Important

1. This book applies exclusively to GA30-GA37-GA45 equipped with an electronic regulator with a liquid crystal display. This regulator is used from following serial number onwards

   All-310 000

2. This book must be used together with the "User manual for electronic regulator for GA30-GA37-GA45 compressors"

This instruction book meets the requirements for instructions specified by the machinery directive 89/392/EEC and is valid for CE as well as non-CE labelled machines.
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 are stationary, single-stage, oil-injected screw compressors driven by an electric motor. GA30, -37 and -45 are air-cooled, whereas GA30 W, -37 W and -45 W are water-cooled.

GA Pack
The compressors are enclosed in a sound-insulated bodywork. The front panel comprises an electronic control module including the start and stop buttons. An emergency stop button is also provided. An electric cabinet comprising the motor starters is located behind this panel.

GA Full-feature
GA Full-feature compressors are additionally provided with an air dryer integrated in the bodywork. The dryer removes moisture from the compressed air by cooling the air to near freezing point and automatically draining the condensate.

1.1.1 Air flow (Fig. 4b)

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

Check valve (CV) prevents blow-back of compressed air when the compressor is stopped. Minimum pressure valve (Vp) prevents the receiver pressure from dropping below a minimum pressure.

1.1.2 Oil system (Fig. 4b)

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.

---

**E1. Electronic control module**
1. Air outlet pipe  
2. Electric cable inlet  
3. Condensate drains  
4. Side door

*Fig. 1. General view of GA45*
AF. Air filter
AR. Air receiver/oil separator
BV. Oil cooler by-pass valve
Ca. Air cooler
Co. Oil cooler
CV. Check valve
DP2. Oil drain plug, oil stop valve
DP3. Oil drain plug, check valve
DP4. Oil drain plug, gear casing
E. Compressor element
E1. Electronic control module
FN2. Fan
I. Start button
MT. Air cooler moisture trap
M1. Compressor motor
M2. Fan motor
O. Stop button
OF. Oil filter

Fig. 2a. Front view of air-cooled GA45 Pack/Full-feature

Fig. 2b. Rear view of water-cooled GA45 Pack

PT20. Pressure sensor, compressed air outlet
SV. Safety valve
S3. Emergency stop button
TT11. Temperature sensor, outlet of compressor element
UA. Unloader
Vp. Minimum pressure valve
VP. Oil cooler vent plug
Vs. Oil stop valve
1. Electric cabinet
2. Stud and nut (to be removed)
3. Bolt (to be removed)
4. Compressor motor support
5. Compressor element support
6. Oil scavenging flexible
7. Vibration damper
8. Oil drain flexible
9. Plate
10. Condensate drain flexibles
11. Cooling water inlet pipe
12. Cooling water outlet pipe
13. Compressed air pipe

Figs. 2. GA45 Pack and Full-feature
The oil system is provided with a by-pass valve (BV). When the oil temperature is below 40°C (104°F)\textsuperscript{1}, 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.

By-pass valve (BV) starts opening the oil supply from cooler (Co) when the oil temperature has increased to the above-mentioned value. At approx. 55°C (131°F)\textsuperscript{1} all the oil flows through the oil cooler.

Oil stop valve (Vs) prevents the compressor element from flooding with oil when the compressor is stopped. The valve is opened by element outlet pressure when the compressor is started.

1.1.3 Cooling and condensate drain systems (Figs. 2)

The cooling system comprises air cooler (Ca) and oil cooler (Co). On air-cooled compressors, the cooling air is generated by fan (FN2). Water-cooled compressors have a cooling water system. The water flows through inlet pipe (11), the tube stacks of the air cooler and oil cooler, and outlet pipe (12).

A moisture trap (MT) is provided in the air outlet system. The trap is equipped with a valve for automatic condensate draining during operation (Da-Fig. 3) and a manually operated valve for draining after stopping the compressor (Dm-Fig. 3).

1) The valve starts opening at 65°C (149°F) and is fully open at 80°C (176°F) for 13 bar and 175 psi compressors.

1.2 Unloading/loading system (Figs. 4)

1.2.1 Unloading (Fig. 4a)

If the air consumption is less than the air output of the compressor, the net pressure increases. When the net pressure reaches the unloading pressure, solenoid valve (Y1) is de-energized. The plunger of the valve returns by spring force:

1. The control pressure present in the chambers of loading plunger (LP) and unloading valve (UV) is vented to atmosphere via solenoid valve (Y1).
2. Loading plunger (LP) moves upwards and causes inlet valve (IV) to close the air inlet opening.
3. Unloading valve (UV) is opened by receiver pressure. The pressure from air receiver (AR) is released towards unloader (UA).
4. The pressure is stabilized at a low value. A small amount of air is kept drawn in through flexible (3) and is also blown to the unloader.

Air output is stopped (0 %), the compressor runs unloaded.

1.2.2 Loading (Fig. 4b)

When the net pressure decreases to the loading pressure, solenoid valve (Y1) is energized. The plunger of solenoid valve (Y1) moves upwards against spring force:

1. Control pressure is fed from air receiver (AR) via solenoid valve (Y1) to loading plunger (LP) and unloading valve (UV).
2. Unloading valve (UV) closes the air blow-off opening. Loading plunger (LP) moves downwards and causes inlet valve (IV) to open fully.

Air output is resumed (100 %), the compressor runs loaded.
Fig. 4a. GA30/37/45 Full-feature during unloading
Fig. 4b. GA30 W/37 W/45 W Pack during loading
1.3 Electrical system

The system comprises (Figs. 2)::

1. Compressor motor (M1) and fan motor (M2) 1)
2. Electronic control module (Fig. 7a)
3. Compressor start button (I) and stop button (O)
4. Emergency stop button (S3)
5. Electric cabinet (Fig. 5)
6. Sensors for the compressor element outlet temperature (TT11) and for the air outlet pressure (PT20)
7. Dewpoint temperature sensor (TT90-Figs. 6) for Full-feature compressors
8. Phase control relay (K25-Fig. 5)

1.4 Electronic control module

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

1) Air-cooled compressors only

---

On Full-feature also:

FN1. Fan, dryer condensor
M1. Refrigerant compressor
M2. Motor, condensor fan
S3. Condensor fan control switch
S7. High pressure shut-down switch 1)
5. Air/air heat exchanger
6. Refrigerant/refrigerant heat exchanger (evaporator)
7. Liquid separator
8. Refrigerant/refrigerant heat exchanger 2)
9. Condensor
10. Liquid receiver
11. Expansion valve
12. Filter

Figs. 4. Air-oil and unloading-loading systems

See Figs. 6 for denomination of components

Fig. 5. Electric cabinet (typical example)
Fig. 6b. Dryer ID80/100 on GA Full-feature

Fig. 6c. Dryer ID120 on GA Full-feature
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.

Monitoring components subject to service
The regulator continuously monitors the oil, oil filter, oil separator and air filter. Each input is compared to programmed time intervals. If these limits are exceeded, a message will appear on the display (Fig. 7a) to warn the operator to replace the indicated component.

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.

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.

1) Only for Full-feature compressors
2) Only for compressors designed for high temperature conditions
3) Only on 220/230 V compressors, CSA/UL approved
4) Relay not yet mounted
5) TÜV-approved compressors only

1.4.1 Electronic regulator (E1-Fig. 2a)

The regulator has following functions:

Controlling the compressor
The regulator maintains the net pressure between programmable limits by automatically loading and unloading the compressor. A number of programmable settings, e.g. the unloading and loading pressures, the minimum stop time and the maximum number of motor starts are taken into account.

The regulator stops the compressor whenever possible to reduce the power consumption and restarts it automatically when the net pressure decreases. In case the expected unloading period is too short, the compressor is kept running to prevent too-short standstill periods.

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. 7a). The compressor will also be stopped in case of overload of compressor motor (M1) or fan motor (M2). 1)
### 1.4.2 Control panel (Fig. 7a)

To control the compressor and to read and modify programmable parameters, the regulator is provided with a panel including:

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Designation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Automatic operation</td>
<td>Indicates that the regulator is automatically controlling the compressor: the compressor is loaded, unloaded, stopped and restarted depending on the air consumption and the limitations programmed in the regulator.</td>
</tr>
<tr>
<td>2</td>
<td>Voltage on LED</td>
<td>Indicates that the voltage is switched on.</td>
</tr>
<tr>
<td>3</td>
<td>General alarm LED</td>
<td>Is normally out. Is alight or blinks in case of an abnormal condition. See below.</td>
</tr>
<tr>
<td>4</td>
<td>Display</td>
<td>Indicates:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the name of the sensor of which the actual reading is displayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- the unit and actual reading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- messages regarding the operating status, a sensor error, a service need or a fault</td>
</tr>
<tr>
<td>5</td>
<td>Function keys</td>
<td>Keys to control and program the compressor. The actual function of each key is abbreviated and indicated on the bottom line. The most common ones are listed below.</td>
</tr>
<tr>
<td>6</td>
<td>Scroll keys</td>
<td>As long as an arrow is shown on the right side of the display, the key with the same symbol can be used to scroll through the display.</td>
</tr>
<tr>
<td>7</td>
<td>Tabulator key</td>
<td>Key to go to the next field of the display.</td>
</tr>
<tr>
<td>8</td>
<td>Start button</td>
<td>Push button to start the compressor. LED (1) lights up indicating that the regulator is operative (in automatic operation). The LED goes out after unloading the compressor manually.</td>
</tr>
<tr>
<td>9</td>
<td>Stop button</td>
<td>Push button to stop the compressor. LED (1) goes out. The compressor will stop after running in unloaded condition for 30 seconds.</td>
</tr>
<tr>
<td>S3</td>
<td>Emergency stop button</td>
<td>Maintained-action push button to stop the compressor immediately in case of emergency.</td>
</tr>
</tbody>
</table>

**Fig. 7a. Control panel**

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

**Fig. 7b. Example of the main display**

**Fig. 7c. Example of a main menu**
1.4.2.1 General alarm LED (3-Fig. 7a) 1)

- The LED blinks in case of a shut-down (due to either too high a compressor element outlet temperature or overload of the compressor motor or fan motor) 2); at the same time the shut-down screen appears. After eliminating the cause of the trouble and when the abnormal condition has disappeared, press key Rset (5).
- The LED blinks and the compressor is shut down if the sensor of the compressor element (TT11-Fig. 2b) is out of order; at the same time the display will show a fault message. Switch off the voltage, depressurize and 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 5.
- The LED is alight if the dewpoint sensor (TT90) is out of order (on Full-feature compressors); at the same time a fault message is shown. Stop the compressor, switch off the voltage, depressurize and check the sensor and its wiring.

1.4.2.2 Selecting a menu

To facilitate controlling the compressor, menu-driven programs are implemented in the electronic module. Use the function keys (5) to select the menus in order to program and monitor the compressor. The "User manual for electronic regulator for GA30-GA37-GA45 compressors" deals elaborately with all regulator functions.

1.4.2.3 Function keys

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Designation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add</td>
<td>Add</td>
<td>To add compressor start/stop commands (day/hour)</td>
</tr>
<tr>
<td>Canc</td>
<td>Cancel</td>
<td>To cancel a programmed setting when programming parameters</td>
</tr>
<tr>
<td>Del</td>
<td>Delete</td>
<td>To delete compressor start/stop commands</td>
</tr>
<tr>
<td>Lim</td>
<td>Limits</td>
<td>To show limits for a programmable setting</td>
</tr>
<tr>
<td>List</td>
<td>List</td>
<td>To list programmed start/stop commands (day/hour)</td>
</tr>
<tr>
<td>Load</td>
<td>Load</td>
<td>To load the compressor manually</td>
</tr>
<tr>
<td>Main</td>
<td>Main</td>
<td>To return from a menu to the main display (Fig. 7b)</td>
</tr>
<tr>
<td>Menu</td>
<td>Menu</td>
<td>Starting from the main display (Fig. 7b), to initiate the main menu (Fig. 7c) which gives access to submenus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Starting from a submenu, to return to the main menu (Fig. 7c)</td>
</tr>
<tr>
<td>Mod</td>
<td>Modify</td>
<td>To modify programmable settings</td>
</tr>
<tr>
<td>More</td>
<td>More</td>
<td>To have a quick look at the compressor status</td>
</tr>
</tbody>
</table>

1.5 Electric cabinet (Fig. 5)

The cabinet comprises electric components such as relays, transformers and fuses as well as the start contactors for the compressor motor and fan motor 1). An overload relay for the compressor motor (F21) and a fan motor circuit breaker (Q15) are provided.

A phase control relay (K25) 2) is installed to monitor the connection to the mains. The relay has two LEDs. The green LED is alight if the voltage is switched on. If the connection of the incoming electric lines is correct, the yellow LED of the relay will be alight and the compressor will start after pressing button (8-Fig. 7a). In the other case, the yellow LED will be out and the compressor will not start: switch off the voltage and reverse two of the incoming lines of terminal strip (1X2).

On air-cooled compressors: if it should be necessary to change the rotation direction of the fan motor (M2-Figs. 2) only, switch off the voltage and reverse two connections at the terminals of circuit breaker (Q15).

On GA Full-feature, the voltage supply to the dryer must be 220-240 V single-phase. The voltage to the dryer is supplied over the contacts of relay (K11), which close when the compressor is started. Consult section 7.4.

1.6 Air dryer on GA Full-feature (Figs. 4a and 9)

GA Full-feature are provided with a dryer which removes moisture from the compressed air. Depending on the compressor type, following types of air dryers may be provided: ID80, ID100 or ID120. The type is stamped on the data plate (13-Fig. 9).

1.6.1 Compressed air circuit

Compressed air enters heat exchanger (5) and is cooled by the outgoing, cold, dried air. Water and oil in the incoming air start to condense. The air then flows through heat exchanger (6) where the refrigerant evaporates and withdraws heat from the air. This

1) Consult the User manual for the electronic regulator, section “Status data submenu”.
2) Air-cooled compressors only.
3) Not installed on later production compressors. In this case, the phase control is carried out by the electronic regulator
cools the air to close to the evaporating temperature of the refrigerant. More water and oil in the air condense. The cold air then flows through moisture trap (MT) where all the condensate is separated from the air. The condensate is automatically drained through outlet (Da). The cold dried air then flows through heat exchanger (5), 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. The pressure dewpoint can be called up. See section 2.4.1.

1.6.2 Refrigerant circuit

Compressor (M1) delivers hot, high-pressure refrigerant gas which flows via liquid separator (7) through air-cooled condensor (9) where most of the refrigerant condenses. The cooled refrigerant then collects in receiver (10).

The liquid flows through heat exchanger (8) and filter (12) to expansion valve (11) where it expands to evaporating pressure. The refrigerant enters evaporator (6) where it withdraws heat from the compressed air by further evaporation. Dependent on the compressed air load, all, or almost all, refrigerant evaporates at constant pressure and temperature. The vapour refrigerant leaving evaporator (6) flows through heat exchanger (8) 1) into liquid separator (7). The liquid separator prevents any droplets from entering compressor (M1) because warm refrigerant, leaving the compressor, flows through the liquid separator evaporating the surrounding liquid. The refrigerant gas is sucked in by compressor (M1).

1.6.3 Automatic regulation system

Expansion valve (11) maintains the evaporating temperature between 1 and -1°C (34 and 30°F); these are the approximate temperatures at zero and maximum air load respectively.

1.6.4 Dryer control and safety devices

Fan control switch (S3)
The condensor pressure must be kept as constant as possible to obtain stable operation of expansion valve (11). Therefore, fan control switch (S3) starts motor (M2) of the condensor fan as soon as the condensor pressure reaches the upper set point and will stop the motor when the condensor pressure reaches the lower set point.

Overload switch (S6-Fig. 6b) 1)
The motor of the refrigerant compressor (M1) is protected by a thermal overload switch (S6), built into the motor. The motor will automatically be restarted when it has cooled down.

Pressure shut-down switch (S7) 2)
The switch breaks the circuit to motor (M1) of the refrigerant compressor if the refrigerant pressure becomes too high. If this occurs, the switch must be reset by pressing its reset button.

Fig. 8. Components delivered with the compressor (typical examples)

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Air outlet valve</td>
</tr>
<tr>
<td>2</td>
<td>Manual condensate drain valve</td>
</tr>
<tr>
<td>3</td>
<td>Condensate drain flexible for automatic drain</td>
</tr>
<tr>
<td>4</td>
<td>Condensate drain flexible for manual drain</td>
</tr>
<tr>
<td>4</td>
<td>Connection between flexible (2) and valve (Dm)</td>
</tr>
<tr>
<td>1</td>
<td>Bottle containing Atlas Copco Roto-injectfluid</td>
</tr>
</tbody>
</table>

1) Not on dryers of type ID120
2) Only TÜV-approved compressors
2 Operating instructions

Safety precautions

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

2.1 Initial start-up

2.1.1 Remarks

1. Read the "User manual for electronic regulator for GA30-GA37-GA45 compressors" to familiarize yourself with all regulator functions.
2. Consult section 7 for the dimension drawings, electrical connections and installation proposal.

2.1.2 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 at high altitude, consult Atlas Copco.

2.1.3 Moving/lifting

The compressor can be moved by a lift truck using the slots in the frame. 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.

2.1.4 Cooling water requirements

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

<table>
<thead>
<tr>
<th>Recommended maxima - mg/l</th>
<th>Recirculating system</th>
<th>Open system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride (Cl⁻)</td>
<td>&lt; 600</td>
<td>&lt; 150</td>
</tr>
<tr>
<td>Sulphate (SO₄²⁻)</td>
<td>&lt; 400</td>
<td>&lt; 250</td>
</tr>
<tr>
<td>Total solids</td>
<td>&lt; 3000</td>
<td>&lt; 750</td>
</tr>
<tr>
<td>Suspended solids (as SiO₂)</td>
<td>&lt; 10</td>
<td>&lt; 10</td>
</tr>
<tr>
<td>Free chlorine (Cl₂)</td>
<td>&lt; 4</td>
<td>&lt; 2</td>
</tr>
<tr>
<td>Ammonia (NH₄⁺)</td>
<td>&lt; 0.5</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Copper</td>
<td>&lt; 0.5</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Iron</td>
<td>&lt; 0.2</td>
<td>&lt; 0.2</td>
</tr>
<tr>
<td>Manganese</td>
<td>&lt; 0.1</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>Oxygen</td>
<td>&lt; 3</td>
<td>&lt; 3</td>
</tr>
<tr>
<td>Carbonate hardness (as CaCO₃)</td>
<td>50-1000</td>
<td>50-500</td>
</tr>
<tr>
<td>Organics (KMnO₄ Consumption)</td>
<td>&lt; 25</td>
<td>&lt; 10</td>
</tr>
</tbody>
</table>

Remarks

- No algae nor oil.
- Chloride and sulphate are interactive. In open systems the sum of the squares of these values 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.
- The content of calcium compounds must be as low as possible and not exceed 120 mg of calcium oxide (CaO) per litre.

2.1.5 Initial start-up

1. The compressor element and motor are secured to the frame, immobilizing the vibration dampers (7-Figs. 2) during transport. Remove the stud and nuts (2) of both compressor element supports. Remove the bolts (3) of the motor support. Loosen the nut of the central stud and remove support (4). Turn the nut until it contacts the vibration damper (7). Tighten the nut.
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. An isolating switch must be installed near the compressor.
3. Check the voltage selecting wires at the primary side of transformer (T1-Fig. 5), the settings of compressor motor overload relay (F21) and fan motor circuit breaker (Q15), and that overload relay (F21) is set for automatic resetting. On water-cooled units, circuit breaker (Q15) is installed but not used. Check that the switch on the circuit breaker is in position "I".
4. Fit air outlet valve (AV-Fig. 8) to pipe (1-Fig. 1). Close the valve. Connect the air net to the valve.
5. Connect valve (Dm-Fig. 8) to the manual condensate drain outlet (Fig. 3). Close the valve. Connect the valve to a drain collector by means of flexible (2-Fig. 8) and connection (3-Fig. 8).
6. Connect the automatic drain outlet (Da-Fig. 3) to a drain collector by means of flexible (1-Fig. 8).
7. On water-cooled compressors, a drain valve, regulating valve and shut-off valve should be fitted by the customer in the cooling water piping.
8. Check the oil level. The pointer of the level gauge (Gl-Fig. 12) should register in the green or orange range. Bottle (4-Fig. 8) can be used for topping up.
9. Noise-dampening plates are delivered loose. Close off the forklift grooves by means of these plates to reduce the sound pressure level.
10. 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, as well as with those mentioned in section 7.5.
11. Switch on the voltage. If the yellow LED of relay (K25-Fig. 5) is alight, start the compressor. Check the rotation direction of the motors. When facing the drive end shaft of the motors, the correct rotation direction is:
- counter-clockwise for the fan motor (M2-Figs. 2)  
- counter-clockwise for the compressor motor (M1-Figs. 2) (except for GA30 7 bar (50 Hz) and GA37 10 bar (50 Hz): clockwise)

If the rotation direction is wrong, consult section 1.5.

12. Check the programmed settings.  
13. Start and run the compressor for a few minutes. Check that the compressor operates normally.

1) Not installed on later production compressors, consult section 1.5.  
2) Air-cooled compressors only.  
3) Consult the User manual for the electronic regulator, sections regarding the submenus "Measured data", "Service", "Modify settings", "Timer" and "Programmable settings".

### 2.2 Before starting

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: remove bolts (7-Fig. 14b), lift unloader (UA) and pour 3/4 l of oil into the compressor element. Reinstall the unloader.

1. Check the oil level (Gl-Fig. 12). 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 unscrewing oil filler plug (FC) one turn) and add oil until the level reaches the filler plug. Tighten the plug.
2. If necessary, empty the dust trap of air filter (AF-Fig. 2a).
3. If the red part of the air filter service indicator (VI-Fig. 14b) shows full out, replace the air filter element (see section 4.1).

### On water-cooled compressors also:

4. Check that the cooling water drain valve (customer's installation) is closed.
5. Open the cooling water inlet valve (customer's installation).
6. Open the water flow regulating valve (customer's installation). This step can be overlooked if, after previous operation, the setting of this valve has not been disturbed.

### Remark

It is possible to remotely control following functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Action (see strip 1X1-Fig. 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote start/stop programmed</td>
<td>Connect a remote start button between terminals 30 and 31. Connect a remote stop button between terminals 30 and 32. Bridge terminals 30 and 34. Close switch CMS2.</td>
</tr>
<tr>
<td>Remote load/unload</td>
<td>Bridge terminals 30 and 35. Connect a load/unload switch between terminals 30 and 34. Close switch CMS2</td>
</tr>
</tbody>
</table>

### 2.3 Starting (Fig. 7a)

1. Switch on the voltage. Check that voltage on LED (2) lights up. The message **compressor off** appears.
2. Open air outlet valve (AV).
3. Close condensate drain valve (Dm-Fig. 3).
4. Press start button I (8). The compressor starts running and automatic operation LED (1) lights up. Ten seconds after starting, the compressor motor switches over from star to delta. At the same time 1) the compressor starts running loaded. The message on display (4) changes from **Auto unloaded** to **Auto loaded**.

1) Programmable. See the User manual for the electronic regulator, section "Programmable settings".
2.4 During operation (Fig. 7a)

1. Check the oil level during loaded operation: the pointer of the level indicator (Gl-Fig. 12) must register in the green range; if not, press button O (9), wait until the compressor has stopped, depressurize the oil system (by unscrewing oil filler plug (FC) one turn), wait a few minutes and add oil until the level reaches the filler plug. Tighten the plug.

2. If the red part of the air filter service indicator (VI-Fig. 14b) shows full out, stop the compressor and replace the air filter element (see section 4.1).

3. If automatic operation LED (1) is alight, the regulator is automatically controlling the compressor, i.e. loading, unloading, stopping of the motors and restarting.

2.4.1 Checking the display 1)

1. Regularly check the display for readings and messages. Normally the main display (Fig. 7b) is shown, indicating the compressor outlet pressure, the status of the compressor and the abbreviations of the functions of the keys below the display. See section 1.4.

2. Always check the display (4) and remedy the trouble if alarm LED (3) is alight or blinks. See section 1.4.2.1.

1) Consult the User manual for the electronic regulator, sections "Status data submenu" and "Service submenu".
3. The display (4) will show a service message if one of the monitored components is to be serviced; replace the component and reset the relevant timer.

   **Notes:**
   - Whenever a shut-down, shut-down warning, service request, sensor error or motor overload message is displayed, the free spaces on the display between the function keys (5) are filled with blinking indicators (**).
   - When more than one message needs to be displayed (e.g. both warning and service), the messages will be displayed one after the other for 3 seconds.

4. Regularly press the key **More (5)** 1) to call up information about the actual compressor condition:
   - the status of controlling the compressor (automatic or manual, local or remote)
   - the status of the compressor start/stop timer (on or off) 2)
   - the maximum allowable unloading pressure
   - the outlet pressure
   - the compressor element outlet temperature
   - the dewpoint temperature (on Full-feature compressors)
   - the status of the motor overload protection (normal or not)
   - the total running and loading hours

2.5 Manual control (Fig. 7a) 3)

   Normally, the compressor runs in automatic operation, i.e. the electronic regulator loads, unloads, stops and restarts the compressor automatically. LED (1) is then alight.

   If required, the compressor can be unloaded manually. In this case, the compressor is switched out of automatic operation, i.e. the compressor remains running unloaded unless it is loaded again manually.

   **Manually unloading**
   Press the key **Unld** (unload) (5). LED (1) goes out. The message **Manual Unloaded** appears on the display.

   **Manually loading**
   Press the key **Load** (5). LED (1) lights up. The command **Load** does not force the compressor in loaded condition, but it will switch the compressor to automatic operation again, i.e. the compressor will be loaded if required by the air net pressure.

   **Manually starting**
   In automatic operation, the regulator limits the number of motor starts. If the compressor is stopped manually, it must not be restarted within 6 minutes after the last stop.

2.6 Stopping (Fig. 7a)

1. Press stop button O (9). LED (1) goes out. The message **Programmed stop** appears. The compressor runs unloaded for 30 seconds and then stops.
2. **To stop the compressor in case of emergency**, press button (S3). Alarm LED (3) blinks. After remedying the fault, unlock the button by turning it anticlockwise and press key Rset (5) before restarting. The message **All conditions are OK** appears. Press keys **Menu and Main**.
3. Close air outlet valve (AV-Figs. 4) and switch off the voltage.
4. Open condensate drain valve (Dm-Fig. 3).

   **On water-cooled compressors only:**
5. Close the cooling water inlet valve.
6. **If freezing temperatures can be expected**, drain the cooling system completely.

2.7 Taking out of operation at end of compressor life cycle

1. Stop the compressor and close the air outlet valve.
2. Switch off the voltage and disconnect the compressor from the mains.
3. **Depressurize the compressor by opening plug (FC-Fig. 12) and valve (Dm-Fig. 3).**
4. 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.
5. Shut off the compressor water piping and isolate it from the cooling water net.
6. Drain the oil, water and condensate circuits.
7. Disconnect the compressor condensate piping from the condensate drain system.

1) If the **More** function is not indicated on the bottom line of display (4-Fig. 7a), press key **Menu** (5) until function **Main** appears above key (F1), then press the key **Main**.
2) The compressor is automatically started and stopped if these start/stop commands are programmed and activated; consult the User manual for the electronic regulator, section "Timer submenu".
3) If the **Load** or **Unld** (unload) function is not indicated on the bottom line of display (4), press key **Menu** (5) until the function **Main** appears above key (F1), then press the key **Main**.
3 Maintenance

Attention
Before starting any maintenance, press stop button O (9-Fig. 7a), wait until the compressor has stopped (approx. 30 seconds), press stop button (S3-Fig. 7a) and switch off the voltage. Apply all relevant safety precautions, including those mentioned in this book.

A yellow-painted blocking device is delivered loose. The device can be fitted around the closed outlet valve (AV-Fig. 8) to lock the valve during maintenance or repair works.

3.1 Compressor motor (M1-Figs. 2)

The bearings must be regreased with a lithium-soap-based grease according to DIN 51 825 K3k. Quantity: 10 g (0.35 oz) per bearing each 2000 operating hours if working in ambient temperatures above 25°C, 20 g (0.7 oz) each 4000 hours if working below 25°C. The lubrication points are marked.

3.2 Preventive maintenance schedule for the compressor (see next page)

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.

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

3.3 Oil and oil filter change interval

Consult section 3.2 for the change intervals and section 3.4 for the oil specifications.

The oil change interval depends on the working temperature. See note 5 below the maintenance schedule.

3.4 Oil specifications

Never mix oils of different brands or types. Consult Atlas Copco for the recommended oils. Use only non-toxic oils where there is a risk of inhaling delivered air.

3.4.1 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. If Atlas Copco Roto-Injectfluid is not available, oil as specified in section 3.4.2 can be used.

3.4.2 Mineral oil for hydraulics

High-quality, mineral oil for hydraulics with oxidation inhibitors and anti-foam and anti-wear properties. The viscosity grade must correspond to the ambient temperature and ISO 3448, as follows:

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Viscosity grade</th>
<th>Viscosity index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistently above 25°C (77°F)</td>
<td>ISO VG 68</td>
<td>Minimum 95</td>
</tr>
<tr>
<td>Between 25°C (77°F) and 0°C (32°F)</td>
<td>ISO VG 32 or 46</td>
<td>Minimum 95</td>
</tr>
</tbody>
</table>

3.4.3 Synthetic hydrocarbon lubricant

A polyalphaolefine-based synthetic hydrocarbon lubricant with anti-oxidation, anti-foam and anti-wear properties can also be used.

The viscosity grade must be ISO VG 32 or ISO VG 46 and the viscosity index minimum 130. Consult Atlas Copco.

Fig. 11. Preventive maintenance kits (typical examples)
Running hours 1) See section

Before starting
- Check oil level
- Empty dust trap of air filter (AF), if necessary

During operation
- Check readings on display
- Check that condensate is discharged during loading (Da)
- Check oil level (Gl)
- Check air filter service indicator (VI)

After stopping
- Drain condensate (Dm)

Monthly
- Clean compressor
- Operate safety valve (SV)
- Carry out a LED/display test
- Check for possible leaks
- Inspect coolers (Ca/Co); clean if necessary
- Remove air filter element (AF), inspect
- Check pressure difference over Atlas Copco prefilters or afterfilters (optional)

Yearly
- Have safety valve tested
- Have operation of electrical components tested
- Test temperature shut-down protection
- Replace air filter element (AF)
- Replace felt disc between air filter service indicator (VI) and its connection
- Test temperature shut-down protection
- Test temperature shut-down protection
- Have oil separator (OS) replaced
- Regrease compressor motor bearings (M1)
  - For 13 bar and 175 psi compressors
- If Roto-injectfluid is used, replace oil filter (OF)
- If Roto-injectfluid is used, change oil
- Replace air filter element (AF)
  - 6000
- If mineral oil is used, inspect restrictor (Rf2) for cleanness
- If mineral oil is used, change oil and oil filter (OF)
- If mineral oil is used, inspect restrictor (Rf2) for cleanness
- If mineral oil is used, inspect restrictor (Rf2) for cleanness
1) Whichever interval comes first. The local Sales Company may overrule the maintenance schedule, especially the service intervals, depending on the environmental and working conditions of the compressor.

**Remark**

For overhauling valves or carrying out preventive maintenance, service kits are available (Fig. 11). Consult the Parts list for the contents of the kits.

**Notes**

1. More frequently when operating in a dusty atmosphere.
2. Use an oil filter as specified in the Parts list. The part number is marked on the filter.
3. Special Atlas Copco oil for screw compressors keeping the compressor in excellent condition.
4. If the pressure drop reaches 0.5 bar, it is strongly recommended to change the filter element as its efficiency is decreasing. The filter element must be changed when the pressure drop reaches 0.7 bar.
5. It is strongly recommended to use Atlas Copco Roto-injectfluid. The change interval for this oil is 4000 running hours or yearly if operating continuously at a compressor element outlet temperature below 100°C and 2000 running hours or yearly if operating continuously close to or above 100°C.
6. Consult the User manual for the electronic regulator for resetting the service timer.
7. Replace the filter if damaged.
8. On Full-feature compressors, brush or blow off the surface of the condensor.
9. Consult the User Manual for the electronic regulator, section "Display test".
10. Consult the User Manual for the electronic regulator before modifying the temperature protection settings, section "Modify settings submenu". 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.
11. Atlas Copco has oil separators to separate the major part of oil from condensate to ensure that the condensate meets the requirements of the environmental codes.
12. Any leak should be attended to immediately.
13. Damaged flexibles must be replaced immediately.

3.5 Oil change (Fig. 12)

1. Run the compressor until warm. Stop the compressor, wait a few minutes and depressurize it by unscrewing oil filler plug (FC) only one turn to permit any pressure in the system to escape.
2. Remove vent plug (VP-Fig. 2a or 2b). Drain the oil by removing drain plugs (DP2, DP3-Fig. 2b), the drain plug of flexible (8-Fig. 2a) and plug (DP4-Fig. 2a). Fit and tighten all plugs after draining. Collect the oil in a collector and deliver it to the local oil collection service.
3. Fill air receiver (AR) with oil until the level reaches the filler neck. Take care that no dirt drops into the system. Reinstall and tighten filler plug (FC).
4. Run the compressor for a few minutes. Stop the compressor and wait a few minutes to allow the oil to settle. Depressurize the system. Fill the air receiver with oil until the level reaches the filler neck. Tighten filler plug (FC).
5. Reset the oil service warning. 1)

1) Consult the User manual for the electronic regulator, section "Service submenu"
3.6 Oil filter change (Fig. 12)

To change the filter without spilling oil:
1. Run the compressor unloaded for 3 minutes.
2. Stop the compressor and depressurize by unscrewing oil filler plug (FC) one turn to permit any pressure in the system to escape.
3. Remove vent plug (VP-Fig. 2a or 2b), wait 5 minutes, remove drain plug (DP2-Fig. 2b) and catch the oil in a receptacle.
4. Remove oil filter (OF-Fig. 14a).
5. Clean the filter seat on the manifold. Oil the gasket of the new element. Screw the element into place and tighten firmly by hand.
6. Fill the receiver (AR) with oil until the level reaches the filler plug.
7. Tighten plugs (FC, VP and DP2).
8. Reset the oil filter service warning.

3.7 Storage after installation

Run the compressor twice a week until warm. Load and unload the compressor a few times.

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

3.8 Service kits

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

| Service kit for oil filters and air filters | Ordering number |
| G30 all versions, 2901 0325 00 |
| G37 10-13 bar, 2901 0325 00 |
| G37 125-150-175 psi, 2901 0325 00 |
| G45 13 bar, 2901 0326 00 |
| G45 175 psi, 2901 0326 00 |
| G37 7.5 bar, GA37 100 psi, 2901 0326 00 |
| G45 7.5-10 bar, GA45 100-125-150 psi, 2901 0326 00 |

Note: Atlas Copco Roto-injectfluid (see section 3.4.1) can be ordered in following quantities:

| Quantity | Ordering number |
| 15-litre can | 2901 0086 01 |
| 25-litre can | 2901 0001 01 |
| 209-litre drum | 2901 0045 01 |

Service kit for the oil separator

| Ordering number |
| GA30/45 | 2901 0213 00 |

4 Adjustments and servicing procedures

4.1 Air filter (AF-Fig. 2a)

4.1.1 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.

4.1.2 Servicing

1. Release the snap clips and remove the dust trap and air filter element. Clean the trap.
2. Refit the new element and the trap. Check that the clips are properly engaged.
3. Reset the service indicator (VI-Fig. 14b) by pushing the knob in the extremity of the body.
4. Reset the air filter service warning.

1) Consult the User manual for the electronic regulator, section "Service submenu".

4.2 Coolers

Keep the coolers clean to maintain the cooling efficiency.

On air-cooled compressors:

To facilitate cleaning of the coolers, side panel (4-Fig. 1) can be removed, giving access to an inspection hole in the fan cowl through which the inlet side of the coolers can be inspected and cleaned.

First loosen bolts (4-Fig. 14a), lower bracket (3-Fig. 14a) until it touches air receiver (AR-Fig. 14a) and then tighten bolts (4). In this way, the coolers are supported before the side panel is 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. If it should be necessary to wash the coolers with a cleansing agent, consult Atlas Copco.
Refit the side panel and fit the bracket (3) in its original lifted position.

On water-cooled compressors:
Consult Atlas Copco for cleaning.

4.3 Safety valve (SV-Fig. 14a)

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

Testing
The valve can be tested on a separate compressed air line. If the valve does not open at the pressure specified in section 6.2, consult Atlas Copco. **No adjustments are allowed.**

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**Fig. 13. Safety label**

**Fig. 14a. View of minimum pressure valve**

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**Fig. 14. View of minimum pressure valve and unloader**
4.4 Fan control switch on GA Full-feature

The switch (S3-Fig. 9) is factory-adjusted and must be replaced if the switch-on or cut-out pressure deviates from the values given in section 6.2.

4.5 High pressure shut-down switch on GA Full-feature (TÜV-approved units only)

The switch (S7-Fig. 4a) is factory-adjusted and must be replaced if the shut-down value deviates from the value given in section 6.2.

4.6 Expansion valve on GA Full-feature

The valve (11-Fig. 4a) is a regulator which keeps the evaporator pressure, and consequently also the temperature, stable. The valve is factory-set to keep the effective evaporator pressure at no-load at a minimum of 4.1 bar (59 psi), which corresponds to 1°C (34°F). If necessary, have the valve adjusted.

5 Problem solving

Attention:
- To facilitate solving some problems, a number of messages may appear on the control panel. Examples:

<table>
<thead>
<tr>
<th>Message</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>System failure 10 or 106</td>
<td>Switch off the voltage. Check the terminals on connector 2X1, emergency stop button (S3) and the bridge on terminals 24 for correct connection.</td>
</tr>
<tr>
<td>System failure 11</td>
<td>Switch off the voltage. Check for possible connection with the ground of one of the digital inputs at connector 2X4.</td>
</tr>
<tr>
<td>System failure 104</td>
<td>Switch off the voltage. Check that the contacts to the digital inputs at the connectors of the module are voltage-free.</td>
</tr>
</tbody>
</table>

Connector 2X5 must only be used for connecting the Atlas Copco Relay expansion box (optional) which allows indication of manual/automatic operation, warning condition or shut-down condition.

- Before starting repairs, press stop button O (9-Fig. 7a), wait until the compressor has stopped (approx. 30 seconds), press stop button (S3-Fig. 7a) and switch 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 the electronic regulator if a service message or fault message appears on the display (4-Fig. 7a) or when alarm LED (3-Fig. 7a) is alight or blinks.

- A yellow-painted blocking device is delivered loose. The device can be fitted around the closed outlet valve (AV-Fig. 8) to lock the valve during maintenance or repair works.

- To facilitate some maintenance or repair works, it may be efficient to remove side panel (4-Fig. 1). For air-cooled compressors, consult section 4.2. On water-cooled compressors, removal is possible as long as air cooler (Ca) and pipe (13-Fig. 2b) remain installed.

Mechanical faults and suggested remedies (Figs. 4)

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. **Push button (I) is pressed, compressor starts running, but does not load after a delay time**
   a. Solenoid valve (Y1) out of order
   b. Replace valve
   c. Inlet valve (IV) stuck in closed position
   d. Consult Atlas Copco
   e. Leak in control air flexibles
   f. Minimum pressure valve (Vp) leaking (when net is depressurized)
   g. Consult Atlas Copco

2. **Compressor does not unload, safety valve blows**
   a. Solenoid valve (Y1) out of order
   b. Inlet valve (IV) does not close
   c. Consult Atlas Copco

3. **Condensate is not discharged from moisture trap during loading**
   a. Discharge flexible clogged
   b. Float valve malfunctioning
   c. Consult Atlas Copco

4. **Compressor air output or pressure below normal**
   a. Air consumption exceeds air output of compressor
   b. Choked air inlet filter element (AF)
   c. Replace filter element
   d. Solenoid valve (Y1) malfunctioning
   e. See 1a
   f. Leak in control air flexibles
   g. See 1c
   h. Inlet valve (IV) does not fully open
   i. Consult Atlas Copco

5. **Excessive oil flow through air inlet filter after stopping**
   a. Check valve (CV) leaking or oil stop valve (Vs) jammed
   b. Consult Atlas Copco

6. **Safety valve (SV) blows after loading**
   a. Inlet valve (IV) malfunctioning
   b. Minimum pressure valve (Vp) malfunctioning
   c. Consult Atlas Copco

7. **Element outlet 1) or air outlet temperature above normal**
   a. Insufficient cooling air or cooling air temperature too high
   b. Check for cooling air restriction or improve ventilation of compressor room. Avoid recirculation of cooling air. If installed, check capacity of compressor room fan. On water-cooled compressors, check cooling water conditions
   c. Oil level too low
   d. Check and correct as necessary
   e. Oil cooler (Co) clogged
   f. Clean cooler
   g. By-pass valve (BV) malfunctioning
   h. Have valve replaced
   i. Air cooler (Ca) clogged
   j. Clean cooler
   k. Compressor element (E) out of order
   l. See 4i

1) A warning message will appear on display (4-Fig. 7a).
6 Principal data

6.1 Readings on display (4-Fig. 7a) 1)

Ref.: Air outlet pressure
Reading: Modulates between programmed unloading and loading pressures.
Shown: On main display (Fig. 7b), when:
- switching on voltage
- selecting main display with keys Menu and Main (5-Fig. 7a)
- keys of module are not used for four minutes
Sensor: PT20-Fig. 2b

Ref.: Compressor element outlet temperature
Reading: Approx. 60°C/108°F above cooling air temperature or above cooling water temperature
Shown: When using the key More (5-Fig. 7a) on the main display (Fig. 7b)
Sensor: TT11-Fig. 2b

On Full-feature also:

Ref.: Dewpoint temperature
Reading: 3°C (37°F)
Shown: When using the key More (5-Fig. 7a) on the main display (Fig. 7b)
Sensor: TT90

1) See User manual for electronic regulator, sections "Modify settings submenu" and "More function"

6.2 Settings of switches and safety valve

<table>
<thead>
<tr>
<th>Compressor type</th>
<th>Safety valve Set pressure(e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>- GA30/37/45 7.5 bar</td>
<td>8.5 bar(e)</td>
</tr>
<tr>
<td>- GA30/37/45 10 bar</td>
<td>11.5 bar(e)</td>
</tr>
<tr>
<td>- GA30/37/45 13 bar</td>
<td>14.5 bar(e)</td>
</tr>
<tr>
<td>- GA30/37/45 100 psi</td>
<td>145 psig</td>
</tr>
<tr>
<td>- GA30/37/45 125 psi</td>
<td>145 psig</td>
</tr>
<tr>
<td>- GA30/37/45 150 psi</td>
<td>175 psig</td>
</tr>
<tr>
<td>- GA30/37/45 175 psi</td>
<td>200 psig</td>
</tr>
<tr>
<td>- GA30/37/45 7.5 bar/ISPESL approved</td>
<td>9.3 bar(e)</td>
</tr>
<tr>
<td>- GA30/37/45 10 bar/ISPESL approved</td>
<td>11 bar(e)</td>
</tr>
<tr>
<td>- GA30/37/45 13 bar/ISPESL approved</td>
<td>14 bar(e)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dryer control switch (only on GA Full-feature)</th>
<th>Cut-out pressure</th>
<th>Switch-on pressure</th>
<th>Unit</th>
<th>Ref.</th>
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<td>Fan control switch ................................</td>
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<table>
<thead>
<tr>
<th>Dryer shut-down switch (only on TÜV-approved GA Full-feature)</th>
<th>Breaks at</th>
<th>Unit</th>
<th>Ref.</th>
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6.3 Settings of motor overload relay and fuses

<table>
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<tr>
<th>Compressor type</th>
<th>Supply voltage (V)</th>
<th>Frequency (Hz)</th>
<th>Max. setting of relay F21 (A)</th>
<th>Fuses gL/gG (A)</th>
<th>Fuses CSA (A)</th>
<th>Fuses HRC (A)</th>
<th>Fuses UL K5 (A)</th>
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<tbody>
<tr>
<td>GA30/W</td>
<td>230</td>
<td>50</td>
<td>62</td>
<td>125</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>GA30/W</td>
<td>400</td>
<td>50</td>
<td>36</td>
<td>80</td>
<td>/</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>GA30/W</td>
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<td>50</td>
<td>29</td>
<td>63</td>
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<td>/</td>
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<td>GA37/W</td>
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<td>160</td>
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<td>/</td>
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<td>50</td>
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<td>50</td>
<td>100</td>
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<td>/</td>
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<td>100</td>
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<td>/</td>
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<tr>
<td>GA30/W</td>
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<td>60</td>
<td>69</td>
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<td>150</td>
<td>150</td>
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</tr>
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<td>60</td>
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<td>125</td>
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<td>/</td>
<td>/</td>
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<tr>
<td>GA30/W</td>
<td>440/460</td>
<td>60</td>
<td>35</td>
<td>100</td>
<td>80</td>
<td>70</td>
<td>/</td>
</tr>
<tr>
<td>GA30/W</td>
<td>575</td>
<td>60</td>
<td>27</td>
<td>/</td>
<td>80</td>
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<td>/</td>
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<tr>
<td>GA37/W</td>
<td>220/230</td>
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<td>160</td>
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<td>175</td>
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<tr>
<td>GA37/W</td>
<td>380</td>
<td>60</td>
<td>50</td>
<td>100</td>
<td>/</td>
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<td>GA37/W</td>
<td>440/460</td>
<td>60</td>
<td>43</td>
<td>100</td>
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<td>100</td>
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<tr>
<td>GA37/W</td>
<td>575</td>
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<td>220/230</td>
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<td>60</td>
<td>50</td>
<td>100</td>
<td>80</td>
<td>100</td>
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<tr>
<td>GA45/W</td>
<td>575</td>
<td>60</td>
<td>39</td>
<td>/</td>
<td>80</td>
<td>100</td>
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6.4 Settings of fan motor circuit breaker (on air-cooled compressors)

<table>
<thead>
<tr>
<th>Compressor type</th>
<th>Supply voltage (V)</th>
<th>Frequency (Hz)</th>
<th>Max. setting of breaker Q15 (A)</th>
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</thead>
<tbody>
<tr>
<td>GA30/37/45</td>
<td>230</td>
<td>50</td>
<td>3</td>
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<tr>
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<td>400</td>
<td>50</td>
<td>1.8</td>
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<tr>
<td>GA30/37/45</td>
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<td>1.3</td>
</tr>
<tr>
<td>GA30/37/45</td>
<td>220/230</td>
<td>60</td>
<td>3</td>
</tr>
<tr>
<td>GA30/37/45</td>
<td>380</td>
<td>60</td>
<td>1.7</td>
</tr>
<tr>
<td>GA30/37/45</td>
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</tr>
<tr>
<td>GA30/37/45</td>
<td>575</td>
<td>60</td>
<td>1.5</td>
</tr>
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</table>

6.5 Compressor specifications

6.5.1 Reference conditions

Air inlet pressure (absolute) ............................................... bar 1
Air inlet temperature ......................................................... °C 20
Relative humidity ................................................................. % 0
Nominal working pressure as mentioned below

On water-cooled compressors also:
Cooling water inlet temperature ............................................. °C 20
### 6.5.2 Specific data of GA30/GA30 W 1)

<table>
<thead>
<tr>
<th>Compressor type</th>
<th>7.5</th>
<th>10</th>
<th>13</th>
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<th>125</th>
<th>150</th>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Maximum (unloading) pressure (for Pack compressors)</td>
<td>bar(e)</td>
<td>7.5</td>
<td>10</td>
<td>13</td>
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<td>9.1</td>
<td>10.8</td>
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<tr>
<td>Maximum (unloading) pressure (for Full-feature compressors)</td>
<td>bar(e)</td>
<td>7.25</td>
<td>9.75</td>
<td>12.75</td>
<td>7.15</td>
<td>8.85</td>
<td>10.55</td>
</tr>
<tr>
<td>Nominal working pressure</td>
<td>bar(e)</td>
<td>7</td>
<td>9.5</td>
<td>12.5</td>
<td>6.9</td>
<td>8.6</td>
<td>10.3</td>
</tr>
<tr>
<td>Minimum working pressure</td>
<td>bar(e)</td>
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<td>4</td>
<td>4</td>
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<tr>
<td>Maximum air inlet temperature</td>
<td>°C</td>
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<td>40</td>
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<td>°C</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Pack compressors)</td>
<td>°C</td>
<td>30</td>
<td>27</td>
<td>27</td>
<td>30</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Full-feature compressors)</td>
<td>°C</td>
<td>25</td>
<td>22</td>
<td>22</td>
<td>23</td>
<td>23</td>
<td>20</td>
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<tr>
<td>Oil capacity, approx. 3)</td>
<td>l</td>
<td>14 (17.5)</td>
<td>14 (17.5)</td>
<td>14 (17.5)</td>
<td>14 (17.5)</td>
<td>14 (17.5)</td>
<td>14 (17.5)</td>
</tr>
<tr>
<td>Sound pressure level, according to CAGI PNEUROP</td>
<td>dB(A)</td>
<td>74</td>
<td>73</td>
<td>72</td>
<td>77</td>
<td>77</td>
<td>76</td>
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<tr>
<td>Compressor electrical power input 4)</td>
<td>kW</td>
<td>33.3 (35.0)</td>
<td>33.9 (35.4)</td>
<td>33.3 (34.9)</td>
<td>36.1</td>
<td>36.5</td>
<td>36.7</td>
</tr>
<tr>
<td>Compressor electrical power input 5)</td>
<td>kW</td>
<td>34.2 (35.8)</td>
<td>34.7 (36.2)</td>
<td>34.2 (35.7)</td>
<td>37.3</td>
<td>37.7</td>
<td>38.0</td>
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<td>kW</td>
<td>188-2</td>
<td>188-2</td>
<td>188-2</td>
<td>188-2</td>
<td>188-2</td>
<td>188-2</td>
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<td>Fan motor, SIEMENS type 1PP5</td>
<td>kW</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
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<tr>
<td>For water-cooled compressors also:</td>
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<td>50</td>
<td>50</td>
<td>50</td>
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<td>50</td>
</tr>
<tr>
<td>Maximum cooling water inlet pressure</td>
<td>bar(e)</td>
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### 6.5.3 Specific data of GA37/GA37 W 1)

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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Maximum (unloading) pressure (for Pack compressors)</td>
<td>bar(e)</td>
<td>7.5</td>
<td>10</td>
<td>13</td>
<td>7.4</td>
<td>9.1</td>
<td>10.8</td>
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<td>Maximum (unloading) pressure (for Full-feature compressors)</td>
<td>bar(e)</td>
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<td>7.15</td>
<td>8.85</td>
<td>10.55</td>
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<td>Nominal working pressure</td>
<td>bar(e)</td>
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<td>9.5</td>
<td>12.5</td>
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<tr>
<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Pack compressors)</td>
<td>°C</td>
<td>30</td>
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<td>27</td>
<td>30</td>
<td>30</td>
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<tr>
<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Full-feature compressors)</td>
<td>°C</td>
<td>25</td>
<td>22</td>
<td>22</td>
<td>23</td>
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<td>Oil capacity, approx.</td>
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<td>17.5</td>
<td>17.5</td>
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<td>Sound pressure level, according to CAGI PNEUROP</td>
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<td>77</td>
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<td>Compressor electrical power input 4)</td>
<td>kW</td>
<td>40.8 (43.2)</td>
<td>39.7 (41.8)</td>
<td>40.9 (43.0)</td>
<td>44.7</td>
<td>45.2</td>
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<td>Compressor electrical power input 5)</td>
<td>kW</td>
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<td>40.5 (42.6)</td>
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<td>47.3</td>
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<td>207-2</td>
<td>207-2</td>
<td>207-2</td>
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<td>207-2</td>
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<td>kW</td>
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<td>090-4</td>
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<td>Maximum cooling water inlet pressure</td>
<td>bar(e)</td>
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### 6.5.4 Specific data of GA45/GA45 W 1)

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<td>Maximum (unloading) pressure</td>
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<td>10</td>
<td>13</td>
<td>7.4</td>
<td>9.1</td>
<td>10.8</td>
<td>12.5</td>
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<td>(for Pack compressors)</td>
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<td></td>
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<tr>
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<td>7.25</td>
<td>9.75</td>
<td>12.75</td>
<td>7.15</td>
<td>8.85</td>
<td>10.55</td>
<td>12.25</td>
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<tr>
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<td>7</td>
<td>9.5</td>
<td>12.5</td>
<td>6.9</td>
<td>8.6</td>
<td>10.3</td>
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<tr>
<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Pack compressors) 3)</td>
<td>33(30)</td>
<td>30</td>
<td>30</td>
<td>33(30)</td>
<td>33(30)</td>
<td>30</td>
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<td>Temperature of air leaving air outlet valve at nominal working pressure, approx. (for Full-feature compressors) 3)</td>
<td>28(25)</td>
<td>25</td>
<td>25</td>
<td>26</td>
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<td>Oil capacity, approx.</td>
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<td>17.5</td>
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<td>17.5</td>
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<td>73</td>
<td>78</td>
<td>77</td>
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<td>54.9</td>
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<td>55.2</td>
</tr>
<tr>
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<td>50.8(53.8)</td>
<td>49.9(52.6)</td>
<td>50.7(53.0)</td>
<td>55.8</td>
<td>56.2</td>
<td>56.6</td>
<td>56.4</td>
</tr>
<tr>
<td>Compressor motor, SIEMENS type 1LA5</td>
<td>208-2</td>
<td>208-2</td>
<td>208-2</td>
<td>208-2</td>
<td>208-2</td>
<td>208-2</td>
<td>208-2</td>
</tr>
<tr>
<td>Fan motor, SIEMENS type 1PP5</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
<td>090-4</td>
</tr>
</tbody>
</table>

**For water-cooled compressors also:**

| Maximum cooling water outlet temperature | 50  | 50  | 50  | 50  | 50  | 50  | 50  |
| Maximum cooling water inlet pressure | 5   | 5   | 5   | 5   | 5   | 5   | 5   |

### 6.6 Conversion list of SI units into 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 mbar = 0.401 in wc
1 N = 0.225 lbf
1 m = 3.281 ft
1 mm = 0.039 in
1 m³/min = 35.315 cfm

x°C = (32 + 1.8x) °F
∆t 1°C = ∆t 1.8 °F

---
1) At reference conditions
2) 35°C for Full-feature compressors; 40°C for Full-feature compressors designed for operation in tropical conditions (consult Atlas Copco)
3) Figures between brackets refer to water-cooled compressors
4) For water-cooled compressors. Figures between brackets refer to Full-feature compressors
5) For air-cooled compressors. Figures between brackets refer to Full-feature compressors
7 Installation

7.1 Dimension drawings (Figs. 15)

![Dimension drawing, air-cooled compressors](image)

Fig. 15a. Dimension drawing, air-cooled compressors
Fig. 15b. Dimension drawing, water-cooled compressors
7.2 Electric cable section

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. If may be necessary to use cables with a larger section than those stated to comply with this requirement.

<table>
<thead>
<tr>
<th>Compressor type</th>
<th>Voltage (V)</th>
<th>Frequency (Hz)</th>
<th>Line current (A)</th>
<th>Cable section (mm²/AWG size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA30/W</td>
<td>230</td>
<td>50</td>
<td>114</td>
<td>50</td>
</tr>
<tr>
<td>GA30/W</td>
<td>400</td>
<td>50</td>
<td>67</td>
<td>25</td>
</tr>
<tr>
<td>GA30/W</td>
<td>500</td>
<td>50</td>
<td>52</td>
<td>16</td>
</tr>
<tr>
<td>GA37/W</td>
<td>230</td>
<td>50</td>
<td>138</td>
<td>70</td>
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<tr>
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<td>400</td>
<td>50</td>
<td>80</td>
<td>35</td>
</tr>
<tr>
<td>GA37/W</td>
<td>500</td>
<td>50</td>
<td>61</td>
<td>25</td>
</tr>
<tr>
<td>GA45/W</td>
<td>230</td>
<td>50</td>
<td>160</td>
<td>95</td>
</tr>
<tr>
<td>GA45/W</td>
<td>400</td>
<td>50</td>
<td>92.5</td>
<td>35</td>
</tr>
<tr>
<td>GA45/W</td>
<td>500</td>
<td>50</td>
<td>71</td>
<td>25</td>
</tr>
<tr>
<td>GA30/W</td>
<td>230</td>
<td>60</td>
<td>127</td>
<td>70 / AWG1</td>
</tr>
<tr>
<td>GA30/W</td>
<td>380</td>
<td>60</td>
<td>74</td>
<td>25 / AWG4</td>
</tr>
<tr>
<td>GA30/W</td>
<td>440-460</td>
<td>60</td>
<td>64</td>
<td>25 / AWG4</td>
</tr>
<tr>
<td>GA30/W</td>
<td>575</td>
<td>60</td>
<td>50</td>
<td>16 / AWG6</td>
</tr>
<tr>
<td>GA37/W</td>
<td>230</td>
<td>60</td>
<td>154</td>
<td>95 / AWG0</td>
</tr>
<tr>
<td>GA37/W</td>
<td>380</td>
<td>60</td>
<td>88</td>
<td>35 / AWG3</td>
</tr>
<tr>
<td>GA37/W</td>
<td>440-460</td>
<td>60</td>
<td>74</td>
<td>25 / AWG4</td>
</tr>
<tr>
<td>GA37/W</td>
<td>575</td>
<td>60</td>
<td>60</td>
<td>25 / AWG6</td>
</tr>
<tr>
<td>GA45/W</td>
<td>230</td>
<td>60</td>
<td>175</td>
<td>95 / 2 X AWG2</td>
</tr>
<tr>
<td>GA45/W</td>
<td>380</td>
<td>60</td>
<td>102</td>
<td>50 / AWG0</td>
</tr>
<tr>
<td>GA45/W</td>
<td>440-460</td>
<td>60</td>
<td>88</td>
<td>35 / AWG1</td>
</tr>
<tr>
<td>GA45/W</td>
<td>575</td>
<td>60</td>
<td>68</td>
<td>25 / AWG3</td>
</tr>
</tbody>
</table>

7.3 Installation proposal (Figs. 16)

Ref. Description/recommendation

1 Install the compressor on a level floor suitable for taking the weight of the compressor.
2 Position of compressed air outlet valve.
3 The maximum total pipe length (including interconnecting piping between compressor and receiver) can be calculated as follows:
\[ L = \frac{\Delta P \times d^5 \times P}{450 \times Q_c^{1.65}} \]

\( L \) = pipe length in m
\( \Delta P \) = maximum allowable pressure drop (recommended 0.1 bar)
\( d \) = inner diameter of pipe in mm
\( P \) = compressor outlet pressure in bar absolute
\( Q_c \) = free air delivery of compressor in l/s

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 air velocity to the grids must be limited to 5 m/s. The maximum allowable pressure drop over the cooling air ducts is 30 Pa. If this pressure drop is exceeded, a fan is needed at the outlet of the cooling air ducts. The maximum air temperature at the compressor intake opening is 40°C (minimum 0°C).
Fig. 16a. Installation proposal

Fig. 16b. Installation proposal (compressor with optional by-pass system)
The required ventilation to limit the compressor room temperature can be calculated as follows:

For alternatives 1 and 3: \( Q_v = 0.92 \frac{N}{\Delta T} \)

\( Q_v \) = required ventilation capacity in m³/s
\( N \) = shaft input of compressor in kW
\( \Delta T \) = 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 caused by the cooling air outlet ducts.

Position of condensate drain flexibles. The flexibles towards the drain collector must not dip into the water of the drain collector. Atlas Copco has oil separators to separate the major part of oil from condensate to ensure that the condensate meets the requirements of the environmental codes.

Position of compressor control module.

Position of mains cables entry. See section 7.2 for the recommended electric cables. See section 7.4 for connecting the power supply. Provide an isolating switch near the compressor.

Provision for energy recovery system.

High efficiency filter, type PD (optional). Filter traps solid particles down to 0.01 micron with max. oil carry-over of 0.01 mg/m³. A PD filter must be installed downstream of a DD filter (optional).

If oil vapour and odours are undesirable, a filter of the QD type (optional) should be installed downstream of the PD filter.

Position of safety valve.

Position of small grating (is not to be ducted away due to heat dissipation below 1 kW).

Position of moisture trap in case the optional by-pass system is installed.

Position of optional by-pass pipe.

The air receiver (optional) should be installed in a frost-free room and on a level concrete foundation.

For normal air consumption, the volume of the air net (receiver and piping) can be calculated as follows:

\[
V = \frac{0.25 \times Q_c \times P_1 \times T_o}{f_{max} \times \Delta P \times T_1}
\]

\( V \) = volume of air net in l
\( Q_c \) = free air delivery of compressor in l/s
\( P_1 \) = compressor air inlet pressure in bar absolute
\( f_{max} \) = cycle frequency = 1 cycle/30 s
\( \Delta P \) = Punload - Pload in bar
\( T_1 \) = compressor air inlet temperature in K
\( T_o \) = air receiver temperature in K
7.4 Electrical connections

General
1. Check the fuses and the setting of the overload relay. See section 6.3.
2. Connect the power supply to terminals (L1, L2 and L3). Connect the earth conductor to connector (PE) and the neutral conductor (if provided) to connector (N). Consult section 7.2.

On GA Full-feature (Fig. 17):
1. For compressor supply voltages of 3 x 400 V plus neutral or 3 x 230 V, the wiring is provided ex-factory. Check that the wiring is as shown.
2. For all other supply voltages, a separate single-phase 220-240 V voltage supply must be provided. Use wiring of minimum 1.5 mm². The system must be protected by fuses. A hole (3-Fig. 3) is provided for the voltage supply cable. Lay out the cable along the inside of the bodywork through plate (9-Fig. 2b). The bottom plate of the cubicle is provided with a hole to pass through the cable.
7.5 Pictographs

Fig. 18 shows typical examples of pictographs used for GA compressors.

1. Water outlet
2. Water inlet
3. Manual condensate drain
4. Automatic condensate drain
5. Before connecting compressor electrically, consult instruction book for motor rotation direction
6. Torques for steel (Fe) or brass (CuZn) bolts
7. Consult Instruction book before greasing
8. Switch off voltage before removing protecting cover inside electric cubicle
9. Switch off voltage and depressurize compressor before repairing

Fig. 18. Pictographs