Quincy

Industrial piston compressors

QB 10-580, QB 15-580, QB 20-580, QB 25-580, QB 30-580, QB 40-580, QB 15-363, QB 15-363, QB 20-363, QB 25-363

Instruction book

Quincy COMPRESSOR

Quincy

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QB 10-580, QB 15-580, QB 20-580, QB 25-580, QB 30-580, QB 40-580, QB 15-363, QB 15-363, QB 20-363, QB 25-363

Instruction book

Original instructions

June 2023

No. 2920 7218 11

www.quincycompressor.com

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1 Safety precautions

1.1 Safety icons

Danger: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Notice: Indicates a potential situation which, if not avoided, might result in property damage or in an undesirable result or state.

Note: Indicates important information.

1.2 General safety precautions

- The operator must employ safe working practices and observe all related work safety requirements and regulations.
- If any of the following statements does not comply with the applicable legislation, the stricter of the two shall apply.
- Installation, operation, maintenance and repair work must only be performed by authorized, trained, specialized personnel. The personnel should apply safe working practices by use of personal protection equipment, appropriate tools and defined procedures.
- The compressor is not considered capable of producing air of breathing quality. For air of breathing quality, the compressed air must be adequately purified according to the applicable legislation and standards.
- Before any maintenance, repair work, adjustment or any other non-routine checks, switch the controller in service mode (see section *Service mode*), 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. The process of locking, tagging and trying to turn on the equipment to confirm it cannot operate is called Lock Out, Tag Out (LOTO).

  Danger: If the machine is equipped with an automatic restart after voltage failure function and if this function is active, be aware that the machine will restart automatically when the power is restored if it was running when the power was interrupted!
- 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.
- The owner is responsible for maintaining the unit in safe operating condition. Parts and accessories shall be replaced if unsuitable for safe operation.
- It is not allowed to walk or stand on the unit or on its components.
- If compressed air is used in the food industry and more specifically for direct food contact, it is recommended, for optimal safety, to use certified Class 0 compressors in combination with appropriate filtration depending on the application. Please contact your customer center for advice on specific filtration.
- The service switch should only be operated by a trained service specialist from the manufacturer.

1.3 Safety precautions during installation

Warning: 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.

- The machine must only be lifted using suitable equipment in accordance with the applicable safety regulations. Loose or pivoting parts must be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and deceleration must be kept within safe limits. Wear a safety helmet when working in the area of overhead or lifting equipment.
- The unit is designed for indoor use. If the unit is installed outdoors, special precautions must be taken. Consult your supplier.
- Place the machine where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care must be taken to minimize the entry of moisture at the air inlet.
- Any blanking flanges, plugs, caps and desiccant bags must be removed before connecting the pipes.
- Air hoses must be the correct size suitable for the working pressure. Never use frayed, damaged or worn hoses. Distribution pipes and connections must be the correct size and suitable for the working pressure.
- It is suggested to always use pipes with diameter equal to or bigger than the one used on the compressor.
- The aspirated air must be free of flammable fumes, vapors and particles, e.g. paint solvents, that can lead to internal fire or explosion.
- Arrange the air intake so that loose clothing worn by people cannot be drawn in.
- 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.
- No external force may be exerted on the air outlet valve; the connected pipe must be free of strain.
- If remote control is installed, the machine must bear a clear sign stating: “DANGER: This machine is remotely controlled and may start without warning”.

  Before any maintenance or repair, the operator has to make sure that the machine is stopped and depressurized as well as that the electrical isolating switch is locked and labelled with a temporary warning. As a further safeguard, persons switching on or off remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
- 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.
- 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.
- On machines with an automatic start/stop system or if the automatic restart after voltage failure (ARAVF) function is activated, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
- 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.

- 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.
- Piping or other parts with a temperature higher than 70˚C (158˚F) that can be touched accidentally by personnel during normal operation must be guarded or insulated.
- If the ground is not level or can be subject to variable inclination, consult the manufacturer.
- In an installation with multiple compressors, the outlet piping must be installed in such a way that condensate cannot flow back into the compressor. See section *Installation proposal*.

Note: Also consult the following safety precautions: *Safety precautions during operation* and *Safety precautions during maintenance or repair*.

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

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

1.4 Safety precautions during operation

Warning: 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.

- Never touch any piping or components of the machine during operation.
- 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.
- 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.
- Never operate the machine when there is a possibility of taking in flammable or toxic fumes, vapors or particles.
- Never operate the machine below or in excess of its limit ratings.
- 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 and eye protection when opening a door.

  On machines without bodywork, wear ear protection in the vicinity of the machine.
- People staying in environments or rooms where the sound pressure level reaches or exceeds 80 dB(A) shall wear ear protectors.
- Periodically check that:
  - All guards are in place and securely fastened
  - All hoses and/or pipes inside the machine are in good condition, secure and not rubbing
  - No leaks occur
  - All fasteners are tight
  - All electrical leads are secure and in good order
  - Safety valves and other pressure relief devices are not obstructed by dirt or paint
  - Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good repair, free of wear or abuse

- All pre-filters are not clogged

- If warm cooling air from compressors is used in air heating systems, e.g. to warm up a workroom, take precautions against air pollution and possible contamination of the breathing air.
- Do not remove any of, or tamper with, the sound-damping material.
- Never remove or tamper with the safety devices, guards or insulations fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure shall be protected by a pressure relieving device or devices as required.
- 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.

Note: Also consult the following safety precautions: *Safety precautions during operation* and *Safety precautions during maintenance or repair*.

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

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

1.5 Safety precautions during maintenance or repair

Warning: 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.

- Always use the correct safety equipment (such as safety glasses, gloves, safety shoes, etc.).
- Use only the correct tools for maintenance and repair work.
- Use only genuine spare parts for maintenance or repair. The manufacturer will disclaim all damage or injuries caused by the use of non-genuine spare parts.
- All maintenance work shall only be undertaken when the machine has cooled down.
- A warning sign bearing a legend such as "Work in progress; do not start" shall be attached to the starting equipment.
- 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.
- Close the compressor air outlet valve and depressurize the compressor before connecting or disconnecting a pipe.
- Before removing any pressurized component, effectively isolate the machine from all sources of pressure and relieve the entire system of pressure. See section *Maintenance*.
- Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapors of cleaning liquids.
- Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.
- Never weld or perform any operation involving heat near the oil system. Oil tanks must be completely purged, e.g. by steam cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels.
- Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before

sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of the oil vapor when air is admitted.

- Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
- Make sure that no tools, loose parts or rags are left in or on the machine.
- When replacing the air filter, make sure no dirt, dust, rags, tools or loose parts can fall in the air inlet.
- 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.
- 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.
- Every time the separator element is renewed, examine the discharge pipe and the inside of the oil separator vessel for carbon deposits; if excessive, the deposits should be removed.
- Protect the motor, air filter, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam cleaning.
- Make sure that all sound-damping material and vibration dampers, e.g. damping material on the bodywork and in the air inlet and outlet systems of the compressor, is in good condition. If damaged, replace it by genuine material from the manufacturer to prevent the sound pressure level from increasing.
- Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.
- **Only if applicable, the following safety precautions are stressed when handling refrigerant:**
  - Never inhale refrigerant vapors. 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.
- Protect hands to avoid injury from hot machine parts, e.g. during draining of oil.
- Be aware of eventual sharp edges on certain parts of the machine.

Note: Also consult the following safety precautions: *Safety precautions during operation* and *Safety precautions during maintenance or repair*.

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

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

1.6 Dismantling and disposal

The device must be disposed according to local regulations. The product is not designed for refurbishing after finished lifecycle.

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, etc.).
3. Have trained personnel dismantle the installation.
4. Separate the harmful from the safe components (e.g. drain oil from parts containing oil).
5. Refer to the disposal topic 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) as well as under the UKCA Waste Electrical and Electronic Equipment regulations 2013 and may not be disposed as unsorted waste.

The equipment is labelled in accordance with the European Directive 2012/19/EU and the UKCA Waste Electrical and Electronic Equipment regulations 2013 with the crossed-out wheelie 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

QB 10-40 and QB 5-25 are air-cooled, single stage, belt driven, oil lubricated piston booster compressors. The QB 10-40 is intended to compress air and nitrogen from a relative inlet pressure between 6-10 bar to an effective delivery pressure up to 25-40 bar, whereas the QB 5-25 compresses air and nitrogen from a relative inlet pressure between 2-5 bar to an effective delivery pressure up to 10-25 bar.

The **ST version** is a fully operational unit, including the electrical cubicle, mounted on a wall and the Elektronikon® Touch controller.

The **FF version** is a fully operational unit with aftercooler, including the electrical cubicle, mounted on a frame and the Elektronikon® Touch controller.

The unit is equipped with limitation control of minimum inlet pressure (2 bar).

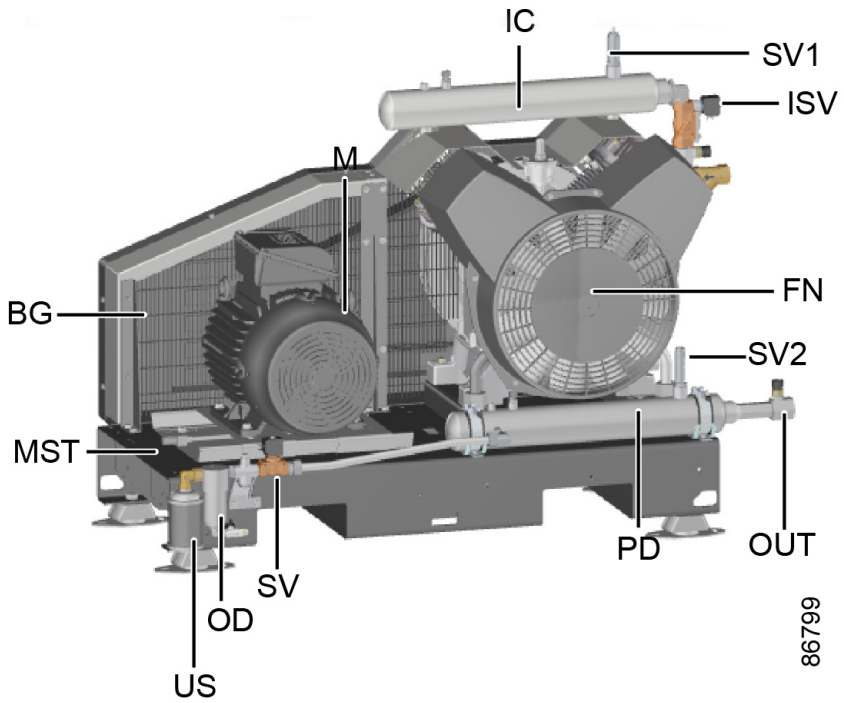


Figure 1: ST version

Reference	Name	Reference	Name
BG	Belt guard	OD	Oil filter
FN	Fan	OUT	Outlet
IC	Inlet collector	PD	Pulsation damper
ISV	Inlet solenoid valve	SV	Solenoid valve

Reference	Name	Reference	Name
M	Motor	SV1	Safety valve
MST	Motor sledge tensioner	SV2	Safety valve
		US	Silencer

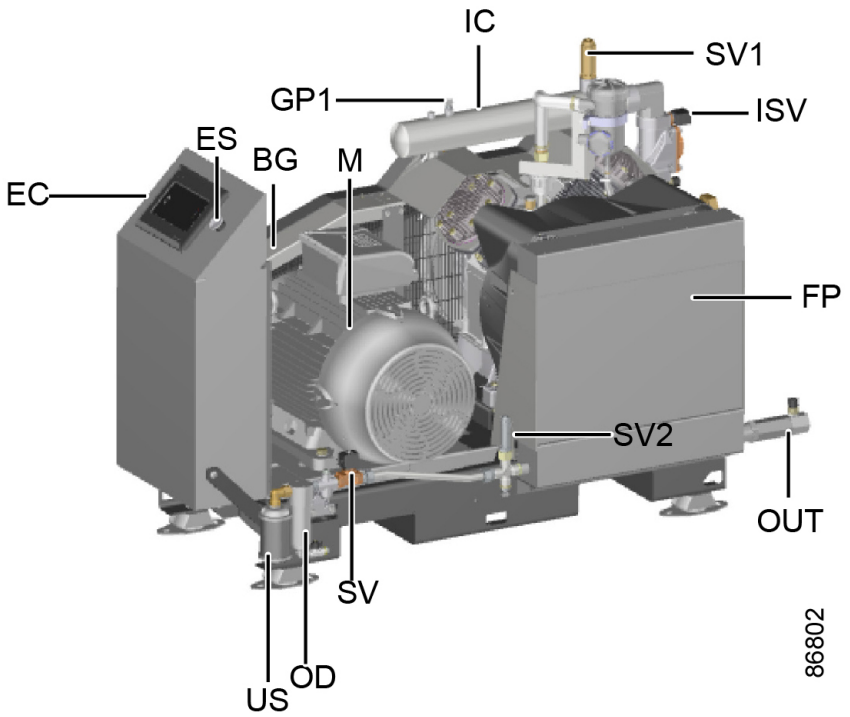


Figure 2: FF version

Reference	Name	Reference	Name
BG	Belt guard	OD	Oil filter
EC	Electronic controller	OUT	Outlet
ES	Emergency stop	PD	Pulsation damper
GP1	Temperature sensor	SV	Solenoid valve
FP	Aftercooler	SV1	Safety valve
IC	Inlet collector	SV2	Safety valve
ISV	Inlet solenoid valve	US	Silencer
M	Motor		

Compressor variants

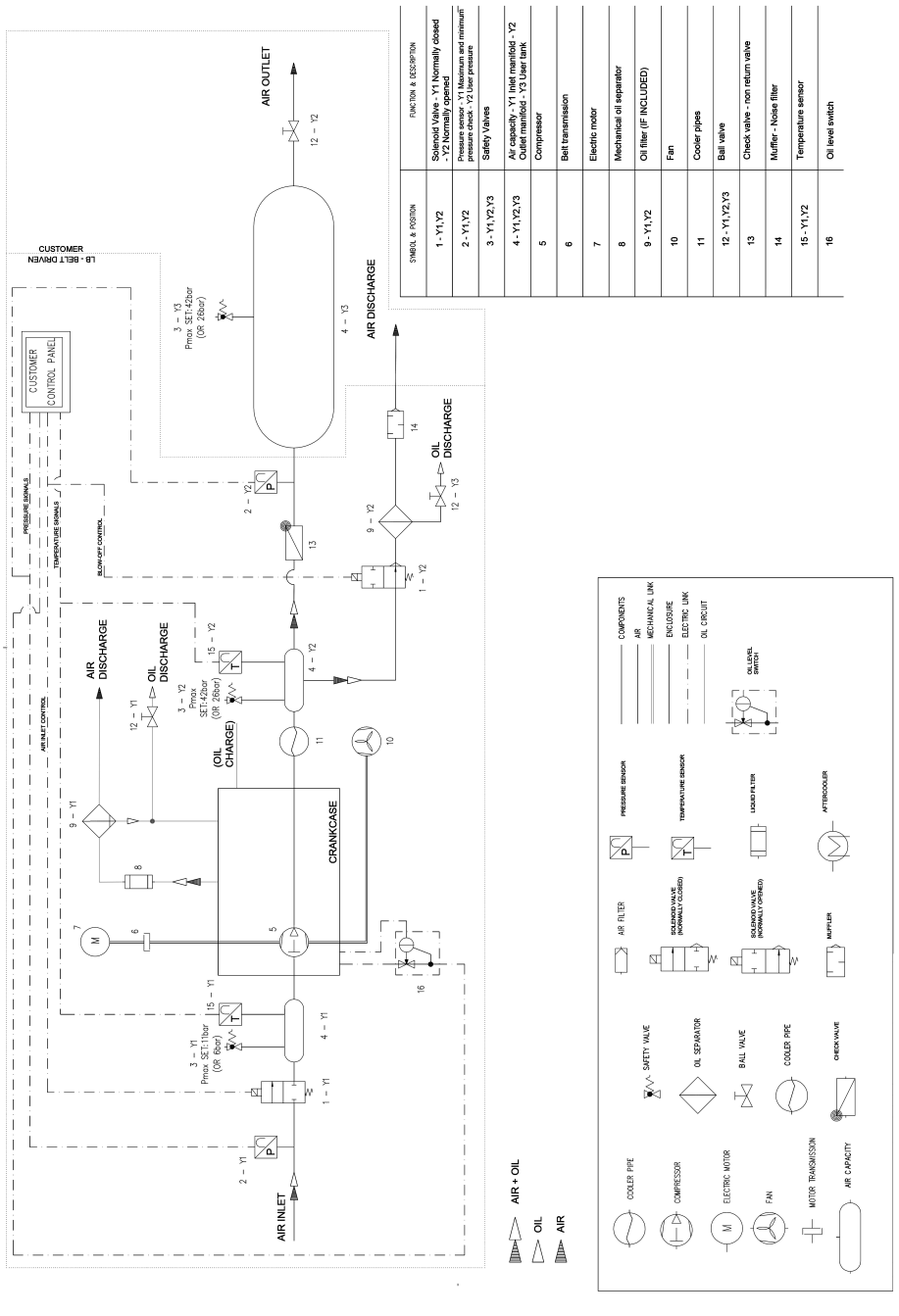
The **ST version** comprises:

- Pressure transducer (PR)
- Safety valves (SV)
- Condensate drain valve (DM)

The **FF version** comprises:

- Pressure transducer (PR)
- Safety valves (SV)
- Electronic controller (EC)
- Aftercooler (FP)

2.2 Operating principle



SYMBOL & POSITION	FUNCTION & DESCRIPTION
1 - Y1, Y2	Solenoid Valve - Y1 Normally closed - Y2 Normally opened
2 - Y1, Y2	Pressure sensor - Y1 Maximum and minimum pressure check - Y2 User pressure
3 - Y1, Y2, Y3	Safety Valves
4 - Y1, Y2, Y3	Air capacity - Y1 Inlet manifold - Y2 Outlet manifold - Y3 User tank
5	Compressor
6	Belt transmission
7	Electric motor
8	Mechanical oil separator
9 - Y1, Y2	Oil filter (IF INCLUDED)
10	Fan
11	Cooler pipes
12 - Y1, Y2, Y3	Ball valve
13	Check valve - non return valve
14	Muffler - Noise filter
15 - Y1, Y2	Temperature sensor
16	Oil level switch

86859

Figure 3: ST versions

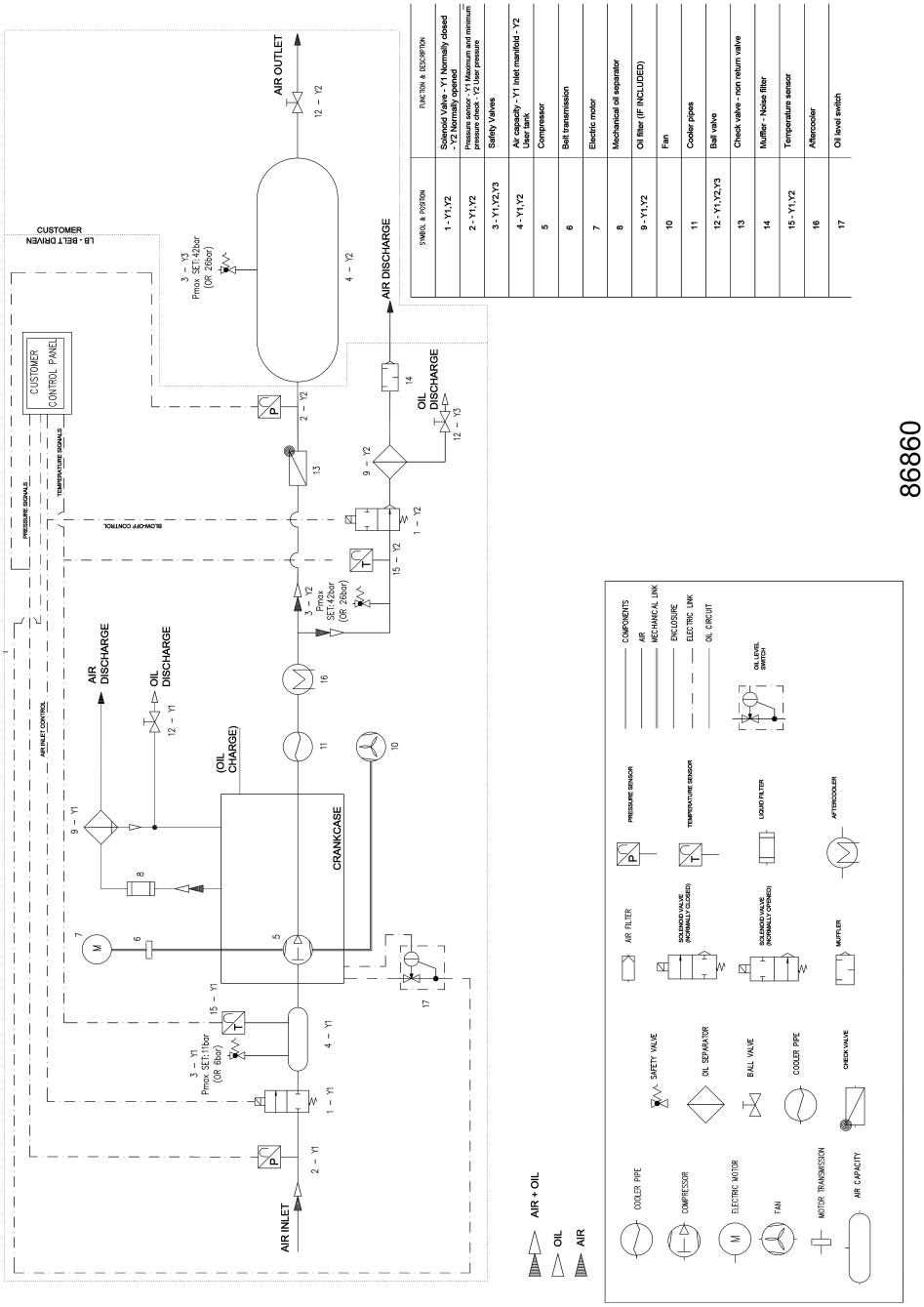


Figure 4: FF versions

Functioning mode

- At the booster outlet, a check valve ensures non-return fluid from the vessel/line.
- A pressure sensor is installed to control the cut-off and cut-in pressures.

- Booster at rest: motor off, inlet solenoid valve normally closed (NC), blow off solenoid valve normally open (NO).
- When the outlet pressure drops below the cut-in pressure, the motor is started in YD. The solenoid valve at the inlet opens and the blow off solenoid valve closes. Then the booster starts to load.
- When the outlet pressure exceeds the cut off pressure the motor stops, the inlet solenoid valve closes, the blow off solenoid valve opens to discharge the head via the silencer.
- The controller controls the cut-in and cut-off pressure via sensors and provides warnings and preventive shutdown.

2.3 Available options

The compressors can be completed with the following options. For more detailed information, contact your supplier.

- Multiple unit control system ECO6i

  Integrated central controller for a maximum of six compressors.

3 Controller

3.1 Controller functions

85199D

Figure 5: Elektronikon™ Touch controller

Introduction

The controller has the following functions:

- Controlling the unit
- Protecting the unit
- Monitoring components subject to service
- Automatic restart after voltage failure (ARAVF)

Automatic control of the unit

The controller maintains the net pressure between programmable limits by automatically loading and unloading the unit (fixed speed units) or by adapting the motor speed (units with frequency converter).

A number of programmable settings, e.g. the unloading and loading pressures (for fixed speed units), the setpoint (for units with frequency converter), the minimum stop time, the maximum number of motor starts and several other parameters are taken into account.

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

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

Shutdown

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

Example: If the outlet pressure exceeds the programmed shutdown level, the unit will be stopped. This will be indicated on the display of the controller.

The unit will also be stopped in case of overload of the drive motor or fan motor.

Warning:

Before remedying, consult the safety precautions.

Before resetting a warning or shutdown message, an authorized technician should solve the problem. If a warning or alarm persists to occur, consult your supplier. Frequently resetting these messages without remedying may damage the unit.

Shutdown warning

A shutdown warning level is a programmable level below the shutdown level.

If one of the measurements exceeds the programmed shutdown warning level, a message will appear on the display and the general alarm LED will light up to warn the operator before the shutdown level is reached.

The message disappears as soon as the warning condition disappears.

When the shutdown warning is shown, press the stop button to stop the unit and wait until the unit has stopped. Consult an authorized technician to solve the problem.

A warning will also appear if the dew point temperature is too high (on units with integrated dryer).

Service warning

A number of service operations are grouped as a Service Plan. Each Service Plan has a programmed time interval. If the service timer exceeds a programmed value, this will be indicated on the display to warn the operator to carry out the service actions belonging to that Service Plan.

When the service warning is shown, stop the unit, switch off the voltage and carry out the required service actions.

Warning: Ignoring this service warning could severely damage your machine in the long term. The supplier is not liable for failures caused by neglecting service interval timings.

Automatic restart after voltage failure (ARAVF)

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

For units leaving the factory, this function is made inactive. If desired, the function can be activated. Consult your supplier.

Warning:

If the function is activated and the controller was in the automatic operation mode before the supply voltage was interrupted, the unit will automatically restart once the supply voltage to the unit is restored. The ARAVF label shall be attached near to the controller.

3.2 Control panel

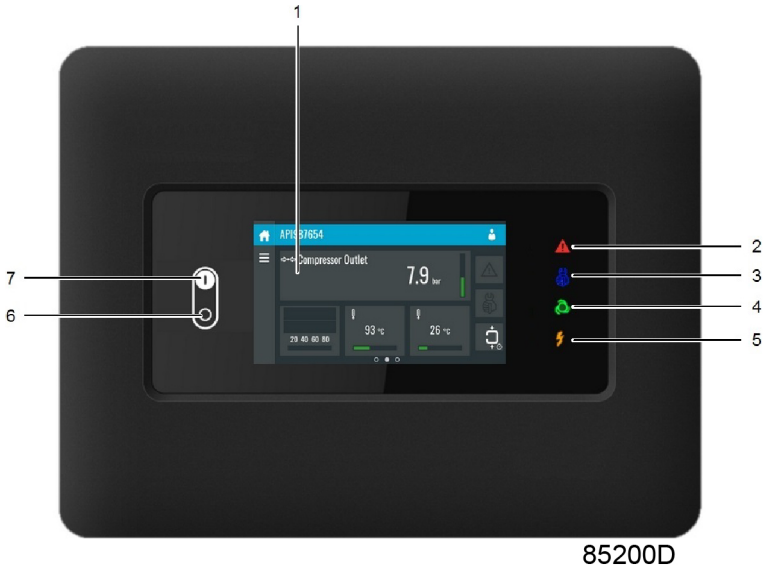


Figure 6: Control panel

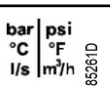
Reference	Designation	Function
1	Touch screen	Shows the operating condition of the unit and several icons to navigate through the menu. The screen can be operated by touch.
2	Warning sign	Flashes in case of a shutdown, is lit in case of a warning condition.
3	Service sign	Is lit when service is needed.
4	Operation sign	Is lit when the unit is running in automatic operation.
5	Voltage sign	Indicates that the voltage is switched on.
6	Stop button	Stops the unit.
7	Start button	Starts the unit. The operation sign lights up. The controller is operative.

3.3 Icons used

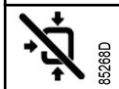
Menu icons

Menu	Icon	Menu	Icon	Menu	Icon
Data	 85233D	Status	 85239D		

Menu	Icon	Menu	Icon	Menu	Icon
		Inputs			
		Outputs			
		Counters			
		Auxiliary Equipment Parameters		Converters	
Service		Service		Overview	
				Service Plan	
				Service History	
		Service Functions			
		Clean Screen			
Week Timer				Week	
				Remaining Running Time	
Event History		Saved Data			
Machine Settings		Alarms			
		Regulation			
		Control Parameters			
		Auxiliary Equipment Parameters		Converters	
				Fan	
				Internal SmartBox	
		Auto Restart			

Menu	Icon	Menu	Icon	Menu	Icon
Controller Settings		Network Settings		Ethernet Settings	
				CAN Settings	
		Localisation		Language	
				Date/Time	
				Units	
		User Password			
		Help			
		Information			

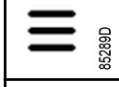
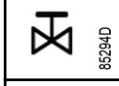
Status icons

Icon	Description
	Motor Stopped
	Motor Stopped Wait
	Running Unloaded
	Manual Unload
	Running Unloaded Wait
	Running Loaded
	Failed to Load
	Running Loaded Wait
	Manual Stop

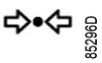
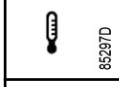
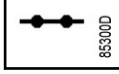
Icon	Description
	Machine Control Mode, Local
	Machine Control Mode, Remote
	Machine Control Mode, LAN
	Automatic Restart After Voltage Failure
	Week Timer Active

System icons

Icon	Description
	Basic User
	Advanced User
	Service User
	Antenna 25%
	Antenna 50%
	Antenna 75%
	Antenna 100%
	Change between screens (indication)
	Energy recovery
	Dryer
	Element
	Drain(s)

Icon	Description
	Analogue Output
	Menu
	Reset
	Auto Restart
	Filter(s)
	Cooler
	Valve(s)
	Power Meter

Input icons

Icon	Description
	Pressure
	Temperature
	Special Protection
	Open
	Closed

Note:

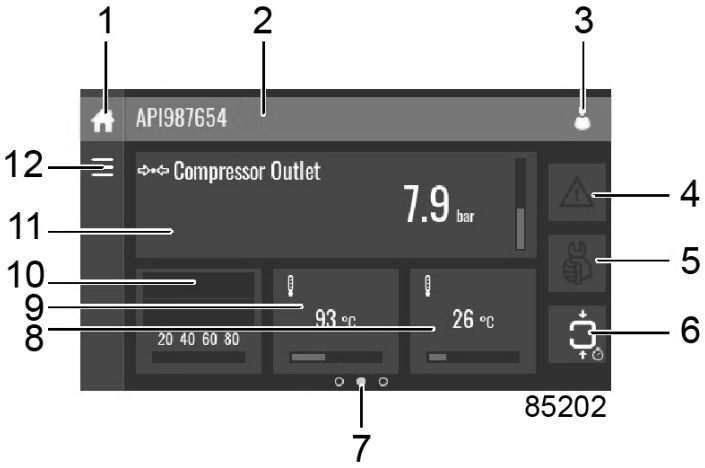
This chapter gives a general survey of available icons. Not all icons mentioned in this chapter are applicable to every machine.

3.4 Main screen

Function

The main screen is the screen that is shown automatically when the voltage is switched on. It is switched off automatically after a few minutes when there is no touch input.

Description



Reference	Designation	Function
1	Home button	The home button is always shown and can be tapped to return to the main screen.
2	Screen information	On the main screen, the screen information bar shows the serial number of the machine. When scrolling through menus, the name of the current menu is shown.
3	Access level button	The access level button is always shown and can be tapped to change the current user access level.
4	Alarm button	The alarm button can be tapped to show the current alarms. If an alarm occurs, the icon on the button will be red.
5	Service button	The service button can be tapped to show the service information.
6	Status	This icon shows the current status of the unit.
7	Page indicator	This indicates which page you are currently seeing. The middle indication is the main screen, left is the menu screen and the right the quick access screen. Swipe left or right to go to another screen.
8, 9, 10, 11	These fields can contain a certain value, depending on the type of the unit.	Tap the field to view the type of measurement. This will be shown in the screen information bar. Examples of values shown: • Temperature • Pressure • Purity level
12	Menu button	The menu button is always shown and can be tapped to go to the menu.

3.5 Quick access screen

Function

The screen is used to directly access some frequently used functions.

Procedure

The quick access screen can be viewed by swiping left, starting from the main screen.

Description

86856

Through this screen, several important settings can be viewed and modified.

Reference	Function	Description
1	Setpoints	Several setpoints can be modified by tapping this icon.
2	Control mode	The control mode can be changed by tapping this icon. • Local control via start/stop buttons • Remote control via digital input(s) • LAN control via the network. When in remote or LAN control, the start/stop buttons on the controller will not work.
3	Display language	The display language of the controller can be changed by tapping this icon.
4	Operation mode	When tapped, the operation mode can be chosen between manual and automatic. When manual mode is selected, the controller will switch to automatic mode automatically after 24 hours.
5	Week timer	Week timers can be set by tapping this icon.
6	Remaining running time	The remaining running time can be set and modified by tapping this icon.

Reference	Function	Description
7	Internal SmartBox	The reception quality of the internal antenna can be monitored. Each bar represents 25% reception strength. If the four bars are filled, the reception strength is 100%. If only one bar is filled, the reception strength is just 25%.
8	Auto Restart	Auto restart can be activated by tapping this icon.

3.6 Menu screen

Function

This screen is used to display the different menus where settings can be viewed or changed.

Procedure

The menu screen can be viewed by tapping the menu button or by swiping right, starting from the main screen.

Description

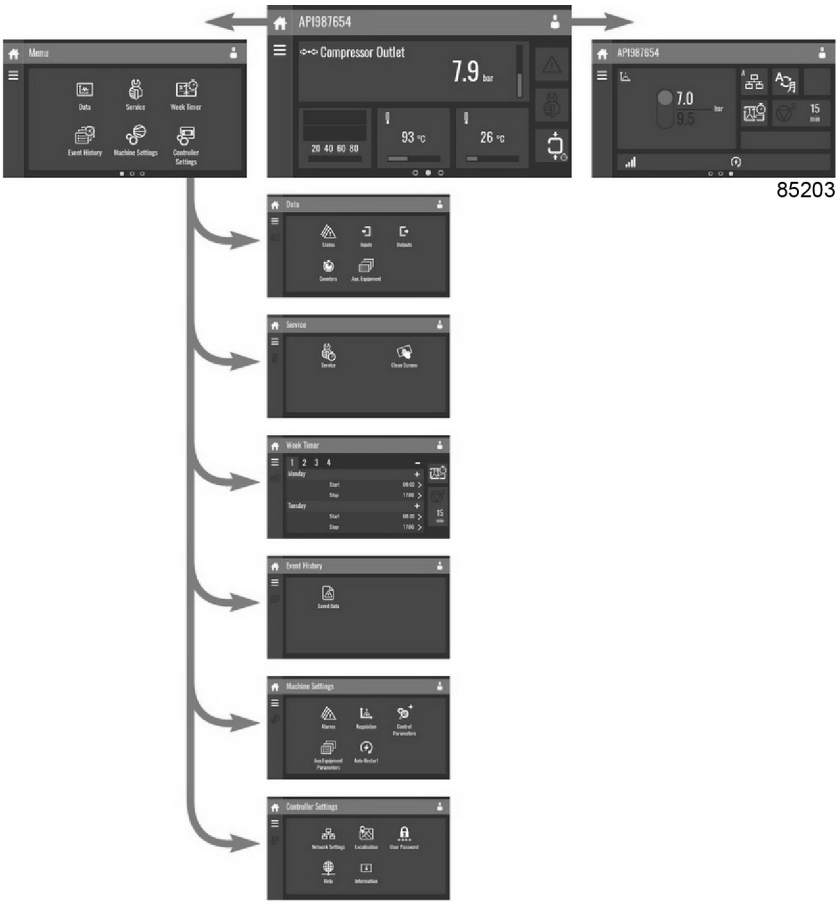
85204

Reference	Designation	Function
(1)	Data	The data menu contains the status of the unit, information about the inputs, outputs and counters. The auxiliary equipment can also be viewed through this menu.
(2)	Service	The service menu contains the service information. The "clean screen" function can be used to clean the touchscreen.
(3)	Week timer	Multiple week timers and a remaining running time can be set through this menu.
(4)	Event history	In case of an alarm, the status information of the unit is saved and can be viewed through this menu.

Reference	Designation	Function
(5)	Machine settings	Alarms settings, regulation settings and control parameters can be changed through this menu. Auxiliary equipment parameters can also be changed. The automatic restart function can be set through this menu. This function is password-protected.
(6)	Controller settings	Network settings, localisation settings and a user password can be set through this menu. There is also a help page available and the controller information can be shown.

Menu structure

Operating the controller can be done by swiping through screens and tapping icons or menu items.



This is the main structure. It can differ depending on the configuration of the unit.

3.7 Data menu

Function

This screen is used to display the following submenus:

- **Status**
- **Inputs**
- **Outputs**
- **Counters**
- **Internal Data**

These submenus can be entered by tapping the icons.

Procedure

To enter the **Data** menu screen:

1. Tap the Menu button.
2. Tap the **Data** icon.

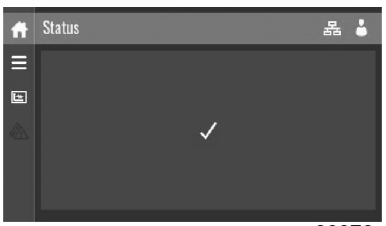
Description

86847

Reference	Designation
(1)	**Status** menu
(2)	**Inputs** menu
(3)	**Outputs** menu
(4)	**Counters** menu
(5)	**Internal Data** menu

Status menu

Tap the **Status** icon to enter the **Status** menu.



86370

This menu shows the current status of the unit.

If an alarm is active, it can be viewed by tapping the alarm message. To reset an alarm, tap the reset button.

Warning:

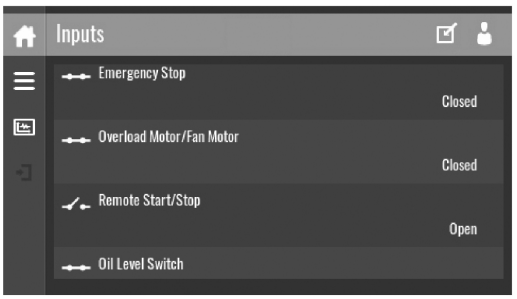
Before remedying, consult the safety precautions.

Before resetting a warning or shutdown message, an authorized technician should solve the problem. If a warning or alarm persists to occur, consult your supplier. Frequently resetting these messages without remedying may damage the unit.

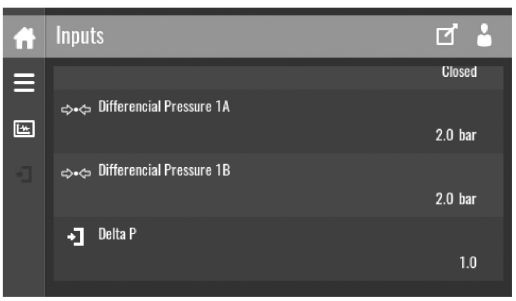
Inputs menu

Tap the **Inputs** icon to enter the **Inputs** menu.

86848



86849

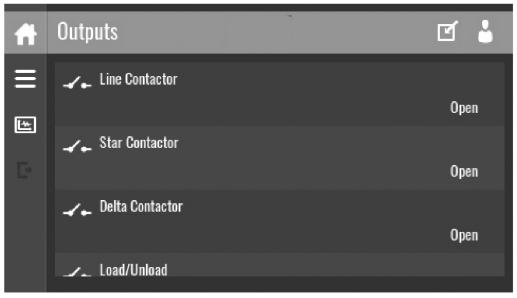


86850

This menu shows information about all the inputs.

Outputs menu

Tap the **Outputs** icon to enter the **Outputs** menu.



86851

This menu shows information about all the outputs.

Danger:

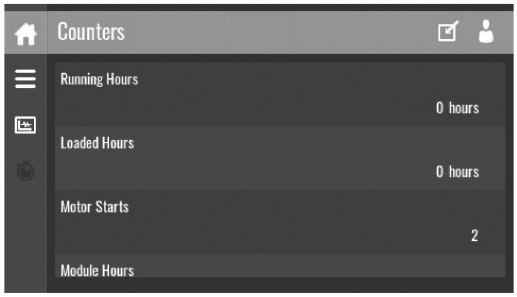
Voltage-free outputs may only be used to control or monitor functional systems. They should **NOT** be used to control, switch or interrupt safety related circuits. Check the maximum allowed load on the label.

Warning:

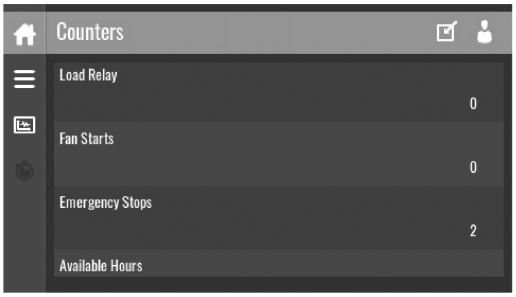
Stop the unit and switch off the supply before connecting external equipment. Consult the safety precautions.

Counters menu

Tap the **Counters** icon to enter the **Counters** menu.



86852



86853

86854

This menu shows an overview of all actual hours and counters of the unit and controller.

3.8 Service menu

Function

This screen is used to display the following submenus:

- **Service**
- **Service Functions** (visible as advanced user)
- **Clean Screen**

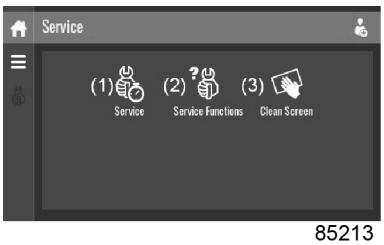
These submenus can be entered by tapping the icons.

Procedure

To enter the **Service** menu screen:

1. Tap the Menu button.
2. Tap the **Service** icon.

Description



85213

Reference	Designation
(1)	**Service**
(2)	**Service Functions** (only visible for advanced user)
(3)	**Clean Screen**

Service menu

Tap the **Service** icon to enter the **Service** menu.

85211

This menu shows the remaining **Running Hours** and the remaining **Real Time Hours** until the next service. The first row (A) shows the **Running Hours** when the first service is needed (green).

A service overview can be viewed by tapping icon (1).

86846

The service plan can be viewed by tapping icon (2). Through this menu, the service plan can be modified:

1. Tap the desired service plan. A selection screen will pop up.
2. Change the Running Hours by tapping '–' or '+'.
3. Confirm by tapping 'V' or decline by tapping 'X'.

The service history can be viewed by tapping icon (3).

When a service plan interval is reached, a message will appear on the screen. When service has been performed, the service timer can be reset by tapping the reset button (4).

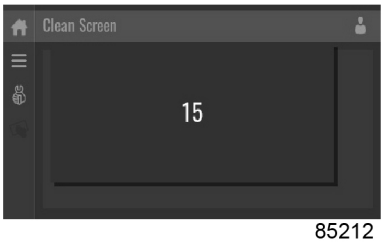
Service functions (visible for advanced user)

Tap the **Service Functions** icon to enter the **Service Functions** menu.

Depending on the machine, this menu can have a different set of functions. Many of them are password protected, as they are only accessible for authorized personnel.

Clean screen

Tap the **Clean Screen** icon to start the 15 seconds countdown to perform cleaning of the touch screen.



85212

The touch screen and the start and stop button become inactive for 15 seconds.

3.9 Week timer menu

Function

This screen is used to set up to 4 different timers with each up to 8 settings per day.

The week timers can be activated through this screen.

A **Remaining Running Time** can be set from 5 up to 240 minutes.

Procedure

To enter the **Week Timer** menu screen:

1. Tap the Menu button.
2. Tap the **Week Timer** icon.

Description

86861

Reference	Designation	Function
(1)	Add or select week	If less than 4 weeks are programmed, tap the '+' button to add a week.
(2)	Remove week	Tap to remove a programmed week timer.
(3)	Activate week timer	A selection screen pops up. The user can choose the correct week by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.
(4)	Remaining running time	A selection screen pops up. The user can change the remaining time by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.
(5)	Add setting	A selection screen pops up. The user can change the setting by swiping up or down and confirm by tapping 'V' or decline by tapping 'X'.

3.10 Event history menu

Function

This screen is used to display the saved data in case of an alarm.

These submenus can be entered by tapping the icons.

Procedure

To enter the **Event History** menu screen:

1. Tap the Menu button.
2. Tap the **Event History** icon.

Description

85216

Reference	Designation
(1)	Saved Data

Saved data

Tap the **Saved Data** icon to enter the **Saved Data** menu.

Scroll through the items by swiping up and down in this list. The event date and time is shown at the right side of the screen.

Press on one of the items in the list for more information regarding the status of the unit when the shutdown occurred.

3.11 Machine settings menu

Function

This screen is used to display the following submenus:

- **Alarms**
- **Regulation**
- **Control Parameters**

  Only visible if the machine has adaptable parameters.
- **Aux. Equipment Parameters**
- **Auto Restart**

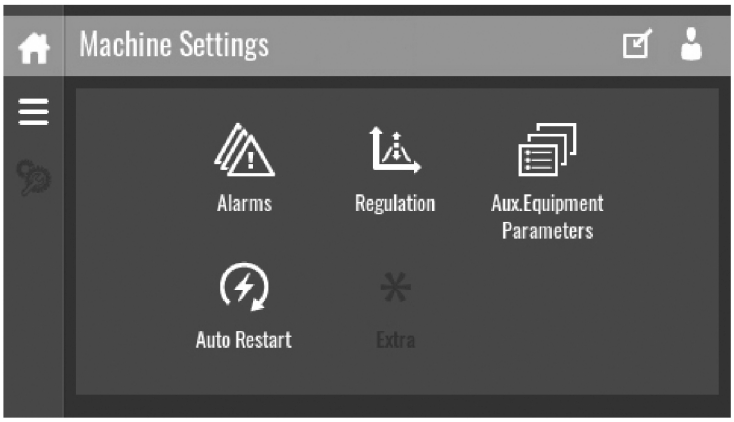
These submenus can be entered by tapping the icons.

Procedure

To enter the **Machine Settings** menu screen:

1. Tap the Menu button.
2. Tap the **Machine Settings** icon.

Description

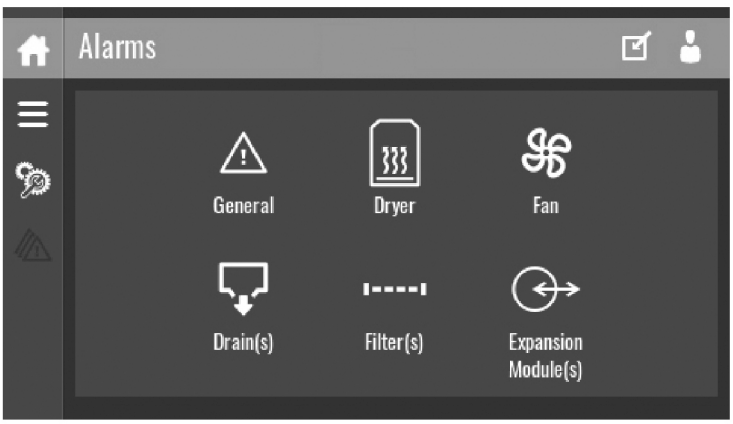


86839

Reference	Designation
(1)	**Alarms** menu
(2)	**Regulation** menu
(3)	**Aux. Equipment Parameters** menu
(4)	**Auto Restart** menu

Alarms menu

Tap the **Alarms** icon to enter the **Alarms** menu.



86840

A list of all alarms is shown.

When pressing on one of the items in the underlying list, the warning and/or shutdown levels are shown for this alarm.

Regulation menu

Tap the **Regulation** icon to enter the **Regulation** menu.

86848

Modify a setting

When tapping a list item, a selection screen pops up. The user can modify the setting by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.

Change a selection

When tapping a list item, a selection screen pops up. The user can change the selection by swiping up or down and confirm by tapping 'V' or decline by tapping 'X'.

Auxiliary equipment parameters menu

Tap the **Aux. Equipment Parameters** icon to enter the **Aux. Equipment Parameters** menu.

This menu shows an overview of all the auxiliary equipment fitted.

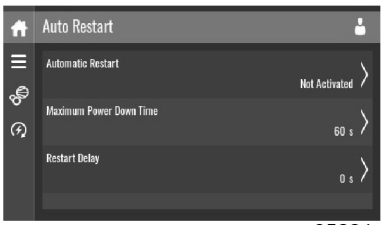
Through this menu, the parameters of the auxiliary equipment can be changed.

Modify a setting

When tapping a list item, a selection screen pops up. The user can modify the setting by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.

Auto restart menu

Tap the **Auto Restart** icon to enter the **Auto Restart** menu.



85221

Through this menu, the automatic restart can be activated. The activation is password protected.

The automatic restart settings can also be changed.

Enter a password

When tapping a password protected item, a selection screen pops up. The user can enter the password by swiping up or down to select the desired number. Once the 4 digits are entered, the user can confirm by tapping 'V' or decline by tapping 'X'.

Modify a setting

When tapping a list item, a selection screen pops up. The user can modify the setting by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.

3.12 Controller settings menu

Function

This screen is used to display the following submenus:

- **Network Settings**
- **Localisation**
- **User Password**
- **Help**
- **Information**

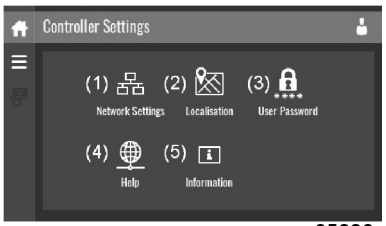
These submenus can be entered by tapping the icons.

Procedure

To enter the **Controller Settings** menu screen:

1. Tap the Menu button.
2. Tap the **Controller Settings** icon.

Description

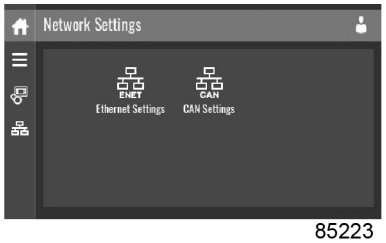


85228

Reference	Designation
(1)	**Network Settings** menu
(2)	**Localisation** menu
(3)	**User Password** menu
(4)	**Help** menu
(5)	**Information** menu

Network settings menu

Tap the **Network Settings** icon to enter the **Network Settings** menu.



85223

Ethernet Settings

The list of **Ethernet Settings** is shown. When ethernet is turned off, the settings can be modified.

CAN Settings

The list of **CAN Settings** is shown. When CAN is turned off, the settings can be modified.

Modify a setting

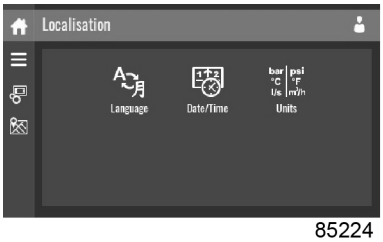
When tapping a list item, a selection screen pops up. The user can modify the setting by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.

Change a selection

When tapping a list item, a selection screen pops up. The user can change the selection by swiping up or down and confirm by tapping 'V' or decline by tapping 'X'.

Localisation menu

Tap the **Localisation** icon to enter the **Localisation** menu.



85224

Language

The language setting of the controller can be modified through this menu.

Date/Time

The date and time settings of the controller can be modified through this menu.

Units

The units displayed can be modified through this menu.

Modify a setting

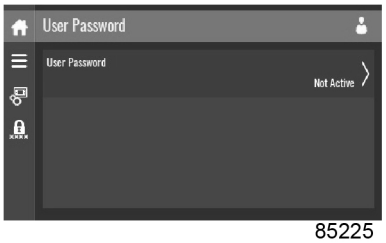
When tapping a list item, a selection screen pops up. The user can modify the setting by tapping '–' or '+' and can confirm by tapping 'V' or decline by tapping 'X'.

Change a selection

When tapping a list item, a selection screen pops up. The user can change the selection by swiping up or down and confirm by tapping 'V' or decline by tapping 'X'.

User password menu

Tap the **User Password** icon to enter the **User Password** menu.



85225

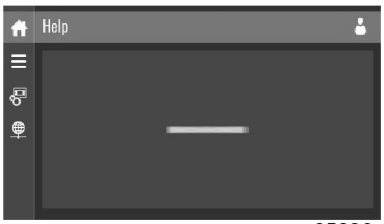
The user password can be activated or deactivated through this menu. Enter and confirm a user password to activate, repeat to deactivate.

Enter a password

When tapping a password protected item, a selection screen pops up. The user can enter the password by swiping up or down to select the desired number. Once the 4 digits are entered, the user can confirm by tapping ‘V’ or decline by tapping ‘X’.

Help menu

Tap the **Help** icon to enter the **Help** menu.



85226

This menu can show a link to the web page of your supplier, a helpdesk phone number or other helpful information.

Information menu

Tap the **Information** icon to enter the **Information** menu.

85227

This menu shows information about the controller.

3.13 Web server

All controllers have 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 the display of the controller.

Getting started

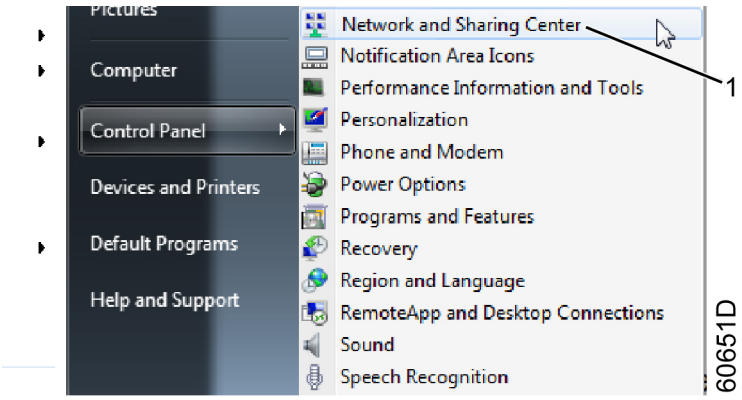
Make sure you are logged in as administrator.

- Use the internal network card from your computer or a USB to LAN adapter.
- Use a UTP cable (CAT 5e) to connect to the controller (see picture below).

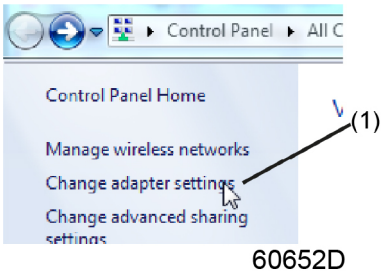
81508D

Configuration of the network card

- Go to Network and Sharing Center (1).

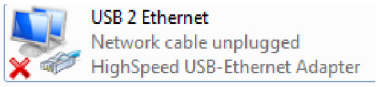


- Click on Change adapter settings (1).



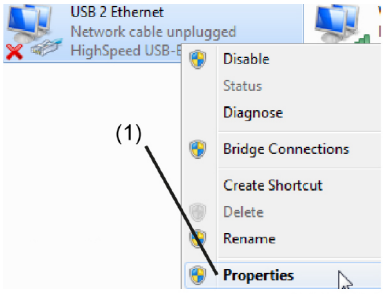
60652D

- Select the Local Area Connection, which is connected to the controller.



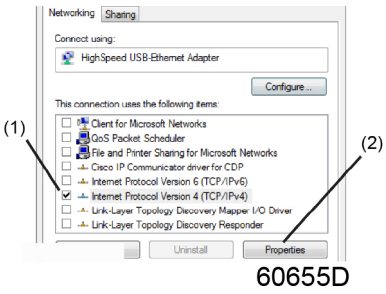
60653D

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



60654D

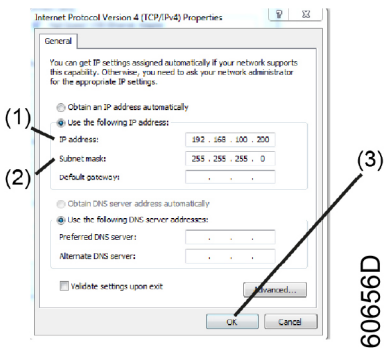
- Use the check box Internet Protocol version +4 (TCP/IPv4) (1) (see picture). To avoid conflicts, uncheck other properties if they are checked. After selecting TCP/IPv4, click on the Properties button (2) to change the settings.



60655D

- Use the following settings
  - IP Address 192.168.100.200(1)
  - Subnetmask 255.255.255.0(2)

  Click OK (3) and close network connections.



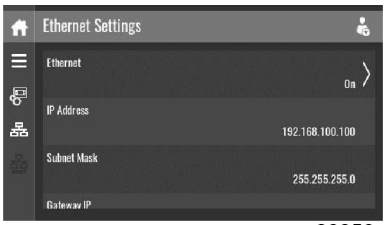
60656D

Configure a company network (LAN) connection

- Ask your IT department to generate a fixed IP address in your company's network. That IP address will be excluded from the DNS server, so it will be reserved for the controller. Also get the correct Gateway and Subnet mask settings. For example:
  - IP = 10.25.43.200
  - Gateway = 10.25.42.250
  - Subnet mask = 255.255.254.0
- Connect the controller to the company's network (LAN) by using a UTP cable (min. CAT 5e).

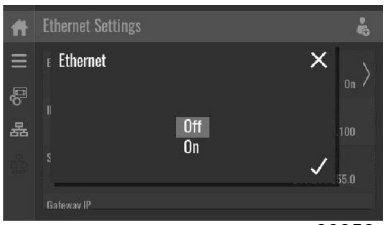

81508D

- Adapt the network settings in the controller.
  - Put the controller in advanced mode by navigating to **Menu** > **Controller settings** > **Network settings** > **Ethernet settings**.



86359

  - Switch off the ethernet communication to allow the editing of the settings.



86358

  - Adapt IP adress
  - Adapt Gateway IP
  - Adapt Subnetmask
  - Switch on the Ethernet communication
  - Wait a few minutes so the controller can be connected to the LAN network.

Configuration of the web server

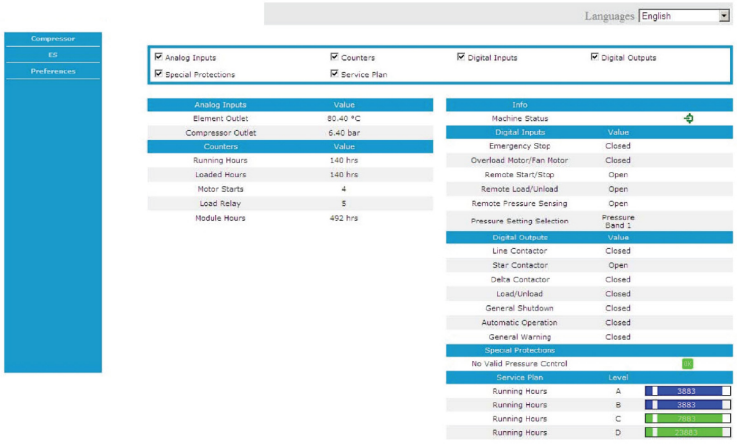
The internal web server is designed and tested for Microsoft® Internet Explorer. Opera, Mozilla Firefox, Safari and Chrome should also work.

Viewing the controller data

Note:

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.



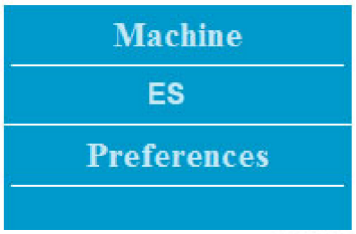
81520D

Navigation and options

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

81521D

- • On the left side of the interface, you can find the navigation menu. If a license for ESi is foreseen, the menu contains 3 buttons:



83810D

  - Machine: shows all generator settings.
  - ES: shows the ESi status (if a license is provided).
  - Preferences: allows to change temperature and pressure unit.

3.14 Access level

Function

Through this pop-up screen, the access level settings can be viewed or changed.

Procedure

The **Access Level** screen can be viewed or changed by tapping the **Access Level** button at the upper right corner of the screen.

Description

85229

Reference	Designation	Function
(1)	User	A basic set of parameters is visualized, no password required.
(2)	Service	A basic set of parameters can be modified, no password required.
(3)	Full	This access level is not accessible to end users.
(4)	Decline	Tap to decline the selected user level.
(5)	Confirm	Tap to confirm the selected user level.

Service access level

85230

Tap the **Service** access level icon (1) and confirm (2).

85231

The screen information bar (1) now shows the current status of the unit instead of the machine serial number.

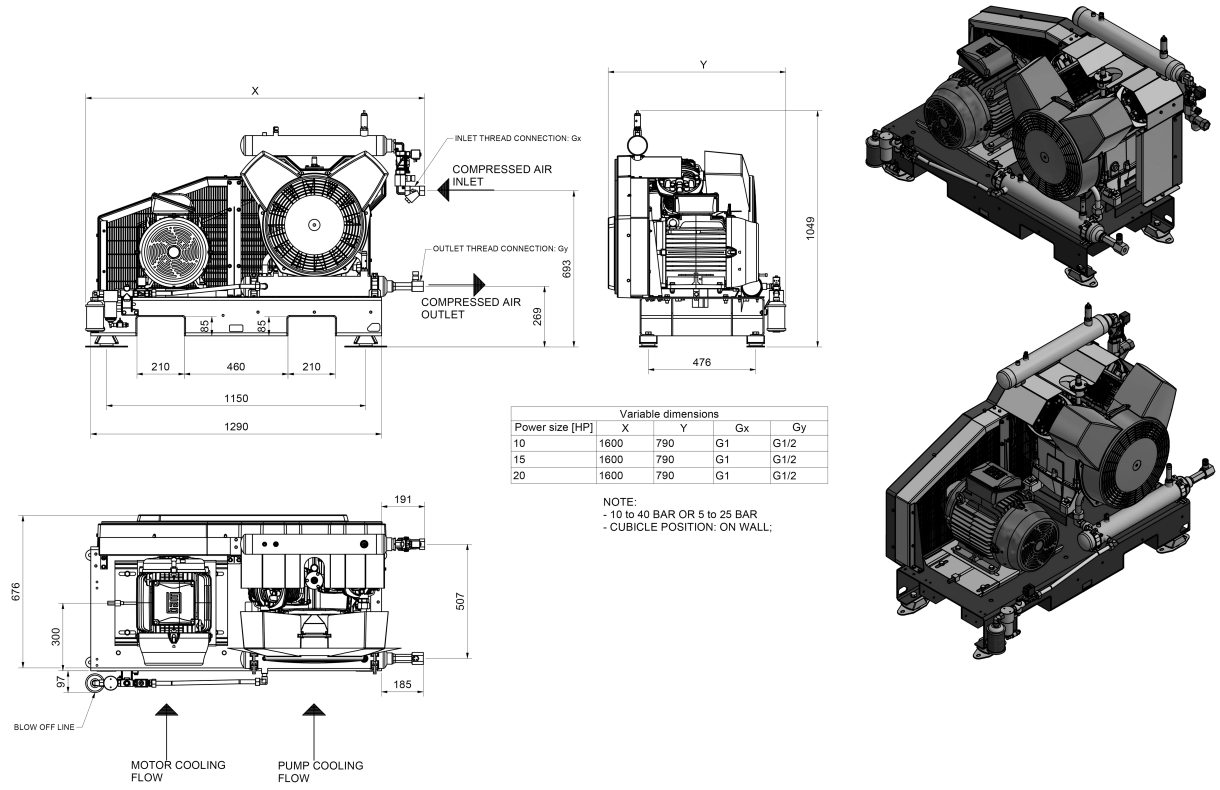
The Received Signal Strength Indicator (RSSI) value is now shown in the Internal SmartBox menu. See section *Quick access screen*.

In the service menu, an extra menu item is now available. See section *Service menu*.

4 Installation

4.1 Dimension drawings

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



Variable dimensions				
Power size [HP]	X	Y	Gx	Gy
10	1600	790	G1	G1/2
15	1600	790	G1	G1/2
20	1600	790	G1	G1/2

NOTE:
- 10 to 40 BAR OR 5 to 25 BAR
- CUBICLE POSITION: ON WALL;

Figure 7: ST version

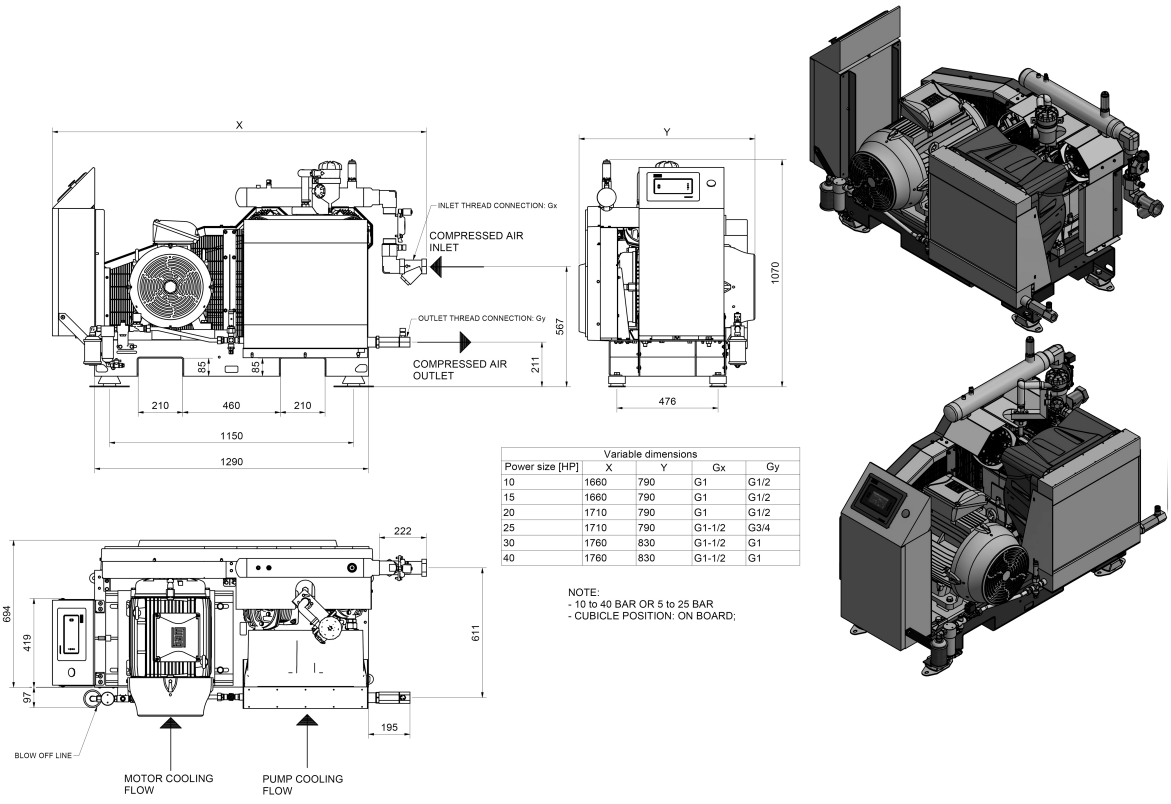


Figure 8: FF version

Text on drawings	Translation or explanation
Inlet thread connection	Thread connection for inlet
Compressed air inlet	Booster inlet pipe
Outlet thread connection	Thread connection for outlet
Compressed air outlet	Booster outlet pipe
Blow off line	Booster discharge line
Motor cooling flow	Flow for motor cooling
Pump cooling flow	Flow for pump cooling

4.2 Installation proposal

Install the compressor in an area where the noise levels do not cause inconvenience and adequate ventilation is available for cooling.

	Unit should work within the condition indicated in Chapter 5, **Operating instructions**

Other influencing factors:

- Corrosive cleaning agents: in rooms where corrosive cleaning agents are used, the metal parts that may be in contact with the cleaning agent can suffer corrosion. In order to prevent this, it is beneficial to place the compressor plant either on hard rubber plates or in a stainless-steel tank.

- Tropical installation conditions: when installing in tropical environments, ensure that the quoted temperatures are not exceeded.

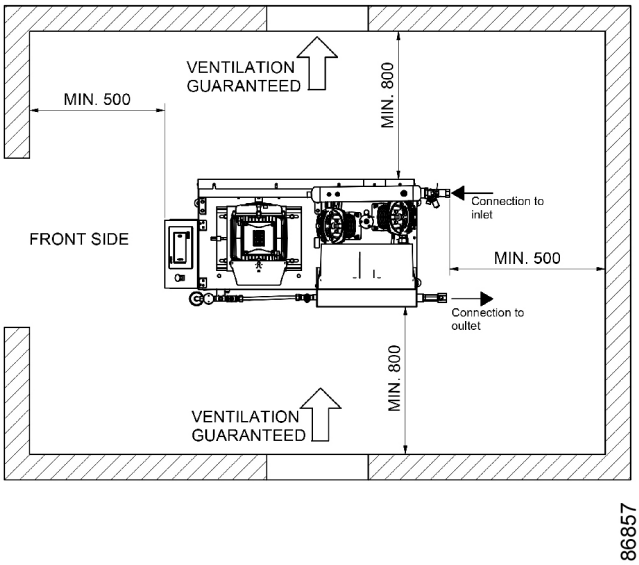


Figure 9: Installation proposal

Compressor:

- Install the compressor horizontally, in a cool but frost-free and well-ventilated area. Place the compressor on a level floor.
- Recommended minimum distance between the top of the compressor and the ceiling is 1.1 m (3.6 ft).
- For maintenance purposes, consider leaving a minimum distance between the compressor and any walls for maintenance purposes, as indicated on the drawings.
- Position of the compressed air outlet valve.

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

  $\Delta p = (L \times 450 \times Qc1.85) / (d5 \times P)$ with

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

  L = length of the pipe in m

  Qc= Free air delivery of the compressor in l/s

  d = inner diameter of the pipe in mm

  P = absolute pressure at the compressor outlet in bar(a)

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

  It is suggested to use a clamping system for the high-pressure pipes that connect the machine to the line of compressed air. Contact the supplier of the pipes to give an indication about this fixing system.

Ventilation:

- Install the inlet grid(s) and the ventilation fan (if available) in such way that any recirculation of cooling air to the compressor is avoided. The air velocity over the grids must be limited to 5 m/s.

  The maximum allowable pressure drop over cooling air ducts is 30 Pa.

  When 30 Pa is exceeded, a ventilation fan is required at the outlet of cooling air ducts.
- The maximum allowed inlet temperature is 45 °C (113 °F), the minimum is 5°C (41 °F).
- The required ventilation to limit the compressor room temperature can be calculated from

  $Q_v = 0.92\ N/\Delta T$

  with

  Q_v = required ventilation capacity in m^3/s

  N = power of the compressor motor in kW

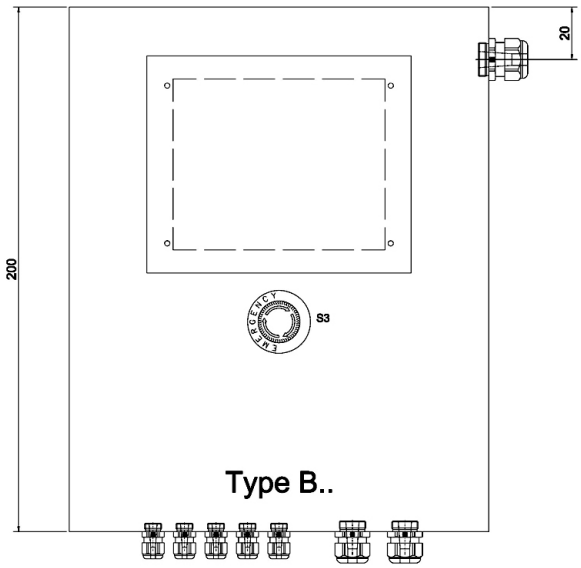
  ΔT = temperature increase in the compressor room in °C
- Based on the application a proper inlet and outlet filtration system might be needed

4.3 Electrical connections

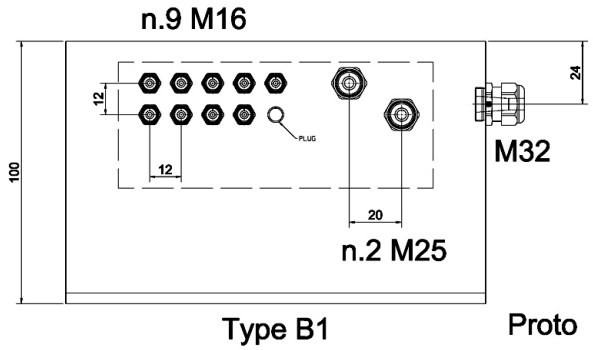
	Consult section *Safety precautions during installation*. The electrical connections must be carried out by a qualified electrician. All wiring must be in accordance with the applicable regulations. Before connecting the compressor, check that the voltage and frequency on the compressor data plate correspond to the supply net. Provide an isolating switch in the power line near the compressor and protect each phase against short-circuits by fuses. The power supply and earthing lines must be of a suitable size. See section *Overload relays and fuses* and *Cable sizes*.

Figure 10: Electrical cabinets - ST - FF versions

CUBICLE WALL

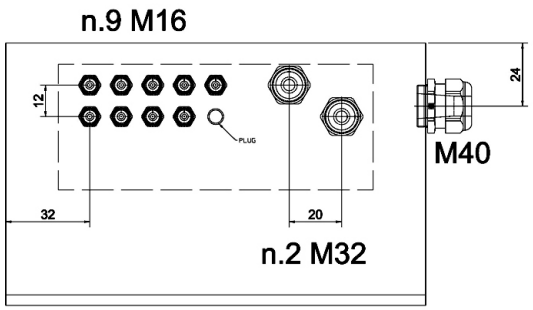


Box 500x400X250



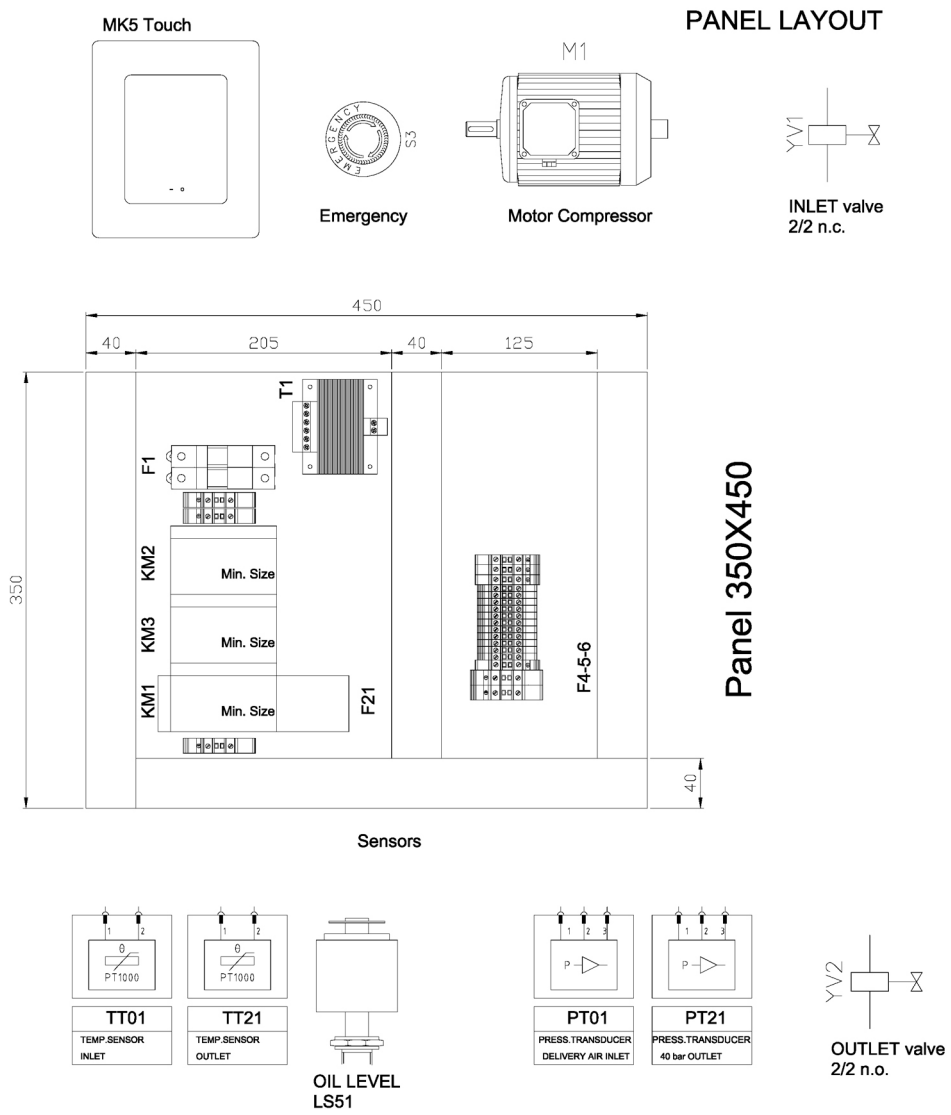
Type B1

Proto



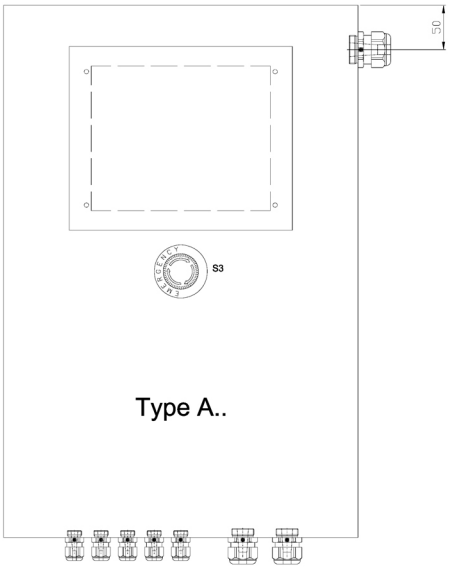
Type B2

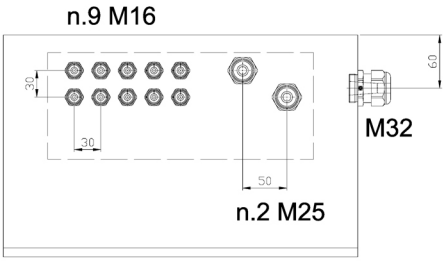
86870


PANEL LAYOUT
MK5 Touch
Emergency
S3
M1
Motor Compressor
YV1
INLET valve
2/2 n.c.
450
40
205
40
125
350
T1
F1
KM2
KM3
KM1
Min. Size
Min. Size
Min. Size
F21
F4-5-6
40
Panel 350X450
Sensors
PT1000
PT1000
TT01
TEMP.SENSOR
INLET
TT21
TEMP.SENSOR
OUTLET
OIL LEVEL
LS51
PT01
PRESS.TRANSDUCER
DELIVERY AIR INLET
PT21
PRESS.TRANSDUCER
40 bar OUTLET
YV2
OUTLET valve
2/2 n.o.

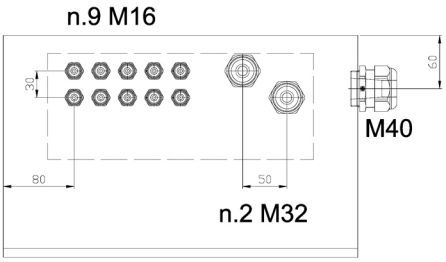
86869

CUBICLE WALL





Type A1

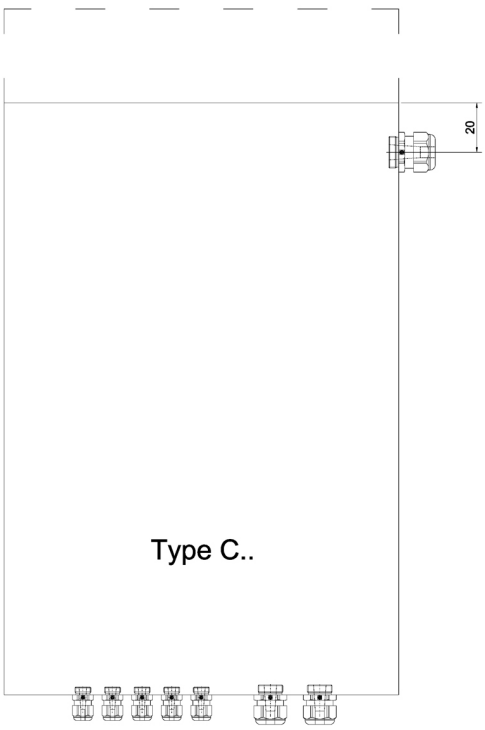


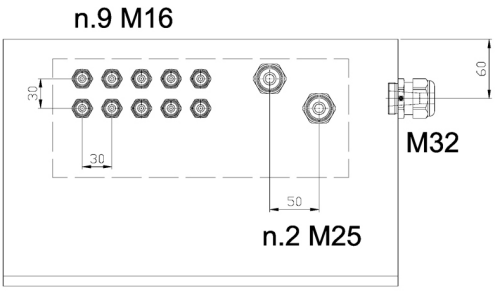
Type A2

Box 600x400X200

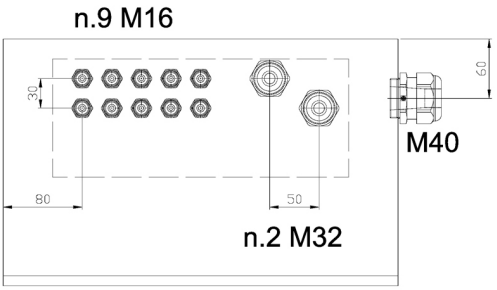
86874

CUBICLE BOARD





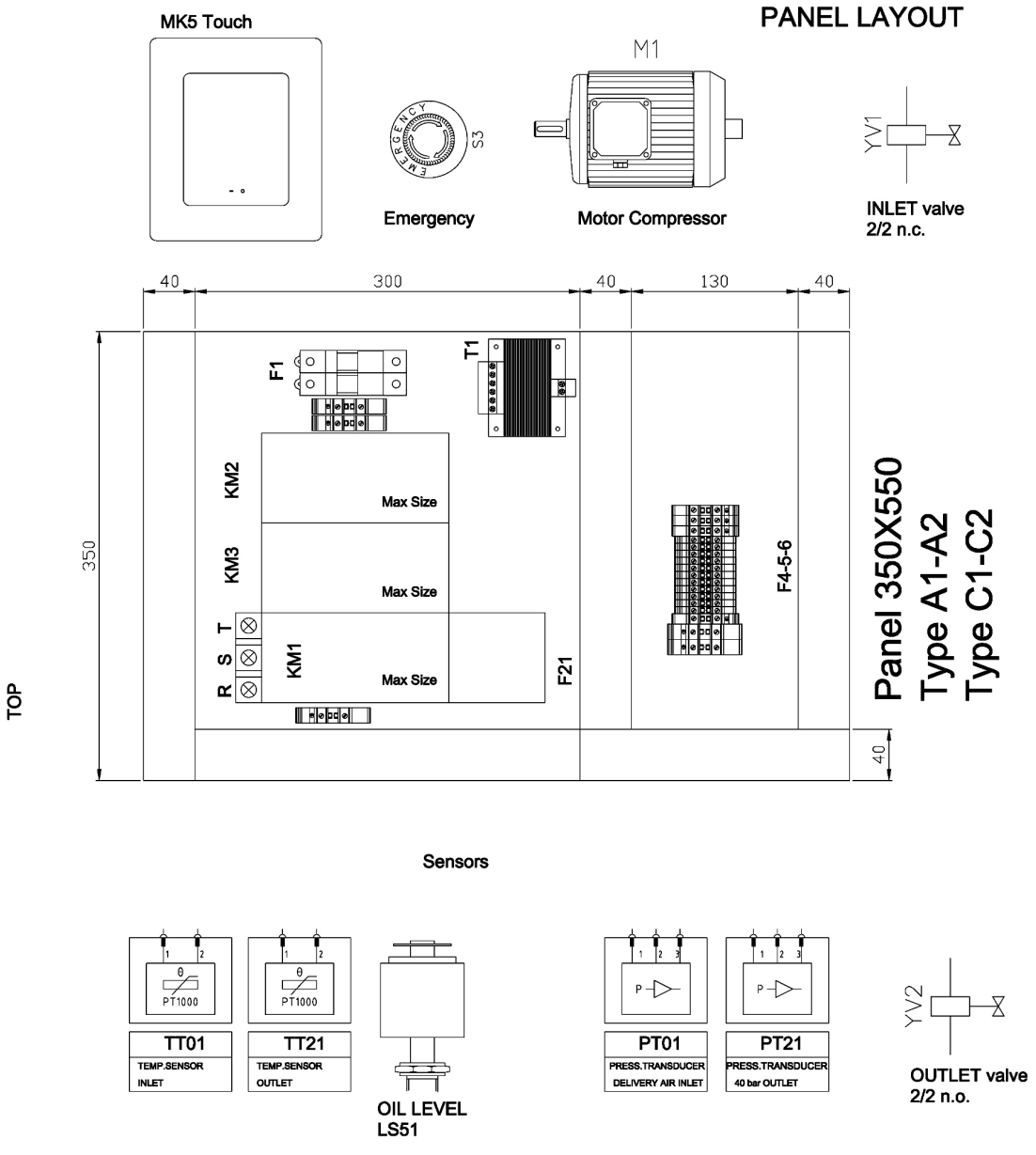
Type C1



Type C2

Box 600x400X200

86871



Reference	Description
AP1	Electronic card
HM	Hour meter
S3/SBE	Emergency stop
S2-S3	Contactors

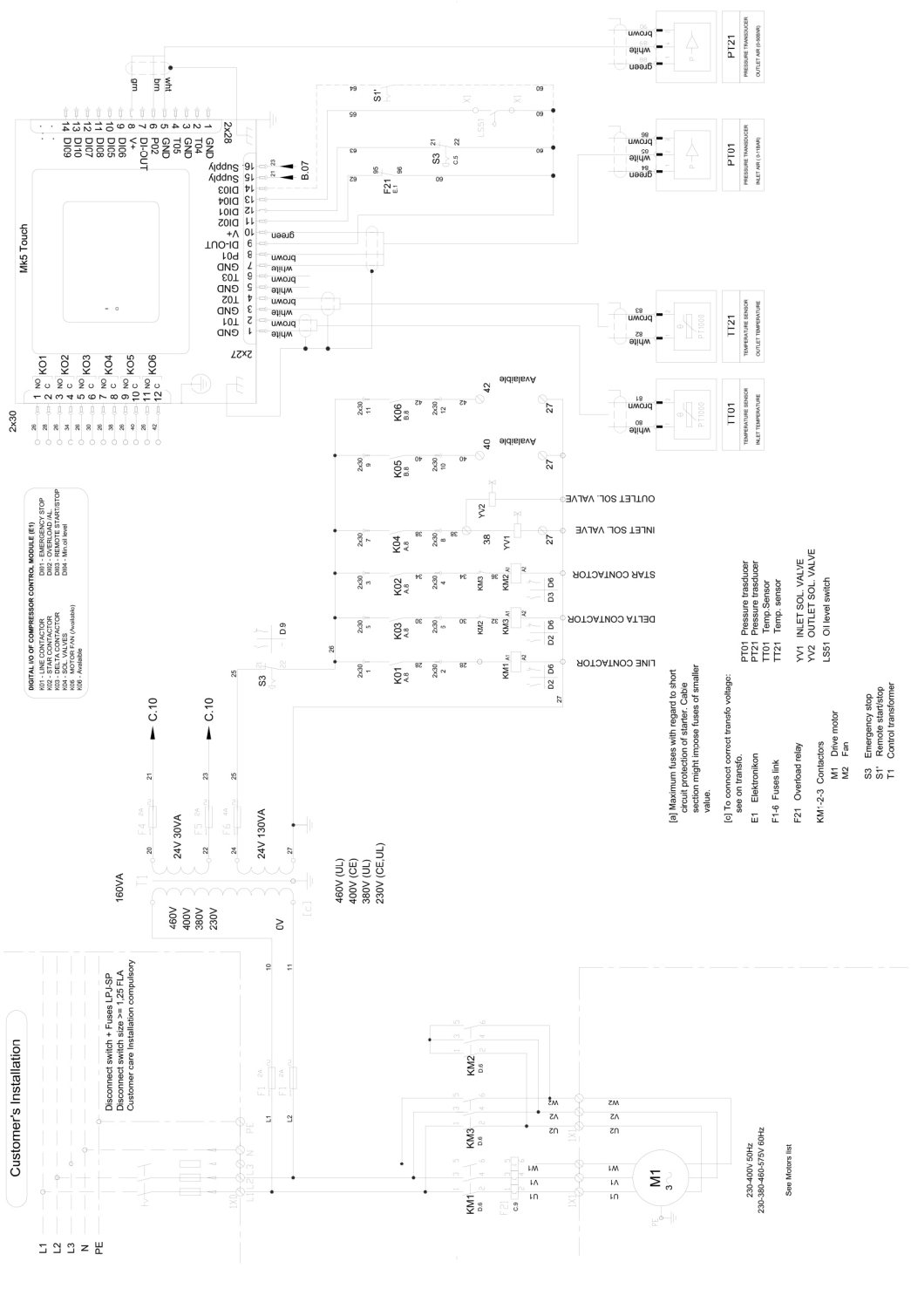


Figure 11: Service diagram - with electronic controller

Reference	Description	Reference	Description
F21	Overload	PT01	Pressure transducer (outlet)

Reference	Description	Reference	Description
FU3	Fuse	PT21	Pressure transducer (inlet)
GND	Ground	QF	Customer care installation
KML	Contactor	SA1	Remote start (optional)
KMS	Contactor	SB	Emergency stop
KMT	Contactor	SP1	Pressure switch
KO1	Line contactor	SP2	Pressure switch
KO2	Star contactor	SP3	Pressure switch
KO3	Delta contactor	TR1	Transformer
KO4	Sol. valves	TT01	Temperature sensor (inlet)
KO5	Motor fan	TT21	Temperature sensor (outlet)
KO6	Available output	YV1	Solenoid valve
LS1	Oil level switch	YV3	Solenoid valve

Table 1: References used in the electrical diagram

4.4 Overload relay and fuses

60 Hz

Type	Voltage (V)	Setting overload relay (A)	Fuses (A)
QB 10	230	20	32
QB 15	230	25	40
QB 20	230	35	50
QB 25	230	43	63
QB 30	230	50	63
QB 40	230	62	100

Type	Voltage (V)	Setting overload relay (A)	Fuses (A)
QB 10	460V	8	16
QB 15	460V	11	20
QB 20	460V	15	32
QB 25	460V	20	40
QB 30	460V	23	50
QB 40	460V	29	63

4.5 Cable sizes

60 Hz

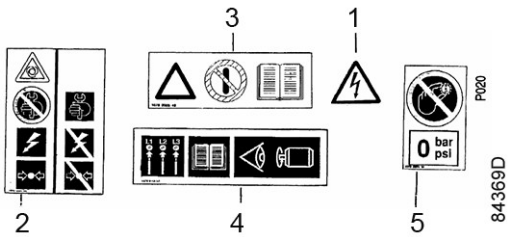
Type	Voltage (V)	Cable size
QB 10	230	6
QB 15	230	6

Type	Voltage (V)	Cable size
QB 20	230	10
QB 25	230	10
QB 30	230	10
QB 40	230	16

Type	Voltage (V)	Cable size
QB 10	460	2.5
QB 15	460	4
QB 20	460	6
QB 25	460	6
QB 30	460	10
QB 40	460	10

4.6 Pictographs

Main pictographs



Reference	Description
1	Warning: voltage
2	Switch off voltage and depressurize before maintenance or repair
3	Read Instruction book before starting
4	Consult the instruction book for the correct direction of rotation
5	Do not adjust the pressure switch when it is depressurized

5 Operating instructions

5.1 Initial start-up

Procedure

	Always apply all relevant *Safety precautions during operation*.

-	Consult sections *Installation proposal*, *Cable sizes* and *Overload relays and fuses*.
	Set the cut-in and cut-off pressure based on the allowed working condition. The cut-in pressure shall be at least two bar lower than the cut-off pressure.
-	Check that the electrical connections correspond to the applicable codes and that all wires are clamped tight to their terminals. The installation must be earthed and protected against short circuits by fuses of the inert type in all phases. An isolating switch must be installed near the compressor.
-	Check the transformer for correct connection. Check the settings of the drive motor overload relay. Check that the motor overload relay is set for manual resetting.
-	Check the oil level and top up if necessary. The compressor is filled with Altair compressor oil. Check that the oil level is still at the top of the red circle of the sight glass.  84444D If the compressor has not run for the past 6 months (at initial start-up, check the date on the data plate), it is strongly recommended to improve the initial lubrication of the compressor: drain the oil, refill the compressor with the same oil while turning the crankshaft.
-	Switch on the voltage and start the compressor. If the rotation direction of the drive motor, which is indicated by the arrow sticker on the Booster, is incorrect or if the motor doesn't start, open the isolating switch and reverse the two incoming electric lines. Incorrect rotation direction of the motor may cause damage to the compressor!
-	Start and run the compressor for a few minutes. Check that the compressor operates normally.

5.2 Starting and stopping

Starting

Step	Action
1	Before starting, check the oil level. The level must be at the top of the red circle of sight glass. The minimum level is the lower part of the red circle.
2	Switch on the voltage.
3	Start by pushing the on/off button on the electronical controller.

	The compressor is protected by 2 pressure transducers, 1 at the inlet and 1 at the outlet. It will only start if the inlet pressure is above 6 bar (87 psi) (10-40 versions) and above 2 bar (29 psi) (5-25 versions). The outlet pressure cannot be higher than 40 bar (10-40 configuration) / 25 bar (5-25) configuration. The working inlet air temperature is between 5°C (41°F) and 45°C (113°F).

Stopping

	Always apply all relevant *Safety precautions during operation*.

Step	Action
1	Switch off the compressor at the electronic controller.
2	Switch off the voltage.
3	Use the emergency stop switch only to stop the compressor in emergency conditions.

5.3 Recommended working conditions and duty cycle

Consult section *Reference conditions* for the acceptable working conditions.

For deviating conditions, consult your supplier.

* these are the allowable working points

		Pout (Bar)				
		20	**25**	**30**	**35**	**40**
Pin (Bar)	**10**	*	*	*	*	*
	9	*	*	*	*	*
	8	*	*	*	*	*
	7	*	*	*	*	-
	6	*	*	*	-	-

Table 2: Working points for 10-40

	Pout (Bar)			
	10	**15**	**20**	**25**

Pin (Bar)	5	*	*	*	*
	4	*	*	*	-
	3	*	*	-	-
	2	*	-	-	-

Table 3: Working points for 5-25

	CONDENSATION: It is recommended to avoid general load cycles less than one hour (see duty cycle time frame below). A smaller unit should be proposed in such cases, to allow the unit to achieve good working temperature. Occasional short load cycles are admitted.

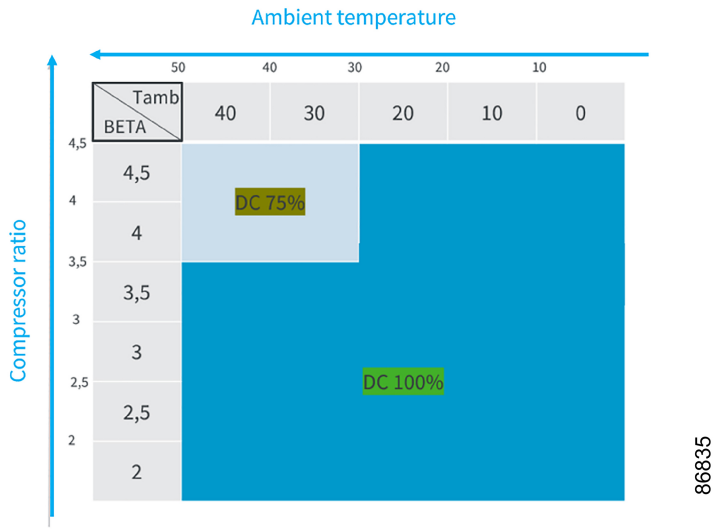


Figure 12: Duty cycle - all machines

N.B. BETA: Compression ratio

Compression ratio defined as ratio of absolute pressures: (Pout +1)/(Pin +1)

Pout is the outlet pressure in bar(g)

Pin is the inlet pressure in bar(g)

	Time frame 1 hour and load cycle A max load time % -B min stop time %

LOAD CYCLE INDICATION A - B

A = MAX. LOAD TIME %

B = MIN. STOP TIME %

Example: A load cycle of 70 % load time – 30 % stop time means that in 1 hour, the compressor motor may run a maximum of 42 minutes and must stand still for at least 18 minutes. The amount of motor starts must not exceed 15 starts per hour.

.

5.4 Taking out of operation

At the end of the service life of the compressor, proceed as follows:

1. Stop the compressor.
2. Switch off the voltage and disconnect the compressor from the mains.
3. Depressurize the compressor.
4. Shut off and depressurize the part of the air net which is connected to the outlet valve. Disconnect the compressor from the air net.

5.5 Storage

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

- Protect the compressor against dust and moisture by keeping it in a cool, dry and well ventilated area if possible.
- Make sure that the compressor is not subject to vibration.
- If the compressor is stored in packing, put some vapor corrosion inhibitor (VCI) paper into the packing.
- Store the compressor in its normal position, not upside down or on its side.
- If the compressor is stored for one year or more, rotate the bearings once a month to change the position of the roller balls in the bearings. Consult Customer center.

5.6 Long-term storage

Long-term storage instructions

It relates to new compressors as delivered from the product company. If the present guidelines differ in any way from similar instructions in previous bulletins, the present guidelines shall prevail.

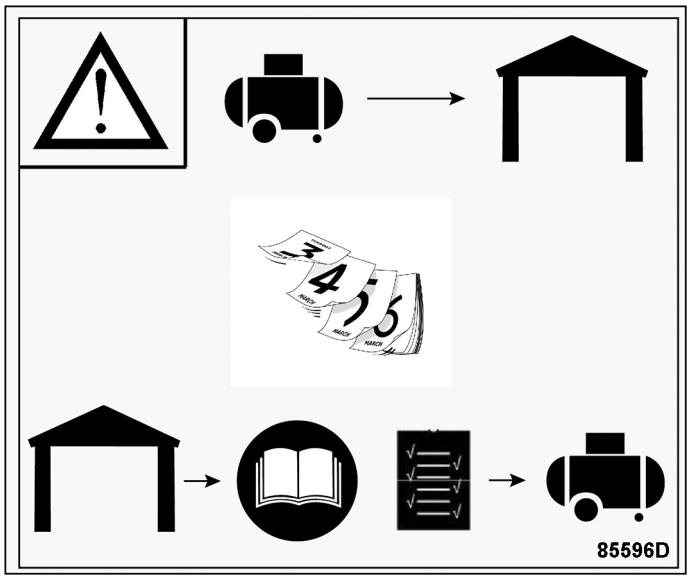
Important: Long-term storage is not recommended and should always be avoided if possible. All equipment should be put in operation as soon as possible. Only when no other option is available, a unit can be put in storage. The instructions in this bulletin will protect the equipment from the most common, known risks. Note that this document does not guarantee that there will be no problems with the equipment, even when all guidelines are followed. Unknown or local effects can still damage the equipment. All feedback on such problems is useful and should be reported to the Service department.

Introduction

These instructions explain how to take care of equipment in storage and/or in transit in the best possible way. These instructions apply during the entire period of storage, up to the point of delivery to the end user. The present information relates to industrial and marine application pistons.

Storage instructions, issued in ASB bulletins, which have been published previously, remain generally valid. These should be handed out to any customers who intend to keep their oil-injected compressor(s) in storage.

The following warning label is applied on the packaging and on the compressor as an indication to consult this service bulletin in case of long storage.



Shipping Precautions/Packing, ex-factory

The aim is to prevent mechanical damage or corrosion during shipment. These procedures apply to all compressor units.

Package

All compressor units are test-run with recommended oil according to instruction book, a film of which remains behind on shafts, gears and bearings.

Depending on the unit, several VCI (Volatile Corrosion Inhibitor) papers or silica gel bags are placed. The VCI papers will evaporate components that precipitate on surfaces in the compressor, thus protecting the surfaces from corrosion.

Over time, the silica gel bags will absorb any moisture inside the plastic bag covering the compressor.

The compressor outlet pipe is closed airtight, also using a plastic plug or adhesive tape. In case the unit is water-cooled, the water circuit is drained properly, the pipes are blown dry and the water in- and outlet pipes are tapped. All drains and vent holes are plugged/taped. The complete compressor unit is placed on a wooden pallet with silica gel inside a PE-bag, compressor and PE-bag are both stapled to the pallet. The complete compressor unit is placed on a wooden pallet and covered by a PE-bag, which is stapled to the pallet. A cardboard sleeve is slid over the whole unit and this combination is again enclosed in a PE-bag. The pallet is treated according the ISPM 15 guidelines. Lifting marks and the centre of gravity are painted on these cardboard sleeves. Custom shipping marks are applied.

Inspection after shipment

Always inspect the equipment immediately after shipment. Verify the mode of transport as well as the length of time that the equipment has been underway. The purpose of such an interim inspection is to secure that the equipment will reach its final destination in perfect condition. The silica gel lasts about 3 months, after which it should be changed.

Never forward a compressor unit or stage to a customer without first having inspected it properly.

A brief inspection entails checking the crate or container for damage. Check that no moisture has penetrated the package material and that the contents have not moved inside the box or container.

If you encounter transport damage, immediately submit a damage claim directly with the carrier, and document it with digital pictures. Also send a copy of the damage claim report to the Service Center.

Inspection of compressor units

1. Remove the outer PE-bag, dismount the top part and the cardboard sleeve. Take the plastic cover off the unit.
2. Check the equipment inside:
   - Check that the air outlet opening is still covered.
   - Check that all drain orifices are still plugged with plastic caps or closed with adhesive tape.
   - Check that any unpainted surfaces are still covered with a layer of highly adhesive grease or a VCI-cap.
   - Check if the silica gel bags (if any) or caps are still in place. Silica gel must be substituted after 3 months.
3. Rectify any possible faulty conditions that you may find and proceed as per section *Precaution before storage - Compressor units*.

Precautions before storage

Compressor units

1. Important: Carry out storage maintenance on any equipment that has been in shipment or storage for close to a year, and which is due for further storage (or transport).
2. Close the main air inlet duct using the original, or similar, protective material (if applicable). Cover the roof with plastic sheeting to reach down over the frame.
3. Store the unit outdoors for a maximum of 3 months, and under a canopy. If the storage takes longer than 3 months then store the unit in a clean, dry, well-ventilated warehouse. Place the unit upright in its bag, box or crate. Make sure that there is no source of vibration nearby (e.g. vibrations coming up through the floor can have a detrimental effect on the bearings over time).

Piston units are normally delivered with ex-factory recommended oil according to instruction book as first fill. This oil also has preservative qualities. The duration of the protective period is 12 months and this is valid for all types of oil. Using this oil precludes the need for separate oil circulation procedures. Lubricate cylinders manually by opening the heads and brush cylinders walls with recommended oil according to instruction book. For gear driven units, turn the shaft (after removing the motor cowl) by hand for a few minutes in order to re-distribute the oil film on bearing balls, rollers and drive gears.

The compressor unit is now ready for storage for maximum 6 months. The storage period remains valid if the ambient conditions remain normal. If the unit is to be stored for a period longer than 6 months, repeat the storage maintenance procedures once every 6 months. Replace the VCI papers, plugs, tapes and other protective materials after every storage maintenance procedure. Silica gel bags should be replaced every 3 months.

After every 12 months of storage, you have to change the oil. If the storage takes longer than 12 months, re-grease the bearings (except “greased for life”-bearings) with twice the quantity normally needed for standard maintenance.

If the storage takes longer than 24 months, the greased for life bearings have to be replaced.

If the unit is stored for more than 6 months, the unit's functionality has to be tested before shipping or before initial start-up. If the storage takes longer than 24 months before shipment to the customer center, the unit has to be completely tested (re-measured).

Instructions for equipment in transit

Compressor units

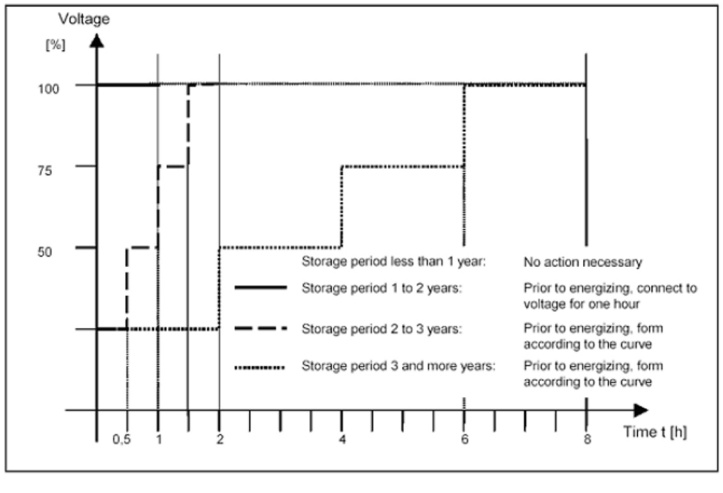
The following instructions apply to equipment which has been inspected upon arrival, and which is due for further transport to the end-user site. The purpose of these procedures is to ensure continued protection against corrosion or other damage.

These instructions also apply to units which (in exceptional cases) are to be returned to the Product Company.

1. Verify that the cooling system has been properly drained and blown dry.
2. Inspect the unit as per section *Shipping precautions/Packing, ex-factory - Package* above.
3. Carry out the storage instructions as per section *Shipping precautions/Packing, ex-factory - Package*.
4. Place the original plastic cover over the unit, or cover it up with plastic sheeting secured with adhesive tape. Make sure that the frame and machine are fully covered.
5. Place the unit in its original packing. Failing this, construct a wooden crate strong and safe enough to withstand routine handling by forklift or slings and crane. Depending on the local rule, the wood has to comply with the ISPM 15 regulation.
6. Apply the shipping data to the crate, using indelible ink. Apply the markings on both sides, including the center of gravity position. If the original packing is used, delete the old markings.
7. Wherever applicable, make sure to include the required customs and transport documents for shipment with the unit.

If the unit is stored for more than 6 months, the unit's functionality has to be tested before shipping or before initial start-up. If the storage takes longer than 24 months before shipment to the Customer Center, the unit has to be completely tested (re-measured).

Frame Sizes A to F



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Start-up after long-term storage

If the compressor has not run between 6 months and 1 year

Check lubrication:

1. Turn the shaft to redistribute the oil on shafts, gears and bearings.
2. Lubricate the cylinders manually by opening the heads and brushing the cylinder walls with oil.
3. Turn the crankshaft by hand for a few minutes.

If the compressor has not run for longer than 1 year

Check lubrication:

1. Drain the compressor oil, remove the cylinder heads, lubricate the cylinder liners with the compressor lube oil.
2. Lubricate the cylinders manually by opening the heads and brushing the cylinder walls with oil.
3. Turn the crankshaft by hand for a few minutes.
4. Check the functioning of the compressor safety valves.
5. Check the functioning of the solenoid valves by keeping a piece of paper or cloth in the flow-path, or by spraying some leak-finder on the valve outlet before start-up.

6 Maintenance

6.1 Preventive maintenance schedule

Warning

	**Before carrying out any maintenance, repair work or adjustments, proceed as follows:** • Stop the compressor. • Close the air outlet valve and depressurize the compressor. • Press the emergency stop button. • Switch off the voltage. • Depressurize the compressor.

	If the oil level exceeds the maximum level, the Oil Breather may be clogged. If so, check and replace the OB cartridge

	The schedule contains a summary of the maintenance instructions. Read the respective section before taking any maintenance measures. When servicing, replace all disengaged packing components, e.g. gaskets, O-rings, washers. **The "longer interval" checks must also include the "shorter interval" checks.**

Preventive maintenance schedule

	Maintenance code	**First 100 hrs.**	**2000 hrs.**	**4000 hrs.**	**8000 hrs.**
Oil replacement		X			
Check fan cover is clean	Check	Daily			
Check oil level	Check	Weekly			
Drain the blow off filter	Check	Monthly			
Check safety valves	Check		X		
Check pressure switches wiring (basic version only)	Check		X		
Check cables tightening	Check		X		
Check aftercooler (FF)	Check		X (monthly)		
Check solenoid valves	Check		X (yearly)		

	Maintenance code	First 100 hrs.	2000 hrs.	4000 hrs.	8000 hrs.
Check inlet filter/ cleaning	Check		X		
Check belt tensioning	Check		X		
Oil replacement	4000-8000 hrs			X	X
Silencer/Muffler replacement	4000-8000 hrs			X	X
Check valve replacement	every 2000 hrs		X	X	X
Breather filter element replacement	4000-8000 hrs			X	X
Blow off filter element replacement	4000-8000 hrs			X	X
Inlet filter replacement	4000-8000 hrs			X	X
Valve plate replacement					X
Piston Rings replacement					X

Test and inspect the safety valves according to the applicable regulations.

6.2 Disposal of used material

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

Electronic components are subject to the EU Directive 2012/19/EC for Waste Electrical and Electronic Equipment (WEEE). As such, these parts must not be disposed of at a municipal waste collection point. Refer to local regulations for directions on how to dispose of this product in an environmentally friendly manner.

7 Servicing and adjustment procedures

7.1 Blow-off filter

⚠	Release the pressure from the compressor before starting repair or maintenance works. Switch off the voltage and isolate the compressor from the mains.

Dirt, condensate and oxidation influence the proper operation of the blow-off filter. Depending on the environmental and working conditions (ambient temperature, working pressure, load cycle), the Customer center or authorized distributor may overrule the maintenance schedule (consult the Customer center).

The checking and the substitution of the blow-off filter must be performed according to the *Preventive maintenance schedule* (see paragraph 5.1).

1. Unscrew the upper part of the filter (see images).
2. Clean the valve cartridge. Replace if worn.
3. Reassemble and tighten carefully.

7.2 Servicing valves and piston rings

	A faulty valve must be replaced immediately. A faulty valve can be diagnosed as stated in section *Problem solving*. Consult your supplier.

It is highly recommended to replace the valve discs, O-rings and gaskets when disassembling the cylinder heads. For more information on parts and part numbers, please consult the spare parts list.

Valve disc replacement

1. Depressurize the compressor and disconnect from the piping.
2. Remove the fan cover.
3. Unscrew the head connection pipes.
4. Unscrew the inlet pressure pipe.
5. Unscrew the 2 copper recycling pipes.
6. Unscrew the 8 screws on the cylinder head.
7. Remove the cylinder head.
8. Remove and replace the valve disc by a new one.
9. Reassemble the components, following the opposite order of disassembly.

Piston rings

1. Follow the procedure as explained for the valve disc replacement (steps 1 up to 7 (included)).
2. Remove the valve plate.
3. Unscrew the 4 cylinder base nuts.
4. Remove and clean the cylinder.
5. Remove the piston rings and replace them by new ones.
6. Remove the gasket and replace it with a new one , using sealing adhesive.
7. Reassemble the components, following the opposite order of disassembly.

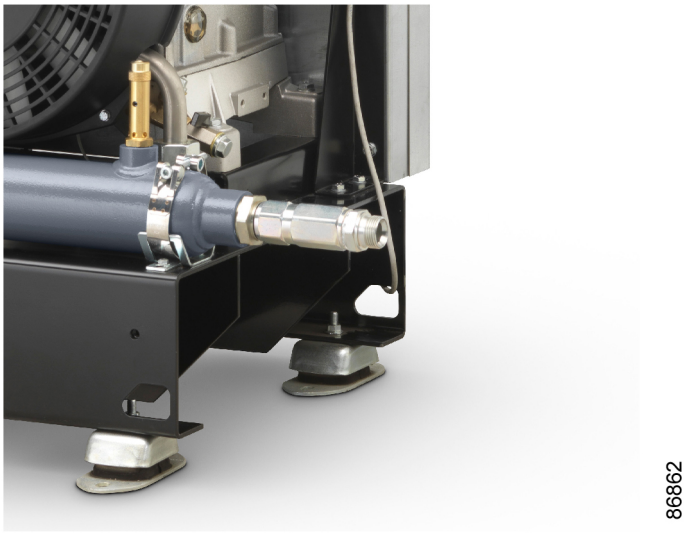
Thread size	Tightening torque (Nm)	Allowed deviation (Nm)
M6	10	±2
M8	23	±2
M10	46	±5

7.3 Oil breather cartridge

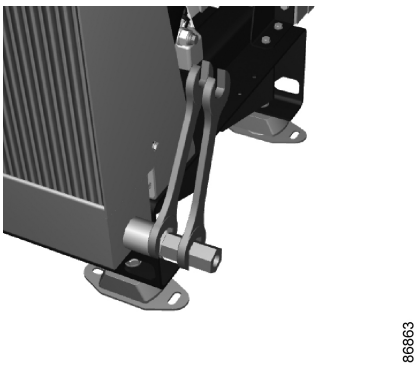
1. Remove the oil breather cover.
2. Replace the filter cartridge by a new one, if necessary.
3. Reassemble the oil breather cover.
4. A signal of reduced functionality or clogging of the filter can be given by an excessive increase in the pressure of the crankcase. Therefore, if the oil exceeds the maximum RL level, most likely the filter is clogged and therefore must be replaced. If, on the other hand, the RL level is below the minimum, you will have to top up the oil. RL max and min are indicated by the two clips on the oil recovery tube.

7.4 Servicing the outlet check valve

Checking of the outlet check valve must be done according to the *Preventive maintenance schedule* (see paragraph 5.1).



1. Unscrew the valve connections.



2. Assemble the spare valve and tighten carefully.

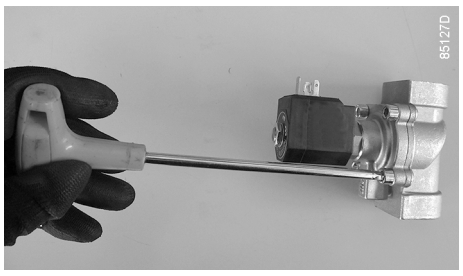
7.5 Outlet solenoid valve

Dirt, condensate and oxidation influence the proper operation of the outlet solenoid valve.

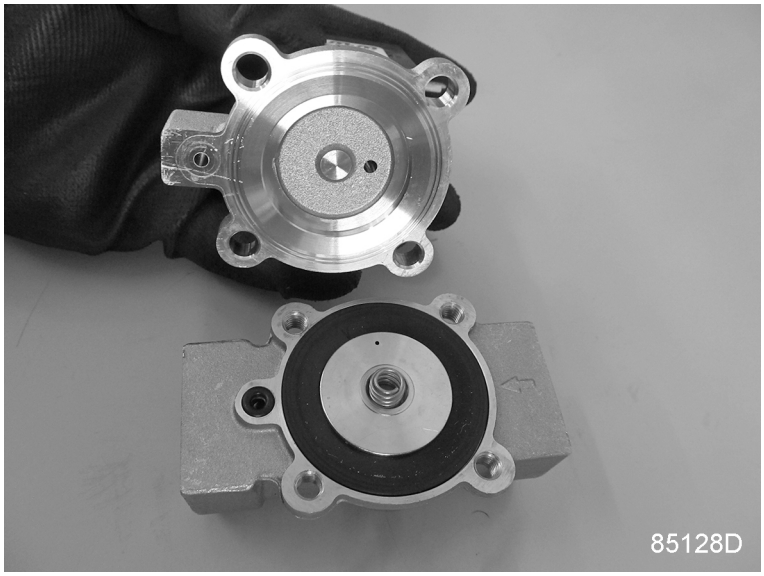
If oil, grease, and dirt settle on and at the bottom of the valve, functionality problems may arise, which may cause the valve to not close properly after the booster starts.

Cleaning of the outlet solenoid valve must be done according to the *Preventive maintenance schedule* (see paragraph 5.1).

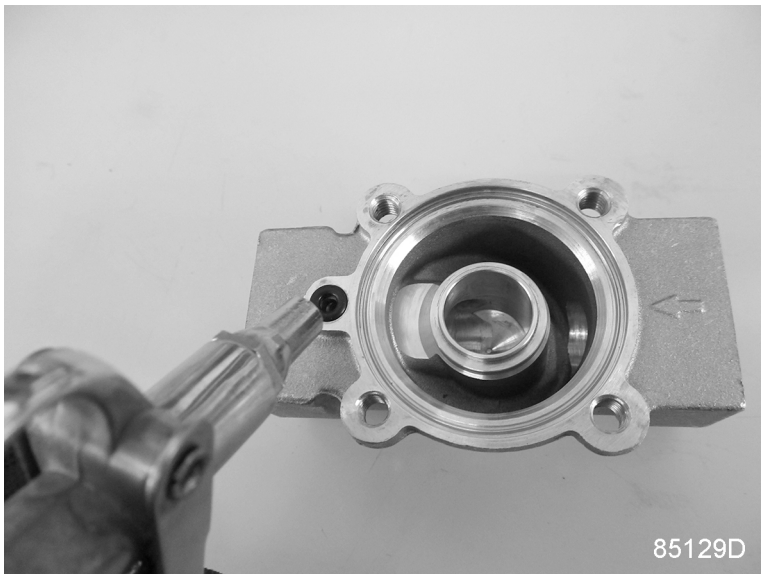
1. Remove the four screws with a suitable tool.



2. Open the valve and take off the spring.



3. If necessary, remove grease and dust from inside the valve with a compressed air blowing gun.



4. Reassemble the spring, valve, and screws.

7.6 Lubrication

⚠	Use only the recommended lubrication oil (L piston fluid). Check the spare parts list for part numbers.

Checking the oil level

Check the oil level by means of the sight glass while the compressor is standing still.

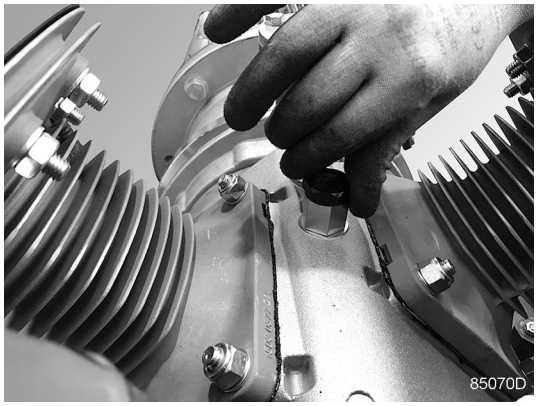
The level must be at the top of the red circle of the sight glass. The minimum level is the lower part of the red circle.

Topping up

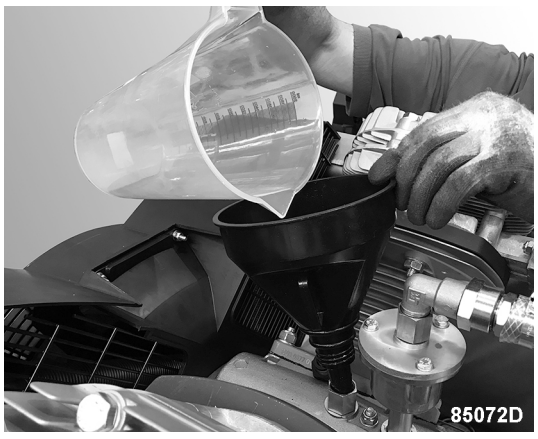
Refill the oil via the yellow plug on top of the crankcase.

Follow the instructions below:

1. Unscrew the oil tap by turning it counterclockwise.



2. Put a suitable funnel into the opening of the oil refill hole and add oil until the level of red dot.



3. Reassemble the oil tap and tighten.

7.7 Safety valves

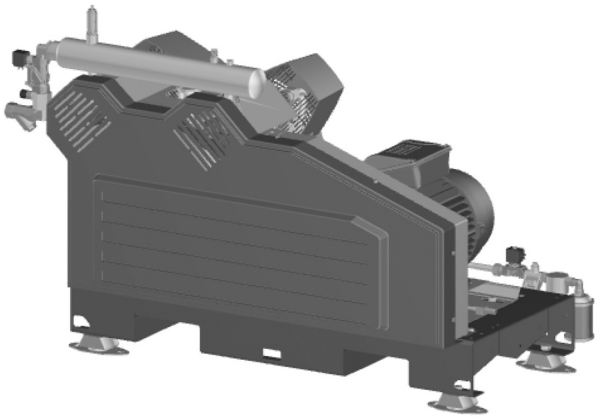
	Replace the valve if it does not open at the correct pressure. No adjustment is allowed.

⚠	Always wear safety glasses and ear protection.

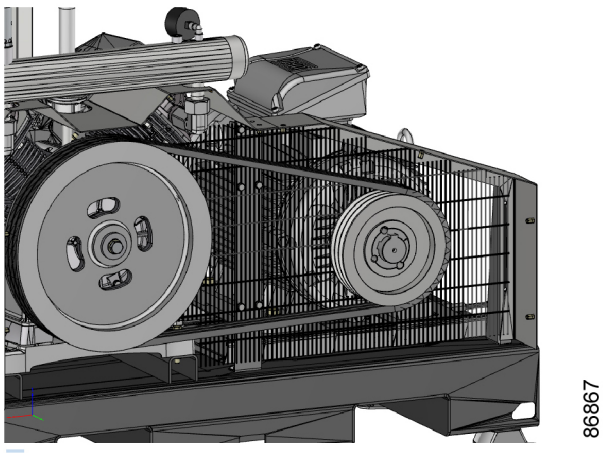
7.8 Belt tensioning

Checking the belt tensioning must be done according to the *Preventive maintenance schedule* (see paragraph 5.1).

1. Remove the Front Belt guard, by removing the screws



2. Check the belt tension by pulling down the belt
3. If the vertical displacement is more than 10mm, the belts need tensioning.



4. Act on the motor sledge tensioner. Once done, reassemble the front belt guard.

Compressor	Belt type	SPAN (mm)	Acceptable frequency	Tension (NM)
QB15	CAPXPB2240	640	39-41	411
QB25	CAPXPB2280	643	39-41	435
QB40	CAPXPB2360	658	45-47	596

8 Problem solving

Problem	Cause	Remedy
Unit does not start	No supply voltage.	Check power line, use cables with correct size.
	Power on, electronic controller Off.	Switch off power supply. Check fuses.
	Power on, electronic controller Off, compressor stopped.	Switch off power supply. Check fuses.
	Blown fuse(s).	Substitute defective fuse(s).
	Electric current is too low.	Check power line.
	Overload relay.	Reset overload relay.
	Power consumption too high.	Check line and fuses. Compare the motor data with the mains supply.
	Numbers of starts per hour exceeded.	The compressor will delay to re-start when number of starts per hour is exceeded.
	Inlet vessel capacity not sufficient.	Increase the vessel capacity.
	Inlet solenoid valve clogged.	Check and possibly replace valve.
	Blow off open.	Check and possibly replace.
	Check valve failure.	Check and possibly replace.
	Oil level too low.	Drain and refill.
	Belts transmission problem.	Check belts and their tension.
	Inlet pressure under minimum preset.	Check inlet airnet.
	Outlet pressure above preset value.	The compressor will start again when the pressure at the inlet or outlet is below the preset values.
	Outlet pressure sensor.	Check if the outlet pressure sensor works within pressure switch limits.
	Outlet pressure value higher than cut-in pressure set.	The compressor will start again at the pressure cut-in.
	Inlet pressure value lower than min. allowable preset.	Check the air net.
	Inlet pressure value higher than max. allowable preset.	Check the air net.
	Operating parameters are not fulfilled.	Check the operating parameters in the instruction book.

Problem	Cause	Remedy
Unit does not start	Booster cannot start if the pressure ratio exceeds the limit.	Check the operating parameters in the instruction book.
	Inlet temperature exceeds the limit - shutdown condition and a message is displayed.	Check the operating parameters in the instruction book.
	Outlet temperature exceeds the limit -shutdown condition and a message is displayed.	Check the operating parameters in the instruction book.
	Booster unused for a long period.	Consult the long term storage procedure.
	Oil level in the crankcase is too low.	Refill the oil.
	Power outage.	Start the booster manually.
Starts too frequent / Operating periods too shorts	Outlet pressure cut-in and cut-off set point.	Check the operating parameters in the instruction book.
	Outlet pressure switch/sensors.	Check if the outlet pressure switch/sensors work according to the preset values.
	Outlet vessel not correctly dimensioned.	Check outlet vessel capacity.
	SV2 intervention.	Outlet solenoid valve clogged. Check and, if necessary, replace.
	Controller power supply problems.	Check fuses.
	Air leaks.	Check the system.
Air pressure rises above maximum and causes safety valves to blow	Inlet pressure sensors or pressure switches malfunction.	Check inlet sensor or pressure switches.
	Outlet pressure sensors or pressure switches malfunction.	Check outlet sensor or pressure switches.
	Outlet check valve jammed.	Inspect the check valve and/or replace it.

Problem	Cause	Remedy
The outlet flow rate decreases	Belts slipping.	Check the belts tension or replace the belts.
	Leaks.	Check piping, O-rings and tighten fittings.
	Clogged inlet.	Check the suction pipe.
	Piston rings worn.	Replace the piston rings.
	Inlet pressure too low.	Check inlet pressure.
	Inlet vessel capacity not sufficient.	Increase the vessel capacity.
	Blow off solenoid valve open.	Check or replace the solenoid valve.
	Motor speed.	Check motor speed.
	Air consumption exceeds the maximum compressor output.	Decrease air consumption.

Condition	Fault	Remedy
The compressor does not reach the maximum pressure	Suction valve doesn't work.	Replace suction valve.
	Piston rings worn.	Replace the worn piston rings.
	Early opening of the safety valve.	Check and, if necessary, replace valve.
	Transmission belts slipping.	Check belts and their tension.
Overload relay trips	Overload relay incorrectly set.	Check, set and reset relay.
	Ambient temperature above the limit.	Improve compressor room ventilation.
	Current absorption too high.	Call a service technician.
	Outlet check valve jammed.	Inspect the check valve and/or replace it.
The Booster overheats	Valves dirty or not working.	Replace the intake cylinder valves.
	Wrong motor rotation direction.	Change the phases of the electric motor.
Excessive oil consumption	Ambient temperature above the limit.	Check the installation guidelines.
	High temperature in the unit.	Check the cooling air ports.
	Too much oil inside the compressor.	Check oil level and drain if necessary.
	Oil Breather clogged.	Check the oil recovery line as indicated on the instruction book and replace the breather filter.
	Piston rings worn.	Replace piston rings.
	Oil at the air outlet.	Check filters of the main compressor.
		Install and check a pressure. gauge/sensor at the filter location.

Condition	Fault	Remedy
Power On, controller Off	Outlet pressure switch.	Check if the outlet pressure switch works within pressure switch limits.
Warning /shutdown	Inlet pressure sensor failure.	Check and, if necessary, replace.
	Outlet pressure sensor failure.	Check and, if necessary, replace.
	Inlet temperature sensor failure.	Check and, if necessary, replace.
	Outlet temperature sensor failure.	Check and, if necessary, replace.
	The inlet temperature exceeds the upper/lower limit.	Check air net condition.
	The outlet temperature exceeds the upper warning threshold.	Don't try to restart booster - check for any possible failure.
	Inlet pressure exceeds the upper/lower limit.	Check airnet condition.
	Outlet pressure exceeds the warning threshold.	Stop booster - check for any possible failure.
	Compression ratio exceeds the warning threshold.	Stop booster - check for operating parameters in instruction book.
	Compression ratio exceeds the shutdown threshold.	Don't try to re-start booster - check for any possible failure.
	Booster unused for a long period.	Check for long term storage procedure in instruction book.
	Oil level.	Stop booster - check for any oil leaks and refill or replace the oil.
	Maintenance intervals.	Contact a service technician for maintenance.

9 Technical data

9.1 Reference conditions

	Power size						
	10	15	20	25	20	25	30
Compressed medium	Air or nitrogen						
Inlet pressure	10 bar	10 bar	10 bar	10 bar	10 bar	10 bar	10 bar
	5 bar	5 bar	5 bar	5 bar	5 bar	5 bar	5 bar
Relative humidity	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Ambient temperature	20 °C	20 °C	20 °C	20 °C	20 °C	20 °C	20 °C
	68 °F	68 °F	68 °F	68 °F	68 °F	68 °F	68 °F
Working pressure	40 bar	40 bar	40 bar	40 bar	40 bar	40 bar	40 bar
	25 bar	25 bar	25 bar	25 bar	25 bar	25 bar	25 bar

For work limitations, refer to paragraph 5

10 Declaration of conformity

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.

Performance You Demand. Reliability You Trust.

No. 2920 7218 11 / June 2023 A. Aria C. S.R.L.