



# OIL-FREE SCROLL COMPRESSORS

QOF 20, QOF 22, QOF 30



## Instruction Manual

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

Manual No. 2930 7140 30

November 2014 Edition



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

### Safety Alert Symbols

## IMPORTANT!

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



### **DANGER!**

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



### **WARNING!**

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



### **DANGER!**

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



### **CAUTION!**

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



### **CAUTION!**

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

### **NOTICE!**

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

## Section I - General Information

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### Safety Precautions

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

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



### **WARNING!**

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

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

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

### **NOTICE!**

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

### **NOTICE!**

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

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### Spare Parts Ordering Information

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

### Serial/Model Identification Plate



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

## Section I - General Information

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### Warranty

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

### Standard Warranty

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

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



- General description
- Flow diagram
- Regulating system
- Electrical system
- Electric diagram
- Temperature protection
- Air dryer

### General description

#### Introduction

QOF 20, QOF 22 and QOF 30 are stationary, oil free compressors.

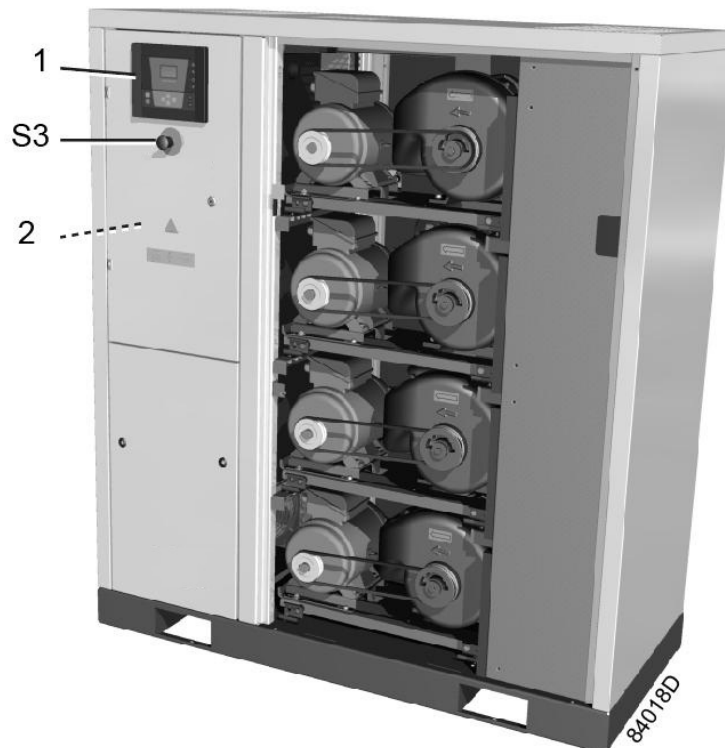
Dependent on the model, the compressors have 3 or 4 electric motor driven compressor modules, enclosed in a sound insulating canopy. The front door panel houses the controller with graphical display and the emergency stop button. An electric cabinet with the electric components is located behind the front panel.

The compressors can be delivered with or without integrated refrigerant air dryer.

QOF is the type designation of the compressor variant without integrated dryer. On QOF, the compressed air of each compressor module flows via an individual check valve to a common air cooler and leaves the compressor via the air outlet valve.

QOF with dryer compressors are QOF compressors provided with a refrigerant air dryer, integrated in the bodywork.

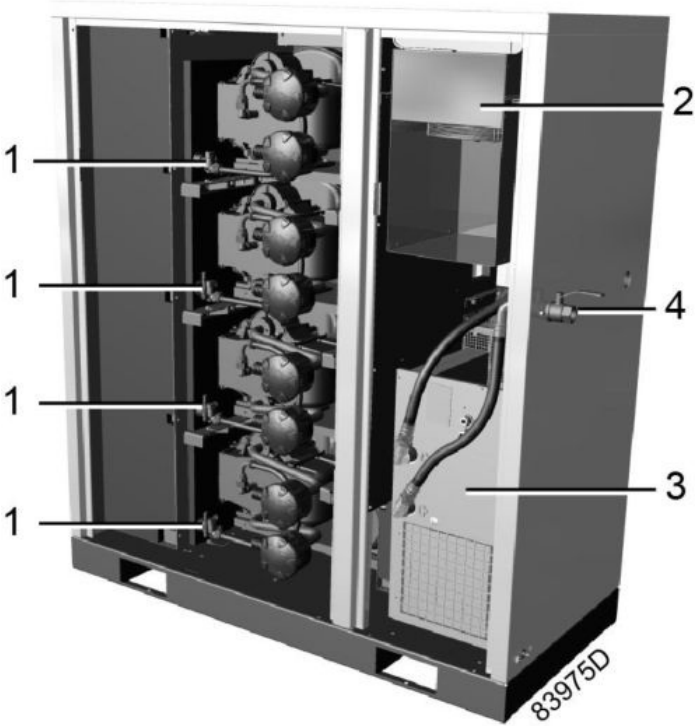
The dryer removes moisture from the compressed air by cooling the air to near freezing point and automatically draining the condensate.



*QOF 30 with dryer, front view*

Section II - Description

1	Electronic controller	S3	Emergency stop button
2	Hour meter		

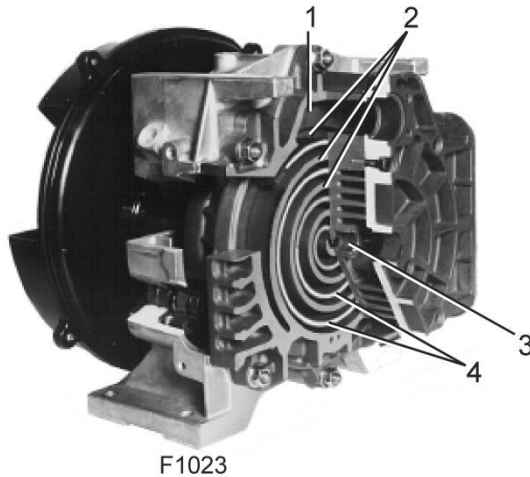


QOF 30 with dryer, rear view

1	Compressor module	3	Refrigerant dryer
2	Air cooler	4	Compressed air outlet valve

Compressor element operating principle

Each compressor element consists of a fixed scroll shaped housing and a scroll shaped rotor. Air enters the compressor element through inlet opening (1). Once the air is drawn in, the orbiting scroll (4) seals the inlet opening and forces the air into a continuously decreasing space. As scroll (4) keeps orbiting, this process of compression is constantly repeated, resulting in discharging of oil free compressed air through outlet opening (3).

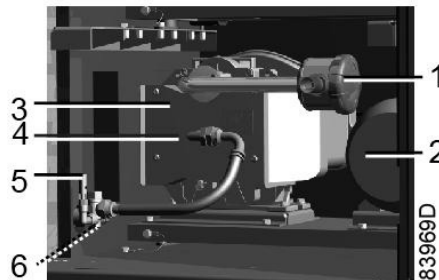


*Compressor element, typical*

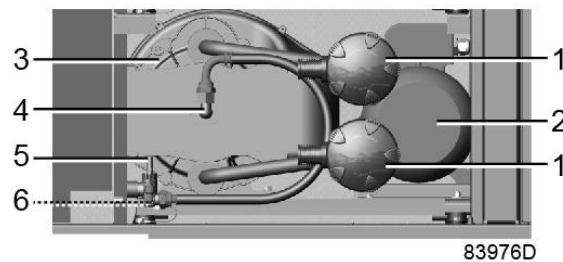
1	Air inlet	3	Air outlet
2	Fixed scroll	4	Orbiting scroll

### Compressor module

The QOF 20 has four 3.7 kW modules, while the QOF 22 and the QOF 30 respectively have three or four 5.5 kW modules.



*3.7 kW compressor module*

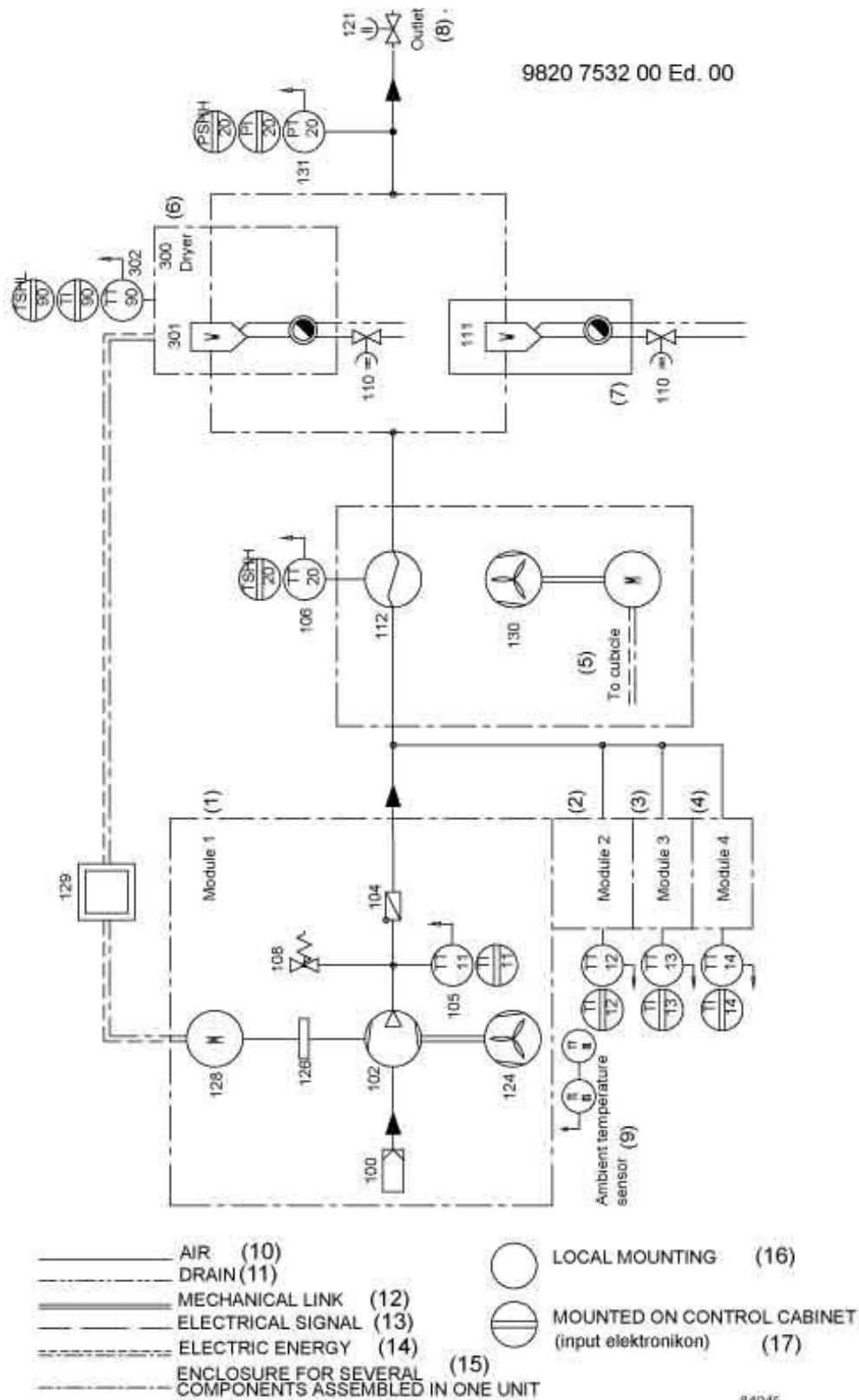


*5.5 kW compressor module*

1	Air filter	4	Compressor element air outlet
2	Motor	5	Safety valve
3	Compressor element	6	Temperature sensor

Section II - Description

Flow diagram



Flow diagram

Text on image

(1)	Compressor module 1	(10)	Air
(2)	Compressor module 2	(11)	Drain
(3)	Compressor module 3	(12)	Mechanical link
(4)	Compressor module 4	(13)	Electrical signal
(5)	To cubicle	(14)	Electric energy
(6)	Refrigerant dryer (units with dryer)	(15)	Enclosure
(7)	Water separator (units without dryer)	(16)	Local mounting
(8)	Outlet	(17)	On control cabinet
(9)	Ambient temperature sensor		

### Air flow

Air is drawn through air filter (100) and is compressed by the compressor element (102) of each compressor module. The compressed air is discharged via the check valve (104) and a common air cooler (112).

On compressors without integrated dryer, the compressed air passes a water separator (111) and flows to the outlet valve (121).

On standard compressors with an integrated air dryer, the compressed air flows through a common refrigerant dryer (300) before reaching the outlet valve (121). For details on the operation of the dryer, see section Refrigerant dryer.

### Cooling

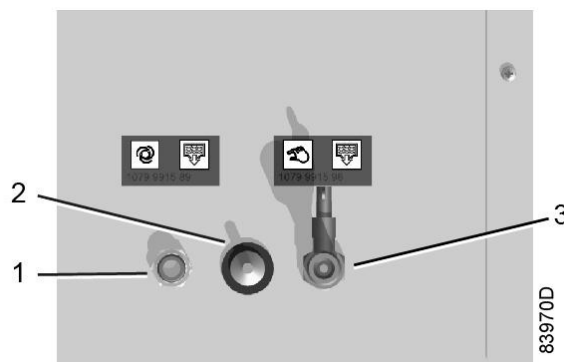
Each compressor element (102) is cooled by a radial fan (124), mounted on the drive shaft of the compressor element. The cooling air is blown over the compressor element via a duct.

A separate electric fan (130) provides cooling air for the common air cooler (112).

### Condensate management

The water separator (111) on compressors without integrated dryer has an automatic condensate outlet and a manual drain valve.

On compressors with integrated dryer, the dryer is equipped with a water trap with an automatic condensate outlet and a manual drain valve.



*Condensate drain connections (typical)*

## Section II - Description

1	Automatic condensate drain outlet	3	Manual condensate drain valve
2	Ambient temperature sensor		

### Regulating system

The compressor is provided with an electronic controller module.

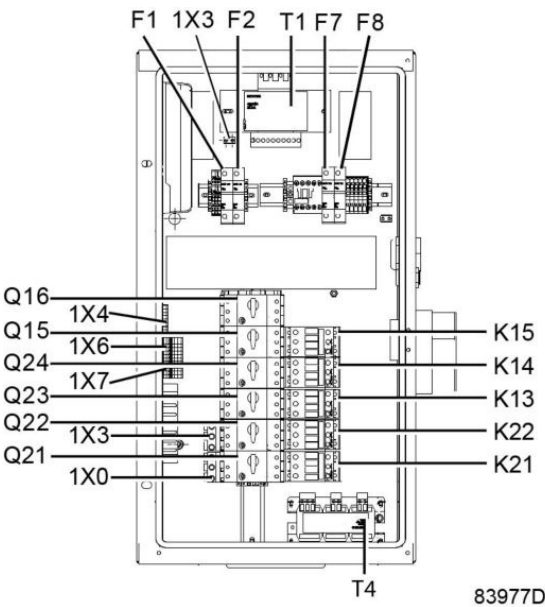
The controller performs following functions:

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

For more details, please consult the sections on the controller further in this book.

### Electrical system

#### Cubicle layout



*Electrical cabinet QOF 20, QOF 22 and QOF 30, typical*

K21, K22,...	Contactor	1X0, 4X3,...	Terminals
Q21, Q22,...	Circuit breaker	T1, T4,...	Transformer
F1, F2,...	Fuses		

### Electric diagram

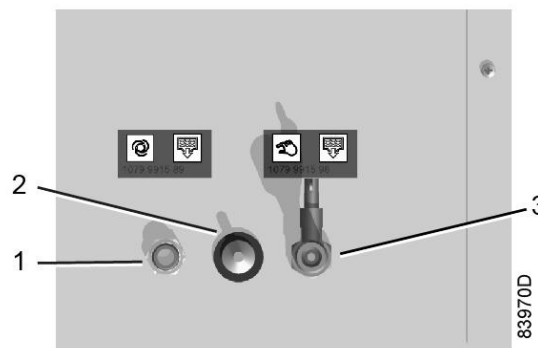
#### **NOTICE!**

- The electrical installation must correspond to the applicable codes.
- The mains supply and earthing lines must be of suitable size. See section Electric cable size and fuses.
- The installation must be earthed and protected by fuses in each phase.
- An isolating switch must be installed near the compressor. Make sure that this switch is open to isolate the compressor from the mains before carrying out any connection.

The complete electrical diagram is available in the electric cubicle of the compressor. For connection of the supply wires, please see section Electrical connections.

### Temperature protection

The compressor is equipped with an ambient temperature sensor. The sensor creates a warning message on the controller if the ambient temperature rises above 40 °C (104 °F). If the ambient temperature reaches 45 °C (113 °F), the compressor is stopped.



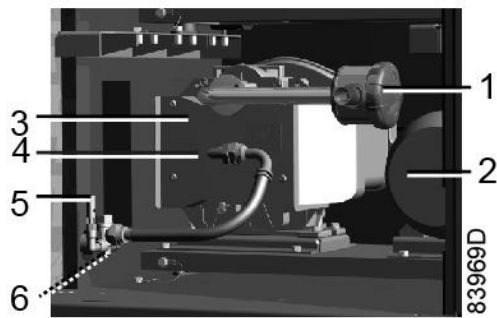
*Condensate drain connections*

1	Automatic condensate drain outlet	3	Manual condensate drain valve
2	Ambient temperature sensor		

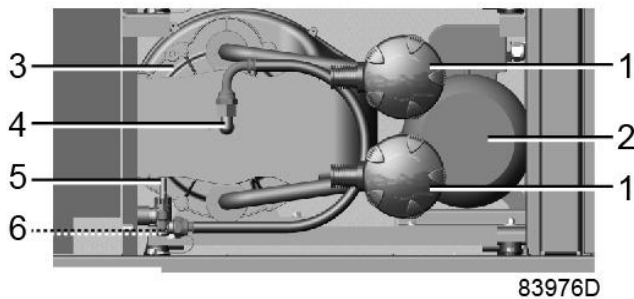
Each compressor element is protected by a PT 1000 sensor (6) in the outlet pipe. The sensor is connected to the electronic regulator.

When the maximum temperature is exceeded, the compressor element is stopped during 2 minutes before it can restart. If this happens 2 times within a time span of 2 hours, the element will be stopped during 10 minutes.

If the compressor element stops a third time within the 2 hours time span, the element will be shut down and must be reset manually.



3.7 kW compressor module

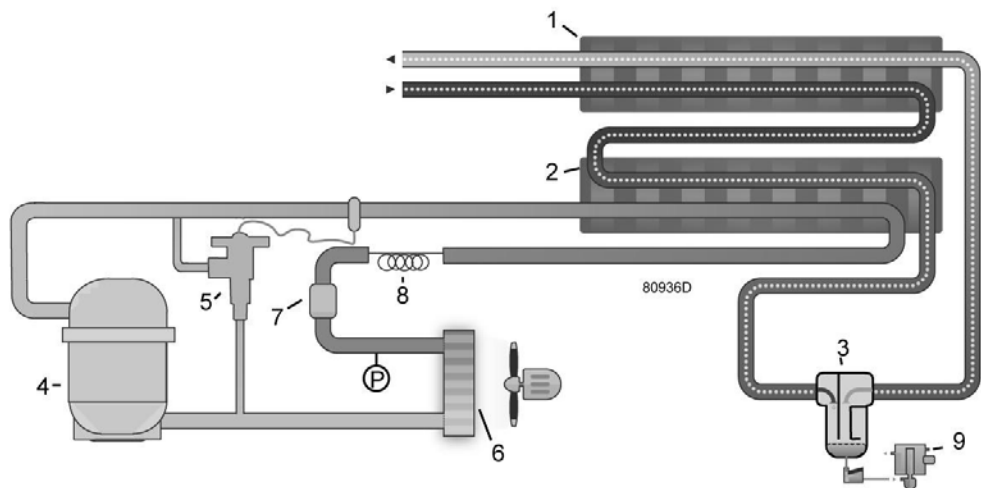


5.5 kW compressor module



When the compressor is stopped due to overheating, the compressor will not restart until the failure is acknowledged and the compressor is restarted manually. See also sections Shutdown warning and Shutdown.

Air dryer  
Flow diagram





### Compressed air circuit

Compressed air enters heat exchanger (1) and is cooled by the outgoing, cold, dried air. Water in the incoming air starts to condense. The air then flows through heat exchanger/evaporator (2) where the refrigerant evaporates, causing the air to be cooled further to close to the evaporating temperature of the refrigerant. More

water in the air condenses. The cold air then flows through separator (3) where all the condensate is separated from the air.

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

The condensate is automatically drained by the electronic condensate drain (9).

### Refrigerant circuit

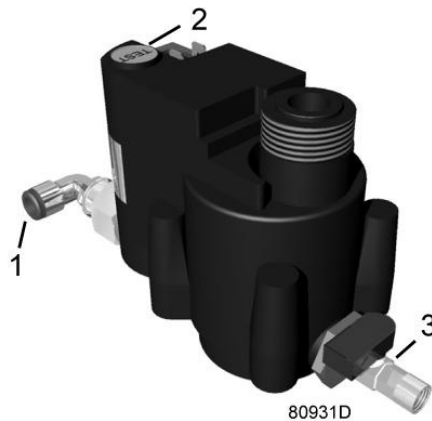
Compressor (4) delivers hot, high-pressure refrigerant gas which flows through condenser (6) where most of the refrigerant condenses.

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

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

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

### Automatic drain



The dryers are equipped with an electronic condensate drain (EWD). The condensate from the condensate trap accumulates in a collector. When the condensate reaches a certain level, it is discharged through the drain outlet (1).

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

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

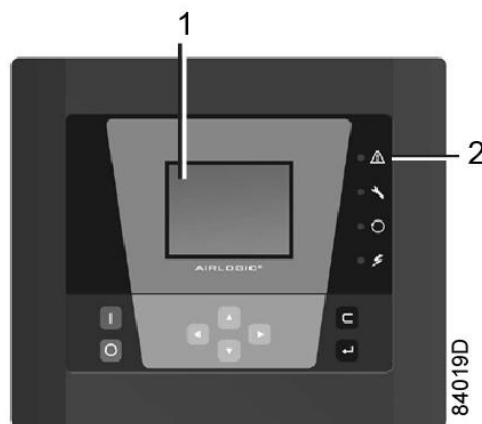
## Section III - Controller

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- General
- Control panel
- Icons used
- Main screen
- Calling up menus
- Shutdown warning
- Shutdown
- Inputs menu
- Outputs menu
- Counters
- Control mode selection
- Service menu
- Setpoint menu
- Event history menu
- General settings menu
- Info menu
- Week timer menu
- Test menu
- User password menu
- Web server
- Programmable settings

### General

#### Control panel



#### Introduction

The controller has following functions:

- Controlling the compressor
- Protecting the compressor
- Monitoring components subject to service
- Automatic restart after voltage failure (made inactive)

#### Automatic control of the compressor operation

The controller maintains the net pressure between programmable limits by automatically starting and stopping one or more compressor modules. A number of programmable settings, e.g. the starting and stopping pressures and the maximum allowed motor

starting frequency and several other parameters are hereby taken into account.

The controller stops the compressor whenever possible to reduce the power consumption and restarts it automatically when the net pressure decreases.



### **CAUTION!**

A number of time based automatic start/stop commands can 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**

##### **Shutdown**

Several sensors are provided on the compressor. If one of the measured signals exceeds the programmed shutdown level, the compressor will be stopped. This will be indicated on display (1) and general alarm LED (2) will blink.

Remedy the trouble and reset the message. See also section Inputs menu.



### **CAUTION!**

Before remedying, consult the applicable safety precautions.

##### **Shutdown warning / shutdown**

If the compressor element temperature exceeds the factory set warning level, the compressor element will be stopped for a short time and a warning will appear on the controller display (1) and the general alarm LED (2) will light up.

In case of repetitive stops due to a too high temperature, a manual reset will be necessary before restarting the compressor.

The compressor will also be stopped when the motor is overloaded.

A warning message will also appear if, on compressors with integrated dryer, the dew point temperature is too high in relation to the ambient temperature.

##### **Service warning**

A number of service operations are grouped (called Service Plans). Each Service Plan has a programmed time interval. If a time interval is exceeded, a message will appear on display (1) to warn the operator to carry out the service actions belonging to that Service Plan.

The running hours will be recalculated with respect to the ambient temperature. This algorithm is activated when the compressor is operated above 30 °C (86 °F) ambient.

##### **Automatic restart after voltage failure**

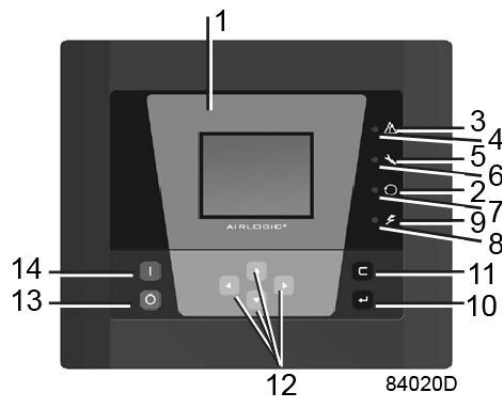
The controller has a built-in function to automatically restart the compressor when the voltage is restored after voltage failure. For compressors leaving the factory, this function is made inactive. If desired, the function can be activated.

Consult your supplier if a change is considered (password protected function).



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 within the programmed time interval.

Control panel



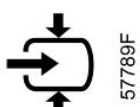








Parts and functions









Reference	Designation	Function
1	Display	Shows the compressor operating condition and a number of icons to navigate through the menu.
2	Pictograph	Automatic operation
3	Pictograph	General alarm
4	Alarm LED	Flashes in case of a shutdown, is lit in case of a warning condition.
5	Pictograph	Service
6	Service LED	Lights up if service is needed
7	Automatic operation LED	Indicates that the regulator is automatically controlling the compressor. The compressor is stopped and restarted
8	Voltage on LED	Indicates that the voltage is switched on.
9	Pictograph	Voltage
10	Enter key	Use this button to confirm the last action.
11	Escape key	Use this button to go to previous screen or to end the current action.
12	Scroll keys	Keys to scroll through the menu.
13	Stop button	Button to stop the compressor. LED (7) goes out.
14	Start button	Button to start the compressor. LED (7) lights up indicating that the controller is operative.

## 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
	 57789F	Motor running
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

## Section III - Controller











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
	 82418D	Not valid

### Input icons



Icon	Description
 57799F	Pressure
 57800F	Temperature
 57801F	Digital input

	Special protection
-----------------------------------------------------------------------------------	--------------------









#### System icons

Icon	Description
	Compressor element (LP, HP, ...)
	Dryer
	Fan
	Drain
	Filter
	Motor
	Failure expansion module
	Network problem
	General alarm
	The compressor module is running and can be stopped






## Section III - Controller

 83983D	The compressor module is stopped and is ready to start
 83984D	The compressor module is awaiting the minimum stop time to expire



### Menu icons

Icon	Description
 57813F	Inputs
 57814F	Outputs
 57812F	Alarms (Warnings, shutdowns)
 57815F	Counters
 57816F Or  82641D	Test
 57817F	Settings
 57798F	Service



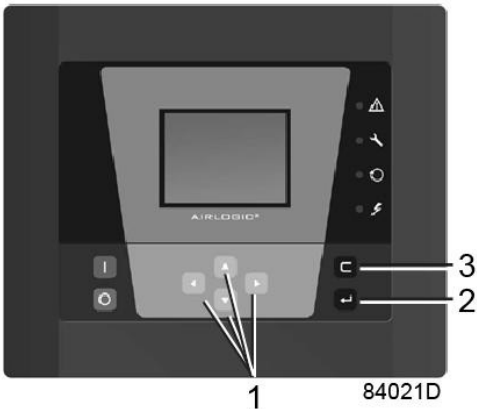
 57818F	Event history (saved data)
 57819F	Access key / User password
 57792F	Network
 57820F	Setpoint
 57867F	Info

#### Navigation arrows

Icon	Description
 57821F	Up
 57822F	Down

# Section III - Controller

## Main screen Control panel



1	Scroll keys	3	Escape key
2	Enter key		

### 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, 6 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)
- 6. Scroll animation

### 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)

Text on image

(1)	Compressor Outlet
(2)	Ambient Air
(3)	Load, Shutdown, ... (text varies upon the compressors actual condition)
(4)	Menu



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

Text on image

(1)	Compressor Outlet
(2)	Element 2 Outlet
(3)	Off, Shutdown,... (text varies upon the compressors actual condition)
(4)	Menu
(5)	Element 1 Outlet
(6)	Ambient Air

- Section A shows information regarding the compressor operation (e.g. the outlet pressure, the ambient temperature or the temperature at one of the compressor element outlets).
- 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).
  - 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 III - Controller

- **Section D** shows the Action buttons. Depending on the situation, 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

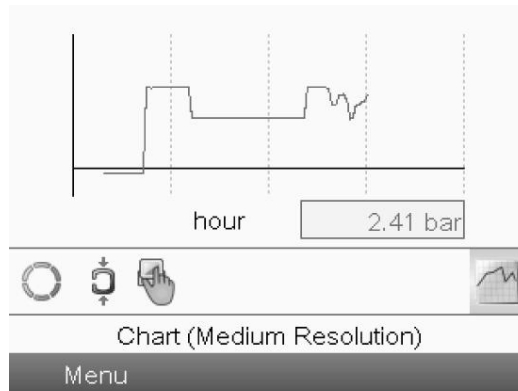
Instead of viewing values, it is also possible to view a graph of one of the input signals (see section Inputs menu) in function of the time.



59166D

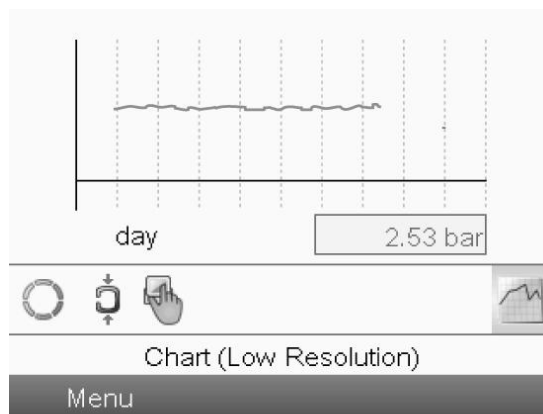
When Chart (High Resolution) is selected, the chart shows the variation of the selected input (in this case the pressure) per minute. Also the instantaneous value is displayed. The screen shows the last 4 minutes.

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



59167D

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.

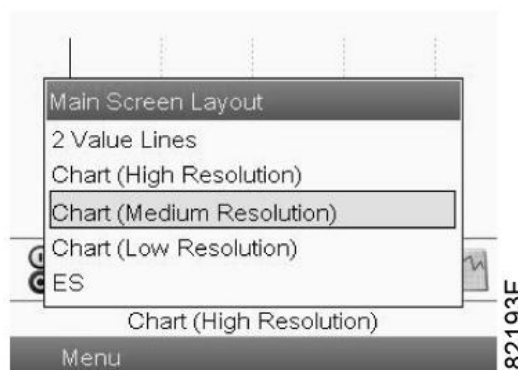


59168D

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 Icons used) and press the Enter key. A screen similar to the one below opens:

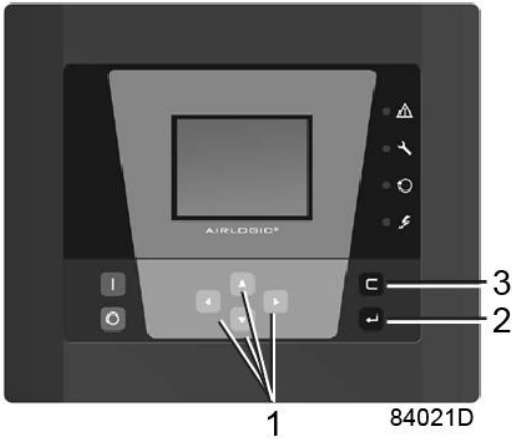


Select the layout required and press the Enter key. See also section Inputs menu.

Section III - Controller

Calling up menus

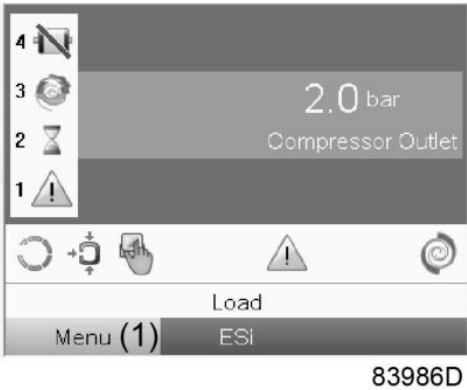
Control panel



1	Scroll keys	3	Escape key
2	Enter key		

Procedure

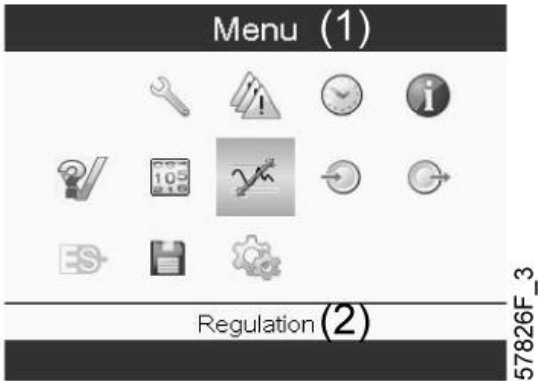
When the voltage is switched on, the Main screen is switched on automatically:



Typical Main screen (2 value lines)

- To go to the Menu screen, select action button Menu (1) by means of the Scroll keys and press the Enter key.

Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- The menu screen shows a number of icons. Each icon indicates a menu item. By default, the 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 the required icon (see further). Pressing the Escape key returns to the Main screen.

### Shutdown warning

#### Description

A shutdown warning will appear in the event of:

- Too high element temperature
- Too high ambient temperature
- Too high dew point temperature (on compressors with integrated refrigerant dryer)

#### High element temperature

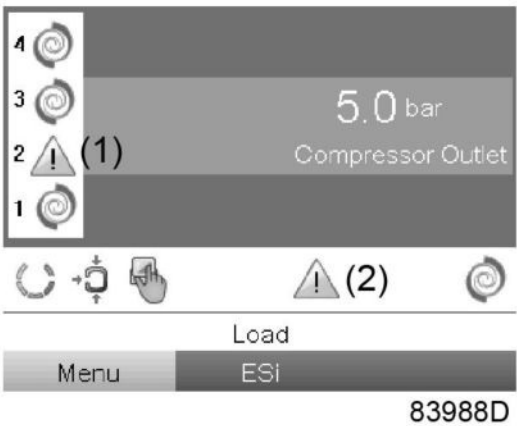
When a compressor element temperature exceeds the warning level, the element stops during a Minimum Stop Time . It will be restarted automatically after this time has elapsed and if the temperature is below this limit.

As long as the element is stopped, an hourglass icon (1) replaces the element concerned in the main screen:



*Element 2 is stopped during a Minimum Stop Time  
due to a high element temperature*

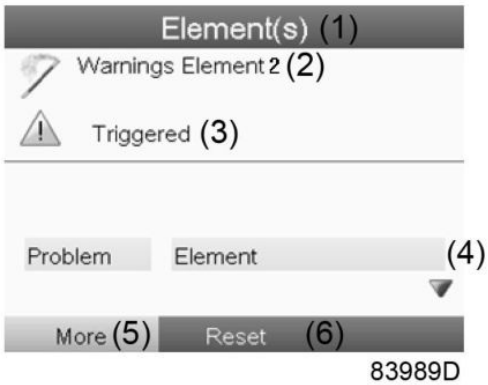
If the element temperature exceeds the factory set shutdown warning repeatedly, the element will shut down, alarm LED (4) (see section Control panel) will lit and following screen will appear:



Element 2 is shutdown due to repeatedly high element temperature warnings

If this occurs:

- 1. Switch off the voltage and remedy the problem cause.
- 2. Switch on the voltage and reset the element manually by selecting the warning icon (or go to warning menu - elements) and press Reset:



Warning element screen (element 2 is triggered)

Text on image

(1)	Element(s)
(2)	Warning Element 2
(3)	Triggered
(4)	Problem Element
(5)	More
(6)	Reset

Each time an element is reset manually, this will be logged in the Element Problem Reset counter:





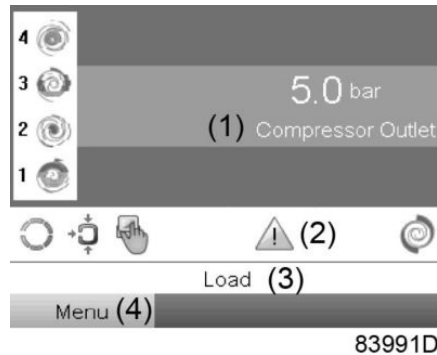
Counter screen where one element was reset manually

Text on image

(1)	Information
(2)	Trigger level
(3)	High Temperature Warnings
(4)	Element Warnings
(5)	Element Problem Resets
(6)	Modify

### High ambient temperature

If the ambient temperature is above the factory setting (40 °C - 104 °F), a warning is triggered and a warning icon (1) is shown on the main screen:

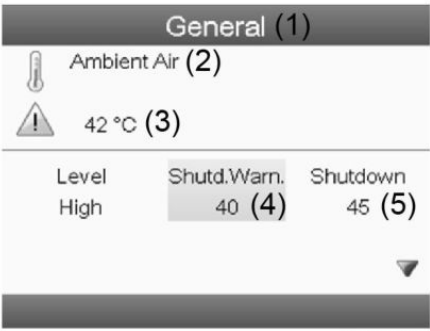


Main screen with high ambient temperature warning

Text on image

(1)	Compressor outlet (pressure)
(2)	Warning icon
(3)	Load
(4)	Menu

If this warning is triggered, the description of this warning can be found in the protection menu. Following screen is shown:



83992D

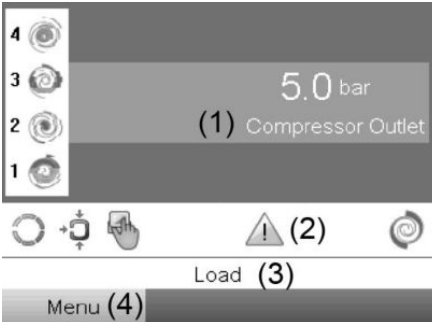
Description of high ambient alarm in the protection menu

Text on image

(1)	General
(2)	Ambient air
(3)	High Temperature Warnings
(4)	Shutd. Warn.
(5)	Shutdown

Dew point temperature

On compressors with integrated dryer, alarm LED (4) will be lit and the related alarm icon will be flashing if the dew poin temperature exceeds the warning level:



83991D

Main screen with dew point exceeding the limit

Text on image

(1)	Compressor outlet (pressure)
(2)	Warning icon
(3)	Load
(4)	Menu

Go to the Input menu to see the actual dew point temperature. Press the Stop button (13 - see section Control panel) to stop the compressor, switch off the voltage, inspect the compressor and remedy if necessary.

The warning message will disappear as soon the warning condition disappears.

### Shutdown

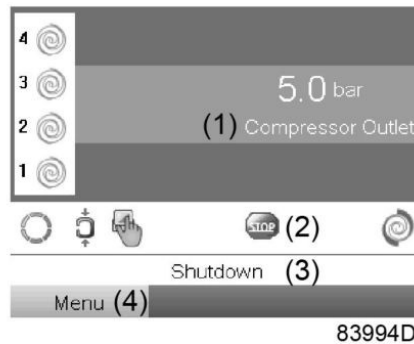
#### Description

The compressor will shut down in case of:

- Too high ambient temperature
- Motor overload
- Outlet pressure sensor error

#### High ambient temperature

If the ambient temperature is above the factory set shutdown temperature (45 °C - 113 °F), the compressor will be stopped and a stop icon will be shown on the main screen of the controller:



*Main screen - shutdown by too high ambient temperature*

Text on image

(1)	Compressor outlet (pressure)
(2)	Stop icon
(3)	Shutdown
(4)	Menu

#### Motor overload

A motor overload relay protects the motor of each compressor module. The motor is shutdown if the motor current is too high.

# Section III - Controller

## Inputs menu

Menu icon, Inputs



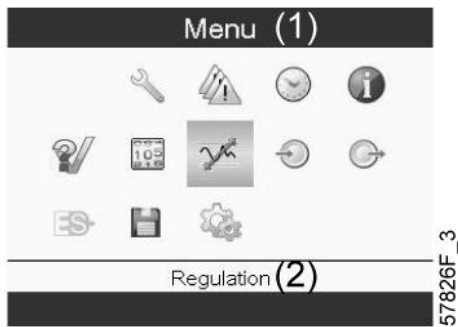
### Function

- 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,

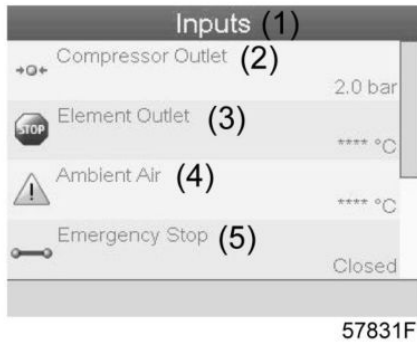
- Move the cursor to the action button Menu and press the Enter key. Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Inputs icon (see above, section Menu icon).
- 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(Closed)

- 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 (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:

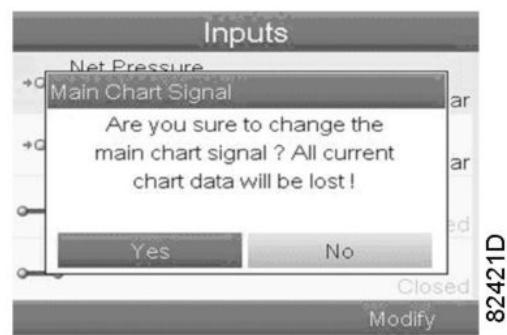


The first item in the list is highlighted. In this example, the Net Pressure is selected (chart icon).

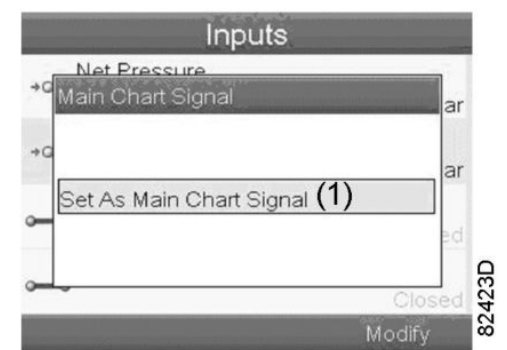
To change, press the Enter button again. A pop up window opens:



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:



Text on image

(1)	Set As Main Chart Signal
-----	--------------------------

## Outputs menu

Menu icon, Outputs



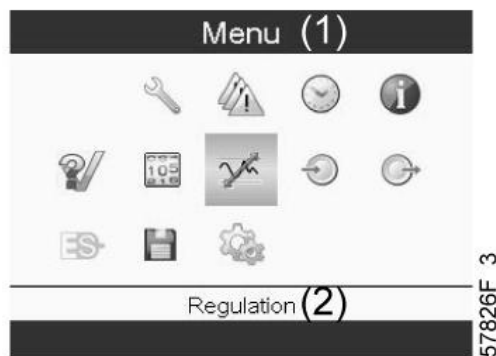
### Function

To call up information regarding the actual status of some outputs such as the condition of the Fan motor overload contact, the general warning contact, etc.

### Procedure

Starting from the Main screen,

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



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the outputs icon (see above).
- Press the Enter key. A screen similar to the one below appears:



83996D

*Outputs screen (typical)*

Text on image

(1)	General
(2)	General shutdown
(3)	Fan motor

# Section III - Controller

(4)	General warning
(5)	Cabinet fan

- 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.

## Counters

### Menu icon, Counters



### Function

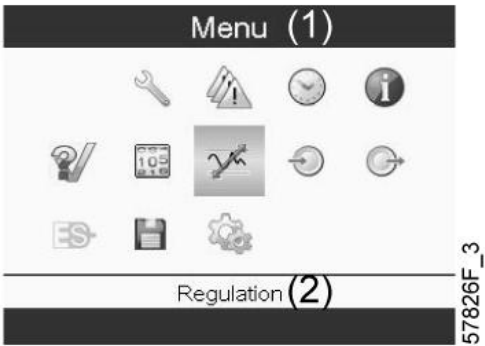
To call up:

- 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,

- Using the Scroll keys, move the cursor to the action button Menu and press the Enter key. Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Counters icon (see above).
- Press the Enter key. Following screen appears:



Counters (1)		
Shutdowns Element 2	(2)	2
Load Relay	(3)	0
Fan Starts	(4)	0
Module Hours	(5)	1 hours

83997D

Text on image

(1)	Counters
(2)	Shutdowns element 2
(3)	Load relay
(4)	Fan starts
(5)	Module hours

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

### 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 action button Menu (1) is selected:

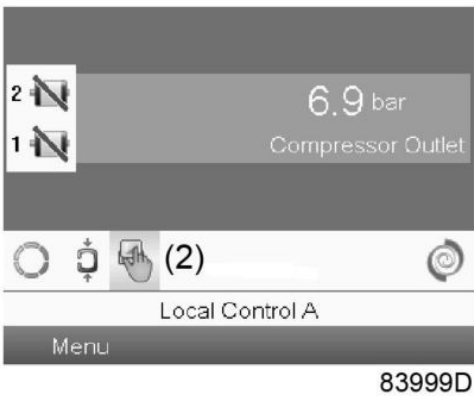


83998D

Text on image

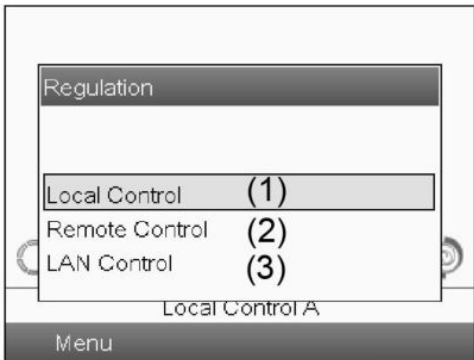
(1)	Menu
-----	------

- Next, use the scroll buttons to go to the control mode icon (2) and press the Enter key (see section Icons used for the meaning of the icons):

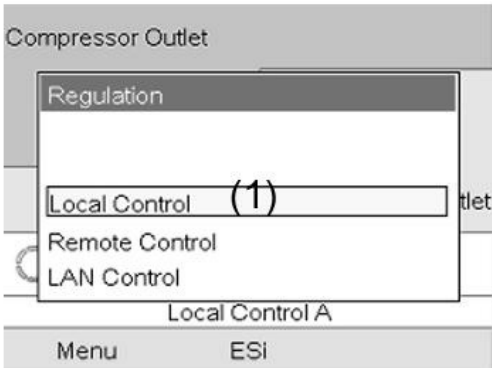


83999D

- There are 3 possibilities:
  - Local control (1)
  - Remote control (2)
  - LAN control (3)



84000D



82024F

After selecting the required control mode, press the Enter key on the controller to confirm your selection. The new control mode selection is now visible on the main screen.

## Service menu

Menu icon, Service



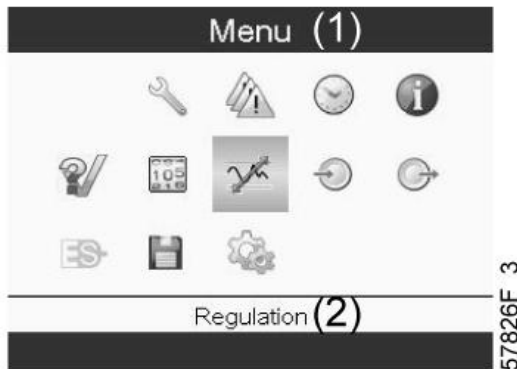
### Function

- 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,

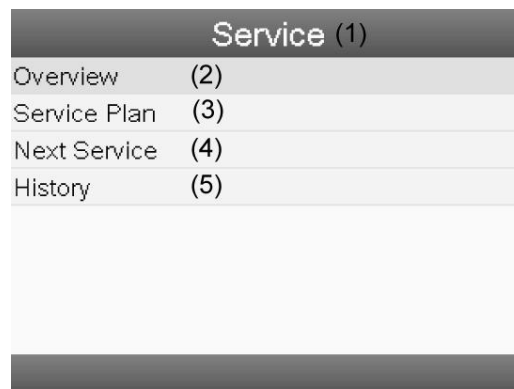
- Move the cursor to the action button Menu and press the Enter key. Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Service icon (see above, section Menu icon).
- Press the Enter key. Following screen appears:



### Section III - Controller



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 500 hours (upper row) and the programmed number of real time hours is 2190 hours, which corresponds to one year (second row). This means that the controller will launch a service warning when either 500 running hours or 2190 real hours are reached, whichever comes first. Note that the real time hours counter keeps counting, also when the controller is not powered.

A new algorithm is implemented for a better protection of the compressor elements. The running hours will be recalculated depending on the ambient temperature. A compressor continuously running in an ambient temperature between 30 °C (86 °F) and 35 °C (95 °F) is working in harder conditions than an element running at 20 °C (68 °F). Therefore a service done earlier (a time reduction of 30 % is applied in this temperature zone) will protect the element in a better way. In the zone between 35 °C (95 °F) and 40 °C (104 °F), the time reduction is 60 %.

The figures within 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 500 running hours or 2187 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::

Service Plan (1)		
Level (2)	Running(3) Hours	Real (4) Time
A	500	2190
B	2500	8760
C	5000	17520
D	5000	17520
E	10000	35040
F	10000	35040
		(5) Modify

84002D

Text on image

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

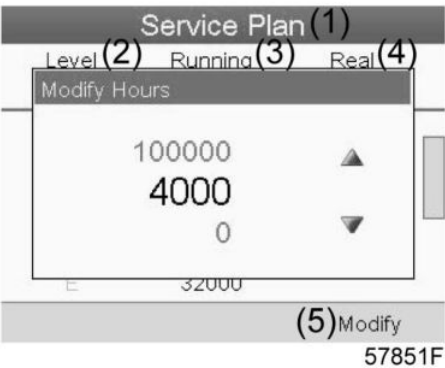
### Modifying a service plan

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:

Service Plan (1)		
Level (2)	Running(3) Hours	Real (4) Time
A	500	2190
B	2500	8760
C	5000	17520
D	5000	17520
E	10000	35040
F	10000	35040
		(5) Modify

84002D

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 500 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.

## Setpoint menu

Menu icon, Setpoint



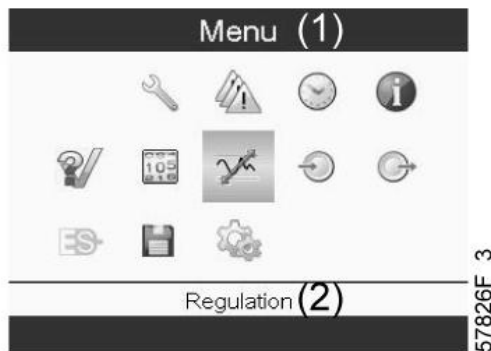
### Function

It is possible to program 2 different pressure bands. This menu is also used to select the active pressure band.

### Procedure

Starting from the Main screen,

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



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Setpoint icon (see above, section Menu icon)
- Press the Enter key. Following screen appears:



Text on image

(1)	Regulation
-----	------------

Section III - Controller

(2)	Pressure band 1 High
(3)	Pressure band 1 Low
(4)	Pressure band 2 High
(5)	Pressure band 2 Low
(6)	Modify

- The screen shows the actual stopping and starting 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:



Text on image

(1)	Regulation
(2)	Stopping pressure

- 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.



## Event history menu

Menu icon, Event History



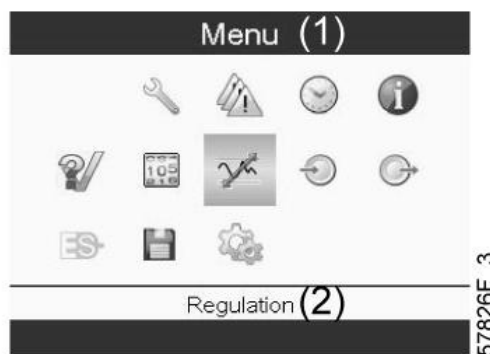
### Function

To call up the last shutdown and last emergency stop data.

### Procedure

Starting from the Main screen,

- Using the Scroll keys, move the cursor to the action button Menu and press the Enter key. Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Event History icon (see above).
- Press the Enter key. The list of last shutdown and emergency stop cases is shown.



*Example of Event History screen*

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

# Section III - Controller

## General settings menu

### Menu icon, Settings



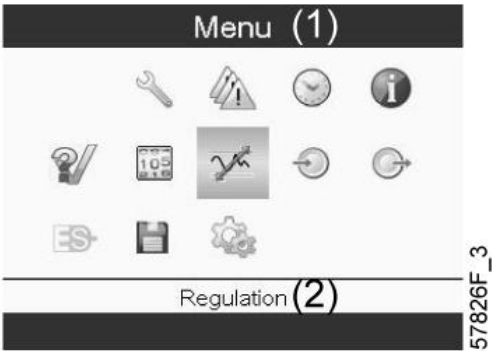
### Function

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. Following screen appears:



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Settings icon (see above)
- Press the Enter key. Following screen appears:



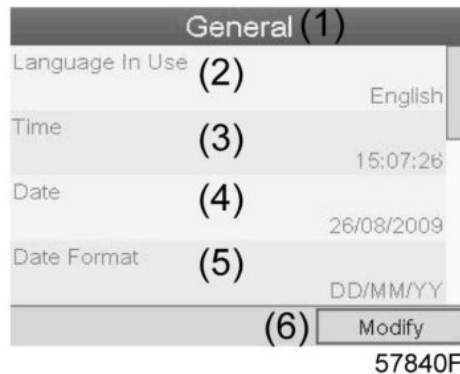
This screen shows again a number of icons. By default, the User Password icon is selected. The status bar shows the description that corresponds with the selected icon. Each icon covers one or more items , such as

- Access level
- Elements
- Dryer

- Fan
- Filter(s)
- Motor/Starter
- General
- Automatic restart after voltage failure
- 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 In Use
(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.

# Section III - Controller

## Info menu

Menu icon, Info



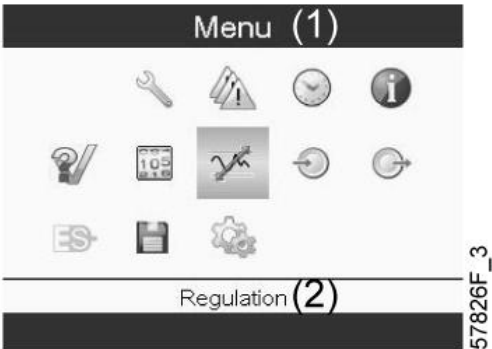
## Function

Shows the SPIRALAIR internet address.

## Procedure

Starting from the Main screen,

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



Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, move the cursor to the Info icon (see above, section Menu icon).
- Press the Enter key. The internet address appears on the screen.

## Week timer menu

Menu icon, Week timer



### Function

- To program time based start/stop commands for the compressor.
- To program time based changeover 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.



**Notice!**

**Important remark:**

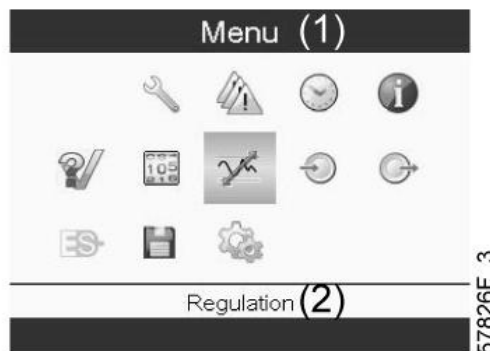
You can select different timers on one day.(up to 8 actions). It is however not possible to program 2 actions at the same time. The solution: leave at least 1 minute in between 2 actions.

Example: Start Compressor: 5.00 AM, Pressure Setpoint 2: 5.01 AM (or later).

### 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.



Text on image

(1)	Menu
(2)	Regulation

- Press the Enter key on the controller. Following screen appears:



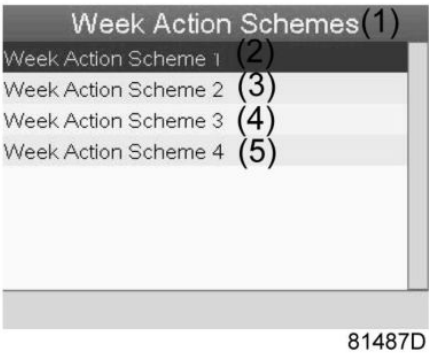
Text on image

(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 to be adapted and press the Enter key on the controller to modify.

Programming week schemes

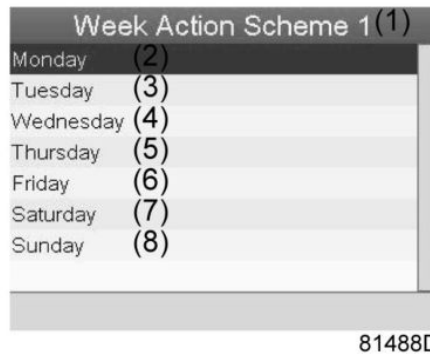
- Select Week action schemes and press Enter. A new window opens. The first item in the list is highlighted in red. Press the Enter key on the controller to modify Week Action Scheme 1.



Text on image

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

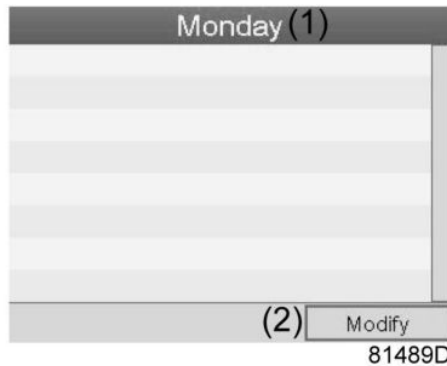
- A weekly list is shown. Monday is automatically selected and highlighted in red. Press the Enter key on the controller to set an action for this day.



Text on image

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

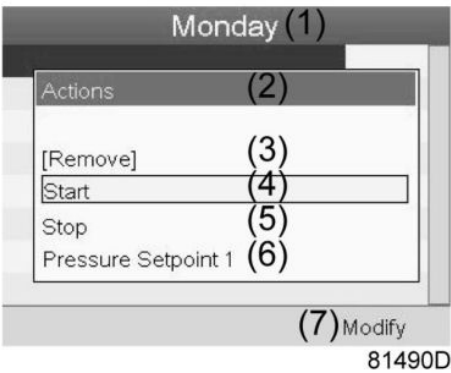
- A new window opens. The Modify action button is selected. Press the enter button on the controller to create an action.



Text on image

(1)	Monday
(2)	Modify

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



Text on image

(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.



Text on image

(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.





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



Text on image

(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.



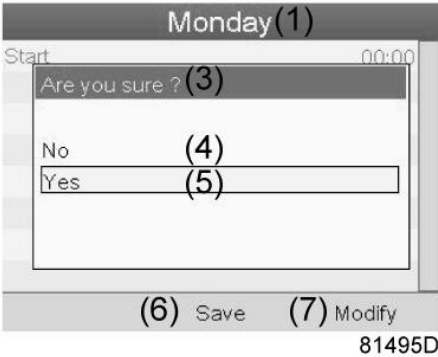
Text on image

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

Section III - Controller

(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.

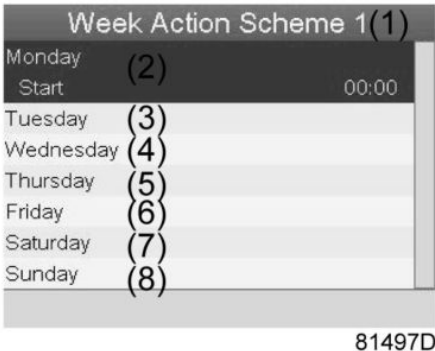


Text on image

(1)	Monday
(3)	Are you sure?
(4)	No
(5)	Yes
(6)	Save
(7)	Modify
(7)	Modify

Press the Escape key to leave this window.

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



Text on image

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

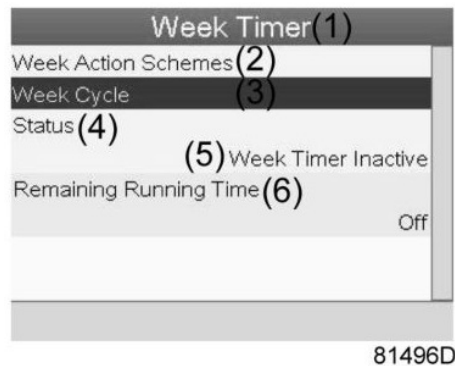
(7)	Saturday
(8)	Sunday

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.

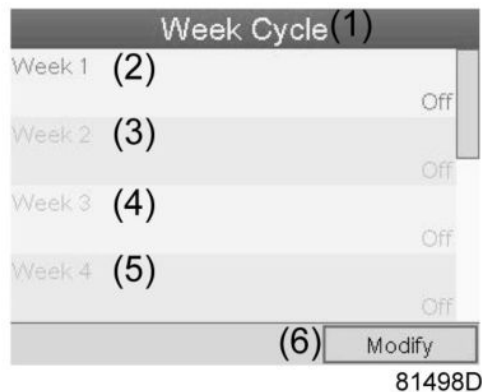
- Select Week Cycle from the main Week Timer menu list.



Text on image

(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.



Text on image

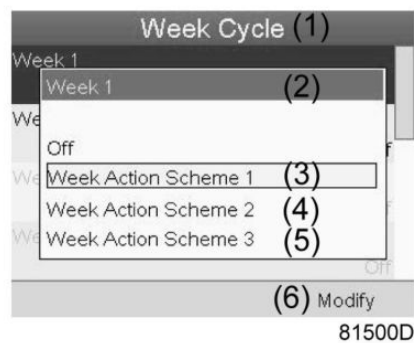
(1)	Week Cycle
(2)	Week 1
(3)	Week 2

Section III - Controller

(4)	Week 3
(5)	Week 4
(6)	Modify

Press the Enter key twice to modify the first week.

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



Text on image

(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.

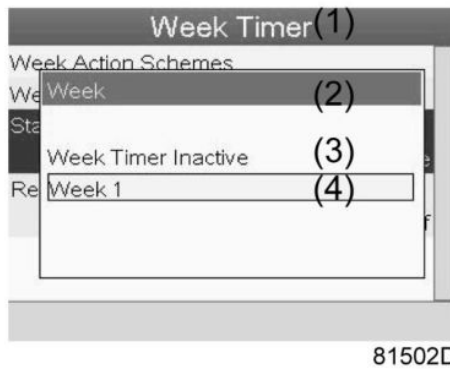


Text on image

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

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

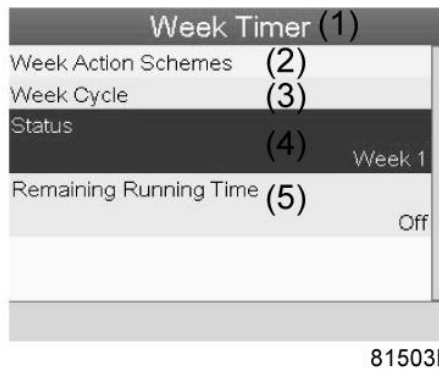
- A new window opens. Select Week 1 to set the Week Timer active.



Text on image

(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.



Text on image

(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.



81504D

- 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.



81505D

Text on image

(1)	Week Timer
(2)	Week Action Schemes
(3)	Remaining Running Time

## Test menu

Menu icon, Test



or



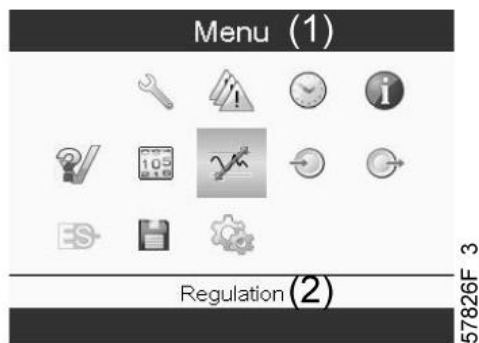
## Function

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

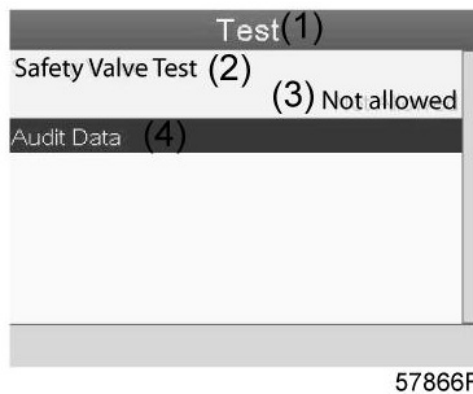
## Procedure

Starting from the Main screen,

- Move the cursor to the action button Menu and press the Enter key (2). Following screen appears:



- Using the scroll keys, move the cursor to the test icon (see above)
- Press the Enter key, following screen appears:



Text on image

(1)	Test
(2)	Safety Valve Test
(3)	Not allowed

### Section III - Controller

(4)	Audit Data
-----	------------

- 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.

#### User password menu

Menu icon, Password



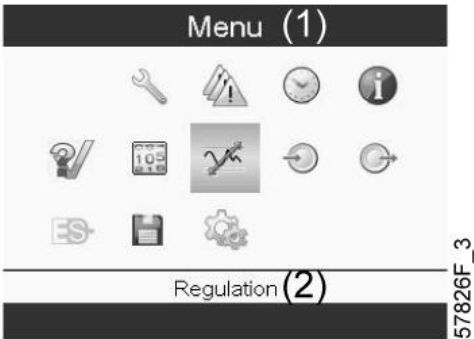
#### Function

If the password option is activated, it is impossible for not authorized persons to modify any setting.

#### Procedure

Starting from the Main screen,

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

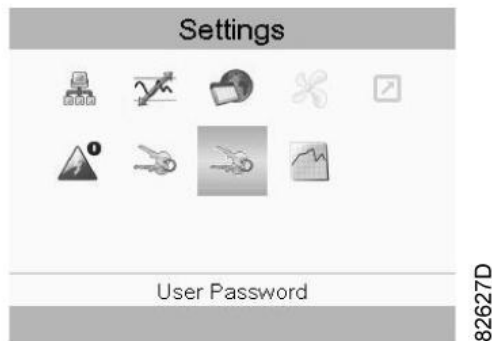


Text on image

(1)	Menu
(2)	Regulation

- Using the Scroll keys, select the Settings icon (see section General settings menu).
- Press the Enter key. Following screen appears:





- Move the cursor to the Password icon (see above, section Menu icon)
- Select Modify, using the Scroll keys and press the Enter key. Next, modify the password as required.

---

### Web server

The controller has a built-in web server that allows direct connection to the company network or to a dedicated PC via a local area network (LAN). This allows to consult certain data and settings via a PC instead of on the display of the controller.

### **Getting started**

Make sure you are logged in as administrator.

- Use the internal network card from your computer or a USB to LAN adapter (see picture below).



*USB to LAN adapter*

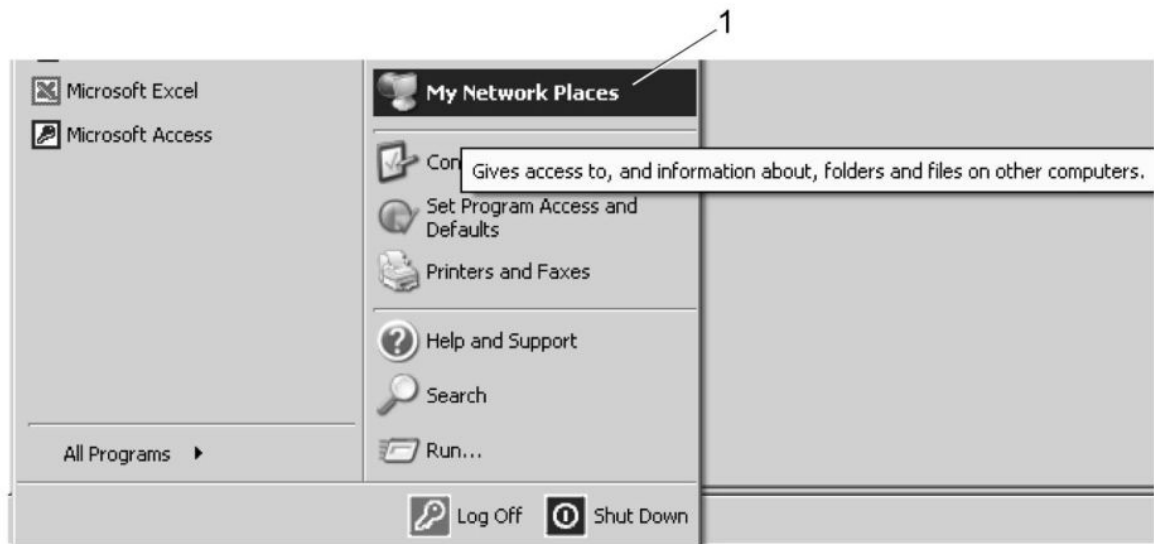
- Use a UTP cable (CAT 5e) to connect to the controller (see picture below).



# Section III - Controller

## Configuration of the network card (in Windows)

- Go to My Network places (1).



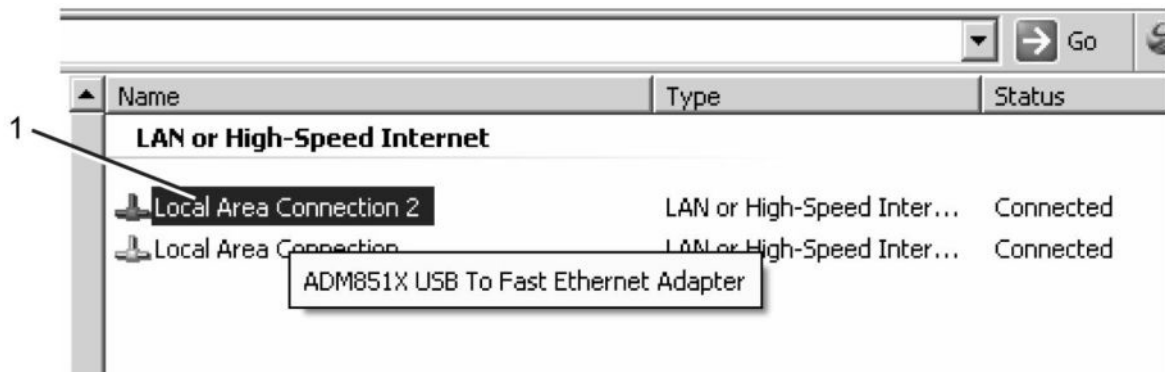
81509D

- Click on View Network connections (1).



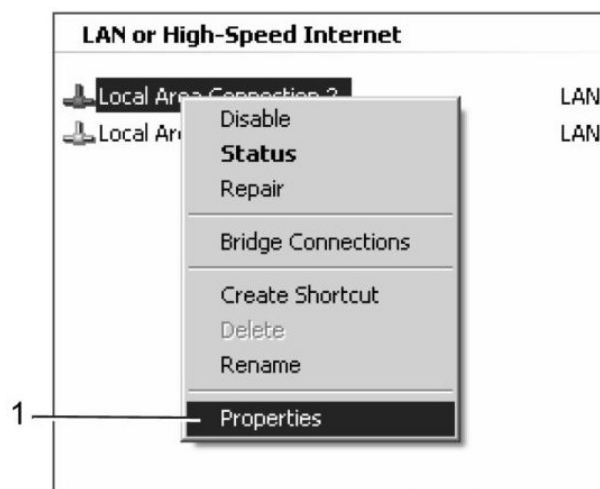
81510D

- Select the Local Area connection (1), which is connected to the controller.



81511D

- Click with the right button and select properties (1).



81512D

- Use the check box Internet Protocol (TCP/IP) (1) (see picture). To avoid conflicts, uncheck other properties if they are checked. After selecting TCP/IP, click on the Properties button (2) to change the settings.



81513D

- Use the following settings:
  - IP Address 192.168.100.200

## Section III - Controller

- Subnetmask 255.255.255.0

Click OK and close network connections.

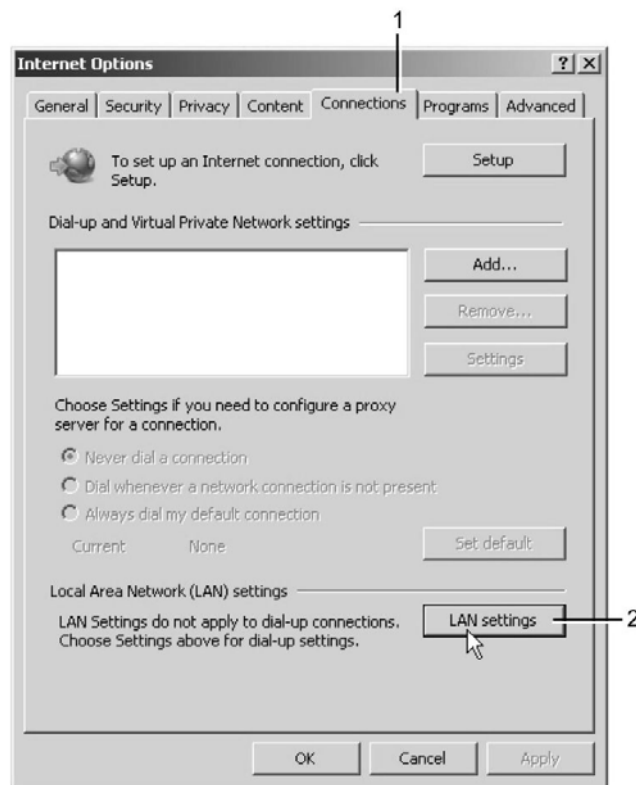
### Configuration of the web server

Configure the web interface (for Internet Explorer)

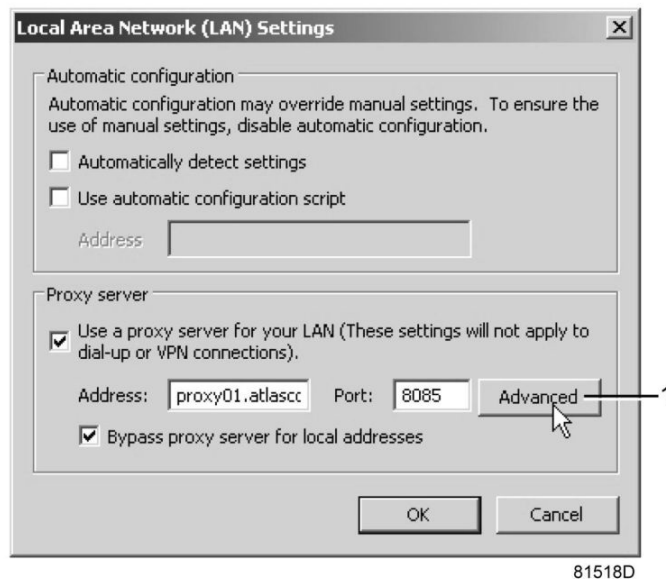
- Open Internet Explorer and click on Tools - Internet options (2).



- Click on the Connections tab (1) and then click on the LAN settings button (2).

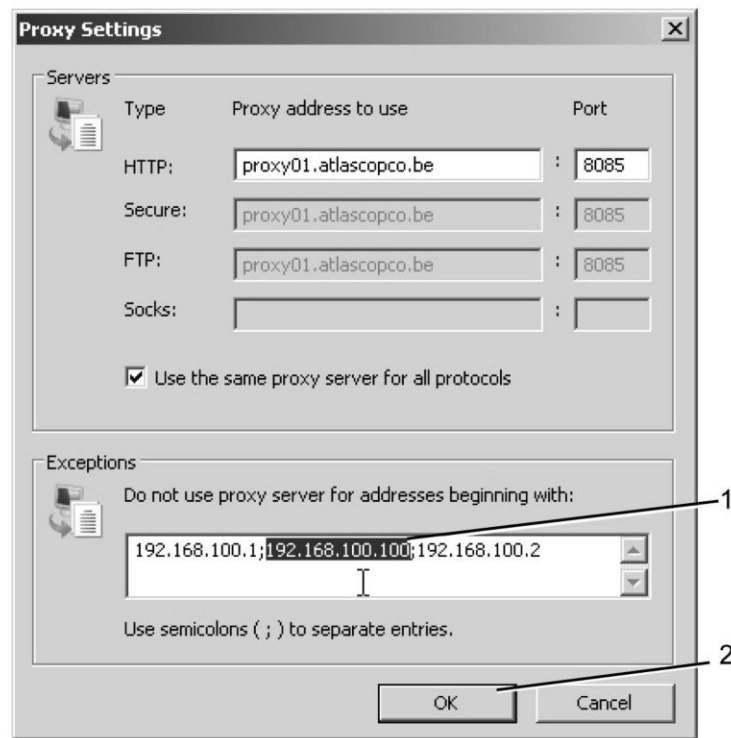


- In the Proxy server Group box, click on the Advanced button (1).



81518D

- In the Exceptions Group box, enter the IP address of your controller. Multiple IP addresses can be given but they must be separated with semicolons (;). Example: Suppose that you already added two IP addresses (192.168.100.1 and 192.168.100.2). Now you add 192.168.100.100 and separate the 3 IP addresses by putting semicolons between them (1) (see picture). Click OK (2) to close the window.



81519D

# Section III - Controller

## Viewing the controller data



### NOTICE!

All screen shots are indicative. The number of displayed fields depends on the selected options.

- Open your browser and type the IP address of the controller you want to view in your browser (in this example <http://192.168.100.100>). The interface opens:

Oil free compressors

Serial Number : AP1000000

SPR15\_13

Language: English

Machine

TS

Preferences

Analogue Inputs

Special Protections

Counters

Service Plan

Analogue Inputs

Value

Counters

Value

Digital Inputs

Value

Digital Outputs

Value

Special Protections

Level

Service Plan

Level

Compressor Outlet

9.0 bar

Element 1 Outlet

33 °C

Element 2 Outlet

33 °C

Ambient Air

23 °C

Running Hours

136 hrs

Running Hours Element 1

125 hrs

Running Hours Element 2

126 hrs

Starts Element 1

805

Starts Element 2

980

Shutdowns Element 1

7

Shutdowns Element 2

8

Load Relay

702

Fan Starts

568

Module Hours

340 hrs

Machine Status

Off

Digital Inputs

Value

Emergency Stop

Closed

Remote Start Stop

Open

Auxiliary Equipment Overload

Closed

Overload Motor Element 1

Closed

Overload Motor Element 2

Closed

Pressure Setting Selection

Pressure Band 1

Digital Outputs

Value

Element 1 Motor

Open

Element 2 Motor

Open

General Shutdown

Closed

Fan Motor

Open

General Warning

Closed

Cabinet Fan

Open

Special Protections

No Valid Pressure Control

Expansion Module Communication

Warnings Element 1

Warnings Element 2

Service Plan

Level

500

374

A

2190

2190

A

2500

2374

B

8760

8760

B

5000

4874

C

17520

17520

C

5000

4874

D

17520

17520

D

84022D

Screen shot (typical)

## Navigation and options

- The banner shows the compressor type and the language selector. In this example, three languages are available on the controller.



### Compressor settings

All compressor settings can be displayed or hidden. Put a check mark in front of each point of interest and it will be displayed. Only the machine status is fixed and can not be removed from the main screen.

### Analog inputs

Lists all current analog input values. The measurement units can be changed in the preference button from the navigation menu.

<input checked="" type="checkbox"/> Analog Inputs	Analog Inputs	Value
	Compressor Outlet	6.9 bar
	Element 1 Outlet	104 °C
	Element 2 Outlet	96 °C
	Dryer PDP	15 °C
	Ambient Air	16 °C

84009D

### Counters

Lists all current counter values from controller and compressor.

<input checked="" type="checkbox"/> Counters	Counters	Value
	Running Hours	0 hrs
	Running Hours Element 1	0 hrs
	Running Hours Element 2	0 hrs
	Starts Element 1	0
	Starts Element 2	0
	Shutdowns Element 1	1
	Shutdowns Element 2	1
	Load Relay	0
	Dryer Starts	0
	Fan Starts	0
	Module Hours	6 hrs

84010D

### Info status

Machine status is always shown on the web interface.

# Section III - Controller

Info	
Machine Status	Shutdown

84011D

## Digital inputs

Lists all Digital inputs and their status.

<input checked="" type="checkbox"/> Digital Inputs	Digital Inputs	Value
	Emergency Stop	Closed
	Remote Start/Stop	Open
	Auxiliary Equipment Overload	Closed
	Overload Motor Element 1	Open
	Overload Motor Element 2	Open
	Pressure Setting Selection	Pressure Band 1

84012D

## Digital outputs

Lists all Digital outputs and their status.

<input checked="" type="checkbox"/> Digital Outputs	Digital Outputs	Value
	Element 1 Motor	Open
	Element 2 Motor	Open
	General Shutdown	Open
	Dryer Motor	Open
	Fan Motor	Open
	General Warning	Open
	Cabinet Fan	Open

84013D

## Special protections

Lists all special protections of the compressor.

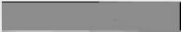





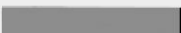





<input checked="" type="checkbox"/> Special Protections	Special Protections	
	Dryer Dewpoint Protection	OK
	No Valid Pressure Control	OK
	Dryer Freeze Protection	OK
	Expansion Module Communication	OK
	Warnings Element 1	OK
	Warnings Element 2	OK

84014D

## Service plan

Displays all levels of the service plan and their status. This screen shot underneath only shows the running hours. It is also possible to show the current status of the service interval.



<input checked="" type="checkbox"/> Service Plan	Service Plan	Level
500		500 A
2190		2190 A
2500		2500 B
8760		8760 B
5000		5000 C
17520		17520 C
5000		5000 D
17520		17520 D
10000		10000 E
35040		35040 E
10000		10000 F
35040		35040 F

84015D

### Programmable settings

#### Compressors without built-in refrigeration dryer

		Minimum setting	Factory setting	Maximum setting
Starting pressure				
Starting pressure (8 bar compressors)	bar(e)	4	7	8
Starting pressure (8 bar compressors)	psig	58	101.5	116
Starting pressure (10 bar compressors)	bar(e)	4	9	10
Starting pressure (10 bar compressors)	psig	58	130.5	145

		Minimum setting	Factory setting	Maximum setting
Stopping pressure				
Stopping pressure (8 bar compressors)	bar(e)	4	8	8
Stopping pressure (8 bar compressors)	psig	58	116	116
Stopping pressure (10 bar compressors)	bar(e)	4	10	10
Stopping pressure (10 bar compressors)	psig	58	145	145

## Section III - Controller

### Compressors with built-in refrigeration dryer

		Minimum setting	Factory setting	Maximum setting
Starting pressure				
Starting pressure (8 bar compressors)	bar(e)	4	6.8	7.8
Starting pressure (8 bar compressors)	psig	58	98.6	113.1
Starting pressure (10 bar compressors)	bar(e)	4	8.8	9.8
Starting pressure (10 bar compressors)	psig	58	127.6	142.1

		Minimum setting	Factory setting	Maximum setting
Stopping pressure				
Stopping pressure (8 bar compressors)	bar(e)	4	7.8	7.8
Stopping pressure (8 bar compressors)	psig	58	113.1	113.1
Stopping pressure (10 bar compressors)	bar(e)	4	9.8	9.8
Stopping pressure (10 bar compressors)	psig	58	142.1	142.1

### Parameters

		Minimum setting	Factory setting	Maximum setting
Allowed number of motor starts per day		72	720	720
Power recovery time (Automatic restart function)	s	60	60	3600
Restart delay	s	0	0	1200
Communication time-out	s	10	30	60

### Protections

		Minimum setting	Factory setting	Maximum setting
Ambient temperature warning level	°C	0	40	40
Ambient temperature warning level	°F	32	104	104
Ambient temperature shut-down level	°C	0	45	45
Ambient temperature shut-down level	°F	32	113	113

### Service plan

The built-in service timers will give a Service warning message after their respective pre-programmed time interval has elapsed.

Also see section Preventive maintenance schedule.

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

### Terminology

Term	Explanation
ARAVF	Automatic Restart After Voltage Failure. See section General.
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).
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.
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.
Starting / stopping pressure	The regulator does not accept inconsistent settings, e.g. if the stopping pressure is programmed at 7.0 bar(e) (101 psi(g)), the maximum limit for the starting pressure changes to 6.9 bar(e) (100 psi(g)). The recommended minimum pressure difference between starting and stopping is 0.6 bar (9 psi(g)).

## Section IV - Installation guidelines

---

- Dimension drawing
- Installation proposal
- Electrical connections
- Pictographs

### Dimension drawing

The dimension drawings can be found on the CD, delivered with the compressor.

Hereby a list of commonly used terms with their translation:

Text on drawings	Translation
Cooling air outlet of aftercooler and dryer	Cooling air outlet of aftercooler and dryer
Cabinet ventilation	Cabinet ventilation
Cooling air outlet of compressor	Cooling air outlet of compressor
Electric cable passage	Electric cable passage
Compressed air outlet	Compressed air outlet
Manual drain	Manual drain
Ambient sensor	Ambient sensor
Automatic drain tube	Automatic drain tube
Compressor mounting holes	Compressor mounting holes
Cooling air inlet of aftercooler and dryer	Cooling air inlet of aftercooler and dryer
Cooling air inlet of compressor and cabinet	Cooling air inlet of compressor and cabinet
Center of gravity dimensions and mass	Center of gravity dimensions and mass

---

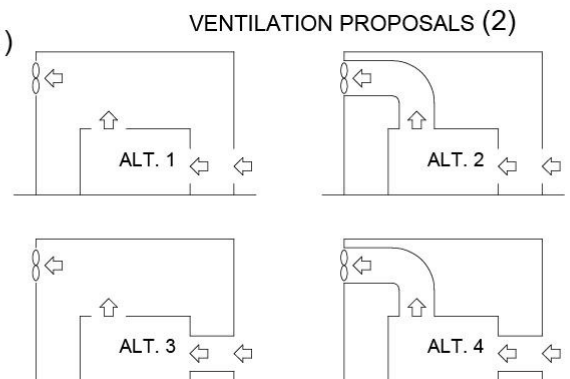
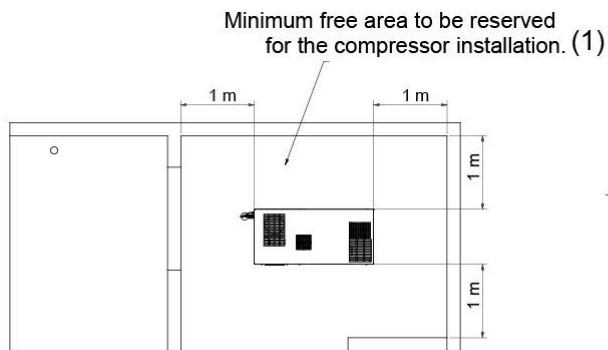
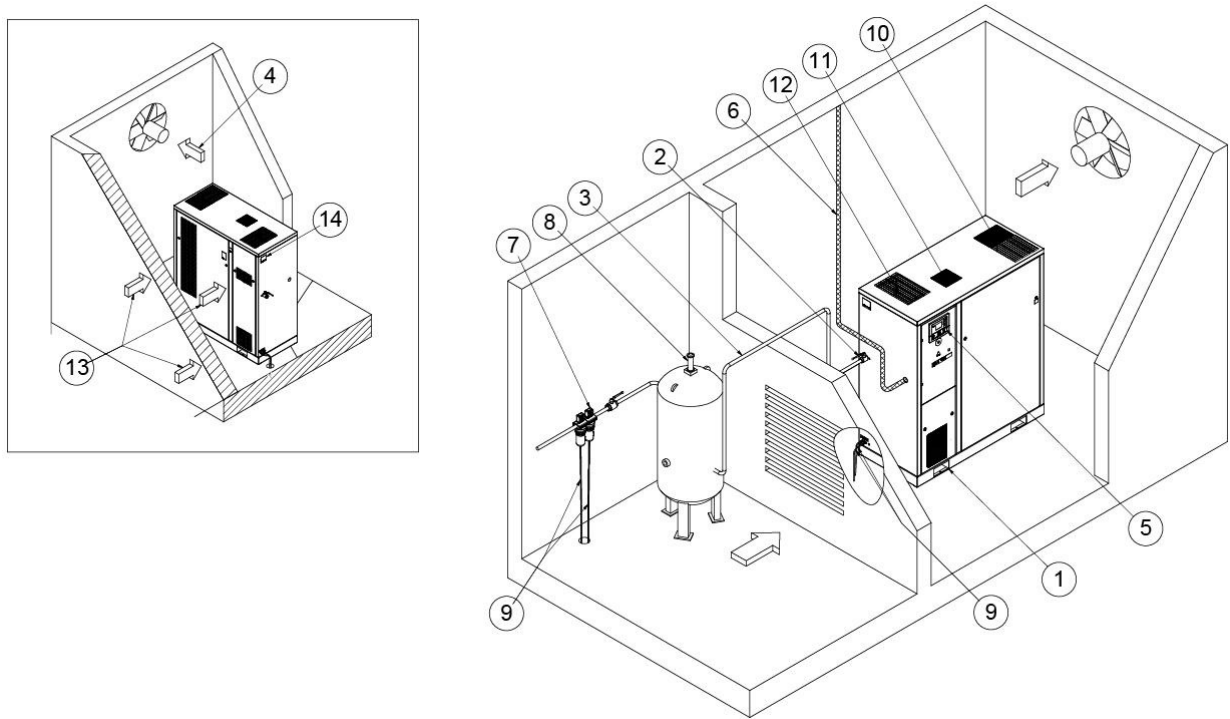
### Installation proposal

Outdoor/altitude operation

#### **NOTICE!**

If the compressor is installed outdoors or if the air inlet temperature can be below 0 °C (32 °F), precautions must be taken. In this case, and also if operating at high altitude, consult your supplier.

### Installation proposal



84059D

Reference	Description
1	Minimum free area to be reserved for the compressor installation
2	Ventilation proposals

### Procedure

1. Install the compressor on a level floor, suitable for taking the weight of the compressor in a frost free and preferably low dust location.
2. Compressed air outlet valve.
3. Delivery pipe.

The pressure drop over the air delivery pipe can be calculated as follows:

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

d = inner diameter of the pipe in mm

## Section IV - Installation guidelines

---

$\Delta p$  = pressure drop in bar (recommended maximum: 0.1 bar (1.5 psi))

$L$  = length of the pipe in m

$P$  = absolute pressure at the compressor outlet in bar

$Q_c$  = Free air delivery of the compressor in l/s

4. Ventilation: The inlet grid(s) and ventilation fan should be installed in such a way that any recirculation of hot cooling air to the inlet gratings of the compressor/dryer is avoided.

The air velocity to the grid(s) has to be limited to 5 m/s (16.5 ft/s).

Maximum allowable pressure drop over cooling air ducts is 50 Pa (0.12 in WC).

When 50 Pa is exceeded, a ventilation fan is needed at the outlet of the cooling air ducts. The maximum air temperature at the compressor intake opening is 40° C (104 °F), the minimum is 0° C (32 °F).

Alternative 1 and 3: The required ventilation to limit the compressor room temperature can be calculated

from :

$$Q_v = 0,92 N / \Delta t$$

with

$Q_v$  = required ventilation capacity in m<sup>3</sup>/s

$N$  = nominal motor power of the compressor in kW

$\Delta t$  = temperature increase in the compressor room in °C

Alternative 2 and 4: The fan capacity should match the compressor fan capacity at a pressure head equal to the pressure drop caused by the cooling air ducts.

5. Control cubicle with monitoring panel.

6. Mains cable entry.

7. Optional filters can be installed in the pressure line downstream the air outlet valve, e.g.:

- A filter for general purpose filtration. The filter traps solid particles down to 1 micron.
- A filter for filtration down to 0.01 micron. This filter must always be installed downstream of the general purpose filter.

It is recommended to provide bypass pipes and valves across the filters in order to isolate the filters during maintenance without disturbing the compressed air delivery.

8. Safety valve.

9. The drain pipes to the drain must not dip into the water.

10. Compressor cooling air outlet.

11. Ventilation outlet

12. Aftercooler and dryer cooling air outlet.

13. Data plate.

### Electrical connections

#### Attention



#### **WARNING!**

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

The installation must be earthed and protected by fuses in each phase. An isolating switch should be installed near the compressor.

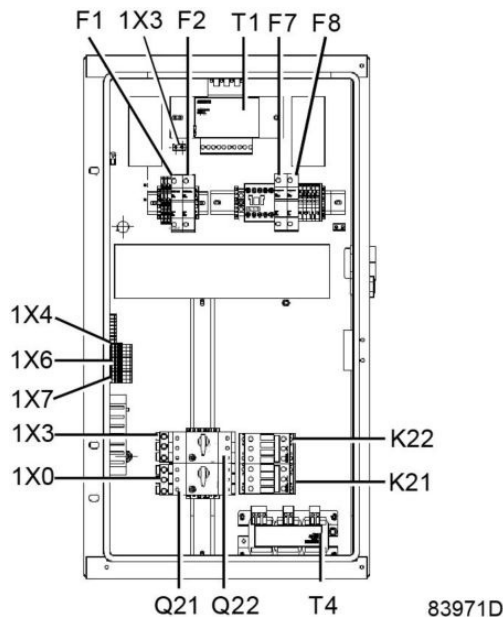
Make sure that this switch is open to isolate the compressor from the mains before carrying out any connection.

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.

#### Supply cable

Consult section Electric cable size and fuses for the section of the power supply cable.

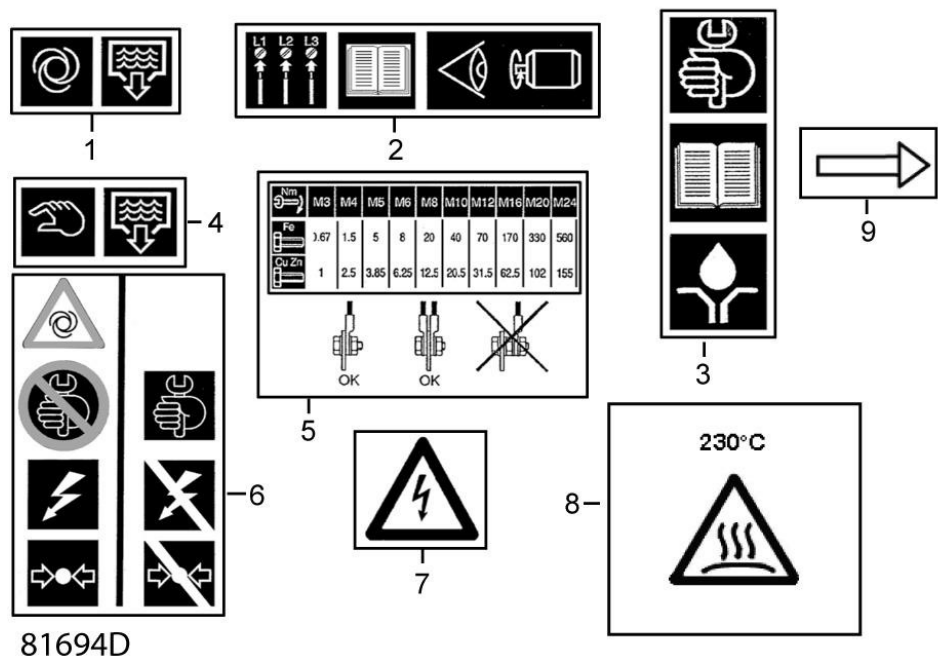
Connect the supply cable to terminals L1, L2 and L3 of terminal strip (1X0), connect the neutral conductor to terminal (N) (if applicable) and the earthing conductor to the earthing bolt (1X3).



# Section IV - Installation guidelines

## Pictographs

Pictographs



Pictographs

Reference	Description
1	Automatic condensate drain
2	Warning: before connecting compressor electrically, consult Instruction book for motor rotation direction
3	Consult the specific instructions before greasing
4	Manual condensate drain
5	Torques for steel (Fe) or brass (CuZn) bolts
6	Switch off the voltage and depressurize the compressor before maintenance or repair
7	Warning: voltage
8	Warning: hot surface
9	Rotation direction of fan



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

### Initial start-up

#### Safety

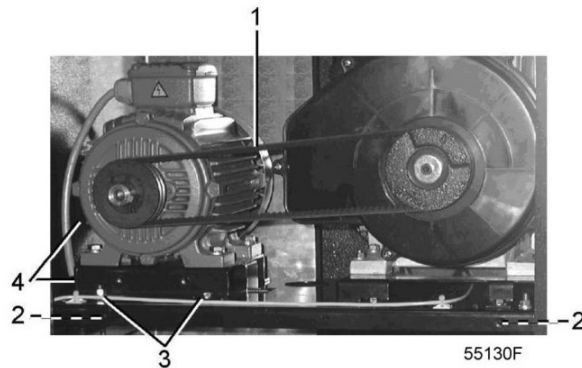


### **CAUTION!**

The operator must apply all relevant Safety precautions.

#### Initial start-up procedure

1. Remove the red painted transport brackets (2).



2. Check the settings of the overload relays. See section Electric cable size and fuses.
3. Connect the compressor electrically. See section Electrical connections.
4. Close the condensate drain valve. See chapter Condensate management in section Flow diagram.
5. Switch on the voltage. Start and stop the compressor. On 3-phase compressors, check for correct direction of rotation (direction arrows are provided on the motors). If the rotation direction is wrong, switch off the voltage and reverse two incoming electric lines.

## Section V - Operating instructions

---

### Starting

#### Procedure



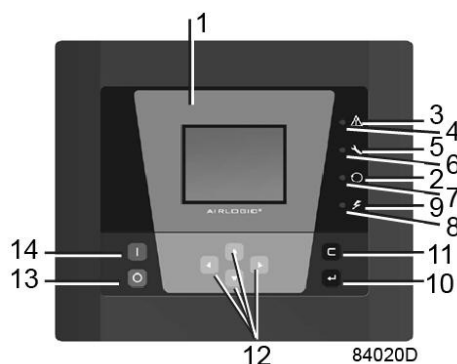
1. Open the air outlet valve. See section Introduction for its location.
2. Switch on the voltage.
3. Close all manual condensate drain valves.
4. Press the start button (1). The compressor starts running and automatic operation LED lights up.
5. The regulator will automatically stop and start the compressor modules in function of the air pressure.
6. On compressors with integrated dryer, the nominal pressure dew point will be reached after a few minutes.

#### **NOTICE!**

The number of starts is limited to 30 starts per hour. See also section Programmable settings.

---

### During operation



#### Procedure

1. If the automatic operation LED (3) is alight, the regulator is automatically controlling the compressor modules (starting/stopping).
2. Check the readings on the display (1). In case of a warning or shutdown condition, see section Problem solving or Event history menu.

3. Check that condensate is discharged automatically from the condensate drain outlet during operation.

### **NOTICE!**

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

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### Stopping Procedure



1. Press the stop button (2).
  2. Close the air outlet valve. See section Introduction.
  3. Switch off the voltage.
  4. Open the manual condensate drain valve.
- 

### Taking out of operation Procedure

1. Stop the compressor and close the air outlet valve.
2. Switch off the voltage and disconnect the compressor from the mains.
3. Depressurize the compressor. Open the condensate drain valve.
4. Shut off and depressurize the part of the air net which connected to the outlet valve.  
Disconnect the compressor from the air net.
5. Disconnect the condensate piping from the local condensate drain system.

## Section VI - Maintenance

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

### Preventive maintenance schedule

#### Warning



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

- Stop the compressor.
- Switch off the voltage and open the isolating switch.
- Press the emergency stop button (S3).
- Close the air outlet valve.
- Depressurize the compressor by opening the manual drain valve(s).

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

#### Warranty - Product Liability

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

#### General

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

#### Intervals

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



The longer interval checks must always include the shorter interval checks.

### Preventive maintenance schedule

A number of service operations are grouped in plans called Service plans I, A, B or D. See the table below. A message will appear on the controller display when reaching the interval, indicating which Service plans are to be carried out. After servicing, the regulator is to be reset. For detailed information, consult section Service menu.

Period (note 1)	Running hours (note 1)	Service Plan	Operation
Daily	-	-	<ul style="list-style-type: none"><li>• Check readings on display.</li><li>• Check if condensate is discharged during operation.</li><li>• Drain condensate manually (when applicable).</li><li>• On compressors with integrated dryer: check the dew point.</li></ul>
Every 3 months (note 2)	500	-	<ul style="list-style-type: none"><li>• Check the pressure drop over the (optional) filters .</li><li>• Inspect the air inlet filters: check for cleanness and damage. Replace a dirty or damaged filter with a new one.</li><li>• Check the coolers. Clean by air jet if necessary.</li></ul>

Period (note 1)	Running hours (note 1)	Service Plan	Operation
Every 6 months	1000	-	<ul style="list-style-type: none"> <li>• Operate the safety valve.</li> <li>• Clean the compressor.</li> <li>• On compressors with integrated dryer: <ul style="list-style-type: none"> <li>• Brush or blow off the finned surface of the condenser.</li> <li>• Inspect and clean the electronic drain: <ul style="list-style-type: none"> <li>• Functioning of the drain can be checked by pushing the TEST button of the drain.</li> <li>• Cleaning of the drain filter can be done by opening the manual drain valve during a few seconds.</li> </ul> </li> </ul> </li> </ul>
Yearly	2500	-	<ul style="list-style-type: none"> <li>• Replace the air inlet filters.</li> <li>• Test the safety valves.</li> <li>• Have temperature protection and motor overload tested.</li> <li>• Check tension and condition of the V-belts.</li> </ul>
Every 2 years	5000	A	<ul style="list-style-type: none"> <li>• Replace V-belt(s).</li> <li>• Replace the check valves.</li> </ul>
Every 2 years	5000	B	<p>8 bar and 116 psi compressors:</p> <ul style="list-style-type: none"> <li>• Clean fan (ref 124 on Flow diagram), fan duct and element cooling fins (see note 2). See section Cleaning cooling fins.</li> <li>• Have orbiting scroll bearing greased (see note 3).</li> </ul>
Every 2 years	5000	B	<p>10 bar and 145 psi compressors:</p> <ul style="list-style-type: none"> <li>• Replace the element outlet pipe and the plastic insert. See section Outlet pipe replacement (3.7 kW elements only).</li> <li>• Clean fan (ref 124 on Flow diagram), fan duct and element cooling fins (see note 2). See section Cleaning cooling fins.</li> <li>• Have orbiting scroll bearing and pin crank bearings greased (see note 3).</li> <li>• Replace tip seals and dust seal.</li> <li>• Replace inlet seal.</li> </ul>
Every 4 years	10000	B	<p>8 bar and 116 psi compressors:</p> <ul style="list-style-type: none"> <li>• Replace the element outlet pipe and the plastic insert. See section Outlet pipe replacement (3.7 kW elements only).</li> <li>• Clean fan (ref 124 on Flow diagram), fan duct and element cooling fins (see note 2). See section Cleaning cooling fins.</li> <li>• Have orbiting scroll bearing and pin crank bearings greased (see note 3).</li> <li>• Replace tip seals and dust seal.</li> <li>• Replace inlet seal.</li> </ul>

## Section VI - Maintenance

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### Notes:

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

### Service kits

#### Service kits

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

Consult the Spare Parts List for part numbers.

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### Disposal of used material

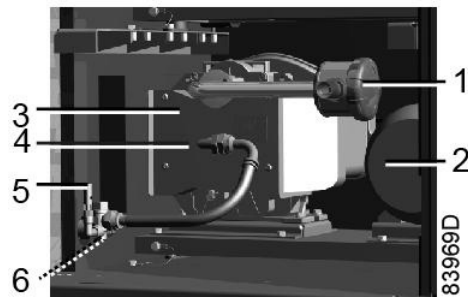
Used filters or any other used material (e.g. desiccant, lubricants, cleaning rags, machine parts, etc.) must be disposed of in an environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

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

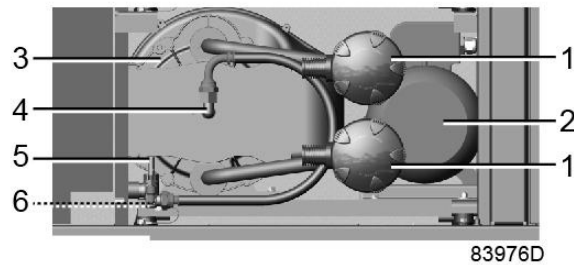
- Air filter
- Air cooler
- Drive motor
- Safety valve
- Belt set exchange and tensioning
- Cleaning the compressor element
- Replacement of the outlet pipe
- Dryer maintenance

### Air filter

#### Procedure



*3.7 kW compressor module*



*5.5 kW compressor module*

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

---

### Air cooler

#### Cleaning

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

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

## Section VII - Adjustments and servicing procedures

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### Drive motor

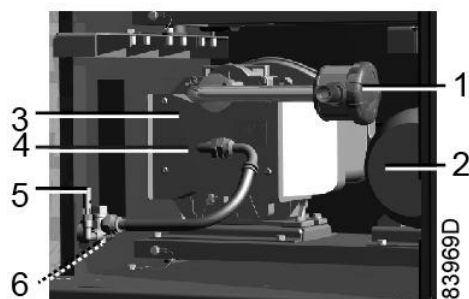
#### Instructions

The motor bearings are greased for life and do not require special attention.

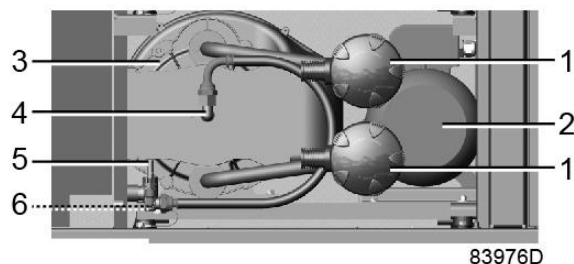
Keep the motor free from dust for optimal cooling.

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### Safety valve



*3.7 kW compressor module*



*5.5 kW compressor module*

#### Operating

Operate the safety valve (5) by unscrewing the knurled cap one or two turns. Retighten the cap.

#### Testing

The valve can be tested on a separate compressed air line.

If the safety valve does not open at the specified pressure, it must be replaced.



**CAUTION!**

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



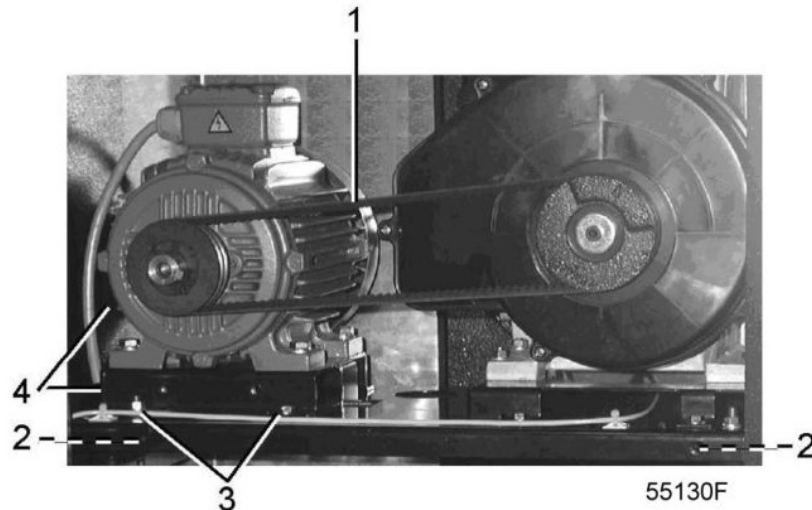
### Belt set exchange and tensioning

#### Important



The belts must be replaced as a set, even if only one of them seems worn.

#### Procedure



1. Loosen motor hold-down bolts (3).
2. Loosen the belt tension by screwing bolts (4) equally and take off the belts (1).
3. Install new belts.
4. Tension the belts by screwing bolts (4) equally.  
The tension is correct if the deflection is between 5 mm and 7 mm when exerting a force of 25 N on the belt midway between the pulleys. Make sure that the pulleys remain aligned. The maximum out-of-line is:
  - Maximum parallel out-of-line: 0.5 mm
  - Maximum angular out-of-line: 0.5 degrees
5. Tighten bolts (3).
6. Check the belt tension after the first 500 running hours.

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### Cleaning the compressor element



#### **CAUTION!**

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

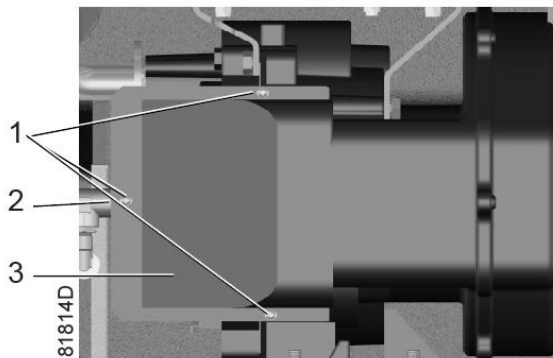
The purpose of cleaning the cooling channels of a scroll element is to prevent the cooling channels to silt up and as such reduce the cooling efficiency. A reduced cooling efficiency can lead towards a premature compressor element failure.

## Section VII - Adjustments and servicing procedures

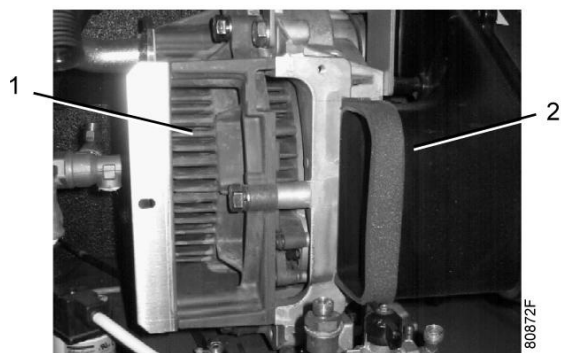
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Procedure:

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



- Remove fan duct (3).
4. Clean cooling channels:
    - Remove dust from the cooling channels (1) by means of air jet (see next figure).
    - Clean the fan duct (2).



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

The unit is now again ready for use.

### Replacement of the outlet pipe

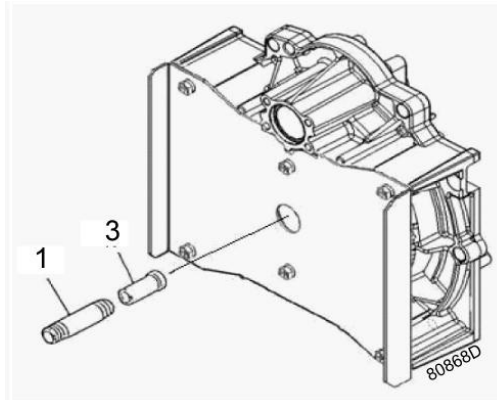
(only applicable to QOF 20)

#### Description

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

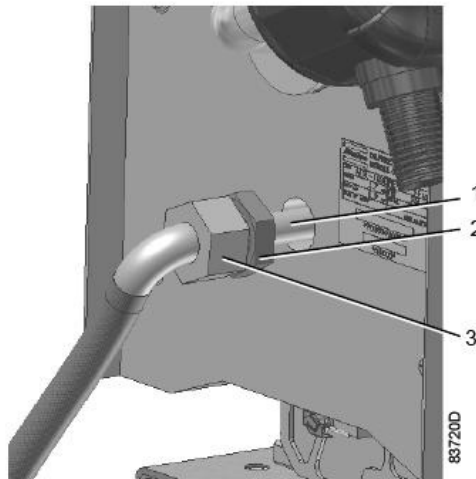
The outlet pipe set contains two parts:

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



#### Procedure

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



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

## Section VII - Adjustments and servicing procedures

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### Dryer maintenance

(only applicable to compressors with refrigerant dryer)

#### Safety precautions

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

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

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

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

Local legislation may stipulate that:

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

#### General

The following remarks should be kept in mind:

- Keep the dryer clean.
- Brush or blow off the finned surface of condenser regularly.

#### Device settings

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



**CAUTION!**

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

### **NOTICE!**

Before carrying out any maintenance or repair, perform following steps:

- Stop the compressor and switch off the voltage.
- Open and lock the isolating switch to prevent an accidental start.
- Isolate the compressor by closing the outlet valve.
- Depressurize the system by opening the drain valve(s).

#### Compressor

Condition	Fault	Remedy
The compressor does not start.	Pressure too high.	Compressor will start again when the pressure drops to the starting pressure.
	Loose connection.	Check all electrical connections.
Safety valve blows.	Pressure too high	Check settings and correct.
	Safety valve opens too soon.	Replace valve.
Compressor capacity or pressure below normal.	Air consumption exceeds capacity of compressor.	Check equipment connected.
	Choked air inlet filter.	Remove and check filter. Replace if necessary.
	Safety valve leaking.	Replace valve.
	Compressor element out of order.	Consult your supplier.
Compressor module overheating or compressor shutdown on high air temperature.	Insufficient compressor cooling.	Improve ventilation of compressor room. Clean compressor element fins and fan, see Cleaning the compressor element.
	Cooling fan out of order.	Check and correct.
Condensate trap continuously discharging air and water	Automatic drain out of order	Have the drain checked. Replace as necessary

#### Refrigerant dryer

For compressors with a built-in refrigerant dryer also:

## Section VIII - Problem solving

Condition	Fault	Remedy
Dew point too high	Air inlet temperature too high	Check and correct; see section Reference conditions and limitations
	Fuses blown	Check fuses and remedy the cause.
	Shortage of refrigerant	Have circuit repaired or recharged.
	Refrigerant compressor does not run	See below
	Evaporator pressure is too high	See below
	Condenser pressure is too high	See below
Condenser pressure too high or too low	Fan control switch out of order	Have switch replaced
	Condenser fan motor out of order	Have fan motor inspected
	Ambient temperature too high	Improve ventilation of compressor room, see section Installation proposal
	Condenser externally clogged	Clean condenser
Motor of refrigerant compressor stops or does not start	The internal thermal protection of the motor has tripped	Compressor will restart when the motor windings have cooled down.
	Electric power supply to refrigerant compressor interrupted	Check and correct as necessary
Evaporator pressure is too high or too low	Condenser pressure too high or too low	See above
	Shortage of refrigerant	Have circuit repaired or recharged
	Hot gas bypass valve incorrectly set or out of order	Have the valve adjusted or replaced
Condensate trap continuously discharging air and water	Automatic drain out of order	Have the drain checked. Replace as necessary
Electronic condensate drain inoperative	Drain system clogged	Clean the filter of the automatic drain by opening the manual drain valve. Check functioning of the drain by pushing the test button.

- Electric cable size and fuses
- Reference conditions and limitations
- Compressor data

### Electric cable size and fuses



Notice!

- 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, indicated on the dimension drawings.

To preserve the IP 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..
- Caution:
- Always double-check the fuse size versus the calculated cable size. If required, reduce fuse size or enlarge cable size.
- Cable length should not exceed the maximum length according to IEC 60204 table 10.

### Currents and fuses

Compressor type				I <sub>tot</sub> (1)	Max fuse (1)	I <sub>tot</sub> (2)	Max fuse (2)	Q21/ Q22/ Q23/ Q24	Q15
QOF 20	IEC	50 Hz	230 V	55 A	63 A	60 A	80 A	15.0 A	
QOF 20	IEC	60 Hz	380 V	32 A	40 A	37 A	50 A	8.9 A	
QOF 20	IEC	50 Hz	400 V	32 A	35 A	35 A	50 A	8.7 A	
QOF 20	IEC	50 Hz	400 V + N	32 A	35 A	37 A	50 A	8.7 A	
QOF 20	UL/cUL	60 Hz	200 V	60 A	70 A	68 A	80 A	16.6 A	
QOF 20	UL/cUL	60 Hz	230 V	55 A	70 A	62 A	80 A	15.0 A	
QOF 20	UL/cUL	60 Hz	460 V	28 A	35 A	31 A	40 A	8.0 A	
QOF 20	UL/cUL	60 Hz	575 V	21 A	30 A	24 A	35 A	5.9 A	

## Section IX - Technical data

Compressor type				Itot (1)	Max fuse (1)	Itot (2)	Max fuse (2)	Q21/ Q22/ Q23/ Q24	Q15
QOF 22	IEC	50 Hz	230 V	64 A	80 A	69 A	80 A	23.3 A	0.38 A
QOF 22	IEC	60 Hz	380 V	40 A	50 A	44 A	50 A	14.5 A	0.26 A
QOF 22	IEC	50 Hz	400 V	37 A	50 A	40 A	50 A	13.4 A	0.22 A
QOF 22	IEC	50 Hz	400 V + N	37 A	50 A	44 A	50 A	13.4 A	0.22 A
QOF 22	UL/cUL	60 Hz	200 V	76 A	90 A	84 A	100 A	25.0 A	0.74 A
QOF 22	UL/cUL	60 Hz	230 V	66 A	80 A	73 A	90 A	24.0 A	0.26 A
QOF 22	UL/cUL	60 Hz	460 V	33 A	40 A	37 A	45 A	12.0 A	0.43 A
QOF 22	UL/cUL	60 Hz	575 V	27 A	30 A	30 A	35 A	9.6 A	0.44 A

Compressor type				Itot (1)	Max fuse (1)	Itot (2)	Max fuse (2)	Q21/ Q22/ Q23/ Q24	Q15
QOF 30	IEC	50 Hz	230 V	85 A	100A	90 A	125 A	23.3 A	0.38 A
QOF 30	IEC	60 Hz	380 V	53 A	63 A	57 A	63 A	14.5 A	0.26 A
QOF 30	IEC	50 Hz	400 V	49 A	63 A	52 A	63 A	13.4 A	0.22 A
QOF 30	IEC	50 Hz	400 V + N	49 A	63 A	58 A	63 A	13.4 A	0.22 A
QOF 30	UL/cUL	60 Hz	200 V	101 A	125 A	109 A	125 A	25.0 A	0.74 A
QOF 30	UL/cUL	60 Hz	230 V	88 A	110 A	94 A	125 A	24.0 A	0.26 A
QOF 30	UL/cUL	60 Hz	460 V	44 A	60 A	48 A	60 A	12.0 A	0.43 A
QOF 30	UL/cUL	60 Hz	575 V	35 A	40 A	38 A	40 A	9.6 A	0.44 A

Itot (1): maximum current in the supply lines at maximum load and nominal voltage for compressors without integrated dryer.

Max fuse (1): maximum fuse size in case of compressors without integrated dryer.

Itot (2): maximum current in the supply lines at maximum load and nominal voltage for compressors with integrated dryer.

Max fuse (2): maximum fuse size in case of compressors with integrated dryer.

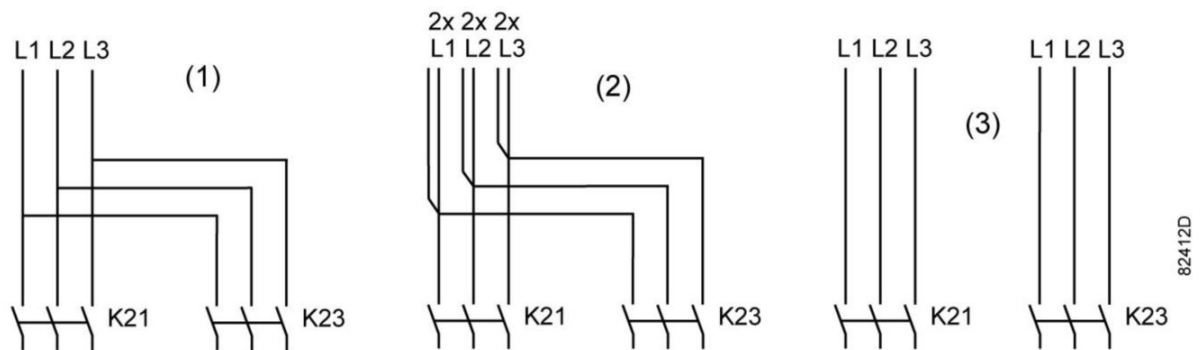
IEC fuses: class gL/gG

UL fuses: class K5; CSA: HRC form II



### Possible configurations

There are 3 possible cabling layouts:



- (1): Single supply cables (for DOL variants, only K21 is used)
- (2): Parallel supply cables (for DOL variants, only K21 is used)
- (3) is only valid for Y-D versions

### 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.

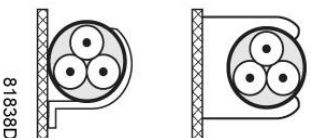
The allowed currents are valid for PVC insulated cables with three loaded copper conductors (maximum conductor temperature 70 °C).

	<p>Installation method B2 according table B.52.1. Multicore cable in conduit on a wooden wall</p>
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Maximum allowed current in function of the ambient temperature for installation method B2

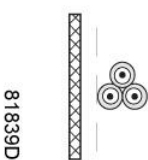
Cable section	Ambient temperature				
	30 °C	40 °C	45 °C	50 °C	55 °C
4 mm <sup>2</sup>	< 27 A	< 23 A	< 21 A	< 19 A	< 16 A
6 mm <sup>2</sup>	< 34 A	< 30 A	< 27 A	< 24 A	< 21 A
10 mm <sup>2</sup>	< 46 A	< 40 A	< 36 A	< 33 A	< 28 A
16 mm <sup>2</sup>	< 62 A	< 54 A	< 49 A	< 44 A	< 38 A
25 mm <sup>2</sup>	< 80 A	< 70 A	< 63 A	< 57 A	< 49 A
35 mm <sup>2</sup>	< 99 A	< 86 A	< 78 A	< 70 A	< 60 A
50 mm <sup>2</sup>	< 118 A	< 103 A	< 93 A	< 84 A	< 72 A
70 mm <sup>2</sup>	< 149 A	< 130 A	< 118 A	< 106 A	< 91 A
95 mm <sup>2</sup>	< 179 A	< 156 A	< 141 A	< 127 A	< 109 A
120 mm <sup>2</sup>	< 206 A	< 179 A	< 163 A	< 146 A	< 126 A

## Section IX - Technical data

	<p>Installation method C according table B.52.1. Single core or multicore cable on a wooden wall</p>
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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 mm <sup>2</sup>	< 32 A	< 28 A	< 25 A	< 23 A	< 20 A
6 mm <sup>2</sup>	< 41 A	< 36 A	< 32 A	< 29 A	< 25 A
10 mm <sup>2</sup>	< 57 A	< 50 A	< 45 A	< 40 A	< 35 A
16 mm <sup>2</sup>	< 76 A	< 66 A	< 60 A	< 54 A	< 46 A
25 mm <sup>2</sup>	< 96 A	< 84 A	< 76 A	< 68 A	< 59 A
35 mm <sup>2</sup>	< 119 A	< 104 A	< 94 A	< 84 A	< 73 A
50 mm <sup>2</sup>	< 144 A	< 125 A	< 114 A	< 102 A	< 88 A
70 mm <sup>2</sup>	< 184 A	< 160 A	< 145 A	< 131 A	< 112 A
95 mm <sup>2</sup>	< 223 A	< 194 A	< 176 A	< 158 A	< 136 A
120 mm <sup>2</sup>	< 259 A	< 225 A	< 205 A	< 184 A	< 158 A

	<p>Installation method F according table B.52.1. Single-core cables, touching in free air Clearance to wall not less than one cable diameter</p>
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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 mm <sup>2</sup>	< 110 A	< 96 A	< 87 A	< 78 A	< 67 A
35 mm <sup>2</sup>	< 137 A	< 119 A	< 108 A	< 97 A	< 84 A
50 mm <sup>2</sup>	< 167 A	< 145 A	< 132 A	< 119 A	< 102 A
70 mm <sup>2</sup>	< 216 A	< 188 A	< 171 A	< 153 A	< 132 A
95 mm <sup>2</sup>	< 264 A	< 230 A	< 209 A	< 187 A	< 161 A
120 mm <sup>2</sup>	< 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 current (I<sub>tot</sub> 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 current ( $I_{tot}$  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 current ( $I_{tot}$  from the tables) and divide by  $\sqrt{3}$
  - 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  $\sqrt{3}$  on each cable.
- Size of the PE cable: use following rule of thumb:
  - For supply cables up to 16 mm<sup>2</sup>: same size as supply wires
  - For supply cables between 16 mm<sup>2</sup> and 35 mm<sup>2</sup>: 16 mm<sup>2</sup>
  - For supply cables larger than 35 mm<sup>2</sup>: 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: For QOF 15 T 400 V 50 Hz IEC,  $I_{tot} = 52$  A, ambient temperature is 40 °C, recommended fuse: maximum 63 A.

- In case of single supply cables (3 phases + PE - configuration (1)):
  - $I = 52 \text{ A} + 10 \% = 52 \times 1.1 = 57.2 \text{ A}$
  - The table for installation method B2 allows a maximum current of 54 A for a 16 mm<sup>2</sup> cable. For a cable of 25 mm<sup>2</sup>, the maximum allowed current is 70 A, which is sufficient. Therefore, use a 3 x 25 mm<sup>2</sup> + 16 mm<sup>2</sup> cable. If method C is used, 16 mm<sup>2</sup> is sufficient (maximum 66 A at 40 °C). Use a 3 x 16 + 16 mm<sup>2</sup> cable.
- Install 63 A fuses.
- In case of parallel supply cables (2 x 3 phases + PE - configuration (2)):
  - $I = (52 \text{ A} + 10 \%)/2 = (52 \times 1.1)/2 = 28.6 \text{ A}$
  - For a cable of 6 mm<sup>2</sup> and installation method B2, the maximum current is 30 A x 0.8 = 24 A, which is insufficient. For a cable of 10 mm<sup>2</sup>, the maximum allowed current is 50 A x 0.8 = 40 A. So 2 parallel cables of 3 x 10 mm<sup>2</sup> + 10 mm<sup>2</sup> are sufficient. In case of installation method C, the maximum current of a 6 mm<sup>2</sup> cable at 40 °C is 36 A x 0.8 = 28.8 A. 2 parallel cables of 3 x 6 + 6 mm<sup>2</sup> will be sufficient.
- Install 32 A fuses on each cable..

#### 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 (NFPA70 table 310.16)

AWG or kcmil	Maximum current
14	20 A
12	25 A
10	35A

## Section IX - Technical data

8	50 A
6	65 A
4	85 A
3	100 A
2	115 A
1	130 A

Correction factors

Ambient temperature	Correction factor
21-25 °C (70-77 °F)	1.05
26-30 °C (78-86 °F)	1.00
31-35 °C (87-95 °F)	0.94
36-40 °C (96-104 °F)	0.88

Calculation method for UL:

- Single supply cables (3 phases + 1 PE - configuration (1)):
  - Add 25 % to the total current ( $I_{tot}$  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 ( $I_{tot}$  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 ( $I_{tot}$  from the tables) and divide by  $\sqrt{3}$
  - 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  $\sqrt{3}$  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:  $I_{tot} = 28$  A, maximum ambient temperature is 40°C, recommended fuse = 40

- Single supply cables (3 phases + 1 PE - configuration (1)):
  - $I = 28$  A + 25 % =  $28 \times 1.25 = 35$  A

- 
- For AWG8, the maximum current at 40 °C is  $50 \text{ A} \times 0.88 = 44 \text{ A}$ , which is sufficient  
=> use AWG8.
  - Install the prescribed maximum fuse (40 A) on each cable
  - Parallel supply cable (2 x 3 phases + 2 PE - configuration (2)):
    - $I = (28 \text{ A} + 25\%)/2 = (28 \times 1.25)/2 = 17.5 \text{ A}$
    - For a AWG14, the maximum current at 40 °C is  $20 \text{ A} \times 0.88 \times 0.8 = 14.1 \text{ A}$ , which is insufficient. For an AWG14, the maximum current is  $25 \times 0.88 \times 0.8 = 17.6 \text{ A}$ .  
So 2 parallel cables of 3 x AWG12 + 2 x AWG12 are sufficient.
    - Install 20 A fuses on each cable..
- 

### Reference conditions and limitations

#### Reference conditions

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

#### Limits

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

## Section IX - Technical data

### Compressor data



Notice!

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

#### 8 bar compressors, 50 Hz

Compressor type		QOF 20	QOF 22	QOF 30
Maximum working pressure (compressors without integrated dryer)	bar(e)	8	8	8
Maximum working pressure (compressors without integrated dryer)	psi(g)	116	116	116
Maximum working pressure (compressors with integrated dryer)	bar(e)	7.75	7.75	7.75
Maximum working pressure (compressors with integrated dryer)	psi(g)	112	112	112
Reference working pressure (compressors without integrated dryer)	bar(e)	7	7	7
Reference working pressure (compressors without integrated dryer)	psi(g)	101.5	101.5	101.5
Reference working pressure (compressors with integrated dryer)	bar(e)	6.75	6.75	6.75
Reference working pressure (compressors with integrated dryer)	psi(g)	98	98	98
Air temperature at outlet valve (compressors without integrated dryer)	°C	32	30	30
Air temperature at outlet valve (compressors without integrated dryer)	°F	90	86	86
Air temperature at outlet valve (compressors with integrated dryer)	°C	25	25	20
Air temperature at outlet valve (compressors with integrated dryer)	°F	77	77	68
Motor shaft speed	rpm	2900	2900	2900
Nominal motor power	kW	4 x 3.7	3 x 5.5	4 x 5.5
Nominal motor power	hp	4 x 5	3 x 7.5	4 x 7.5
Sound pressure level (compressors without integrated dryer)	dB(A)	63	64	65
Refrigerant type (compressors with integrated dryer)	°C	R404a	R404a	R404a
Dew point (compressors with integrated dryer)	°F	4	4	4
Dew point (compressors with integrated dryer)	°F	39	39	39

## 10 bar compressors, 50 Hz

Compressor type		QOF 20	QOF 22	QOF 30
Maximum working pressure (compressors without integrated dryer)	bar(e)	10	10	10
Maximum working pressure (compressors without integrated dryer)	psi(g)	145	145	145
Maximum working pressure (compressors with integrated dryer)	bar(e)	9.75	9.75	9.75
Maximum working pressure (compressors with integrated dryer)	psi(g)	141	141	141
Reference working pressure (compressors without integrated dryer)	bar(e)	9	9	9
Reference working pressure (compressors without integrated dryer)	psi(g)	130.5	130.5	130.5
Reference working pressure (compressors with integrated dryer)	bar(e)	8.75	8.75	8.75
Reference working pressure (compressors with integrated dryer)	psi(g)	127	127	127
Air temperature at outlet valve (compressors without integrated dryer)	°C	32	30	30
Air temperature at outlet valve (compressors without integrated dryer)	°F	90	86	86
Air temperature at outlet valve (compressors with integrated dryer)	°C	25	30	55
Air temperature at outlet valve (compressors with integrated dryer)	°F	77	86	131
Motor shaft speed	rpm	2900	2900	2900
Nominal motor power	kW	4 x 3.7	3 x 5.5	4 x 5.5
Nominal motor power	hp	4 x 5	3 x 7.5	4 x 7.5
Sound pressure level (compressors without integrated dryer)	dB(A)	63	64	65
Refrigerant type (compressors with integrated dryer)		R404a	R404a	R404a
Dew point (compressors with integrated dryer)	°C	4	4	4
Dew point (compressors with integrated dryer)	°F	39	39	39

## 116 psi compressors, 60 Hz

Compressor type		QOF 20	QOF 22	QOF 30
Maximum working pressure (compressors without integrated dryer)	bar(e)	8	8	8
Maximum working pressure (compressors without integrated dryer)	psi(g)	116	116	116
Maximum working pressure (compressors with integrated dryer)	bar(e)	7.75	7.75	7.75

## Section IX - Technical data

Compressor type		QOF 20	QOF 22	QOF 30
Maximum working pressure (compressors with integrated dryer)	psi(g)	112	112	112
Reference working pressure (compressors without integrated dryer)	bar(e)	7	7	7
Reference working pressure (compressors without integrated dryer)	psi(g)	101.5	101.5	101.5
Reference working pressure (compressors with integrated dryer)	bar(e)	6.75	6.75	6.75
Reference working pressure (compressors with integrated dryer)	psi(g)	98	98	98
Air temperature at outlet valve (compressors without integrated dryer)	°C	30	28	30
Air temperature at outlet valve (compressors without integrated dryer)	°F	86	82	86
Air temperature at outlet valve (compressors with integrated dryer)	°C	25	28	30
Air temperature at outlet valve (compressors with integrated dryer)	°F	77	82	86
Motor shaft speed	rpm	3505	3505	3505
Nominal motor power	kW	4 x 3.7	3 x 5.5	4 x 5.5
Nominal motor power	hp	4 x 5	3 x 7.5	4 x 7.5
Sound pressure level (compressors without integrated dryer)	dB(A)	63	64	65
Refrigerant type (compressors with integrated dryer)		R404a	R404a	R404a
Dew point (compressors with integrated dryer)	°C	4	4	4
Dew point (compressors with integrated dryer)	°F	39	39	39

### 145 psi compressors, 60 Hz

Compressor type		QOF 20	QOF 22	QOF 30
Maximum working pressure (compressors without integrated dryer)	bar(e)	10	10	10
Maximum working pressure (compressors without integrated dryer)	psi(g)	145	145	145
Maximum working pressure (compressors with integrated dryer)	bar(e)	9.75	9.75	9.75
Maximum working pressure (compressors with integrated dryer)	psi(g)	141	141	141
Reference working pressure (compressors without integrated dryer)	bar(e)	9	9	9
Reference working pressure (compressors without integrated dryer)	psi(g)	130.5	130.5	130.5
Reference working pressure (compressors with integrated dryer)	bar(e)	8.75	8.75	8.75



Compressor type		QOF 20	QOF 22	QOF 30
Reference working pressure (compressors with integrated dryer)	psi(g)	127	127	127
Air temperature at outlet valve (compressors without integrated dryer)	°C	32	30	30
Air temperature at outlet valve (compressors without integrated dryer)	°F	90	86	86
Air temperature at outlet valve (compressors with integrated dryer)	°C	25	30	55
Air temperature at outlet valve (compressors with integrated dryer)	°F	77	86	131
Motor shaft speed	rpm	3505	3505	3505
Nominal motor power	kW	4 x 3.7	3 x 5.5	4 x 5.5
Nominal motor power	hp	4 x 5	3 x 7.5	4 x 7.5
Sound pressure level (compressors without integrated dryer)	dB(A)	63	64	65
Refrigerant type (compressors with integrated dryer)		R404a	R404a	R404a
Dew point (compressors with integrated dryer)	°C	4	4	4
Dew point (compressors with integrated dryer)	°F	39	39	39

## Section X - Guidelines for inspection

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### Guidelines

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

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

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

## Section XI - PED (Pressure Equipment Directive)

### Components subject to 97/23/EC Pressure Equipment Directive

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

Part number	Description	Medium	Pressure
0830 1009 17	Safety valve	Air	9.3 bar
0830 1008 49	Safety valve	Air	9.3 bar
0830 1009 18	Safety valve	Air	11.5 bar
0830 1008 35	Safety valve	Air	11 bar

Volume	P x V or P	Life cycle	PED class
NA	NA	2 x 10 <sup>6</sup>	IV
NA	NA	2 x 10 <sup>6</sup>	IV
NA	NA	2 x 10 <sup>6</sup>	IV
NA	NA	2 x 10 <sup>6</sup>	IV

### Overall rating

The compressors conform to PED category I or smaller.

## Section XII - Declaration of conformity

### **EC DECLARATION OF CONFORMITY**

(1)

We, ....., declare under our sole responsibility, that the product

Machine name

Machine type

Serial number

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

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

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

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

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

**Conformity of the specification  
to the directives**

**Conformity of the product to the  
specification and by implication to the  
directives**

Issued by

Product engineering

Manufacturing

Name

Signature

Date

*Typical example of a Declaration of Conformity document*

(1): Contact address:

International Compressor Distribution NV

Boomsesteenweg 957

B-2610 Wilrijk (Antwerp)

Belgium

81679D

## Section XII - Declaration of conformity

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

## STANDARD TERMS AND CONDITIONS

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### QUINCY COMPRESSOR AND ORTMAN FLUID POWER DIVISIONS

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

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

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

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

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

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

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

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

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

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

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

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

## STANDARD TERMS AND CONDITIONS

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### QUINCY COMPRESSOR AND ORTMAN FLUID POWER DIVISIONS

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

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

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

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

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

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

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

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

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

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

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

## Notes



## This image shows a full page of blank, lined paper. It features approximately 28 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.



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Website: [www.quincycompressor.com](http://www.quincycompressor.com)



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