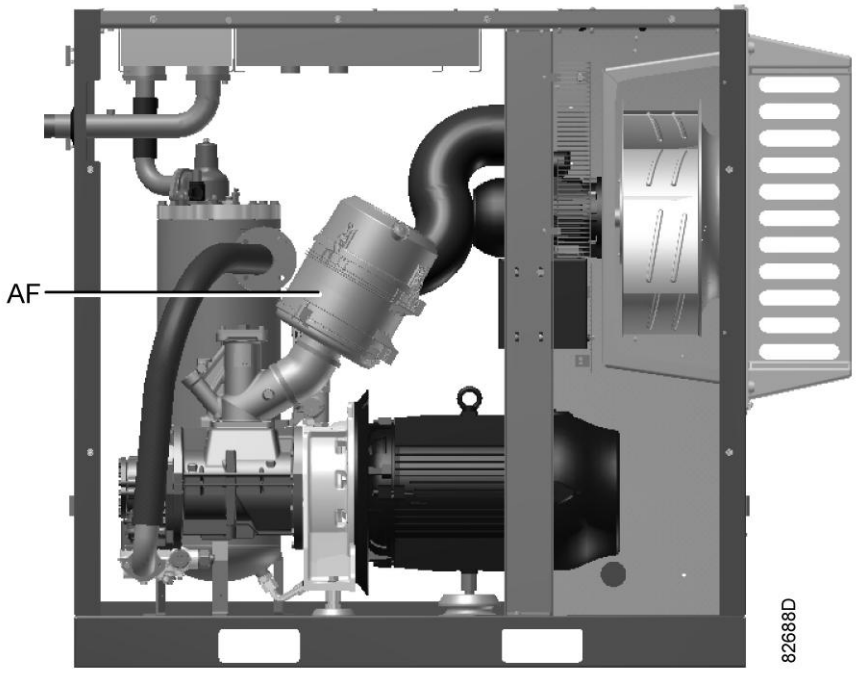
7.1 Air filter

	IMPORTANT If you do not replace the filtering element when needed, permanent dirt build-up will result. This reduces the air inflow to the compressor and could damage the oil separator and the compressor.

1. Never remove the element while the compressor is running.
2. For minimum downtime, replace the dirty element by a new one.
3. Discard the element when damaged.

Procedure

1. Stop the compressor. Switch off the voltage.
2. Release the snap clips of air filter (AF) and remove the dust trap and the air filter element. Clean the trap. Discard the filter element.



Position of air filter

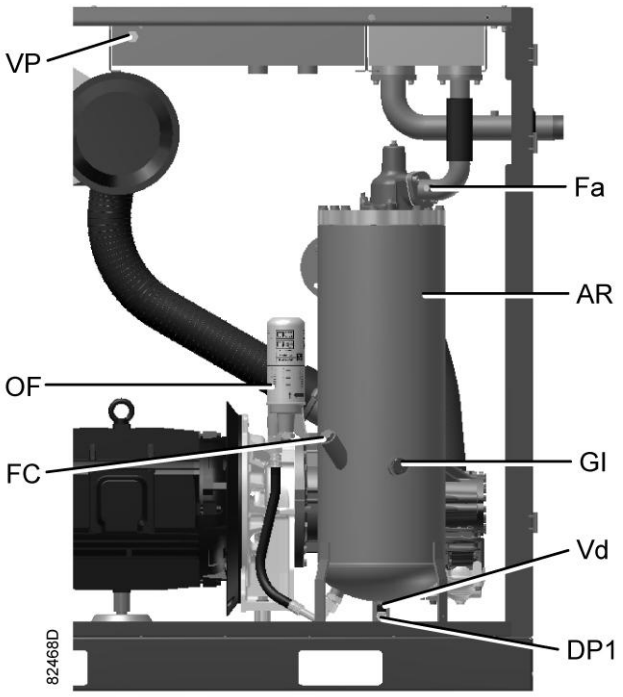
3. Fit the new element and the cover.
4. Reset the air filter service warning.
   For compressors equipped with an AIRLOGIC² regulator, see section Service menu.

7.2 Oil and oil filter change

Warning

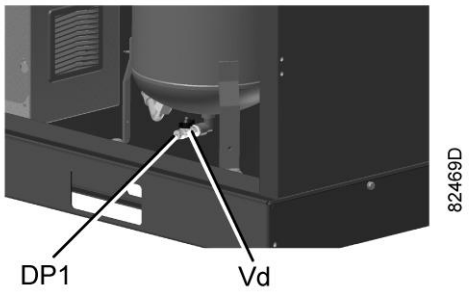
⚠	The operator must apply all relevant Safety precautions. Always drain the compressor oil at all drain points. Used oil left in the compressor can contaminate the oil system and can shorten the lifetime of the new oil. Never mix lubricants of different brands or types as they may not be compatible and the oil mix will have inferior properties. A label, indicating the type of oil filled ex-factory, is stuck on the air receiver/oil tank.

Procedure



Oil system components

1. Run the compressor until warm. Stop the compressor. Close the air outlet valve and switch off the voltage. Depressurise the compressor by opening manual drain valve(s) (if available). Wait a few minutes and depressurise the air receiver/oil tank (AR) by unscrewing oil filler plug (FC) just one turn to permit any pressure in the system to escape. Also depressurize the air pipe by unscrewing the air vent plug (Fa) with one turn.
2. Loosen the vent plug (VP) of the oil cooler and wait for 5 minutes.
3. Remove oil drain plug (DP1). Drain the oil by opening valve (Vd). Close the valve and fit the plug after draining.



Oil drain plugs

4. Collect the oil and deliver it to the local collection service. Refit and tighten the drain and vent plugs after draining.
   Re-tighten the top connection of the oil cooler.
5. Remove the oil filter (OF). Clean the seat on the manifold. Oil the gasket of the new filter and screw it into place. Tighten firmly by hand.
6. Remove filler plug (FC).
   Fill the air receiver/oil tank (AR) with oil until the level reaches the filler neck.
   Take care that no dirt drops into the system. Refit and tighten filler plug (FC).
7. Run the compressor loaded for a few minutes. Stop the compressor and wait a few minutes to allow the oil to settle.
8. Depressurise the system by unscrewing filler plug (FC) just one turn to permit any pressure in the system to escape. Remove the plug.
   Add oil, the oil level should be between the lower region and the centre in the sight glass (Gl).
   Tighten the filler plug.
9. Reset the service warning after carrying out all service actions in the relevant Service Plan: see Service menu.

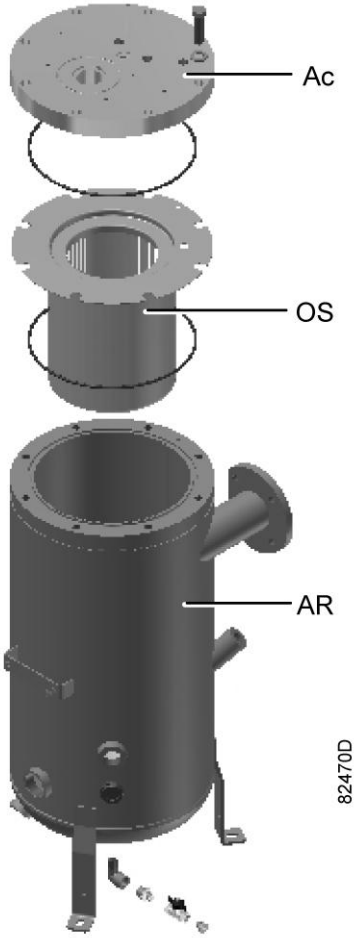
7.3 Oil separator change

Warning

⚠	The operator must apply all relevant Safety precautions.

Procedure

1. Run the compressor until warm. Stop the compressor, close the air outlet valve and switch off the voltage. Wait a few minutes and depressurise by unscrewing oil filler plug (FC) just one turn to permit any pressure in the system to escape.
2. Remove the cover (Ac) from the air receiver/oil tank (AR) by unscrewing the bolts.



Oil separator components

3. Remove the oil separator (OS).
4. Clean the seat on air receiver/oil tank (AR).
   Place the new separator into the air receiver/oil tank and replace the vessel cover (Ac) with the bolts.
   Take care that no dirt drops into the system. Refit and tighten filler plug (FC).
5. Remove filler plug (FC).
   Fill the oil tank (AR) with oil until the level reaches the middle of sight-glass (Gl).
6. Run the compressor loaded for a few minutes. Stop the compressor and wait a few minutes to allow the oil to settle.
7. Depressurise the system by unscrewing filler plug (FC) just one turn to permit any pressure in the system to escape. Remove the plug.
   Fill the oil tank with oil. The oil level should be between the lower region and the centre in the sight glass (Gl).
   Tighten the filler plug.
8. Reset the service timer: see Service menu.

7.4 Coolers

General

Keep the coolers clean to maintain their efficiency.

⚠	Never use a high pressure water jet to clean the compressor.

Instructions for air-cooled compressors

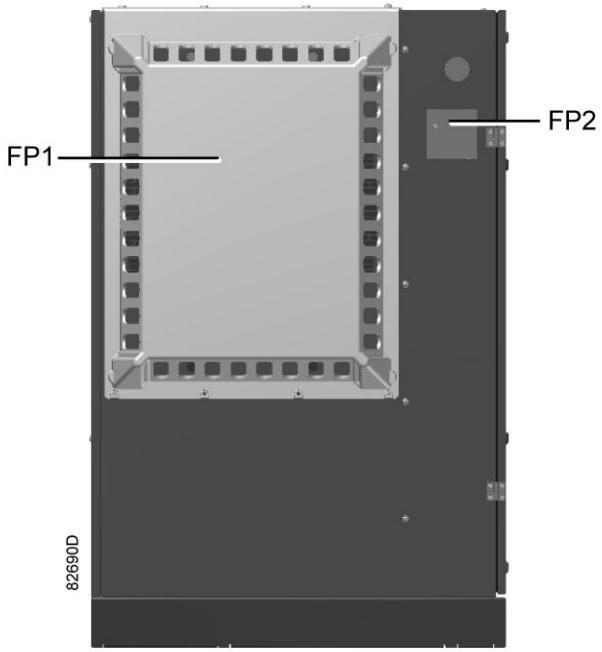
1. Stop the compressor, close the air outlet valve and switch off the voltage.
2. Remove any dirt from the coolers with a fibre brush. Never use a wire brush or metal objects.
3. Cover all parts under the coolers.
4. Next, clean with an air jet in the reverse direction to normal flow. Use low pressure air. If necessary, the pressure may be increased up to 6 bar(e) (87 psig).

7.5 Filtering panel

Cleaning the filtering panel

⚠	Before carrying out any operation on the machine, ensure that the electric power supply has been disconnected.

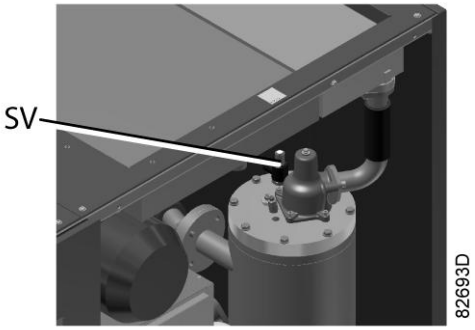
- Stop the compressor.
  Close the air outlet valve and switch off the voltage.
- Remove the air inlet filter panel(s) (FP1) and the cubicle filter (FP2).



- Clean the inlet filtering panel with a jet of air wash it with water, do not use solvents.
- Replace the cubicle filter.
- Once the operation has been completed, reassemble the filter panel.

7.6 Safety valves

Location of safety valve



Operating

Operate the safety valve by unscrewing the cap one or two turns and retighten it.

Testing

Before removing the valve, depressurise the compressor.

See section Problem solving.

Valve (SV) can be tested on a separate air line. If the valve does not open at the set pressure stamped on the valve, it needs to be replaced.

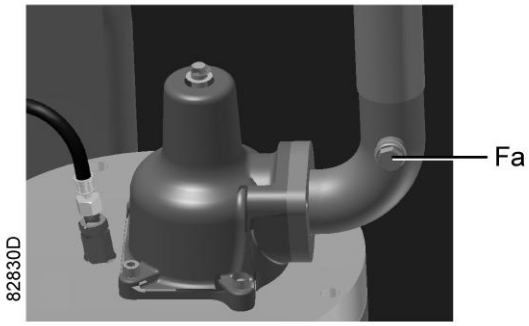
Warning

No adjustments are allowed. Never run the compressor without safety valve.

8 Problem solving

Warning

	Before carrying out any maintenance, repair work or adjustment, press the stop button, wait until the compressor has stopped, press the emergency stop button and switch off the voltage. Close the air outlet valve and lock it if necessary. Depressurize the air connection between the minimum pressure valve and the compressor outlet ball valve. Turn slowly the air vent plug (Fa) just one turn to permit any pressure in the system to escape. If provided, open the manual condensate drain valves. Depressurise the compressor by opening the oil filler plug one turn. **For location of components, see sections:** Introduction and Initial start-up.
	Open and lock the isolating switch.
	The operator must apply all relevant Safety precautions.



Position of air vent plug

Compressor

On compressors equipped with an AIRLOGIC² controller: if the alarm LED is lit or flashes, consult sections Main screen and following.

-	Condition	Fault	Remedy
	Compressor starts running, but does not load after a delay time	Solenoid valve out of order	Replace valve
		Inlet valve stuck in closed position	Have valve checked
		Leak in control air flexibles	Replace leaking flexible
		Minimum pressure valve leaking (when net is depressurised)	Have valve checked

-	Condition	Fault	Remedy
	Compressor does not unload, safety valve blows	Solenoid valve out of order	Replace valve
		Inlet valve does not close	Have valve checked

-	Condition	Fault	Remedy
	Compressor air output or pressure below normal	Air consumption exceeds air delivery of compressor	Check equipment connected
		Choked air filter element	Replace filter element
		Solenoid valve malfunctioning	Replace valve
		Leak in control air flexibles	Replace leaking flexibles
		Inlet valve does not fully open	Have valve checked
		Oil separator clogged	Have element replaced
		Air leakage	Have leaks repaired
		Safety valve leaking	Have valve replaced
		Compressor element out of order	Consult your supplier

-	Condition	Fault	Remedy
	Excessive oil consumption; oil carry-over through discharge line	Oil level too high	Check for overfilling. Release pressure and drain oil to correct level
		Incorrect oil causing foam	Change to correct oil
		Oil separator defective	Have element checked. Replace if necessary.
		Scavenge line clogged	Check and remedy

-	Condition	Fault	Remedy
	Excessive oil flow through air inlet filter after stopping compressor	Check valve leaking or oil stop valve jammed	Replace defective parts. Replace air filter element

-	Condition	Fault	Remedy
	Safety valve blows after loading	Inlet valve malfunctioning	Have valve checked
		Minimum pressure valve malfunctioning	Have valve checked
		Safety valve out of order	Have valve replaced
		Compressor element out of order	Consult your supplier
		Oil separator element clogged	Have element replaced

-	Condition	Fault	Remedy
	Compressor element outlet temperature or delivery air temperature above normal	Oil level too low	Check and correct
		On air-cooled compressors, insufficient cooling air or cooling air temperature too high	Check for cooling air restriction or improve ventilation of the compressor room. Avoid circulation of cooling air. If installed, check capacity of compressor room fan
		Oil cooler clogged	Clean cooler

-	Condition	Fault	Remedy
		Thermostatic bypass valve malfunctioning	Have valve tested
		Air cooler clogged	Clean cooler
		Compressor element out of order	Consult your supplier
		Oil filter clogged	Replace

9 Technical data

9.1 Electric cable size and fuses

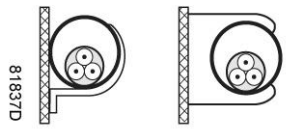
Important

	• The voltage on the compressor terminals must not deviate more than 10% of the nominal voltage. It is however highly recommended to keep the voltage drop over the supply cables at nominal current below 5% of the nominal voltage (IEC 60204-1). • If cables are grouped together with other power cables, it may be necessary to use cables of a larger size than those calculated for the standard operating conditions. • Use the original cable entry. See section Dimension drawings. **To preserve the protection degree of the electric cubicle and to protect its components from dust from the environment, it is mandatory to use a proper cable gland when connecting the supply cable to the compressor.** • Local regulations remain applicable if they are stricter than the values proposed below.

Cable sizing according IEC

The tables below indicate the current carrying capacities of cables for 3 commonly used installation methods, calculated according to standard 60364-5-52 - electrical installations of buildings part 5 - selection and erection equipment and section 52 - current carrying capacities in wiring systems.

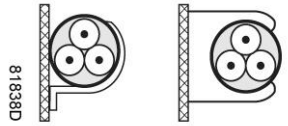
The allowed currents are valid for PVC insulated cables with three loaded copper conductors (maximum conductor temperature 70 °C).

	Installation method B2 according table B.52.1. Multi-core cable in conduit on a wooden wall

Maximum allowed current in function of the ambient temperature for installation method B2

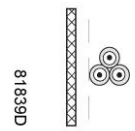
	Ambient temperature				
Cable section	**30 °C**	**40 °C**	**45 °C**	**50 °C**	**55 °C**
4 mm²	< 27 A	< 23 A	< 21 A	< 19 A	< 16 A
6 mm²	< 34 A	< 30 A	< 27 A	< 24 A	< 21 A
10 mm²	< 46 A	< 40 A	< 36 A	< 33 A	< 28 A
16 mm²	< 62 A	< 54 A	< 49 A	< 44 A	< 38 A
25 mm²	< 80 A	< 70 A	< 63 A	< 57 A	< 49 A
35 mm²	< 99 A	< 86 A	< 78 A	< 70 A	< 60 A
50 mm²	< 118 A	< 103 A	< 93 A	< 84 A	< 72 A
70 mm²	< 149 A	< 130 A	< 118 A	< 106 A	< 91 A
95 mm²	< 179 A	< 156 A	< 141 A	< 127 A	< 109 A

	Ambient temperature				
Cable section	**30 °C**	**40 °C**	**45 °C**	**50 °C**	**55 °C**
120 mm²	< 206 A	< 179 A	< 163 A	< 146 A	< 126 A

	Installation method C according table B.52.1. Single-core or multi-core cable on a wooden wall

Maximum allowed current in function of the ambient temperature for installation method C

	Ambient temperature				
Cable section	**30 °C**	**40 °C**	**45 °C**	**50 °C**	**55 °C**
4 mm²	< 32 A	< 28 A	< 25 A	< 23 A	< 20 A
6 mm²	< 41 A	< 36 A	< 32 A	< 29 A	< 25 A
10 mm²	< 57 A	< 50 A	< 45 A	< 40 A	< 35 A
16 mm²	< 76 A	< 66 A	< 60 A	< 54 A	< 46 A
25 mm²	< 96 A	< 84 A	< 76 A	< 68 A	< 59 A
35 mm²	< 119 A	< 104 A	< 94 A	< 84 A	< 73 A
50 mm²	< 144 A	< 125 A	< 114 A	< 102 A	< 88 A
70 mm²	< 184 A	< 160 A	< 145 A	< 131 A	< 112 A
95 mm²	< 223 A	< 194 A	< 176 A	< 158 A	< 136 A
120 mm²	< 259 A	< 225 A	< 205 A	< 184 A	< 158 A

	Installation method F according table B.52.1. Single-core cables, touching in free air Clearance to wall not less than one cable diameter

Maximum allowed current in function of the ambient temperature for installation method F

	Ambient temperature				
Cable section	**30 °C**	**40 °C**	**45 °C**	**50 °C**	**55 °C**
25 mm²	< 110 A	< 96 A	< 87 A	< 78 A	< 67 A
35 mm²	< 137 A	< 119 A	< 108 A	< 97 A	< 84 A
50 mm²	< 167 A	< 145 A	< 132 A	< 119 A	< 102 A
70 mm²	< 216 A	< 188 A	< 171 A	< 153 A	< 132 A
95 mm²	< 264 A	< 230 A	< 209 A	< 187 A	< 161 A
120 mm²	< 308 A	< 268 A	< 243 A	< 219 A	< 188 A

Calculation method for IEC:

- Single supply cables (3 phases + PE - configuration (1)):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables)

- Install the prescribed fuse on each cable
- Parallel supply cable (2 x 3 phases + PE - configuration (2)):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables) and divide by 2
  - Multiply the ampacity of the cables with 0.8 (see table A.52.17 (52-E1))
  - Install fuses of half the size of the recommended maximum fuse size on each cable.
- When using 2 x 3 phases + PE as in (3):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables) and divide by √3
  - Multiply the ampacity of the cables with 0.8 (see table A.52.17 (52-E1))
  - Fuse size: the recommended maximum fuse size divided by √3 on each cable.
- Size of the PE cable:
  - For supply cables up to 35 mm²: same size as supply cables
  - For supply cables larger than 35 mm²: half the size of the supply wires

Always check the voltage drop over the cable (less than 5 % of the nominal voltage is recommended).

Example: I_{tot} = 89 A, maximum ambient temperature is 45 °C, recommended fuse = 100 A

- Single supply cables (3 phases + PE - configuration (1)):
  - I = 89 A + 10 % = 89 x 1.1 = 97.9 A
  - The table for B2 and ambient temperature = 45 ° C allows a maximum current of 93 A for a 50 mm² cable. For a cable of 70 mm², the maximum allowed current is 118 A, which is sufficient. Therefore, use a 3 x 70 mm² + 35 mm² cable.
    If method C is used, 50 mm² is suffficient. (35 mm² for method F) => cable 3 x 50 mm² + 25 mm².
- Parallel supply cable (2 x 3 phases + PE - configuration (2)):
  - I = (89 A + 10 %)/2 = (89 x 1.1)/2 = 49 A
  - For a cable of 25 mm², B2 at 45 °C, the maximum current is 63 A x 0.8 = 50.4 A. So 2 parallel cables of 3 x 25 mm² + 25 mm² are sufficient.
  - Install 50 A fuses on each cable instead of 100 A.

Fuse calculations for IEC are done according to 60364-4-43 electrical installations of buildings, part 4: protection for safety- section 43: protection against overcurrent. Fuse sizes are calculated in order to protect the cable against short circuit. Fuse type aM is recommended but gG/gL is also allowed.

Cable sizing according CSA

Calculation method according CEC part 1, table 2 column 3: allowable ampacities for not more than 3 copper conductors in raceway or cable (based on an ambient temperature of 30 °C (86 °F). Correction factors for other temperatures table 5A column 3.

Maximum allowed current in function of the ambient temperature

	Ambient temperature				
Cable section (AWG or kcmil)	**30 °C (86 °F)**	**40 °C (104 °F)**	**45 °C (113 °F)**	**50 °C (122 °F)**	**55 °C (131 °F)**
10	< 30 A	< 26 A	< 25 A	< 23 A	< 20 A
8	< 45 A	< 40 A	< 37 A	< 34 A	< 29 A
6	< 65 A	< 57 A	< 53 A	< 49 A	< 42 A
4	< 85 A	< 75 A	< 70 A	< 64 A	< 55 A
3	< 100 A	< 88 A	< 82 A	< 75 A	< 65 A
2	< 115 A	< 101 A	< 94 A	< 86 A	< 75 A
1	< 130 A	< 114 A	< 107 A	< 98A	< 85 A
1/0	< 150 A	< 132 A	< 123 A	< 113 A	< 98 A

	Ambient temperature				
Cable section (AWG or kcmil)	**30 °C (86 °F)**	**40 °C (104 °F)**	**45 °C (113 °F)**	**50 °C (122 °F)**	**55 °C (131 °F)**
2/0	< 175 A	< 154 A	< 144 A	< 131 A	< 114 A
3/0	< 200 A	< 176 A	< 164 A	< 150 A	< 130 A
4/0	< 230 A	< 202 A	< 189 A	< 173 A	< 150 A

Calculation method for CSA

- Single supply cables (3 phases + PE - configuration (1)):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables)
  - Install the prescribed fuse on each cable
- Parallel supply cable (2 x 3 phases + 2 PE - configuration (2)):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables) and divide by 2
  - Multiply the ampacity of the cables with 0.8 (see CEC Part 1 table 5C)
  - Install fuses of half the size of the recommended maximum fuse size on each cable.
- When using 2 x 3 phase + 2 PE as in (3):
  - Add 10 % to the total compressor current (I_{tot}Pack or I_{tot}FF from the tables) and divide by √3
  - Multiply the ampacity of the cables with 0.8 (see CEC Part 1 table 5C)
  - Fuse size: the recommended maximum fuse size divided by √3 on each cable.
- Size PE cable:
  - For supply cables up to AWG8: same size as supply cables
  - For supply cables larger than AWG8: use maximum allowed ampacity of the selected supply cables and compare with value in table below (see CEC Part 1 table 17)

< 100 A: use AWG8
< 200 A: use AWG6
< 400 A: use AWG3

Always check the voltage drop over the cable (less than 5 % of the nominal voltage is recommended).

Example of supply cable calculation: I_{tot} = 128 A, maximum ambient temperature is 45 °C, recommended fuse = 150 A

- Single supply cables (3 phases + PE - configuration (1)):
  - I = 128 A + 10 % = 128 x 1.1 = 140.8 A
  - AWG2/0 allows a maximum current of 144 A at 45 °C (113 °F), which is sufficient.
  - Fuses: 150 A
- Parallel supply cables (2 x 3 phases + 2 PE - configuration (2)):
  - I = (128 A + 10 %)/2 = (128 x 1.1)/2 = 70.4 A
  - For AWG3 at 45 °C (113 °F), the maximum current is 82 A x 0.8 = 65.6 A, which is insufficient. For an AWG2, the maximum current is 94 x 0.8 = 75.2 A. So 2 parallel cables of 3 x AWG2 + AWG8 are sufficient.
  - Install fuses of 80 A instead of 150 A.

Fuse size is the max. fuse size in order to protect the motor against short circuit. For CSA fuse HRC form II, for UL fuse class RK5.

Cable sizing according UL/cUL

Calculation method according UL 508A, table 28.1 column 5: allowable ampacities of insulated copper conductors (75 °C (167 °F)).

Maximum allowed current in function of the wire size

AWG or kcmil	Maximum current
10	< 30 A
8	< 50 A
6	< 65 A
4	< 85 A
3	< 100 A
2	< 115 A
1	< 130 A
1/0	< 150 A
2/0	< 175 A
3/0	< 200 A

Calculation method for UL:

- Single supply cables (3 phases + 1 PE - configuration (1)):
  - Add 25 % to the total current from the tables (see UL 508A 28.3.2: "Ampacity shall have 125 % of the full load current")
  - Install the prescribed maximum fuse on each cable
- Parallel supply cable (2 x 3 phases + 2 PE - configuration (2)):
  - Add 25 % to the total current from the tables and divide by 2
  - Multiply the ampacity of the cables with 0.8 (see UL 508A table 28.1 continued)
  - Install fuses of half the size of the recommended maximum fuse size on each cable.
- When using 2 x 3 phase + 2 PE as in (3):
  - Add 25 % to the total current from the tables and divide by √3
  - Multiply the ampacity of the cables with 0.8 (see UL 508A table 28.1 continued)
  - Fuse size: the recommended maximum fuse size divided by √3 on each cable.
- Size PE cable:
  - For supply cables up to AWG8: same size as the supply cables
  - For supply cables larger than AWG8: use maximum allowed ampacity of the selected supply cables and compare with value in table below (see CEC Part 1 table 17)

< 100 A: use AWG8
< 200 A: use AWG6
< 300 A: use AWG4

Always check the voltage drop over the cable (less than 5 % of the nominal voltage is recommended).

Example of supply cable calculation: I_{tot} = 128 A, maximum ambient temperature is 45 °C, recommended fuse = 150 A

- Single supply cables (3 phases + 1 PE - configuration (1)):
  - I = 128 A + 25 % = 128 x 1.25 = 160 A
  - For AWG2/0, the maximum current is 175 A, which is sufficient => use AWG2/0
  - Install the prescribed maximum fuse (150 A) on each cable
- Parallel supply cable (2 x 3 phases + 2 PE - configuration (2)):
  - I = (128 A + 25%)/2 = (128 x 1.25)/2 = 80 A
  - For a AWG4, the maximum current is 85 A x 0.8 = 68 A, which is insufficient. For an AWG3, the maximum current is 100 x 0.8 = 80 A. So 2 parallel cables of 3 x AWG3 + 2 x AWG8 are sufficient.

- Install 80 A fuses on each cable.

The indicated fuse size is the maximum fuse size in order to protect the motor against short circuit. For cUL fuse HRC form II, for UL fuse class RK5.

9.2 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

Limits

Maximum working pressure		See section Compressor data
Minimum working pressure	bar(e)	4
Minimum working pressure	psig	58
Maximum air inlet temperature	˚C	46
Maximum air inlet temperature	˚F	115
Minimum ambient temperature	˚C	0
Minimum ambient temperature	˚F	32

9.3 Compressor data

Reference conditions

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

Gearbox driven units

	Units	7.5 bar	8 bar	10 bar	13 bar	100 psi	125 psi	150 psi	175 psi
Frequency	Hz	50	50	50	50	60	60	60	60
Nominal working pressure	bar(e)	7	8	9.5	12.5	6.9	8.6	10.3	12
	psig	102	116	138	181	100	125	150	175
Maximum working pressure	bar(e)	7.5	8	10	13	7.4	9.1	10.8	12.5
	psig	109	116	145	189	107	132	157	181
Unloading pressure Factory setting	bar(e)	7	8	9.5	12.5	6.9	8.6	10.3	12
	psig	102	116	138	181	100	125	150	175

	Units	7.5 bar	8 bar	10 bar	13 bar	100 psi	125 psi	150 psi	175 psi
Unloading pressure Minimum setting	bar(e)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	psig	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5
Loading pressure Factory setting	bar(e)	6.4	7.6	8.9	11.9	6.3	8	9.7	11.4
	psig	93	110	129	173	91	116	141	165
Loading pressure Minimum setting	bar(e)	4	4	4	4	4	4	4	4
	psig	58	58	58	58	58	58	58	58
Set point, thermostatic valve	˚C	40	40	40	65	40	40	40	65
	˚F	104	104	104	149	104	104	104	149

	Units	7.5 bar	8 bar	10 bar	13 bar	100 psi	125 psi	150 psi	175 psi
Set point, thermostatic valve (converter)	˚C	65	65	65	65	65	65	65	65
	˚F	149	149	149	149	149	149	149	149

Power	hp	40	50	60	75	100	100	125	150
Oil capacity, air-cooled units	l	20	20	20	25	25	30	30	35

10 Options

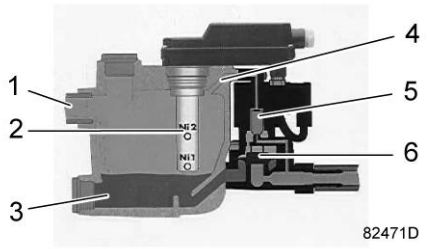
10.1 Automatic drain

Description

The automatic drain valve allows all air consumption to be avoided while the compressor is not running.

Overview

- There is no air loss due to the level detection system : an inductive sensor detects the level of water and thus controls the opening of the electric bleed valve. A low level of condensation is also detected in order to close the electric drain valve and to prevent compressed air from being wasted.
- This type of purge valve does not require any maintenance. The purge valve does not require the use of the metallic intake filter that is usually installed on electronic purge valves to protect the solenoid valve. The solenoid valve will not be damaged.
- Condensate discharge facilitated as condensates are not discharged under pressure facilitating separation of the condensate oil and water phases.



Main components

Reference	Designation
1	Condensation intake
2	Capacitive sensor
3	Receiver
4	Main duct
5	Solenoid valve
6	Membrane

Technical features

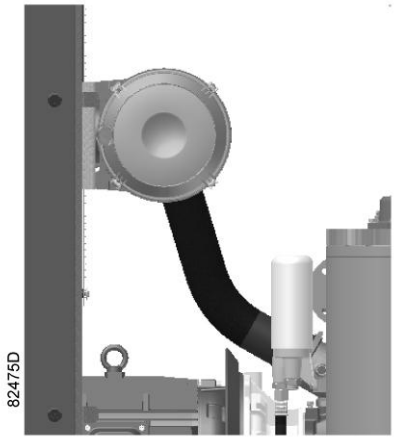
Maximum capacity of the compressor :	5 m^3/min
Working pressure : 0.8 / 16 bar Operating temperature :	+ 1 / + 60°C
Electric power supply :	230 / 110 / 24/ …
AC socket in the compressor electric cabinet.	

10.2 Heavy duty filter

Description

This system is equipped for "high efficiency" air filtration in order to improve the quality of the air intake and to preserve the compressor's oil and internal filter components.

This option is particularly useful in very dusty surroundings.



Overview

- This option is used as a replacement for the standard filter
- The quality of the air intake by a compressor is essential. Low quality air creates the following :
- Quick pollution of the oil thus an increase in draining cycles.
- Binding of the air / oil separator before 4000 hours thus an increase in maintenance cycles and operation costs.
- Pollution increases the elements that filter into the air and oil, speeding up the damage to the mechanical components of the compressor, screw element, ...
- Installation of the filter(s), depending on the model, outside the compressor, for intake of fresh air, hence resulting in a lower oil temperature and more efficient compression.

10.3 Pre-filtration panels

Description

Installing air filtration panels on the ventilation intakes guarantees protection of the compressor's internal components and an increase in air sucked into the compression assembly.

This option is recommended if the heavy duty filtration option is installed

Overview

The pre-filtration panels eliminate 90% of the particles normally admitted inside the compressor and considerably decrease internal contamination of the machine.

The high quality of the ventilation air is also essential for protecting internal components of the compressor and, more specifically, the motor and the air / air and air / oil exchangers. Clogging in the exchangers creates an increase in temperature, deterioration of the lubricant and the motor becomes overloaded thus increasing the energy consumed.

The quality of the air drawn in by a compressor is essential. Low quality air results in the following :

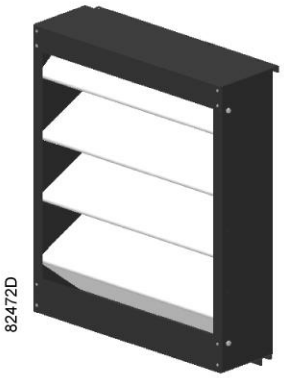
- Fast pollution of the oil thus an increase in oil change cycles.
- Increased pollution of the air and oil filtering components that increases the deterioration of the mechanical components in the compressor, screw block, ...
- Binding of the air / oil separator before 4000 Hours thus an increase in maintenance cycles and maintenance costs.

Access to the filtering media is allowed by removal that does not require any particular tool. The panel frame can be unlocked manually in order to clean the medium.

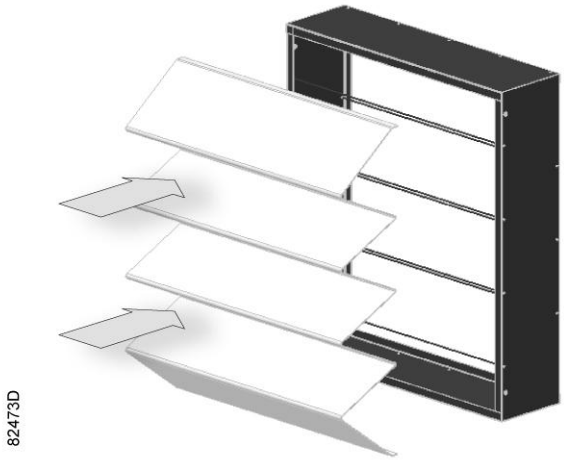
Exceptional longevity of the medium that is quick to take apart. The medium can be scoured by blowing compressed air in thus increasing the usage term for the filtering medium.

Galvanised steel covered frame.

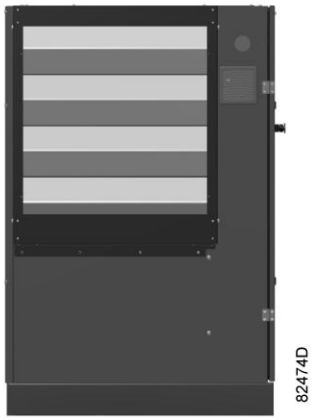
Non flammable medium (belonging to fire protection class M1) made of polyester fibres.



Easy to disassemble for rapid cleaning.



Pleated medium on support grid placed downstream the direction of the airflow



Assembly

Technical features

Filter medium:

Degree of filtration :	90% of the dust emitted is filtered.
Total nominal flow :	6 000 m3/h
Filter panel number :	2
Initial charge loss :	75 Pa

Dimensions	
Width :	500 mm
Height :	500 mm
Thickness :	200 mm

This option may be fitted to a compressor already installed.

10.4 Rotation direction indicator - Phase controller

Description

The phase controller enables permanent and easier verification of the rotation direction of the machine by means of a diode. This prevents any risk of physical damage by disabling the compressor start up in case of phase reversal or if a phase is disconnected and indicates a machine fault.

Marking on the motor of the standard machine version identifies the motor fan rotation direction during the start up phase. Work on the electric network or the machine may change the rotation direction and damage the compressor which must be detected quickly.

10.5 Remote starting and stopping

Description

This option allows the compressor to be remotely started and stopped. However, in all cases, stopping the compressor at the machine itself is essential. If the compressor is shut down from remote it may be restarted from remote as well.

Technical features

This option requires configuration of the electronic controller and installation of an informative insert on the door of the compressor electric cabinet.

Whenever the compressor is shut down, the emergency push-button must be pressed or the electricity isolating switch opened.

	For any intervention to be conducted on the machine, it is essential to activate the emergency stop of the machine in order to ensure safe conditions and electrical diagram.

10.6 Special oils

Description

Different oils meet different needs:

4000 hours oil : longer interval between 2 drainage operations - 4000 hours under standard conditions of use.

8000 hours oil : longer interval between 2 drainage operations - 8000 hours under standard conditions of use.

Food Grade Oil: use of the compressor in the agricultural food & beverage industry.

Note:

If this option is chosen on a machine that has previously run on standard oil, the flushing procedure must first be strictly complied with.

Overview

4000 and 8000 hours oil

The qualities of these oils enable the maintenance planning schedule to be based on main drainage operations of 4000 or 8000 hours (under standard conditions of use).

The maintenance tasks are consequently less frequent, thus making for certain savings, such as the availability of the equipment and lower operating cost of the compressor.

Food Grade Oil

This oil has been specially developed for use as a lubricant that may come into contact with foodstuffs.

11 Guidelines for inspection

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.

12 Pressure equipment directives

Components subject to 97/23/EC Pressure Equipment Directive

The following table contains the necessary information for the inspection of all pressure equipment of category II and higher according to the Pressure Equipment Directive 97/23/EC and all pressure equipment according to the Simple Pressure Vessel Directive 87/404/EEC.

Compressor type	Component	Description	Volume	Design pressure	Minimum and maximum design temperature	PED Class
30-50 kW	1631 0137 80	Vessel	41 l	15 bar(e)	-10 ˚C/ 120 ˚C	SPV
55 kW (belt FS) 55-75 kW (belt IVR / gear) 75 kW	1631 0138 80		55 l			SPV
75-90 kW	1631 0164 80		70 l			SPV
All types	0830 1000 78	Safety valve	-	-	-	IV
All types	0830 1000 79	Safety valve	-	-	-	IV

Overall rating

The compressors conform to PED smaller than category I.

The compressors conform to PED smaller than category II.

13 Declaration of conformity

EC DECLARATION OF CONFORMITY

We, (1) ....., 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		

81679D

Typical example of a Declaration of Conformity document

(1): Contact address:

Quincy Compressor

701 North Dobson Avenue

Bay Minette, AL 36507

United States

Quincy Compressor Products: 217 222.7700
E-mail: info@quincycompressor.com
Website: quincycompressor.com