

Atlas Copco Stationary Air Compressors

GA18 VSD and GA30 VSD

Instruction Book

From serial number AII-297 500 onwards.

Important: This book must be used together with the "User manual for the Elektronikon® II regulator for GA VSD compressors"

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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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Atlas Copco

This instruction book describes how to handle the machines to ensure safe operation, optimum efficiency and long service life.

Read this book before putting the machine into operation to ensure correct handling, operation and proper maintenance from the beginning. The maintenance schedule comprises measures for keeping the machine in good condition.

Keep the book available for the operator and make sure that the machine is operated and that maintenance is carried out according to the instructions. Record all operating data, maintenance performed, etc. in an operator's logbook available from Atlas Copco. Follow all relevant safety precautions, including those mentioned on the cover of this book.

Repairs must be carried out by trained personnel from Atlas Copco who can be contacted for any further information.

In all correspondence always mention the type and the serial number, shown on the data plate.

For all data not mentioned in the text, see sections "Preventive maintenance schedule" and "Principal data".

The company reserves the right to make changes without prior notice.

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1 LEADING PARTICULARS

1.1 General description

GA VSD (Variable Speed Drive) compressors are air-cooled stationary, single-stage, oil-injected screw compressors, driven by an electric motor.

GA Workplace (Fig. 1.1)

The compressors are enclosed in a sound-insulated bodywork. The front panel comprises an emergency stop button (S3) and an Elektronikon control module (E1) including the start and stop buttons. An electric cabinet comprising fuses,

transformers, fan motor overload relay, etc. is located behind this panel. The compressor is also provided with an automatic condensate drain system.

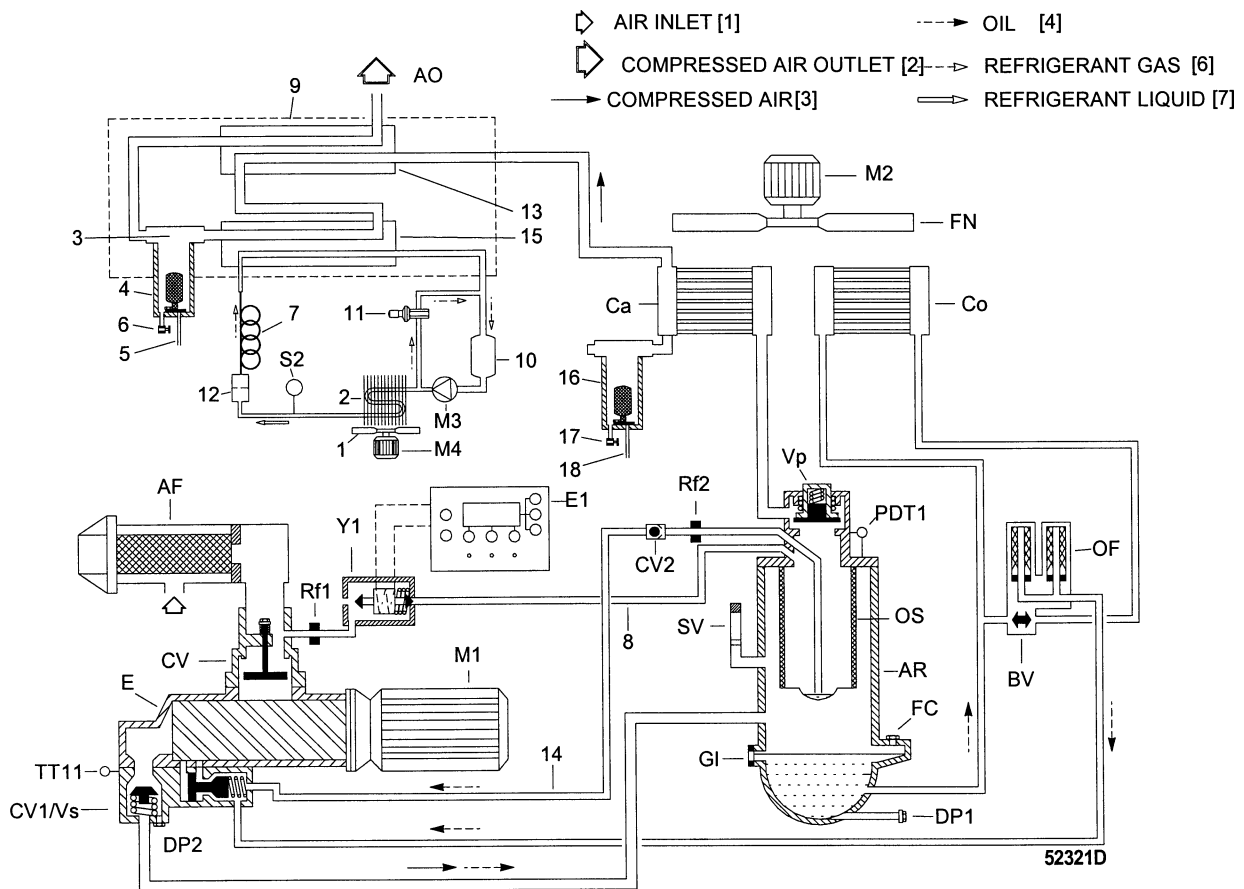
GA Workplace Full-feature

GA Workplace Full-feature are additionally provided with an air dryer (1-Fig. 1.4) which removes moisture from the compressed air by cooling the air to near freezing point and automatically draining the condensate.



E1 Elektronikon control module
S3 Emergency stop button

Fig. 1.1 General view of GA18 VSD



| | | | | | |
|--------|--|------|---|----|---|
| AF | Air filter | M3 | Refrigerant compressor | 6 | Manual condensate drain valve |
| AO | Dry air outlet | M4 | Condenser fan motor | 7 | Capillary tube |
| AR | Air receiver/oil separator | OF | Oil filter | 8 | Blow-off air flexible |
| BV | Oil cooler by-pass valve | OS | Oil separator element | 9 | Insulating block |
| Ca | Air cooler | PDT1 | Differential pressure sensor, oil separator | 10 | Accumulator |
| Co | Oil cooler | Rf1 | Nozzle | 11 | Hot gas by-pass valve |
| CV | Check valve | Rf2 | Restrictor | 12 | Liquid refrigerant dryer/filter |
| CV1/Vs | Check valve/oil stop valve | SV | Safety valve | 13 | Air/air heat exchanger |
| CV2 | Non-return valve | S2 | Fan control switch | 14 | Oil scavenging line |
| DP1 | Oil drain plug, air receiver | TT11 | Temperature sensor, compressor element outlet | 15 | Air/refrigerant heat exchanger/evaporator |
| DP2 | Oil drain plug, check valve/oil stop valve | Vp | Minimum pressure valve | 16 | Condensate trap, air cooler |
| E | Compressor element | Y1 | Solenoid valve, blow off | 17 | Manual condensate drain valve |
| E1 | Elektronikon control module | 1 | Condenser cooling fan | 18 | Automatic condensate drain valve |
| FC | Oil filler plug | 2 | Refrigerant condenser | | |
| FN | Fan, compressor coolers | 3 | Condensate separator | | |
| GI | Oil level gauge | 4 | Condensate trap, dryer | | |
| M1 | Compressor motor | 5 | Automatic condensate drain hose | | |
| M2 | Fan motor, compressor coolers | | | | |

Fig. 1.2 Flow diagram

1.1.1 Air flow (Fig. 1.2)

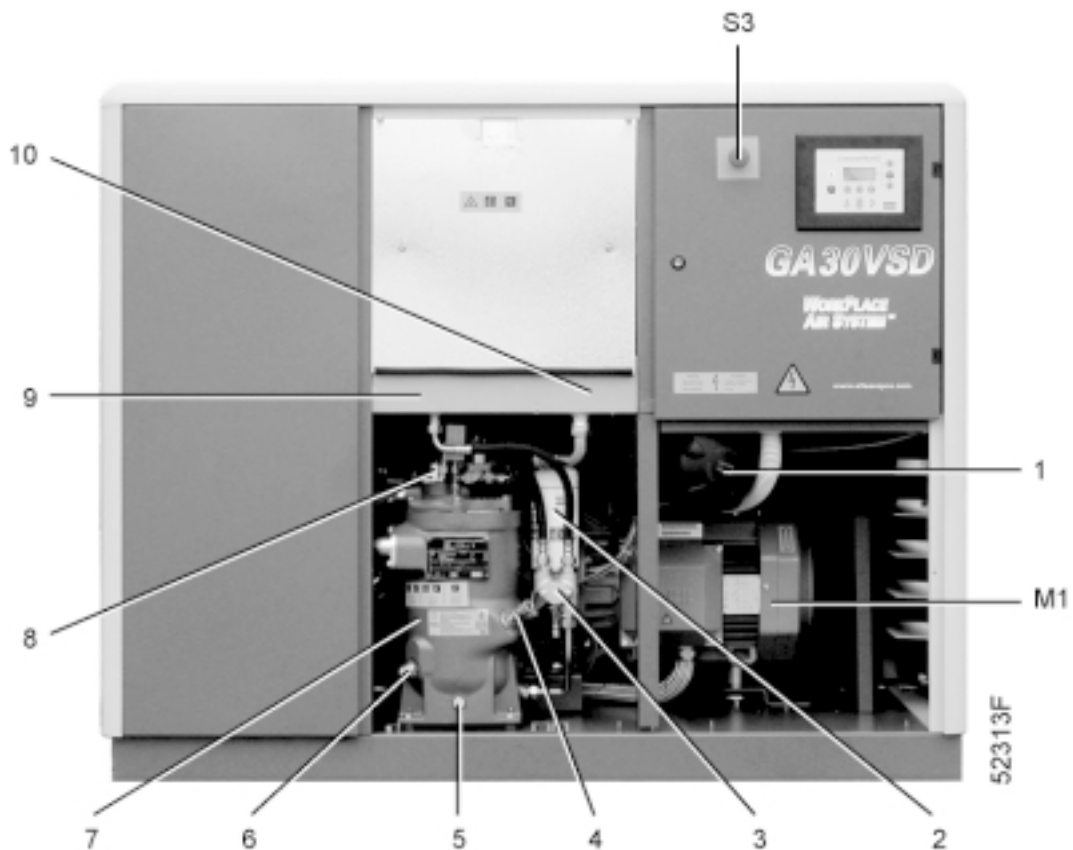
Air drawn through filter (AF) and check valve (CV) into compressor element (E) is compressed. Compressed air and oil flow into air receiver/oil separator (AR). The air is discharged through the outlet valve via minimum pressure valve (Vp), air cooler (Ca) and condensate trap (4).

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 air net.

1.1.2 Oil system (Fig. 1.2)

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

The oil system is provided with a by-pass valve (BV). When the oil temperature is below 60 degrees Celsius, by-pass valve (BV) shuts off the oil supply from oil cooler (Co). Air pressure forces the oil from air receiver/oil separator (AR) through oil filter (OF) and oil stop valve (Vs) to compressor element (E) and its lubrication points. Oil cooler (Co) is by-passed.



- | | | |
|-----------------------------|--------------------------------|--------------------------|
| 1 Air filter | 5 Oil drain plug, air receiver | 9 Air cooler |
| 2 Oil filter | 6 Oil level gauge | 10 Oil cooler |
| 3 By-pass valve, oil cooler | 7 Air receiver/oil separator | M1 Compressor motor |
| 4 Oil filler plug | 8 Minimum pressure valve | S3 Emergency stop button |

Fig. 1.3 Front view of GA18 VSD

By-pass valve (BV) starts opening the oil supply from cooler (Co) when the oil temperature has increased to 60 degrees Celsius. At approx. 75 degrees Celsius all the oil flows through the oil cooler.

1.1.3 Cooling and condensate drain systems (Fig. 1.4)

The cooling system comprises air cooler (2) and oil cooler (6). The compressors are air-cooled; the cooling air is generated by fan (3).

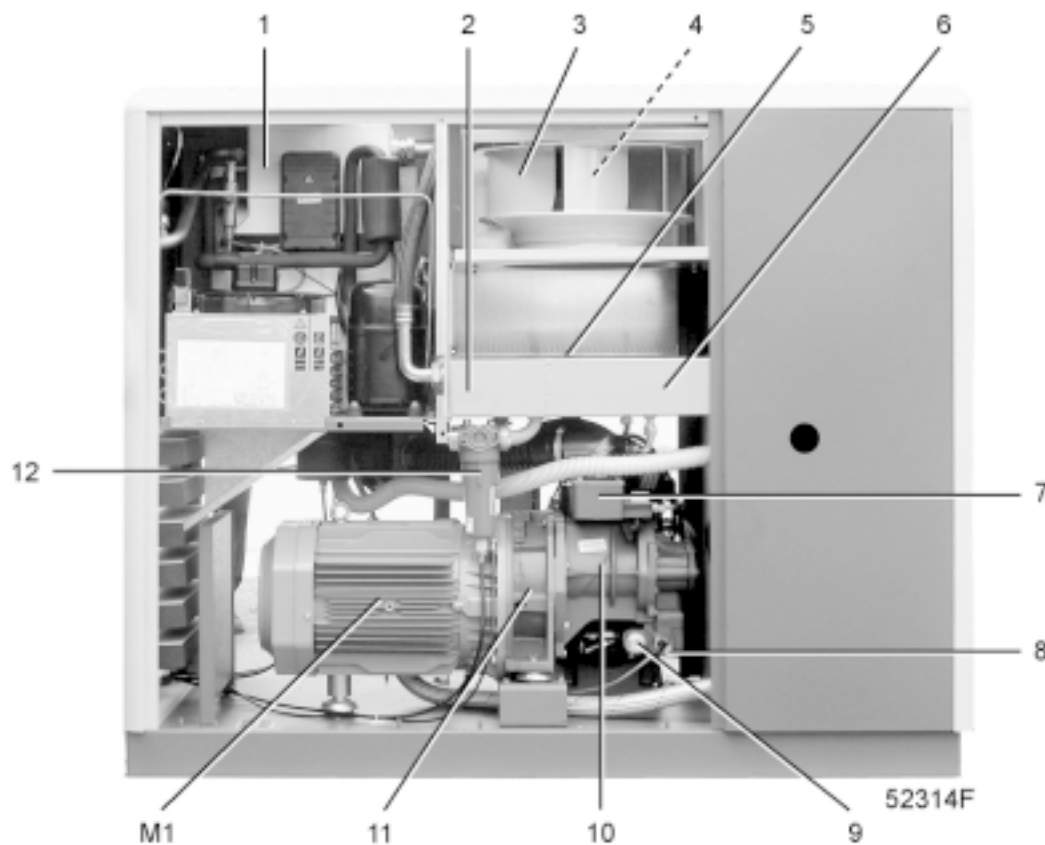
A condensate trap (12) is provided in the air outlet system. Full-feature compressors have an extra condensate trap on the integrated dryer. Each trap is equipped with a valve for automatic condensate draining during operation (2 and 5-Fig. 1.5) and a manually operated valve (1 and 4-Fig. 1.5) for draining after stopping the compressor.

1.2 Regulating system

If the air consumption is less than the air output of the compressor, the net pressure increases. When the net pressure is higher than the setpoint (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 will stop the motor. If the motor is stopped automatically and the net pressure approaches the setpoint, the regulator will restart the motor.

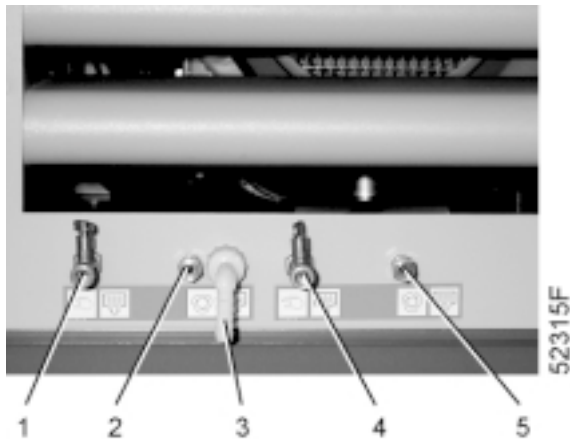
1.3 Elektronikon control module

The control module consists of an Elektronikon regulator and a control panel.



- | | | | | | |
|---|-------------------------|----|----------------------------|----|---------------------------|
| 1 | Dryer | 6 | Oil cooler | 11 | Arrow, rotation direction |
| 2 | Air cooler | 7 | Check valve, air inlet | 12 | Condensate trap |
| 3 | Fan, compressor coolers | 8 | Oil drain plug | M1 | Compressor motor |
| 4 | Fan motor | 9 | Check valve/oil stop valve | | |
| 5 | Vent plug, oil cooler | 10 | Compressor element | | |

Fig. 1.4 Rear view of GA18 VSD



- 1 Manual condensate drain, dryer condensate trap
- 2 Automatic condensate drain, dryer condensate trap
- 3 Condensate outlet, optional OSD
- 4 Manual condensate drain, air cooler condensate trap
- 5 Automatic condensate drain, air cooler condensate trap

Fig. 1.5 Condensate outlets

1.3.1 Elektronikon regulator (E1-Fig. 1.1)

The regulator has following functions:

Controlling the compressor

The regulator matches the compressor output to the air consumption by speed regulation of the motor.

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
- Direct stop: i.e. the compressor runs at a speed in between minimum and maximum and the net pressure rises above the direct stop setpoint.

Both settings are programmable; consult the "User manual for Elektronikon regulator", section "Modify settings submenu".

Note: to prevent the safety valve from opening too frequently on 13 bar compressors, the setting of the direct stop setpoint should never be more than 1 bar.

Protecting the compressor

If the compressor element outlet temperature exceeds the programmed shut-down level, the compressor will be stopped. This will be indicated on the control panel (Fig. 1.7). The compressor will also be stopped in case of overload of fan motor (4-Fig. 1.4).

If the compressor element outlet temperature exceeds a programmed value below the shut-down level, this will also be indicated to warn the operator before the shut-down level is reached.

Service plans

A number of service operations are grouped in plans (called Service plans A, B and C). Each Service plan has a programmed time interval. If a time interval is exceeded, a message will appear on display (12-Fig. 1.7) to warn the operator to carry out the service actions belonging to that plan. See section 4.1.

Automatic restart after voltage failure

For compressors leaving the factory, this function is made inactive. If desired, the function can be activated. Consult Atlas Copco.

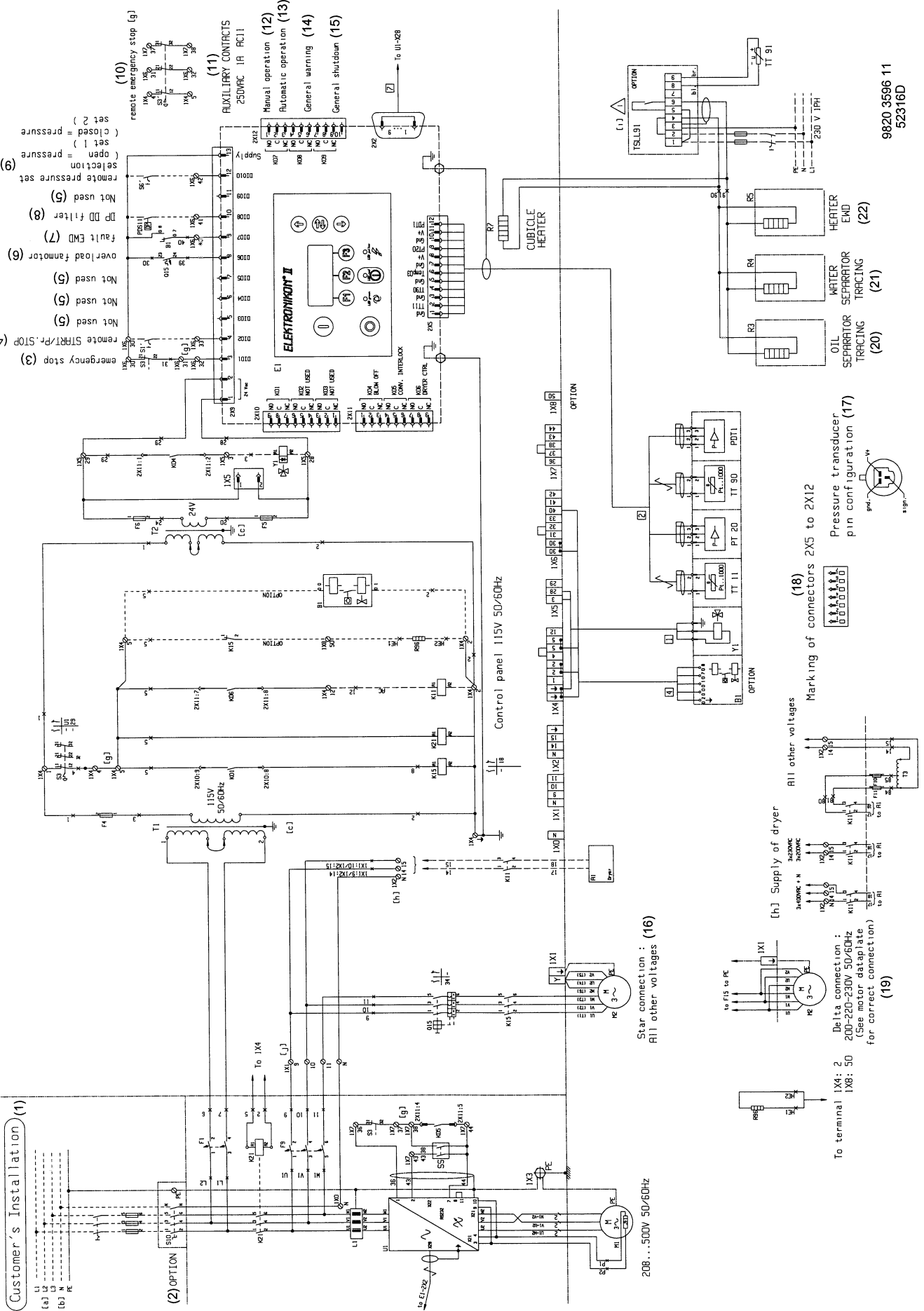
Warning *If activated and provided the module was in the automatic operation mode, the compressor will automatically restart if the supply voltage to the module is restored within a programmed time period.*

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.

1.3.2 Control panel (Figs. 1.1 and 1.7)

LEDs/buttons/keys

| Ref. | Designation | Function |
|------|---------------|---|
| 1 | Scroll keys | Keys to scroll through the display. |
| 2 | Tabulator key | Key to select the parameter indicated by a horizontal arrow. Only the parameters followed by an arrow pointing to the right are accessible for modifying. |



COMPRESSOR

| | |
|--------|--|
| A1 | Dryer (optional) |
| B1 | Optional electronic condensate drain |
| PDS11 | Delta P switch, integrated dryer (optional) |
| PDT1 | Differential pressure sensor, oil separator |
| PT20 | Pressure sensor, air outlet |
| R3,4,5 | Freeze protection (optional) |
| R7 | Heater cubicle (optional) |
| R96 | Anti-condensation heater (optional) |
| TSSL91 | Thermostat, freeze protection (optional) |
| TT11 | Temperature sensor, compressor element outlet |
| TT90 | Temperature sensor, dewpoint |
| TT91 | Temperature sensor, converter cubicle (optional) |
| Y1 | Solenoid valve, blow-off |

MOTORS

| | |
|----|-------------------------------|
| M1 | Compressor motor |
| M2 | Fan motor, compressor coolers |

ELECTRIC CABINET

| | |
|--------|--|
| E1 | Elektronikon control module |
| F4/5/6 | Fuses |
| K11 | Contactor, dryer |
| K15 | Contactor, fan motor |
| S3 | Emergency stop button |
| S5 | Service switch |
| S10 | Main power isolating switch (optional) |
| T1/T2 | Transformer |
| T3 | Transformer |
| Q15 | Circuit breaker, fan motor |

CONVERTER CABINET

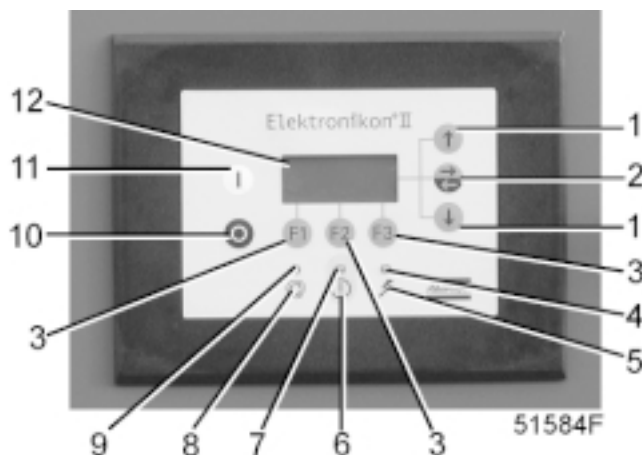
| | |
|------|-----------------|
| F1/2 | Fuses |
| F9 | Circuit breaker |
| K21 | Line contactor |

| | |
|----|---------------------|
| U1 | Frequency converter |
| Z1 | EMC filter |

CONTROL MODULE (E1)

| | |
|-----|---|
| I | Start button |
| K01 | Auxiliary relay, fan motor |
| K02 | Auxiliary relay |
| K03 | Auxiliary relay |
| K04 | Auxiliary relay, solenoid valve |
| K05 | Auxiliary relay, converter shut-down |
| K06 | Auxiliary relay, dryer |
| K07 | Auxiliary relay, manual/automatic operation |
| K08 | Auxiliary relay, general warning |
| K09 | Auxiliary relay, general shut-down |
| O | Stop button |

Fig. 1.6 Electrical diagram



- 1 Scroll keys
- 2 Tabulator key
- 3 Function keys
- 4 LED, voltage on
- 5 Pictograph, voltage on
- 6 Pictograph, alarm
- 7 LED, general alarm
- 8 Pictograph, automatic operation
- 9 LED, automatic operation
- 10 Stop button
- 11 Start button
- 12 Display

Fig. 1.7 Control panel

| Ref. | Designation | Function | Abbreviation | Designation | Function |
|-----------------|-------------------------|---|--------------|-------------|--|
| 3 | Function keys | Keys to control and program the compressor. See below. | Add | Add | To add compressor start/stop commands (day/hour) |
| 4 | Voltage on LED | Indicates that the voltage is switched on. | Back | Back | To return to a previously shown option or menu |
| 5 | Pictograph | Voltage on | Canc | Cancel | To cancel a programmed setting when programming parameters |
| 6 | Pictograph | Alarm | Del | Delete | To delete compressor start/stop commands |
| 7 | General alarm LED | Is normally out. Is alight or blinks in case of an abnormal condition. See below | Help | Help | To find the Atlas Copco internet address |
| 8 | Pictograph | Automatic operation | Lim | Limits | To show limits for a programmable setting |
| 9 | Automatic operation LED | Indicates that the regulator is automatically controlling the compressor. | Main | Main | To return from a menu to the main screen (Fig. 1.8) |
| 10 | Stop button | Push button to stop the compressor. LED (9) goes out. | Menu | Menu | Starting from the main screen (Fig. 1.8): to have access to submenus |
| 11 | Start button | Push button to start the compressor. LED (9) lights up indicating that the regulator is operative (in automatic operation). | Menu | Menu | Starting from a submenu: to return to the previous menu |
| 12 | Display | Indicates messages concerning the compressor operating condition, a service need or a fault. | Mod | Modify | To modify programmable settings |
| S3- Fig. 1.1 | Emergency stop button | Push button to stop the compressor in case of emergency. After remedying the trouble, unlock the button by pulling it out. | Prog | Program | To program modified settings |
| | | | Rset | Reset | To reset a timer or message |
| | | | Rtrn | Return | To return to a previously shown menu |
| | | | Xtra | Extra | To find information regarding the installed modules |

General alarm LED (7-Fig. 1.7) 1)

- The LED blinks in case of a shut-down (due to too high a compressor element outlet temperature, overload of the fan motor, etc.); at the same time the shut-down screen appears. After eliminating the cause of the trouble and when the abnormal condition has disappeared, press function key (3) below Rset.
- The LED blinks and the compressor is shut down if the sensor of the compressor element is out of order; at the same time the display will show a fault message. Depressurize the compressor by pressing the emergency stop button, close the air outlet valve and open the manual drain valve. Check the sensor and its wiring.
- The LED is alight in case of a shut-down warning; at the same time a warning message appears. Remedy; see section 6.

Function keys

The keys are used:

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

The functions of the keys vary depending on the displayed menu. The actual function is abbreviated and indicated on the bottom line of the display just above the relevant key. The most common abbreviations are listed below.

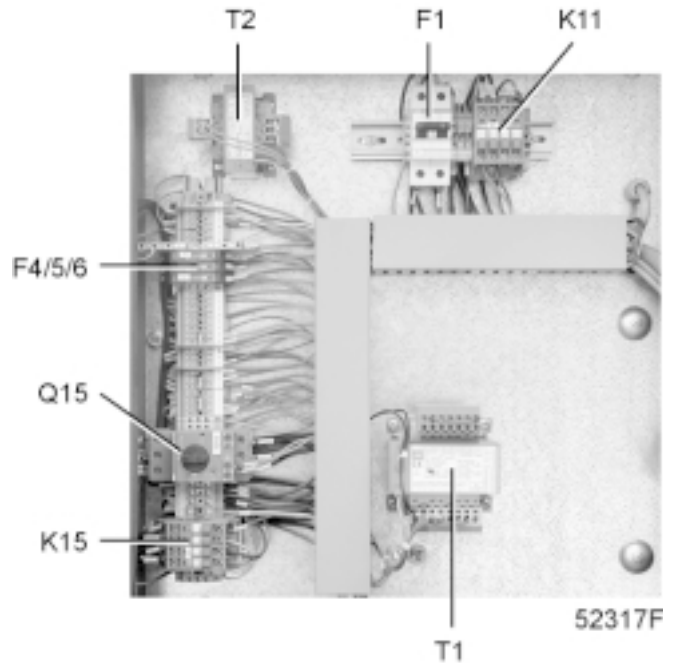
| | | | |
|----------------|------|----|---|
| Compressor out | | | |
| bar | 7.0 | | |
| rpm | 5065 | | ↓ |
| Menu | | | |
| F1 | F2 | F3 | |

Fig. 1.8 Example of the main screen

| | | |
|---------------|----|----|
| Status data | → | |
| Measured data | | |
| Counters | | |
| Main | ↓ | |
| F1 | F2 | F3 |

Fig. 1.9 Example of a main menu

Figs. 1.8 and 1.9 Displays



| | | | |
|----------|-----------------------|-----|----------------------------|
| F1 | Circuit breaker | Q15 | Circuit breaker, fan motor |
| F4/F5/F6 | Fuses | T1 | Transformer |
| K11 | Contactors, dryer | T2 | Transformer |
| K15 | Contactors, fan motor | | |

Fig. 1.10 Electric cabinet (typical example)

Calling up other menus

Starting from the Main screen:

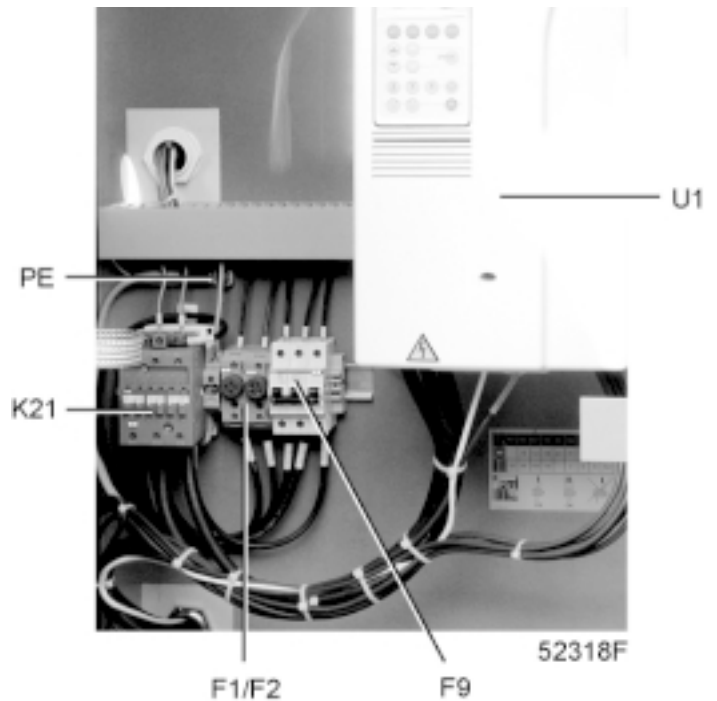
- Use the ↓ key (1-Fig. 1.7) for a quick look at the actual compressor status
- Press the key Menu (F1), the option Status data will be followed by a horizontal arrow:
 - either press the tabulator key (2-Fig. 1.7) to select this menu
 - or use the ↓ key (1-Fig. 1.7) to scroll until the desired submenu is followed by a horizontal arrow and then press tabulator key to select this menu

1.4 Electric cabinet (Fig. 1.10)

The electric cabinet mainly comprises transformers, fuses, a fan motor contactor and circuit breaker, and for Full-feature compressors also the dryer contactor.

The Elektronikon regulator and emergency stop button are fitted in the door of the cabinet.

The converter cabinet comprises the start and speed regulation unit. The parameters of the start and speed regulation unit are factory-set and need no adjustment. Changing the parameters may damage the compressor; consult Atlas Copco.



| | | | |
|-------|-----------------|----|---------------------|
| F1/F2 | Fuses | PE | Earth terminal |
| F9 | Circuit breaker | U1 | Frequency converter |
| K21 | Line contactor | | |

Fig. 1.11 Converter cabinet

1.5 Air dryer on GA Workplace Full-feature (Figs. 1.2 and 3.5)

GA Workplace Full-feature are provided with a dryer which removes moisture from the compressed air.

1.5.1 Compressed air circuit (Fig. 1.2)

Compressed air enters heat exchanger (13) 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 (15) where the refrigerant evaporates causing the air to be further cooled 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 collects in condensate trap (4) and is automatically drained. The cold, dried air flows through heat exchanger (13), where it is warmed up by the incoming air. Condensation in the air net cannot occur unless the air is cooled to below the pressure dewpoint.

1.5.2 Refrigeration circuit (Fig. 1.2)

Compressor (M3) delivers hot, high-pressure refrigerant gas which flows through condenser (2) where most of the refrigerant condenses.

The liquid flows through liquid refrigerant dryer/filter (12) to capillary tube (7). The refrigerant leaves the capillary tube at evaporating pressure.

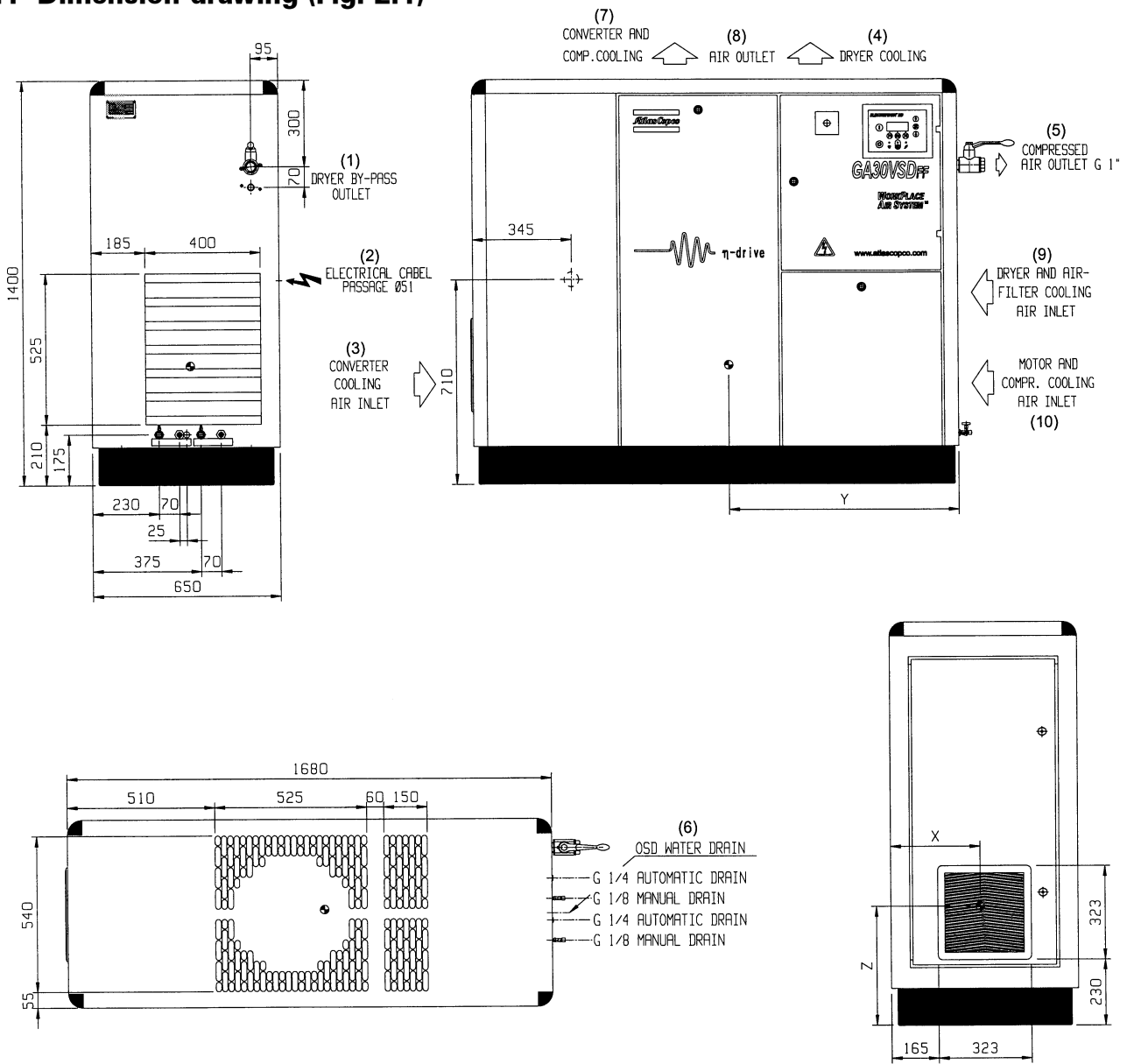
The refrigerant enters evaporator (15) where it withdraws heat from the compressed air by further evaporation at constant pressure. The heated refrigerant leaves the evaporator and is sucked in by the compressor.

Footnote chapter 1

1) Consult the "User manual for Elektronikon regulator", section "Status data submenu".

2 INSTALLATION

2.1 Dimension drawing (Fig. 2.1)



| TYPE (16) | PACK (11) | | | | FULL FEATURE (14) | | | |
|-------------|------------------------|---|---|-------------------------|------------------------|-----|-----|-------------------------|
| | CENTER OF GRAVITY (12) | | | WEIGHT (13) | CENTER OF GRAVITY (12) | | | WEIGHT (13) |
| | X | Y | Z | OIL ± BKG INCLUDED (15) | X | Y | Z | OIL ± BKG INCLUDED (15) |
| GA18 - 200V | | | | . | | | | . |
| GA18 - 400V | | | | . | | | | . |
| GA18 - 575V | . | . | . | . | 310 | 792 | 413 | . |
| GA30 - 200V | | | | . | | | | . |
| GA30 - 400V | | | | . | | | | 587 |
| GA30 - 575V | | | | . | | | | . |

DIMENSIONS IN MM (17) : ± 20 MM WEIGHTS IN KG (18) : ± 10KG

Fig. 2.1 Dimension drawing

9820 3619 00
52319D

2.2 Electric cable size

Attention

- Local regulations remain applicable if they are stricter than the values proposed below.
- The voltage drop shall not exceed 5% of the nominal voltage. It may be necessary to use cables with a larger size than those stated to comply with this requirement.
- Use the original cable entrance ((2-Fig. 2.1).
- The voltage on the compressor terminals must not deviate more than 10% of the nominal voltage.

50 Hz compressors

| Compressor type | GA18 VSD | GA18 VSD | GA18 VSD | GA30 VSD | GA30 VSD | GA30 VSD |
|---|----------|----------|----------|----------|----------|----------|
| Voltage (V) | 400+N | 400 | 500 | 400+N | 400 | 500 |
| Maximum line current | | | | | | |
| - Pack (A) | 51 | 51 | 36 | 68 | 68 | 56 |
| - Full-feature (A) | 56 | 59 | 40 | 73 | 77 | 60 |
| Cable size (mm ²) | 25 | 25 | 25 | 50 | 50 | 50 |
| Maximum fuse (A) | 63 | 63 | 63 | 80 | 80 | 80 |

60 Hz compressors

| Compressor type | GA18 VSD | GA18 VSD | GA30 VSD | GA30 VSD |
|--|----------|----------|----------|----------|
| Voltage (V) | 380 | 460 | 380 | 460 |
| Maximum line current | | | | |
| - Pack (A) | 45 | 37 | 71 | 60 |
| - Full-feature (A) | 52 | 42 | 78 | 65 |
| Cable size (mm ² /AWG size) | 25/4 | 25/4 | 50/1 | 50/1 |
| Maximum fuse (A) IEC/CSA-UL | 63/60 | 63/60 | 125/125 | 125/125 |

2.3 Installation proposal (Fig. 2.2)

| Ref. | Description/recommendation | Ref. | Description/recommendation |
|------|--|------|---|
| 1 | Install the compressor on a level floor suitable for taking the weight of the compressor. | L = | $(dP \times d^5 \times P) / (450 \times Qc^{1.85})$ |
| 2 | Compressed air outlet valve. | L = | pipe length in m |
| 3 | The maximum total pipe length (including interconnecting piping between compressor and receiver) can be calculated as follows: | dP = | maximum allowable pressure drop (recommended 0.1 bar) |
| | | d = | inner diameter of pipe in mm |
| | | P = | compressor outlet pressure in bar absolute |
| | | Qc = | free air delivery of compressor in l/s |

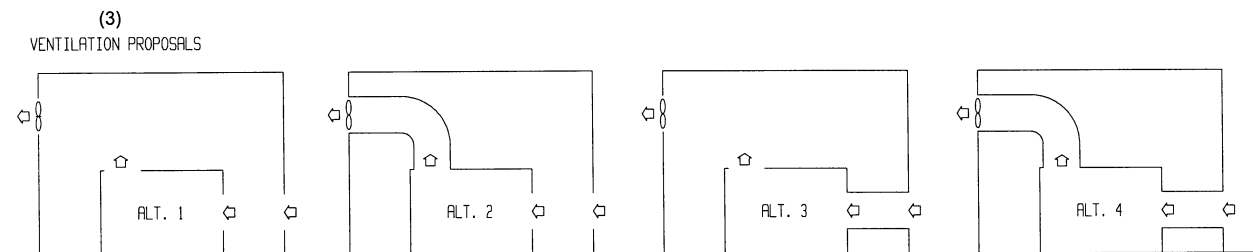
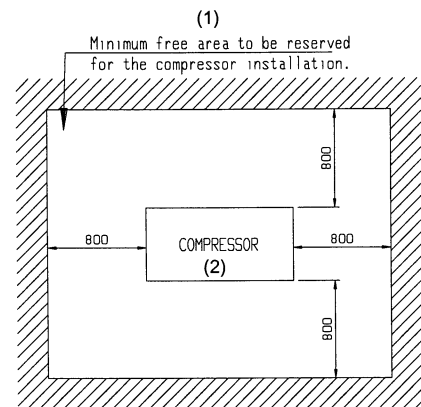
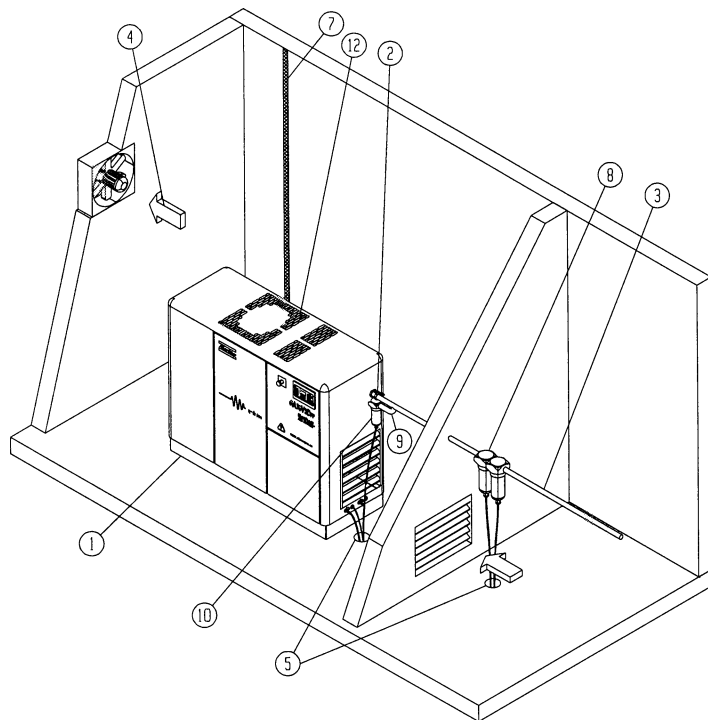


Fig. 2.2 Installation proposal

9820 3646 00
52322D

| Ref. | Description/recommendation | Ref. | Description/recommendation |
|------|--|---|----------------------------|
| 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 is avoided. The air velocity to the grids must be limited to 5 m/s. The maximum allowable pressure drop over the cooling air ducts depends on the ambient temperature; consult Atlas Copco. The maximum air temperature at the compressor intake opening is 40 degrees Celsius (minimum 0 degrees Celsius).</p> <p>For alternatives 1 and 3, the required ventilation to limit the compressor room temperature can be calculated as follows:</p> | <p>$Q_v = 1.06 N/dT$ for GA VSD Workplace</p> <p>$Q_v = (1.06 N + 1.3)/dT$ for GA VSD Workplace Full-feature</p> <p>$Q_v =$ required ventilation capacity in m^3/s</p> <p>$N =$ nominal motor power input of compressor in kW</p> <p>$dT =$ temperature increase in compressor room</p> | |

Ref. Description/recommendation

- 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 Mains cables entry.
- 8 Filter type DD (optional) for general purpose filtration (particle removal down to 1 micron with a maximum oil carry-over of 0.5 ppm). A high-efficiency filter, type PD (optional) may be installed downstream the DD filter (particle removal down to 0.01 micron with max. oil carry-over of 0.01 ppm). If oil vapour and odours are undesirable, a filter of the QD type (optional) should be installed downstream of the PD filter.
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.
- 9 By-pass system to by-pass the dryer during service operations (available as an option, consult Atlas Copco).
- 10 High efficiency water separator, removes 90% of the moisture in the compressed air when by-passing the dryer.
-

Attention:

Working with machinery controlled by a frequency converter requires special safety precautions. These safety precautions depend on the kind of network used (TN, TT or IT system). Consult Atlas Copco.

2.4 Electrical connections (Fig. 1.11)

- Check the fuses and the setting of the circuit breaker. See section 7.3.
- Connect the power supply to line contactor (K21). Connect the earth conductor to connector (PE). Consult section 2.2.

3 OPERATING INSTRUCTIONS**Safety precautions**

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

Altitude operation

Consult Atlas Copco if operating above 1000 m.

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

3.1 Initial start-up**Remarks**

1. Read the "User manual for Elektronikon regulator" to familiarize yourself with all regulator functions.
2. Consult section 2 for the dimension drawings, electric cable size and installation proposal.

Start-up

1. The compressor element and motor are secured to the frame, immobilizing the vibration dampers during transport.
Remove the bolts and bushes (4-Fig. 3.2) immobilizing the vibration dampers of the compressor element.
Remove bolts (2-Fig. 3.2) and support (3-Fig. 3.2).
2. Check that the electrical connections correspond to the local codes and that all wires are clamped tight to their terminals. The installation must be earthed and protected against short circuits by fuses of the inert type in all phases.
3. Check the voltage selecting wires at the primary side of transformers (T1 and T2-Fig. 1.10) and the setting of fan motor circuit breaker (Q15-Fig. 1.10). Check that the switch on the circuit breaker is in position "I".
4. Fit the air outlet valve to the air outlet pipe. Close the valve. Connect the air net to the valve.
5. Connect the manual and automatic condensate drain outlets to a drain collector as described in section 2.3.

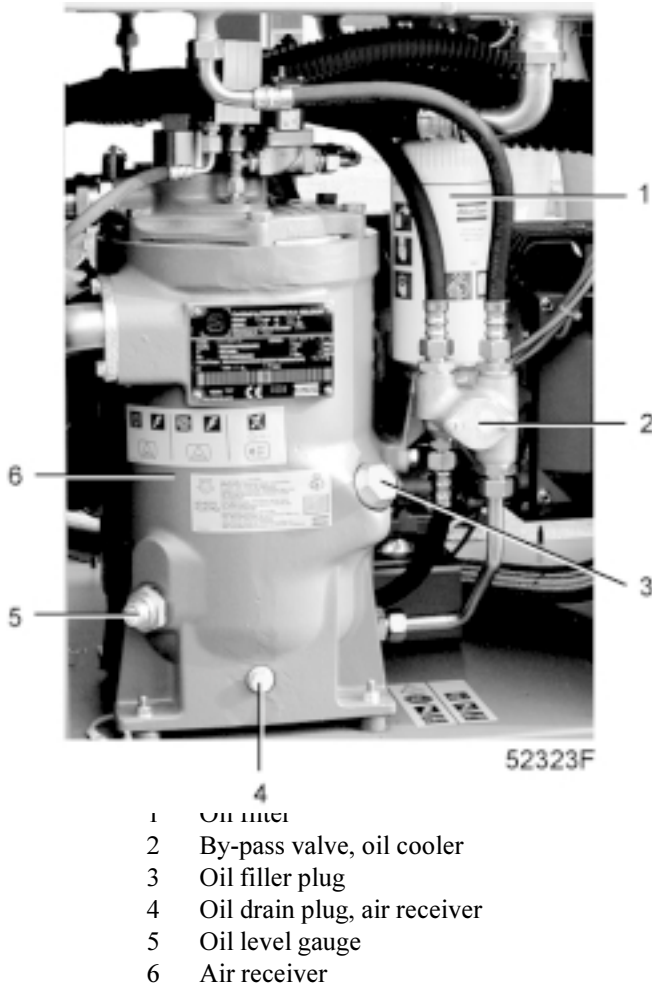


Fig. 3.1 Oil system components

6. Check the oil level. The pointer of the level gauge (5-Fig. 3.1) should register in the green or orange range. The bottle delivered loose with the compressor is filled with Atlas Copco Roto-injectfluid and can be used for topping up.
7. A sticker dealing in short with the operating instructions and explaining the pictographs is delivered with the literature set. Affix the sticker next to the control panel. Make yourself familiar with the instructions and pictographs explained. Stick labels on an obvious place near the control panel, warning the operator that:
 - the compressor is automatically started and stopped (see section 1.2)
 - the compressor may automatically restart after voltage failure (see section 1.3.1)
 - the compressor may be remotely controlled (see section 3.1.1)
8. Switch on the voltage. Start the compressor and 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, reverse two incoming connections on the terminals of circuit breaker (Q15-Fig. 1.10). Check the rotation direction of the drive motor, the correct direction is indicated by arrow (11-Fig. 1.4) on the gear casing. If the rotation direction is wrong, reverse two incoming connections on the drive motor.
9. Check the programmed settings. 1)
10. Start the compressor and run it for a few minutes. Check that the compressor operates normally.

3.1.1 Remote control

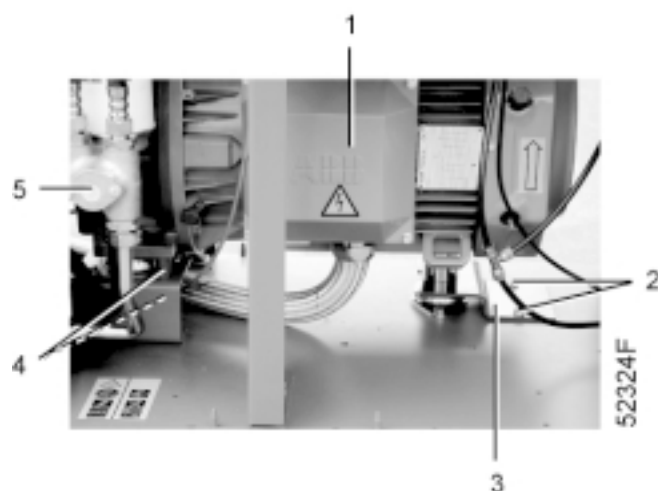
Consult the “User manual for Elektronikon II regulators” section “Configuration menu” if it is desired to switch to the remote control mode.

Attention

Consult Atlas Copco before connecting a remote start/programmed stop button.

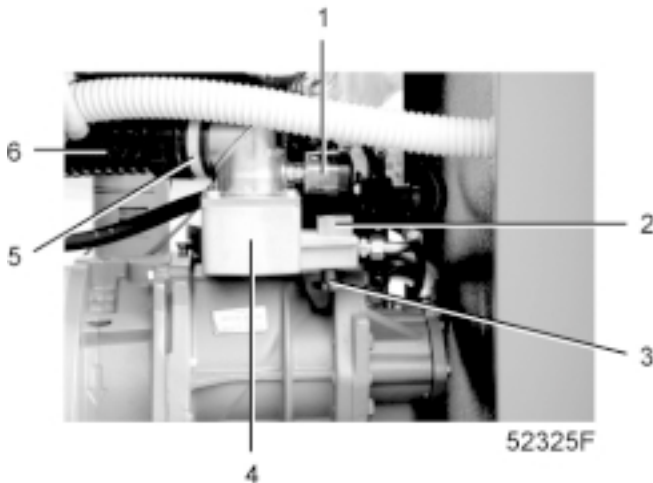
3.2 Before starting

- If the compressor has not run for the past 6 months, special precautions must be taken. Improve the lubrication of the compressor element at starting: remove the four bolts of expander (4-Fig. 3.3) lift the expander and **pour 3/4 l of oil into the compressor element**. Reinstall the expander.
- Check the oil level (5-Fig. 3.1). The pointer should be in the upper field of the green range or in the HIGH range. If the pointer registers in the LOW range, depressurize the oil system **by pushing the emergency stop button, close the air outlet valve and open manual drain valves (1 and 4-Fig. 1.5)**. Wait until the compressor has depressurized. Unscrew oil filler plug (3-Fig. 3.1) 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.



- 1 Compressor motor
- 2 Bolts (to be removed)
- 3 Support (to be removed)
- 4 Bolt and bush (to be removed)
- 5 By-pass valve, oil cooler

Fig. 3.2 Parts, transport protection



- 1 Air filter service indicator
- 2 Nozzle
- 3 Palm grip
- 4 Expander
- 5 Hose clip, air inlet hose
- 6 Air inlet hose

Fig. 3.3 View of blow-off nozzle

- oil until the level reaches the filler neck. Tighten the plug.
2. If the coloured part of air filter service indicator (1-Fig. 3.3) shows fully out, stop the compressor, switch off the voltage and replace the air filter element. Reset the indicator by pushing its knob.
3. If automatic operation LED (9) 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.

Warning When the motors are stopped and LED (9) is alight, the motors may start automatically.

Checking the display 2) (Fig. 1.7)

1. Regularly check the display for readings and messages. Normally the main screen (Fig. 1.8) is shown, indicating the compressor outlet pressure, the motor speed and the abbreviations of the functions of the keys below the display. See section 1.3.
2. Always check the display (12) and remedy the trouble if alarm LED (7) is alight or blinks. See section 1.3.2.

- If the coloured part of the service indicator (1-Fig. 3.3) shows full out, replace the air filter element.

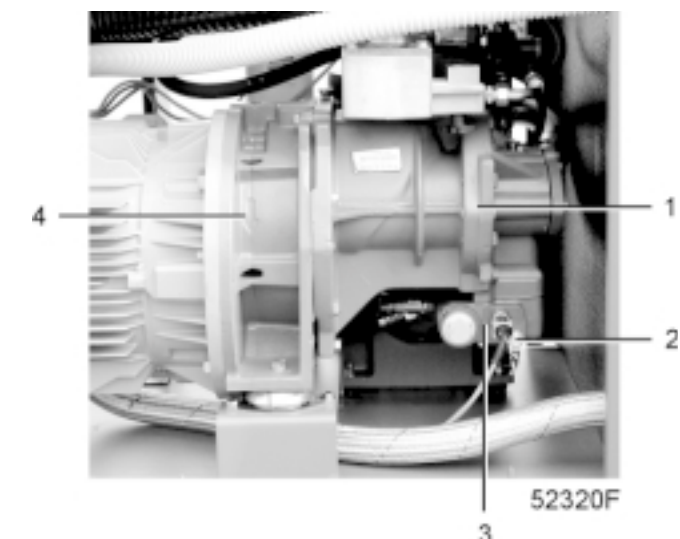
3.3 Starting (Fig. 1.7)

1. Switch on the voltage. Check that voltage on LED (4) lights up. The message **compressor off** appears.
2. Open the air outlet valve.
3. Close condensate drain valves (1 and 4-Fig. 1.5).
4. Press start button I (11). The compressor starts running and automatic operation LED (9) lights up.

3.4 During operation (Fig. 1.7)

In order to ensure sufficient motor cooling, the doors must be closed during operation and may be opened for short periods only to carry out checks.

1. Check the oil level **during operation**: the pointer of the level indicator (5-Fig. 3.1) must register in the green range; if not, press stop button O (10), **press the emergency stop button (S3-Fig. 1.1), close the air outlet valve, open manual drain valves (1 and 4-Fig. 1.5) and wait until the compressor has depressurized. Unscrew oil filler plug (3-Fig. 3.1) only one turn to permit any pressure in the system to escape.** Remove the filler plug and add



- 1 Compressor element
- 2 Oil drain plug
- 3 Check valve/oil stop valve
- 4 Arrow, indicating the correct rotation direction of the drive motor

Fig. 3.4 View of compressor element

- The display (12) 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.

Warning Before carrying out any maintenance, repair or adjustment, stop the compressor, press the emergency stop button (S3-Fig. 1.1), close the air outlet valve and open valves (1 and 4-Fig. 1.5). Wait until the compressor is depressurized. Switch off the voltage.

Notes:

- Whenever a shut-down, shut-down warning, service request, sensor error or fan motor overload message is displayed, the free spaces on the display between the function keys (3) are filled with blinking indicators (**).
- When more than one message needs to be displayed (e.g. both warning and service), the messages are continuously displayed for 3 seconds each.

- Regularly press the ↓ key (1-Fig. 1.7) on the main screen to call up information about the actual compressor condition:
 - the maximum pressure
 - the status of controlling the compressor (local or remote)
 - the status of the compressor start/stop timer (on or off) **3)**
 - the actual speed
 - the loaded hours
 - the motor starts
 - the module hours
 - the accumulated m³
 - the outlet pressure
 - the pressure difference over the oil separator
 - the compressor element outlet temperature
 - the dewpoint temperature **4)**
 - the status of the fan motor overload protection (normal or not)

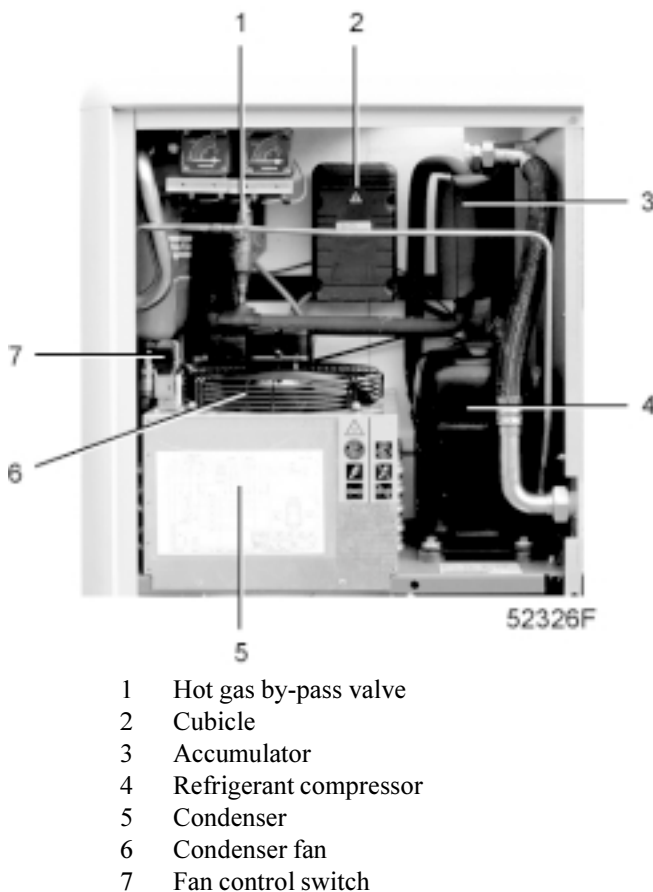


Fig. 3.5 Air dryer

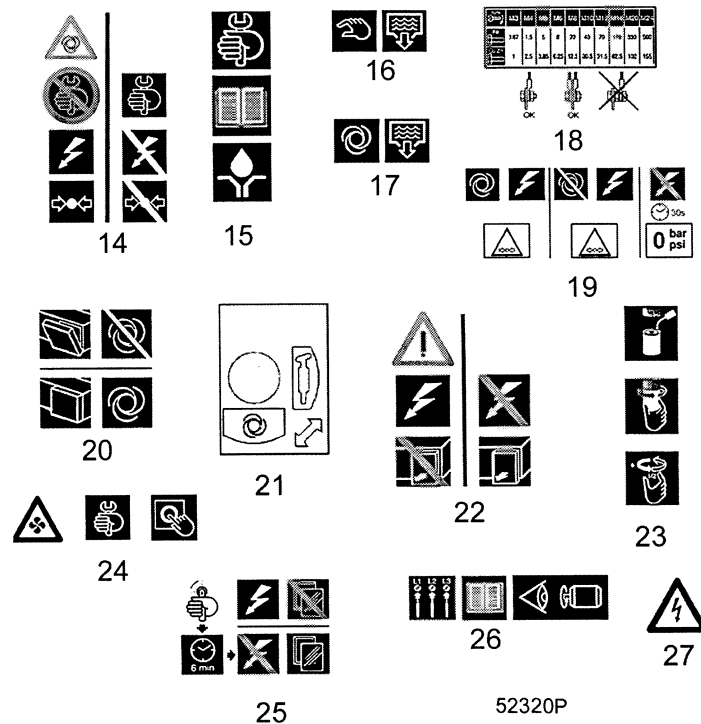
3.5 Stopping (Fig. 1.7)

- Press stop button O (10). LED (9) goes out. The compressor stops and the message **Programmed stop** appears on the screen. Five seconds later, the message changes from **Programmed stop** to **Compressor stopped**.
- To stop the compressor in case of emergency, press the emergency stop button (S3-Fig. 1.1).
- Close the air outlet valve and switch off the voltage.
- Open condensate drain valves (1 and 4-Fig. 1.5).

3.6 Taking out of operation

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

- Stop the compressor and close the air outlet valve.
- Switch off the voltage and disconnect the compressor from the mains.
- Wait until the compressor has depressurized. Unscrew plug (3-Fig. 3.1) only one turn to permit any pressure in the system to escape. Open drain valves (1 and 4-Fig. 1.5).
- 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.
- Drain the oil and condensate circuits.
- Disconnect the compressor condensate piping from the condensate drain net.



- | | | | |
|----|---|----|--|
| 14 | Switch off the voltage and depressurize the compressor before starting maintenance or repairs | 22 | Switch off voltage before removing protecting cover inside electric cubicle |
| 15 | Consult Instruction book before greasing | 23 | Lightly oil the gasket of the oil filter, screw it on and tighten by hand (approx. half a turn) |
| 16 | Manual condensate drain | 24 | Stop the compressor before cleaning the coolers |
| 17 | Automatic condensate drain | 25 | Switch off the voltage and wait for at least 6 minutes before removing the screen |
| 18 | Torques for steel (Fe) or brass (CuZn) bolts | 26 | Before connecting compressor electrically, consult the Instruction book for the motor rotation direction |
| 19 | Compressor remains pressurized for 30 seconds after switching off the voltage | 27 | Warning, voltage |
| 20 | Keep the doors closed during operation | | |
| 21 | Nozzle position, regreasing or automatic operation | | |

Fig. 3.6 Pictographs

Footnotes chapter 3

- 1) Consult the "User manual for Elektronikon regulator", sections regarding the submenus "Measured data", "Service", "Modify settings", "Timer" and "Programmable settings".
- 2) Consult the "User manual for Elektronikon regulator", sections "Status data submenu" and "Service submenu".
- 3) The compressor is automatically started and stopped if these start/stop commands are programmed and activated; consult the "User manual for Elektronikon regulator", section "Timer submenu".
- 4) For Full-feature compressors.

4 MAINTENANCE

Attention: Before starting any maintenance, press stop button O (10-Fig. 1.7), press the emergency stop button (S3-Fig. 1.1), close the air outlet valve, open manual drain valves (1 and 4-Fig. 1.5) and switch off the voltage.

The air outlet valve can be locked as follows:

- Close the valve.
- Remove the bolt fixing the handle to the valve.
- Lift the handle and turn it until the slot fits over the blocking edge.
- Fix the handle to the valve using the special bolt and wrench delivered loose with the compressor.

Mechanical maintenance

Before starting maintenance, open drain valves (1 and 4-Fig. 1.5) and wait for at least 30 seconds (time needed for the compressor to depressurize).

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.

Apply all relevant safety precautions, including those mentioned in this book.

4.1 Preventive maintenance schedule for the compressor 1)

Service plans

A number of service operations are grouped in plans, called Service plans A, B or C. 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 "User manual for Elektronikon regulator", section "Status data menu".

After servicing, the intervals are to be reset. See "User manual for Elektronikon regulator".

Important

Always consult Atlas Copco in case any timer setting should be changed.

Service kits

For overhauling or carrying out preventive maintenance, service kits are available. See section 4.8. Atlas Copco offers several types of Service contracts, relieving you of all preventive maintenance work. For more details, consult your nearest Atlas Copco customer's centre.

General

The schedule comprises a summary of the maintenance instructions. Read the respective section before taking maintenance measures. When servicing, replace all disengaged packings, e.g. gaskets, O-rings, washers.

Preventive maintenance schedule

| Period | See section | See notes below table | Operation |
|------------------|-------------|-----------------------|--|
| Daily | 3 | - | Check oil level |
| " | 3 and 7 | - | Check readings on display |
| " | -- | - | Check that condensate is discharged during operation |
| " | 3 | - | Check air filter service indicator |
| " | 3 | - | Drain condensate |
| 3-monthly | 5 | - | Check coolers and condenser of dryer; clean if necessary |
| " | 5 | 1 | Remove and inspect air filter element (AF) |

Service plans

| Running hours | See section | See notes below table | Service plan | Operation |
|---------------|-------------|-----------------------|--------------|--|
| 4000 | 4 | 2/4 | A | If Atlas Copco Roto-injectfluid is used, change oil and oil filter |
| 1000 | 4 | 2/4/3 | A | If oil as specified in section 4.4.2 is used, change oil and oil filter |
| 4000 | -- | - | B | Check pressure and temperature readings |
| " | -- | 7 | B | Carry out a LED/display test |
| " | -- | 6 | B | Check for possible air or oil leakage |
| " | 4 and 5 | 2 | B | Replace air filter element |
| " | -- | - | B | Remove, dismantle and clean float valve of condensate trap |
| " | 4 | - | B | Re-grease bearings of drive motor as specified |
| " | -- | - | B | Check blow-off solenoid valve (Y1) after stopping and pressing the emergency stop button |
| " | -- | 8 | B | Test temperature shut-down function |
| " | 5 | - | B | Have the safety valve tested |
| " | -- | - | B | Clean cooling fins of electric motors |
| " | -- | - | B | Inspect restrictor in scavenging line for cleanness |
| " | 5 | - | B | Clean air and oil coolers |
| 8000 | -- | 5 | C | Have oil separator replaced |

Notes

1. More frequently when operating in a dusty atmosphere. Replace damaged or heavily contaminated elements.
2. Use genuine Atlas Copco filters.
3. **The interval for Service plan A is to be reduced to the mentioned interval in case mineral oil is used instead of Roto-injectfluid. Consult the "User manual for Elektronikon regulator", section "Modify settings".**
4. Recommended oil: Atlas Copco Roto-injectfluid. For the change interval in extreme conditions of temperature, humidity or cooling air, consult Atlas Copco.
5. Or when the pressure drop over the separator exceeds 1 bar. See "User manual for Elektronikon regulator", section "Measured data menu" to call up this value. Check the pressure drop when the compressor is running loaded and preferably with a stable working pressure.
6. Any leakage should be attended to immediately. Damaged flexibles or flexible joints must be replaced.
7. See "User manual for Elektronikon regulator", section "Test menu".
8. See "User manual for Elektronikon regulator", section "Modify settings menu".
Decrease the shut-down warning level and shut-down level for the compressor element outlet temperature to the minimum settings. Run the compressor: when reaching the setting, the unit must shut down. Afterwards, reset the warning and shut-down levels to their original values.

4.2 Compressor motor (1-Fig. 3.2)

The correct type of grease can be ordered from Atlas Copco (see section 4.8).

The bearings must be regreased with KLÜBERQUIET BQH 72 - 102.

Quantity: 24 g per bearing

To regrease the motor (Fig. 3.3) loosen palm grip (3), lift nozzle (2) and turn it 90 degrees clockwise (automatic operation pictograph covered and grease pump pictograph visible); tighten the palm grip. Run the Regreasing program from the Test submenu on the regulator. When the regreasing program has finished, loosen the palm grip, lift the nozzle and turn it back into its original position (grease pump pictograph covered and automatic operation pictograph visible), tighten the palm grip.

During the Regreasing program, the compressor will run for 30 minutes at minimum speed. The compressed air is blown off via the solenoid valve.

The compressor can be put into operation again by pressing the start button. Reset the regulator as described in the "User manual for Elektronikon regulator", section "Service reset".

4.3 Oil and oil filter change interval

Consult section 4.1 for the change intervals and section 4.4 for the oil specifications.

4.4 Oil specifications

4.4.1 Atlas Copco Roto-injectfluid

It is strongly recommended to use Atlas Copco Roto-injectfluid. This is special oil for screw compressors which keeps the compressor in excellent condition.

Atlas Copco Roto-injectfluid can be ordered in following quantities:

| Quantity | Ordering number |
|--------------------------|-----------------|
| 5-litre can | 2901 0245 01 |
| 20-litre can | 2901 0522 00 |
| 209-litre drum | 2901 0045 01 |

4.4.2 Mineral oil

Although Roto-injectfluid is recommended, a high-quality mineral oil with oxidation inhibitors and anti-foam and anti-wear properties can also be used after taking some precautions. The oil system should first be drained and flushed. The viscosity grade must correspond to the ambient temperature and ISO 3448, as follows:

| Ambient temperature | Viscosity grade | Viscosity index |
|---------------------------------------|-----------------|------------------|
| Consistently above 25 degrees Celsius | ISO VG 68 | Minimum 95 |
| Between 25 and 0 degrees Celsius | ISO VG 32 | Minimum 95 or 46 |

Attention

Never mix oils of different brands or types. Use only non-toxic oils.

4.5 Oil change (Fig. 3.1)

1. Run the compressor until warm. **Stop the compressor, press the emergency stop button (S3-Fig. 1.1), close the air outlet valve, open manual drain valves (1 and 4-Fig. 1.5) and wait until the compressor has depressurized.** Unscrew oil filler plug (3) only one turn to permit any pressure in the system to escape.
2. Remove vent plug (5-Fig. 1.4). Drain the oil by removing drain plugs (4-Fig. 3.1 and 2-Fig. 3.4). Collect the oil in a collector and deliver it to the oil collection service. Fit and tighten the drain plugs after draining.
3. Fill air receiver (6) with oil until the level reaches the filler neck. Take care that no dirt drops into the system. Reinstall and tighten filler plug (3) and vent plug (5-Fig. 1.4).
4. Run the compressor for a few minutes. **Stop the compressor and press the emergency stop button to depressurize the compressor.** Wait a few minutes to allow the oil to settle. Unscrew oil filler plug (3) only one turn to permit any pressure in the system to escape. Fill the air receiver with oil until the level reaches the filler neck. Fit and tighten filler plug (3).
5. Reset the oil service warning (2).

4.6 Oil filter change (Fig. 3.1)

1. Close the air outlet valve and let the compressor run at minimum speed for 3 minutes. **Stop the compressor, press the emergency stop button (S3-Fig. 1.1) and open manual drain valves (1 and 4-Fig. 1.5). Wait until the compressor has depressurized. Unscrew oil filler plug (3) only one turn to permit any pressure in the system to escape.**
2. Remove vent plug (5-Fig. 1.4), wait 5 minutes, remove drain plug (2-Fig. 3.4) of the check valve/oil stop valve. Catch the oil in a receptacle.
3. Remove oil filter (1-Fig. 3.1).
4. Clean the filter seat on the manifold. Oil the gasket of the new element. Screw the element into place and tighten it firmly by hand.
5. Tighten the plug in the check valve/oil stop valve.
6. Fill the receiver (6) with oil until the level reaches the filler neck. Fit and tighten plug (3) and vent plug (5-Fig. 1.4).
7. Reset the oil filter service warning. (2)

4.7 Storage after installation

Run the compressor twice a week until warm.

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

4.8 Service kits

Service kits are available offering you the benefits of genuine Atlas Copco parts while keeping the maintenance budget low. The kits comprise all parts needed for servicing.

See section 4.4.1 for the ordering number for Atlas Copco Roto-injectfluid.

5 ADJUSTMENTS AND SERVICING PROCEDURES

5.1 Air filter

5.1.1 Recommendations

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

5.1.2 Servicing

1. Stop the compressor. Switch off the voltage. Remove the air filter cover by turning it anti-clockwise. Remove the filter element. Clean the cover. Discard the filter element.
2. Install a new element and the cover.
3. Reset the service indicator (1-Fig. 3.3) by pushing the reset knob.
4. Reset the air filter service warning **1**).

5.2 Coolers

Keep the coolers clean to maintain the cooling efficiency.

To facilitate external cleaning of the coolers, the side panels can be removed.

Remove any dirt from the coolers with a fibre brush. Never use a wire brush or metal objects. Then clean by air jet in reverse direction of normal flow.

Refit the side panels.

5.3 Safety valve

Operating

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

Testing

The valve can be tested on a separate compressed air line. If the valve does not open at the pressure specified in section 7.2, consult Atlas Copco. No adjustments are allowed.

Footnotes chapter 4

- 1) Use only authorized parts. Any damage or malfunction caused by the use of unauthorized parts is not covered by Warranty or Product Liability.
- 2) Using key <<Rset>> in submenu <<Service>>: see User manual for Elektronikon regulator, section "Service submenu".

Footnote chapter 5

- 1) Using key <<Rset>> in submenu <<Service>>: see User manual for Elektronikon regulator, section "Service submenu".

6 PROBLEM SOLVING

- Before starting repairs, press stop button O (10-Fig. 1.7), wait until the compressor has stopped, press emergency stop button (S3-Fig. 1.1) and switch off the voltage. Close the air outlet valve; the air outlet valve can be locked as described in section 4. **Open manual drain valves (1 and 4-Fig. 1.5) and wait for at least 30 seconds (time needed for the compressor to depressurize) before starting any mechanical repairs. Wait 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.** Furthermore, apply all relevant safety precautions, including those mentioned in this book.
- The chart helps to solve mechanical problems. An electrical fault must be traced by an electrician. Check that the wires are not damaged and that they are clamped tight to their terminals.
- Consult the "User manual for Elektronikon regulator" if a service message or fault message appears on the display (12-Fig. 1.7) or when alarm LED (7-Fig. 1.7) is alight or blinks.

Mechanical faults and suggested remedies (Fig. 1.2)

Explanation of the table below:

- Conditions of the compressor, always preceded by a number, are printed in bold.
- Each possible fault is followed by its relevant suggested remedy and both are preceded by the same letter.

1 **Condensate is not discharged from moisture trap during operation**

- a Discharge flexible clogged
- a Check and correct as necessary
- b Float valve malfunctioning
- b Remove float valve assembly, clean and check

2 **Compressor air output or pressure below normal**

- a Air consumption exceeds air output of compressor
- a Check equipment connected
- b Choked air inlet filter element (AF)
- b Replace filter element
- c Solenoid valve (Y1) malfunctioning
- c Remove and check valve, replace if necessary
- d Oil separator element (OS) clogged
- d Replace element
- e Air leakage
- e Check and correct as necessary

- f Safety valve (SV) leaking
- f Remove and check. Replace if not airtight after reinstalling
- g Compressor element (E) out of order
- g Consult Atlas Copco

3 **Safety valve (SV) blows**

- a Minimum pressure valve (Vp) malfunctioning
- a Remove and check. Replace defective parts
- b Oil separator element (OS) clogged
- b Replace element
- c Safety valve (SV) out of order
- c Remove and check. Replace if not airtight after reinstalling
- d On Full-feature compressors, dryer piping clogged due to formation of ice
- d Have the refrigerant system checked by Atlas Copco

4 **Element outlet 1) or air outlet temperature above normal**

- a Oil level too low
- a Check and correct as necessary
- b Oil cooler (Co) clogged
- b Clean cooler
- c By-pass valve (BV) malfunctioning
- c Remove and test valve
- d Air cooler (Ca) clogged
- d Clean cooler
- e Compressor element (E) out of order
- e Consult Atlas Copco
- f Insufficient cooling air or cooling air temperature too high
- f Check for cooling air restriction or improve ventilation of compressor room. Avoid recirculation of cooling air. If installed, check capacity of compressor room fan

5 **Motor temperature above normal**

- a Insufficient cooling air or cooling air temperature too high
- a Check for cooling air restriction or improve ventilation of compressor room. Avoid recirculation of cooling air. If installed, check capacity of compressor room fan
- b Insufficient sealing of door panels
- b Check that all doors are closed, check seals of door panels

Footnote chapter 6

- 1) A warning message will appear on display (12-Fig. 1.7).

7 PRINCIPAL DATA

7.1 Readings on display (12-Fig. 1.7)

Ref.: Air outlet pressure
 Reading: Depends on the setpoint (desired net pressure)
 Shown: On main screen (Fig. 1.8)

Ref.: Compressor element outlet temperature
 Reading: Approx. 60 degrees Celsius above ambient temperature
 Shown: Use ↓ key on main screen (Fig. 1.8)

Ref.: Dewpoint temperature (Full-feature compressors)
 Reading: Approx. 4 degrees Celsius
 Shown: Use ↓ key on main screen (Fig. 1.8)

7.2 Setting of safety valve

ASME 215 psig
 Others 14.5 bar(e)

7.3 Settings of circuit breakers

| Compressor type | Circuit breaker | Supply voltage | Frequency | Maximum setting |
|-----------------|---------------------------|----------------|-----------|-----------------|
| GA18 VSD | Fan motor (Q15-Fig. 1.10) | 400 V | 50 Hz | 1.3 A |
| | | 500 V | 50 Hz | 1.0 A |
| | | 380 V | 60 Hz | 1.3 A |
| | | 460 V | 60 Hz | 1.3 A |
| GA30 VSD | Fan motor (Q15-Fig. 1.10) | 400 V | 50 Hz | 2.1 A |
| | | 500 V | 50 Hz | 1.7 A |
| | | 380 V | 60 Hz | 2.4 A |
| | | 460 V | 60 Hz | 2.0 A |

7.4 Compressor specifications

7.4.1 Reference conditions

Air inlet pressure (absolute) bar 1
 Air inlet temperature Celsius 20
 Relative humidity % 0

7.4.2 Specific data of GA18 VSD 1)

| Working pressure | bar(e) | 7 | 9.5 | 12.5 |
|--|---------|-------|-------|-------|
| Frequency | Hz | 50/60 | 50/60 | 50/60 |
| Number of compression stages | | 1 | 1 | 1 |
| Maximum speed | rpm | 5065 | 4485 | 3785 |
| Minimum working pressure | bar(e) | 4 | 4 | 4 |
| Maximum air inlet temperature | Celsius | 40 | 40 | 40 |
| Minimum air inlet temperature | Celsius | 0 | 0 | 0 |
| Temperature of air leaving air outlet valve, approx. | | | | |
| - GA Pack | Celsius | 28 | 28 | 28 |
| - GA FF | Celsius | 23 | 23 | 23 |
| Oil capacity, approx. | l | 7.5 | 7.5 | 7.5 |
| Electric power input | | | | |
| - GA Pack 50 Hz | kW | 24.1 | 25.3 | 24.8 |
| - GA Pack 60 Hz | kW | 24.1 | 25.3 | 24.8 |
| - GA FF 50 Hz | kW | 26.1 | 26.3 | 25.8 |
| - GA FF 60 Hz | kW | 25.4 | 26.5 | 26.0 |
| Sound pressure level 3) 2) | | | | |
| - 50 Hz | dB(A) | 68 | 67 | 67 |
| - 60 Hz | dB(A) | 68 | 67 | 67 |

7.4.3 Specific data of GA30 VSD 1)

| Working pressure | bar(e) | 7 | 9.5 | 12.5 |
|--|---------|-------|-------|-------|
| Frequency | Hz | 50/60 | 50/60 | 50/60 |
| Number of compression stages | | 1 | 1 | 1 |
| Maximum speed | rpm | 7200 | 6620 | 5930 |
| Minimum working pressure | bar(e) | 4 | 4 | 4 |
| Maximum air inlet temperature | Celsius | 40 | 40 | 40 |
| Minimum air inlet temperature | Celsius | 0 | 0 | 0 |
| Temperature of air leaving air outlet valve, approx. | | | | |
| - GA Pack | Celsius | 29 | 29 | 29 |
| - GA FF | Celsius | 23 | 23 | 23 |
| Oil capacity, approx. | l | 10 | 10 | 10 |
| Electric power input | | | | |
| - GA Pack 50 Hz | kW | 37.2 | 38.2 | 38.9 |
| - GA Pack 60 Hz | kW | 37.2 | 38.2 | 38.9 |
| - GA FF 50 Hz | kW | 38.3 | 39.3 | 40.0 |
| - GA FF 60 Hz | kW | 38.6 | 39.6 | 40.3 |
| Sound pressure level 3) 2) | | | | |
| - 50 Hz | dB(A) | 71 | 70 | 70 |
| - 60 Hz | dB(A) | 71 | 70 | 70 |

7.5 Conversion list of SI units into US/British units

1 bar = 14.504 psi
1 g = 0.035 oz
1 kg = 2.205 lb
1 km/h = 0.621 mile/h
1 kW = 1.341 hp (UK and US)
1 l = 0.264 US gal
1 l = 0.220 Imp gal (UK)
1 l = 0.035 cu.ft
1 m = 3.281 ft
1 mm = 0.039 in
1 m³/min = 35.315 cfm
1 mbar = 0.401 in wc
1 N = 0.225 lbf
1 Nm = 0.738 lbf.ft
x degrees Celsius = (32 + 1.8x) degrees Fahrenheit
1 degree Celsius = 1.8 degrees Fahrenheit

8 Instructions for use of air receiver

1. This vessel can contain pressurized air; be aware of its potential danger in case of misuse.
2. This vessel shall only be used as compressed air/oil separator and be operated within the specified limits as mentioned on the data plate.
3. No alterations shall be made to this vessel by welding, drilling or other methods of mechanical work without written permission of the manufacturer.
4. 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), for M16 bolts 185 Nm (+/- 45).
5. Pressure and temperature of this vessel must be clearly indicated.
6. 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.
7. Use only oil as specified by the manufacturer.
8. 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. Therefore, there is no intrinsic need for in service inspection of the vessel when used within the design limits and in its intended application. However, national legislation may require in service inspection.

Footnotes chapter 7

- 1) At reference conditions
- 2) Free field conditions
- 3) According to PNEUROP/CAGI PN8NTC2