

**GA 75 VSD, GA 90 VSD**



# Atlas Copco

GA 75 VSD, GA 90 VSD

## Instruction book

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This instruction book meets the requirements for instructions specified by the machinery directive 98/37/EC and is valid for CE as well as non-CE labelled machines.

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
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# 1 Safety precautions

## 1.1 Safety icons

### Explanation

	Danger for life
	Warning
	Important note

## 1.2 Safety precautions during installation

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

1. The operator must employ safe working practices and observe all related local work safety requirements and regulations.
2. If any of the following statements does not comply with local legislation, the stricter of the two shall apply.
3. Installation, operation, maintenance and repair work must only be performed by authorised, trained, specialised personnel.
4. The compressor is not considered capable of producing air of breathing quality. For air of breathing quality, the compressed air must be adequately purified according to local legislation and standards.
5. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the compressor, press the emergency stop button, switch off the voltage and depressurise the compressor. In addition, the power isolating switch must be opened and locked.
6. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.

### Precautions during installation

1. The machine must only be lifted using suitable equipment in accordance with local safety regulations. Loose or pivoting parts must be securely fastened before lifting. It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Lifting acceleration and deceleration must be kept within safe limits. Wear a safety helmet when working in the area of overhead or lifting equipment.
2. Place the machine where the ambient air is as cool and clean as possible. If necessary, install a suction duct. Never obstruct the air inlet. Care must be taken to minimise the entry of moisture at the inlet air.
3. Any blanking flanges, plugs, caps and desiccant bags must be removed before connecting the pipes.



4. Air hoses must be of correct size and suitable for the working pressure. Never use frayed, damaged or worn hoses. Distribution pipes and connections must be of the correct size and suitable for the working pressure.
5. The aspirated air must be free of flammable fumes, vapours and particles, e.g. paint solvents, that can lead to internal fire or explosion.
6. Arrange the air intake so that loose clothing worn by people cannot be sucked in.
7. Ensure that the discharge pipe from the compressor to the aftercooler or air net is free to expand under heat and that it is not in contact with or close to flammable materials.
8. No external force may be exerted on the air outlet valve; the connected pipe must be free of strain.
9. If remote control is installed, the machine must bear a clear sign stating: DANGER: This machine is remotely controlled and may start without warning.  
The operator has to make sure that the machine is stopped and that the isolating switch is open and locked before any maintenance or repair. As a further safeguard, persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
10. Air-cooled machines must be installed in such a way that an adequate flow of cooling air is available and that the exhausted air does not recirculate to the compressor air inlet or cooling air inlet.
11. The electrical connections must correspond to the local codes. The machines must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the compressor.
12. On machines with automatic start-stop system or if the automatic restart function after voltage failure is activated, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
13. In multiple compressor systems, manual valves must be installed to isolate each compressor. Non-return valves (check valves) must not be relied upon for isolating pressure systems.
14. Never remove or tamper with the safety devices, guards or insulation fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure must be protected by a pressure-relieving device or devices as required.
15. Pipework or other parts with a temperature in excess of 80°C (176°F) and which may be accidentally touched by personnel in normal operation must be guarded or insulated. Other high-temperature pipework must be clearly marked.
16. For water-cooled machines, the cooling water system installed outside the machine has to be protected by a safety device with set pressure according to the maximum cooling water inlet pressure.
17. If the ground is not level or can be subject to variable inclination, consult the manufacturer.



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

## 1.3 Safety precautions during operation



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

## General precautions

1. The operator must employ safe working practices and observe all related local work safety requirements and regulations.
2. If any of the following statements does not comply with local legislation, the stricter of the two shall apply.
3. Installation, operation, maintenance and repair work must only be performed by authorised, trained, specialised personnel.
4. The compressor is not considered capable of producing air of breathing quality. For air of breathing quality, the compressed air must be adequately purified according to local legislation and standards.
5. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the compressor, press the emergency stop button, switch off the voltage and depressurise the compressor. In addition, the power isolating switch must be opened and locked.
6. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.

## Precautions during operation

1. 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.
2. 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.
3. Never operate the machine when there is a possibility of taking in flammable or toxic fumes, vapours or particles.
4. Never operate the machine below or in excess of its limit ratings.
5. Keep all bodywork doors shut during operation. The doors may be opened for short periods only, e.g. to carry out routine checks. Wear ear protectors when opening a door.
6. People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB(A) shall wear ear protectors.
7. 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
  - There are no leaks
  - All fasteners are tight
  - All electrical leads are secure and in good order
  - Safety valves and other pressure-relief devices are not obstructed by dirt or paint
  - Air outlet valve and air net, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good repair, free of wear or abuse
8. 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.
9. Do not remove any of, or tamper with, the sound-damping material.
10. Never remove or tamper with the safety devices, guards or insulations fitted on the machine. Every pressure vessel or auxiliary installed outside the machine to contain air above atmospheric pressure shall be protected by a pressure-relieving device or devices as required.



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

## 1.4 Safety precautions during maintenance or repair



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

### General precautions

1. The operator must employ safe working practices and observe all related local work safety requirements and regulations.
2. If any of the following statements does not comply with local legislation, the stricter of the two shall apply.
3. Installation, operation, maintenance and repair work must only be performed by authorised, trained, specialised personnel.
4. The compressor is not considered capable of producing air of breathing quality. For air of breathing quality, the compressed air must be adequately purified according to local legislation and standards.
5. Before any maintenance, repair work, adjustment or any other non-routine checks, stop the compressor, press the emergency stop button, switch off the voltage and depressurise the compressor. In addition, the power isolating switch must be opened and locked.
6. Never play with compressed air. Do not apply the air to your skin or direct an air stream at people. Never use the air to clean dirt from your clothes. When using the air to clean equipment, do so with extreme caution and wear eye protection.

### Precautions during maintenance or repair

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

11. Never weld or perform any operation involving heat near the oil system. Oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels.
12. Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of the oil vapour when air is admitted.
13. Never use a light source with open flame for inspecting the interior of a machine, pressure vessel, etc.
14. Make sure that no tools, loose parts or rags are left in or on the machine.
15. All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
16. Before clearing the machine for use after maintenance or overhaul, check that operating pressures, temperatures and time settings are correct. Check that all control and shut-down devices are fitted and that they function correctly. If removed, check that the coupling guard of the compressor drive shaft has been reinstalled.
17. Every time the separator element is renewed, examine the discharge pipe and the inside of the oil separator vessel for carbon deposits; if excessive, the deposits should be removed.
18. Protect the motor, air filter, electrical and regulating components, etc. to prevent moisture from entering them, e.g. when steam-cleaning.
19. Make sure that all sound-damping material, e.g. on the bodywork and in the air inlet and outlet systems of the compressor, is in good condition. If damaged, replace it by genuine material from the manufacturer to prevent the sound pressure level from increasing.
20. Never use caustic solvents which can damage materials of the air net, e.g. polycarbonate bowls.
21. **The following safety precautions are stressed when handling refrigerant:**
  - Never inhale refrigerant vapours. Check that the working area is adequately ventilated; if required, use breathing protection.
  - Always wear special gloves. In case of refrigerant contact with the skin, rinse the skin with water. If liquid refrigerant contacts the skin through clothing, never tear off or remove the latter; flush abundantly with fresh water over the clothing until all refrigerant is flushed away; then seek medical first aid.
22. Protect hands to avoid injury from hot machine parts, e.g. during draining of oil.



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

## 2 General description

### 2.1 Introduction

#### Introduction

GA 75 VSD and GA 90 VSD are single-stage, oil-injected screw compressors driven by an electric motor. The compressors are air-cooled.

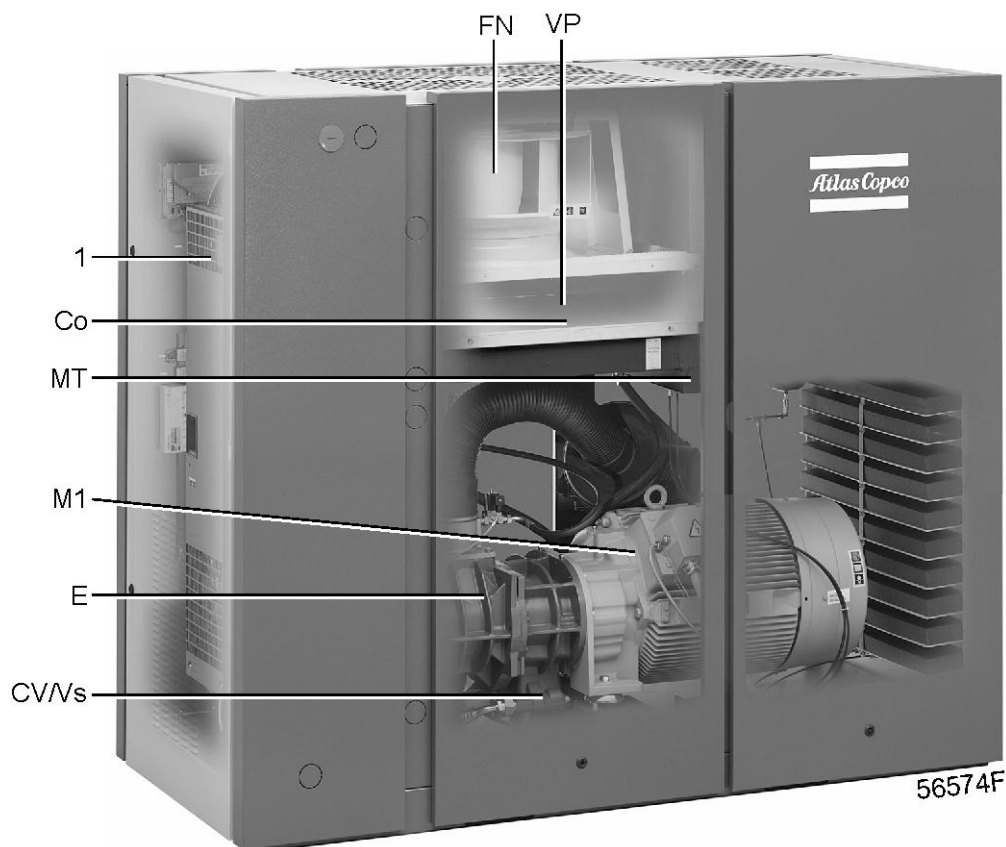
Water-cooled GA 75 VSD and GA 90 VSD are single-stage, oil-injected screw compressors driven by an electric motor.

#### GA Workplace

GA Workplace are enclosed in a sound-insulated bodywork. The compressors are controlled by the Atlas Copco Elektronikon® II regulator. The electronic control module is fitted to the door at the right side. An electric cabinet comprising fuses, transformers, relays, etc. is located behind this panel. An automatic condensate drain system is provided.



Front view, GA 75 VSD and GA 90 VSD Workplace



*Rear view, GA 75 VSD and GA 90 VSD Workplace*

Reference	Name
AR	Air receiver
AV	Air outlet valve
Ca	Air cooler
Co	Oil cooler
CV/Vs	Check valve/oil stop valve
Da	Automatic condensate outlet
E	Compressor element
ER	Elektronikon II regulator
FN	Cooling fan
MT	Condensate trap
M1	Drive motor
OF	Oil filter
S3	Emergency stop button
VP	Vent plug
1	Electric cabinet

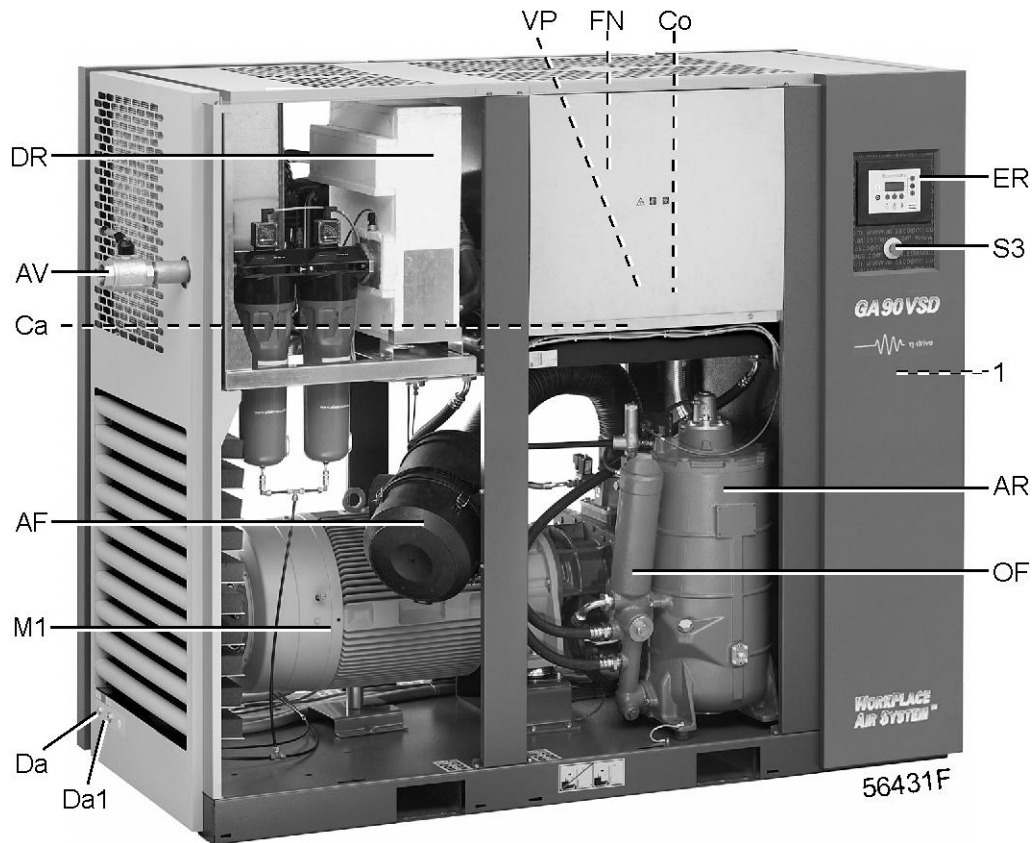
### GA Workplace Full-Feature

GA Workplace Full-Feature (FF) are enclosed in a sound-insulated bodywork. The compressors are controlled by the Atlas Copco Elektronikon® II regulator. The electronic control module is fitted to the door at the right

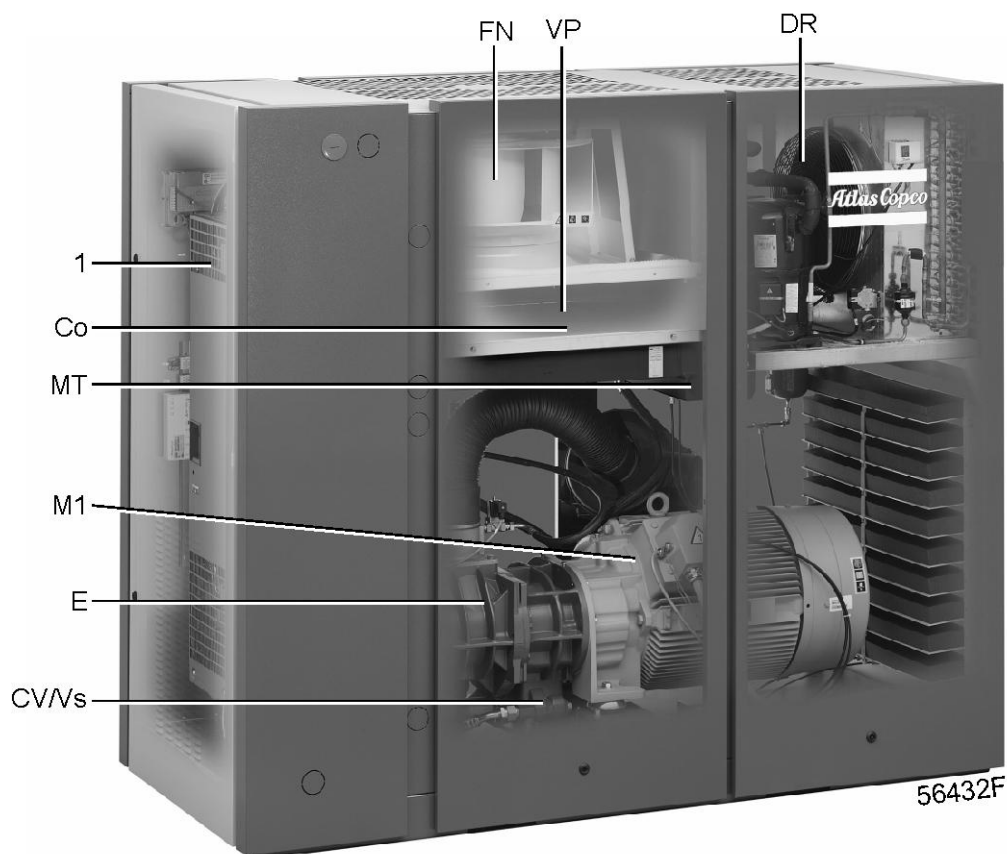


side. An electric cabinet comprising fuses, transformers, relays, etc. is located behind this panel. An automatic condensate drain system is provided.

The compressors are provided with an air dryer which is integrated in the sound-insulated bodywork. The dryer removes condensate from the compressed air by cooling the air to near freezing point.



*Front view, GA 75 VSD and GA 90 VSD Workplace Full-Feature*

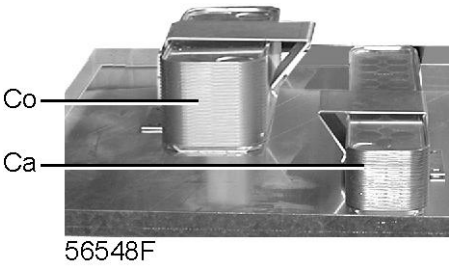


*Rear view, GA 75 VSD and GA 90 VSD Workplace Full-Feature*

Reference	Name
AF	Air filter
AR	Air receiver
AV	Air outlet valve
Ca	Air cooler
Co	Oil cooler
CV/Vs	Check valve/oil stop valve
Da	Automatic condensate outlet
Da1	Automatic condensate outlet, dryer
DR	Dryer
E	Compressor element
ER	Elektronikon II regulator
FN	Cooling fan
MT	Condensate trap
M1	Drive motor
OF	Oil filter
S3	Emergency stop button
VP	Vent plug
1	Electric cubicle



Coolers on water-cooled compressors

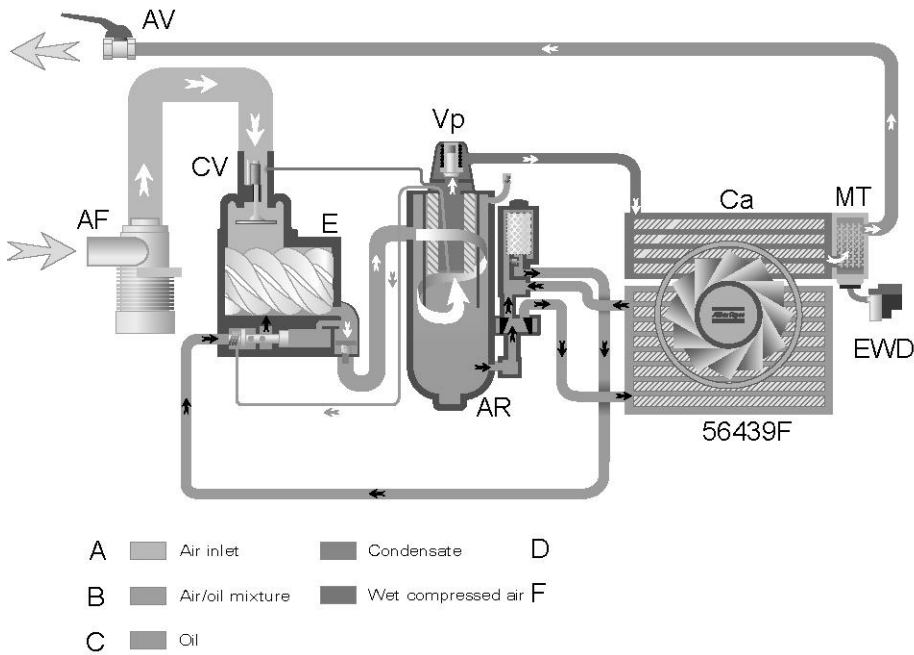


Water-cooled air cooler and oil cooler

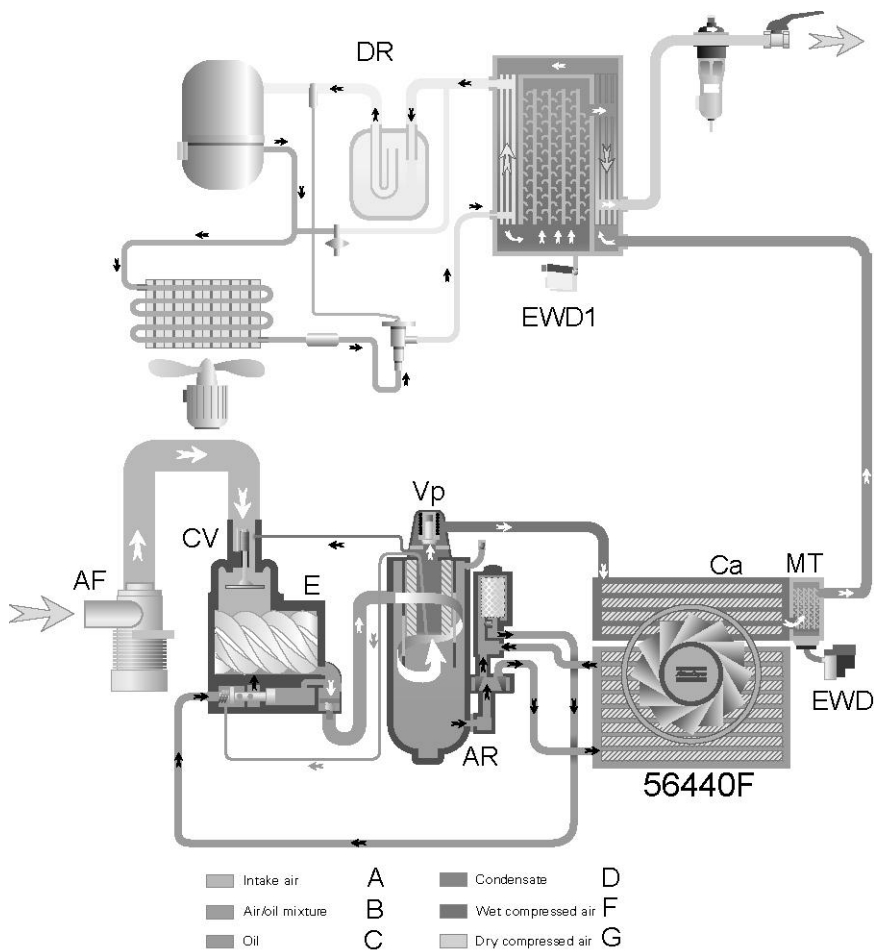
Reference	Name
Ca	Air cooler
Co	Oil cooler

2.2 Air flow

Flow diagram



GA 75 VSD and GA 90 VSD Workplace



GA 75 VSD and GA 90 VSD Workplace Full-Feature

Reference	Description
A	Air inlet
B	Air/oil mixture
C	Oil
D	Condensate
F	Wet compressed air
G	Dry air

**Note:** The cooling fan is not provided on water-cooled compressors.

### Description

Air drawn through filter (AF) and check valve (CV) into compressor element (E) is compressed.

Compressed air and oil flow into the air receiver/oil separator (AR). The air is discharged through the outlet valve via minimum pressure valve (Vp), air cooler (Ca) and condensate trap (MT).

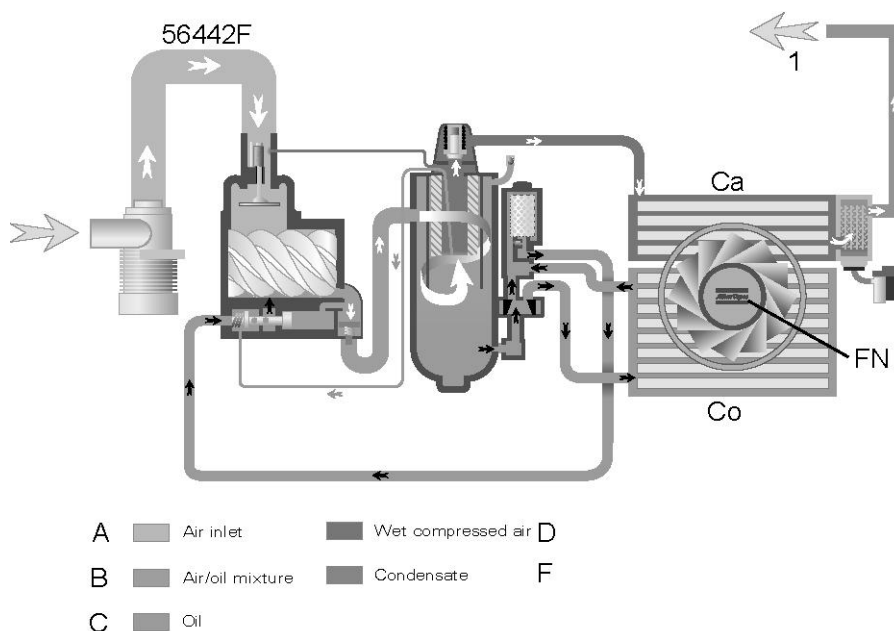
Minimum pressure valve (Vp) prevents the receiver pressure from dropping below a minimum pressure and includes a check valve which prevents blow-back of compressed air from the net.

Full-Feature compressors are provided with a dryer (DR).



## 2.4 Cooling system

### Flow diagrams



Reference	Description
A	Air inlet
B	Air/oil mixture
C	Oil
D	Wet compressed air
F	Condensate
1	In case of a Workplace unit to the water separator In case of a Full-Feature unit to the dryer

**Note:** The cooling fan is not provided on water-cooled compressors.

### Description

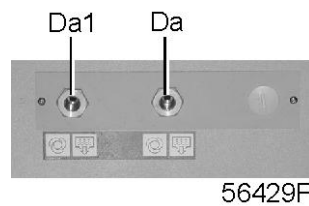
The cooling system comprises air cooler (Ca) and oil cooler (Co).

Air-cooled compressors have a cooling fan (FN).

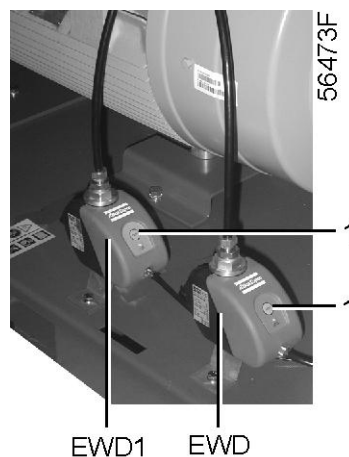
Water-cooled compressors have a cooling water system. The water flows through the inlet pipe, the coolers and the outlet pipe.

## 2.5 Condensate system

### Electronic water drains



*Condensate drains, typical example*



*Location of electronic condensate drains*

GA Workplace and Workplace Full-Feature compressors have an electronic water drain (EWD). The condensate from the air cooler accumulates in a collector. When the condensate reaches a certain level, it is discharged through drain outlet (Da).

On GA Workplace Full-Feature compressors, an additional electronic water drain (EWD1) is provided. The condensate from the separator of the dryer is collected by water drain (EWD1) and discharged through drain outlet (Da1).

Also see section [Air flow](#).

Testing the electronic water drain can be done by pressing the test button (1) on top of the drain.

## 2.6 Regulating system

### Description

If the consumption is less than the air output of the compressor, the net pressure increases. When the net pressure is higher than the set-point (desired net pressure), the regulator will decrease the motor speed. If the net pressure keeps on rising when the motor runs at minimum speed, the regulator stops the motor. If the motor is stopped automatically and the net pressure approaches the set-point, the regulator will restart the motor.

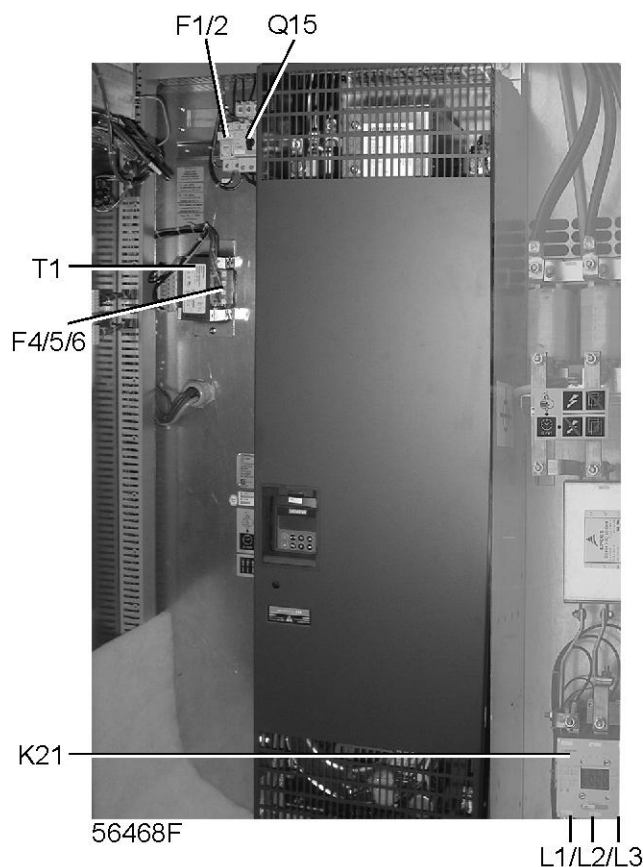
## 2.7 Electrical system

### General

Also consult sections [Electrical diagrams](#) and [Electrical connections](#).

### Electric cabinet

The electrical system comprises the frequency converter and following components:



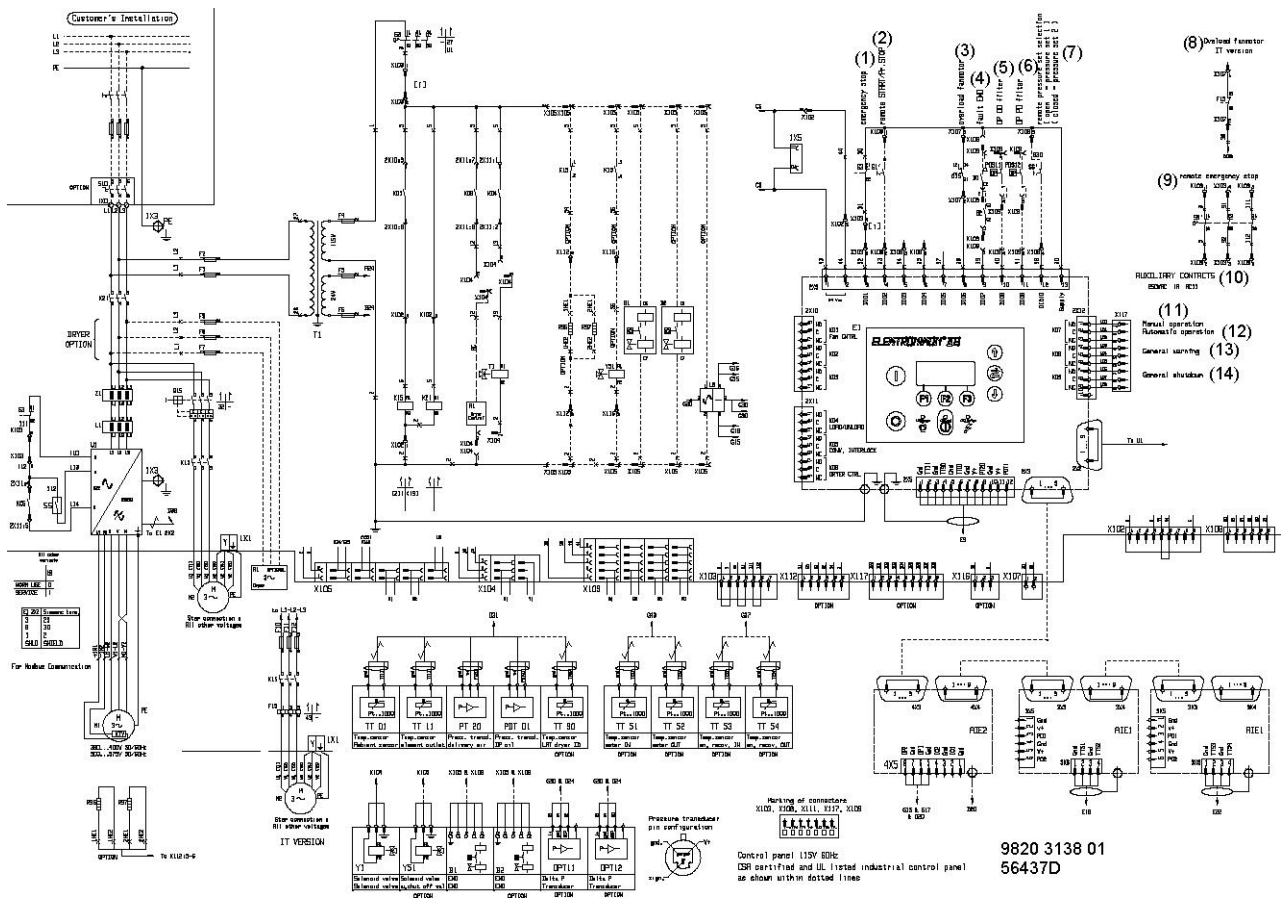
*Electric cabinet for GA 75 VSD and GA 90 VSD, typical example*

### References

Reference	Designation
F1/2	Fuses
F4/5/6	Fuses
K21	Delta contactor
L1/L2/L3	Terminals, power supply
Q15	Circuit breaker
T1	Transformer

## 2.8 Electrical diagrams

### Diagrams



Service diagram for GA 75 VSD and GA 90 VSD

Reference	Designation
(1)	Emergency stop
(2)	Remote start/stop
(3)	Overload, fan motor
(4)	Fault, EWD
(5)	Dp of DD filter
(6)	Dp of PD filter
(7)	Remote pressure set selection
(8)	Overload fan, motor (IT version)
(9)	Remote emergency stop
(10)	Auxiliary contacts
(11)	Manual operation
(12)	Automatic operation
(13)	General warning
(14)	General shut-down

## Designations

Reference	Compressor
A1	Dryer
B1	Electronic Water Drain (EWD)
M1	Compressor motor
M2	Fan motor
PDT01	Pressure sensor, pressure difference across oil separator
PT20	Pressure sensor, delivery air
TT01	Temperature sensor, ambient air
TT11	Temperature sensor, element outlet
TT51	Temperature sensor, cooling water inlet (water-cooled compressors)
TT52	Temperature sensor, cooling water outlet (water-cooled compressors)
TT53/54	Temperature sensor, energy recovery water inlet/outlet
TT90	Temperature sensor, dew-point (Full-Feature)
Y1	Loading solenoid valve

Reference	Starter cubicle
F1/F12	Fuses
K11	Auxiliary contactor for dryer (Full-Feature)
K15	Contactor, fan motor
K21	Main contactor
L1	Filter
Q15	Circuit breaker, fan motor
SS	Service switch
T1	Transformer
U1	Frequency converter
Z1	E.M.C. filter
1X1/1X7	Terminal strips
X101/X121	Connectors

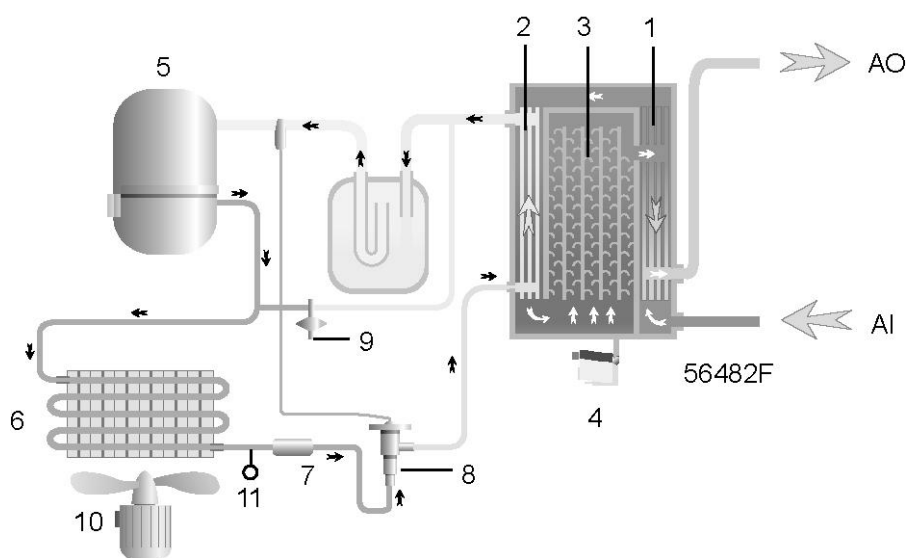
Reference	Control module
I	Start button
K01	Auxiliary relay, fan motor
K02	Auxiliary relay
K03	Auxiliary relay
K04	Auxiliary relay, load/unload
K05	Auxiliary relay, VSD
K06	Auxiliary relay, dryer control
K07	Auxiliary relay, manual/automatic operation
K08	Auxiliary relay, general warning
K09	Auxiliary relay, general shut-down
O	Stop button
S3	Emergency stop button



Reference	Optional equipment
AIE1	Analogue input expansion module
B2	Electronic Water Drain (EWD) (Full-Feature)
PDS11	Dp switch for integrated DD filter
PDS12	Dp switch for integrated PD filter
R3/R4/R7	Freeze protection
R8/R9	Heaters converter
R96	Anti-condensation heater
S10	Main power isolating switch
TSLL91	Thermostat, cubicle freeze protection
TSLL92	Thermostat, converter freeze protection
TT91	Temperature sensor, cubicle freeze protection
TT92	Temperature sensor, converter freeze protection
Y51	Water shut-off valve (water-cooled compressors)

## 2.9 Air dryer

### Flow diagram



*Air dryer*

Reference	Name
AI	Air inlet
AO	Air outlet
1	Air/air heat exchanger
2	Air/refrigerant heat exchanger/evaporator
3	Condensate separator
4	Condensate outlet
5	Refrigerant compressor

Reference	Name
6	Refrigerant condenser
7	Liquid refrigerant dryer/filter
8	Thermostatic expansion valve
9	Hot gas by-pass valve
10	Condenser cooling fan
11	Pressure switch, fan control

### Compressed air circuit

Compressed air enters heat exchanger (1) and is cooled by the outgoing, cold, dried air. Water in the incoming air starts to condense. The air then flows through heat exchanger/evaporator (2) where the refrigerant evaporates causing the air to be cooled further to close to the evaporating temperature of the refrigerant. More water in the air condenses. The cold air then flows through separator (3) where all the condensate is separated from the air. The condensate is automatically drained through outlet (4).

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

### Refrigerant circuit

Compressor (5) delivers hot, high-pressure refrigerant gas which flows through condenser (6) where most of the refrigerant condenses.

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

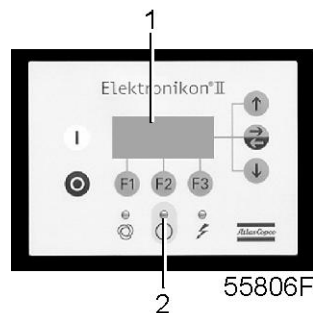
The refrigerant enters evaporator (2) where it withdraws heat from the compressed air by further evaporation at constant pressure. The heated refrigerant leaves the evaporator and is sucked in by the compressor (5).

By-pass valve (9) regulates the refrigerant flow. Fan (10) is switched on or off by switch (11) depending on the loading degree of the refrigerant circuit.

## 3 Elektronikon II regulator

### 3.1 Elektronikon® II regulator

#### Control panel



#### General

**The Elektronikon regulator controls the compressor:**

- By matching the compressor output to the air consumption
- By stopping the compressor whenever necessary
- By restarting the compressor when required

**In general, the Elektronikon regulator has following functions:**

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

#### Controlling the compressor

**The regulator matches the air output of the compressor to the air consumption by speed regulation of the motor. The regulator takes into account a number of programmable settings, e.g:**

- Net pressure set-point
- Indirect stop offset
- Direct stop offset
- Proportional band
- Integration time
- Minimum speed
- Minimum stop time
- Maximum speed limit
- Power recovery time (if activated)

**The regulator stops the compressor whenever necessary:**

- Indirect stop: i.e. the compressor runs at minimum speed and the net pressure rises to the indirect stop level.  
See section [Programmable settings](#).
- Direct stop: i.e. the compressor runs at a speed between minimum and maximum and the net pressure rises above the direct stop set-point.

See section [Programmable settings](#).



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

## Protecting the compressor

### Shut-down

If the compressor element outlet temperature exceeds the programmed shut-down level, the compressor will be stopped. This will be indicated on display (1) and general alarm LED (2) will flash. The compressor will also be stopped in case of overload of the fan motor.

Remedy the trouble and reset the message. See also section [Status data menu](#).



Before remedying, consult sections [Safety precautions](#) and [Problem solving](#)

### Shut-down warning

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

If the compressor element outlet temperature exceeds the programmed shut-down warning level, a message will appear on display (1) and general alarm LED (2) will light up to warn the operator that the shut-down warning level is exceeded.

The message disappears as soon as the warning condition disappears.

## Service warning

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

## Warning

### A warning message also appears if:

- On water-cooled compressors, the cooling water outlet temperature exceeds the warning level.
- On Full-Feature compressors, the dewpoint temperature exceeds the warning level.

## Automatic restart after voltage failure

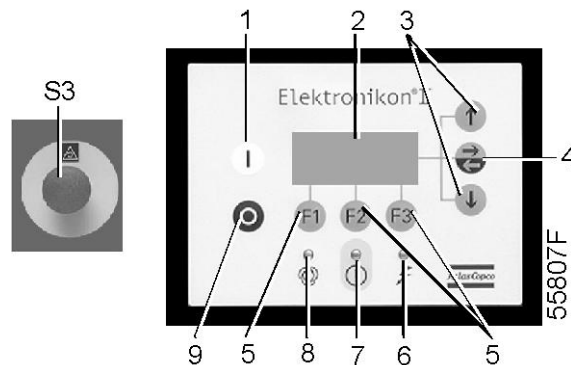
The regulator has a built-in function to automatically restart the compressor when the voltage is restored after voltage failure. This function is deactivated in compressors leaving the factory. If desired, the function can be activated. Consult the Atlas Copco Customer Centre.



If activated, and provided the regulator was in the automatic operation mode, the compressor will automatically restart if the supply voltage to the module is restored within a programmed time period.  
The power recovery time (the period within which the voltage must be restored to have an automatic restart) can be set between 10 and 3600 seconds or to 'Infinite'. If the power recovery time is set to 'Infinite', the compressor will always restart after a voltage failure, no matter how long it takes to restore the voltage. A restart delay can also be programmed, allowing e.g. two compressors to be restarted one after the other.

## 3.2 Control panel

### Elektronikon regulator

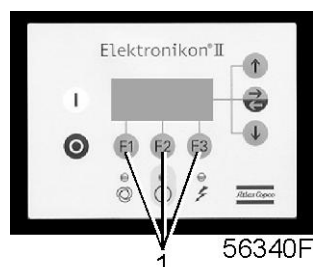


### Parts and functions

Reference	Designation	Function
1	Start button	Button to start the compressor. LED (8) lights up indicating that the Elektronikon regulator is operative.
2	Display	Shows messages about the compressor operating condition, a service need or a fault.
3	Scroll keys	Keys to scroll upwards or downwards through the display.
4	Tabulator key	Key to select the parameter indicated by the horizontal arrow. Only the parameters followed by an arrow pointing to the right can be modified.
5	Function keys	Keys to control and program the compressor.
6	Voltage on LED	Indicates that the voltage is switched on.
7	General alarm LED	Is lit if a warning, service warning or shut-down warning condition exists.
7	General alarm LED	Flashes if a shut-down condition exists, if an important sensor is out of order or after an emergency stop.
8	Automatic operation LED	Indicates that the regulator is automatically controlling the compressor.
9	Stop button	Button to stop the compressor. LED (8) goes out. On GA 75 VSD and GA 90 VSD only: button to stop the compressor. LED (8) goes out. The compressor will slow down to minimum speed and then stop after a few seconds.
S3	Emergency stop button	Push button to stop the compressor immediately in the event of an emergency. After remedying the trouble, unlock the button by pulling it out.

## 3.3 Function keys

### Control panel



### Function keys

The keys (1) are used:

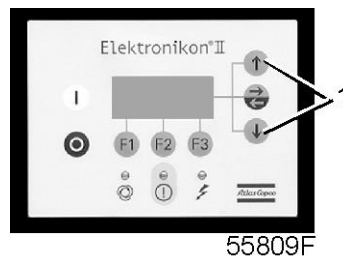
- To call up or to program settings
- To reset a motor overload, shut-down or service message, or an emergency stop
- To access all data collected by the regulator

The functions of the keys vary depending on the displayed menu. The actual function is indicated just above the relevant key. The most common functions are listed below:

Designation	Function
'Add'	To add compressor start/stop commands (day/hour)
'Back'	To return to a previously shown option or menu
'Canc'	To cancel a programmed setting when programming parameters
'Del.'	To delete compressor start/stop commands
'Help'	To find the Atlas Copco Internet address
'Lim.'	To show limits for a programmable setting
'Main'	To return from a menu to the main screen
'Menu'	Starting from the main screen, to have access to the submenus
'Menu'	Starting from a submenu, to return to a previous menu
'Mod.'	To modify programmable settings
'Prog'	To program modified settings
'Rset'	To reset a timer or message
'Rtrn'	To return to a previously shown option or menu
'Xtra'	To find the module configuration of the regulator

### 3.4 Scroll keys

#### Control panel



The keys (1) allow the operator to scroll through the display.

As long as a downwards pointing arrow is shown at the far right position of the display, the scroll key with the same symbol can be used to see the next item.

As long as an upwards pointing arrow is shown at the far right position of the display, the scroll key with the same symbol can be used to see the previous item.

### 3.5 Emergency stop button

#### Control panel



In the event of an emergency, press button (S3) to stop the compressor immediately.

#### Warning



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

- Wait until the compressor has stopped.
- Close the air outlet valve. Unlock the button by pulling it out. Press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurised.
- Open the isolating switch (customer's installation) to switch off the voltage to the compressor.
- Depressurise the air system.

For detailed instructions, see section [Problem solving](#).

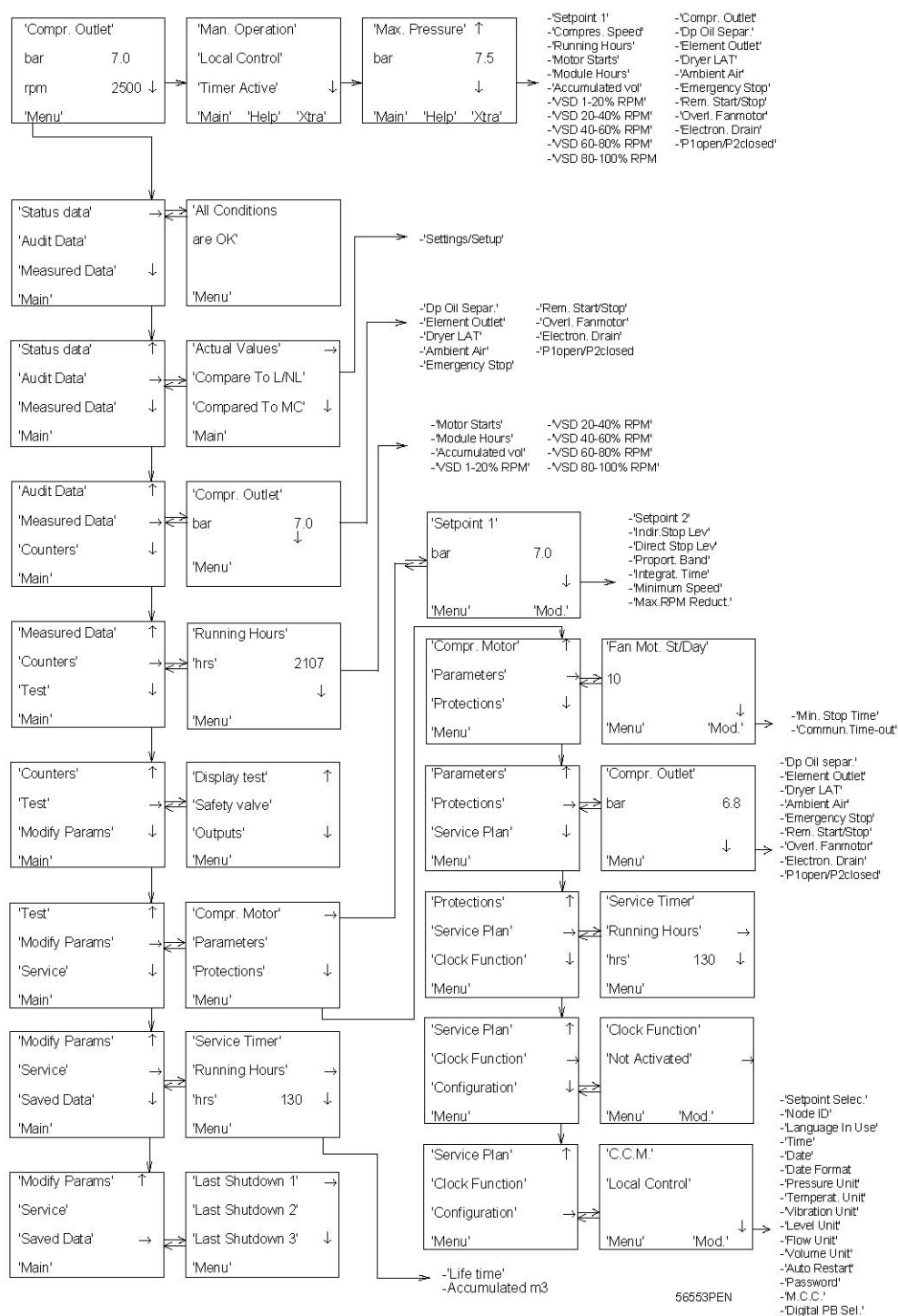
The operator must apply all relevant [Safety precautions](#).

## 3.6 Control programs

### Description

In order to facilitate programming and controlling, menu-driven control programs have been implemented in the regulator.

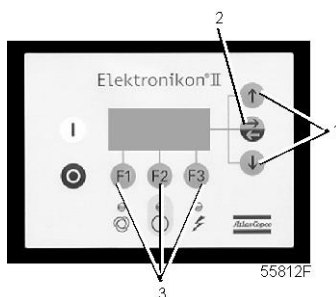
### Menu flow (simplified)





## 3.7 Main screen menu

### Function



*Control panel*

The Main screen menu shows the status of the compressor operation and is the gateway to all functions implemented in the regulator.

### Procedure

The Main screen is shown automatically when the voltage is switched on.

If the function or arrow keys (1, 2 and 3) are not used for some minutes, the regulator will automatically return to the Main screen.

Whenever displayed on a submenu screen, press the 'Main' key (F1) to return to the Main screen.

Example of Main screen

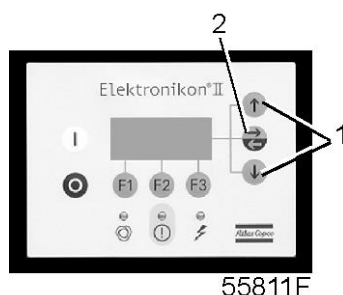
'Compr. Outlet'			
bar		7.0	
rpm		2500	↓
'Menu'			
F1	F2	F3	

#### The display indicates:

- The name of the sensor and its actual reading
- Messages regarding the compressor operating condition
- Just above the function keys (3), the actual functions of these keys

## 3.8 Calling up menus

### Description



Control panel

When the voltage is switched on, the Main screen is shown automatically.

'Compr. Outlet'			
bar		7.0	
rpm		2500	↓
'Menu'			
F1	F2	F3	

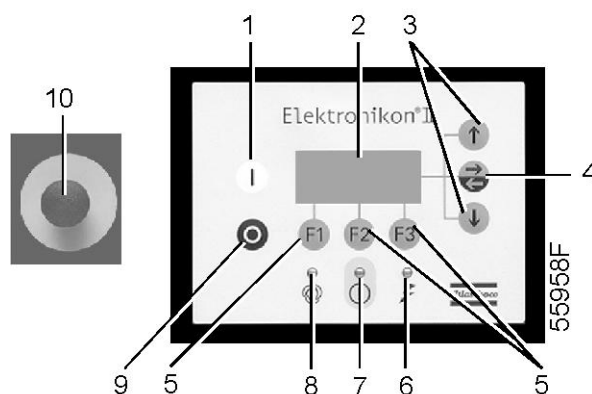
The arrow down key (1) can be used for a quick look at the actual compressor status.

**After pressing the 'Menu' (F1) key, the option 'Status data' will be followed by a horizontal arrow:**

- Either press the tabulator key (2) to select this menu,
- Or use the arrow down key (1) until the desired submenu is followed by a horizontal arrow and then press the tabulator key (2) to select this menu.

## 3.9 Quick look at the actual compressor status

### Procedure



Control panel

Starting from the Main screen (see section [Main screen menu](#)), press the arrow down key (3): A screen similar to the one below appears:

Example of the compressor status screen

'Auto Operation'			
'Local Control'			
'Timer Active'			
'Main'	'Help'	'Xtra'	↓
F1	F2	F3	

Line 1 indicates the automatic or manual operation status of the regulator: 'Auto Operation' means that the regulator automatically adapts the operation of the compressor, i.e. matching the compressor output to the air consumption.


Line 2 indicates whether the regulator is operating in local control or remote control mode: 'Local Control' means that the start/stop buttons on the keyboard are activated. 'Remote Control' means that these functions are controlled remotely.

Line 3 indicates whether the timer which generates time-based start and stop commands is activated or not.

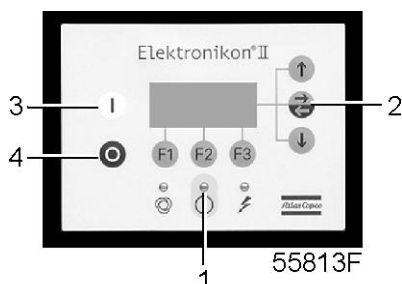
Press the arrow down key (3) to get other data (actual condition of the compressor). See section [Control programs](#).

## 3.10 Status data menu

### Warning

	Before starting any maintenance or repairs, press the stop button (4) and wait until the compressor has stopped. Close the air outlet valve and press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurized. Press the red emergency stop button and open the isolating switch (customer's installation) to switch off the voltage to the compressor.
	Before remedying, consult sections <a href="#">Safety precautions</a> and <a href="#">Problem solving</a>
	Depressurise the air system.

### Function



Control panel

The Status data submenu gives information regarding the status of the compressor protection functions (shut-down, shut-down warning, service warning and warning) and allows resetting of a shut-down, motor overload and service condition.

## Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the key 'Menu' (F1): the option 'Status data' will be followed by a horizontal arrow.
- Press the tabulator key (2).

### No message exists

- General alarm LED (1) is out and the message on the display will indicate that all conditions are normal:

'All Conditions are OK'			
.			
.			
'Menu'			
F1	F2	F3	

### A shut-down message exists

- If the compressor is shut down, LED (1) will flash.
- In the event of a shut-down due to too high a temperature at the outlet of the compressor element:

'Element Outlet'			
°C		122	
'Shd'	'Max'	120	
'Menu**'		'**Rset'	
F1	F2	F3	

- The indicators (\*\*) are flashing. The screen shows the actual reading (122°C), that the compressor is shut down ('Shd'), and the shut-down setting (120°C).
- It remains possible to scroll through other menus, e.g. to check the values of other parameters. When returning to the 'Status data' menu, the option 'Shutdowns' will flash. This option can be selected by pressing the tabulator key (2) to return to the above shut-down screen.

### Shut-down reset

- Switch off the voltage and remedy the trouble. After remedying and when the shut-down condition has disappeared, switch on the voltage and press the key 'Rset' (F3).
- Press the keys 'Menu' and 'Main' to return to the Main screen and restart the compressor by means of start button (3).

### Reset of fan motor overload

- Switch off the voltage and remedy the trouble. The fan motor circuit breaker (Q15) must be reset manually. Switch on the voltage and press the key 'Rset' (F3).
- Press the keys 'Menu' and 'Main' to return to the Main screen and restart the compressor by means of start button (3).

### A shut-down warning message exists

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

- If a shut-down warning exists, LED (1) is lit. The Main screen will change into a screen similar to the one below:

'Compr. Outlet'			
bar		7.0	
'*Shd'	'Warn*'		
'Menu**'			
F1	F2	F3	

- The indicators (\*\*) are flashing.
- Press the key 'Menu' (F1) and the tabulator key (2) to select the 'Status data' menu; the option 'Protection' is flashing.
- Scroll to this option and select it by pressing the tabulator key (2). A screen similar to the one below appears:

'Element Outlet'			
°C			
'Shdw'	'Max'	116	
'Menu**'		110	
F1	F2	F3	

- The screen indicates that the temperature at the outlet of the compressor element exceeds the programmed shut-down warning level.
- If necessary, stop the compressor by means of stop button (4) and wait until it has stopped.
- Switch off the voltage, inspect and remedy.
- The warning message will disappear automatically as soon as the warning condition disappears.

### A service warning exists

- LED (1) is lit. The Main screen will change into a screen similar to the one below:

'Compr. Outlet'			
bar		7.0	
'*Serv.Requir.*'			
'Menu**'			
F1	F2	F3	

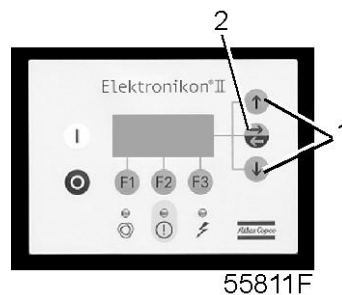
- The indicators (\*\*) are flashing and the service warning message appears.
- Press the key 'Menu' (F1) and the tabulator key (2) to select the 'Status data' menu: the option 'Service' is flashing.
- Scroll to this option and select it by pressing the tabulator key (2); following options may flash:
  - 'Inputs': if the programmed service level of a component is exceeded (e.g. the maximum pressure drop of the oil separator).
  - 'Plans': if a service plan interval is exceeded.
- Stop the compressor and switch off the voltage.
- If the service message was referring to 'Inputs' (oil separator): replace the separator, switch on the voltage, scroll in the 'Status data' menu to 'Inputs' and press the 'Rset' key to reset the service message.
- If the service message was referring to 'Plans': carry out the service actions related to the indicated plans. Reset the timers of the related plans. Contact your Atlas Copco Customer Centre. See section [Service menu](#).

### A warning message exists

- LED (1) is lit and a warning message will appear on the screen.
- The indicators (\*\*) are flashing. This warning indicates that:
  - On water-cooled compressors, the cooling water temperature exceeds the programmed warning level.
  - On Full-Feature compressors with dryer, the dew-point temperature exceeds the warning level.
- Stop the compressor and switch off the voltage. Inspect the compressor and remedy.

## 3.11 Audit data menu

### Control panel



### Function

To find the energy saved by the GA VSD compressor compared to a compressor with load/no-load regulation (L/NL) or compared to one with modulating control (MC). Consult the menu flow in section [Control programs](#).

### Procedure

**Starting from the Main screen (see [Main screen menu](#)):**

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Audit data' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2). Three submenus are shown: 'Actual Values', 'Compare To L/NL' and 'Compared to MC'. By pressing the arrow down key (1) another submenu appears: 'Settings/Setup'. Only the submenus followed by a horizontal arrow are accessible.

### 'Actual Values' submenu

If scrolling to submenu 'Actual Values' and pressing key (2), the current load percentage will be shown (compared to the maximum load). By pressing the arrow down key (1), the current power consumption is shown.

### 'Compare to L/NL' or 'Compared to MC' submenu

The 'Compare To L/NL' or 'Compared to MC' submenu is only accessible if a test period is running or finished, see below.

**If scrolling to one of these submenus and pressing key (2), following data are shown:**

- 'Capacity': average flow during the test period
- 'Capacity': average flow (percentage) compared to the maximum load
- 'Package Power': average power consumption during the test period

- ‘Energy saved’: percentage of energy saved compared to a compressor with load/no-load regulation (L/NL) or compared to one with modulating control (MC)
- ‘Energy saved’: amount of energy (kWh) saved compared to a compressor with load/no-load regulation (L/NL) or compared to one with modulating control (MC)
- ‘Savings’: cost saving

### ‘Settings/Setup’ submenu

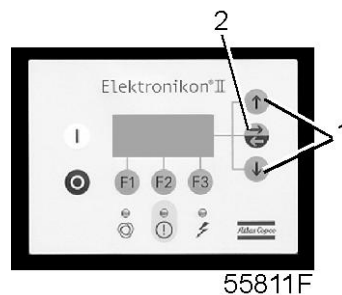
To enter all data: scroll to submenu ‘Settings/Setup’ and press key (2), then enter: the duration of the test period (in hours), the capacity of the air net, the currency unit (not possible on earlier production compressors, otherwise in USD) and the kWh cost.

During a test period, the following screen will show the remaining time of the period in hours.

After the test period, the message ‘Period Finished’ will appear.

## 3.12 Measured data menu

### Control panel



### Function

To call up information regarding the actually measured data and the status of some inputs such as the motor overload protection. Consult the menu flow in section [Control programs](#).

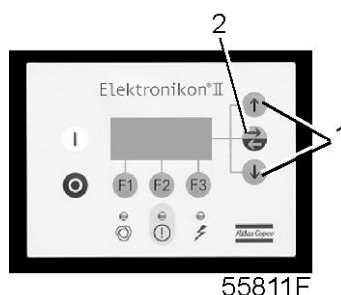
### Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the key ‘Menu’ (F1).
- Press the arrow down key (1) until ‘Measured data’ is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- By pressing the scroll keys (1), a number of actually measured data can be found.
- If one of the sensors is linked to a shut-down, service or warning function, both the actually measured value as well as the corresponding shut-down, warning or service level can be called up by pressing key (2).

### 3.13 Counters menu

#### Control panel



#### Function

##### To call up:

- The loaded hours
- The number of motor starts
- The number of hours the regulator (module) has been under tension
- The accumulated volume

#### Procedure

Starting from the Main screen (see section [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Counters' is followed by a horizontal arrow.
- Press the tabulator key (2) to activate the menu.
- By pressing the arrow key (1), the above-mentioned data can be found.

#### Calling up the accumulated volume

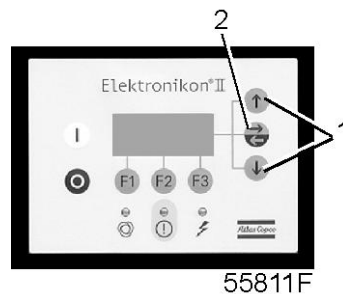
'Accumulated vol'			↑
'1000 m3'		230	
.			
'Menu'	'Mod.'		↓
F1	F2	F3	

- Consult the procedure above to select 'Accumulated vol'.
- In the example above, the display indicates that the compressor has delivered 230 x 1000 m<sup>3</sup>. If it should be required to modify the value of the indicated timer, consult Atlas Copco.



## 3.14 Test menu

### Control panel



### Function

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

### Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press arrow down key (1) until 'Test' is followed by a horizontal arrow.
- Activate the menu by pressing the key (2).
- The option 'Display test' will be followed by a horizontal arrow.
- To test the display, press the key (2). During testing, the regulator will generate a series of patterns on the display which enable the operator to check that each pixel still functions normally; at the same time the LEDs are lit.

## 3.15 Modify parameters menu

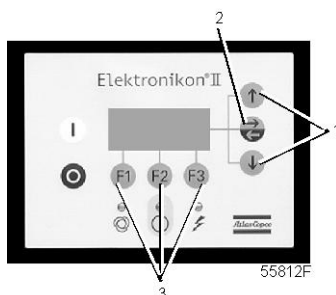
### Function

**To modify a number of programmable settings:**

- Compressor/motor settings (see section [Modifying compressor and motor settings](#)).
- Parameters (see section [Modifying parameters](#)).
- Protections (see section [Modifying protections](#)).
- Service plan settings (see section [Modifying service plan settings](#)).
- Clock function settings (see section [Modifying clock function settings](#)).
- Configuration settings (see section [Modifying configuration settings](#)).

## 3.16 Modifying compressor/motor settings

### Control panel



### Function

To modify a number of settings. Consult the menu flow in section [Control programs](#).

### Procedure

Starting from the Main screen (see section [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- The first item 'Compr. Motor' will be followed by a horizontal arrow.
- Press the tabulator key (2): the first item 'Setpoint 1' and its setting will appear.
- Press the arrow down key (1) until the parameter to be modified is followed by a horizontal arrow.

### Modifying the net pressure set-points

If desired, the operator can program two set-points ('Setpoint 1' and 'Setpoint 2').

- Consult the steps above to select 'Setpoint 1'.

'Setpoint 1'			
bar		7.0	
.			
'Menu'	'Mod.'		↓
F1	F2	F3	

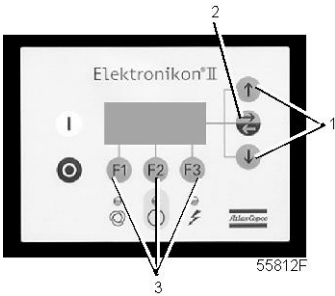
- The screen shows that the current setting is 7.0 bar(e). To modify this setting, press the key 'Mod.' (F2); the setting will flash.
- The key 'Lim.' (F2) can be used to find out the limitations for the parameter.
- Use the scroll keys (1) to change the setting.
- Press the key 'Prog' (F1) to program the new value or the key 'Canc' (F3) to cancel the modification operation.
- The procedure to modify 'Setpoint 2' is similar.



The regulator will not accept new values beyond the limits. Press the key 'Lim.' to check the limitations for the parameter. Consult section Programmable settings for the most important settings.

### 3.17 Modifying parameters

Control panel



Function


To modify a number of parameters. Consult the menu flow in section [Control programs](#).

Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the key ‘Menu’ (F1).
- Press the arrow down key (1) until ‘Modify Params’ is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Press the arrow down key (1): the first item ‘Fan Mot. St/Day’ and its setting will appear.
- To modify this setting, press the key ‘Mod.’ (F2), the setting will flash. Use the arrow down key or the arrow up key (1) to change the value. Press the key ‘Prog’ (F1) to program the new setting or the key ‘Canc’ (F3) to cancel the operation.
- The procedure to modify other parameters is similar.

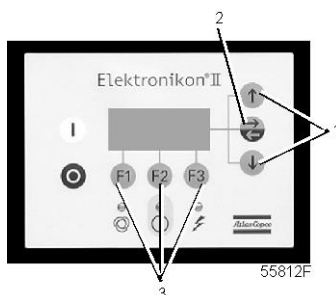
‘Fan Mot. St/Day’			
‘Number’		240	
.			
‘Menu’	‘Mod.’		↓
F1	F2	F3	



The regulator will not accept new values beyond the limits. Press the key ‘Lim.’ to check the limitations for the parameter. Consult section [Programmable settings](#) for the most important settings.

## 3.18 Modifying protection settings

### Control panel



### Function

To modify protection settings:

- Shut-down ('Shd'), e.g. for the compressor element outlet temperature
- Shut-down warning ('Shdw'), e.g. for the compressor element outlet temperature
- Warning ('Warn'), e.g. the cooling water temperature outlet for water-cooled compressors
- Service warning ('Serv'), e.g. the pressure drop of oil separator

To check various compressor conditions, e.g. the status of the fan motor overload contacts.

Some parameters cannot be modified.

### Procedure

Starting from the Main screen (see section [Main screen menu](#)):

- Press the 'Menu' key (F1).
- Press the arrow down key (1) until the option 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Press the arrow down key (1) until the option 'Protections' is followed by a horizontal arrow.
- Press the tabulator key (2): the first item and its value will appear.
- Press the arrow down key (1) until the item to be modified is followed by a horizontal arrow and press the tabulator key (2).

### Modifying settings for the compressor element temperature

- Consult the section Procedure to select the parameter 'Element outlet'. Example:

'Element outlet'			
°C		94	→
'Shd Max.'		120	↓
'Menu'	'Mod.'		
F1	F2	F3	

- The screen shows the current temperature (94 °C) and the shut-down setting (120 °C). To modify the setting, press the 'Mod.' key (F2); the setting will flash.
- The 'Lim.' key (F2) can be used to find out the limits for the parameter.
- Use the scroll keys (1) to change the setting.
- Press 'Prog' key (F1) to program the new value or 'Canc' (F3) to cancel the modification operation.

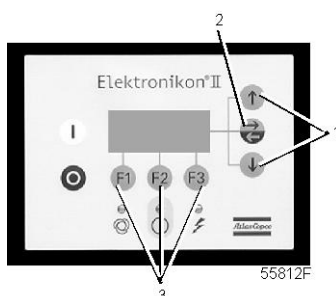
- The screen also shows a horizontal arrow indicating that the shut-down warning value can be modified (the procedure is similar to the description above).
- The procedure to modify other items is similar. For some settings, a delay can be programmed.



The regulator will not accept new values beyond the limits. Press the key 'Lim.' to check the limits for the parameter. Consult Programmable settings for the most important settings.

## 3.19 Modifying service plans

### Control panel



### Function

To modify the hour intervals for the service levels.

### Service plans

The service actions to be carried out are grouped in plans called Service level A, B, C or D. When reaching an interval, a message will appear on the screen indicating which Service plans are to be carried out.



Always consult your Atlas Copco Customer Centre if any timer should be changed. The intervals must not exceed the intervals below and must coincide logically.

### Programmed service plan intervals

Service plans	Intervals
Service plan A	Each 4000 running hours
Service plan B	Each 4000 running hours
Service plan C	Each 8000 running hours
Service plan D	Each 24000 running hours



The regulator will not accept new values beyond the limits. Press the key 'Lim.' to check the limits for the parameter. Consult [Programmable settings](#) for the most important settings.

## Resulting service actions to be carried out

Service actions according to	At
Service plan A and B	4000 running hours
Service plan A, B and C	8000 running hours
Service plan A and B	12000 running hours
Service plan A, B and C	16000 running hours
Service plan A, B, C and D	24000 running hours
...	...

## Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the 'Menu' key (F1).
- Press the arrow down key (1) until 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Press the arrow down key (1) until 'Service Plan' is followed by a horizontal arrow.
- Press the tabulator key (2): a screen similar to the one below will appear:

'Service Timer'			
'Running hours'			→
'hrs'		2130	
'Menu'			↓
F1	F2	F3	

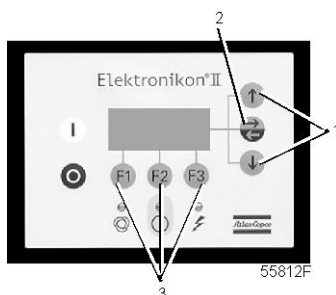
- The screen shows the actual running hours.
- Press the tabulator key (2): a screen similar to the one below will appear:

'Service Timer'			
'Level A'			
'hrs'		4000	
'Menu'	'Mod.'		↓
F1	F2	F3	

- The screen indicates that the level for Service plan A is set at 4000 running hours.
- Press the 'Mod.' key (F2). The key 'Lim.' (F2) can be used to find out the limitations for the parameter. Use the arrow up and arrow down keys to modify the interval.
- Press the 'Prog' key (F1) to program the new setting or the 'Canc' key (F3) to cancel the modification operation.
- The procedure to modify the Service plans B, C and D is similar.

## 3.20 Programming clock function

### Control panel



### Function

To program:

- Time-based start/stop commands for the compressor
- Time-based change-over commands for the setpoint

### Programming start, stop and setpoint commands

In this example, the compressor will be programmed as follows:

- On Monday at 06:15 starting with setpoint 1
- On Friday at 18:00 changing over to setpoint 2
- On Saturday at 18:00 stopping

Starting from the Main screen (see [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing tabulator key (2).
- Use the arrow down key (1) to scroll until the option 'Clock Function' is followed by a horizontal arrow.
- Activate the menu by pressing tabulator key (2); the following screen appears:

'Clock Function'			
'Not Activated'			→
.			
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

- Press the tabulator key (2), the following screen appears:

'Monday'			→
'Tuesday'			
'Wednesday'			↓
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

- Use the scroll keys (1) until the day on which a command must be programmed is followed by a horizontal arrow. Press the tabulator key (2); the following screen appears:

--:--	-----		→
--:--	-----		
--:--	-----		↓
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

- Press the key 'Mod.' (F2). The first two dashes will flash. Use the scroll keys (1) to enter 06. Press the tabulator key (2) to jump to the following two dashes. Use the scroll keys to enter 15. Press the tabulator key to jump to the row of dashes. Use the scroll keys to enter the command 'Start'.
- Press the key 'Prog' to program the command: '06:15 Start Compressor'.
- Press the arrow down key (1): the horizontal arrow indicates that the second line is accessible. Press the key 'Mod.' and modify this line in a similar way to the following command: '06:15 Setpoint 1'.
- Press the key 'Menu' (F1) and scroll to 'Friday':

'Thursday'			↑
'Friday'			→
'Saturday'			↓
'Menu'		'Del.'	
F1	F2	F3	

- Programming the command to change over at 18 o'clock to setpoint 2 is carried out in a similar way as described above.
- Press the key 'Menu' (F1) and scroll to 'Saturday'. Programming the command '18:00 Compressor Stop' is carried out in a similar way as described above.


### Activating/deactivating the timer

- The timer can only be activated if at least one start/stop command is programmed.
- Starting from the Main screen, press the key 'Menu' (F1).
- Use arrow down key (1) until the option 'Modify Params' is followed by a horizontal arrow.
- Press the tabulator key (2) to activate the menu.
- Use the arrow down key until the option 'Clock Function' is followed by a horizontal arrow, press the tabulator key (2), the following screen appears:

'Clock Function'			→
		'Not Activated'	
.			
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

- Press the key 'Mod', 'Not Activated' starts flashing.
- Press the arrow down key (1) 'Not Activated' changes to 'Activated'.
- Press the key 'Prog'.



	<p>It is necessary to program the start/stop commands in successive order time-wise. Program the commands from 'Monday' till 'Sunday', e.g.:</p> <ul style="list-style-type: none"> <li>• 07.30 Start Compressor</li> <li>• 07.30 Setpoint 1</li> <li>• 08.30 Setpoint 2</li> <li>• 18.00 Stop Compressor</li> </ul>
	Make sure that the timer function is activated ('Activated'). If not, the programmed start/stop commands will not be executed.
	The timer can be deactivated again. In this case, the programmed start/stop commands will not be executed (but remain in the memory of the regulator).

## Modifying a command

Suppose the command to stop the compressor on Saturday 18:00 is to be modified, i.e. stopping at 17 o'clock instead of 18 o'clock.

- Starting from the Main screen, press the key 'Menu' (F1), press the arrow down key (1) until the option 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Use the arrow down key (1) to scroll until the option 'Clock Function' is followed by a horizontal arrow. Press the tabulator key, the following screen appears:

'Clock Function'			→
		'Not Activated'	
.			
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

- Press the tabulator key (2), the following screen appears:

'Monday'			→
'Tuesday'			
'Wednesday'			↓
'Menu'		'Del.'	
F1	F2	F3	

- Scroll through the display until 'Saturday' is followed by a horizontal arrow. Press the tabulator key (2). If necessary, scroll through the commands until the command to be modified is followed by a horizontal arrow. Press the key 'Mod.', the first two digits of the command start flashing. Modify as required using the scroll keys, i.e. in the example above change 18 to 17 using the arrow up key (1).
- If necessary, press the tabulator key (2) to go to the next field to be modified, the minutes indication and the start/stop/setpoint indication.
- Press the key 'Prog' to program the new command or the key 'Canc' to quit without reprogramming.

## Adding a command at the end of an existing list

- Starting from the Main screen, press the key 'Menu' (F1), press the arrow down key until the option 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Use the arrow down key (1) to scroll until the option 'Clock Function' is followed by a horizontal arrow. Press the tabulator key, the following screen appears:

'Clock Function'			→
		'Not Activated'	
.			
'Menu'	'Mod.'	'Del.'	
F1	F2	F3	

Suppose the command to stop the compressor at 18:00 must be added to the list of Monday.

- Press the tabulator key (2), the following screen appears:

'Monday'			→
'Tuesday'			
'Wednesday'			↓
'Menu'		'Del.'	
F1	F2	F3	

- Scroll through the display until 'Monday' is followed by a horizontal arrow. Press the tabulator key (2). Scroll through the compressor start/stop/setpoint commands until the first empty command line is indicated by the horizontal arrow.
- Press the key 'Mod.'; the first two digits start flashing. Enter '18:00 Compressor Stop' using the scroll keys (1) to modify a field and the tabulator key (2) to jump from one field to another.
- Press the key 'Prog' to program the new command or the key 'Canc' to quit without reprogramming.

### Adding a command between two existing commands

Suppose the command '17:00 Setpoint 2' must be added to the following list:

- '06:00 Start Compressor'
- '06:00 Setpoint 1'
- '18:00 Stop Compressor'

The regulator does not allow the entering of a new command which time-wise is situated before the last command in the list.

Scroll through the display until the command before which the new command must be entered is followed by a horizontal arrow (in the example above: '18:00 Stop Compressor') and press the key 'Mod.'.

Change this command to the new command (in the example above '17:00 Setpoint 2').

Press the arrow down key and add the last command of the list (in the example above '18:00 Stop Compressor' and press the key 'Prog'.

### Deleting a command

- Starting from the Main screen, press the key Menu (F1), press the arrow down key until the option 'Modify Params' is followed by a horizontal arrow.
- Activate the menu by pressing the tabulator key (2).
- Use the scroll keys (1) to scroll until the option 'Clock Function' is followed by a horizontal arrow. Press the tabulator key, the following screen appears:

'Clock Function'			→
		'Not Activated'	
.			
'Menu'	'Mod'	'Del'	
F1	F2	F3	

### Deleting all commands

- Press the key 'Del.' in the screen above. A question to confirm the deleting operation will appear.

### Deleting all commands of a specific day

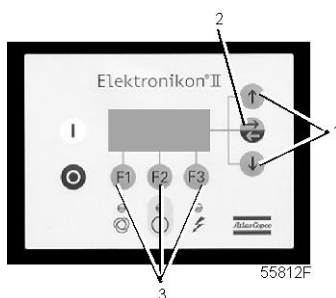
- Scroll through the display until the desired day is followed by a horizontal arrow. Press the key 'Del.', a question to confirm the deleting operation will appear.

### Deleting a specific command

- Scroll through the display until the command to be deleted is followed by a horizontal arrow. Press the key 'Del.', a question to confirm the deleting operation will appear.

## 3.21 Modifying configuration settings

### Control panel



### Function

To modify a number of parameters. Consult the menu flow in section [Control programs](#).

### Procedure

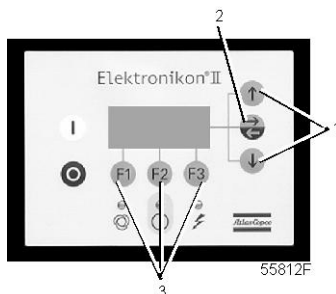
Starting from the Main screen (see [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Modify Params' is followed by an arrow pointing to the right.
- Activate the menu by pressing tabulator key (2).
- Press the arrow down key (1) to scroll until 'Configuration' is followed by a horizontal arrow.
- Activate the menu by pressing tabulator key (2): the first item 'Time' will appear. If another option is desired, scroll through the display until the option is followed by a horizontal arrow. Select the option by pressing the tabulator key (2).
- For the option 'Time', the second line on the screen indicates the actual setting, e.g. '14:30'. To modify this setting, press the key 'Mod.' (F2); the first field '14' will flash.
- Use the scroll keys (1) to change the setting, then press the tabulator key (2) to go to the next field '30'. The setting of this field can now be modified using the scroll keys (1).

- Press the key 'Prog' (F1) to program the new value or the key 'Canc' (F3) to cancel the modification operation (the original value will be retained).
- The procedure to modify other parameters is similar.

## 3.22 Programming compressor control modes

### Control panel



### Compressor control modes

The compressor can be controlled locally, remotely or via a local area network (LAN).

### Procedure

Starting from the Main screen (see [Main screen menu](#)):

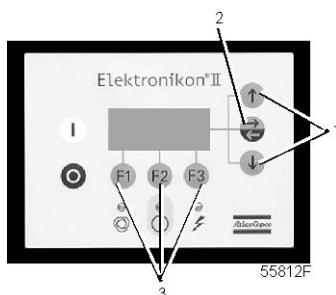
- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Modify Params' is followed by an arrow pointing to the right.
- Activate the menu by pressing tabulator key (2).
- Press the arrow down key (1) to scroll until 'Configuration' is followed by a horizontal arrow.
- Activate the menu by pressing tabulator key (2): the first item 'Time' will appear. Scroll through the display using the scroll keys (1) until the option 'C.C.M.' is followed by a horizontal arrow and select it using the tabulator key (2). The following screen is shown:

'C.C.M.'			↑
'Local Control'			
.			
'Menu'	'Mod.'		↓
F1	F2	F3	

- Press the key 'Mod.' and use the scroll keys (1) to select the desired control mode. Press the key 'Prog' to program or the key 'Canc' to cancel the modification.

## 3.23 Service menu

### Control panel



### Function

- To reset the service plans which are carried out.
- To check when the next service plans are to be carried out.
- To find out which service plans were carried out previously.

### Service plans

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

When a service plan interval is reached, a message will appear on the screen; see section [Status data menu](#). After carrying out the service actions related to the indicated levels, the timers must be reset.

### Example

Service plans	Intervals
Service plan A	Every 4000 running hours
Service plan B	Every 4000 running hours
Service plan C	Every 8000 running hours
Service plan D	Every 24000 running hours

Resulting service actions according to	At
Service plan A and B	4000 running hours
Service plan A, B and C	8000 running hours
Service plan A and B	12000 running hours
Service plan A, B and C	16000 running hours
Service plan A, B, C and D	24000 running hours
...	...

### Procedure

Starting from the Main screen (see [Main screen menu](#)):

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until 'Service' is followed by a horizontal arrow.
- Activate the menu by pressing tabulator key (2).

- A screen similar to the one below appears:

'Service Timer'			
'Running Hours'			→
'hrs'		7971	↓
'Menu'			
F1	F2	F3	


- The screen shows that the total compressor running time is 7971 hours.
- Press the tabulator key (2), the following screen appears:

'Next Timer'			
'Level'	A B C		
'hrs'		8000	↓
'Back'		'Rset'	
F1	F2	F3	

- The screen shows that the next service plans to be carried out are plans A, B and C and that these plans are to be carried out every 8000 running hours.
- Press the arrow down key (1) to find out which service plans were carried out previously; the following screen appears:

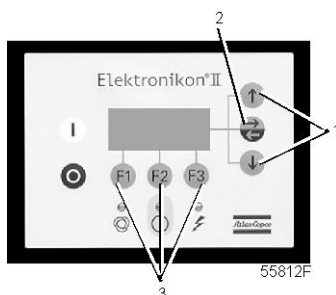
'Previous Timer'			↑
'Level'	A B		
'hrs'		4008	
.			
F1	F2	F3	

- The screen shows that service plans A and B were carried out at 4008 running hours.
- Stop the compressor, switch off the voltage and carry out the service operations related to plans A, B and C.  
See section [Preventive maintenance schedule](#).
- Switch on the voltage and scroll to the 'Next Timer' service screen.
- Press the 'Rset' button (F3). Confirm the question for resetting.

	The 'Rset' button only appears when the 'Next Timer' level is almost reached.
	After pressing the arrow down key in the 'Service Timer' screen, the 'Life Time' hours are shown, i.e. the number of hours elapsed since initial programming ex-factory. This timer is not taken into account.

## 3.24 Saved data menu

### Control panel



### Function

To call up some compressor data saved by the regulator. These data are:

- Last shut-down data
- Last emergency stop data

### Procedure

**Starting from the Main screen:**

- Press the key 'Menu' (F1).
- Press the arrow down key (1) until the option 'Saved Data' is followed by a horizontal arrow.
- Press the tabulator key (2) to activate the menu.
- The list of last shut-down and emergency stop cases is shown.
- Scroll through the items to select the desired shut-down or emergency stop item.
- Press tabulator key (2) to find the date, time and other data reflecting the status of the compressor when the last shut-down occurred.

## 3.25 Programmable settings

### Compressor/motor

		Minimum setting	Factory setting	Maximum setting
Set-point 1/2				
GA VSD Workplace	bar(e)	4	7	13
GA VSD Workplace	psig	58	100	188
GA VSD Full-Feature	bar(e)	4	7	12.8
GA VSD Full-Feature	psig	58	100	186
Indirect stop level	bar	0.1	0.3	1
Indirect stop level	psi	1.45	4.35	14.5
Direct stop level	bar	0.3	1	1.5
Direct stop level	psi	4.35	14.5	21.8
Proportional band	%	6	10	15

		<b>Minimum setting</b>	<b>Factory setting</b>	<b>Maximum setting</b>
Integration time	sec	5	6	10

Minimum motor speed:				
200 V and 230 V units	rpm	700	700	1000
500 V and 575 V units	rpm	600	600	1000
380 V, 400 V and 460 V units	rpm	600	600	1000
Maximum RPM reduction	%	75	100	100

Maximum motor speed:		Pressure setpoint 7.5 bar	Pressure setpoint 13 bar
200 V and 230 V units	rpm	2700	2060
500 V units	rpm	2850	2175
575 V units	rpm	2560	2100
380 V, 400 V and 460 V units	rpm	2560	2100

## Parameters

		<b>Minimum setting</b>	<b>Factory setting</b>	<b>Maximum setting</b>
Minimum stop time:				
GA 75 VSD	sec	5	5	30
GA 90 VSD	sec	5	5	30
Power recovery time	sec	10	10	3600
Restart delay	sec	0	0	1200
Communication time-out	sec	10	30	60
On air-cooled compressors also:				
Fan motor starts per day		1	240	240

## Protections

		<b>Minimum setting</b>	<b>Factory setting</b>	<b>Maximum setting</b>
Compressor element outlet temperature (shut-down warning level)	°C	50	110	119
Compressor element outlet temperature (shut-down warning level)	°F	122	230	246
Compressor element outlet temperature (shut-down level)	°C	111	120	120
Compressor element outlet temperature (shut-down level)	°F	232	248	248



		Minimum setting	Factory setting	Maximum setting
Oil separator (pressure difference)	bar	0	1	2
Oil separator (pressure difference)	psi	0	14.5	29
Oil separator (delay at signal)	sec	0	10	20

<b>For Full-Feature compressors also:</b>		Minimum setting	Factory setting	Maximum setting
Dewpoint warning temperature	°C		25	99
Dewpoint warning temperature	°F		77	210
Delay at signal	sec	0	3	255
Delay at starting	sec	0	255	255

<b>For water-cooled compressors also:</b>		Minimum setting	Factory setting	Maximum setting
Cooling water inlet temperature (warning level)	°C	0	50	99
Cooling water inlet temperature (warning level)	°F	32	122	210
Cooling water outlet temperature (warning level)	°C	0	60	99
Cooling water outlet temperature (warning level)	°F	32	140	210
Delay at warning signal	sec	0	0	255
Delay at start	sec	0	0	255

## Service plan

Also see section [Preventive maintenance schedule](#).

Consult Atlas Copco in case any timer setting should be changed. The intervals must not exceed the nominal intervals and must coincide logically. See section [Modifying service plans](#).

		Minimum setting	Factory setting	Maximum setting
Service plan A (running hours)				
On compressors filled with Food Grade Fluid (running hours)	hr		2000	
On compressors filled with Roto-Inject Fluid (running hours)	hr		4000	
On compressors filled with HD Roto-FluidPlus	hr		8000	
Service plan B (running hours)	hr		4000	
Service plan C (running hours)	hr		8000	
Service plan D (running hours)	hr		24000	

## Terminology

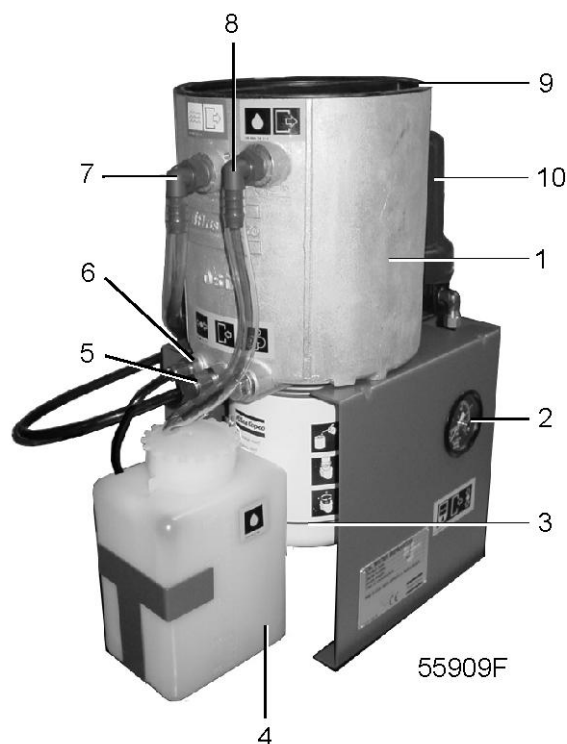
Term	Explanation
ARAVF	Automatic restart after voltage failure. See section <a href="#">Elektronikon regulator II</a> .
Compressor element outlet	The regulator does not accept illogical settings, e.g. if the warning level is programmed at 95 °C (203 °F), the minimum limit for the shut-down level changes to 96 °C (204 °F). The recommended difference between the warning level and shut-down level is 10 °C (18 °F). The recommended minimum setting is 70 °C (158 °F). For testing the temperature sensor the setting can be decreased to 50 °C (122 °F). Reset the value after testing.
Delay at signal	Is the time period during which the warning signal must exist before the warning message appears.
Delay at start	Is the time period after starting which must expire before generating a warning. The setting should be less than the setting for the delay at signal.
Minimum stop time	Once the compressor has automatically stopped, it will remain stopped for the minimum stop time (approx. 20 seconds), whatever happens with the net air pressure. Consult Atlas Copco if a setting lower than 20 seconds should be required
Oil separator	Use Atlas Copco oil separators. The recommended maximum pressure difference is 1 bar (15 psi).
Power recovery time	Is the period within which the voltage must be restored to have an automatic restart. Is accessible if the automatic restart is activated. See section <a href="#">Elektronikon II regulator</a> . To activate the automatic restart function, consult Atlas Copco.
Proportional band and integration time	The settings for the Proportional band and integration time are determined by experiment. Altering these settings may damage the compressor. Consult Atlas Copco.

## 4 OSD oil/condensate separator (optional)

### 4.1 OSD unit

#### Oil-condensate separators

Compressed air leaving oil-injected compressors contains oil. During cooling of this air, oil-containing condensate is formed. OSD are designed to separate the major part of this oil from the condensate and to catch the oil in a collector. The condensate meets the requirements of the environmental codes.



*General view of OSD 90, typical example*

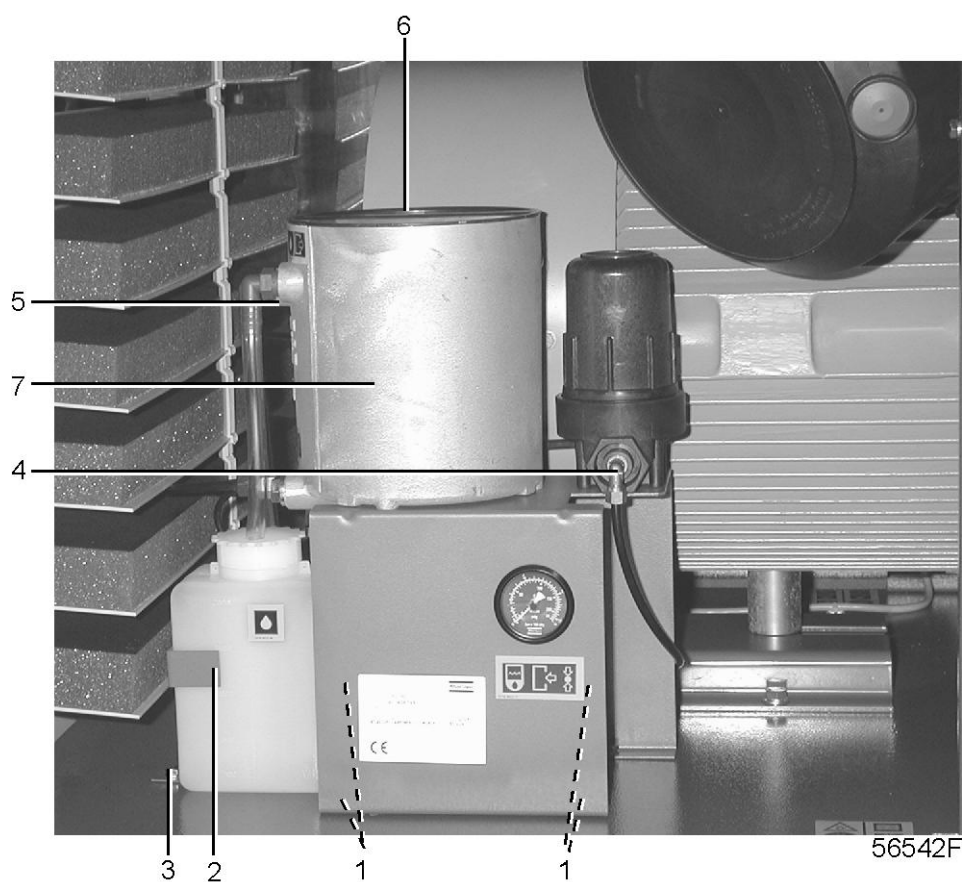
Reference	Designation
1	Vessel
2	Pressure gauge, filter
3	Oil filter
4	Oil collector
5	Condensate inlet
6	Dp of filter
7	Clean condensate outlet
8	Oil outlet
9	Cover
10	Pre-filter

## Operation of OSD 90

Condensate containing fine oil droplets flows through a pre-filter (10) towards strainer (5). The condensate flows through filter (3) in which the droplets coalesce into larger drops. This oil is led to water vessel (1) where the oil rises due to the difference in specific mass. The vessel is provided with two separated outlets: one for condensate (7), which is led outside the bodywork, and one for the separated oil (8), which is caught in collector (4).

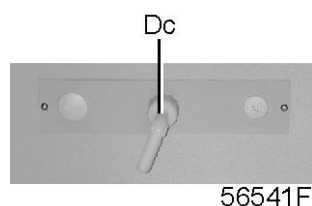
## 4.2 Instructions for Field installation

### Location of OSD

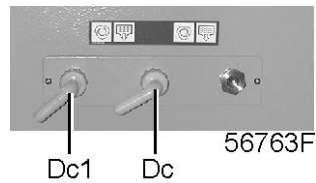


*GA 55<sup>+</sup> up to GA 90, GA 75 VSD and GA 90 VSD*

### Condensate drains



*GA Workplace*



GA Full-Feature

## Procedure

1. Stop the compressor and close the air outlet valve. Depressurize the air outlet system by pressing the test button on top of the Electronic Water Drain(s). Switch off the voltage.
  - Install one OSD unit for Workplace compressors.
  - Install two OSD units for Full-Feature compressors.
 See section [Condensate system](#) for location of the drain(s) and Electronic Water Drain(s).
2. Loosen the condensate drain tube of the compressor condensate trap from its coupling (Da). Also loosen the condensate drain tube of the dryer condensate trap from its coupling (Da1).
3. Position the separator kit as shown and fix it with bolts (1).
4. Fix support (2) with bolt(s) (3).
5. Connect the loose drain tube from condensate drain (Da) to the connection of pre-filter (4). Connect the loose drain tube from condensate drain (Da1) to the connection of pre-filter (4).
6. Remove the coupling (Da) and install the couplings delivered with the separator kit. Connect water tube (5) to the rear side of coupling (Dc). Lead the condensate outlet flexible from coupling (Dc) towards the condensate drain system. For Workplace Full-Feature compressors repeat this action by removing coupling (Da1) and install and connect coupling (Dc1) from the second OSD.
7. Remove the cover (6) and fill vessel (7) with water until the water flows through the water outlet of the OSD (5). Reinstall the cover.

## 4.3 Operating and maintenance instructions

### Safety precautions



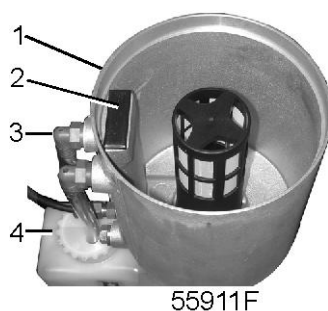
**Before carrying out any maintenance, repair work or adjustments, proceed as follows:**

- Stop the compressor.
- Close the air outlet valve and press the test button on top of the electronic water drain until the air system between air receiver and outlet valve is fully depressurized.
- Press the emergency stop button.
- Switch off the voltage.
- Depressurize the compressor.

For detailed instructions, see [Problem solving](#).

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

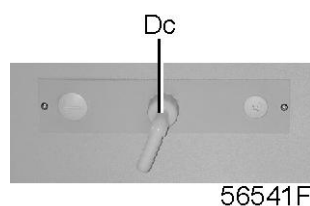
## Operating instructions



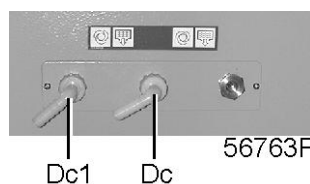
*Inside of OSD*

- Before starting, check that vessel (1) is filled. If necessary, gently pour water into filler pipe (2) until it flows through tube (3). Reinstall the cover.
- During operation of the compressor, an oil layer is built up above the water level in vessel (1). Depending on the capacity of the compressor and its operation cycle, the humidity of the inlet air and the oil content of the compressed air, it may take several weeks or months before an oil level is observed in collector (4).
- Regularly check that vessel (1) is filled. If necessary, gently pour water into filler pipe (2) until it flows through tube (3). Keep the cover installed.

## Condensate drains



*GA and GA VSD Workplace*



*GA Full-Feature and GA VSD Full-Feature*

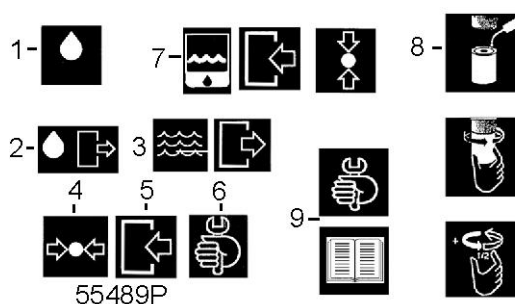
## Maintenance instructions

Consult section [OSD unit](#) for the references.

Interval	Running hours	Operation
Weekly	50	Check pressure gauge (2). If the pressure reaches 2 bar(e) (29 psig) or every 6000 operating hours, replace filter (3): Unscrew the filter. Fill the new filter with water, lightly oil its gasket, screw it on and tighten by hand (approx. half a turn). Check strainer (5); if necessary, clean it.
Monthly	200	Check the oil level in collector (4). If nearly full, disconnect oil tube (8) and deliver the oil to the local oil collection service. Reinstall an empty collector.
"	"	Check pre-filter (10), clean it if necessary.

## 4.4 Pictographs

### Pictographs shown on OSD



Reference	Description
1	Oil
2	Oil outlet
3	Condensate outlet
4	Pressure
5	Inlet
6	Service point drain
7	Separator inlet pressure
8	Oil gasket, screw on filter and tighten by hand (approx. half a turn)
9	Consult instruction leaflet before maintenance or repair

## 5 Energy recovery (optional)

### 5.1 Energy recovery unit

#### Description

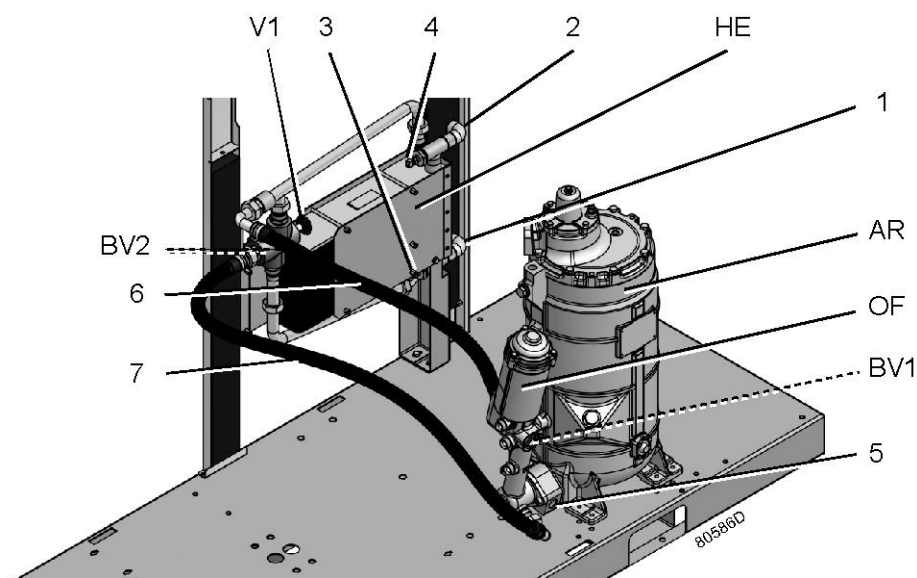
A large part of the energy required for any compression process is transformed into heat. For GA oil-injected screw compressors, the major part of the compression heat is dissipated through the oil system. The Atlas Copco energy recovery (ER) systems are designed to recover most of the above-mentioned heat by transforming it into warm or hot water without any adverse influence on the compressor performance. The water can be used for diverse applications.

#### Components

The energy recovery system is completely integrated and mainly comprises:

- Stainless steel oil/water heat exchanger
- Selector handle (V1) to enable/disable Energy Recovery
- Thermostatic by-pass valve for energy recovery heat exchanger(s) (BV2)
- Two temperature sensors for water inlet and outlet control (3 and 4)
- The necessary bolts, flexibles, etc.

#### Energy recovery unit (ER-unit)



*Main components of the ER unit*

Reference	Designation
1	Water inlet pipe
2	Water outlet pipe
3	Temperature sensor, water inlet pipe
4	Temperature sensor, water outlet pipe



Reference	Designation
5	Oil drain plug
6	Oil line from compressor oil separator vessel to ER unit
7	Oil line from ER unit to oil filter housing
BV2	Location of heat exchanger by-pass valve (BV2)
HE	Heat exchanger
V1	Selector valve
AR	Oil separator vessel
OF	Oil filter housing
BV1	Location of oil cooler bypass valve (BV1)

### Field installation

The main components are assembled ex-factory as a compact unit which fits inside the bodywork of the compressor. Consult Atlas Copco for installing and connecting the energy recovery unit.

## 5.2 Energy recovery systems

### General

The energy recovery systems can be applied as low temperature rise/high water flow systems or as high temperature rise/low water flow systems.

#### Low temperature rise/high water flow (closed water recovery systems)

For this type of application, the temperature difference between the water in the energy recovery system and the compressor oil is low. Therefore, a high water flow is needed for maximum energy recovery.

Example: The heated water is used to keep another medium at a moderately high temperature, in a closed circuit, e.g. central heating.

#### High temperature rise/low water flow (open water recovery systems)

For this type of application, a high water temperature rise in the energy recovery system is obtained, which consequently brings on a low flow rate.

Example: An open circuit where cold water from a main supply is heated by the energy recovery system for use in the factory, e.g. preheating of boiler feed water.

### Recovery water flow

For the references, see section [Energy recovery data](#).

The recovery water enters the unit at inlet connection (1). In heat exchanger (HE) the compression heat is transferred from the compressor oil to the water. The water leaves heat exchanger (HE) via outlet connection (2).

### Recovery water requirements for closed water circuits

The use of a closed recirculating water circuit minimises make-up water requirements. Therefore, the use of soft or even demineralised water is economically feasible and eliminates the problem of scale deposits.

Although the heat exchanger is made of stainless steel, the water circuit connected to the compressor may require corrosion inhibitors. Consult the table below to minimise problems due to bad water quality. If in any doubt, consult Atlas Copco.

Add an anti-freeze product such as ethylene-glycol to the water in proportion to the expected temperature to avoid freezing.

## Recovery water requirements for open water circuits

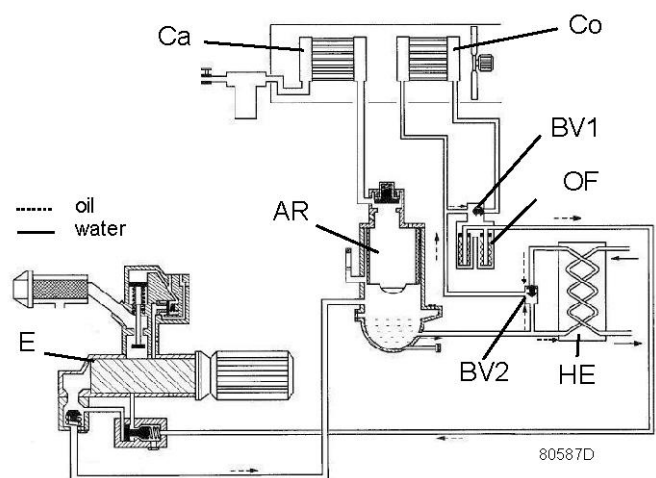
See section [Cooling water requirements](#).

## 5.3 Operation

### General

The compressor oil flow is controlled by two thermostatic valves (BV1 and BV2), ensuring reliable compressor operation and optimum energy recovery.

Bypass valve (BV2) is integrated in the ER unit and controls the working of the oil/water heat exchanger (HE) of the ER unit. Bypass valve (BV1) is integrated in the oil filter housing of the compressor and controls the working of the main oil cooler (Co) of the compressor. Both bypass valves consist of an insert (thermostat) mounted in a housing. Bypass valve BV2 has a separate housing, while BV1 is integrated in the oil filter housing.



*Flow diagram of compressor with energy recovery system*

Reference	Designation	Reference	Designation
BV2	thermostatic bypass valve of ER unit	OF	oil filter
HE	oil/water heat exchanger (ER unit)	AR	oil separator vessel
E	compressor element	BV1	thermostatic bypass valve in oil filter housing
Co	oil cooler (compressor)	Ca	aftercooler (compressor)

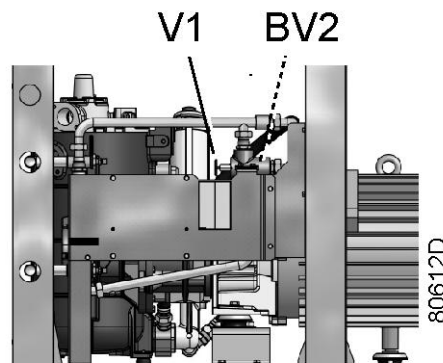
BV2 starts closing the bypass line and opening the oil supply line from the ER heat exchanger (HE) at the lower limit of its temperature range. At the upper limit of its temperature range, the bypass line is completely closed and all the oil flows through the ER heat exchanger.

Variable speed driven (VSD) compressors are equipped with a bypass valve BV2 that starts opening at 60 °C (140 °F) and which is completely open at 75 °C (167 °F).

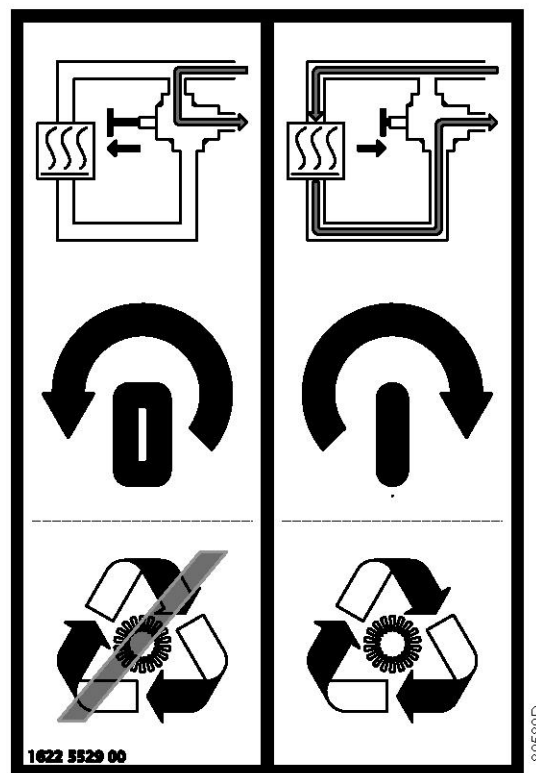
The housing of BV2 is provided with a special handle (V1), allowing to control the working of the energy recovery system.

As can be seen on the ER label, the ER unit is integrated in the oil circuit and will recover energy when the handle is completely turned in clockwise.

When the handle is turned out anticlockwise, the heat exchanger (HE) is bypassed and no energy will be recovered.



*Detail of valve housing of BV2 with handle V1*



*ER label*



Attention: It is only allowed to turn the handle completely in or out. No in-between position is allowed!

The oil cooler bypass valve (BV1) starts closing the bypass line and opening the oil supply line from the main oil cooler (Co) at the lower limit of its temperature range. At the upper limit of its temperature range, the bypass line is completely closed and all the oil flows through the main oil cooler.

BV1 must have a higher opening temperature (set point) than BV2 in order to prevent the heat from being dissipated in the compressor oil cooler (Co) before the warm oil is fed to the oil/water heat exchanger when using the compression heat as source for energy recovery. Thermostat BV1 starts to open at 75 °C (167 °F) and is completely open at 90 °C (194 °F).

### Energy recovery system in use (see drawing)

The handle (V1) of BV2 (bypass valve of the HE) is totally **turned in clockwise**.

- Compressor start-up

When the compressor is started up from cold, the oil temperature will be low. Bypass valve (BV2) shuts off the oil supply from the heat exchanger (HE) and bypass valve (BV1) shuts off the oil supply from the oil cooler (Co) to prevent the compressor oil from being cooled. The oil flows from the oil separator vessel (AR) through the oil filter(s) (OF) back to compressor element (E).

All energy input is used to rapidly warm up the compressor oil. No energy is recovered.

- Maximum energy recovery

As soon the oil temperature reaches the set point (opening temperature) of bypass valve (BV2), the valve starts closing off the bypass over the heat exchanger (HE) oil line, while gradually allowing the oil to flow through the heat exchanger (HE). As the oil temperature rises to approx. 15 °C (27 °F) above the set point, all the oil passes through the heat exchanger. The exchange of heat between the compressor oil and the heat recovery water is maximum. The oil from the heat exchanger outlet flows via oil filter (OF), oil stop valve (Vs - if present), compressor element (E) and separator (AR) back to the inlet of heat exchanger (HE). Bypass valve (BV1) bypasses the oil cooler (Co) as long as the oil temperature remains below its set point.

Operation principle at different loads:

- Low consumption of recovered energy  
In this case, the temperature of the oil leaving heat exchanger (HE) would become too high for the oil to be injected into compressor element (E). Oil cooler bypass valve (BV1) will open the supply line to the compressor oil cooler to allow the hot oil to be cooled in cooler (Co).  
The amount of energy supplied to the water is adapted to the need of energy.
- Recovery water flow too high/temperature too low  
In this case, bypass valve (BV2) will open the bypass line of the oil separator vessel, allowing colder oil from heat exchanger (HE) to be mixed with hot oil from separator (AR). Energy is transferred from the compressor oil to the water, but at a relatively low temperature level.

### Energy recovery system not in use

The handle (V1) is **completely turned out anti-clockwise**.

Except for the opening temperature (set point) of bypass valve (BV1) (see [Thermostatic bypass valves](#)), the oil circuit is the same as without installation of the energy recovery system.

No energy is recovered.

This situation should be considered as exceptional, e.g. in case of maintenance of the energy recovery system or when no energy is required for a long period.

On VSD compressors: close the air outlet valve and run the unit at minimum speed for a few minutes before isolating the energy recovery system from the compressor.

### Stopping the unit for a long period

In case of an open water system and if freezing temperatures can be expected, isolate the compressor water system and blow it through with compressed air.

## 5.4 Maintenance

### Compressor oil

For references used consult section [Energy recovery unit](#).

#### Oil change:

1. Check if handle (V1) is totally turned in clockwise (energy recovery in use).
2. Run the unit until warm. Stop the unit, switch off the isolating switch and close the air outlet valve of the compressor.
3. Depressurize the compressor and drain the oil by opening the drain valve. Also drain the oil from the heat exchanger by removing the drain plug on the oil piping of the ER-unit. Reinstall the drain plug after draining.

### Thermostatic bypass valves

The inserts (thermostats) must be replaced by new ones when abnormal function is noticed. Examples: regulating temperature is not within the normal range, ER heat exchanger remains cold,...

### Heat exchanger (HE)

If the temperature rise over the energy recovery system declines over a period of time with the same basic working conditions, the heat exchanger should be inspected. To clean the oil side, soak the heat exchanger in a degreasing solution. To remove scale formation in the water compartment, a proper descaling process should be applied. Consult Atlas Copco.

## 5.5 Energy recovery data

### Reference conditions

See section [Reference conditions and limitations](#).

### Effective working pressure

Consult section [Compressor data](#) for the normal working pressure.

### Reading settings

In addition to other data, the following temperatures can be read by pressing the scroll key:

- **For air-cooled units:**
  - The water inlet temperature of the energy recovery system.
  - The water outlet temperature of the energy recovery system.

- **For water-cooled units:**
  - The water inlet temperature of the energy recovery system.
  - The water outlet temperature of the energy recovery system.
  - The cooling water outlet temperature of the compressor.

## Modifying settings

If the programmed warning settings for the water temperatures are exceeded, a warning indication is shown on the compressor control module:

Temperature input	Unit	Minimum setting	Nominal setting	Maximum setting
Water inlet of energy recovery	°C	0	50	99
Water inlet of energy recovery	°F	32	122	210
Delay at warning signal	sec	0	Consult Atlas Copco	255
Delay at start (Should be less than delay at warning signal)	sec	0	Consult Atlas Copco	255
Energy recovery water outlet	°C	0	Depends on application	99
Energy recovery water outlet	°F	32	Depends on application	210
Delay at signal	sec	0	Consult Atlas Copco	255
Delay at start	sec	0	Consult Atlas Copco	255

To modify a setting, consult section [Modifying parameters](#)

## Recoverable energy

The recoverable energy can be calculated by using the following formula:

$$\text{RECOVERED ENERGY (kW)} = 4.2 \times \text{water flow (l/s)} \times \text{water temperature rise (°C)}$$

In the tables below, typical examples are given, except for the recovered energy.

Consult Atlas Copco for specifications.

## Data for low temperature rise/high water flow (at maximum speed)

Parameter	Unit	GA75 VSD	GA90 VSD
Recoverable energy	kW	56.3	67.5
Recoverable energy	hp	75.5	90.5
Water flow	l/min	53.6	64.3
Water flow	cfm	1.89	2.27
Temperature at inlet	°C	55	55
Temperature at inlet	°F	131	131
Temperature at outlet	°C	70	70
Temperature at outlet	°F	158	158

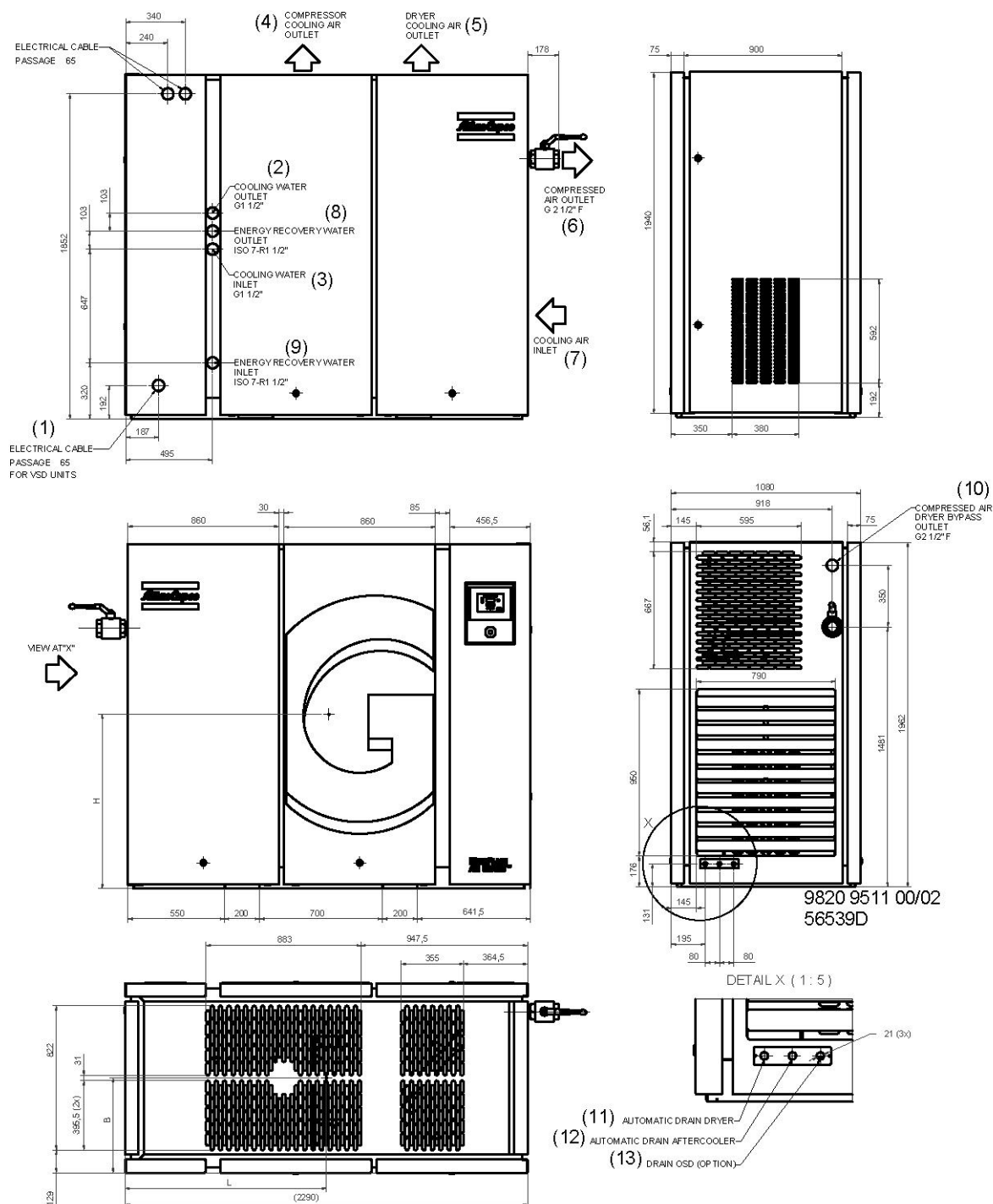
**Data for high temperature rise/low water flow (at maximum speed)**

Parameter	Unit	GA75 VSD	GA90 VSD
Recoverable energy	kW	56.3	67.5
Recoverable energy	hp	75.5	90.5
Water flow	l/min	11.3	13.6
Water flow	cfm	0.40	0.48
Temperature at inlet	°C	20	20
Temperature at inlet	°F	68	68
Temperature at outlet	°C	91	91
Temperature at outlet	°F	196	196

## 6 Installation

### 6.1 Dimension drawings

#### GA 75 VSD and GA 90 VSD



GA 75 VSD and GA 90 VSD



## Centre of gravity

	Unit	With dryer	With dryer	With dryer	Without dryer	Without dryer	Without dryer
Type		L	B	H	L	B	H
GA 75 VSD and GA 90 VSD	mm	1100	505	767	1090	490	700
GA 75 VSD and GA 90 VSD	in	42.9	19.7	29.9	42.5	19.1	27.3

Dimensions in mm: +/- 50 mm (1.95 in)

## Weight

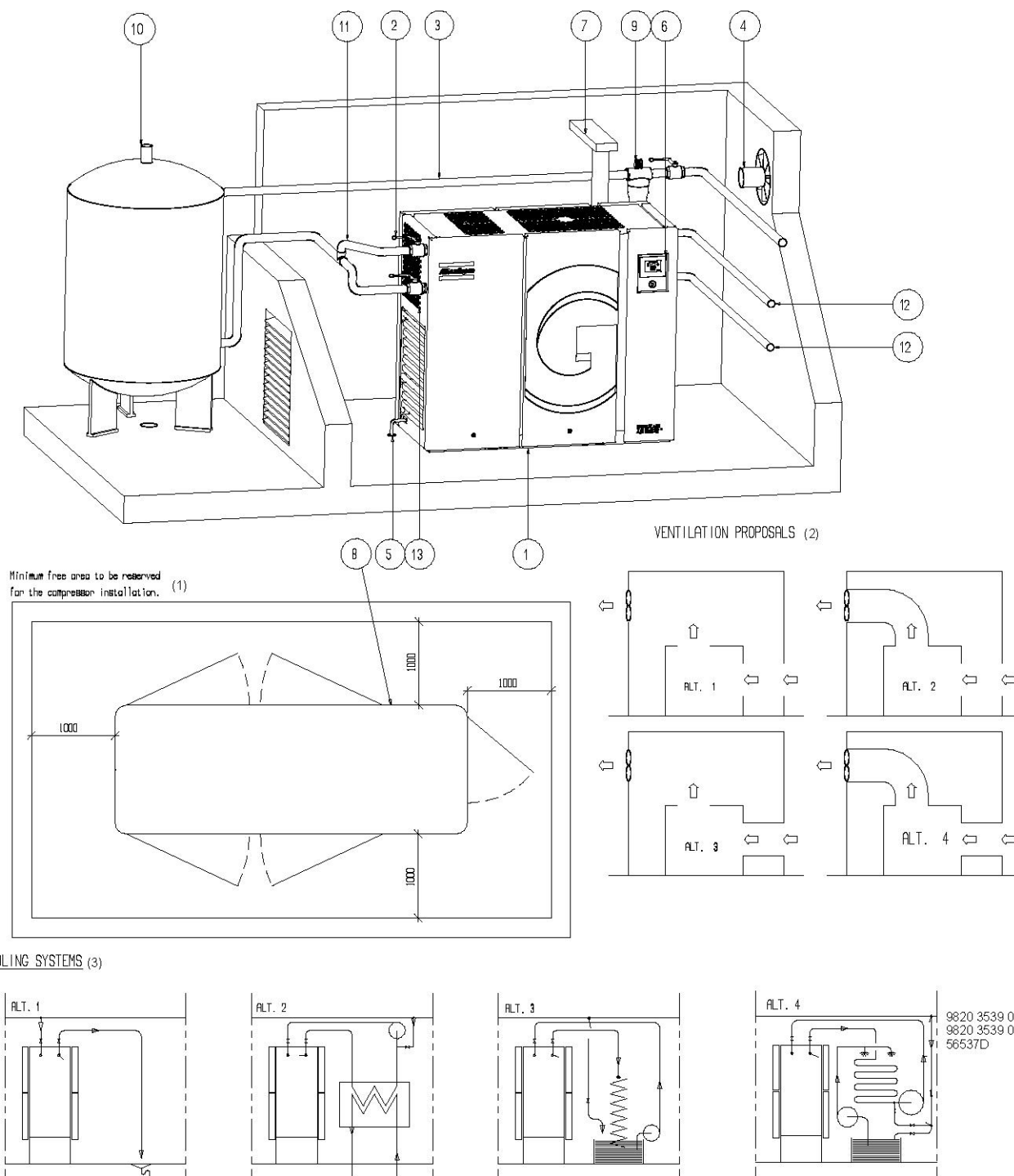
Center of gravity	Unit	Weight	Weight
Type		With dryer	Without dryer
GA 75 VSD	kg	1830	1680
GA 75 VSD	lb	4035	3704
GA 90 VSD	kg	1880	1730
GA 90 VSD	lb	4145	3815

Weights in kg (oil included): +/- 50 kg (110 lb)

Reference	Designation
1	Electric cable passage
2	Cooling water outlet
3	Cooling water inlet
4	Compressor cooling air outlet
5	Dryer cooling air outlet
6	Compressed air outlet
7	Cooling air inlet
8	Energy recovery outlet
9	Energy recovery inlet
10	Compressed air, dryer bypass outlet
11	Automatic drain, dryer (On Workplace Full-Feature units)
12	Automatic drain, aftercooler
13	Drain, OSD unit (optional)

## 6.2 Installation proposal

### Compressor room example



Compressor room example

Text on drawing


(1)	Minimum free area to be reserved for the compressor installation
(2)	Ventilation proposals (on air-cooled compressors)
(3)	Cooling systems (on water-cooled compressors)

## Description

1	Install the compressor unit on a solid, level floor suitable for taking the weight.
2	Position of the compressed air outlet valve.
3	<p>The maximum total pipe length (including interconnecting piping between compressor and receiver) can be calculated as follows:</p> $dp = (L \times 450 \times Q_c^{1.85}) / (d^5 \times p)$ <p>d = Inner diameter of the outlet pipe in mm  dp = Pressure drop (recommended maximum = 0.1 bar/1.5 psi)  L = Length of outlet pipe in m  p = Absolute pressure at the compressor outlet in bar(a)  Qc = Free air delivery of the compressor in l/s</p>
4	<p>Ventilation: the inlet grids and ventilation fan should be installed in such a way that any recirculation of cooling air to the compressor or dryer is avoided. The maximum air velocity through the grids is 5 m/s (16.5 ft/s).  The maximum air temperature at the compressor intake is 46 °C (115 °F) (minimum 0 °C / 32 °F).</p> <p><b>For GA 37 VSD up to GA 90 VSD air-cooled compressors alternatives 1 and 3, the ventilation capacity required to limit the compressor room temperature can be calculated as follows:</b></p> <ul style="list-style-type: none"> <li>• <math>Q_v = 1.06 N/dT</math> for GA VSD Workplace compressors</li> <li>• <math>Q_v = (1.06 N + 8)/dT</math> for GA VSD Workplace Full-Feature compressors</li> </ul> <p>The cooling air of the dryer can be ducted outside  Qv = Required ventilation capacity in m<sup>3</sup>/s  N = Shaft input of compressor in kW  dT = Temperature increase in compressor room  For alternatives 2 and 4: the fan capacity should match the compressor fan capacity at a pressure head equal to the pressure drop over the air ducts.</p> <p><b>For GA 37 VSD up to GA 90 VSD water-cooled compressors, the ventilation capacity required to limit the compressor room temperature can be calculated as follows:</b></p> <ul style="list-style-type: none"> <li>• <math>Q_v = 0.13 N/dT</math> for GA VSD Workplace compressors</li> <li>• <math>Q_v = (0.13 N + 8)/dT</math> for GA VSD Workplace Full-Feature compressors</li> </ul>
5	The drain pipes to the drain collector must not dip into the water of the drain collector. Atlas Copco has oil/water separators (type OSD) to separate the major part of the oil from the condensate to ensure that the condensate meets the requirements of the environmental codes.
6	Control module with monitoring panel.
7	Power supply cable to be sized and installed by an electrician. In case of an IT network consult Atlas Copco.
8	Provision for energy recovery system.
9	<p>Filter, type DD for general purposes. The filter traps solid particles down to 1 micron with a max. oil carry-over of 0.5 mg/m<sup>3</sup>. A high-efficiency filter, type PD, may be installed downstream of a DD filter. This filter traps solid particles down to 0.01 micron with a max. oil carry-over of 0.01 mg/m<sup>3</sup>. If oil vapours and odours are undesirable, a QD type filter should be installed downstream of the PD filter.</p> <p>It is recommended to install by-pass pipes over each filter together with ball valves, in order to isolate the filters during service operations without disturbing the compressed air delivery.</p>

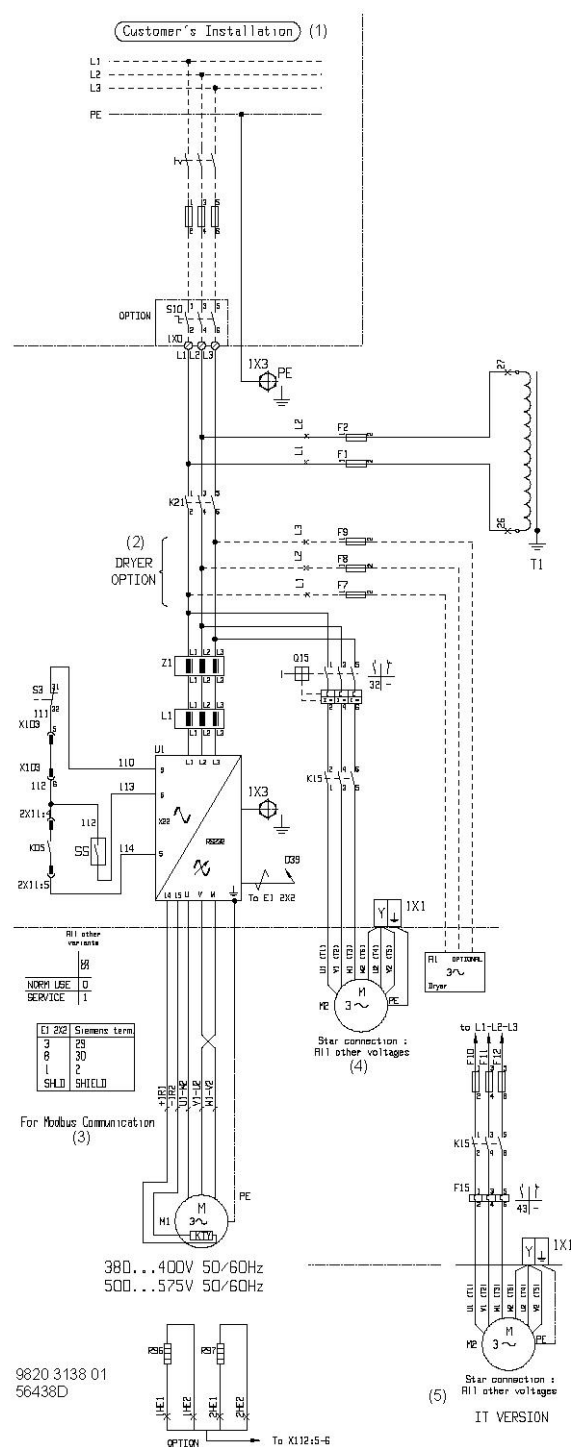
10	Safety valve
11	By-pass system to by-pass the dryer during service operations (available as an option, consult Atlas Copco).
12	<p>On water-cooled compressors:  Water flow and pressure to be adjusted depending upon local concitions.  For cooling water quality see section <a href="#">Cooling water requirements</a>.  A water shut-off valve and water drain valve should be installed by the customer in the compressor water inlet pipe and outlet pipe. If water shut-off valves at the compressor water inlet and outlet pipe are installed, a safety device with set pressure according to the maximum cooling water inlet pressure (see section <a href="#">Reference conditions and limitations</a>) has to be installed between the compressor water outlet pipe and shut-off valve. When operating the unit, the operator must ensure that the cooling water system cannot be blocked. The above-mentioned applies also to the energy recovery cooling water system. Remove the plastic plugs (if provided) from the compressor water pipes and connect the pipes to the cooling water circuit.</p>
13	Cooling air grating, dryer

### Attention

	<p>Working with machinery controlled by a frequency converter requires special safety precautions. These safety precautions depend on the kind of network used (TN, TT, IT system). Consult Atlas Copco.</p>
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## 6.3 Electrical connections

### Electrical connections for GA 75 VSD and GA 90 VSD



Reference	Designation
(1)	Customer's installation
(2)	Dryer option
(3)	For modbus communication
(4)	Star connection: all other voltages
(5)	IT version star connection: all other voltages

## Description

1. Provide an isolating switch.
2. Check that the motor cables and wires inside the electric cabinet are clamped tight to their terminals.
3. Check the fuses. See section [Settings of fuses](#).
4. Connect the power supply cables to terminals (1, 3 and 5) on contactor (K21).
5. Connect the earth conductor to the earth bolt (PE).

## 6.4 Cooling water requirements

### General

Following requirements are given as a general rule to prevent cooling water problems. If in any doubt, consult Atlas Copco.

Recommended maxima	Recirculating system	Pass-through system
Chloride (Cl <sup>-</sup> )	less than 600 mg/l	less than 150 mg/l
Sulphate (SO <sub>4</sub> <sup>2-</sup> )	less than 400 mg/l	less than 250 mg/l
Total solids	less than 3000 mg/l	less than 750 mg/l
Suspended solids (as SiO <sub>2</sub> )	less than 10 mg/l	less than 10 mg/l
Free chlorine (Cl <sub>2</sub> )	less than 4 mg/l	less than 2 mg/l
Ammonia (NH <sub>4</sub> <sup>+</sup> )	less than 0.5 mg/l	less than 0.5 mg/l
Copper	less than 0.5 mg/l	less than 0.5 mg/l
Iron	less than 0.2 mg/l	less than 0.2 mg/l
Manganese	less than 0.1 mg/l	less than 0.1 mg/l
Oxygen	less than 3 mg/l	less than 3 mg/l
Carbonate hardness (as CaCO <sub>3</sub> )	50-1000 mg/l	50-500 mg/l
Organics (KMnO <sub>4</sub> )	less than 25 mg/l	less than 10 mg/l
No algae		
No oil		

### Remark

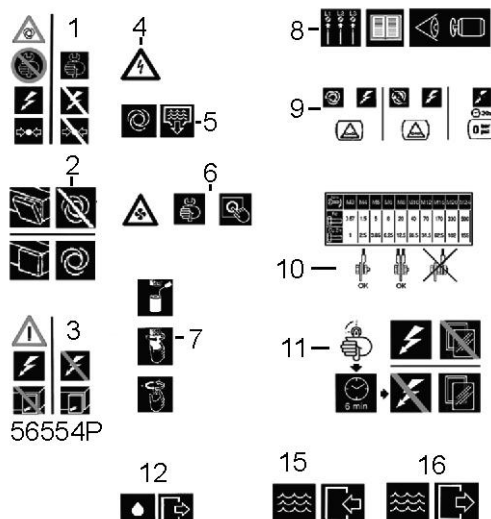
Chloride and sulphate are interactive. In pass-through systems the sum of the squares must not exceed 85,000. For recirculating systems with proper controls and treatment, the sum of the squares may be up to 520,000. Note that the sulphate value must include any sulphite present.

## Additives

If it should be necessary to use additives in the cooling water, take into account that the cooling capacity will change.

## 6.5 Pictographs

### GA 37 VSD up to GA 90 VSD



*Pictographs, GA 37 VSD up to GA 90 VSD*

Reference	Designation
1	Switch off the voltage and depressurize the compressor before starting maintenance or repairs
2	Keep the doors closed during operation
3	Switch off the voltage before removing protecting cover inside electric cubicle
4	Warning, voltage
5	Automatic condensate drain
6	Stop the compressor before cleaning the coolers
7	Lightly oil the gasket of the oil filter, screw it on and tighten by hand (approx. half a turn)
8	Before connecting the compressor electrically, consult the Instruction book for the motor rotation direction
9	Compressor remains pressurized for 30 seconds after switching off the voltage
10	Torques for steel (Fe) or brass (CuZn) bolts
11	Switch off the voltage and wait at least 6 minutes before removing the screen
12	Oil outlet (option DD/PD filters)

Pictographs on water-cooled compressors

Reference	Designation
15	Cooling water inlet
16	Cooling water outlet

## 7 Operating instructions

### 7.1 Before initial start-up

#### Safety



The operator must apply all relevant safety precautions, including those mentioned in this book.

#### Outdoor/altitude operation

If the compressor is installed outdoors or if the air inlet temperature can be below 0 °C/32 °F, precautions must be taken. In this case, and also if operating above 1000 m (3300 ft), consult Atlas Copco.

#### Moving/lifting

The compressor can be moved by a lift truck using the slots in the frame. Take care not to damage the bodywork during lifting or transport. Before lifting, reinstall the transport securing bolts.

See section [Initial start-up](#).

Make sure that the forks protrude from the other side of the frame. The compressor can also be lifted after inserting beams into the slots. Make sure that the beams cannot slide and that they protrude from the frame equally. The chains must be held parallel to the bodywork by chain spreaders in order not to damage the compressor. The lifting equipment must be placed in such a way that the compressor will be lifted perpendicularly. Lift smoothly and avoid twisting.

### 7.2 Initial start-up

#### Safety



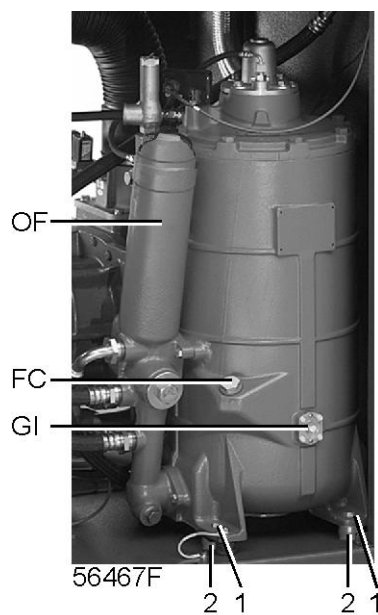
The operator must apply all relevant [Safety precautions](#). Also consult section [Problem solving](#).

#### Procedure

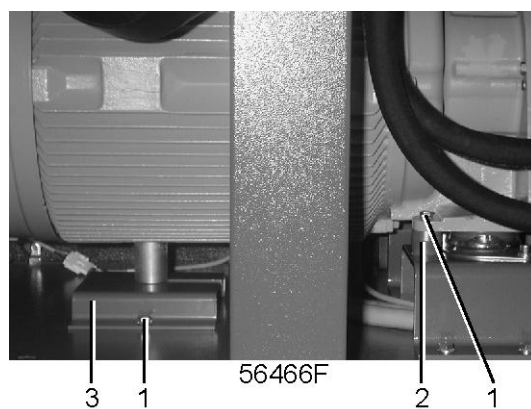


For the position of the air outlet valve and the drain connections, see sections [Introduction](#) and [Condensate system](#)

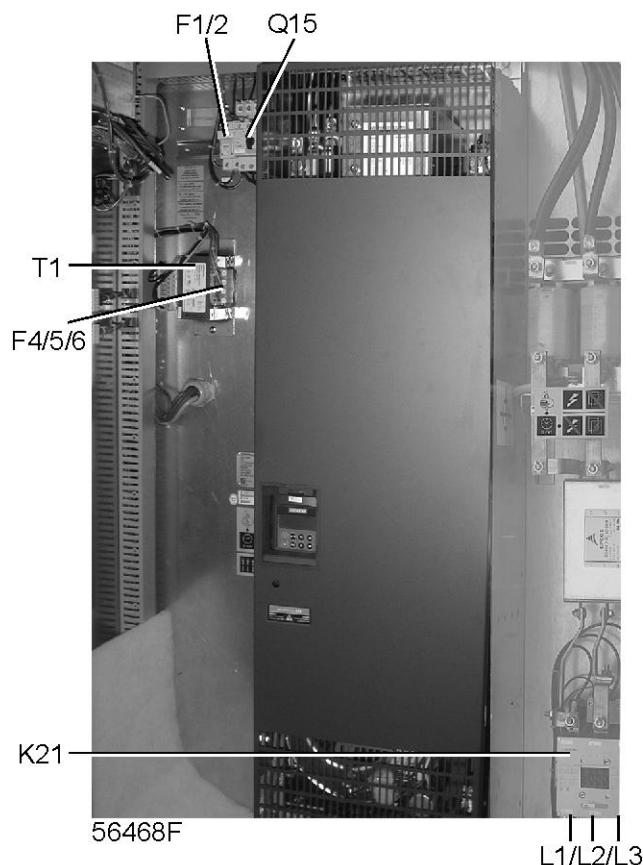




*Air receiver transport fixtures of GA 75 VSD and GA 90 VSD*



*Motor and gear casing transport fixtures of GA 75 VSD and GA 90 VSD*




*Electric cabinet of GA 75 VSD and GA 90 VSD, typical example*

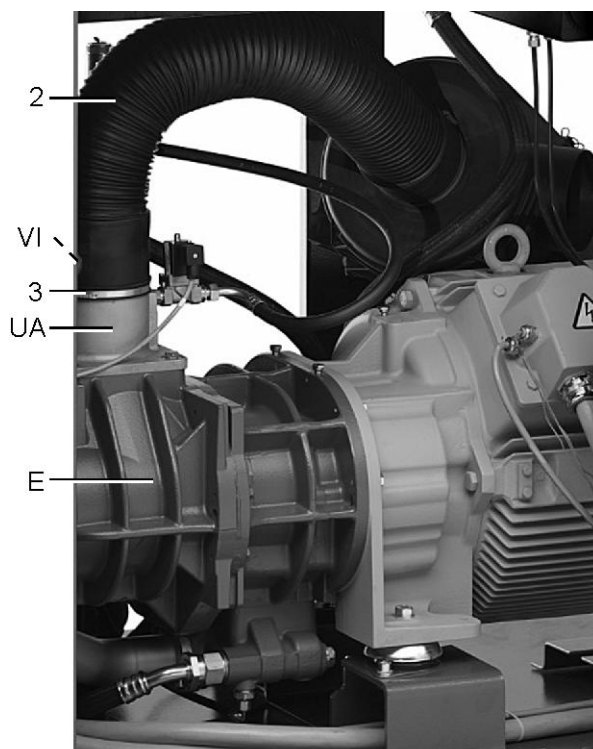
-	Consult the sections <a href="#">Electric cable size</a> , <a href="#">Installation proposals</a> and <a href="#">Dimension drawings</a>
-	<b>The following transport fixtures, painted red, must be removed:</b> <ul style="list-style-type: none"> <li>• Bolts (1)</li> <li>• Bushes (2)</li> <li>• Supports (3)</li> </ul>
-	<p>Check that the electrical connections correspond to the local codes and that all wires are clamped tight to their terminals.</p> <p>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.</p>
-	Check the voltage selecting wires at the primary side of transformer T1.
-	Check the setting of circuit breaker (Q15). Also check that the switch on the circuit breaker is in position I.
-	<p>Fit air outlet valve (AV); see section <a href="#">Introduction</a> for the position of the valve.</p> <p>Close the valve.</p> <p>Connect the air net to the valve.</p> <p>On compressors equipped with a dryer by-pass, fit the air outlet valve to the dryer by-pass pipe.</p>
-	<p>Connect the condensate drain outlet(s) to a drain collector. See section <a href="#">Condensate system</a> and in case of an OSD see section <a href="#">Installation</a>.</p> <p>For Full-Feature units: also connect the condensate drain outlet of the dryer to a drain collector.</p> <p>The drain pipes to the drain collector must not dip into the water. For draining of pure condensate water, install an oil/water separator which is available from Atlas Copco as an option; see section <a href="#">OSD unit</a>.</p> <p>If the pipes have been fitted outside the room where freezing is possible, they must be insulated.</p>
-	For compressors with a DD or a DD and PD filter connect the automatic drain of the filters to a suitable drain collector.

-	On water-cooled compressors, drain valves, shut-off valves and a regulating valve should be fitted by the customer in the cooling water piping.
-	Check the oil level. The pointer of level gauge (GI) should register in the upper field of the green range or in the orange range.
-	<b>Provide labels, warning the operator that:</b> <ul style="list-style-type: none"> <li>• The compressor may automatically restart after voltage failure (if activated, consult Atlas Copco).</li> <li>• The compressor is automatically controlled and may be restarted automatically.</li> <li>• The compressor may be remotely controlled.</li> </ul>
-	On water-cooled compressors, close the cooling water drain valves. Open the cooling water inlet valve and the regulation valve.
-	Switch on the voltage. Start the compressor and stop it immediately. On air-cooled compressors, check the rotation direction of the fan motor. Rotation arrows, visible through the grating in the roof, are provided on the fan plate. If the rotation direction is wrong, open the isolating switch in the voltage supply line and reverse two incoming electric lines.
-	Check the programmed settings. Consult section <a href="#">Programmable settings</a> .
-	Start and run the compressor for a few minutes. Check that the compressor operates normally.

## 7.3 Before starting

### Remarks

	<ul style="list-style-type: none"> <li>• If the compressor has not run for the past 6 months, it is strongly recommended to improve the lubrication of the compressor element at starting.</li> <li>• Loosen the hose clip (3) and disconnect inlet hose (2).</li> <li>• On GA 75 VSD and GA 90 VSD, lift inlet hose (2), open check valve (CV) and pour 0.75 l (0.20 US gal, 0.17 Imp gal) of oil into the compressor element.</li> <li>• Reinstall inlet hose (2).</li> <li>• On Full-Feature compressors, switch on the voltage 4 hours before starting to energize the crankcase heater of the refrigerant compressor of the dryer.</li> </ul>
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*Position of unloader on GA 75 VSD and GA 90 VSD*

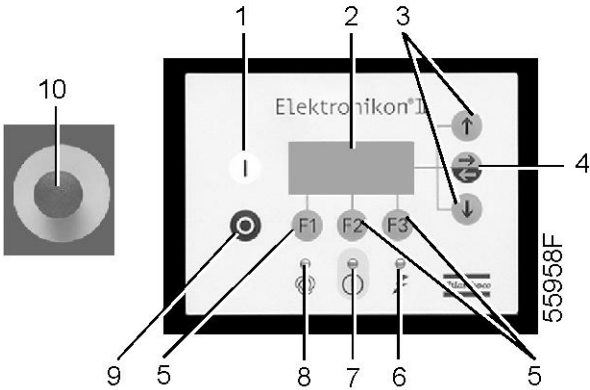
## Procedure

-	See section <a href="#">Initial start-up</a> for location of the oil system components. Check oil level (GI), top up if necessary. The pointer should be in the upper field of the green range or in the orange range. If the pointer registers in the LOW range, depressurize the oil system (see section <a href="#">Problem solving</a> ). Wait until the compressor has depressurized. Unscrew oil filler plug (FC) only one turn to permit any pressure in the system to escape. Remove the filler cap and add oil until the level reaches the filler neck. Tighten the plug.
-	If necessary, empty the dust trap of the filter; see section <a href="#">Air filter</a> .
-	If the red part of the air filter service indicator shows full out, replace the air filter element. Reset service indicator (VI) by pushing the knob in the extremity of the body and reset the service warning; see section <a href="#">Service menu</a> .
-	<b>On water-cooled compressors, also:</b> <ul style="list-style-type: none"> <li>• Check that the cooling water drain valves in the inlet and outlet pipes are closed.</li> <li>• Open the cooling water inlet valve.</li> <li>• Open the water flow regulating valve. This step can be overlooked if, after previous operation, the setting of this valve has not been disturbed.</li> </ul>

## 7.4 Starting

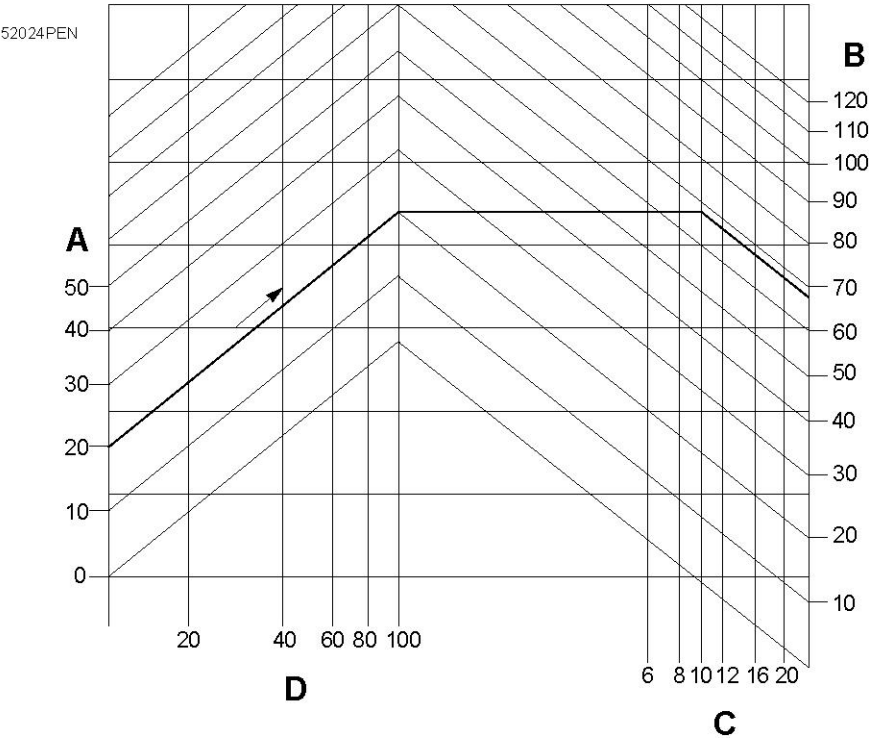
### Procedure

	For the position of the air outlet valve and the drain connections. See sections <a href="#">Introduction</a> and <a href="#">Condensate system</a>
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Control panel

-	Switch on the voltage. Check that voltage on LED (6) lights up. The message 'Compressor off' appears.
-	Open air outlet valve (AV).
-	Press start button (1) on the control panel. The compressor starts running and the automatic operation LED (8) lights up.
-	On water-cooled compressors: regulate the cooling water flow with the compressor running at maximum speed. Adjust the water flow to obtain the most suitable air temperature at the element outlet, i.e. between 2 and 7 °C (4 and 13 °F) above the relevant temperature in the figure below. For optimum operation, the cooling water outlet temperature must never exceed the value specified in section <a href="#">Compressor data</a> . Consult Atlas Copco if condensate should be formed during frequent unloading periods.






Minimum compressor element temperature for water-cooled units

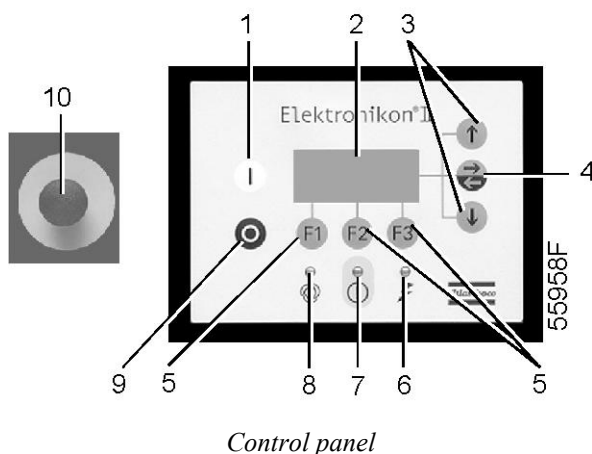
- (A): Air inlet temperature
- (B): Condensation temperature
- (C): Working pressure
- (D): Relative air humidity

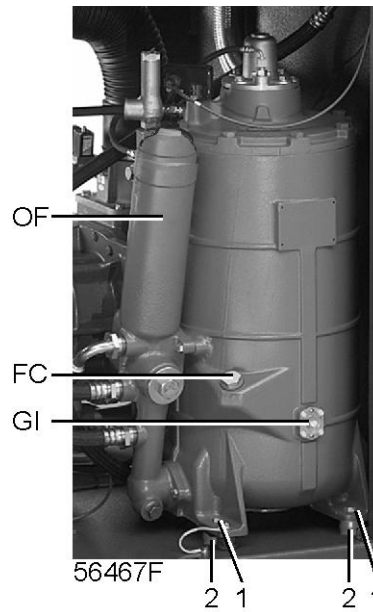
**Example:** If operating at a pressure of 10 bar(e) (145 psig) in an ambient temperature of 20 °C (68 °F) and at a relative air humidity of 100%, the minimum temperature to prevent condensate from forming is 68 °C (154 °F). Regulate the cooling water flow during loaded operation to obtain a temperature between 70 and approx. 75 °C (158 and approx. 167 °F) at the outlet of the compressor element.

## 7.5 During operation

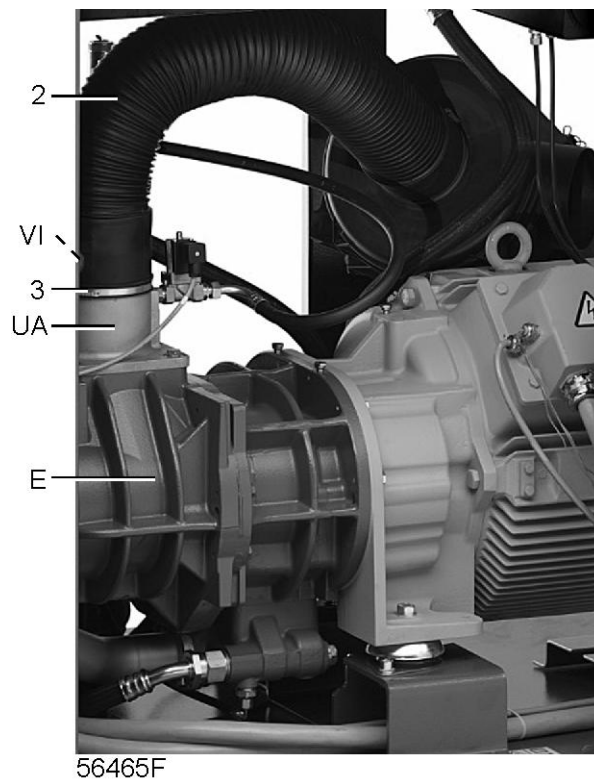
### Procedure

	The operator must apply all relevant <a href="#">Safety precautions</a> . Also consult section <a href="#">Problem solving</a> .
	Keep the doors closed during operation; they may be opened for short periods only to carry out checks.
	When the motors are stopped and LED (8) is alight, the motors may start automatically.





*Position of oil level sight-glass on GA 75 VSD and GA 90 VSD*



*Position of the service indicator on GA 75 VSD and GA 90 VSD*

Check the oil level during operation: the pointer of level gauge (GI) must register in the green range; if not, press stop button (9).

Close air outlet valve (AV) and press the test button on top of the electronic water drain until the air system between the air receiver and outlet valve is fully depressurised (see sections [Introduction](#) and [Condensate system](#) for their location).



For GA 37 VSD up to GA 90 VSD Full-Feature also press the test button on top of the electronic water drain of the dryer until the air system between the air receiver and outlet valve is fully depressurised.

Press the emergency stop button (10).

Wait until the compressor has depressurized. Unscrew oil filler plug (FC) one turn to permit any pressure in the system to escape. Remove the plug and add oil until the level reaches the filler opening. Fit and tighten the plug (FC).

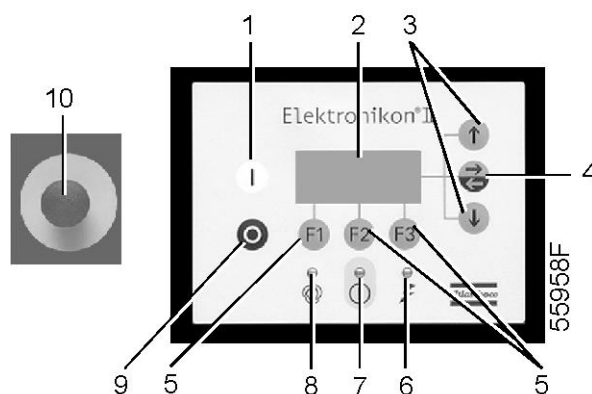
If the coloured part of service indicator (VI) shows full out, stop the compressor, switch off the voltage and replace the air filter element. Reset the service indicator by pushing the knob in the extremity of the body.

When automatic operation LED (8) is alight, the regulator is automatically controlling the compressor, i.e. matching the compressor speed to the net pressure, starting and stopping the compressor whenever necessary.

Regularly check that condensate is discharged during operation. See section [Condensate system](#) and in case of an OSD, also check the level in the oil collector; see section [OSD Maintenance and operating instruction](#). The amount of condensate depends on environmental and working conditions.

## 7.6 Checking the display

### Procedure



*Control panel*

Check the display (2) regularly for readings and messages. Normally, the display shows the compressor outlet pressure, the motor speed and the abbreviations of the functions of the keys below the display.

Always check the display (2) and remedy the trouble if alarm LED (7) is alight or blinks. See section Status data menu.

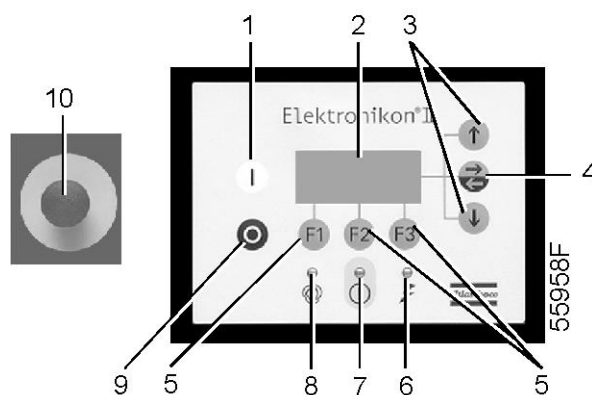
The display (2) will show a service message if a service plan interval has been exceeded or if a service level for a monitored component has been exceeded. Carry out the service actions of the indicated plans or replace the component and reset the relevant timer; see section Status data menu.

Regularly press the arrow down key (3) on the main screen to call up information about the actual compressor condition. See section [Quick look at actual compressor status](#).



## 7.7 Stopping

### Elektronikon regulator



Control panel

### Procedure

-	Press stop button (9). Automatic operation LED (8) goes out. The compressor stops.
-	To stop the compressor in case of emergency, press emergency stop button (10). Alarm LED blinks (7). After remedying the fault, unlock the button by pulling it out and press 'Rset' key (5) before restarting.
-	Close air outlet valve (AV) (see section <a href="#">Introduction</a> ).
-	Press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurised. See section <a href="#">Condensate system</a> . Switch off the voltage.
-	<b>On water-cooled compressors:</b> <ul style="list-style-type: none"> <li>• Close the cooling water inlet valve.</li> <li>• If freezing temperatures may be expected, drain the cooling system completely.</li> </ul>

## 7.8 Taking out of operation

### Warning



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

### Procedure

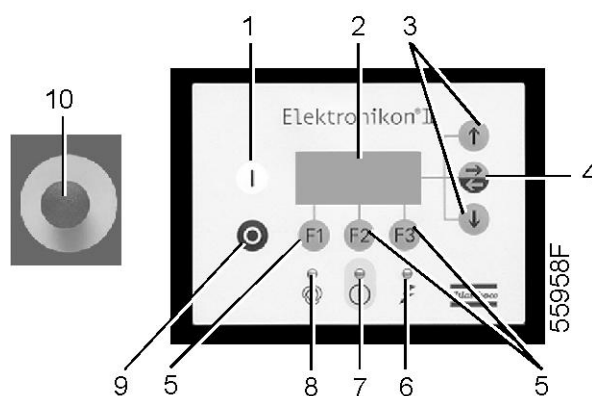
-	Stop the compressor and close the air outlet valve.
-	Press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurised, see section <a href="#">Condensate system</a> . Unscrew the oil filler plug only one turn to permit any pressure in the system to escape. Consult section <a href="#">Oil and oil filter change</a> to locate the filler plug.

-	Press the emergency stop button, switch off the voltage and disconnect the compressor from the mains.
-	Shut off and depressurize the part of the air net which is connected to the outlet valve. Disconnect the compressor air outlet pipe from the air net.
-	<b>On water-cooled compressors:</b> <ul style="list-style-type: none"> <li>• Isolate and disconnect the water system from the cooling water net.</li> <li>• Drain the water circuit.</li> </ul>
-	Drain the oil.
-	Drain the condensate circuit and disconnect the condensate piping from the condensate net.

## 8 Maintenance

### 8.1 Preventive maintenance schedule

#### Control panel



Control panel

#### Warning



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

- Stop the compressor.
- Close the air outlet valve and press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurised.
- Press the emergency stop button (10).
- Switch off the voltage.
- Depressurise the compressor.

For detailed instructions, see section [Problem solving](#).

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

#### Before mechanical maintenance



Close the air outlet valve and press the test button on top of the electronic water drain(s) until the air system between the air receiver and outlet valve is fully depressurised.

For location of components, see section [Condensate system](#)

#### Before electrical maintenance



Wait for at least 6 minutes before starting maintenance as hazardous high voltage remains on the condensers of the start and speed regulation unit for 6 minutes after switching off the voltage.

## Warranty - Product Liability

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

## Service kits

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

## Service contracts

Atlas Copco offers several types of service contracts, relieving you of all preventive maintenance work. Consult your Atlas Copco Customer Centre.

## General

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

## Intervals

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

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

## Service plans

	<p>Besides the daily and 3-monthly checks, the service operations are grouped in plans, called service plans A, B, ... as specified in the schedule below.</p> <p>Each plan has a programmed time interval at which all service actions belonging to that plan are to be carried out. When reaching the interval, a message will appear on the screen indicating which service plans are to be carried out; see section <a href="#">Status data menu</a>. After servicing, the intervals must be reset; see section <a href="#">Service menu</a>.</p>
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## Preventive maintenance schedule

General

Period	Operation
Daily	Check oil level.
“	Check readings on display.
“	Check air filter service indicator.
“	On water-cooled compressors: check for cooling water flow.
3-monthly	Check coolers, clean if necessary.
“	On compressors with internal dryer: check condenser of dryer and clean if necessary.
“	<p>Remove air filter element and inspect. If necessary, clean using an air jet and inspect. More frequently when operating in a dusty atmosphere.</p> <p>Replace damaged or heavily contaminated elements.</p>
“	Check that condensate is discharged when pressing the test button on top of the electronic water drain.

Running hours	Service plan	Operation
2000	--	If Atlas Copco Roto-Foodgrade Fluid is used, change oil and oil filter.
4000	A	If Atlas Copco Roto-Inject Fluid is used, change oil and oil filter.
4000	B	Replace air filter element.
4000	B	Check condition of the air intake hose between air filter and element.
4000	B	Check pressure and temperature readings.
4000	B	Carry out a LED/display test.
4000	B	Replace air filter pads of converter cabinet.
4000	B	Check for possible leakage.
4000	B	On air-cooled compressors: clean coolers.
4000	B	On air-cooled compressors: check and clean cooling fan assembly.
4000	B	Test temperature shut-down function.
4000	B	Have safety valve tested.
4000	B	Clean cooling fins of electric motors.
4000	B	Inspect restrictor in scavenging line for cleanness.
4000	B	Check operation of cooling fans of converter.
4000	B	Check blow-off solenoid valve after stopping and pressing the emergency stop button.
8000	C	Have oil separator replaced. Replace oil separator if the pressure drop exceeds 1 bar during loaded running with a stable working pressure.
8000	C	If Atlas Copco Roto-Xtend Duty Fluid is used, change oil and oil filter.

### Important



- Always consult Atlas Copco if a timer setting has to be changed.
- For the change interval of oil and oil filter in extreme conditions of temperature, humidity or cooling air, consult your Atlas Copco Customer Centre.
- Any leakage should be attended to immediately. Damaged flexibles or flexible joints must be replaced.

## 8.2 Drive motor

### GA 75 VSD and GA 90 VSD

The bearing at the non-drive end side is greased for life.

The bearing at the drive end side is lubricated by the oil system.

## 8.3 Oil specifications



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

It is strongly recommended to use genuine Atlas Copco Lubricants. They are the result of years of extensive field experience and research in our labs. See section Preventive maintenance schedule for replacement intervals and section Service Kits for part number information.

### Atlas Copco Roto-Inject Fluid

Atlas Copco Roto-Inject Fluid is a specially developed lubricant for use in single stage oil-injected screw compressors. Its specific composition keeps the compressor in excellent condition. Roto-Inject Fluid can be used for compressors operating at ambient temperatures between 0 °C (32 °F) and 40 °C (104 °F).

### Atlas Copco Roto-Xtend Duty Fluid

Atlas Copco Roto-Xtend Duty Fluid is a high-quality synthetic lubricant for oil-injected screw compressors which keeps the compressor in excellent condition. Roto-Xtend Duty Fluid can be used for compressors operating at ambient temperatures between 0 °C (32 °F) and 40 °C (104 °F).

### Atlas Copco Roto-Foodgrade Fluid

**Special oil, delivered as an option.**

Atlas Copco Roto-Foodgrade fluid is a unique high-quality synthetic lubricant, specially created for oil-injected screw compressors that provide air for the food industry. This lubricant keeps the compressor in excellent condition. Roto-Foodgrade Fluid can be used for compressors operating at ambient temperatures between 0 °C (32 °F) and 40 °C (104 °F).

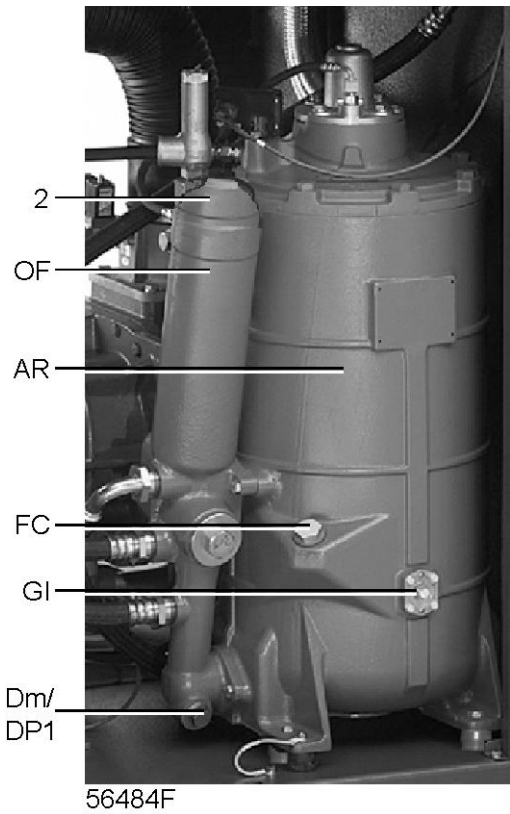
## 8.4 Oil and oil filter change

### Warning

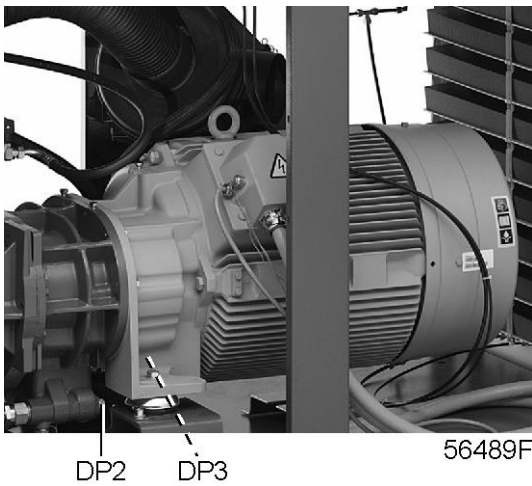


The operator must apply all relevant [Safety precautions](#).  
If the compressor is equipped with an Energy Recovery unit, also consult [Maintenance for Energy Recovery Systems](#).

Procedure



*Oil system components of GA 75 VSD and GA 90 VSD*



*Oil drain plug of GA 75 VSD and GA 90 VSD*

-	Run the compressor until warm, close the air outlet valve and let the compressor run for 3 minutes at minimum speed. Stop the compressor, press the emergency stop button and wait until the compressor has depressurized. Unscrew oil filler plug (FC) only one turn to permit any pressure in the system to escape.
-	Loosen the vent plug of the oil cooler and wait for 5 minutes. See section <a href="#">Introduction</a> for the position of the vent plug (VP).

-	Remove drain plug (DP1) and open drain valve (Dm). Also drain the oil by removing the drain plugs: <ul style="list-style-type: none"> <li>• on the check valve (DP2)</li> <li>• on the gear casing (DP3)</li> </ul>
-	Collect the oil in a collector and deliver it to the local collection service. Refit and tighten the drain and vent plugs after draining. Close drain valve (Dm).
-	Unscrew the bolts of lid (2) and remove it. Take the filter element out of the oil filter housing (OF). Fit a new oil filter. Oil the new gasket. Install the lid and screw the bolts of lid (2) on the oil filter housing.
-	Remove filler plug (FC). Fill the air receiver (AR) with oil until the level reaches the filler neck. Take care that no dirt drops into the system. Refit and tighten filler plug (FC).
-	Run the compressor loaded for a few minutes. Stop the compressor and wait a few minutes to allow the oil to settle.
-	Depressurise the system by unscrewing filler plug (FC) only one turn to permit any pressure in the system to escape. Remove the plug. Fill the air receiver with oil until the level reaches the filler neck. Tighten the filler plug.
-	Reset the service timer: <ul style="list-style-type: none"> <li>• After carrying out all service actions in the relevant 'Service Plan', reset the service warning; see section <a href="#">Service menu</a>.</li> </ul>

## 8.5 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.

## 8.6 Storage after installation

### Procedure

Run the compressor, e.g. twice a week, until warm.



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

## 8.7 Service kits

### Service kits

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



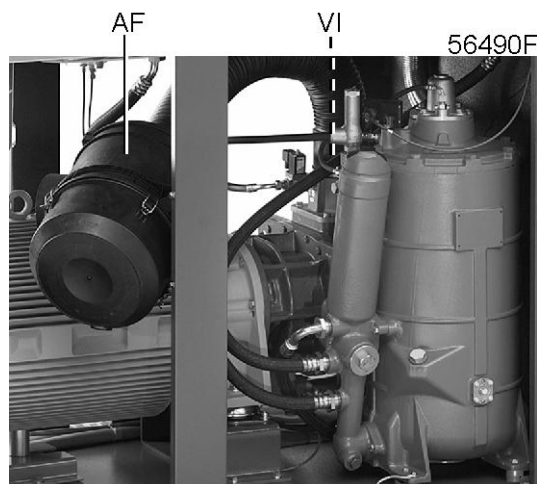
Also a full range of extensively tested lubricants, suitable for your specific needs is available to keep the compressor in excellent condition.

Consult the Spare Parts List for part numbers.

## 9 Adjustments and servicing procedures

### 9.1 Air filter

#### Location of air filter



*Air filter, GA 75 VSD and GA 90 VSD*

#### Recommendations

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

#### Procedure

1. Stop the compressor. Switch off the voltage.
2. Release the snap clips of air filter (AF) and remove the dust trap and the air filter element. Clean the trap. Discard the filter element.
3. Fit the new element and the trap.
4. Reset service indicator (1) by pushing the knob in the extremity of the body.
5. Reset the air filter service warning.  
After carrying out all service actions in the relevant 'Service Plan', reset the service warning; see section [Service menu](#).

### 9.2 Coolers

#### Cleaning

Keep the coolers clean to maintain efficiency.

##### On air-cooled compressors:

- Stop the compressor, close the air outlet valve and switch off the voltage.
- Cover all parts under the coolers.

- Remove the side baffle that encloses the fan compartment.
- Remove any dirt from the coolers with a fibre brush. Brush in the direction of the cooling fins. Also remove any dirt from the fan with a fibre brush.
- Then clean with an air jet in the reverse direction to normal flow. Use low pressure air, if necessary the pressure may be increased up to 6 bar(e) (87 psig).
- If it is necessary to wash the coolers with a cleaning agent, consult Atlas Copco.
- Remove the cover used during cleaning.
- Mount the side baffle that encloses the fan compartment.

**On water-cooled compressors:**

- Consult Atlas Copco about cleaning.

## 9.3 Safety valve

**Location of safety valve**

*GA 75 VSD and GA 90 VSD*

**Operating**

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

**Testing**

Before removing the valve, depressurize the compressor. See section Problem solving.

Valve (SV) can be tested on a separate air line. If the valve does not open at the set pressure specified on the valve, consult Atlas Copco.


**Warning**

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


## 10 Problem solving

### 10.1 Problem solving


#### Warning

	<p>Before carrying out any maintenance, repair work or adjustment, press the stop button and wait until the compressor has stopped.</p> <p>Close the air outlet valve and press the test button on top of the electronic water drain(s) until the air system between air receiver and outlet valve is fully depressurized.</p> <p>Press the emergency stop button and switch off the voltage.</p> <p>Depressurise the compressor by opening the oil filler plug one turn.</p> <p><b>For location of components, see sections:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Introduction</a></li> <li>• <a href="#">Condensate system</a></li> <li>• <a href="#">Initial start-up</a></li> </ul>
	<p>Open and lock the isolating switch.</p>
	<p>The air outlet valve can be locked during maintenance or repair as follows:</p> <ul style="list-style-type: none"> <li>• Close the valve.</li> <li>• Remove the screw fixing the handle with the wrench delivered with the compressor.</li> <li>• Lift the handle and turn it until the slot of the handle fits over the blocking edge on the valve body.</li> <li>• Fit the screw.</li> </ul>
	<p>The operator must apply all relevant <a href="#">Safety precautions</a>.</p>

#### Before mechanical maintenance

	<p>Press the test button on top of the electronic water drain(s) until the air system between air receiver and outlet valve is fully depressurized.</p> <p>For location of components, see section <a href="#">Condensate system</a></p>
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#### Before electrical maintenance

	<p>Wait for at least 6 minutes before starting any electrical repairs as hazardous high voltage remains on the condensers of the start and speed regulation unit for 6 minutes after switching off the voltage.</p>
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#### Faults and remedies

If the alarm LED is lit or flashes, consult sections [Status data menu](#) and [Service menu](#).

-	Condition	Fault	Remedy
	Condensate is not discharged from condensate separator during loading	Discharge flexible clogged	Check and correct as necessary

-	Condition	Fault	Remedy
	Compressor air output or pressure below normal	Air consumption exceeds air delivery of compressor	Check equipment connected
		Choked air filter element	Replace filter element
		Solenoid valve malfunctioning	Replace valve
		Oil separator clogged	Have element replaced
		Air leakage	Have leaks repaired
		Safety valve leaking	Have valve replaced
		Compressor element out of order	Consult Atlas Copco Customer Centre

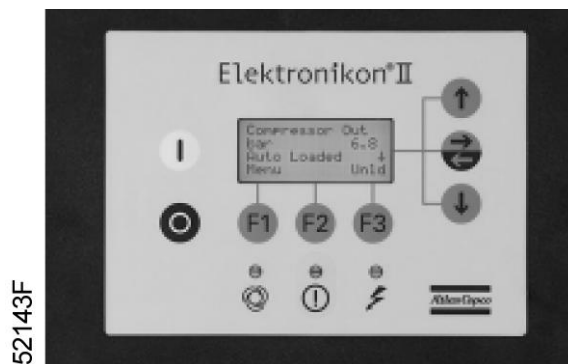
-	Condition	Fault	Remedy
	Safety valve blows	Minimum pressure valve malfunctioning	Check and have defective parts replaced
		Oil separator element clogged	Replace element
		Oil separator clogged	Have element replaced
		Safety valve out of order	Have valve checked. Replace if necessary
		On Full-Feature compressors, dryer piping clogged due to formation of ice	Have system checked by Atlas Copco Customer Centre

-	Condition	Fault	Remedy
	Compressor element outlet temperature or delivery air temperature above normal	Oil level too low	Check and correct
		On air-cooled compressors, insufficient cooling air or cooling air temperature too high	Check for cooling air restriction or improve ventilation of the compressor room. Avoid recirculating of cooling air. If installed, check capacity of compressor room fan
		On water-cooled compressors, cooling water flow too low	Increase flow
		On water-cooled compressors, restriction in cooling water system	Consult Atlas Copco Customer Centre
		Oil cooler clogged	Clean cooler
		By-pass valve malfunctioning	Have valve tested
		Air cooler clogged	Clean cooler
		Compressor element out of order	Consult Atlas Copco Customer Centre

## 11 Technical data

### 11.1 Readings on display

#### Display of Elektronikon regulator



*Elektronikon II regulator*

#### Important



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

Reference	Reading
Air outlet pressure	Depends on the setpoint (desired net pressure).
Compressor element outlet temperature	Approx. 60 °C (108 °F) above ambient temperature.
Dewpoint temperature	Approx. 4 °C (39 °F).
Cooling water outlet temperature (on water-cooled compressors)	Approx. 50 °C (122 °F).

### 11.2 Electric cable size

#### Attention



Local regulations remain applicable if they are stricter than the values proposed below. The voltage drop must not exceed 5% of the nominal voltage. It may be necessary to use cables of a larger size than those stated to comply with this requirement. Use the original cable entry. See section [Dimension drawings](#). The voltage on the compressor terminals must not deviate more than 10% of the nominal voltage.

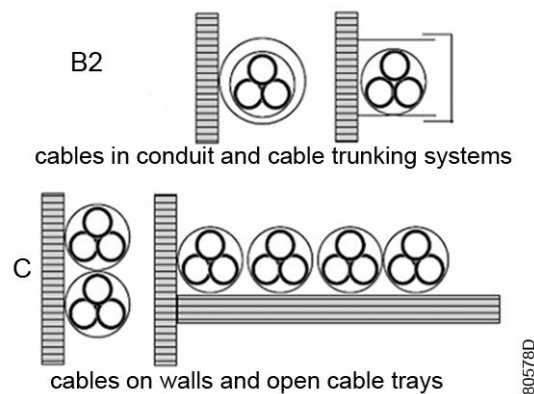
## IEC versions

For IEC designed control panels, the below suggested **cable sections** are calculated according to 60364-5-52 electrical installations of buildings, part 5: selection and erection equipment, section 52: current-carrying capacities in wiring systems.

**Standard conditions refer to** loose copper conductors or multicore cable with 70°C PVC insulation in free air or on open cable trays (installation method C) at 30°C ambient temperature and operating at nominal voltage. The cables may not be grouped with other power circuits or cables.

**Worst case conditions refer to:**

- ambient temperature > 30°C (86 °F)
- cables in closed raceway, conduit or trunking system (installation method B2) at 40 °C ambient temperature
- cables not grouped with other cables



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

## CSA/UL versions

For UL designed machines, calculations for **cable sections and fuses** are done according to UL508A (Industrial control panels).

For CSA, calculations for **cable sections and fuses** are done according to CSA22.2 (Canadian electrical code).

**Standard conditions:** maximum 3 copper conductors in raceway or cable with 85-90°C (185-194 °F) insulation at ambient temperature 30 °C (86 °F), operating at nominal voltage; cables not grouped with other cables.

**Worst case conditions:** ambient temperature > 30 °C (86 °F), max. 3 copper conductors in raceway or cable with 85-90 °C (185-194 °F) insulation at 46 °C (115 °F) ambient temperature and operating at nominal voltage. Cables not grouped with other cables.

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

If the local conditions are more severe than the described standard conditions, the cables and fuses for worst case conditions should be used.

**Cable size**

Type	V	Hz	Approval	I <sub>nom</sub> P (1)	I <sub>nom</sub> F F (1)	Recommended wire section (2)	Recommended wire section (3)	Main fuses (A) (4)
GA 75 VSD	200	50	IEC	297	320	7 x 95 mm <sup>2</sup>	7 x 185 mm <sup>2</sup>	(200)
GA 75 VSD	230	50	IEC	258	281	7 x 70 mm <sup>2</sup>	7 x 120 mm <sup>2</sup>	(160)
GA 75 VSD	400	50	IEC	143	156	4 x 95 mm <sup>2</sup> or 7 x 35 mm <sup>2</sup>	7 x 70 mm <sup>2</sup>	200 (100)
GA 75 VSD	500	50	IEC	119	132	4 x 70 mm <sup>2</sup>	4 x 120 mm <sup>2</sup> or 7 x 50 mm <sup>2</sup>	160 (80)
GA 75 VSD	200	60	IEC	298	321	7 x 95 mm <sup>2</sup>	7 x 185 mm <sup>2</sup>	(200)
GA 75 VSD	230	60	IEC	258	281	7 x 70 mm <sup>2</sup>	7 x 120 mm <sup>2</sup>	( 160)
GA 75 VSD	380	60	IEC	150	163	4 x 95 mm <sup>2</sup> or 7 x 35 mm <sup>2</sup>	7 x 70 mm <sup>2</sup>	200 (100)
GA 75 VSD	460	60	IEC	125	137	4 x 70 mm <sup>2</sup>	4 x 120 mm <sup>2</sup> or 7 x 50 mm <sup>2</sup>	160 (80)
GA 75 VSD	200	60	CSA/UL	298	321	4 x AWG600 or 8 x AWG3/0	4 x AWG700 or 8 x AWG250	600 (300)
GA 75 VSD	230	60	CSA/UL	258	281	4 x AWG500 or 8 x AWG2/0	4 x AWG600 or 8 x AWG3/0	500 (225)
GA 75 VSD	460	60	CSA/UL	125	137	4 x AWG2/0 or 8 x AWG3	4 x AWG3/0 or 8 x AWG3	225 (110)
GA 75 VSD	575	60	CSA/UL	104	117	4 x AWG0	4 x AWG2/0 or 8 x AWG3	175 (90)

Type	V	Hz	Approval	I <sub>nom</sub> P (1)	I <sub>nom</sub> F F (1)	Recommended wire section (2)	Recommended wire section (3)	Main fuses (A) (4)
GA 90 VSD	400	50	IEC	186	200	4 x 120 mm <sup>2</sup> or 7 x 50 mm <sup>2</sup>	7 x 95 mm <sup>2</sup>	250 (125)
GA 90 VSD	500	50	IEC	155	168	4 x 95 mm <sup>2</sup> or 7 x 35 mm <sup>2</sup>	7 x 70 mm <sup>2</sup>	200 (100)
GA 90 VSD	380	60	IEC	196	209	4 x 120 mm <sup>2</sup> or 7 x 50 mm <sup>2</sup>	7 x 95 mm <sup>2</sup>	250 (125)
GA 90 VSD	460	60	IEC	162	175	4 x 95 mm <sup>2</sup> or 7 x 35 mm <sup>2</sup>	7 x 70 mm <sup>2</sup>	200 (100)
GA 90 VSD	460	60	CSA/UL	162	175	4 x AWG4/0 or 8 x AWG2	4 x AWG250 or 8 x AWG1	300 (150)
GA 90 VSD	575	60	CSA/UL	135	148	4 x AWG3/0 or 8 x AWG3	4 x AWG4/0 or 8 x AWG2	250 (125)

Remarks :

(1): current in the supply lines at maximum load

(2): recommended wire section under standard conditions

(3): recommended wire section under worst case conditions

(4): recommended fuse value (value between () valid in case of 6 fuses for parallel supply cables)



Fuse specifications IEC: gL/gG

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

## 11.3 Settings of fan motor circuit breaker

### Circuit breaker

		GA 75 VSD	GA 90 VSD
Frequency (Hz)	Voltage (V)	Fan motor circuit breaker Q15 (A)	Fan motor circuit breaker Q15 (A)
IEC			
50	400	5	7.7
50	500	4.2	6.2
60	380	5	8.0
CSA/UL			
60	460	5	7.3
60	575	4.1	5.8

## 11.4 Reference conditions and limitations

### Reference conditions

Air inlet pressure (absolute)	bar	1
Air inlet pressure (absolute)	psi	14.5
Air inlet temperature	°C	20
Air inlet temperature	°F	68
Relative humidity	%	0
Working pressure for GA 75 and GA 90 VSD		See section <a href="#">Compressor data</a>

<b>On water-cooled units also:</b>		
Cooling water inlet temperature	°C	20
Cooling water inlet temperature	°F	68


### Limitations

Maximum working pressure for GA 75 up to GA 90 VSD		See section <a href="#">Compressor data</a>
Minimum working pressure	bar(e)	4
Minimum working pressure	psig	58
Maximum air inlet temperature	°C	40
Maximum air inlet temperature	°F	104
Minimum air inlet temperature	°C	0
Minimum air inlet temperature	°F	32
Maximum altitude operation	m	1000 m above sea level

Maximum altitude operation	ft	3281 ft above sea level
<b>On water-cooled units also:</b>		
Maximum cooling water outlet temperature	°C	50
Maximum cooling water outlet temperature	°F	122
Maximum cooling water inlet pressure	bar(e)	5
Maximum cooling water inlet pressure	psig	72.52

## 11.5 Compressor data

### Note

	All data specified below are valid at reference conditions; see section <a href="#">Reference conditions and limitations</a> .
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### GA 75 VSD

	Unit	13 bar 175 psi	13 bar 175 psi	13 bar 175 psi
Frequency	Hz	50 60	50 60	50 60
Number of compression stages		1	1	1
Normal effective working pressure	bar(e)	7	9.5	12.5
Normal effective working pressure	psig	102	138	181
Maximum effective working pressure, Workplace	bar(e)	7.5	10	13
Maximum effective working pressure, Workplace	psig	109	145	189
Maximum effective working pressure, Workplace Full-Feature	bar(e)	7.25	9.75	12.75
Maximum effective working pressure, Workplace Full-Feature	psig	105	141	185
Maximum motor shaft speed	rpm	2975	2500	2175
Minimum motor shaft speed	rpm	600	600	600
Temperature of air leaving outlet valve (approx.), Workplace	°C	30	30	30
Temperature of air leaving outlet valve (approx.), Workplace	°F	86	86	86
Temperature of air leaving outlet valve (approx.), Workplace Full-Feature	°C	24	24	24
Temperature of air leaving outlet valve (approx.), Workplace Full-Feature	°F	75	75	75
Nominal motor rating	kW	75	75	75
Nominal motor rating	hp	100	100	100
Refrigerant type, Workplace Full-Feature		R404a	R404a	R404a

	Unit	13 bar 175 psi	13 bar 175 psi	13 bar 175 psi
Total amount (refrigerant), Workplace Full-Feature	kg	2.6	2.6	2.6
Total amount (refrigerant), Workplace Full-Feature	lb	5.73	5.73	5.73
Cooling water consumption (at water inlet temperature below 35 °C and temperature rise of 15 °C), water-cooled units	l/min	91	91	91
Cooling water consumption (at water inlet temperature below 95 °F and temperature rise of 27 °F), water-cooled units	cfm	192.7	192.7	192.7
Cooling water consumption (at water inlet temperature between 35 and 40 °C and temperature rise of 10 °C), water-cooled units	l/min	136	136	136
Cooling water consumption (at water inlet temperature between 95 and 104 °F and temperature rise of 18 °F), water-cooled units	cfm	287.9	287.9	287.9
Oil capacity, approx. (air-cooled)	l	29	29	29
Oil capacity, approx. (air-cooled)	US gal	7.7	7.7	7.7
Oil capacity, approx. (air-cooled)	Imp gal	6.4	6.4	6.4
Oil capacity, approx. (air-cooled)	cu.ft	1.02	1.02	1.02
Oil capacity, approx. (water-cooled)	l	25.5	25.5	25.5
Oil capacity, approx. (water-cooled)	US gal	6.7	6.7	6.7
Oil capacity, approx. (water-cooled)	Imp gal	5.6	5.6	5.6
Oil capacity, approx. (water-cooled)	cu.ft	0.89	0.89	0.89
Sound pressure level, 50 Hz air-cooled variants (according to ISO 2151 (2004))	dB(A)	70	70	70
Sound pressure level, 60 Hz air-cooled variants (according to ISO 2151 (2004))	dB(A)	71	71	71
Sound pressure level, 50 Hz water-cooled variants (according to ISO 2151 (2004))	dB(A)	69	69	69
Sound pressure level, 60 Hz water-cooled variants (according to ISO 2151 (2004))	dB(A)	70	70	70

**GA 90 VSD**

	Unit	13 bar 175 psi	13 bar 175 psi	13 bar 175 psi
Frequency	Hz	50 60	50 60	50 60
Number of compression stages		1	1	1
Normal effective working pressure	bar(e)	7	9.5	12.5
Normal effective working pressure	psig	102	138	181
Maximum effective working pressure, Workplace	bar(e)	7.5	10	13

	Unit	13 bar 175 psi	13 bar 175 psi	13 bar 175 psi
Maximum effective working pressure, Workplace	psig	109	145	189
Maximum effective working pressure, Workplace Full-Feature	bar(e)	7.25	9.75	12.75
Maximum effective working pressure, Workplace Full-Feature	psig	105	141	185
Maximum motor shaft speed	rpm	3480	2970	2510
Minimum motor shaft speed	rpm	600	600	600
Temperature of air leaving outlet valve (approx.), Workplace	°C	30	30	30
Temperature of air leaving outlet valve (approx.), Workplace	°F	86	86	86
Temperature of air leaving outlet valve (approx.), Workplace Full-Feature	°C	24	24	24
Temperature of air leaving outlet valve (approx.), Workplace Full-Feature	°F	75	75	75
Nominal motor rating	kW	90	90	90
Nominal motor rating	hp	121	121	121
Refrigerant type, Workplace Full-Feature		R404a	R404a	R404a
Total amount (refrigerant), Workplace Full-Feature	kg	2.55	2.55	2.55
Total amount (refrigerant), Workplace Full-Feature	lb	5.62	5.62	5.62
Cooling water consumption (at water inlet temperature below 35 °C and temperature rise of 15 °C), water-cooled units	l/min	103	103	103
Cooling water consumption (at water inlet temperature below 95 °F and temperature rise of 27 °F), water-cooled units	cfm	218.0	218.0	218.0
Cooling water consumption (at water inlet temperature between 35 and 40 °C and temperature rise of 10 °C), water-cooled units	l/min	154	154	154
Cooling water consumption (at water inlet temperature between 95 and 104 °F and temperature rise of 18 °F), water-cooled units	cfm	326.0	326.0	326.0
Oil capacity, approx. (air-cooled)	l	30	30	30
Oil capacity, approx. (air-cooled)	US gal	7.9	7.9	7.9
Oil capacity, approx. (air-cooled)	Imp gal	6.6	6.6	6.6
Oil capacity, approx. (air-cooled)	cu.ft	1.05	1.05	1.05
Oil capacity, approx. (water-cooled)	l	25.5	25.5	25.5
Oil capacity, approx. (water-cooled)	US gal	6.7	6.7	6.7
Oil capacity, approx. (water-cooled)	Imp gal	5.6	5.6	5.6
Oil capacity, approx. (water-cooled)	cu.ft	0.89	0.89	0.89

	Unit	13 bar 175 psi	13 bar 175 psi	13 bar 175 psi
Sound pressure level, 50 Hz variants (according to ISO 2151 (2004))	dB(A)	73	73	73
Sound pressure level, 60 Hz variants (according to ISO 2151 (2004))	dB(A)	74	74	74

## 12 Instructions for use of air receiver

### 12.1 Air receiver instructions

#### Instructions

1	This vessel can contain pressurised air; this can be potentially dangerous if the equipment is misused.
2	This vessel must only be used as a compressed air/oil separator and must be operated within the limits specified on the data plate.
3	No alterations must be made to this vessel by welding, drilling or any other mechanical methods without the written permission of the manufacturer.
4	The pressure and temperature of this vessel must be clearly indicated.
5	The safety valve must correspond with pressure surges of 1.1 times the maximum allowable operating pressure. It should guarantee that the pressure will not permanently exceed the maximum allowable operating pressure of the vessel.
6	Use only oil as specified by the manufacturer.
7	This vessel has been designed and built to guarantee an operational lifetime in excess of 20 years and an infinite number of pressure load cycles. There is no intrinsic need for in service inspection of the vessel when used within the design limits for its intended application. However, national legislation may require in service inspection.
8	Original bolts have to be used after opening for inspection. The maximum torque has to be taken into consideration: for M12 bolts 73 Nm (+/- 18) / 54 lbf.ft (+/- 13), for M16 bolts 185 Nm (+/- 45) / 136.5 lbf.ft (+/- 33).

## 13 Guidelines for inspection

### 13.1 Guidelines for inspection

#### Guidelines

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

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

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

## 14 PED

### 14.1 Pressure equipment directives

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

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

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

Part number	Description	Volume	Design pressure	Min and max design temperature	PED Class
1202 5401 00	Safety valve				IV
1202 5749 00	Safety valve				IV
1202 5452 00	Safety valve				IV
1613 7810 00	Safety valve				IV
1622 3658 99	Vessel	63 l	15 bar (e)	-10 °C / 120 °C	II

Part number	Description	Number of cycles (1)	Minimum wall thickness mm	Visual inspection requirements (2)	Hydrostatic inspection requirements (2)
1202 5401 00	Safety valve	-	-	-	-
1202 5749 00	Safety valve	-	-	-	-
1202 5452 00	Safety valve	-	-	-	-
1613 7810 00	Safety valve	-	-	-	-
1622 3658 99	Vessel	2 x 10 <sup>6</sup>	8	10 years	10 years

(1) The number of cycles refers to the number of cycles from 0 bar(e) to maximum pressure.

(2) Other inspection techniques such as ultrasonic or X-ray are equivalent to hydrostatic testing for this equipment.

#### Overall rating

The compressors are conform to PED category II.





**What** sets Atlas Copco apart as a company is our conviction that we can only excel in what we do if we provide the best possible know-how and technology to really help our customers produce, grow and succeed.

There is a unique way of achieving that - we simply call it the Atlas Copco way. It builds on **interaction**, on long-term relationships and involvement in the customers' process, needs and objectives. It means having the flexibility to adapt to the diverse demands of the people we cater for.

It's the **commitment** to our customers' business that drives our effort towards increasing their productivity through better solutions. It starts with fully supporting existing products and continuously doing things better, but it goes much further, creating advances in technology through **innovation**. Not for the sake of technology, but for the sake of our customer's bottom line and peace-of-mind.

That is how Atlas Copco will strive to remain the first choice, to succeed in attracting new business and to maintain our position as the industry leader.