

SpiralAir

Oil-free scroll compressors



SPR 2, SPR 3, SPR 5, SPR 8

Instruction book

spiralAIR

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Instruction book

Original instructions

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1 Safety precautions

1.1 Safety icons

Explanation

	Danger to life
	Warning
	Important note

1.2 Safety precautions, general

General precautions

1. The operator must employ safe working practices and observe all related work safety requirements and regulations.
2. If any of the following statements does not comply with the applicable legislation, the stricter of the two shall apply.
3. Installation, operation, maintenance and repair work must only be performed by authorized, trained, specialized personnel.
4. Never use compressed air as breathing air without prior purification in accordance with local legislation and standards.
5. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the compressor, press the emergency stop button, switch off the voltage and depressurize the compressor. In addition, the power isolating switch must be opened and locked.
6. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.
7. The owner is responsible for maintaining the unit in safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.
8. It is not allowed to walk or stand on the compressor or its components.

1.3 Safety precautions during installation



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

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

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

Precautions during installation

1. The machine must only be lifted using suitable equipment in accordance with local safety regulations. Loose or pivoting parts must be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and deceleration must be kept within safe limits. Wear a safety helmet when working in the area of overhead or lifting equipment.
2. Place the machine where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care must be taken to minimise the entry of moisture at the inlet air. Consult section Reference conditions and limitations.
3. Any blanking flanges, plugs, caps, desiccant bags, packaging films, and transport brackets must be removed before connecting the pipes.
4. Air hoses must be of correct size and suitable for the working pressure. Never use frayed, damaged or worn hoses. Distribution pipes and connections must be of the correct size and suitable for the working pressure.
5. The aspirated air must be free of flammable fumes, vapours, and particles, e.g. paint solvents, which can lead to internal fire or explosion.
6. Arrange the air intake so that loose clothing worn by people cannot be sucked in.
7. Ensure that the discharge pipe from the compressor to the aftercooler or air net is free to expand under heat and that it is not in contact with or close to flammable materials.
8. No external force may be exerted on the air outlet valve. The connected pipe must be free of strain.
9. If remote control is installed, the machine must bear a clear sign stating "DANGER: This machine is remotely controlled and may start without warning".
The operator has to make sure that the machine is stopped and that the isolating switch is open and locked before any maintenance or repair. As a further safeguard, persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
10. Air-cooled machines must be installed in such a way that an adequate flow of cooling air is available and that the exhausted air does not recirculate to the compressor air inlet or cooling air inlet.
11. The electrical connections must correspond to the applicable codes. The machines must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the compressor.
12. On machines with automatic start-stop system or if the automatic restart function after voltage failure is activated, a sign stating "This machine may start without warning" must be affixed near the instrument panel.

13. In multiple compressor systems, manual valves must be installed to isolate each compressor. Non-return valves (check valves) must not be relied upon for isolating pressure systems.
14. Never remove or tamper with the safety devices, guards or insulation fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure must be protected by a pressure relieving device or devices as required.
15. Piping or other parts with a temperature in excess of 80°C (176°F) and which may be accidentally touched by personnel in normal operation must be guarded or insulated. Other high temperature piping must be clearly marked.
16. For water-cooled machines, the cooling water system installed outside the machine has to be protected by a safety device with set pressure according to the maximum cooling water inlet pressure.
17. If the ground is not level or can be subject to variable inclination, consult the manufacturer.



Also consult following safety precautions: [Safety precautions during operation](#) and [Safety precautions during maintenance](#).

1.4 Safety precautions during operation



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

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

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

Precautions during operation

1. Never touch any piping or components of the compressor during operation.
2. Use only the correct type and size of hose end fittings and connections. When blowing through a hose or air line, ensure that the open end is held securely. A free end will whip and may cause injury. Make sure that a hose is fully depressurized before disconnecting it.
3. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
4. Never operate the machine when there is a possibility of taking in flammable or toxic fumes, vapors or particles.
5. Never operate the machine below or in excess of its limit ratings.
6. Keep all bodywork doors shut during operation. The doors may be opened for short periods only, e.g. to carry out routine checks. Wear ear protectors and safety glasses when opening a door.
7. People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB(A) shall wear ear protectors.
8. Periodically check, when the unit is off, that:
 - All guards are in place and securely fastened

- All hoses and/or pipes inside the machine are in good condition, secure and not rubbing
 - There are no leaks
 - All fasteners are tight
 - All electrical leads are secure and in good order
 - Safety valves and other pressure relief devices are not obstructed by dirt or paint
 - Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good condition, free of wear or abuse
9. If warm cooling air from compressors is used in air heating systems, e.g. to warm up a working area, take precautions against air pollution and possible contamination of the breathing air.
 10. Do not remove any of, or tamper with, the sound dampening material.
 11. Never remove or tamper with the safety devices, guards or insulation fitted to the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure shall be protected by a pressure relieving device or devices as required.
 12. Be aware of possible blow off of safety valves during operation. For the location of the safety valves, consult the description in this instruction book.
 13. Yearly inspect the air receiver. Minimum wall thickness as specified in the instruction book must be respected. Local regulations remain applicable if they are more strict.
 14. If automatic restart after voltage failure (ARAVF) is activated and provided the controller was in the automatic operation mode, the compressor will automatically restart if the supply voltage to the module is restored.



Also consult the following safety precautions: [Safety precautions during installation](#) and [Safety precautions during maintenance](#).

1.5 Safety precautions during maintenance or repair



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

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

Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

Precautions during maintenance or repair

1. Always use the correct safety equipment such as safety glasses, gloves, safety shoes, etc.
2. Use only the correct tools for maintenance and repair work.
3. Use only genuine spare parts.
4. All maintenance work shall only be undertaken when the machine has cooled down.
5. A warning sign bearing a legend such as "Work in progress; do not start" shall be attached to the starting equipment.
6. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.

7. Close the compressor air outlet valve before connecting or disconnecting a pipe.
8. Before removing any pressurized component, effectively isolate the machine from all sources of pressure and relieve the entire system of pressure.
9. Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapours of cleaning liquids.
10. Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.
11. Never weld or perform any operation involving heat near any oil system. Oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels.
12. Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed to avoid spontaneous ignition of the oil vapour (if applicable) when air is admitted.
13. Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
14. Make sure that no tools, loose parts or rags are left in or on the machine.
15. All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
16. Before clearing the machine for use after maintenance or overhaul, check that operating pressures, temperatures and time settings are correct. Check that all control and shut-down devices are fitted and that they function correctly. If removed, check that the coupling guard of the compressor drive shaft has been reinstalled.
17. Protect the motor, air filter, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam-cleaning.
18. Make sure that all sound-damping material, e.g. on the bodywork and in the air inlet and outlet systems of the compressor, is in good condition. If damaged, replace it by genuine material from the manufacturer to prevent the sound pressure level from increasing.
19. Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.
20. **The following safety precautions are stressed when handling refrigerant:**
 - Never inhale refrigerant vapours. Check that the working area is adequately ventilated; if required, use breathing protection.
 - Always wear special gloves. In case of refrigerant contact with the skin, rinse the skin with water. If liquid refrigerant contacts the skin through clothing, never tear off or remove the latter; flush abundantly with fresh water over the clothing until all refrigerant is flushed away; then seek medical first aid.
21. Protect hands to avoid injury from hot machine parts, e.g. during draining of oil.
22. Be aware of eventual sharp edges on certain parts of the machine.
23. If automatic restart after voltage failure (ARAVF) is activated and provided the controller was in the automatic operation mode, the compressor will automatically restart if the supply voltage to the module is restored.



Also consult the following safety precautions: [Safety precautions during installation](#) and [Safety precautions during operation](#).

1.6 Dismantling and disposal

Dismantling

Once the end of life of the machine is reached, please follow next steps:

1. Stop the machine.
2. Check all safety precautions mentioned in the previous chapters to secure safe handling (e.g. LOTO, cool-down, depressurize, discharge, ...).
3. Separate the harmful from the safe components (e.g. drain oil from oil containing parts).
4. Refer to the disposal topic mentioned below.

Disposal of electrical and electronic appliances (WEEE)

This equipment falls under the provisions of the European Directive 2012/19/EU on waste electrical and electronic appliances (WEEE) and may not be disposed as unsorted waste.



The equipment is labelled in accordance with the European Directive 2012/19/EU with the crossed-out wheeled bin symbol.

At the end of life-time of the electric and electronic equipment (EEE) it must be taken to separate collection.

For more information check with your local waste authority, customer center or distributor.

Disposal of other used material

Used filters or any other used material (e.g. filter bags, filter media, 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.

2 General description

2.1 Introduction

General

SPR 2, SPR 3, SPR 5 and SPR 8 are stationary, single stage, oil-free compressors, driven by an electric motor.

The compressors are controlled by a pressure switch.

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

Available versions:

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

The basic version (referred to as the floor-mounted version (FM)) does not include an air receiver.

Available options:

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

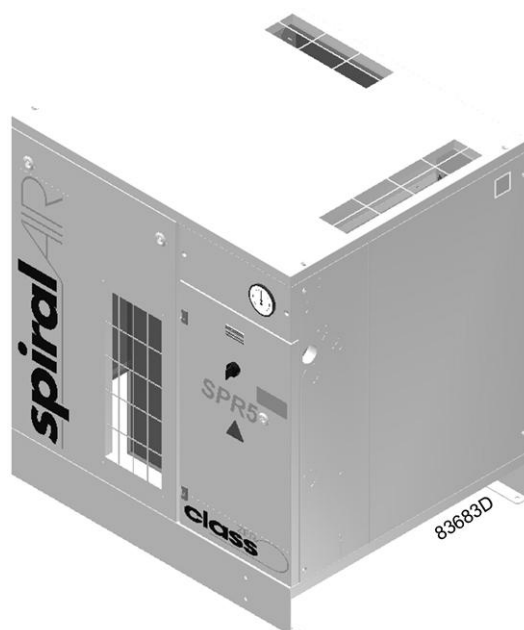
SPR

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

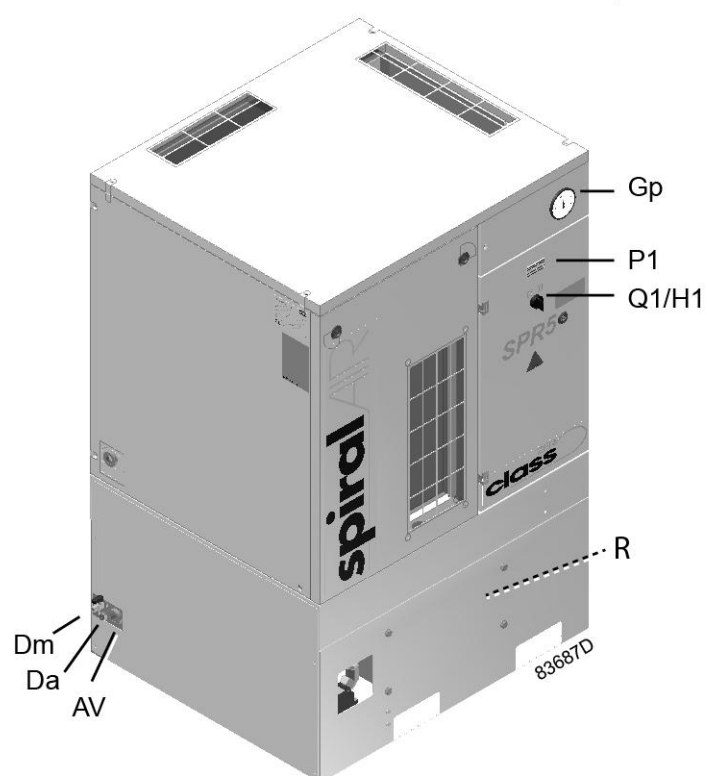
The electric components are located in the cubicle behind the front panel door.

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

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

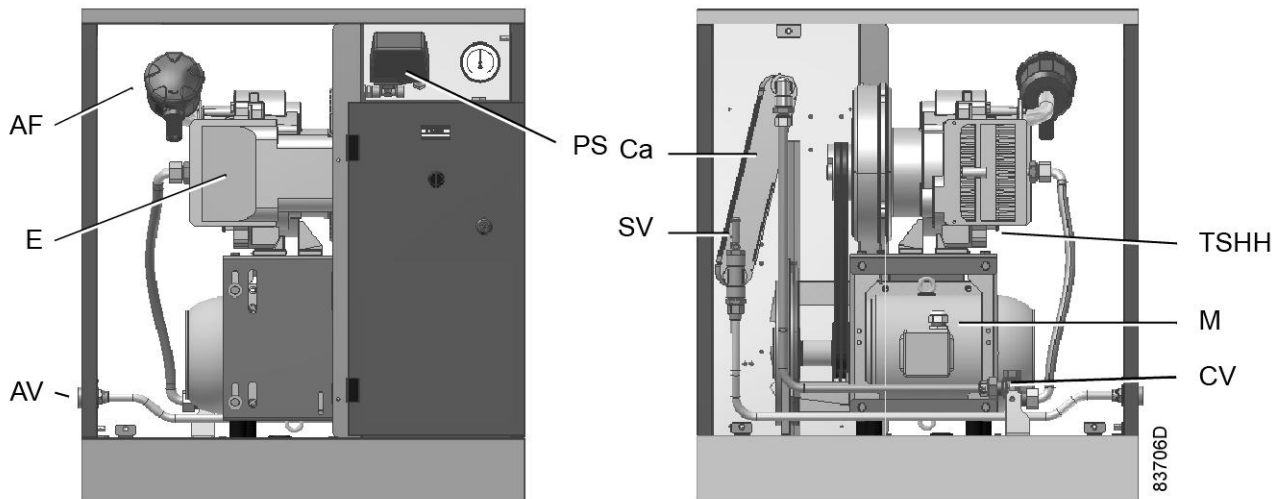


SPR 5 floor-mounted - general view



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

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



SPR 5 floor-mounted - details

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

SPR T

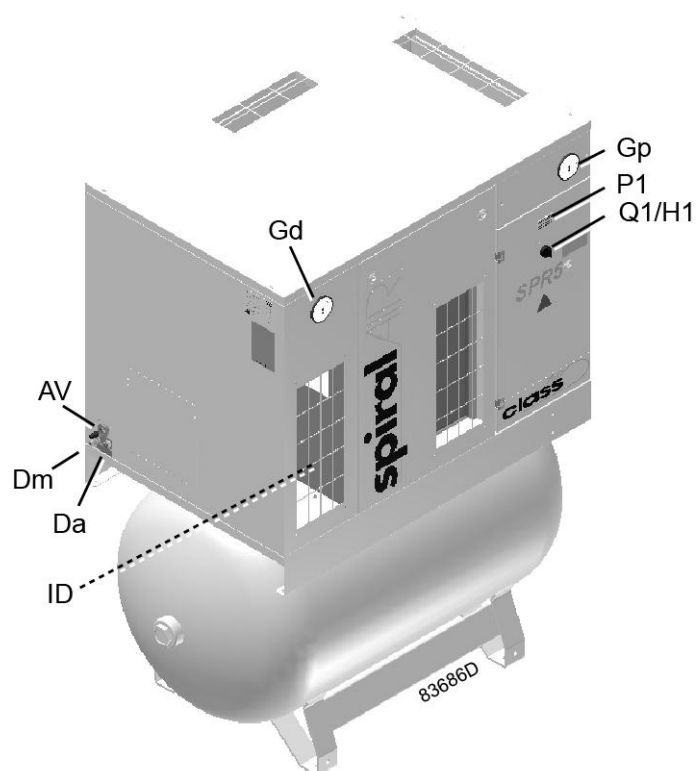
The SPR T consists of an SPR, completed with an integrated refrigerant dryer.

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

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

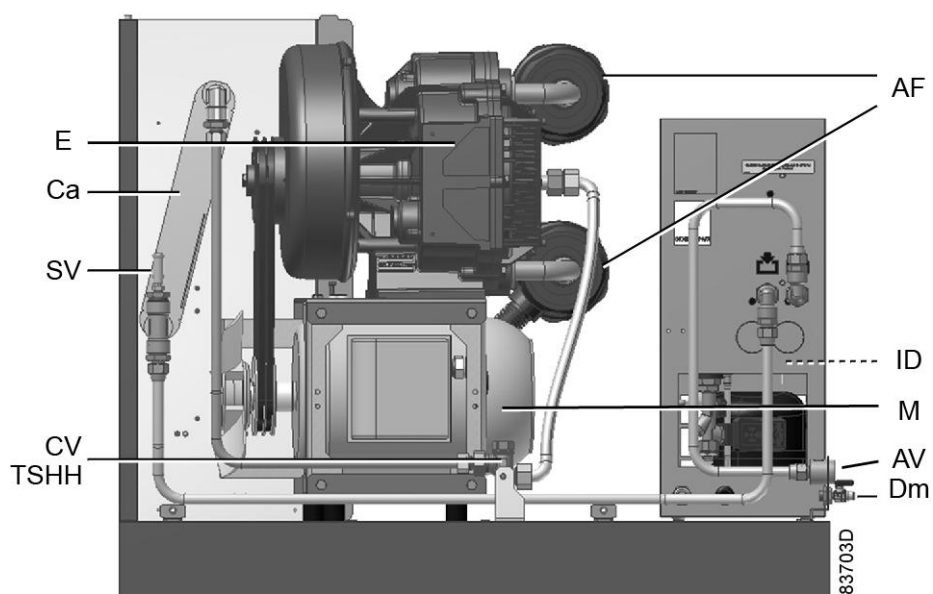
A check valve (CV) prevents loss of compressed air when the compressor is stopped. A temperature switch and a safety valve (SV) protect the compressor element against overheating and too high pressure respectively. The compressed air is cooled by an air cooler (Ca) before it enters the dryer.

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



SPR 5 T on a 270 l receiver - general view

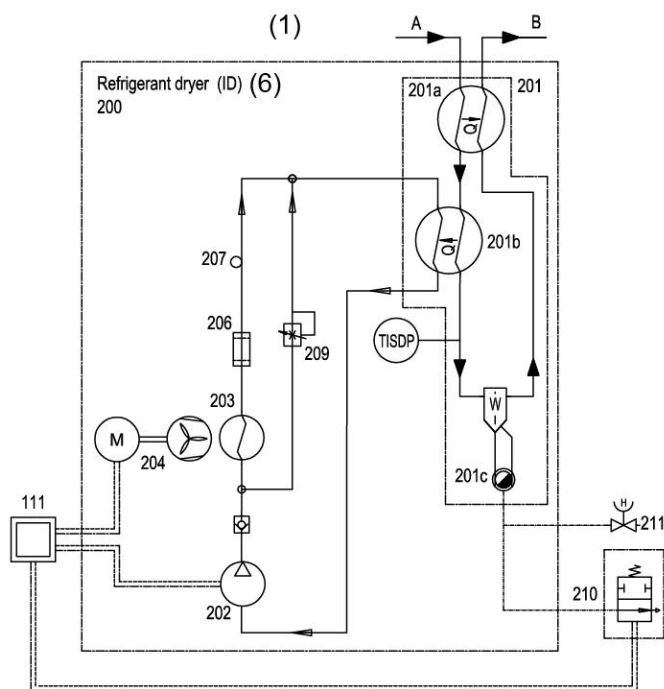
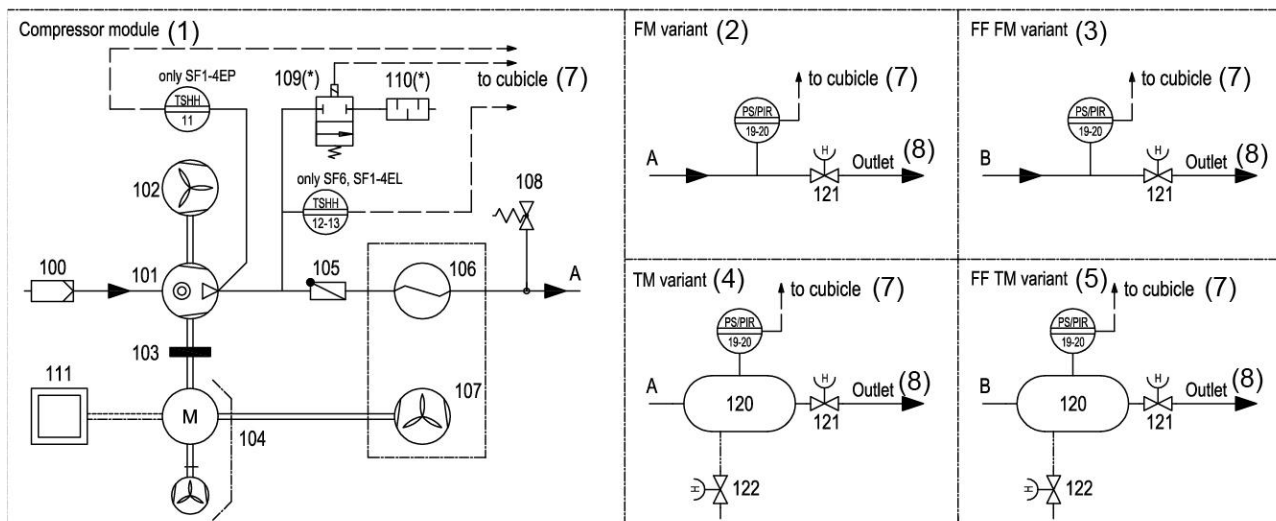
Gp	Pressure gauge	Q1/H1	On/off switch with lamp
P1	Hour meter	AV	Air outlet valve
Dm	Manual drain valve	Da	Automatic drain outlet
Gd	Dew point gauge	ID	Refrigerant dryer



SPR 8 T - details

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

2.2 Flow diagram



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Flow diagram

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

Air flow

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

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

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

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

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

For details on the operation of the ID dryer, see section [Refrigerant dryer](#).

Cooling

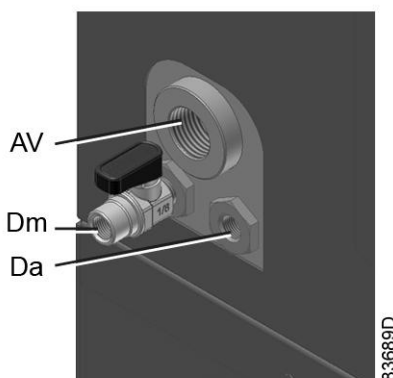
The compressor element (101) is cooled by an integrated radial fan (102). An axial fan (107) fitted on the motor shaft provides cooling air for the air cooler (106).

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

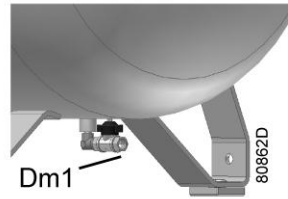
Condensate management

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

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



The receiver of tank-mounted compressors has a manual drain valve (122) at the bottom. A timer drain is available as option.



Regulating system and protection

An Airlogic controller is available as an option.

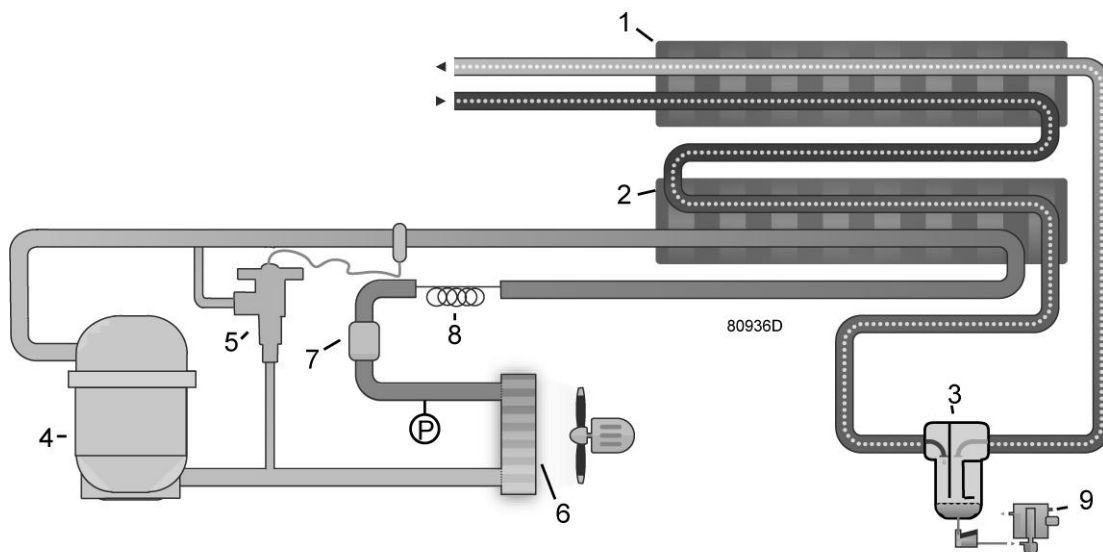
A safety valve (108) protects the compressor element against too high pressure.

2.3 Refrigerant dryer

Operation

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

Compressed air circuit



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

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

Refrigerant circuit

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

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

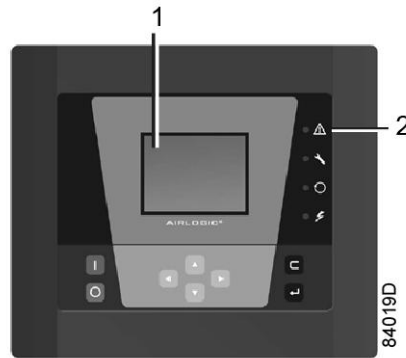
The refrigerant enters the evaporator (2) where it withdraws heat from the compressed air by further evaporation at constant pressure. The heated refrigerant leaves the evaporator and is sucked in again by the compressor.

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

3 Airlogic controller

3.1 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.



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](#).



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

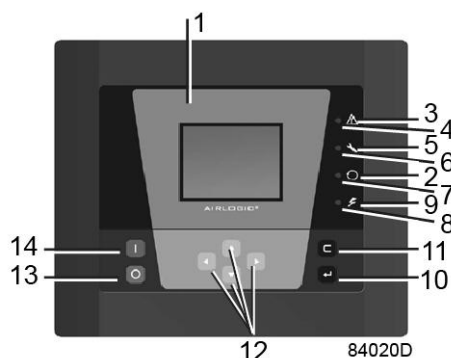
The controller has a built-in function to automatically restart the compressor when the voltage is restored after voltage failure. For compressors leaving the factory, this function is made inactive. If desired, the function can be activated.

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.

3.2 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.

3.3 Icons used

Status icons

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

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

Name	Icon	Description
	 82418D	Not valid

Input icons

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

System icons

Icon	Description
 57803F	Compressor element (LP, HP, ...)
 57804F	Dryer
 57805F	Fan
 57807F	Drain
 57808F	Filter
 57809F	Motor
 57810F	Failure expansion module
 81105D	Network problem
 57812F	General alarm

Icon	Description
 83982D	The compressor module is running and can be stopped
 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

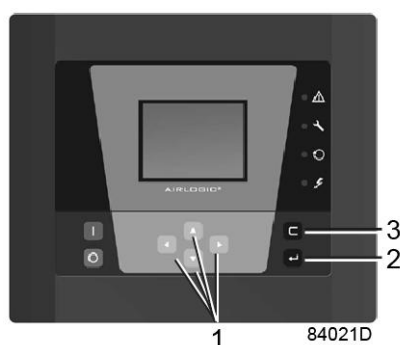
Icon	Description
	Info

Navigation arrows

Icon	Description
	Up
	Down

3.4 Main screen

Control panel



1	Scroll keys
2	Enter key
3	Escape 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

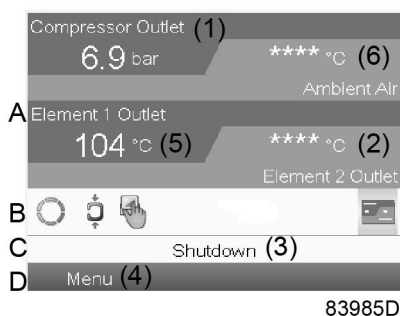
This type of Main screen shows the value of 2 or 4 parameters (see section [Inputs menu](#)).



Typical Main screen (2 value lines)

Text on image

(1)	Compressor Outlet
(2)	Ambient Air
(3)	Load, Shutdown, etc. (text varies based on the compressor's 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 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:

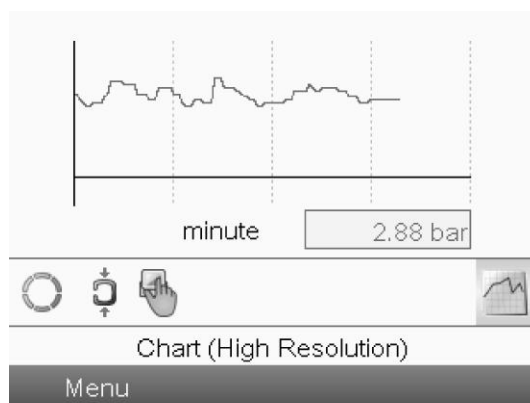
Designation	Function
Menu	To go to the menu
Modify	To modify programmable settings
Reset	To reset a timer or message

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

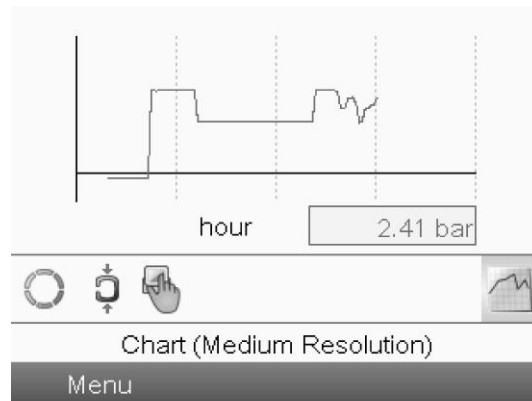
Instead of viewing values, it is also possible to view a graph of one of the input signals (see section [Inputs menu](#)) in function of the time.



59166D

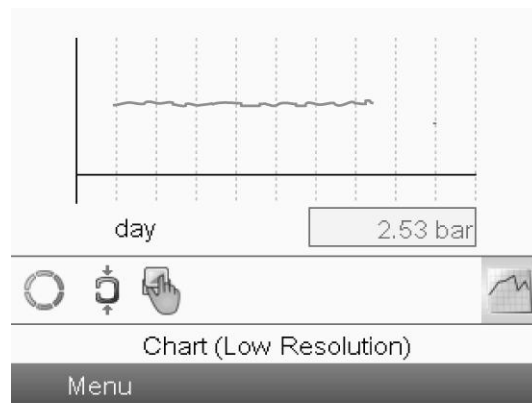
When Chart (High Resolution) is selected, the chart shows the variation of the selected input (in this case the pressure) per minute. Also the instantaneous value is displayed. The screen shows the last 4 minutes.

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.

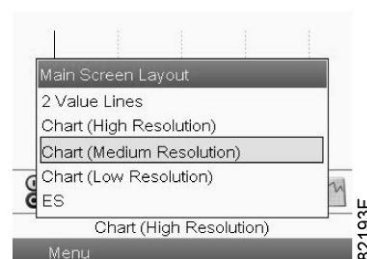


59168D

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

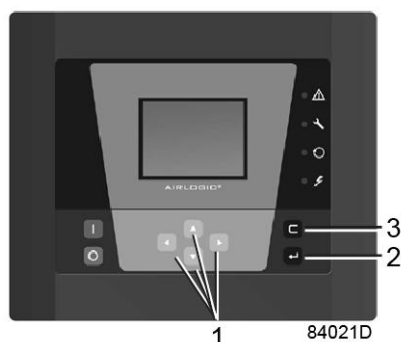
To change between the different screen layouts, select the far right icon in the control icons line (see value lines display icon or chart display icon in section [Icons used](#)) and press the Enter key. A screen similar to the one below opens:



Select the layout required and press the Enter key. See also section [Inputs menu](#).

3.5 Calling up menus

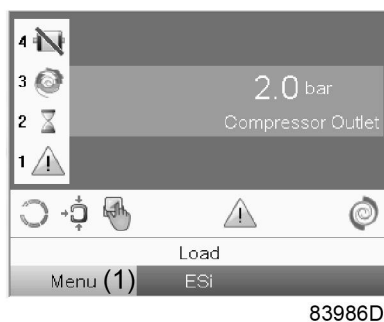
Control panel



1	Scroll keys
2	Enter key
3	Escape key

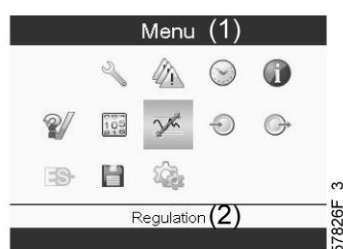
Procedure

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.

3.6 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

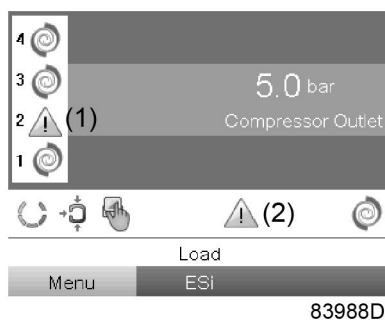
When a compressor element temperature exceeds the warning level, the element stops during a Minimum Stop Time . It will be restarted automatically after this time has elapsed and if the temperature is below this limit.

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

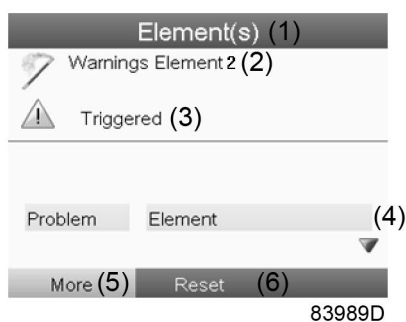
If the element temperature exceeds the factory set shutdown warning repeatedly, the element will shut down, alarm LED (4) (see section [Control panel](#)) will lit and following screen will appear:



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:

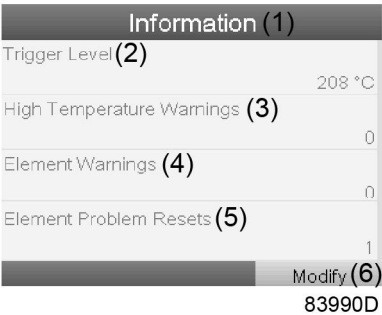


Warning element screen (element 2 is triggered)

Text on image

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

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



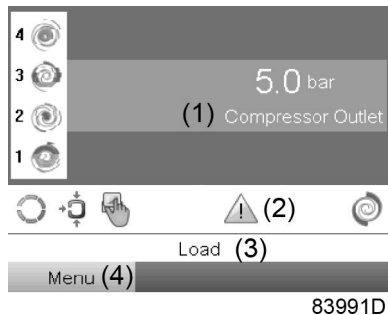
Counter screen where one element was reset manually

Text on image

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

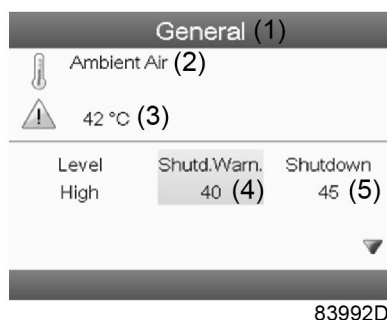


Main screen with high ambient temperature warning

Text on image

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

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



83992D

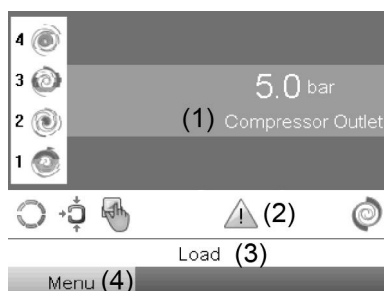
Description of high ambient alarm in the protection menu

Text on image

(1)	General	(4)	Shutd. Warn.
(2)	Ambient air	(5)	Shutdown
(3)	High temperature warning		

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 point temperature exceeds the warning level:



83991D

Main screen with dew point exceeding the limit

Text on image

(1)	Compressor outlet (pressure)	(3)	Load
(2)	Warning icon	(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.

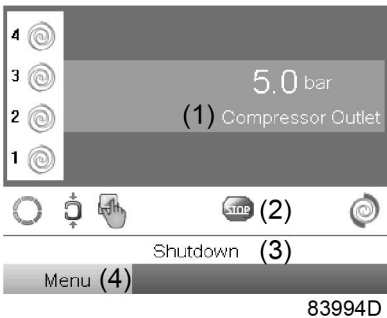
3.7 Shutdown

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	(3)	Shutdown
(2)	Stop icon	(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.

3.8 Inputs menu

Menu icon, Inputs



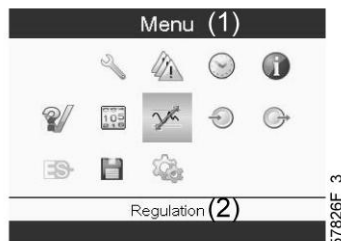
Function

- 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](#),

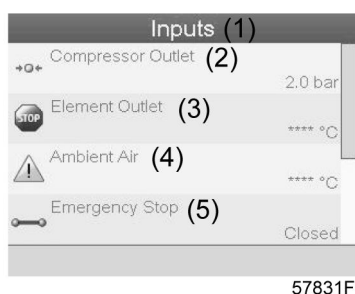
- Move the cursor to the action button Menu and press the Enter key. Following screen appears:



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

- 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

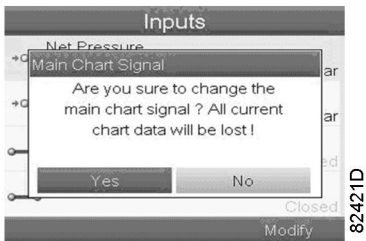
With the Modify button active (light grey background in above screen), press the Enter button on the controller. A screen similar to the one below appears:



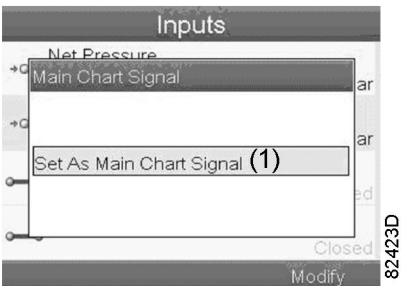
The first item in the list is highlighted. In this example, the Net Pressure is selected (chart icon). To change, press the Enter button again. A pop up window opens:



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		
-----	--------------------------	--	--

3.9 Outputs menu

Menu icon, Outputs



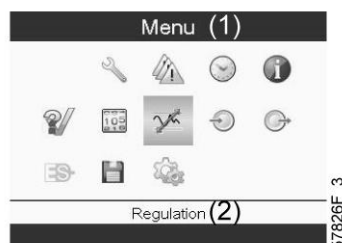
Function

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:



Outputs screen (typical)

Text on image

(1)	General	(4)	General warning
(2)	General shutdown	(5)	Cabinet fan
(3)	Fan motor		

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

3.10 Counters

Menu icon, Counters



Function

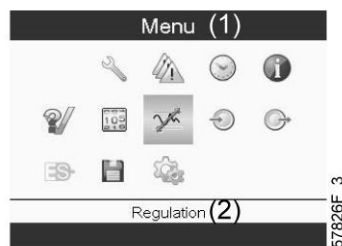
To call up:

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

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

3.11 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:

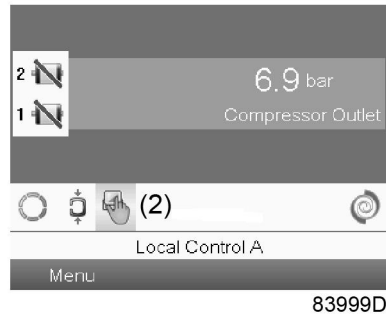


83998D

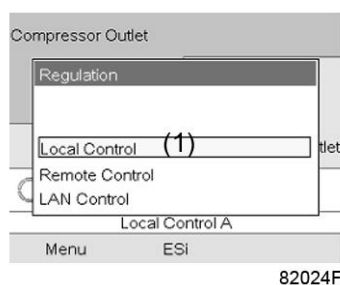
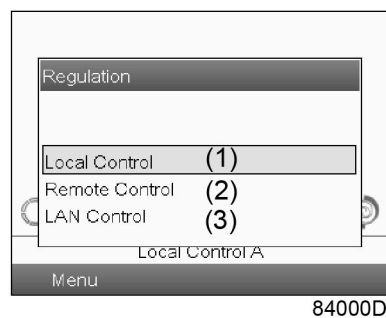
Text on image

(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):



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



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.

3.12 Service menu

Menu icon, Service



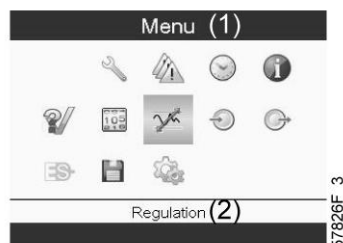
Function

- 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](#),

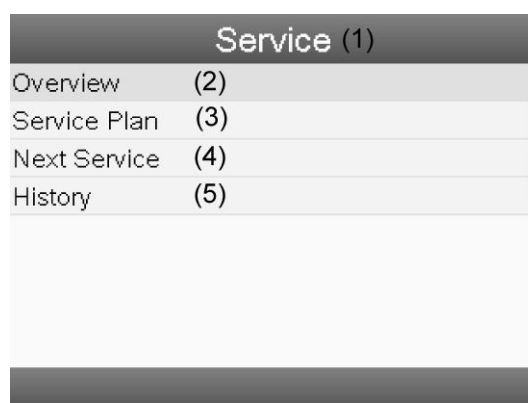
- Move the cursor to the action button Menu and press the Enter key. Following screen appears:



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:



Text on image

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

- 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	(3)	Real Time (hours)
(2)	Running 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 2500 hours (upper row) and the programmed number of real time hours is 8760 hours, which corresponds to one year (second row). This means that the controller will launch a service warning when either 2500 running hours or 8760 real hours are reached, whichever comes first. Note that the real time hours counter keeps counting, also when the controller is not powered.

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 2500 running hours or 8305 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	(4)	Real time hours
(2)	Level	(5)	Modify
(3)	Running hours		

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:

Service Plan (1)		
Level (2)	Running (3) Hours	Real (4) Time
Modify Hours		
100000		
4000		
0		
E 32000		
		(5) Modify

57851F

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

Next Service (1)		
Level (2)	Running (3) Hours	
	Actual (4)	
	0	
A	500	

84003D

Text on image

(1)	Next service	(3)	Running hours
(2)	Level	(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.

3.13 Setpoint menu

Menu icon, Setpoint



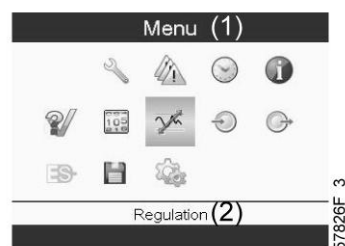
Function

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	(4)	Pressure band 2 High
(2)	Pressure band 1 High	(5)	Pressure band 2 Low
(3)	Pressure band 1 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.

3.14 Event history menu

Menu icon, Event History



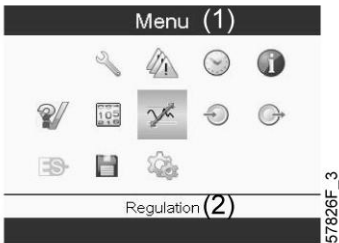
Function

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.

3.15 General settings menu

Menu icon, Settings



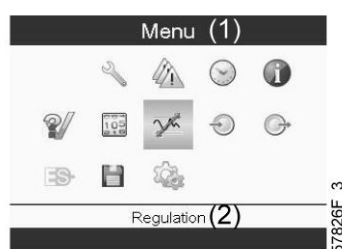
Function

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
-----	------	-----	------------

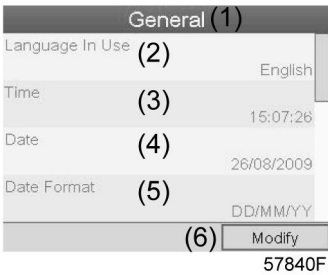
- Using the Scroll keys, move the cursor to the Settings icon (see above)
- Press the Enter key. Following screen appears:



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	(4)	Date
(2)	Language In Use	(5)	Date Format
(3)	Time	(6)	Modify

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

3.16 Info menu

Menu icon, Info



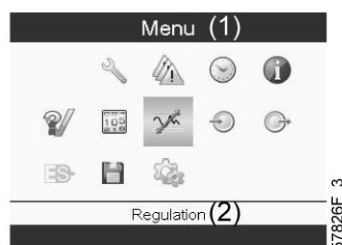
Function

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.

3.17 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.



Important remark:

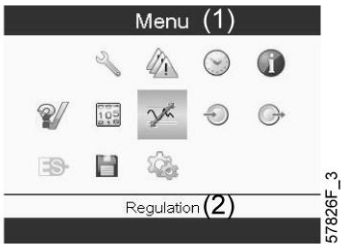
You can select different timers on one day.(up to 8 actions). It is however not possible to program 2 actions at the same time. The solution: leave at least 1 minute in between 2 actions.

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

Procedure

Starting from the [Main screen](#),

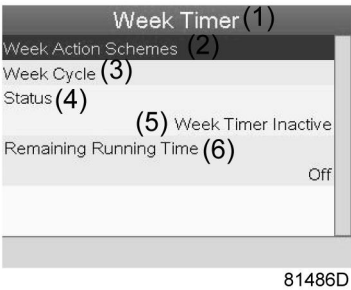
- Move the cursor to the action button Menu and press the Enter key. Use the Scroll buttons to select the Timer icon.



Text on image

(1)	Menu	(2)	Regulation
-----	------	-----	------------

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



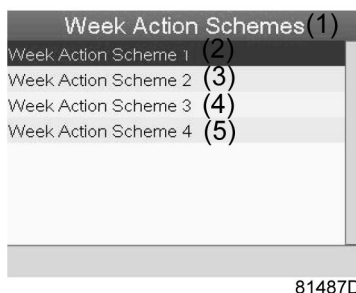
Text on image

(1)	Week Timer	(4)	Status
(2)	Week Action Schemes	(5)	Week Timer Inactive
(3)	Week Cycle	(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

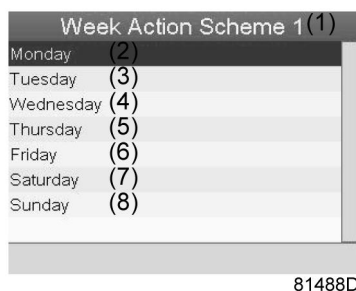
- Select Week action schemes and press Enter. A new window opens. The first item in the list is highlighted in red. Press the Enter key on the controller to modify Week Action Scheme 1.



Text on image

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

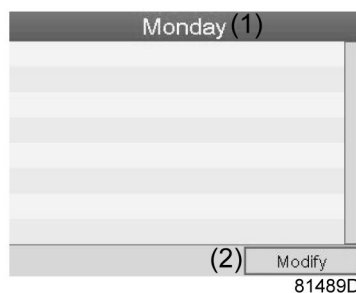
- A weekly list is shown. Monday is automatically selected and highlighted in red. Press the Enter key on the controller to set an action for this day.



Text on image

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

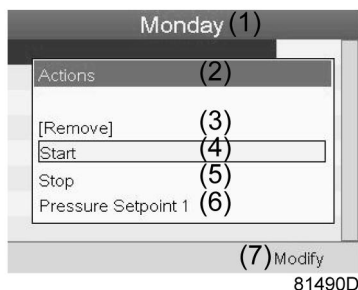
- A new window opens. The Modify action button is selected. Press the enter button on the controller to create an action.



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

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



Text on image

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

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



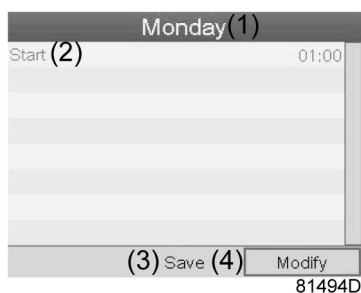
- A new pop up window opens. Use the ↑ or ↓ key of Scroll keys to modify the values of the hours. Use the ← or → Scroll keys to go to the minutes.



Text on image

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

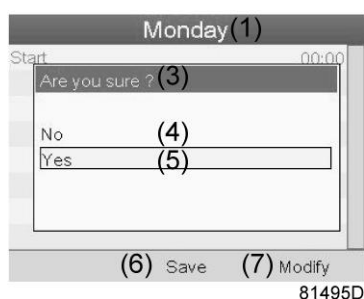
- Press the Escape key on the controller. The action button Modify is selected. Use the Scroll keys to select the action Save.



Text on image

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

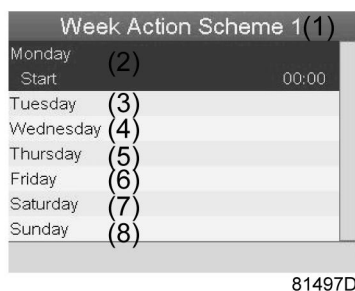


Text on image

(1)	Monday	(5)	Yes
(3)	Are you sure?	(6)	Save
(4)	No	(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	(5)	Thursday
(2)	Monday - Start	(6)	Friday
(3)	Tuesday	(7)	Saturday
(4)	Wednesday	(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.

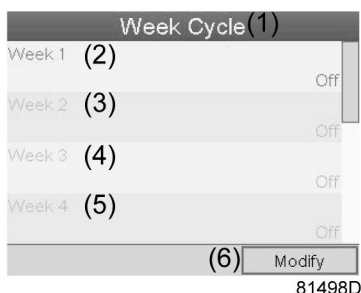
- Select Week Cycle from the main Week Timer menu list.



Text on image

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

- A list of 10 weeks is shown.

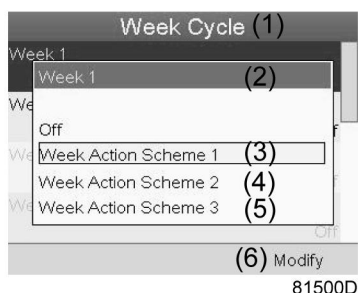


Text on image

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

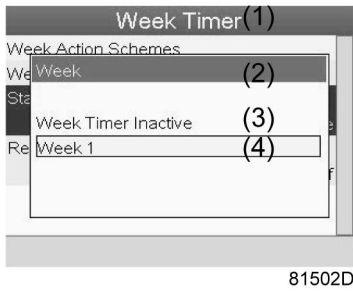
- Check the status of the Week Timer
Use the Escape key on the controller to go back to the main Week Timer menu. Select the status of the Week Timer.



Text on image

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

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



Text on image

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

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



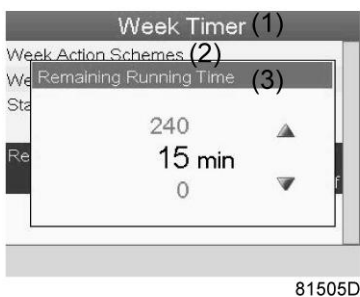
Text on image

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

- 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.



- 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.



Text on image

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

3.18 Test menu

Menu icon, Test



or



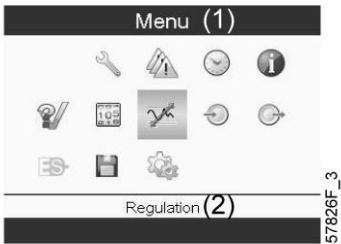
Function

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

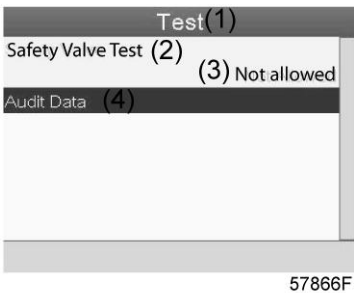
Procedure

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	(3)	Not allowed
(2)	Safety Valve Test	(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 LEDs are lit.

3.19 User password menu

Menu icon, Password



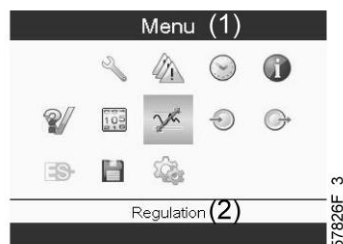
Function

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.

3.20 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).



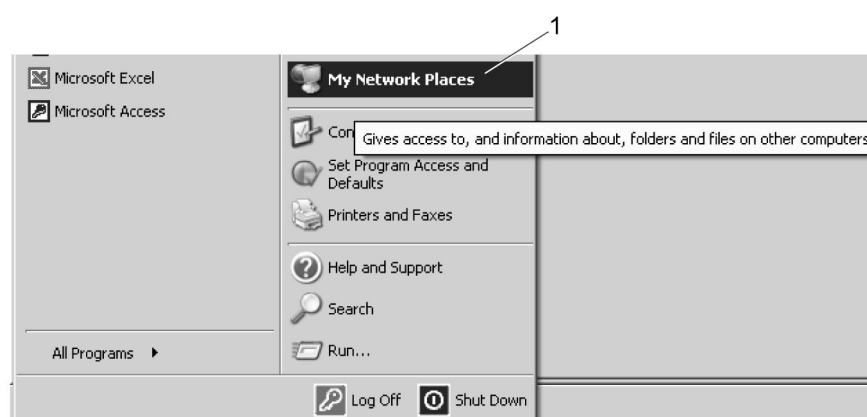
USB to LAN adapter

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



Configuration of the network card (in Windows)

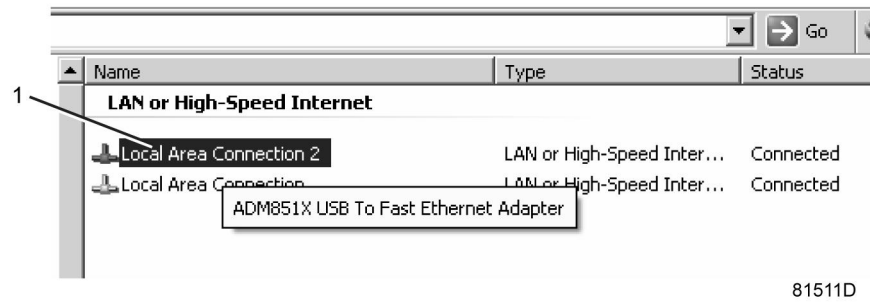
- Go to My Network places (1).



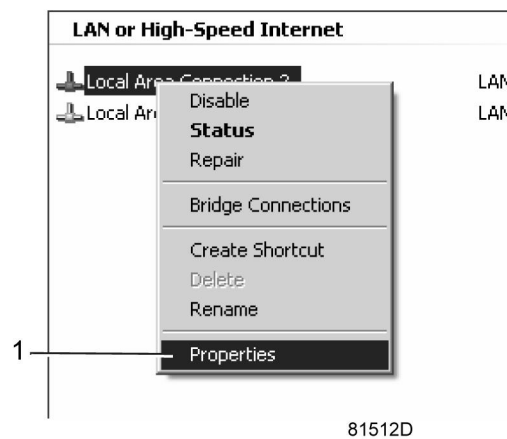
- Click on View Network connections (1).



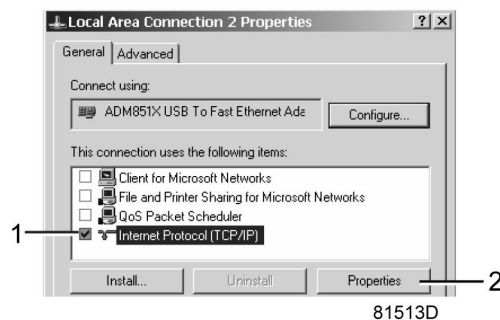
- Select the Local Area connection (1), which is connected to the controller.



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



- 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.



- Use the following settings:
 - IP Address 192.168.100.200
 - Subnetmask 255.255.255.0
- Click OK and close network connections.

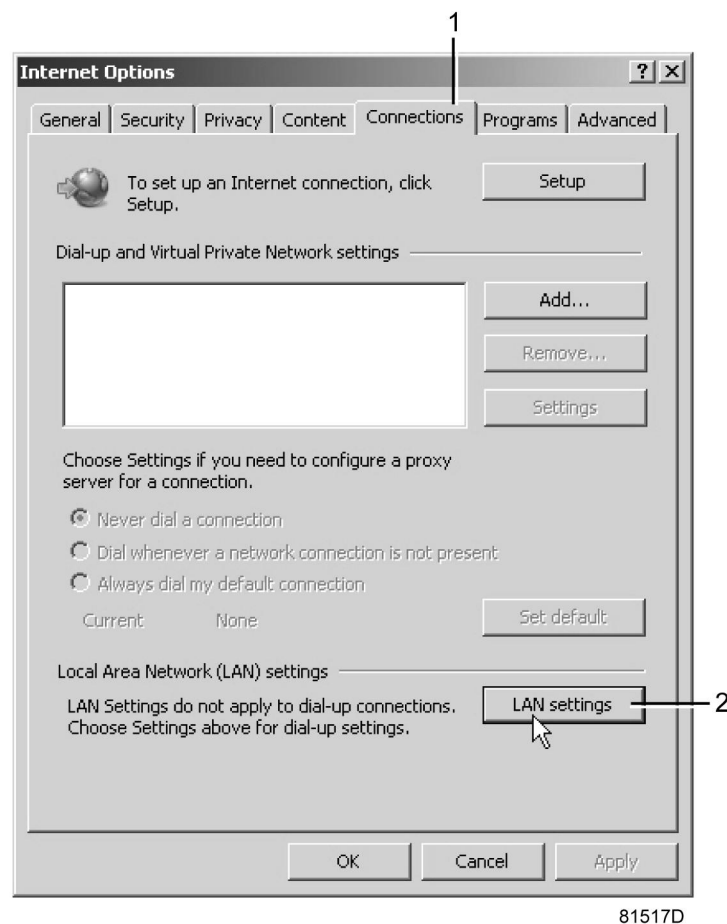
Configuration of the web server

Configure the web interface (for Internet Explorer)

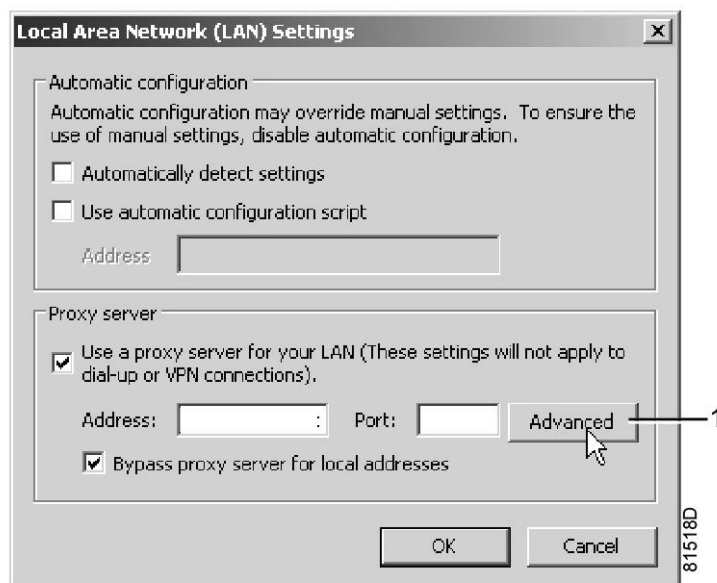
- Open Internet Explorer and click on Tools - Internet options (2).



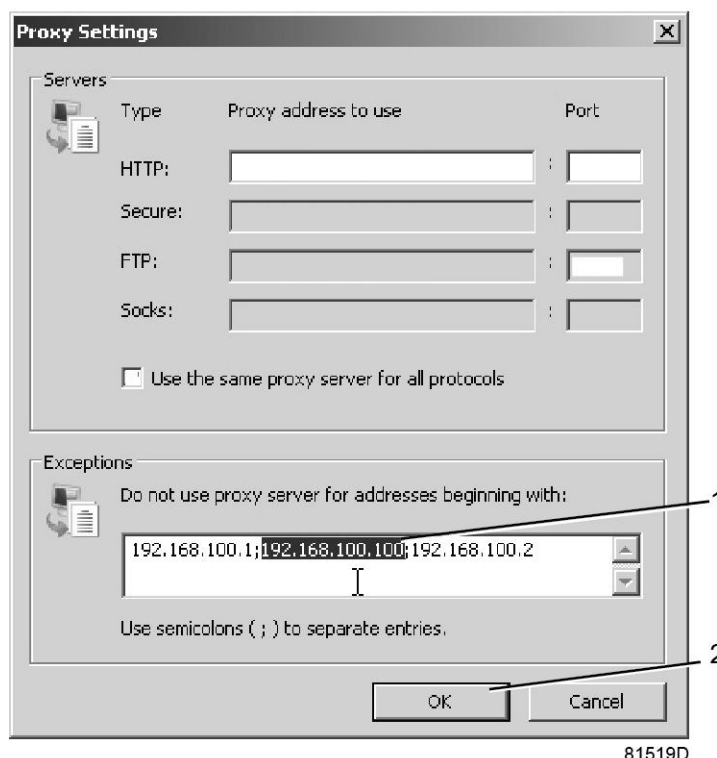
- Click on the Connections tab (1) and then click on the LAN settings button (2).



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



- 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.



Viewing the controller data



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:



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.



81521D

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.

☒ 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.

☒ 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.

Info
Machine Status Shutdown

84011D

Digital inputs

Lists all Digital inputs and their status.

☒ 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.

☒ 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.

☒ 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.

☒ Service Plan	Service Plan	Level
	500	A
	2190	A
	2500	B
	8760	B
	5000	C
	17520	C
	5000	D
	17520	D
	10000	E
	35040	E
	10000	F
	35040	F

84015D

3.21 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

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	480	480
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 shutdown level	°C	0	45	45
Ambient temperature shutdown 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)).

4 Installation

4.1 Dimension drawings

The dimension drawings can be found in the technical documentation, supplied with the compressor.

Model	Dimension drawing number
SPR 2-8 FM EP metric	9820 6376 02-03
SPR 2-8 FM EP imperial	9820 6376 02-06
SPR 2-8 T FM EP metric	9820 6376 03-03
SPR 2-8 T FM EP imperial	9820 6376 03-06
SPR 2-8 TM EP metric	9820 6376 04-03
SPR 2-8 TM EP imperial	9820 6376 04-06
SPR 2-8 T TM EP metric	9820 6376 05-03
SPR 2-8 _T 30 l EP metric	9820 6376 06-03
SPR 2-8 _T 30 l EP imperial	9820 6376 06-06

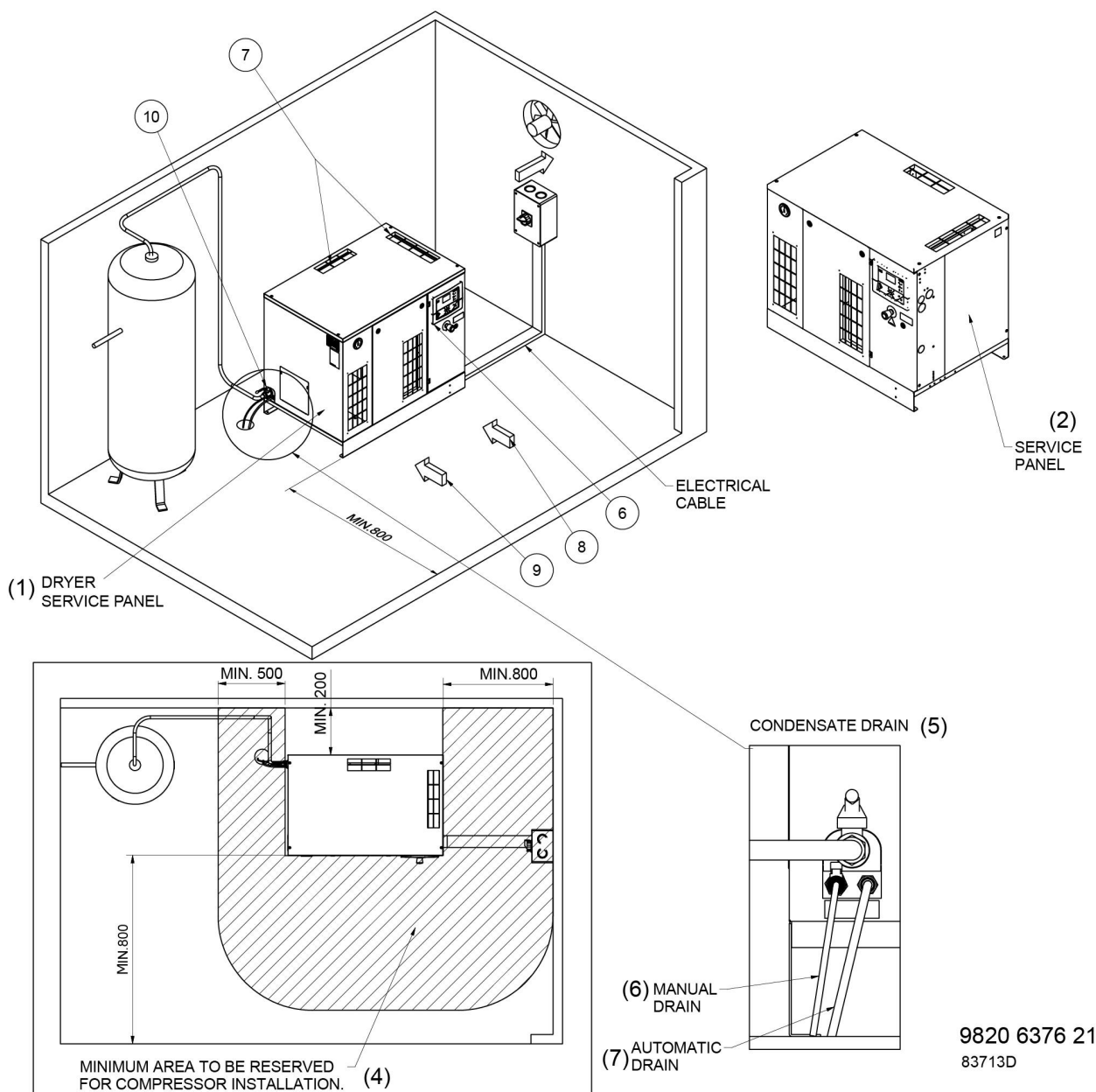
Legend

FM	Floor-mounted	TM	On air receiver
30 l	With integrated 30 l air receiver	EP	Electro-pneumatic control

Hereby a list of commonly used terms with their translation:

Text on drawings	Translation or Explanation
COOLING AIR OUTLET	Cooling air outlet
COMPRESSED AIR OUTLET	Compressed air outlet
COOLING AIR INLET	Cooling air inlet
POWER SUPPLY CABLE	Power supply cable
DRYER MANUAL DRAIN	Manual drain valve of the dryer
AUTOMATIC DRAIN	Automatic drain outlet
CENTER OF GRAVITY	Location of center of gravity
DRYER SERVICE PANEL	Service panel for the dryer
DOOR FULLY OPEN	Dimensions with fully open door
COOLING AIR INLET OF DRYER	Cooling air inlet for the dryer
ANCHOR POINTS	Location of anchoring points
AIR RECEIVER MANUAL DRAIN	Manual drain of the air receiver
THE DIMENSIONS FOR 500 L VESSEL...	Dimensions of the 500 l vessel are indicated between () where they are different from the dimensions of the 270 l vessel.
THE DIMENSIONS FOR FULL-FEATURE UNIT...	Dimensions of the Full-Feature units are indicated between ()

4.2 Installation proposal



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

Recommendations

1. Install the compressor on a level horizontal industrial floor, suitable for taking the weight of the compressor. The compressor unit must be installed on a level floor.
It is mandatory to remove the shipment pallet to install the compressor correctly.
The location must be frost-free and preferably low dust location.

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

$$\Delta p = (L \times 450 \times Q_c^{1.85}) / (d^5 \times P)$$
, with
 d = inner diameter of the pipe in mm
 Δp = pressure drop in bar (recommended maximum: 0.1 bar (1.5 psi))
 L = length of the pipe in m
 P = absolute pressure at the compressor outlet in bar
 Q_c = free air delivery of the compressor in l/s
3. Ventilation: the inlet grids and ventilation fan should be installed in such a way that any recirculation of cooling air to the compressor is avoided. The maximum air velocity through the grids is 5 m/s (16.5 ft/s). The maximum allowable pressure drop over the cooling air ducts is 30 Pa (0.12 in wc). The maximum air temperature at the compressor intake opening is 40 °C (104 °F).

Take care that the temperature of the ambient air and the cooling air may never be lower than 0 °C (32 °F) to avoid freezing of condensate.

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

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

with

Q_v = required ventilation capacity in m³/s

N = shaft input of the compressor in kW

Δt = temperature increase in the compressor room in °C

4. Air receiver: an optional air receiver can be necessary to limit the cycle frequency. Recommended maximum is 20 starts per hour.
5. **Optional filters can be installed in the pressure line downstream the air outlet valve, e.g.:**
 - A DD⁺ filter for general purpose filtration. The filter traps solid particles down to 1 micron.
 - A PD⁺ filter for filtration down to 0.01 micron. A PD filter must always be installed downstream a DD filter.
6. Control cubicle with monitoring panel.
7. Compressor and dryer cooling air outlet
8. Compressor cooling air inlet
9. Refrigerant dryer cooling air inlet
10. Connect condensate drain outlet to a sewer. It is recommended to provide a funnel to allow visual inspection of the condensate flow. If the condensate piping has been led outside the compressor room where it may be exposed to freezing temperatures, the piping must be insulated. The condensate drain pipe from the compressor to the sewer must not dip into the water of the sewer.
11. All piping to be connected free of stress.

4.3 Electrical connections

Attention



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

Supply cable

Consult section [Cable size](#) for the section of the power supply cable.

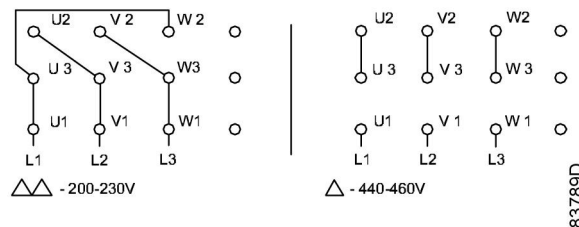
An electric cable is provided on the unit. Fit a suitable plug on the cable.

Plug in the cable.

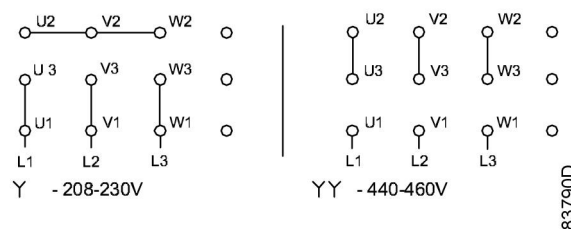
Three voltage units

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

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



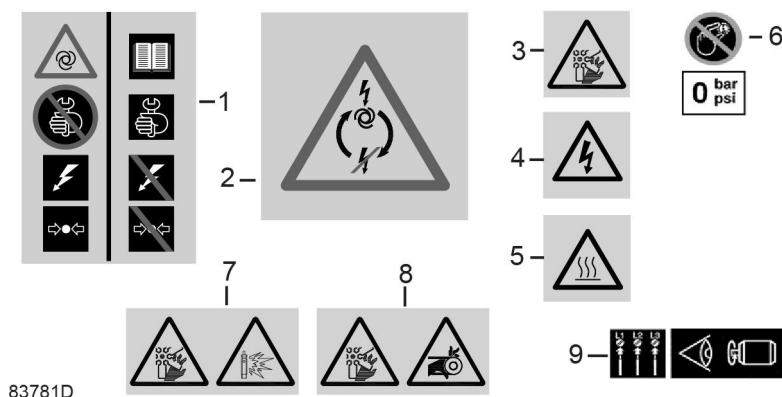
- For SPR 8:



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

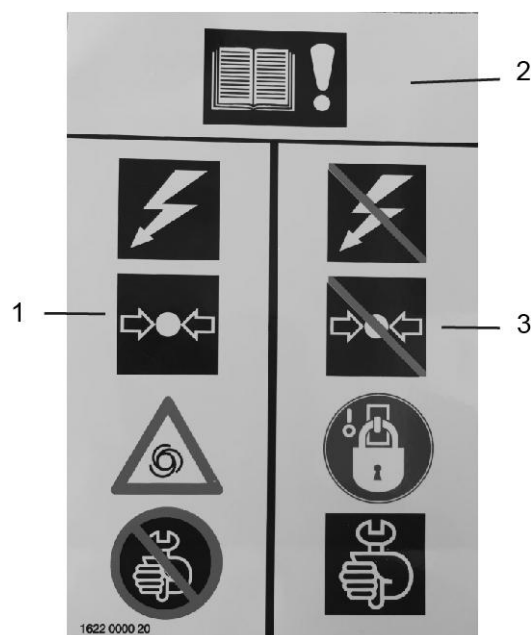
4.4 Pictographs

Pictographs



Reference	Explanation
1	Warning: the compressor starts and stops automatically. Do not perform service when pressurized and when the voltage is on. Read the instruction book, switch off the power and depressurize the compressor before maintenance or repair.
2	After power failure during automatic operation, the unit restarts automatically.
3	Warning: rotating fan
4	Warning: supply voltage
5	Warning: hot surface
6	Do not adjust the pressure switch while it is depressurized because this can damage the switch (only for compressors controlled by a pressure switch).
7	Warning: rotating fan Warning: safety valve blowing
8	Warning: rotating fan Warning: belts
9	Warning: before connecting compressor electrically, consult the instruction book for motor rotation direction.

Alternative for label 1:



Reference	Explanation
1	Do not work on the compressor when the unit is running, under pressure or in automatic operation.
2	Always read the instruction book first.
3	Switch off the voltage, release the pressure and prevent the unit is switched on inadvertently (Lock out/Tag out) before working on the equipment.

5 Operation

5.1 Initial start-up

Safety



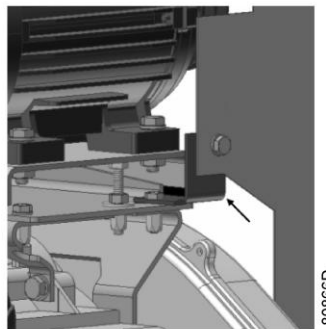
The operator must apply all relevant [Safety precautions during operation](#).



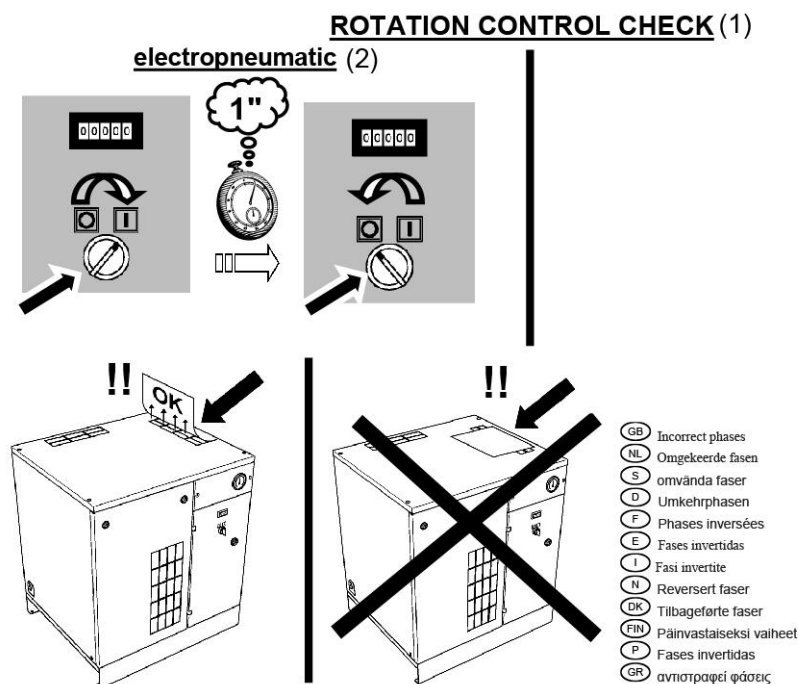
The maximum recommended motor starting frequency is starts is 20 starts per hour. In order to keep the number of starts at an acceptable level, the compressor must be connected to an air receiver with a suitable size.

Initial start-up

1. Remove the red painted transport brackets.



2. Close the air outlet valve (AV - see section [Introduction](#)).
3. Check the settings of overload relay (F21 - see section [Settings of overload relay and fuses](#)).
Check the drive motor connections. Connect the compressor to the electricity net.
4. Close the condensate drain valve(s). See sections [Introduction](#) and [Flow diagram](#) for their location.
5. Start the compressor and stop it immediately by means of switch Q1 (see section [Introduction](#)).
On 3-phase units, check the rotation direction of drive motor. For this purpose, a sheet with start-up instructions is fitted to the outlet grating. When the rotation direction is correct, the paper will be blown upwards. If the direction is wrong, stop the compressor immediately and reverse two incoming electric lines.



(1)	Rotation control check
(2)	Electropneumatic controlled compressors

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

5.2 Starting

Control panel



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

For the optional Airlogic controller, see section [Control panel](#).

Procedure

1. Close the manual condensate drain valve(s) if present.
2. Open the air outlet valve (AV).
- 3.
4. On compressors equipped with an optional controller, press the start button on the controller.

5. The motor starts and stops automatically depending on the air pressure.
6. On compressors equipped with a refrigerant dryer, the dew point of the refrigerant dryer will be reached after a few minutes.

5.3 During operation

Procedure

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



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](#).

5.4 Stopping

Control panel



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

For the optional Airlogic controller, see section [Control panel](#).

Procedure

1. On compressors equipped with an optional controller, press the stop button on the controller.
2. Switch off the voltage.
3. Close air outlet valve (AV - see section Introduction).



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

5.5 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.
On compressors with refrigerant dryer and on compressors with an air receiver, open the manual drain valve(s) (Dm / Dm1).
4. If provided, shut off and depressurize the part of the air net which is connected to the outlet valve. Disconnect the compressor from the air net.
5. If provided, disconnect the compressor condensate piping from the local condensate drain system.
6. Before moving the unit, reinstall the red transport brackets.

6 Preventive maintenance

6.1 Preventive maintenance schedule



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

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

The operator must apply all relevant [Safety precautions during maintenance or repair](#).

Warranty - Product Liability

Use only authorized parts.

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

General

When servicing, replace all removed gaskets, O-rings and washers. Clean parts when reused.

Intervals

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



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

Preventive maintenance schedule

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

Period (note 1)	Running hours (note 1)	Operation
Every 6 months	--	- Manually operate the safety valve. - Check for any damaged wiring or loose connections. - Check for air leaks.
Every 6 months (note 2)	--	Compressors with integrated dryer: - If dirty, brush or blow off the finned surface of the dryer's condenser. - Inspect and clean the electronic drain: - Functioning of the drain can be checked by pushing the TEST button of the drain. - Cleaning of the drain filter can be done by opening the manual drain valve during a few seconds.
Yearly	2500	- Replace the air inlet filter(s) (AF) and the prefilter mats on the cooling air intake openings (if fitted) (note 2). - Test the safety valve. - Have temperature protection and motor overload tested. - Check tension and condition of the V-belt(s).
Every 2 years	5000	- Replace the V-belt(s). - Replace check valve.
Every 2 years	5000	8 bar and 116 psi compressors: Have the orbiting scroll bearing greased (see note 3).
Every 2 years	5000	10 bar and 145 psi compressors: - Replace the element outlet pipe and the plastic insert (only on SPR 2, SPR 3 and SPR 5). See section Outlet pipe replacement. Note: From S/N API 744 000 onwards, a new version of compressor element is used on SPR 5. This new element no longer has a plastic insert in the outlet pipe and preventive replacement is no longer required. - Clean fan (FN1 - see Flow diagram), fan duct and element cooling fins (see note 2). - Clean the motor fan grid. - Have orbiting scroll bearing and pin crank bearings greased (see note 3). - Replace tip seals and dust seal (see also note 4).
Every 4 years	10000	8 bar and 116 psi compressors: - Replace the element outlet pipe and the plastic insert (only on SPR 2, SPR 3 and SPR 5). See section Outlet pipe replacement. Note: From S/N API 744 000 onwards, a new version of compressor element is used on SPR 5. This new element no longer has a plastic insert in the outlet pipe and preventive replacement is no longer required. - Clean fan (FN1 - see Flow diagram), fan duct and element cooling fins (see note 2). - Have orbiting scroll bearing and pin crank bearings greased (see note 3). - Replace tip seals and dust seal (see also note 4).

Notes:

- Maintenance must be done according to the number of running hours or according to the running period, whichever comes first.
- More frequently in a dusty environment.
- Important note:** Greasing of the bearings of the compressor element must be done with **special grease**, a **special grease gun**, and according to a **specific procedure**.

In high ambient conditions, the bearings must be greased more frequently: for every 5 °C (9 °F) increase above 30 °C (86 °F), the maintenance interval should be reduced with 30 %.

Contact your supplier for details.

4. In extremely dry conditions (relative humidity below 15 %), the tip seals and dust seals need to be replaced more frequently.

6.2 Service kits

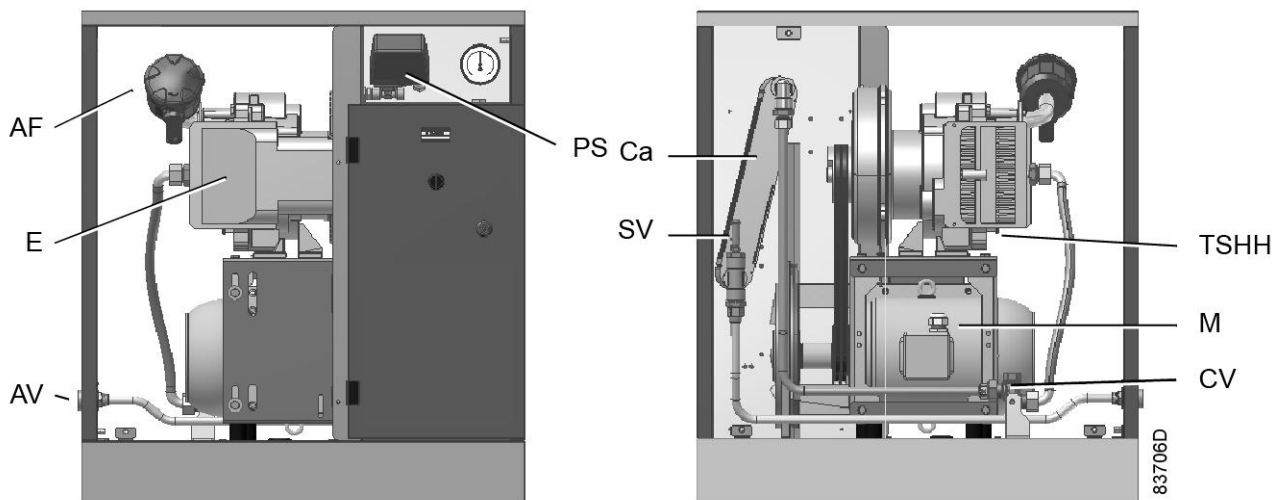
Service kits

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.

7 Adjustments and servicing procedures

7.1 Air filter



Location of the air filter (AF)

Procedure

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

SPR 8 has 2 air filters.

7.2 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.

7.3 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.

7.4 Safety valve

Testing



Testing shall only be carried out by competent personnel

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



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

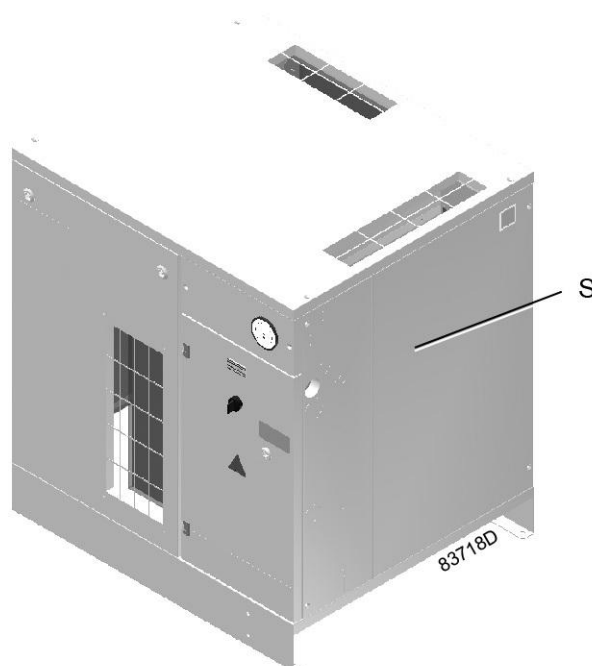
7.5 Belt replacement

Procedure

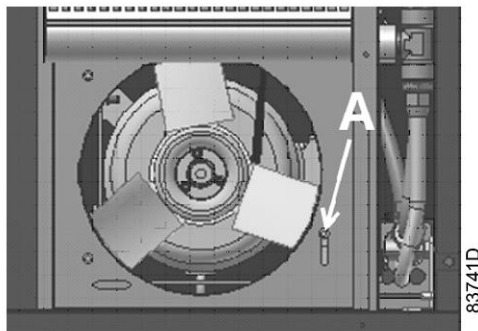


If more than one belt is used, the belts must be replaced as a set, even if only one of them seems worn.

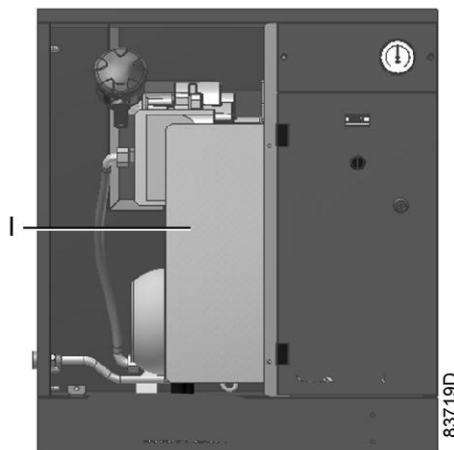
1. Remove the service panel (S).



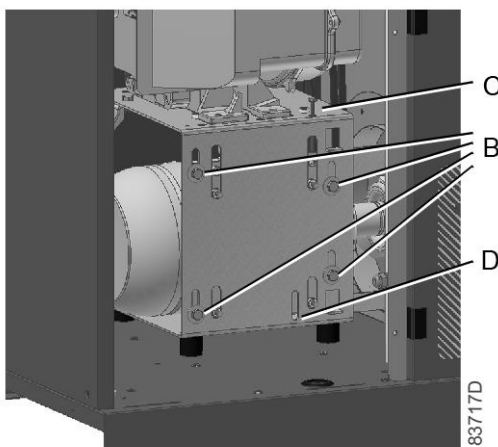
2. Loosen screw (A).



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



5. Loosen screws (B).



6. Loosen screw (C).
7. Use slot (D) to lift the motor plate.
8. Install the new belt(s) in the pulley grooves.
9. Set the tension of the belt(s) by screwing bolt (C) out. Refer to the label on the motor plate for tensioning data:
10. Tighten screws (B). Reinstall the inlet baffle.
11. Check the belt tension after the first 500 running hours.

7.6 Temperature protection

On compressors with an optional controller, the compressor element is protected by a sensor in the element outlet. The sensor is connected to the controller.

When the maximum temperature is exceeded, the compressor is stopped. It will restart automatically if the temperature drops again and if pressure is required. If this happens 4 times within a time span of 1 hour, the element will be shut down and must be reset manually.

7.7 Cleaning the compressor element

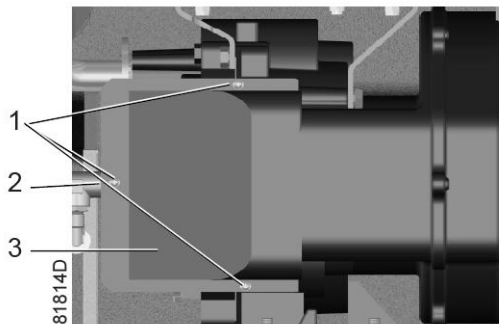


- Compressor element cooling channels can be hot when the compressor has just been turned off.
- Do not clean the cooling channels with organic solvent since this will damage the surface treatment.

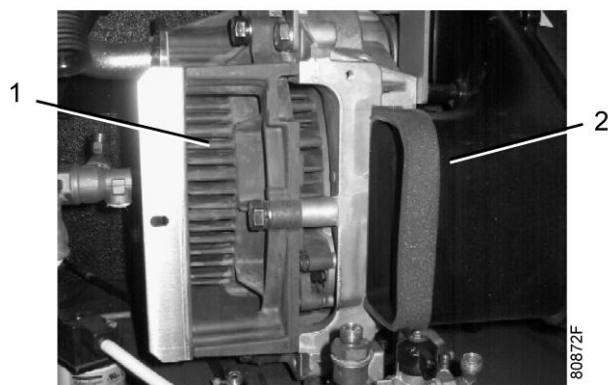
The purpose of cleaning the cooling channels of a scroll element is to prevent the cooling channels to silt up and as such reduce the cooling efficiency. A reduced cooling efficiency can lead towards a premature compressor element failure.

Procedure:

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



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



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

The unit is now again ready for use.

7.8 Replacement of the outlet pipe

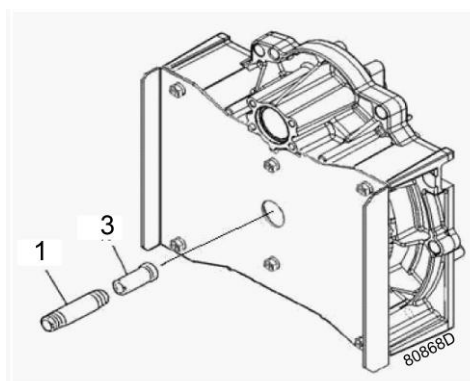
Description

The outlet pipe (1) of the 2.2 kW compressor element (used on SPR 2 and SPR 3) and of the 3.7 kW element (used on SPR 5 up to S/N API 744 000) contains a plastic insert (3).

Due to the heat of the compressed air, the plastic insert may become brittle after time. 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). Consult the Spare Parts List for part numbers.

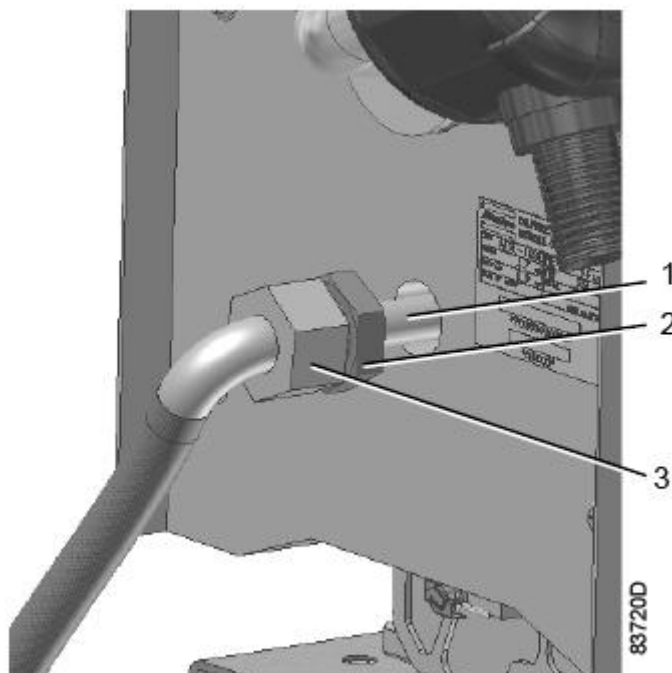
The outlet pipe set contains two parts:

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



Replacement procedure

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



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 5 Nm (3.7 lbf.ft). Maximum one extra turn (360 °) is allowed for positioning of the elbow. Do not end turning counterclockwise in order to avoid leaks. Use only PTFE tape.

Warning: If the outlet pipe is tightened too hard, the thread of the element can get damaged or the insert can break, resulting in overheating of the compressor element! The maximum torque is 40Nm (29.5 lbf.ft).

6. Fasten coupling (3) while holding nipple (2) with a wrench.

Remark:

The outlet pipe of the new version of the 3.7 kW element (used on SPR 5 from S/N API 744 000 onwards) and of the 5.5 kW element (used on SPR 8) does not contain an insert. In case of disassembly, please apply the same assembly procedure as described above. Maximum torque: 15 Nm (hand tight plus maximum 2 revolutions).

7.9 Refrigerant dryer maintenance

Safety precautions

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

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

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

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

Local legislation

Local legislation may stipulate that:

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

General

The following remarks should be kept in mind:

- Keep the dryer clean.
- Brush or blow off the finned surface of condenser regularly.
- Inspect and clean the timer drain 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.



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.

8 Problem solving



Before carrying out any maintenance or repair, perform the 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

Refrigerant dryer

For compressors with a built-in refrigerant dryer also:

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

9 Technical data

9.1 Readings on control panel



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

Pressure switch



Controller

Regularly check the controller display. Important information can be found here, like the working pressure, starting and stopping pressure, dew point, hour meter and service messages.

9.2 Electric cable size

Attention



Local regulations remain applicable if they are stricter than the values proposed below. The voltage drop must not exceed 5% of the nominal voltage. It may be necessary to use cables of a larger size than those stated to comply with this requirement.

Cable size

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

		SPR 2	SPR 3	SPR 5	SPR 8
Frequency	Voltage	Cable size	Cable size	Cable size	Cable size
60 Hz	460 V 3~	--	AWG 12	AWG 10	AWG 8

9.3 Settings for overload relay and fuses

Attention



The indicated fuse value is the maximum value with regard to the short circuit protection of the starter. The cable size used may specify fuses of a lower value.
 Fuse specifications IEC: gL/gG
 Fuse specifications CSA: HRC Form II - UL: Class 5

Settings

		SPR 2	SPR 2	SPR 3	SPR 3
Frequency	Voltage	Overload relay	Maximum fuse	Overload relay	Maximum fuse
IEC					
50 Hz	230 V 1~	12.6 A	25 A	16.4 A	20 A
	230 V 3~	--	--	9.7 A	16 A
	400 V 3~	--	--	5.6 A	10 A
	400 V + N 3~	--	--	5.6 A	10 A
UL/CUL					
60 Hz	200 V 3~	--		10.1 A	15 A*
	230 V 1~	10.6 A	15/15/20 A*	16.3 A	20 A*
	230 V 3~	--	--	9.1 A	10/15 A*
	460 V 3~	--	--	4.6 A	6/8 A*

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

		SPR 5	SPR 5	SPR 8	SPR 8
Frequency	Voltage	Overload relay	Maximum fuse	Overload relay	Maximum fuse
IEC					
50 Hz	200 V 3~	17.3 A	20 A	25.7 A	32 A
50 Hz	230 V 3~	15.7 A	20 A	23.3 A	25 A
50 Hz	400 V 3~	9.1 A	10 A	13.4 A	16 A
50 Hz	400 V + N 3~	9.1 A	10 A	13.4 A	16 A
UL/CUL					
60 Hz	200 V 3~	17.3 A	20 A*	25.2 A	30 A*
60 Hz	208 V	--	--	25 A	25/30 A*
60 Hz	230 V 3~	15.9 A	20 A*	24 A	25/30 A*

		SPR 5	SPR 5	SPR 8	SPR 8
Frequency	Voltage	Overload relay	Maximum fuse	Overload relay	Maximum fuse
60 Hz	460 V 3~	8 A	10 A*	12 A	15 A*

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

9.4 Temperature protection and safety valve settings

Safety valve (SV)

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

9.5 Reference conditions and limitations

Reference conditions

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

Limits

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

9.6 Compressor data



All data specified below apply under reference conditions, see section [Reference conditions and limitations](#).

Compressor type		SPR 2	SPR 2	SPR 3	SPR 3
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Maximum working pressure (Pack)	bar(e)	8	10	8	10
Maximum working pressure (Pack)	psi(g)	116	145	116	145
Maximum working pressure (Full-Feature)	bar(e)	7.75	9.75	7.75	9.75
Maximum working pressure (Full-Feature)	psi(g)	112	141	112	141
Reference working pressure	bar(e)	7	10	7	10
Reference working pressure	psi(g)	100	145	100	145
Air temperature at outlet valve (SPR), approx.	°C	25	25	25	25
Air temperature at outlet valve (SPR), approx.	°F	77	77	77	77
Air temperature at outlet valve (SPR T), approx.	°C	20	20	20	20
Air temperature at outlet valve (SPR T), approx.	°F	68	68	68	68
Motor shaft speed (50 Hz)	r/min	1445	1445	2885	2885
Motor shaft speed (60 Hz)	r/min	1740	1740	3520	3520
Nominal motor power	kW	1.5	1.5	2.2	2.2
Nominal motor power	hp	2	2	3	3
Sound pressure level	dB(A)	52	52	56	56
Refrigerant type (Full-Feature)		R513a	R513a	R513a	R513a
Dew point (refrigerant dryer)	°C	2	2	4	4
Dew point (refrigerant dryer)	°F	36	36	39	39

Compressor type		SPR 5	SPR 5	SPR 8	SPR 8
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Maximum working pressure (Pack)	bar(e)	8	10	8	10
Maximum working pressure (Pack)	psi(g)	116	145	116	145
Maximum working pressure (Full-Feature)	bar(e)	7.75	9.75	7.75	9.75
Maximum working pressure (Full-Feature)	psi(g)	112	141	112	141
Reference working pressure	bar(e)	7	10	7	10
Reference working pressure	psi(g)	100	145	100	145
Air temperature at outlet valve (SPR), approx.	°C	32	32	35	35
Air temperature at outlet valve (SPR), approx.	°F	90	90	95	95
Air temperature at outlet valve (SPR T), approx.	°C	21	21	22	22
Air temperature at outlet valve (SPR T), approx.	°F	70	70	72	72
Motor shaft speed (50 Hz)	r/min	2900	2900	2905	2905
Motor shaft speed (60 Hz)	r/min	3510	3510	3515	3515
Nominal motor power	kW	3.7	3.7	5.5	5.5

Compressor type		SPR 5	SPR 5	SPR 8	SPR 8
		8 bar 116 psi	10 bar 145 psi	8 bar 116 psi	10 bar 145 psi
Nominal motor power	hp	5	5	7.5	7.5
Sound pressure level	dB(A)	58	58	59	59
Refrigerant type (Full-Feature)		R513a	R513a	R513a	R513a
Dew point (refrigerant dryer)	°C	3	3	3	3
Dew point (refrigerant dryer)	°F	37	37	37	37

10 Instructions for use

Air receiver

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

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

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

11 Guidelines for inspection

Guidelines

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

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

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

12 Pressure equipment directives

Components subject to Pressure Equipment Directive 2014/68/EU

Components subject to 2014/68/EU Pressure Equipment Directive greater than or equal to category II

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

Overall rating

The compressors conform to PED smaller than category I.

13 Declaration of conformity



1

EU DECLARATION OF CONFORMITY

2 We, (1) declare under our sole responsibility, that the product
 3 Machine name :
 4 Machine type :
 5 Serial number :

6 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.

7

	Directive on the approximation of laws of the Member States relating to	Harmonized and/or Technical Standards used	Att' mnt
a.	(2)	(3)	
b.			X
c.			
d.			X
e.			
f.			
g.			X

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

8.b <1> 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
11	Issued by	Manufacturing
12	Engineering	
13	Name	
14	Signature	
15	Date	
16	Place	
17		

00500

Typical example of a Declaration of Conformity document

(1): Contact address:

International Compressor Distribution NV
 Boomsesteenweg 957
 B-2610 Wilrijk (Antwerp)
 Belgium

(2): Applicable directives

(3): Standards used

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.

