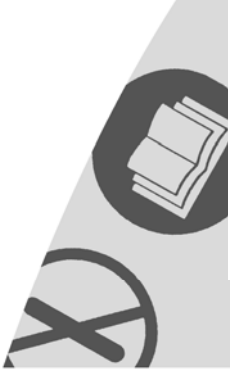
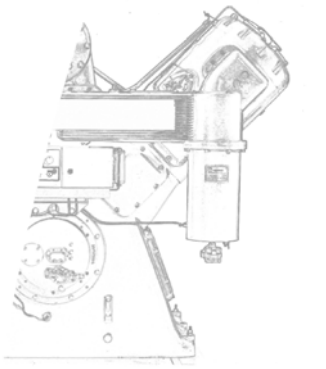
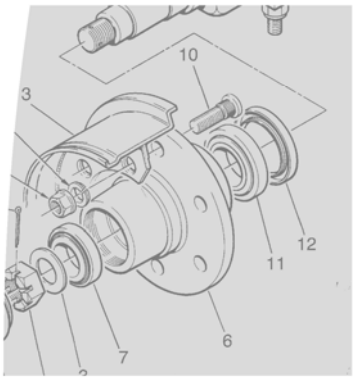
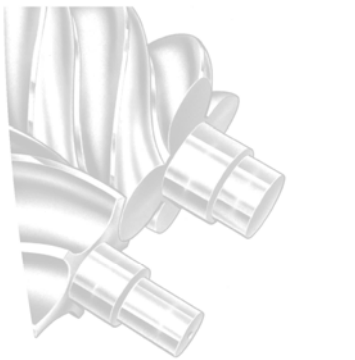
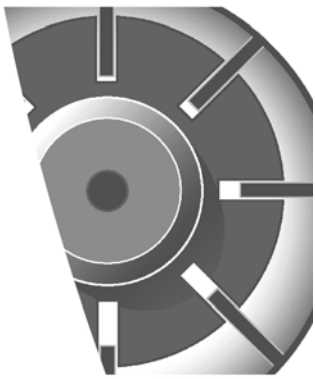










Original Operating Instructions

GD PILOT TS

Electronic Controller
for Stationary Screw Compressors

EnviroAire 15 – 37

EnviroAire VS 15 – 37

GB Id. No. ZS1091777 – 04/2012

Table of Contents

1 Foreword

1.1 About this manual

This manual contains information relating to both Fixed Speed and Regulated Speed models. Throughout this manual, where a section relates exclusively to one or the other model, the symbol FS (Fixed Speed) and VS (Regulated Speed) are used respectively to indicate their relevance.

Any values shown in screen shots are for illustrative purposes only. They are not specific values for your particular model of compressor.

At various stages throughout this manual, references will be made to finding individual menu items. These references are shown in the following format: `Display screen tab > Next menu level > [next menu level ...etc.] > menu item`.

The information given in this manual was correct at the time of printing. However, based on Gardner Denver's policy of continuous product improvement, we reserve the right to make modifications or changes without notice.

This manual is valid from software version DXL-DH(RS)-1.xx.

1.2 Selection and Qualification Of Personnel; Basic Responsibilities

Work on/with the machine must be carried out by reliable personnel only. Statutory minimum age limits must be observed.

Employ only trained or instructed personnel. Clearly set out the individual responsibilities of the personnel for operation, set-up, maintenance and repair.

Ensure that only authorized personnel work on or with the machine.

Define the machine operator's responsibilities, giving the operator the authority to refuse instructions by third persons that are contrary to safety regulations.

Do not allow persons to be trained or instructed or persons taking part in a general training course to work on or with the machine/unit without being permanently supervised by an experienced person.

Work on the electrical equipment of the machine/unit must be carried out only by a skilled electrician in accordance with electrical engineering rules and regulations.

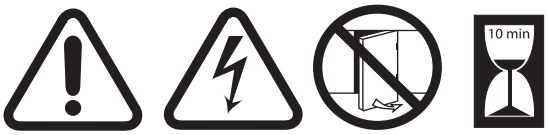
1.3 Intended Use

The installed GD PILOT TS controller is only designed for use with the Gardner Denver D range of compressors.

2 Safety

2.1 Electrical Warning VS

Danger



Risk of electric shock from charged capacitors

Always disconnect the system from the power supply and then wait a further 10 minutes before touching electrical components. The power capacitors require this time to discharge.

Check the DC bus voltage at the system terminal strip of the frequency converter by measuring this between

1) **the +DC and -DC terminals (the exact position can be found in the operating manual supplied for the frequency converter),**
2) **between the +DC terminal and the chassis, as well as**
3) **between the -DC terminal and the chassis.**

The voltage must read zero in all three measurements.

2.2 Safety Guidelines

This operating manual exclusively describes the control unit. It contains important references and warnings, and therefore should be read by the relevant operator as well as by the installer before installing and operating the unit.

Note

Not only should the general safety references mentioned in this "Safety guidelines" chapter be observed, but also any special safety references referred to in the other sections of the manual.

2.3 Safety Instructions

Gardner Denver is not liable for any damage or injury resulting from the non-observance of these safety instructions or negligence of the usual care and attention required during handling, operation, maintenance or repair, even if this is not explicitly mentioned in these operating instructions. This applies even where these operating instructions do not provide specific indications in this regard.

If any of the regulations contained in these instructions – especially with regard to safety – does not correspond to the local legal provisions, the stricter of the two shall prevail.

These safety regulations are general and valid for various types of machines and equipment. It is therefore possible that some references do not apply to the unit(s) described in these instructions.

2.3.1 Danger

The sections marked with the warning symbol and the word **Danger** indicate dangerous operating modes or procedures which may lead to injury or death. The following symbols are used in these instructions, as well as on the unit:

Danger:

Risk of death or serious injury

Danger:

Risk of electric shock

Danger:

Risk of hot surfaces

Danger:

Consult the instruction manual

Danger:

Risk of high pressure

Danger:

Never operate the compressor with open doors or loose access panels.

2.3.2 Caution

Operations or operational procedures marked by the word **Caution** are actions which, if incorrectly followed, may cause possible damage to the unit.

2.3.3 Notes

The sections marked with the word *Note* indicate procedures which facilitate the job, as well as points which require particular attention.

3 Control panel and display

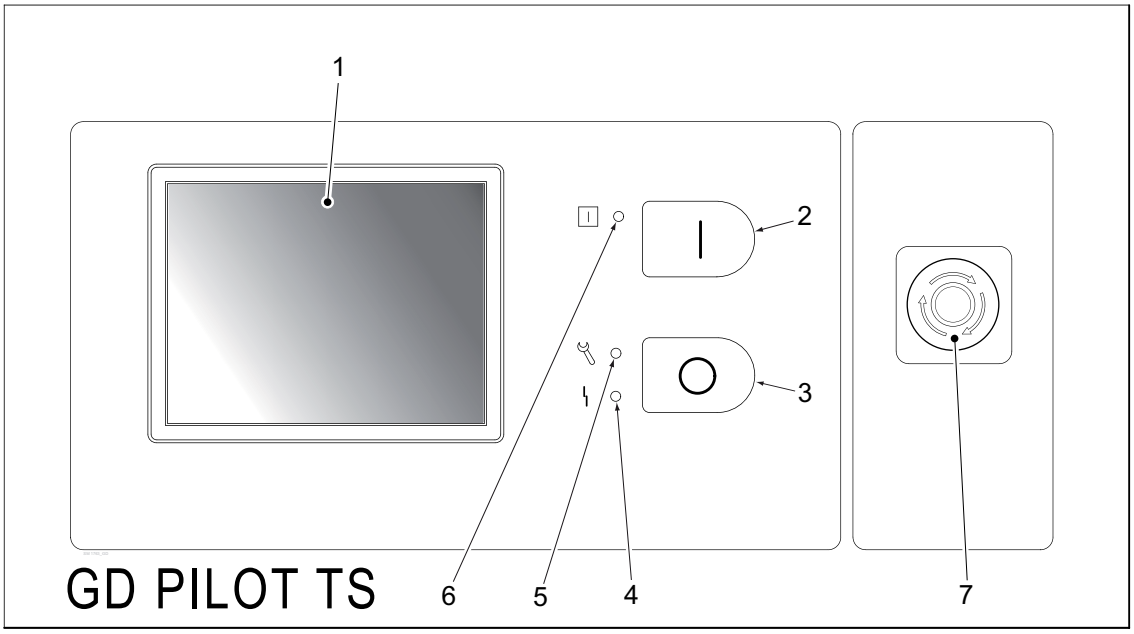


Fig. 1 The GD PILOT TS control panel

1. Touchscreen display – Overview & menu access
2. Start button – Starts the compressor
3. Stop button – Stops the compressor
4. Red LED
   (Flashing slowly) – Warning
   (Flashing rapidly) – Fault
5. Yellow LED
   (Flashing slowly) – Maintenance required
6. Green LED
   (Steady) – Compressor running
   (Flashing) – Compressor in stand-by mode
7. Emergency stop button

3.1 General

This manual describes the GD PILOT TS electronic controller as used in the EnviroAire 15 - 37 and EnviroAire 15 - 37 range of compressors.

Compressors can also be supplied with further options that are not included in the standard package.

3.2 About the controller

This controls all aspects of operation for the compressor such as:–

- compressor starting and stopping
- compressor rotational speed control and loading/unloading in response to variations in air demand
- monitoring of various operating parameters such as pressures and temperatures
- display of any warning/fault messages and automatic shut-down in the event of a fault
- enabling data entry for adjustment of various operating parameters
- keeping track of scheduled maintenance of the compressor.

3.3 Accessing display pages

Access to the various display pages and associated menus is via the tabs located at the bottom of the touchscreen display.

3.4 Home page - Normal operating display

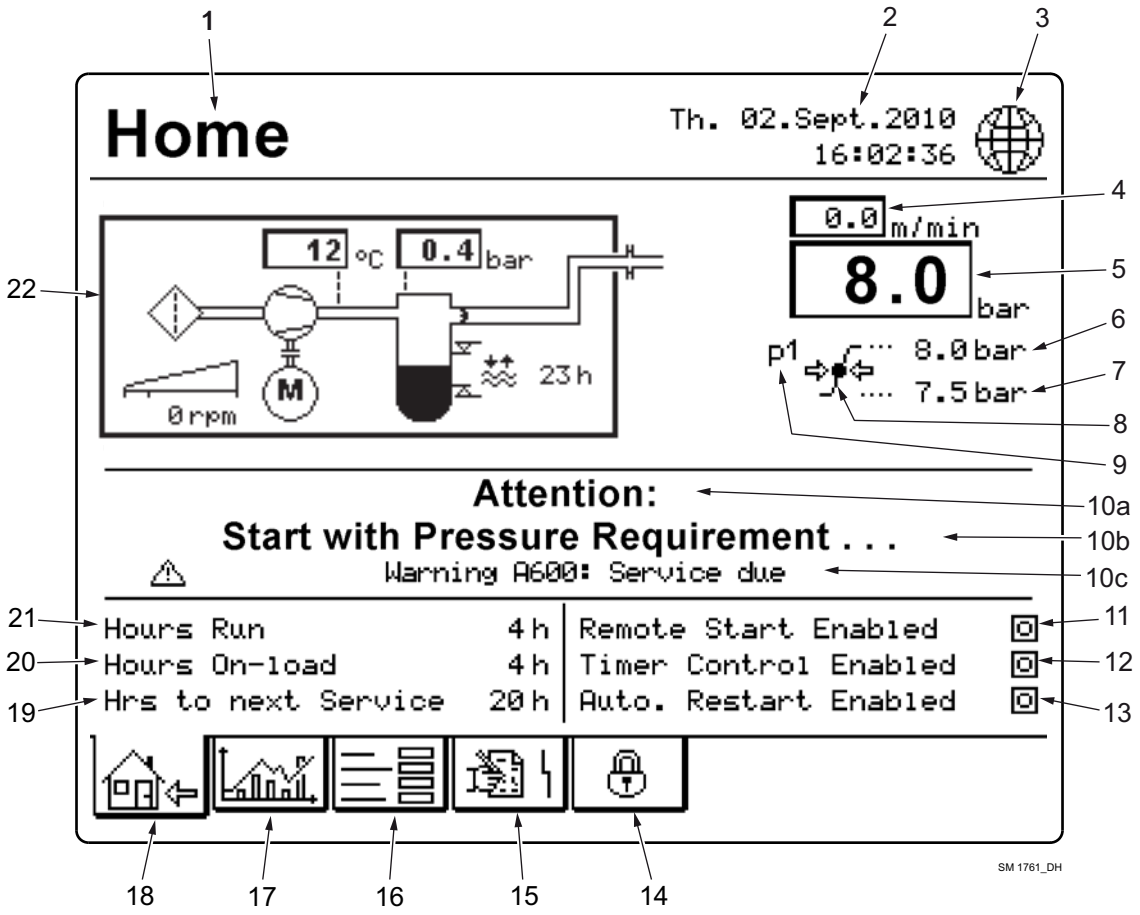


Fig. 2 Home page (normal operating display)

The Home page is the default screen which is displayed during normal running. If the GD PILOT TS is left unattended on a different screen, it will automatically revert back to this screen after 5 minutes.

To access this screen, touch the "Home" tab ⇦(18).

Items displayed on the Home page:

1) Page name
Name of the page currently displayed

2) Current date/time
See Chapter 5.2.

3) Language select button
See Chapter 5.1.

4) Current volume flow
This is continuously calculated based on the rotational speed of the motor and known delivery output.

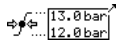
5) Current line pressure
Air pressure in customer's distribution network.

6) P1 Cut-Out Point/P2-Cut-Out Point
Air pressure at which controller switches compressor to off-load operation (motor runs at minimum rotational speed VS). Run-on timer is also activated in "Automatic" operating mode.

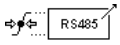
7) P1 Target Pressure/P2 Target Pressure
Air pressure which controller attempts to maintain.

. **P1 Cut-In Point/P2 Cut-In Point**
Air pressure at which controller switches the compressor to on-load operation.

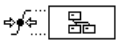
Note
If the pressure band is controlled via other devices, the following symbols apply:



Pressure band control via a RS485:1 port (only)



Control of the on-load/off-load command via a RS485:1 port (only)


Control of the pressure band via the integrated base load sequencing feature. (and)

8) International pressure symbol

9) Current pressure band
p1 or p2. A second pressure band (p2) can be used. For details on activation see Chapter 10.1 as well as Chapter 11.6.

10) Status / Fault / Warning message area
10a/b Compressor Status and Faults
10c Warning messages

11) Remote Start Status *
Must be enabled before the remote start/stop function can operate.

12) Timer Start Control Status *
Must be enabled before timer control can operate.

13) Auto Restart status
Must be enabled if automatic re-start after a power supply failure is required.

14) Tab "Access Code"
Touch the tab to display a keypad enabling entry of codes in order to enter certain menus.

15) Tab "Fault History"
Touch the tab to display a list of the most recent faults and warnings (maximum 64) and further information on each fault.

16) Tab "Settings"
Touch the tab to view or change the various operational settings for the machine.

17) Tab "Trends"
Touch the tab to view various statistics or trends for the machine over a given time period.

18) Tab "Home"
Touch the tab for normal running display.

19) Service Information Line

20) Hours On-Load line

21) Hours Run line

22) Pictogram (see next section for more details)

* = Disabled = Enabled

3.5 Pictogram page Home

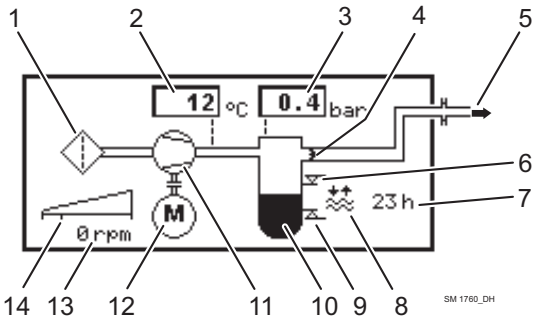


Fig. 3 Pictogram page Home (VS-Version shown, FS-Version similar)

1) Air filter

2) Discharge temperature
Compressed air temperature measured after screw air end.

3) Discharge pressure
The pressure measured in the pressure tank.

4) Status indicator – combined minimum pressure/non-return valve
Indicates Open when the machine is delivering air. Indicates Closed when the machine is not delivering air.

5) Air delivery
The arrow symbol flashes when machine is delivering air; it is invisible when the machine is not delivering air.

6) Water level, maximum

7) Current remaining time to water change
Indicates the remaining time to the next water change.

8) Water change symbol
Flashes when the water change stage is active.

9) Water level, minimum

10) Pressure tank

11) Screw air end

12) Main drive motor

13) Motor speed VS
Current motor speed in rpm shown below in a graphic display. The left side of the graphic represents 0 rpm. The right side represents the maximum motor speed.

VS *Note*
The minimum and maximum motor speeds are dynamically calculated and may change depending on the target pressure selected and the actual measured line pressure.

14) Minimum motor speed mark VS

3.6 Cleaning the touch screen

1) Switch off the compressor and isolate it from the power supply. The touch screen must be off.

2) Use a soft and slightly moistened cloth to clean the touch screen without excessive pressure.

Caution

⚠

Do not wipe the screen with any corrosive liquid or rough objects.
If necessary, a fat-dissolving dish washing liquid or alcohol can be used.

3.7 Status messages table

Status messages table	
Fault Xnnn: <Fault text>	A fault has been detected and the machine has shut down. See the compressor's “Fault History” for more details (X=”F”, “E” or “A”; nnn = fault number)
Ready to start	The compressor is ready to start.
Motor starting…	The motor is currently starting.
Stopping procedure “x” s	The Soft Stop procedure is currently running and will complete in “x” seconds.
VS On-Load “x” rpm (min)	The compressor is On-Load (“min” denotes motor is currently running at allowed minimum rotational speed).
VS On-Load “x” rpm	The compressor is running On-Load at “x” rpm.
VS On-Load “x” rpm (max)	The compressor is On-Load (“max” denotes motor is currently running at allowed maximum rotational speed).
FS On-Load	The compressor is running On-load.
VS Off-Load “xxx” rpm	The compressor is currently Off-Load in continuous operation at allowed minimum rotational speed.
FS Off-Load	The Compressor is currently running Off-Load in continuous operation.
FS Off-Load Run-On Time “x” s	The Run-On Timer has been activated and the compressor will switch to stand-by mode in “x” seconds.
VS Off-Load “xxx” rpm Run-On Time “x” s	The Run-On Timer has been activated and the compressor will switch to stand-by mode in “x” seconds.
Attention: Start by Remote Control…	Attention: This Compressor can start up at any time via remote control.
Attention: Start with Timer Control on <Day of the Week> at <Time>	Attention: The compressor will automatically start via the timer control at the week day and time shown.
Attention: Start on ?? at <??:??>	This message (including all the “????”) will appear if there is no valid timer schedule programmed (all 8 channels are Off). This means the compressor will never start. Check the settings in the `Timer Control` Menu.
Attention: Start with Pressure Requirement…	Attention: This Compressor will automatically start up as soon as there is a pressure requirement on the network.
Attention: Start after De-Pressurise…	Attention: The compressor will automatically start up as soon as the internal pressure in the screw air end has dropped below Start Protection value.
Attention: Starting in “x” s after Power Loss…	Attention: This Compressor has experienced a power loss. It will automatically restart in “x” seconds
Attention: Starting in “x” min after Dryer Pre-Run…	Attention: This Compressor will automatically start as soon as the Dryer Pre-run time has elapsed.
VS VSD Initialising…	The converter is initialised.
VS Sending Data to VSD (x %)	Parameters are being sent to set up the converter.

4 Menu Access Security

4.1 Unlocking and Locking the User Settings

The code for unlocking and locking the user settings is: **3031**

Note
All new machines are delivered with the user settings unlocked by default.

In everyday use, the padlock symbol on the Access Code Entry Tab should be locked. The settings can, therefore, not be changed by an unauthorised person.

4.1.1 Unlocking the User Settings

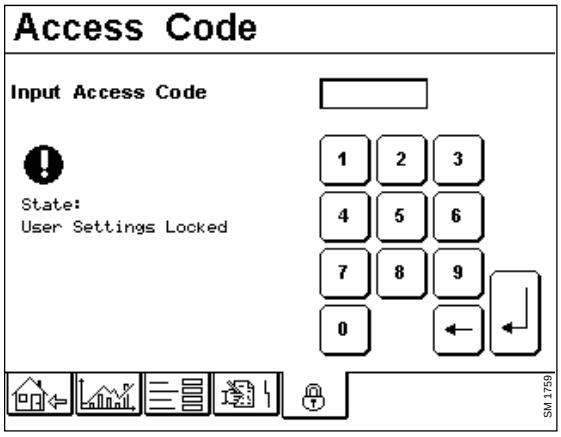


Fig. 4 Access Code keypad

1) Touch the tab “Access Code”.
2) Enter **3031** on the keypad which will appear.
3) Confirm the entry by pressing the button.

When the access code is entered, an unlocked padlock will appear. The user setting are now unlocked. You can implement any changes required.

A padlock displayed alongside a menu item as shown below indicates that the value cannot be changed because

- either the user settings are still locked or
- because they are values which the user is not permitted to change.

Fig. 5 Example of a “locked” value

4.1.2 Locking User Settings

Note
Note that the menu system does not automatically revert to the locked status. After making changes, enter the Access Code once again to lock the menu system.

1) Touch the tab “Access Code”.
2) Enter **3031** on the keypad which will appear.
3) Confirm the entry by pressing the button.

5 Configuration of the GD Pilot TS controller

5.1 Language Selection

On the Home page, touch the Globe symbol, then touch the required language button.

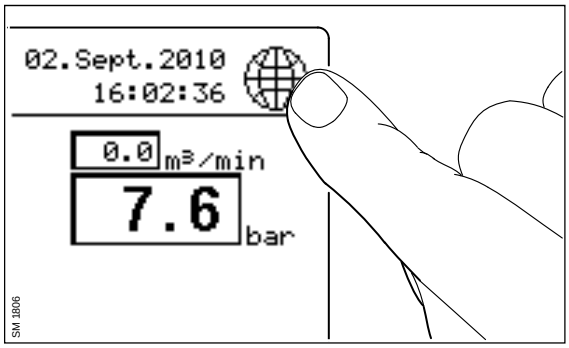


Fig. 6 Language selection, Step 1

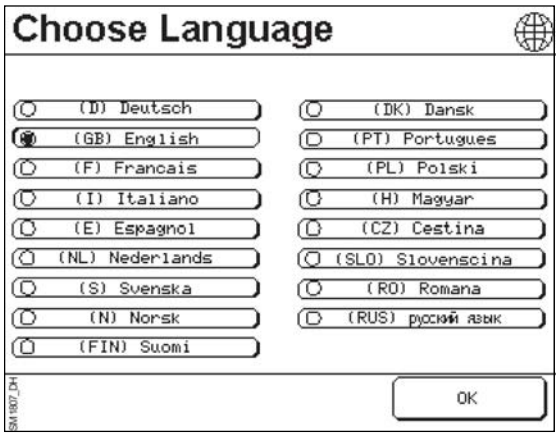


Fig. 7 Language selection, Step 2

Since the GD Pilot TS is continuously being improved, the language selection shown above is purely an example.

Where applicable touch the Up and Down buttons to scroll up and down through the various language options.

Note

Language can also be selected via the `Settings > Configuration > Language` tabs.

5.2 Setting the current date and time

Note

Ensure that the user settings are unlocked (see Chapter 4).

1) Touch `Settings > Timer Control…> Date and Time`.

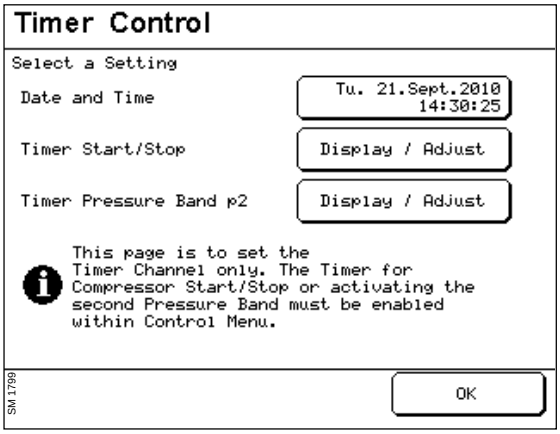


Fig. 8 Setting Date and Time

2) Adjust the values using the + and - buttons.

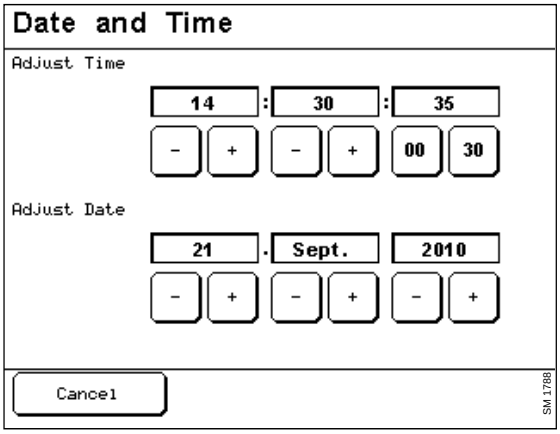


Fig. 9 Date and Time keypad

An OK button appears after the values have been modified.

Note

To make it easier to synchronise time with an external time source, seconds can be set to either 00 or 30. The time will start running only when the OK button is touched.

3) Touch the OK button to confirm the changed date and time.

5.3 Selecting Measurement Units

Note

Ensure that the user settings are unlocked (see Chapter 4).

5.3.1 Temperature Unit

1) Touch: `Settings > Configuration > Temperature Unit`.
2) Select °F or °C.
3) Confirm the entry by pressing `OK`.

5.3.2 Pressure Unit

1) Touch `Settings > Configuration > Pressure Unit`.
2) Select `bar` or `psi`.
3) Confirm the entry by pressing `OK`.

5.3.3 Volume Flow Unit

1) Touch `Settings > Configuration > Volume Flow Unit`.
2) Select cfm, m^3/h or m^3/min.
3) Confirm the entry by pressing `OK`.

6 Setting the pressure bands

Danger

⚠

When the system is in stand-by mode, i.e. the green LED is flashing, the compressor can start automatically at any time.

6.1 About pressure bands

The range between the upper and lower pressure settings is referred to as the pressure band.

Two pressure bands are available. These are called p1 and p2.

- p1 is the normal (default) pressure band and is used whenever p2 is not active.
- p2 is an alternative pressure band that can be activated if a different line pressure is required.

6.2 Regulated Speed Models VS

On VS models, software in the GD Pilot TS controller varies the motor speed to exactly match the demand for compressed air.

Due to the nature of the rotational speed control software, there are two pressure settings:

- the upper setting (p1 Cut-Out Point/p2 Cut-Out Point) and
- the lower setting (p1 Target Pressure/p2 Target Pressure).

The lower pressure setting indicates the pressure which should be kept constant in the distribution system.

The upper pressure setting is the figure at which the compressor will have stopped delivering air and will go off-load.

For example:

- p1 Cut-Out Point: 10.0 bar
- p1 Target Pressure: 9.5 bar

The rotational speed of the machine will vary between minimum and maximum to maintain the p1 Target Pressure of 9.5 bar.

If the line pressure reaches the upper pressure of 10.0 bar due to no or low air demand, the compressor will go off-load and the run-on timer is activated.

6.3 Fixed Speed Models FS

On fixed rotational speed models, there are also two pressure settings:

- the upper setting (p1 Cut-Out Point/p2 Cut-Out Point) and
- the lower setting (p1 Cut-In Point/p2 Cut-In Point)

The lower pressure setting is the pressure at which the compressor will go on-load.

The upper pressure setting is the figure at which the compressor will go off-load.

For example:

- `p1 Cut-Out Point`: 10.0 bar
- `p1 Cut-In Point`: 9.5 bar

At the upper setting, the intake regulator valve within the machine will close and the compressor will go off-load, delivering no more air. The run-on timer will also be started.

At the lower setting, the intake regulator valve will open and the compressor will go back on-load, delivering full output again.

6.4 Setting the p1 Pressure Band

Pressure is set in the `Settings > Control` menu.

1) Touch `p1 Target Pressure` VS or `p1 Cut-In Point` FS.
2) Use the keypad which will appear to enter your desired setting (the permissible pressure limits are displayed on the keypad screen).
3) Confirm the entry by pressing `OK`.

The display will revert to the previous screen.

4) Touch `p1-Cut-Out Point`.

Note
The upper pressure setting must be at least 0.3 bar higher than the lower pressure setting.
The controller checks whether the value set can be used. To prevent excessive wear of your compressor, the difference should preferably be no less than 0.5 bar.

5) Enter your required setting using the keypad.
6) Confirm the entry by pressing `OK`.

6.5 Setting the p2 Pressure Band

1) Touch `Settings > Control >`, then `p2 Target Pressure` VS or `p2 Cut-In Point` FS .
2) Use the keypad which will appear to enter your desired setting (the permissible pressure limits are displayed on the keypad screen).
3) Confirm the entry by pressing `OK`.

The display will revert to the previous screen.

4) Touch `p2 Cut-Out Point`.

Note

The upper pressure setting must be at least 0.3 bar higher than the lower pressure setting.
The controller checks whether the value set can be used. To prevent excessive wear of your compressor, the difference should preferably be no less than 0.5 bar.

5) Enter your required setting using the keypad.
6) Confirm the entry by pressing `OK`.

7 Menu Structure

7.1 "Trends" Tab

There are 4 trend graphs available to the user (5 if you have a VS machine). These allow you to monitor the compressor's performance over time. The following graphs are available:

- Volume Flow
- Line Pressure
- Motor Speed (only VS models)
- Statistics On-Load Hours
- Statistics Weekly Profile

(Touch ◀ or ▶ to move between different trend graphs.)

Note

An additional Volume Flow Trend is available when the Base Load Sequencing (BLS) Group is enabled.
An additional Weekly Profile is available for the BLS Group when the BLS is enabled.
Both functions are exactly the same as for a single compressor, except the title contains the additional text (BLS) to indicate that it is showing BLS Group data.

- Volume Flow (BLS)
- Statistics Weekly Profile (BLS)

7.1.1 Volume Flow, Line Pressure and Motor Speed Graphs

The graphs for Volume Flow, Line Pressure and Motor Speed are line graphs that take the following form:

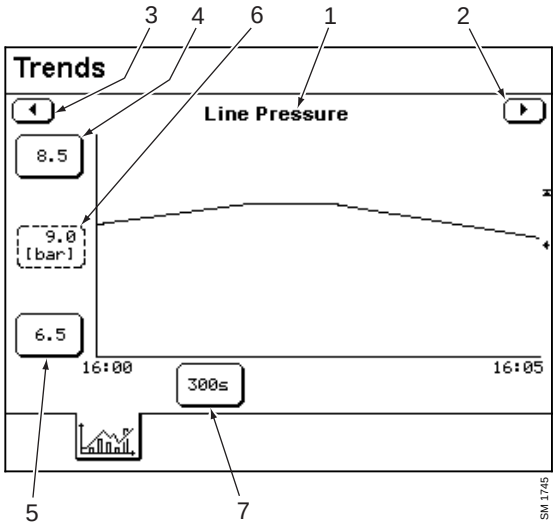


Fig. 10 Typical Volume Flow, Line Pressure or Motor Speed Graph

1. Graph Title
2. "Next Graph" Button
3. "Previous Graph" Button
4. "Upper Y Value" Button
5. "Lower Y Value" Button
6. Current Value
7. Time Axis Button

You can re-scale the graph manually by changing the upper (4) and lower (5) Y values. To do this, touch the appropriate value button and key in the new value.

The current value (6) is displayed to the left of the graph.

The time axis can also be scaled to show data taken from the last 300 seconds, 1 hour, 3 hours, 6 hours or 12 hours.

To change this, touch the time axis button (7) and select a new value from the options available.

7.1.2 Statistics On-Load Hours VS

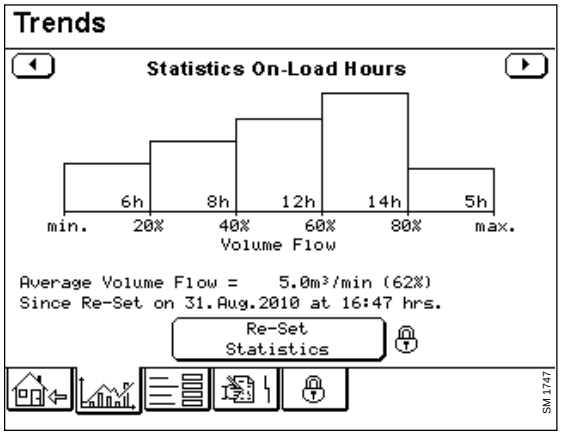


Fig. 11 Statistic On-Load Hours (VS)

This graph shows the number of hours that the compressor has been operating at various volume flows since the statistics button was last reset. It also shows the total average volume flow since this time.

7.1.3 Statistics On-Load Hours FS

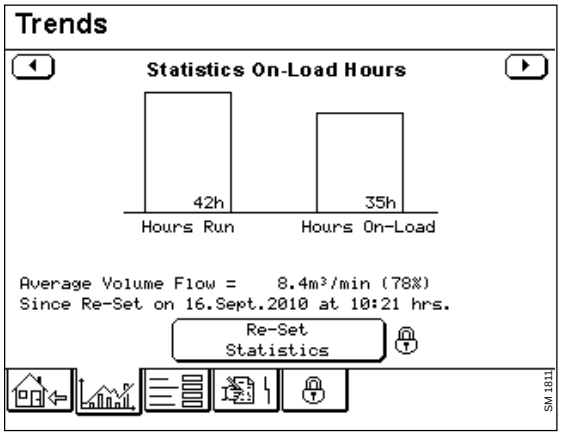


Fig. 12 Statistics On-Load Hours (FS)

This graph shows the number of hours that the compressor has been running (total and on-load) since the statistics button was last reset. It also shows the average volume flow since this time.

7.1.4 Statistics Weekly Profile

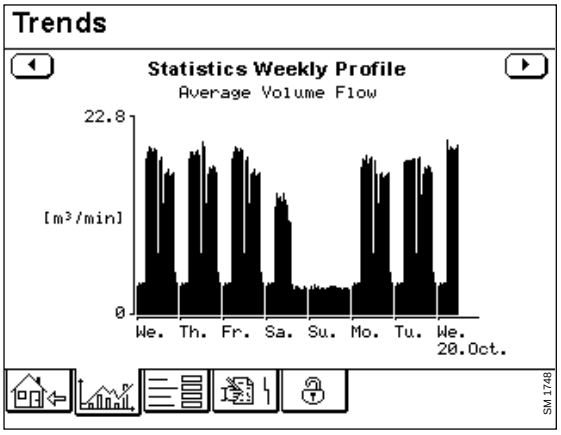


Fig. 13 Statistics Weekly Profile

This graph shows the average volume flow over an 8-day period.

Each day consists of 24 vertical lines, each representing one hour. Peak demand times can be easily identified and the load distributed more efficiently over the week.

7.2 "Settings" Tab

Touch one of the `Settings` Menu buttons to access the corresponding submenu.

Note
Except where specified, all variables can be viewed / changed with user-level security access code unlocked.

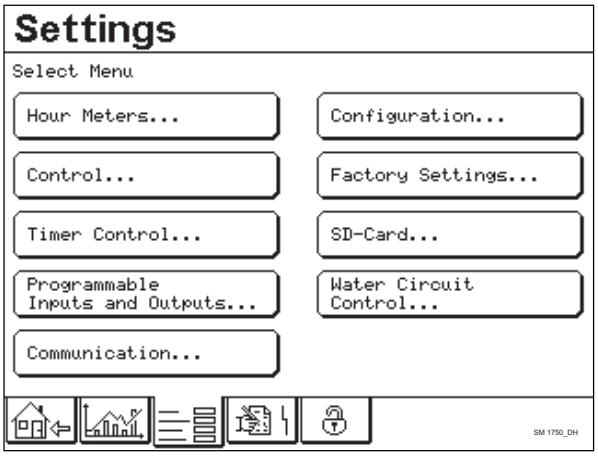


Fig. 14 `Settings` Menu

7.2.1 Maintenance and Hour Meters

The `Maintenance and Hour Meters` menu indicates:

- Hours Run
- Hours On-Load
- Hours to Next Service

Note

The hours to next service can be reset by maintenance personnel as required. For more details, see Chapter 14.5.

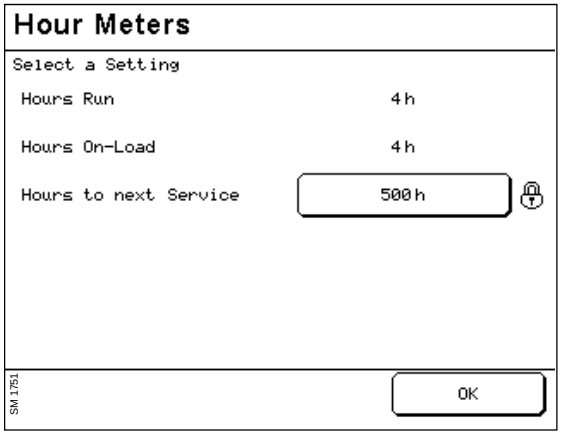


Fig. 15 `Hour Meters` Menu

7.2.2 Control

Touch the ⇧ and ⇩ buttons to scroll up and down through the various settings. For more details, see Chapter 8.5.1, Chapter 11 and Chapter 12.

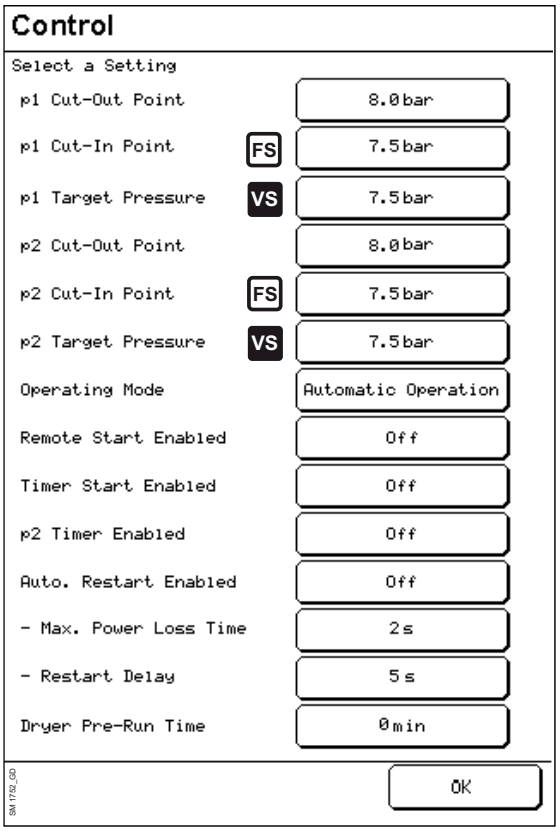


Fig. 16 `Control` Menu

7.2.3 Timer Control

In the `Timer Control` Menu you can:

- set the current date and time
- establish a Start/Stop schedule for the compressor
- establish enable/disable times for the p2 pressure band

Note

For the timers to function, they need to be enabled in the `Control` Menu (see Chapter 11).

7.2.4 Programmable Inputs and Outputs

There are a number of programmable inputs and outputs which can be used with external equipment. For more details, see Chapter 10.

7.2.5 Communication

The Communication Menu allows you to set the communication settings for the RS485 port (labelled RS485:1). For more details, see Chapter 12.2.

7.2.6 Configuration

The Configuration Menu allows you to select the GD Pilot TS controller display language, your preferred units for pressure, temperature and volume flow as well as setting rated delivery volume(s).

Touch the ⇧ and ⇩ buttons to scroll up and down through the various settings.

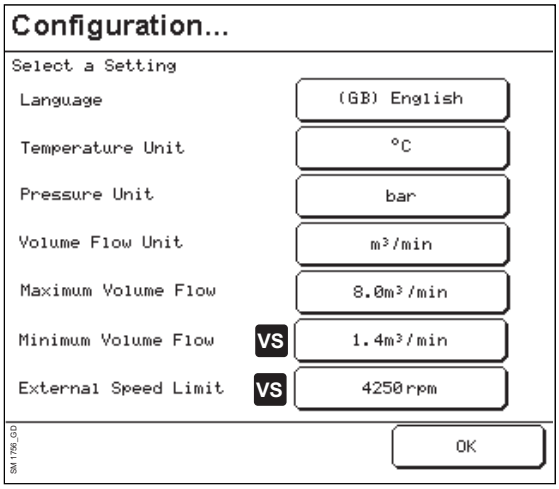


Fig. 17 Configuration Menu

VS For further information on External Speed Limit see Chapter 10.1.

7.2.7 Factory Settings

The Factory Settings Menu displays the compressor settings programmed into the controller at the factory and cannot be changed by the user.

Touch the ⇧ and ⇩ buttons to scroll up and down through the various settings.

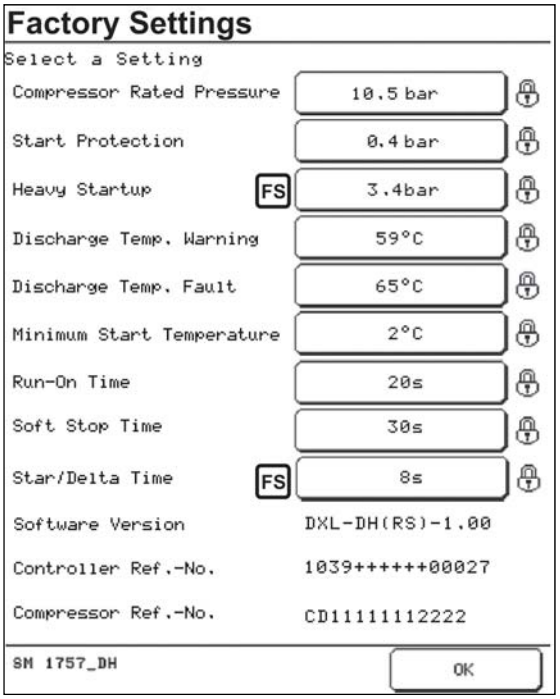


Fig. 18 Factory Settings Menu

VS The Compressor Rated Pressure setting can be set to lower values. In this way, you can limit the setting options for the desired in the Control Menu. For more details, see Chapter 14.6.

7.2.8 SD Card

The GD Pilot TS is fitted with a data recording function (data logger) which can be used to assist maintenance personnel. For more details, see Chapter 14.8.

7.2.9 Water Circuit Control

The Water Circuit Control Menu indicates the water change cycle time (Change Cycle) and the remaining time to the next water change (Remaining Change Time). These values can be changed at the maintenance level. For more details, see Chapter 14.7.

7.3 "Fault History" Tab

The controller memorises the last 64 alarms (both faults and warnings) which have occurred. These are displayed in a list, with the most recent appearing at the top. If the number of stored alarms exceeds 64, the oldest alarm will disappear off the bottom of the list.

If a new alarm has just occurred, it will appear at the top of the list. A flashing alarm symbol will be shown next to the new alarm (⚠ Warning or ⚠ Fault). The "Fault History" tab will also flash. The tab and symbol will continue to flash until the alarm has been acknowledged (reset).

Press the ▲ and ▼ buttons on the right side of the display to scroll up or down through the list, one screen at a time (8 alarms).

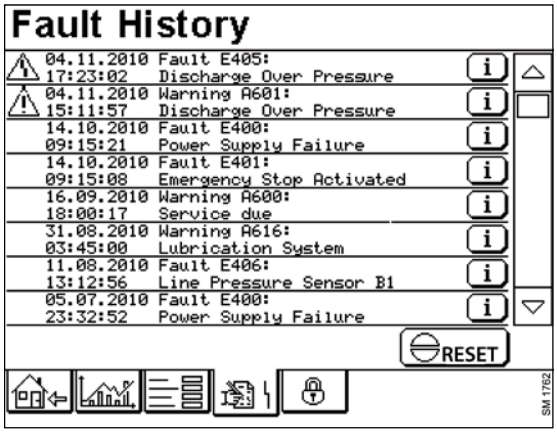


Fig. 19 `Fault History` Menu

Touch the ⓘ button on the right of each menu line for further information about that particular alarm.

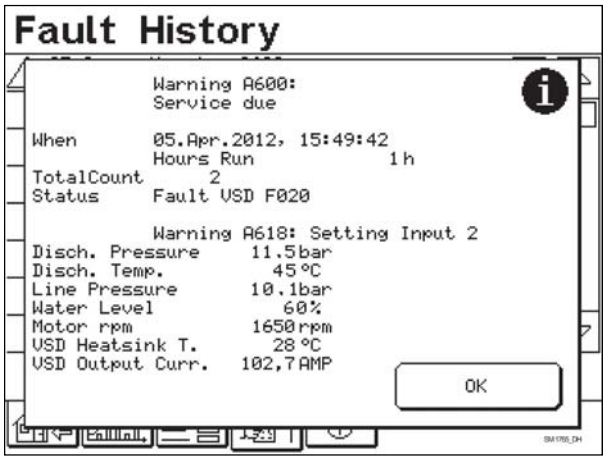


Fig. 20 Alarm information screen

After the cause of the alarm has been rectified, touch the RESET button to reset the controller.

Once this has been done, the flashing alarm symbol will disappear and the "Fault History" tab will stop flashing.

Note

You cannot reset alarms which are still active (e.g. emergency stop button not released or motor temperature still too high).

7.4 "Access Code" Tab

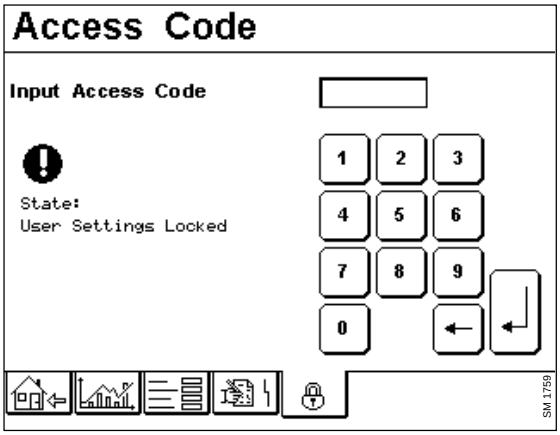


Fig. 21 Access Code Keypad

Use this number pad to key in the access codes when necessary. Touch the ← key to backspace.

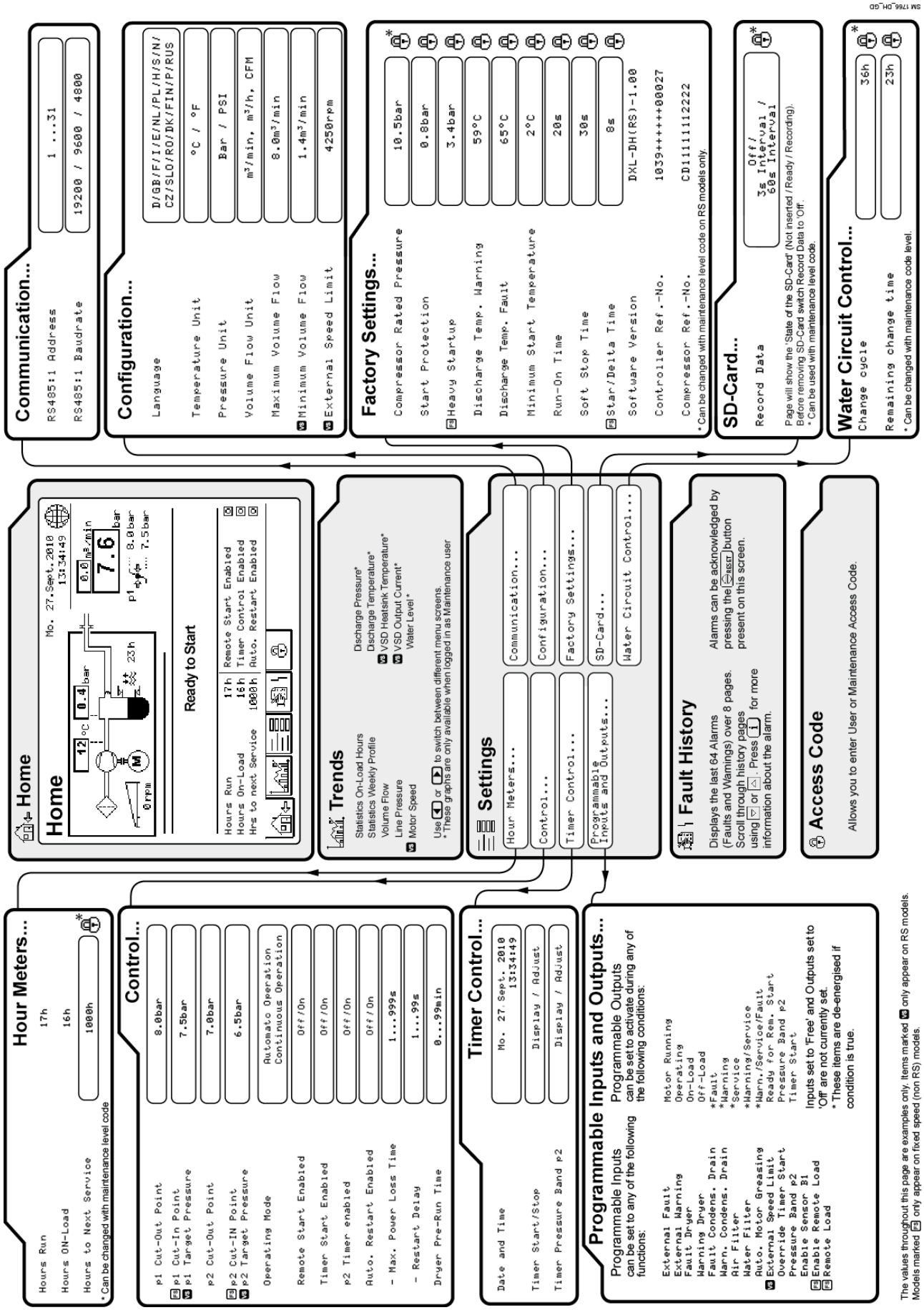
Touch the ↵ key to submit the code to the controller.

The screen also displays the current status of the user access security level.

Note

This status message is not affected by any codes the maintenance personnel may key in.

7.5 Overview of Menu Structure



8 Starting and Operating

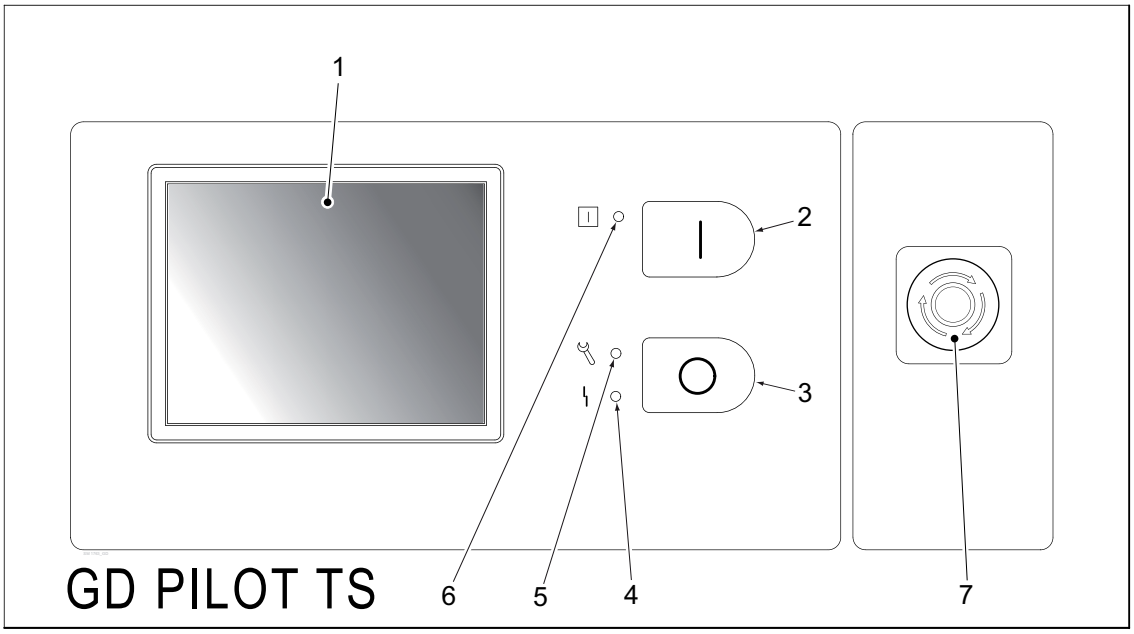


Fig. 22 The GD Pilot TS control panel

1. Touchscreen Display – Overview & Menu Access
2. Start Button – Starts the compressor
3. Stop Button – Stops the compressor
4. Red LED
   (Flashing slowly) – Warning
   (Flashing rapidly) – Fault
5. Yellow LED
   (Flashing slowly) – Maintenance required
6. Green LED
   (Steady) – Compressor running
   (flashing) – Compressor in stand-by mode
7. Emergency stop button

Danger

⚠

When the system is in stand-by mode, i.e. the green LED is flashing, the compressor can start automatically at any time.

8.1 Stopping the Compressor in an Emergency

Caution

⚠

Use this method of stopping the machine in an emergency only, as damage to the compressor could result.

1) Press the Emergency Stop button located beside the GD Pilot TS control panel.

8.2 Starting the compressor

Note

Every time the fault `E400 Power Supply Failure` *is active/displayed, the controller performs a LED test.*

The compressor can only be started when all faults present are removed and confirmed or reset in the `Fault History` Menu.

The first text line of the display should show `Ready To Start`.

1) Press the Start button to start the compressor.

The compressor will then start, unless any of the start inhibits detailed below apply.

8.3 Start Inhibits

8.3.1 No air pressure demand

If there is no requirement for air on pressing the Start button, the system will go into stand-by mode. The green LED will then flash and the text field will read: `Attention: Start with Pressure Requirement...`.

The compressor will start automatically when the lower pressure setting is reached.

8.3.2 Discharge Pressure exceeds the permitted value (see `Factory Settings > Start Protection`)

A safety circuit (start protection) prevents the drive motor from trying to start against an excessive internal residual pressure.

In this case, the system will go into stand-by mode. The green LED will then flash and the text field will read: `Attention: Start after De-Pressurise...`.

The compressor will start automatically as soon as the internal air pressure has dropped below the start protection figure.

8.3.3 The ambient temperature is below the permitted minimum start-up temperature (see `Factory Settings> Minimum Start Temperature`)

If the ambient temperature is below this figure, the red LED will flash. When starting the compressor up, `Fault E404` will be indicated: `Low Start Temperature`.

In this case, arrange for the ambient temperature to be increased and reset the fault (`Fault History >` button RESET).

8.3.4 Dryer pre-run

If the compressor controls a dryer, the GD Pilot TS can be programmed to start the dryer xx minutes before starting the compressor in order for it to reach its optimum operating temperature (`Settings > Control > Dryer Pre-Run Time`).

Here as well, the compressor is initially switched to stand-by. The compressor will then start automatically once the dryer pre-run time has elapsed. The text field will read: `Attention: Starting in "x" min after Dryer Pre-Run...`.

Note

The minimum pre-run time is detailed in the dryer operating instructions.

8.3.5 Start by Remote Control

If the controller is waiting for a start input from a remote start location, the text field will read: `Attention: Start by Remote Control...`.

8.3.6 Start with Timer Control

If the compressor is operating under timer control, the text field will read: `Attention: Start with Timer Control on <Day of the Week> at <Time>...`.

8.4 Regulated Speed VS

The controller attempts to maintain the line pressure at the set target pressure (`Settings > Control > p1 Target Pressure` and `Settings > Control > p2 Target Pressure`) by varying the motor speed to exactly match the demand for compressed air.

As line pressure rises, the maximum permissible rotational speed is constantly calculated to prevent the maximum permissible motor output from being exceeded. For example, the maximum rotational speed at a line pressure of 6 bar will be higher than at a line pressure of 10 bar.

8.5 During Operation

Danger

⚠

When the system is in stand-by mode, i.e. the green LED is flashing, the compressor can start automatically at any time.

8.5.1 Operating Modes

The GD Pilot TS controller incorporates two operating modes: Automatic Operation and Continuous Operation.

Automatic Operation (drive motor stops and starts)

Automatic operation is the most efficient and economical compressor operating mode. Automatic Operation is the compressor's default factory setting (`Settings > Control > Operating Mode > Automatic Operation`).

If the line pressure goes above the p1 Cut-Out Point/p2 Cut-Out Point, the controller will fully unload the compressor and initiate the run-on timer.

If there is no air demand at the end of the run-on time, the controller stops the compressor and goes into stand-by, waiting for the network air pressure to fall below p1 Target Pressure/p2 Target Pressure VS or p1 Cut-In Point/p2 Cut-In Point FS. The controller will then re-start the compressor.

Continuous operation (drive motor runs continuously)

Also in Continuous Operation the GD Pilot TS controls the on-load/off-load operation in response to the demand for air.

If the compressor goes into off-load mode, the motor will not be stopped (`Settings > Control > Operating Mode > Continuous Operation`).

8.6 Water Circuit Control

The water level in the pressure tank is measured by a level sensor. The water treatment unit makes water available for topping up.

8.6.1 Automatic Level Control

The water quantity can increase or decrease during operation (water input through condensate at high atmospheric humidity, water output through low remaining water quantity in compressed air).

The changes in water level are automatically corrected by the level control during operation. Therefore, the water treatment unit does supply water (only in on-load operation) or remove excess water (only with running motor).

8.6.2 Cyclical water change

In order to guarantee a uniform water quality, water is changed at specific intervals (set point `Change cycle`). The `Home` Page indicates the remaining time (`Remaining change time`) next to the symbol. Once the `Remaining change time` has elapsed, the water change cycle starts. This cycle consists of a discharge stage (only in on-load mode), followed by an intake stage (only in on-load mode).

If the water change cycle is interrupted by an off-load stage or machine standstill, the cycle will be resumed in the next on-load stage. If the cycle is terminated, the remaining time (`Remaining change time`) will be restarted (set value `Change cycle`).

8.7 Stopping the Compressor

1) Press the Stop button to stop the compressor. The machine will continue to run but will stop after a 30-second Soft Stop delay (`Settings > Factory Settings > Soft Stop Time`).

2) The screen will display the message `Stopping Procedure "x" s` and the seconds remaining until the motor is stopped will count down to zero.

Note

If the machine is in stand-by when it is necessary to shut it down, press the Stop button.
The message display will change from `Attention: Start with Pressure Requirement...` to `Ready to Start`, and the flashing green LED will switch off.

8.8 Warnings/Faults/Power Failures

8.8.1 Warnings – machine will continue to run

These are messages which are displayed when a monitored parameter is exceeded but not by enough to warrant shutting down the compressor.

For example, if the compression temperature should reach 59°C, a flashing warning symbol (⚠) will appear on the screen with an explanatory message. The red LED and "Fault History" tab will also flash but the machine will keep running.

If the problem is rectified and the temperature lowers, the warning message will remain on the screen and the symbol, LED and tab will keep flashing until the warning has been reset (`Fault History` > button RESET). The warning can be acknowledged whether the machine is stopped or running.

8.8.2 Faults – machine will stop automatically

These are messages which are displayed when a monitored parameter is exceeded by enough to warrant shutting down the compressor automatically for safety reasons or to prevent damage to the machine.

For example, if the compressor's discharge temperature should reach 65°C, the controller will shut the machine down and a flashing fault symbol (⚠) will appear on the screen with an explanatory message. The "Fault History" tab will also flash but in this case, the red LED will flash rapidly.

The compressor cannot be re-started until the cause of the overheating has been rectified and the fault re-set (`Fault History` > button RESET).

8.8.3 Power Failures

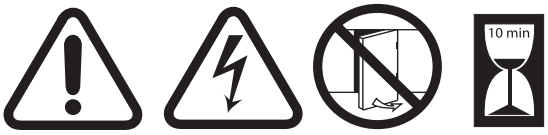
In the event of power failure (Fault `Power Supply Failure`), the light-emitting diode test is activated when power returns.

The test must be acknowledged before the machine can be re-started (`Fault History>` button RESET).

In the remote start mode, however, all that is required is a new REMOTE ON pulse with which the fault is automatically acknowledged in the Fault History.

9 Faults and Warnings

Danger



- **Risk of electric shock from charged capacitors**
- **Always disconnect the system from the power supply and then wait a further 10 minutes before touching electrical components. The power capacitors require this time to discharge.**

9.1 Checklist

Loose connections, plugs, a faulty power supply or failure to observe information/instructions can give rise to a considerable number of fault displays. The faults indicated, therefore, may frequently be attributed to another cause.

Therefore, please always observe the following checklist:

1) The system's supply voltage must be within the permissible limits.
2) The control power transformer must be set to any differing local rated voltages (see electrical circuit diagram).
3) The control cabinet temperature must not exceed 50 °C.
4) All remote controls fitted at a late date (e.g. remote on/off) must be managed without a connection relay at max. 20 metres from the control cabinet.
5) Before starting up and performing maintenance work, make sure that all connection screws are tight and that all plugs are firmly connected.
6) Power supply cables must be of adequate cross-section. When rating the cable(s), therefore, pay attention to the cable-laying method, line length and line temperatures to be expected.
7) When retro-fitting switchgear, the control-power transformers must not, under any circumstances, be tapped as they could be overloaded.
8) Only use genuine Gardner Denver replacement parts.
9) Do not connect additional switchgear or measuring equipment without the approval of Gardner Denver.
10) Do not route measuring sensors out of the system.
11) If you have any technical queries, have the following information to hand so that a fault can be rectified quickly and methodically:

- System type / factory number
- Re-order ref.
- Circuit diagram, drawing no. and ID no.
- Information on the system's operating conditions
- Information on any accessories you have subsequently installed (remote controls, etc.)
- Other subsequent modifications or attachments to the system.
- The fault number and description of the fault that has occurred.

9.2 How the Fault and Warning Codes are Structured

Error codes always begin with a letter followed by a number. They are further divided into compressor errors and VSD errors as detailed in the table below.

9.3 Tables of Faults and Warnings

The following tables show details of possible warnings and faults which may occur on the GD Pilot TS, with their possible cause and suggested remedial action.

For details of the notes to which the numbers in the following tables, please refer to Chapter 9.4 to 9.9.

Alarm Code Letter	Number Range	Refers To
F: (Fault)	000 .. 399	VSD VS
E: (Fault)	400 .. 495	Compressor
E: (Fault)	500 .. 531	VSD VS
A: (Warning)	600 .. 695	Compressor
A: (Warning)	700 .. 731	VSD VS

9.4 Fault Numbers F000 .. F399 (VSD-related) VS

Fault F000... F399 is triggered by the VSD.

Note

If any Fxxx number error appears other than those listed in the table, contact Gardner Denver's Technical Support.

Fault Numbers F000 .. F399		
Display	**Possible Cause**	**Remedy**
Fault VSD Fxxx	The frequency converter (VSD) detected a fault with error number xxx that was not subsequently listed.	Notify your local Gardner Denver Technical Support.
Fault VSD F003 Fault VSD F004	The frequency converter (VSD) detected undervoltage.	Check the power supply. Check back-up fuses, renew if necessary. Check main contactor (compressors with PowerFlex 400 VSD only). Check that all connecting terminals and plugs are tight; retighten if necessary.
Fault VSD F007	The frequency converter (VSD) detected a motor overload.	Notify your local Gardner Denver Technical Support.
Fault VSD F008	Frequency converter (VSD) overtemperature	Check filters of switch gear cabinet, and renew if necessary. Ensure that electric motor-driven switch gear cabinet fans (if any) and frequency converter fans are working correctly. Check frequency converter for blockages in the cooling air supply and dirty cooler fins.
Fault VSD F017	The frequency converter (VSD) detected an input phase loss.	Check the power supply. Check back-up fuses, renew if necessary. Check main contactor (only compressors with PowerFlex 400 converter). Check that all connecting terminals and plugs are tight; retighten if necessary.
Fault VSD F021	The frequency converter (VSD) detected a output phase loss.	Check wiring from VSD to motor. Check that all connecting terminals and plugs are tight; retighten if necessary. Check motor winding.
Fault VSD F038 - 40	The frequency converter (VSD) detected an earth fault at the output.	Check motor winding. Carry out insulation test.
Fault VSD F041 - 46	The frequency converter (VSD) detected a short-circuit at the output.	Check motor winding. Carry out insulation test.
Fault VSD F064	Frequency converter (VSD) overload.	Notify your local Gardner Denver Technical Support.

9.5 Fault Numbers E400 .. E495 (compressor-related)

Fault Numbers E400 .. E495		
Display	**Possible Cause**	**Remedy**
Fault E400: Power Supply Failure	Power failure.	Find cause.
	Voltage dip.	Find cause.
	Cabling damaged.	Check, repair if necessary.
	Loose terminals.	Check that all connecting terminals and plugs are tight; retighten if necessary.
Fault E401: Emergency Stop Activated	Emergency off is being/has been activated.	Unlock.
	Emergency off switch defective.	Check, renew if necessary.
	Cabling damaged.	Check, repair if necessary.
Fault E402: High Motor Temperature	Motor has been started too frequently.	Limit number of starts/hour.
	Inadequate motor cooling. Power consumption too high.	Improve. Check, find cause.
	Faulty power supply. Motor faulty.	Check, find cause. Check, change if necessary.
Fault E403: Compressor Disch. Temp.	Cooling water outlet temperature exceeded. (1)	Find cause.
	Intake temperature too high.	Improve.
	Inadequate cooling.	Improve.
	Unit panel open during operation.	Close panel.
	R2 temperature sensor defective (indication too high).	Check, renew if necessary.
Fault E404: Low Start Temperature	Start attempt at too low temperature. (1)	Heat up compressor room.
	R2 temperature sensor defective (indication too low).	Check, renew if necessary.
Fault E405: Discharge Over Pressure	Rated pressure exceeded by 1.5 bar / 21 psi.(1)	
	• Pressure losses in the system too high.	Check, find cause.
	• Line pressure set points (2) too high.	Correct.
	• External pressure requirement too high.	Check remote on-load/off-load switching points.
	• FS Intake regulator not closing.	Check, find cause.
	• VS Blow-off / bypass valve defective.	Check, find cause.
	• Pressure sensor B1 or B2 defective (incorrect indication).	Check, renew if necessary.
Fault E406: Line Pressure Sensor B1	Faulty line pressure sensor.	Check, renew if necessary.
	Pressure and/or temperature sensor defective.	Check, renew if necessary.
	Cabling to sensor damaged.	Check, renew if necessary.
Fault E407: Disch. Press. Sensor B2	Faulty air end discharge pressure sensor.	Check, renew if necessary.
	Pressure and/or temperature sensor defective.	Check, renew if necessary.
	Cabling to sensor damaged.	Check, renew if necessary.

1) Unit-specific setting: See `Factory Settings` Menu.
2) Unit-specific setting: See `Control` Menu.

Display	Possible Cause	Remedy
Fault E408: Disch. Temp. Sensor R2	Faulty air end discharge temperature sensor.	Check, renew if necessary.
	Pressure and/or temperature sensor defective.	Check, renew if necessary.
	Cabling to sensor damaged.	Check, renew if necessary.
Fault E409: Controller Hardware	Controller hardware error.	Renew GD Pilot TS Controller.
Fault E410: Cooling	• Fan motor circuit breaker tripped.	Check.
	• Resistances too high through delivery/discharge air channels	Check, install auxiliary fan if necessary.
	• Fan-motor circuit breaker incorrectly set.	Set to 110% of rated fan current.
	• Fan motor faulty.	Check, change if necessary.
Fault E411:	Not used / reserved.	
Fault E412: External Fault	Shut down by external device. (3)	Check, find cause.
Fault E413: Dryer	Fault has been received from external dryer. (3)	See dryer operating instructions.
Fault E414: Condensate Drain	Connected condensate drainage valves faulty. (3)	Check, find cause.
Fault E415: No Start Pressure	No pressure being built up at start-up stage, e.g. because the drive motor is turning in the wrong direction.	Check, find cause.
Fault E416 FS: Heavy Startup	Discharge compression pressure too high during motor start phase.	Check that intake regulator is closed and is sealing correctly.
Fault E417: Water Level Sensor B10	Faulty water level sensor B10.	Check, renew if necessary.
	Pressure and/or temperature sensor defective.	Check, renew if necessary.
	Cabling to sensor damaged.	Check, renew if necessary.
Fault E418: Water Level max.	Solenoid valve for water outlet faulty.	Check.
	Dirt trap in front of solenoid valve dirty.	Check dirt trap.
	Outlet ball valve closed?	Open ball valve.
	Faulty water level sensor B10.	Check level sensor and wiring.
Fault E419: Water Level min.	Poor supply of water for machine, water pressure may be too low.	Check water pressure.
	Water treatment unit faulty.	Check.
	Solenoid valve for water inlet faulty.	Check.
	Faulty water level sensor B10.	Check level sensor and wiring.
Fault E420: Water change drain	Recurring error during water change in discharge stage (warning A627 already activated):	
	Solenoid valve for water outlet faulty.	Check.
	Dirt trap in front of solenoid valve dirty.	Check dirt trap.
	Outlet ball valve closed?	Open ball valve.
	Faulty water level sensor B10.	Check level sensor and wiring.

3) Monitoring through optional device/sensor connected to a programmable digital input. Refer to Chapter 10 and the wiring diagram.

Display	Possible Cause	Remedy
Fault E421: Water change supply	Recurring error during water change in intake stage (warning A628 already activated):	
	Poor supply of water for machine, water pressure may be too low.	Check water pressure.
	Water treatment unit faulty.	Check.
	Solenoid valve for water inlet faulty.	Check.
	Faulty water level sensor B10.	Check level sensor and wiring.
Fault E422 FS: Phase monitoring	Incorrect phase sequence.	Check phase sequence and correct if necessary.
	Loss of one or more phases.	Check the power supply.

9.6 Fault Numbers E500 .. E531 (VSD-related) VS

Fault Numbers E500 .. E531		
Display	**Possible Cause**	**Remedy**
Fault E500: Pre-Adjustment VSD	The frequency converter was faulty or not programmed (replacement device), so it had to be reprogrammed by the GD Pilot TS controller.	
Fault E501: Pre-Adjustment	The frequency converter was faulty or not programmed (replacement device), so it had to be reprogrammed by the GD Pilot TS controller.	
Fault E502: VSD Locked	An error occurred while the frequency converter was being programmed.	Notify your local Gardner Denver Technical Support.
Fault E503: VSD Write Fault	An error occurred while the frequency converter was being programmed.	Notify your local Gardner Denver Technical Support.
Fault E504: VSD Communication	Communication to frequency converter disrupted, frequency converter not responding.	Check: Main contactor (Compressors with PowerFlex 400 VSD only) ModBus interface wiring If no fault can be found, notify Gardner Denver service engineer.
Fault E505: VSD Stop Pressed	The red Stop button on the frequency converter (VSD) was pressed while the compressor was running.	Always switch the compressor off via the GD PILOT controller.
Fault E506: VSD EM-Stop Input	Compressors with PowerFlex 75x VSD only: While the GD Pilot TS controller has detected a pressed Emergency Stop button there was no corresponding feedback from the VSD.	Check EM-Stop circuit. This fatal fault cannot be reset. Re-powering the compressor will run the Setup Code procedure. See chapter 13.
Fault E507: VSD Read Fault	An error occurred while reading data from the frequency converter.	Notify your local Gardner Denver Technical Support.
Fault E508: VSD EM-Stop Input	Compressors with PowerFlex 75x VSD only: While the VSD has detected an activated Emergency Stop button there was no corresponding feedback from the GD Pilot TS controller.	Check EM-Stop circuit. This fatal fault cannot be reset. Re-powering the compressor will run the Setup Code procedure. See chapter 13.
Fault E509: See VSD Display	Compressors with PowerFlex 75x VSD only: An unexpected fault code was received from the VSD.	Read displayed fault code from VSD display and notify your local Gardner Denver Technical Support.
Fault E510: Speed below min. Limit	Speed is below permissible minimum rotational speed.	Notify your local Gardner Denver Technical Support.

9.7 Warning Numbers A600 .. A695 (compressor-related)

Warning Numbers A600 .. A695		
Display	**Possible Cause**	**Remedy**
Warning A600: Service due	Hours to next Service below 200 hours.	Service the compressor corresponding to service instructions.
Warning A601: Discharge Over Pressure	Rated pressure exceeded by 1.0 bar / 14 psi (1)	
	• Pressure losses in the system too high.	Check, find cause.
	• Line pressure set points(2) too high	Correct.
	• External pressure requirement too high.	Check remote on-load/off-load switching points.
	• FS Intake regulator not closing.	Check, find cause.
	• VS Blow-off / bypass valve defective.	Check, find cause.
	• Pressure sensor B1 or B2 defective (incorrect indication).	Check, renew if necessary.
Warning A602: Compressor Disch. Temp.	Final compression temperature exceeded. (1)	Find cause.
	Intake temperature too high.	Improve.
	Inadequate cooling.	Improve.
	Unit being operated with enclosure open.	Close enclosure.
	R2 temperature sensor defective (indication too high).	Check, renew if necessary.
Warning A603:	Not used / reserved	
Warning A604:	Not used / reserved	
Warning A605:	Not used / reserved	
Warning A606: Line Pressure high	FS For more details, please refer to section 12.5.	
Warning A607: Controller Battery empty	Battery empty	Renew battery: Gardner Denver Part No. 100016235
Warning A608: Dryer	Alarm has been received from external dryer. (3)	See operating instructions for the dryer.
Warning A609: Condensate Drain	Connected condensate drainage valves (Bekomat) faulty (3)	Check, find cause.
Warning A610:	Not used / reserved	
Warning A611: Air Filter	Air filter differential pressure too high (3)	Check, change air filter if necessary.

1) Unit-specific setting: See `Factory Settings` Menu.
2) Unit-specific setting: See `Control` Menu.
3) Monitoring through optional device/sensor connected to a programmable digital input. See chapter 10 and wiring diagram.

Display	Possible Cause	Remedy
Warning A612:	Not used / reserved	
Warning A613:	Not used / reserved	
Warning A614:	Not used / reserved	
Warning A615: External Warning	Warning by external device (4)	Check, find cause.
Warning A616: Auto. Motor Greasing	A fault has occurred in the motor greasing system or the LC unit is running low. (4)	See Chapter on Motor greasing system in the operating instructions for the compressor system.
Warning A617: Input 1	The programmable digital input 1 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A618: Input 2	The programmable digital input 2 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A619: Input 3	The programmable digital input 3 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A620: Input 4	The programmable digital input 4 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A621: Input 5	The programmable digital input 5 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A622: Input 6	The programmable digital input 6 has been energized but is programmed as `Free`. (4)	Check the assignment of the input in question. (4)
Warning A623: SD card full	The SD card storage space is used up.	Renew SD card. Gardner Denver Part No. ZS1067681
Warning A624: Water Filter	Water filter differential pressure too high. (4)	Check, renew water filter if necessary.
Warning A625: Level control drain	Error during level monitoring in discharge phase:	
	Solenoid valve for water outlet faulty.	Check.
	Dirt trap in front of solenoid valve dirty.	Check dirt trap.
	Outlet ball valve closed?	Open ball valve.
	Faulty water level sensor B10.	Check level sensor and wiring.
Warning A626: Level control supply	Error during level monitoring in intake phase:	
	Poor supply of water for machine, water pressure may be too low.	Check water pressure.
	Water treatment unit faulty.	Check.
	Solenoid valve for water inlet faulty.	Check.
	Faulty water level sensor B10.	Check level sensor and wiring.

4) Monitoring through optional device/sensor connected to a programmable digital input. See chapter 10 and wiring diagram.

Display	Possible Cause	Remedy
Warning A627: Water change drain	Error during water change in discharge phase:	
	Solenoid valve for water outlet faulty.	Check.
	Dirt trap in front of solenoid valve dirty.	Check dirt trap.
	Outlet ball valve closed?	Open ball valve.
	Faulty water level sensor B10.	Check level sensor and wiring.
Warning A628: Water change supply	Error during water change in intake phase:	
	Poor supply of water for machine, water pressure may be too low.	Check water pressure.
	Water treatment unit faulty.	Check.
	Solenoid valve for water inlet faulty.	Check.
	Faulty water level sensor B10.	Check level sensor and wiring.

9.8 Warning Numbers A700 .. A731 (VSD-related) VS

Warning Numbers A700 .. A731		
Display	**Possible Cause**	**Remedy**
Warning A700: VSD Temperature High	Frequency converter (VSD) temperature close to trip temperature.	Check filters of switch gear cabinet, and renew if necessary. Ensure that electric motor-driven switch gear cabinet fans (if any) and frequency converter fans are working correctly. Check frequency converter for blockages in the cooling air supply and dirty cooler fins.

9.9 Others

	Possible Cause	Remedy
A fault/warning cannot be acknowledged.	Fault/warning still in place.	Find cause and remedy.
Pressure and temperature indicator failed, indicator (---)	Ground fault or short circuit for sensor B1, B2 or R2.	Find cause and remedy.
Incorrect display of volume flow	Volumetric flows incorrectly set.	Check setting max. and min. volume flow in `Configuration` Menu (see chapter 7.2).
Unit not automatically starting after power loss.	Automatic restart after power failure is not enabled. Power loss lasted too long. (1)	Enable.
Unit runs continuously in off-load without independently switching to readiness (stand-by).	Continuous Operation mode elected. (1) Very brief pressure requirements during the run-on time.	Select Automatic Operation mode.

1) Unit-specific setting: See `Control` Menu.

10 Programmable Inputs and Outputs

Caution

⚠

- **Only potential-free contacts may be connected to the terminal strip.**
- **External voltages will destroy the GD Pilot TS.**
- **The potential-free contacts must not be more than 20 metres away from the terminal strip. If necessary, coupling relays must be fitted in the control cabinet.**

10.1 Programmable Inputs

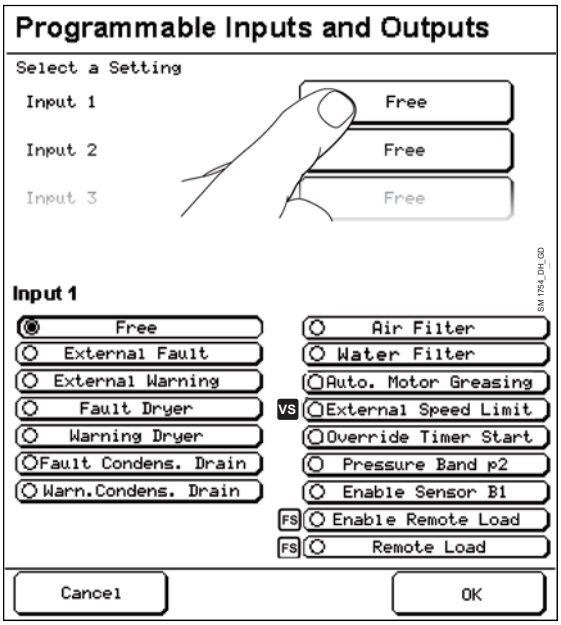


Fig. 23 Programmable Inputs

A number of programmable inputs are available on the GD Pilot TS. The number of inputs can vary depending on how your compressor is set up.

The inputs can be assigned to

- monitor conditions or devices when the contacts on the appropriate terminals are opened, or
- to activate functions when the contacts on the appropriate terminals are closed.

Note

A certain number of programmable inputs may already be occupied by pre-installed accessories and/or optional equipment. Refer to the circuit diagram supplied to check which inputs are freely available.

Caution

⚠

If monitoring equipment has been pre-installed and connected to programmable inputs, you may not change the corresponding settings, as doing so would disable the monitoring equipment.

If a programmable input channel is activated, i.e. an external source has been connected but a function has not been allocated to this input, the message `Input` "x" will appear on the screen. This indicates that a programmable input has been detected (x is the number of the relevant programmable input) but the controller does not understand how to process this input signal.

The following options may be assigned to the programmable inputs:

10.1.1 External Fault

This creates an `External Fault` error message (E412) on the display. This would be used, for example, if a crucial external component sent out an error signal. As it has been assigned as a Fault, this will immediately cause the machine to shut down.

10.1.2 External Warning

This creates an `External Warning` message (A615) on the display. This would be used, for example, if an external component sent out an error signal. This would be used for a non-critical component as the machine would not shut down.

10.1.3 Fault Dryer

In this feature, the input would be connected to a dryer. The compressor would shut down in the event of a fault occurring with the dryer. Fault message E413 would be displayed.

10.1.4 Warning Dryer

In this feature, the input would also be connected to a dryer. Warning message (A608) would be displayed on the controller screen in the event of a monitored parameter exceeding the values pre-set on the dryer. However, the compressor would keep running.

10.1.5 Fault Condens. Drain

This feature would shut down the compressor if the Condensate Drain unit was faulty. Fault message (E414) would be displayed.

10.1.6 Warn. Condens. Drain

This could be set to display a warning message (A609) if the water level in a condensate drain was close to full.

10.1.7 Air Filter

This optional monitoring feature could be set to display a warning (A611) if the Air Filter's Differential Pressure switch indicated it needed cleaning or changing.

10.1.8 Water Filter

This optional monitoring feature could be set to display a warning (A624) if the Water Filter's Differential Pressure switch indicated it needed cleaning or changing.

10.1.9 Auto. Motor Greasing (if model is equipped with an automatic motor greasing system)

This can be set to monitor the operation of automatic motor greasing units.

10.1.10 External Speed Limit VS

This can be used to temporarily limit the upper motor speed of the compressor as set in `Settings > Configuration` Menu.

This function could be used if, for example, there was a power failure and the factory had transferred to a stand-by generator. The reduced motor speed could reduce the maximum load on the generator.

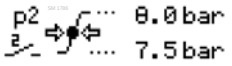
10.1.11 Override Timer Start

If the compressor was switched off according to the settings in the `Timer Start/Stop` Menu (see chapter 11.3), this function will override the timer and start the compressor as long as the input is activated.

This allows the machine, for example, to be started by maintenance personnel during a weekend when the timer would normally have shut down the machine.

10.1.12 Pressure Band p2

This function switches the pressure band over to the alternative p2 pressure band, as defined in `Settings > Control`. When this function is active, the `Home` screen displays that the p2 pressure band is currently in use and that it has been activated by a programmable input. The programmable input channel number is also displayed.



10.1.13 Enable Sensor B1

Ordinarily the controller monitors the line pressure via sensor B1 to determine when to load and unload the compressor.

If this function has been assigned to a programmable input and that programmable input's terminals are open, the controller will still read and display the line pressure. However, it will ignore the values for purposes of loading the compressor.

Note
An open input will unload the compressor.
Closing this programmable input re-enables the sensor's influence on the compressor's loading and unloading.

10.1.14 Enable Remote Load FS

This input enables/disables the "Remote Load" feature (see below).

10.1.15 Remote Load FS

When enabled (see above), this allows fixed rotational speed machines to be remotely loaded and unloaded.

10.2 Conditions Associated With Programmable Inputs

The following table lists certain timing and other conditions which must apply before the GD Pilot TS will trigger the event.

Monitoring	Condition
External Fault	Time > 1 s
External Warning	Time > 1 s
Fault Dryer	Time > 1 s
Warning Dryer	Time > 1 s
Fault Condens. Drain	If line pressure > 1.0 bar and time > 250 s
Warn. Condens. Drain	If line pressure > 1.0 bar and time > 250 s
Air Filter	Time >30 s
Water Filter	Time >30 s
Auto. Motor Greasing	Input=High (closed) for Time > 60 s or Input does not show High state within 24 hours.

10.3 Programmable Outputs

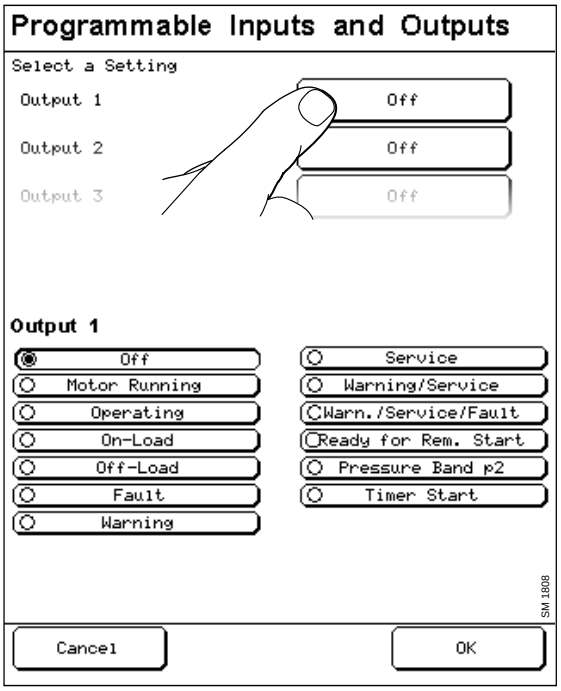


Fig. 24 Programmable Outputs

A number of programmable outputs are available on the controller. They can be used, for example, to activate a warning light in a control centre or activate another device when the appropriate output terminals are closed.

Note

A certain number of programmable outputs may already be used by pre-installed accessories and/or optional equipment. Refer to the circuit diagram supplied to check which outputs are freely available.

Note

Max current/max voltage per relay output: ***1A at 240V***

The default setting for Programmable Outputs is OFF (unless stated otherwise). However, they can be set to be activated if any of the following conditions occurs:

10.3.1 Motor Running

Activated whenever the main drive motor is running.

10.3.2 Operating

Activated whenever the compressor is in operation (on-load, off-load or stand-by).

10.3.3 On-Load

Activated only when the compressor is on-load.

10.3.4 Off-Load

Activated only when the compressor is off-load.

10.3.5 Fault

Activated when there has been a fault as a result of which the compressor has shut down. This programmable output is normally closed and opens when a fault occurs.

10.3.6 Warning

Activated when a warning is shown on the controller display. This programmable output is normally closed and opens when a warning occurs.

10.3.7 Service

Activated when a service is due or overdue. This is triggered within 200 hours of the next service being due. This programmable output is normally closed and opens when a service is due.

10.3.8 Warning/Service

Activated when a warning occurs or a service is due (see above for details). This programmable output is normally closed and opens when a warning/service event occurs.

10.3.9 Warn./Service/Fault

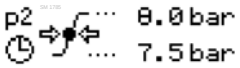
Activated when a warning or fault occurs or a service is due (see above for details). This programmable output is normally closed and opens when a warning/service/fault event occurs.

10.3.10 Ready for Rem. Start

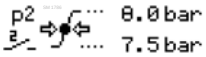
Indicates the compressor has been set to start from a remote signal, as defined in `Settings > Control > Remote Start Enabled` (provided that the discharge temperature is not too low and there is no fault).

10.3.11 Pressure Band p2

Indicates that the Controller is currently using Pressure Band 2 either from the p2 Timer



or from a programmable input.



10.3.12 Timer Start

Indicates that the compressor is currently started under timer control (within the timer schedule).

11 Setting Up Timer Control Operation

Danger

⚠

When the system is in stand-by mode, i.e. the green LED is flashing, the compressor can start automatically at any time.

11.1 Timer-Controlled Starting and Stopping

The GD Pilot TS can be programmed to automatically start and stop the compressor at pre-determined times of the day or night, 7 days a week.

11.2 An Example of Timer-Controlled Operation

A factory might work a 2-shift system where the morning shift starts at 8 am (08:00 hours) and finishes at 4 pm (16:00 hours). An evening shift might then start at 5 pm (17:00) and finish at 1 am (01:00). There is no weekend work.

The GD Pilot TS could then be programmed to start the compressor at 07:50 and stop it at 16:10. The GD Pilot TS could then re-start the compressor at 16:50 in readiness for the evening shift. It could then stop the compressor again at 01:10 after the end of the late shift.

11.3 Setting Compressor Start and Stop Times

Note

Before setting up Timer Control Operation, ensure that current date and time are set up correctly (see chapter 5.2).

If we take the previous example of a factory working a 2-shift system for 5 days a week, the timer control would be set up as follows:

1) Touch `Settings > Timer Control > Timer Start/Stop > Display / Adjust`

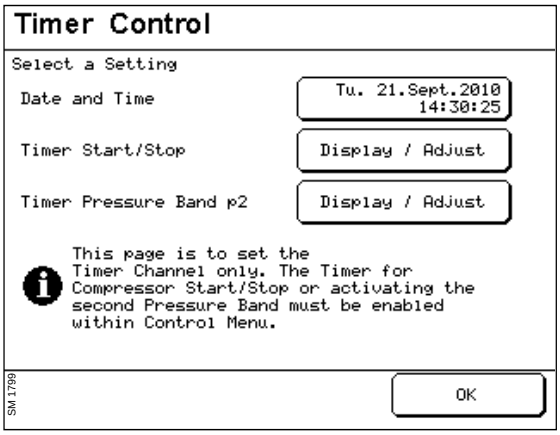


Fig. 25 `Timer Control` Menu

The display will change to show eight timer channels.

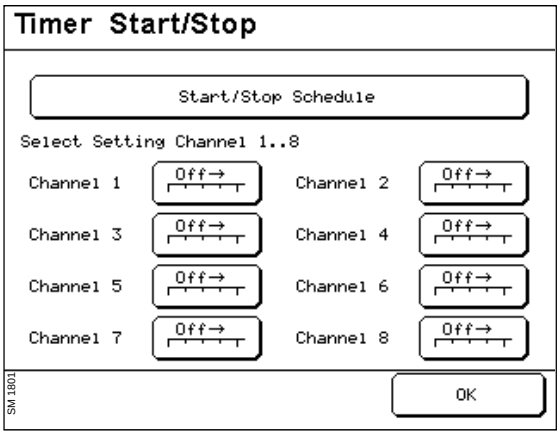


Fig. 26 `Timer Start/Stop` Menu

Each timer channel controls one compressor start time and one compressor stop time and enables them to be applied to one or more days of the week.

If a timer channel has been set, its button displays this graphic:  . Otherwise the button shows this graphic:  .

2) Programme the compressor for the morning shift.

Touch `Channel 1` button to set the times and days of the week for the morning shift. Confirm the entry by pressing `OK`.

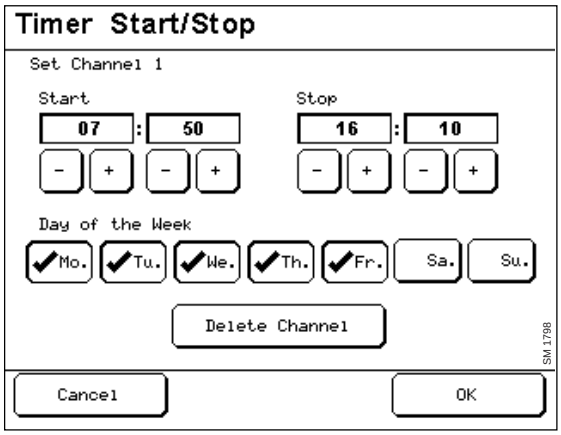


Fig. 27 Setting Channel 1

3) Programme the compressor for the evening shift.

Touch `Channel 2` button to set the times and days of the week for the evening shift.

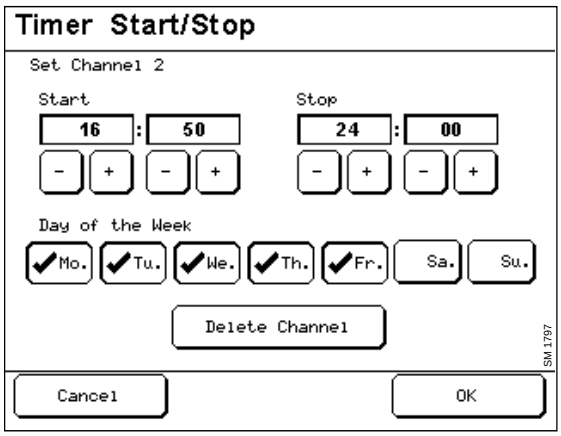


Fig. 28 Setting Channel 2

Note that each timer channel can cover one 24-hour period only (00:00 to 24:00). In order to cover the period 00:00 to 01:10 each morning, a third timer channel would need to be set as shown below.

4) Programme the additionally required third channel.

Key in the settings and confirm your entry by pressing `OK`.

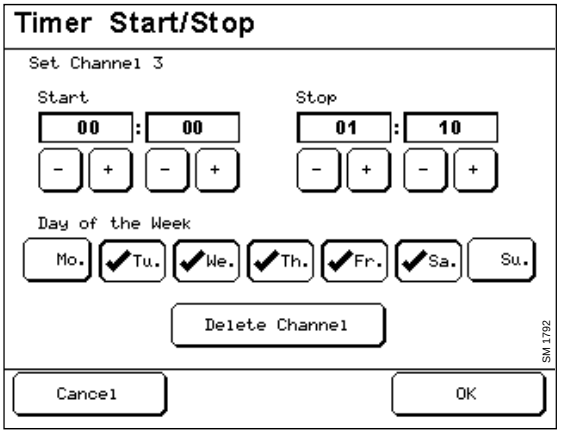


Fig. 29 Setting Channel 3

The channel display will finally be:

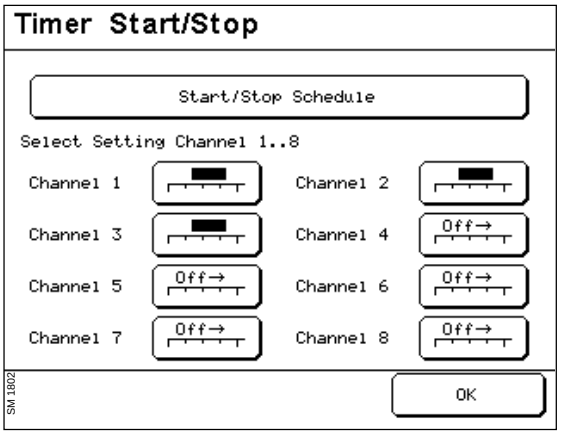


Fig. 30 Timer Channels After Setting

5) Touch `Settings > Timer Control > Timer Start/Stop > Start/Stop Schedule` to see an overview of timer settings.

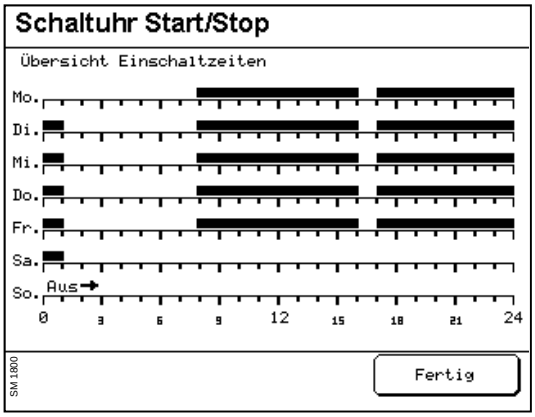


Fig. 31 Overview of Timer Channel Settings

Along the “X” axis, the overview shows the hours of each day between 0:00 and 24:00 and the days of the week along the “Y” axis. The highlighted areas show the timer channels which have been programmed.

11.4 Enabling Start/Stop Timer Control Operation

After setting up the timer/s, timer control operation must then be enabled in `Settings > Control > Timer Start Enabled`.

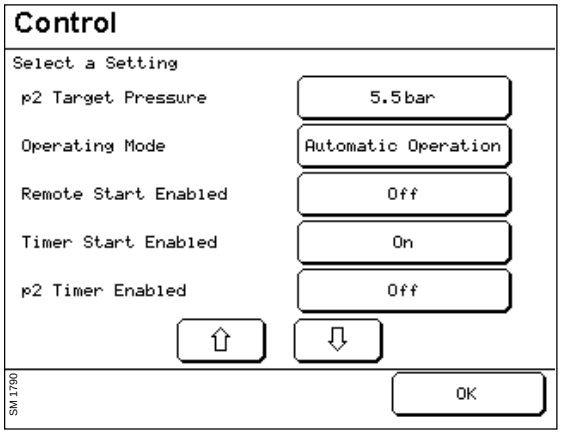


Fig. 32 Timer Start Enabled

The Home page then also shows that timer control is enabled.

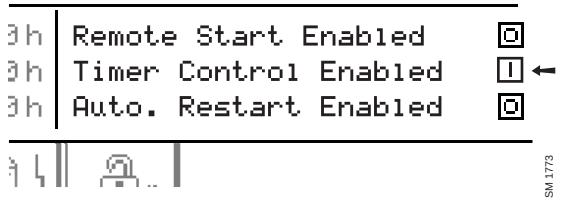


Fig. 33 Timer Enabled Display on Home page

11.5 Setting Timer for p2 Pressure Band (Alternative Pressure) Operation

As an alternative to the example used above, reduced pressure is to be maintained (instead of completely shutting down the station) between 16:10 (4.10 pm) and 16:50 (4.50 pm). The p2 timer would be set up as follows:

1) Touch `Settings > Timer Control > Timer Pressure Band p2`

The display will change to show eight timer channels.

Each timer channel controls one p2 start time and one p2 stop time and enables them to be applied to one or more days of the week.

2) Key in the settings and confirm your entry by pressing OK.

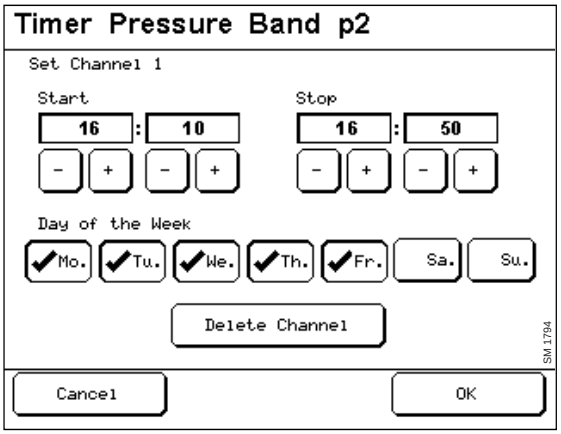


Fig. 34 Setting Channel 1 (p2 timer)

The display will revert to the previous screen.

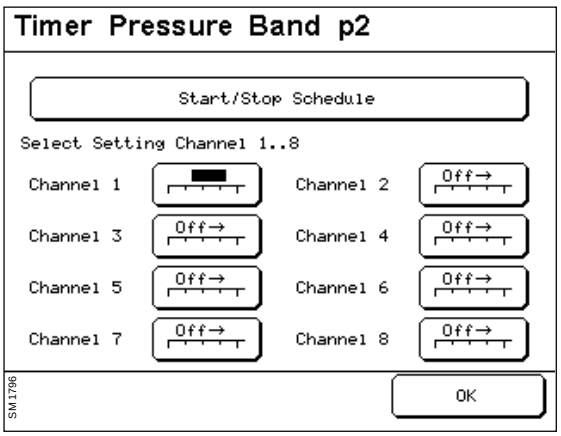


Fig. 35 Channel 1 (p2 Timer) Set

3) Touch `Settings > Timer Control > Timer Pressure Band p2 > Start/Stop Schedule` to see an overview of p2 timer settings.

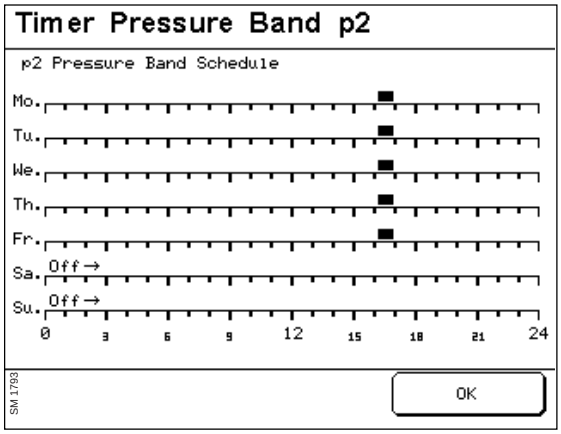


Fig. 36 Overview of p2 Timer Settings

Since the p2 pressure band schedule requires the compressor to be running during the period between 16:10 and 16:50, the Start/Stop timer needs to be adjusted. Only two Start/Stop timer schedules need to be set up now. One will start at 07:50 and end at 24:00, the other starting at 0:00 and ending at 01:10.

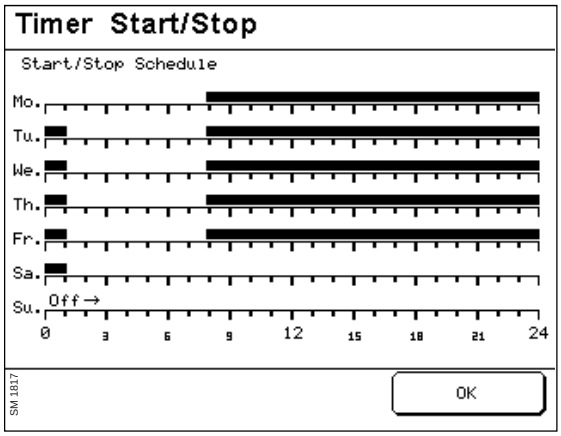


Fig. 37 Overview of Modified Timer Settings

11.6 Enabling Timer Control Operation for p2 Pressure Band

If timer control using pressure band p2 is required, p2 timer operation must also be enabled in `Settings > Control > p2 Timer Enabled`.

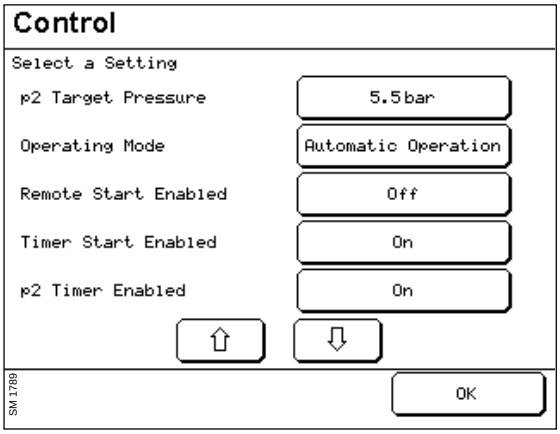
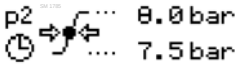


Fig. 38 Setting Channel 3

The compressor will always revert to the p1 pressure band by default unless:

- a scheduled p2 event is currently active and
- the p2 timer has been enabled in the `Control` Menu.

When both of these conditions are met, the current pressure band indicator on the `Home` page switches to p2 and a clock symbol indicates that this has been activated by the p2 timer (as opposed to a programmable input).



12 Advanced Settings

12.1 Setting the Dryer Pre-run Time

If you are using an external dryer which is started with a programmable output set to “Operating”, you can programme the GD Pilot TS to start the dryer a few minutes before starting the compressor so that it can reach its correct operating temperature.

Touch `Settings > Control > Dryer Pre-Run Time`. From there you can select a pre-run time between 0 and 99 minutes.

12.2 RS 485 Communication

There is one RS485 serial communication port (labelled RS485:1) available on the standard GD Pilot TS which uses the ModBus RTU protocol.

This can be used to communicate with external sequencers such as the CompAir SmartAir Master, or for monitoring purposes.

ModBus interfaces and drivers are available from many of the well-known manufacturers of programmable logic controllers (PLC).

You can select the settings for RS 485:1 communication in the menu: `Settings > Communication`.

The following menu options are available:

- `RS485:1 Address`

  You can set the desired address number in this menu item.

  The following options are available: **1** to **31**.

- `RS485:1 Baudrate`

  You can set the desired baud rate in this menu item.

  The following options are available: **4800**, **9600** or **19200**

12.3 Setting Automatic Restart After Power Loss

Danger

⚠

- **In this operating mode, the compressor may start up automatically at any time.**
- **Fit the compressor with warning signs, lock the room containing the compressor and instruct your staff.**
- **Fit the main switch specified by EN60204 and fit the appropriate warning signs on it.**

12.3.1 Automatic restart up to a maximum down time

After a power loss that has not exceeded the pre-set maximum time, the unit can restart automatically.

To enable this feature, select `Settings > Control > Auto. Restart Enabled.`

The `Home` page changes to indicate that the auto restart feature has been enabled.

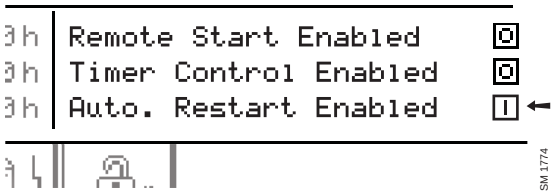


Fig. 39 “Autom. Restart Enabled” indication

Two sub options are shown below this option:

- – `Max Power Loss Time x s`
- – `Restart Delay x s`

Max Power Loss Time

In menu item: `Settings > Control > -Max Power Loss Time` you can set the maximum duration of a power loss after which the compressor is to start up automatically. The selected value can be between 1 and 999 seconds.

If the duration of the power loss exceeds the time you have set, the unit will not restart automatically. The `Power Supply Failure` fault message then appears on the display.

Restart Delay After Power Loss

You can also programme a restart delay of 1 to 99 seconds. This is set in the `Settings > Control > – Restart Delay` menu item and ensures a staggered start-up if the installation incorporates several compressors.

A staggered start ensures a more gradual increase in load on the local power supply.

12.3.2 Unlimited automatic restart after power loss.

The controller can also perform an automatic restart after any power loss period.

For this to be done, you must have read the following safety notices and authorise the unlimited automatic restart by entering an authorisation code.

Please request the required code from Gardner Denver Technical Support.

Danger

⚠

- **In this operating mode, the compressor may start automatically at any time and for an unlimited duration after a power loss.**
- **Check the safety regulations that apply in your country (e. g. EN1012-1, EN60204) to ascertain whether you are allowed to perform an unlimited automatic restart and establish which safety precautions must be taken.**
- **Always fit the compressor with warning signs, lock the room containing the compressor and instruct your staff.**
- **Fit the main switch specified by EN60204 and fit the appropriate warning signs on it.**

To authorise the unlimited automatic restart, proceed as follows:

1) Enter the code on the “Access Code” tab.

2) Set `Settings > Control > -Max Power Loss Time` to `unlimited` by entering 0 s.

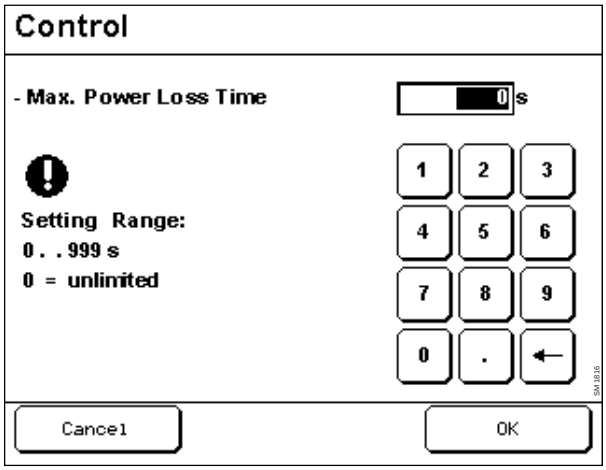


Fig. 40 Setting `- Max Power Loss Time` to `unlimited`

3) Re-enter the code to cancel the authorisation for the unlimited restart functionality.

12.4 Remote Start / Stop

12.4.1 Description

Danger

⚠

In this operating mode, the compressor may start up automatically at any time.

Caution

⚠

- **Only potential-free contacts may be connected to the terminal strip. External voltages will destroy the GD Pilot TS.**
- **The potential-free contacts must not be more than 20 metres away from the terminal strip. If necessary, coupling relays must be fitted in the control cabinet.**

The remote start / stop function allows the operator to start and stop the compressor from a remote location.

This function is permanently programmed and has its own dedicated terminals (see circuit diagram supplied with your compressor).

The unit continues to run while the potential-free contact is closed. If the contact is opened, the soft-stop is undertaken and the unit stops.

Note

The compressor is controlled using a remote start / stop switch. If the compressor shuts down during operation due to a power loss, it will not restart automatically when the power is restored. The remote switch must first be switched to "Off" *and then back to* "On" *before the compressor will restart.*

Enabling Remote Start

Connect the potential-free contact that you need for the remote start / stop function to the corresponding terminals (see circuit diagram supplied with your compressor).

This input is permanently programmed for the remote start / stop function.

This function can be activated via the `Settings > Control > Remote Start Enabled` menu option.

When the remote start / stop function is enabled, the message `Attention: Start by Remote Control...` appears on the screen and the `Home` page indicates `Remote Start Enabled`.

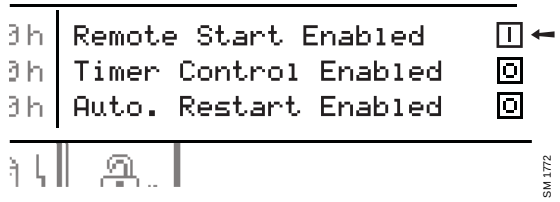


Fig. 41 "Remote Start Enabled Activated" indication

The "Start" and "Stop" buttons on the GD Pilot TS will no longer have any effect but the emergency stop button still remains operational.

The machine can now only be switched on and off using the potential-free contact.

12.5 Remote On-load/Off Load

Danger

⚠

In this operating mode, the compressor may start up automatically at any time.

Caution

⚠

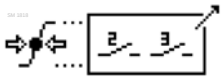
- **Only potential-free contacts may be connected to the terminal strip. External voltages will destroy the GD Pilot TS.**
- **The potential-free contacts must not be more than 20 metres away from the terminal strip. If necessary, coupling relays must be fitted in the control cabinet.**

The GD Pilot TS controller allows the operator to switch the compressor into On-load or Off-load from a remote point through the connection of two potential-free contacts. This function is needed when using an external controller, for example.

To activate the function, go to `Settings > Programmable Inputs and Outputs...`. In this menu item you must programme an output for the `Enable Remote Load` function and another output for the `Remote Load` function.

For example:

The `Enable Remote Load` function could be assigned to programmable input 2 and the `Remote Load` function could be assigned to programmable input 3. This would be indicated on the `Home` page as follows:



As long as the `Enable Remote Load` function is activated (input 2), the On-Load/Off-Load command is given exclusively via the `Remote Load` input (3), while all other internal pressure setpoints are ignored.

If the line pressure exceeds the set rated pressure by more than 0.5 bar due to a permanent `Remote Load` signal, the warning A606: `Line Pressure high` is displayed. This will disable the `Remote Load` input until the warning is reset.

13 Setting Up a Replacement Controller

13.1 The Setup Code and Compressor Data Reference Number

When first applying power to a replacement controller, you will be prompted to enter:

- The setup code

This code is 16 characters long and can be found on a label inside the controller cabinet.

- Compressor data reference number

This is a 13-digit number and can be found on the compressor nameplate. The reference number starts with the letters “CD”.

Note

Make a note of these details and have them ready to hand before powering up the controller.

Caution

⚠

The setup code and compressor data reference number are unique to each compressor. Never attempt to use data from a different compressor.

13.2 Entering the Setup Code and Compressor Data Reference Number

On applying power to the replacement controller you will first be asked to select your preferred language.

1) Touch the appropriate button to select the language, then confirm your selection with 0K.

An on-screen keypad will then appear on the display.

2) Enter the 16-character code you made a note of earlier.

3) Touch the 0K button to confirm your entry.

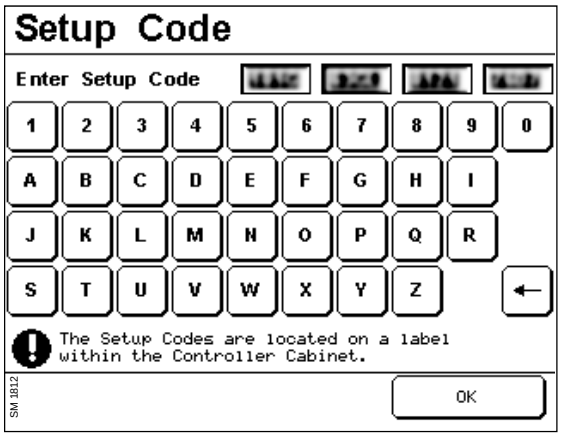


Fig. 42 Entering the Setup Code

Once you have entered the setup code, you will be prompted to enter the compressor identification number.

4) Enter the 13-character number you made a note of earlier. Touch the 0K button to confirm your entry.

Note

The 0K button will not appear unless 13 digits are entered.

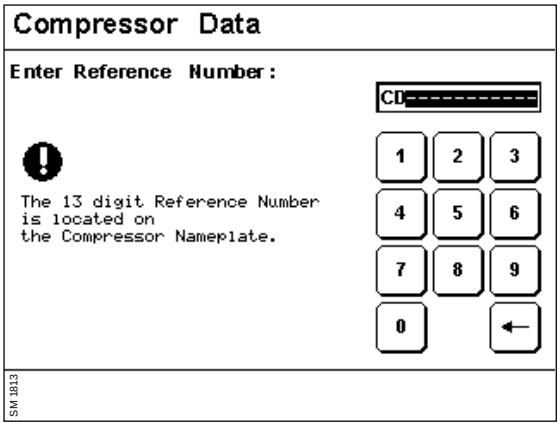


Fig. 43 Entering the Compressor Data Reference number

All settings will then be reset to their default values.

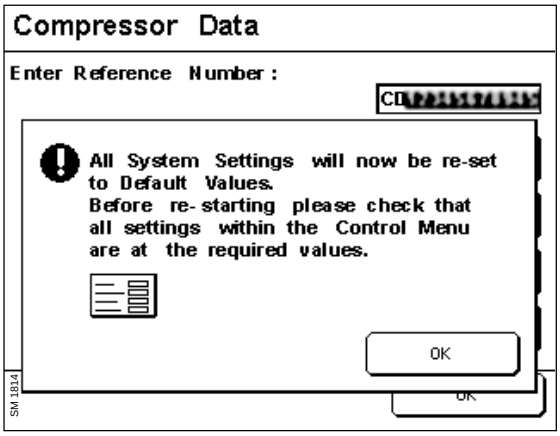


Fig. 44 Warning – Resetting to Defaults

Caution

⚠

Always check all GD PILOT TS settings before starting the compressor after installing a replacement controller. Restore your own specific settings. In particular, you must:

- **reinstate all optional programmable inputs/outputs connected.**
- **check the settings for the rated pressure of the compressor.**

Due to the nature of the controller on some models, you may then see the following prompt: `Press the Emergency Stop Button To Test`. This is to check that both the VSD and the GD Pilot TS have correctly recognised their Emergency Stop input.

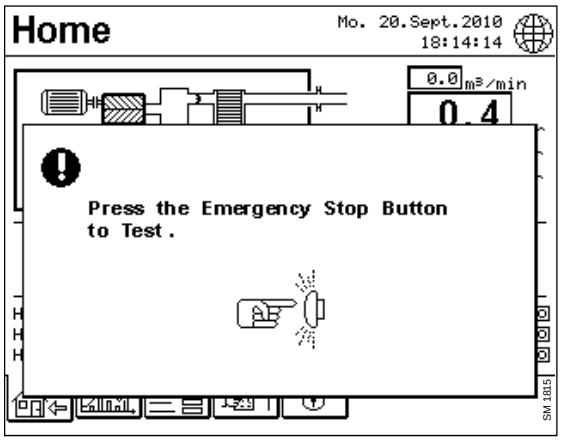


Fig. 45 Testing the Emergency Stop functions

14 Maintenance Level Functions

14.1 Access Security Levels

The menu structure is arranged so that there are two levels of access security.

14.1.1 User Level

This enables the compressor operator to change parameters controlling the everyday operation of the machine (see chapter 4).

14.1.2 Maintenance Level

This level allows local maintenance personnel to change certain additional parameters which are not available in the user level. It also displays some additional graphs.

14.2 Unlocking and Locking the Maintenance Level

14.2.1 To unlock

1) Touch the “Access Code” tab and key in the code **3100**.
2) Touch the appropriate tab for the menu you want to view/change.

14.2.2 To lock

3) Touch the “Access Code” tab and re-enter the code **3100**.

   This will re-lock the system.

Note

The maintenance level will automatically revert to “locked” 5 minutes after the last key press. However, the user level will remain unlocked until the user code is re-entered.

Should maintenance personnel need to access the menu system, they can do so by pressing the tab and keying in the maintenance level code. In this instance, the padlock symbol on the tab does not change to an unlocked padlock but instead, a small figure “2” will appear beside it . This happens regardless of whether the padlock symbol shows “locked” or “unlocked” (as maintenance access level 2 overrides the user level).

On entering the correct access code, the padlock symbol will disappear from all menu items which are available to that access level and changes can be carried out as required.

Maintenance personnel may also change parameters which were locked for the user level by entering the maintenance level code.

Some additional views and parameters are available in the maintenance level:

14.3 Additional maintenance level views

In `Trends` menu

a) Heatsink Temperature
b) VSD Output Current
c) Discharge Pressure
d) Discharge Temperature
e) Line Pressure – Show Targets
f) Water Level

Note

Water level varies strongly with systems depending on the current motor speed.

Touch or to move between the different graphs.

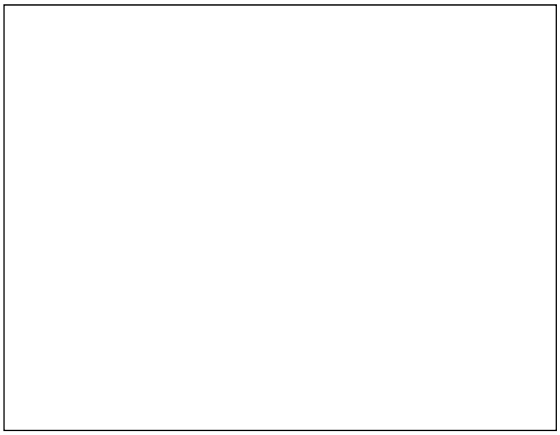


Fig. 46 Line Pressure Graph

When the Maintenance Level access code is entered, a `Show Targets` option button becomes available on the `Line Pressure` screen.

Touch the button to show the setpoint pressure lines on the graph. All changes made to setpoints during the displayed period can also be seen.

14.4 Re-set Statistics On-Load Hours

1) Touch the Re-Set Statistics button in the Trends > Statistics On-Load Hours Menu.

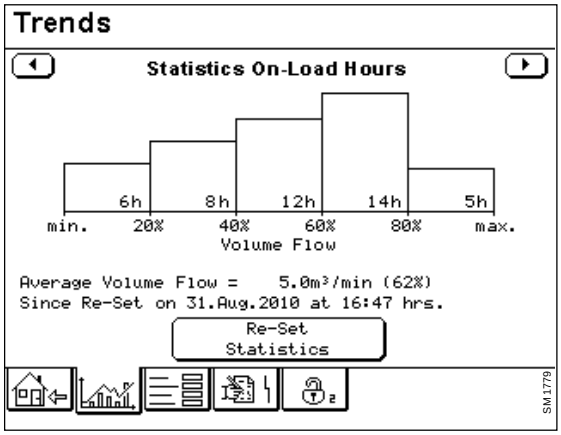


Fig. 47 Reset On-Load Hours Screen (VS shown, FS similar)

A dialogue box will appear.

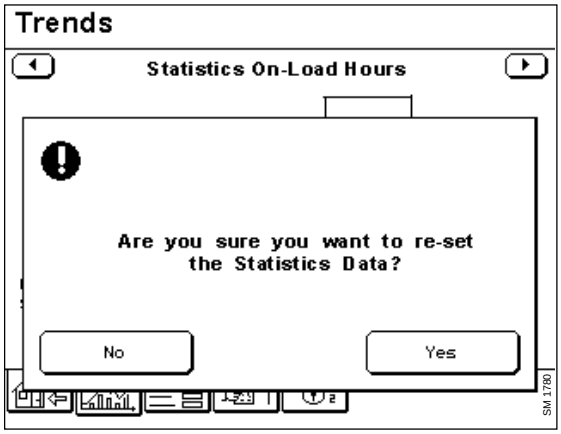


Fig. 48 Reset On-Load Hours Screen (VS shown, FS similar)

2) Touch Yes button.

Figures are re-set.

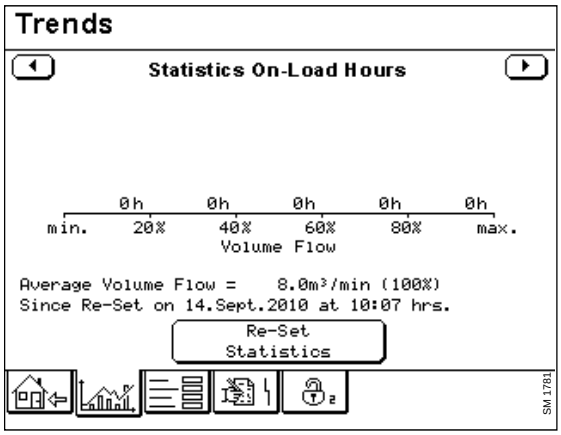


Fig. 49 Statistics On-Load Hours After Reset

14.5 Reset Service Interval

Note

The yellow LED on the panel will start to flash slowly if there are 200 hours or less to the next service. You will also see the corresponding message in the status line.

1) Touch the Hours to next Service button in the Settings > Hour Meters Menu.

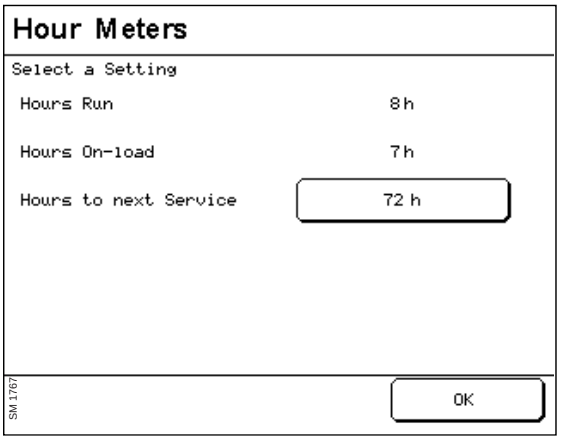


Fig. 50 Change Service Interval

2) Enter the figure required via the keypad. (Refer to the "Maintenance" chapter in the compressor user manual for when the next service is required.)

3) Confirm the entry by pressing OK.

The new figure is displayed and the Home page updated.

Fig. 51 Updated Hrs to next Service figure

14.6 VS Setting or Limiting the Rated Pressure

If your compressor is capable of a higher rated pressure than the network has been designed for (e.g. higher than the safety valves installed in the network), the rated pressure of the compressor can be limited in the `Factory Settings` Menu. This will prevent a user from inadvertently selecting a higher pressure within the `Control` Menu.

1) Touch the `Compressor Rated Pressure` button in `Settings > Factory Settings`.

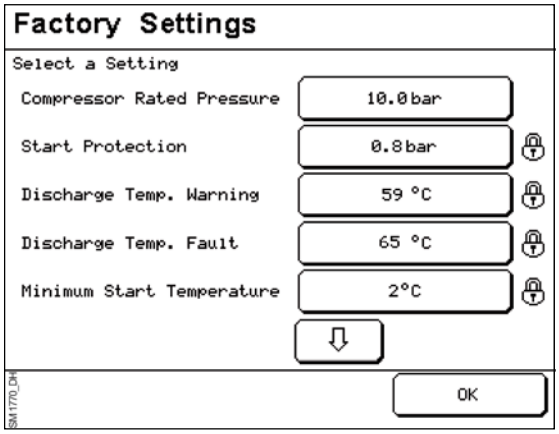


Fig. 52 Changing Rated Pressure

A keypad will appear.

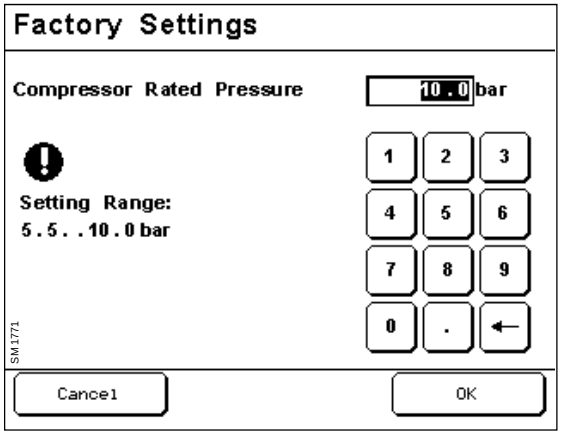


Fig. 53 Rated Pressure Keypad

2) Enter the figure required via the keypad and confirm your entry by pressing `OK`.

The new figure is displayed.

Note

Please note changing this setting may cause the pressure settings in the `Control` Menu to be reduced automatically.

14.7 Water Circuit Control

In the maintenance level settings can be changed in the `Settings > Water Circuit Control` Menu. In addition to this, there are more display and control elements on the `Home` page.

Note

The water treatment unit can only provide a limited amount of water per time unit. Too frequent water intake should therefore be avoided, as it may lead to warnings or faults in level monitoring or during the next water change.

14.7.1 `Change cycle` Setup

Water change cycle time elapses in real-time, i.e. irrespective of whether or not the compressor is running. This cycle time is already pre-set for your compressor.

Note

Never change the cycle time without first consulting Gardner Denver Technical Support.

14.7.2 `Remaining change time` Setup

The current remaining time until the next water change can be modified if required, e.g. in order to initiate or delay a water change cycle.

14.7.3 Display and Control Elements on the `Home` Page.

For test purposes, there is a button for manual water intake (3) and discharge (2) beside the percentage display value for the water level (1). The appropriate valves are opened while these buttons are pressed.

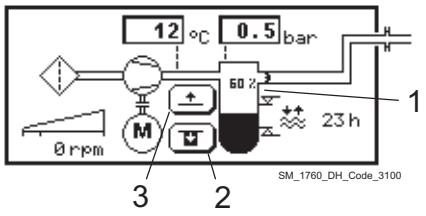


Fig. 54 Additional display and control elements on the `Home` page.

14.8 Data Recording Using the SD Card

14.8.1 The Data Recording Feature

GD PILOT TS is fitted with a data recording function (data logger). This function can be used to monitor and store various compressor parameters. Data created in the process can be stored on an SD card. This can assist maintenance personnel in monitoring compressor performance.

14.8.2 Using the Data Recorder (Data Logger)

The SD card slot is located on the back of the control panel.

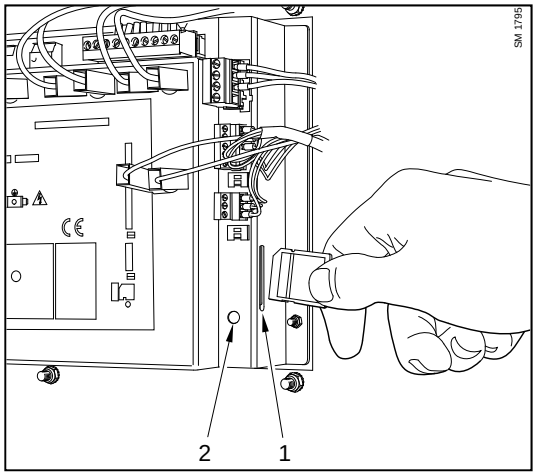


Fig. 55 SD Card Slot Location

1. SD Card Slot
2. LED – Read/Write active

To be able to use the data recorder, you must first unlock the maintenance level (see chapter 14.1).

1) Touch the `Settings > SD-Card > Record Data` tab.

The default setting is `OFF`. The options, which are displayed when you touch the `Record Data` button, allow you to record data at 3 second or 60 second intervals.

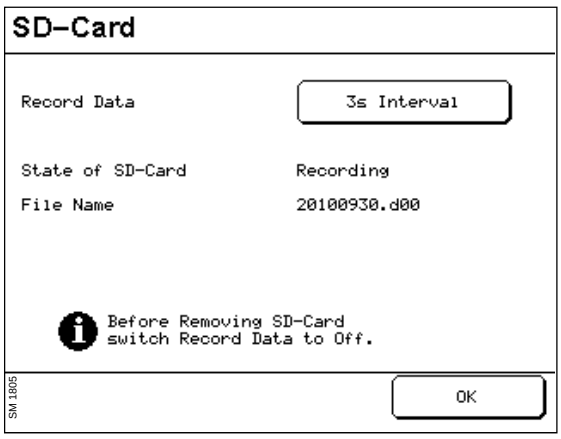


Fig. 56 Activating Data Recording Function

When you start recording data, the name of the current file is displayed on the screen. The status of the SD card reads `Recording`.

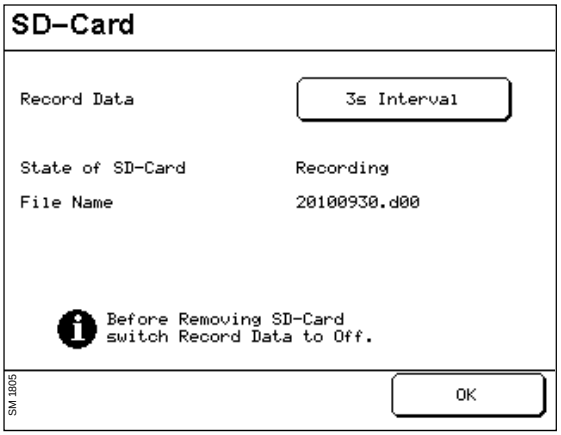


Fig. 57 Selecting Data Recording Time Interval

Caution

⚠

When you have finished recording data you must make sure the `Record Data` option is set to `Off` before removing the SD card. Otherwise the data files could become corrupted.

Note

If a padlock symbol appears next to the `Record Data` button, you will need to re-enter the maintenance level access code again before you can stop the data recorder.

14.8.3 Viewing the Recorded Data

When a data recording session is started, the controller saves a “Settings file”, which contains all the current settings and configuration details of the GD Pilot TS, to your SD card.

The file name comprises the start date and is suffixed with an “S00” as shown:

YYYYMMDD.S00

(The “S” identifies this as a “Settings file”, where YYYY denotes Year, MM denotes Month, DD denotes Day.)

The controller then begins monitoring and recording the machine's data at the intervals chosen in the `SD Card` Menu.

If the recording session crosses over to another day a “Data file”, containing all the data that was recorded during the previous day, is saved to the SD card. The file name comprises the date and is suffixed with a “D00” as shown:

YYYYMMDD.D00

(The “D” identifies this file as a “Data file”.)

A new data file is written every subsequent day that the recording session is allowed to continue, each with its own data-based file name.

When the recording session is ended by the user, a second “Settings file” containing the settings and configuration details of the GD Pilot TS at the end of the recording session is written to the SD card.

This file name contains the date and is also suffixed with an “S00” as shown:

YYYYMMDD.S00

(The “S” identifies this file as a further “Settings file”.)

If more than one data recording session occurs during the same day (and therefore file names have the same date), the suffix number is incremented to show which are the earliest and latest files recorded on any given day.

All files have the TSV (tab-separated values) text format and can be imported and viewed in a spreadsheet program, for example.

14.8.4 SD Card Format

The Data Recorder function only works with SD cards. It will not work with SDHC or SDXC cards.

The SD card (maximum 2GB, class 2) must be formatted in FAT16 format. SD card driver compatibility cannot be guaranteed for any SD card other than the card with Gardner Denver part number ZS1067681.

Not all media card readers are able to read this SD format. Issues may occur, especially with more modern SDHC readers, so Gardner Denver also recommends you use an official GD Pilot TS SD card reader: Part number ZS1069300.

15 Base Load Sequencing (BLS) (Optional)

15.1 About Base Load Sequencing

The Base Load Sequencing feature is optional.

Base Load Sequencing has two functions:

- One central superior controller (the master) is utilised to control a group of compressors in order to maintain the line pressure within a narrow pressure band.
- The master controller regularly changes the priorities of the compressors in the group ensuring that the running hours of all machines are equal. This assists with scheduled maintenance.

15.2 System Requirements

A communication module (RS485:3 module) must be installed on the master GD Pilot TS controller, if it has not been pre-installed ex-factory. For more information see chapter 15.13.

15.3 General description

If the optional RS485:3 module is installed, the GD PILOT TS can act as a base load sequencing master device. Up to 3 slaves can be connected to the master via a serial link.

Note

All slave compressors must be of the same type, i.e. all FS or all VS.

The following compressor group configurations are supported:

Supported group configurations	
Type	**Description**
FS FS	The fixed-speed master can control up to 3 FS slaves. The rated volume flow of each compressor within the base load sequencing group should be approximately the same as the master.
VS Single VS compressors	The regulated-speed master can control up to 3 FS slaves. The rated volume flow of each slave compressor should be equal to or slightly less than the master.
VS Multi VS compressors	The regulated-speed master can control up to 3 VS slaves. The rated volume flow of each compressor within the base load sequencing group should be approximately the same as the master.

15.4 Supported slave controllers

Supported electronic slave controllers are GD Pilot MK, GD Pilot and GD Pilot TS having the minimum required software version installed.

If it is necessary to connect any other compressor controller, or a compressor with electro-mechanical control, to the master, a device known as a Compressor Module (STD) can be installed into the slave. This compressor module controls the loading/unloading of the compressor, monitors its status such as “Ready” and “On-load” and is connected to the master via a serial link. See chapter 15.14.

15.5 Supported Slave Compressor Controllers and Required Software Versions

Note

The slave controller's RS485:1 interface must not be used by any other system e.g. for remote monitoring etc.

The following compressor controllers are supported and must have a software version number not less than one of those stated below:

Required Software Versions	
Electronic Controller	**Minimum Required Software Versions**
GD Pilot TS - EnviroAire	DXL-DH-1.00
GD Pilot TS - EnviroAire VS	DXL-DHRS-1.00
GD Pilot TS -ESM	DXL-L-1.02
GD Pilot TS -VS	DXL-LRS-1.04
GD Pilot-	DPro-L-1.18
GD Pilot-VS	DPro-LRS-1.02
GD Pilot-MK	SD31V2.05
GD Pilot MK -VS	D31RS1.06

The software version can be checked in the controller menu structure. For more information refer to the individual user manuals delivered with your compressor.

Please contact your local Gardner Denver Technical Support if a software update is required.

15.6 The Base Load Sequencing (BLS) Page

To activate the Base Load Sequencing feature, enter code **1234** once on the Access Code Page. The "BLS" tab then becomes visible and can be accessed.

Note

*If code **1234** is entered for a second time, the "Base Load Sequencing" tab will be deactivated again.*
The Base Load Sequencing feature can be activated even if the RS485:3 module is not installed. In this case, you will get a communication fault message because the master cannot establish communication with the slaves, as they are not connected. See chapter 15.13.

If you select the Base Load Sequencing (BLS) page before any slave compressors have been defined, or with the BLS feature switched off, an appropriate message box will appear.

15.6.1 "Base Load Sequencing" Tab

The symbols which appear beside the BLS symbol may vary, depending on the operating status of the machine. They give the following information:

- BLS is switched off. The page is only being displayed and all compressors are running independently using their own individual settings.
- BLS is switched on.
- BLS is switched on and timer-controlled.
- The BLS page displays an alarm.

Typical BLS display.

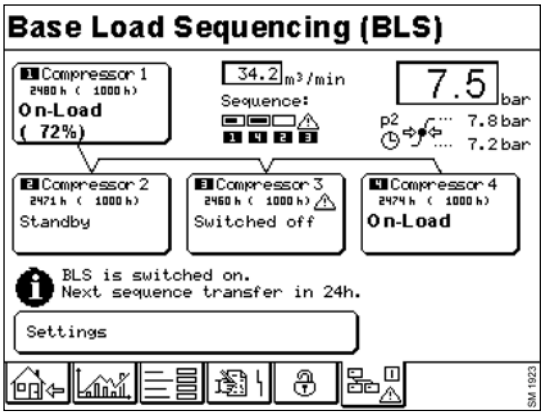


Fig. 58 Example of a BLS

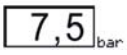
The example above shows a BLS group consisting of the master (compressor 1) and three slaves numbered as 2, 3 and 4.

Note

Only configured slave compressors are shown. This means that at the first activation (number of slaves = 0), only the master compressor is shown. The compressor naming, e.g. "Compressor 1" can be modified freely as described later.

1. 

Current compressed air output of the BLS group.

2. 

Current line pressure

3. 

p1 Cut-In Point/p2 Cut-In Point

p1 Cut-Out Point/p2 Cut-Out Point

If the BLS is turned on, this indication displays the current minimum and maximum line pressure, at which the next available compressor is activated (p1 cut-in point/p2 cut-in point) or shut down (p1 cut-out point/p2 cut-out point).

Note

With VS machines, the target pressure of the BLS group is exactly between the two values.

Symbols p1 or p2 and the optional clock symbol indicate the pressure band in use and whether timer control is in operation (for more information see chapter 6.1 and chapter 11).

4. Sequence and Status Indicator

If the BLS is turned on, this indication shows the current sequence.

a) Sequence Indicator

In the example shown above – – the compressor on the left is the base load machine; the other compressors are consecutively activated from left to right, as the demand for air increases.

b) Status indicator

The status of the machines in the group is displayed above the sequence indicator by the following symbols:

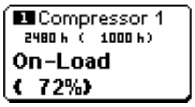
No symbol	Compressor not defined
▭	Compressor off-load
▬	Compressor on-load FS
▬	On-load bar graph
⚠	Compressor not available (switched off, no communication, fault etc.).

Note

A compressor not available for the BLS will consequently be moved to the last position in the sequence.

5. ℹ BLS status information

Full text status information, such as On/Off, remaining sequence change time, timer-controlled start time etc.

6. 

Compressor button

The compressor number, name, actual operating hours, the running hours (BLS) if applicable (for more information see chapter 15.11.2) and the status are displayed on the compressor button.

Touch a compressor button to view more compressor information and to configure compressor data.

15.7 Compressor Status Messages (BLS Group)

Following messages are displayed in normal operation:

Compressor Status Messages	
Message	**Meaning**
Standby	The compressor is ready for start-up by the master.
Level control drain…(1)	The motor is starting up.
Off-Load	The compressor is currently off-load.
On-Load	FS The compressor is currently on-load.
On-Load (xxx %) (1)	Percentage of current compressed air output flow rate (min. 100 %)
De-Pressurising... (1)	The compressor is stopped and currently unloading.
Load Requested…	Slave has received a load request but hasn't started yet.

1) Not displayed for slaves controlled by the compressor module (STD).

15.7.1 Messages displayed if a slave is not available:

If a BLS group Slave is not available (indicated by the ⚠ symbol on the "BLS" tab), one of the following alarm messages will be displayed:

Slave Alarm Messages	
Message	**Meaning**
No communication	No communication can currently be established with the slave.
Fault	Fault at the compressor.
Switched off (1)	The compressor is switched off and is therefore not available.
Incorrect configuration	The BLS configuration states that no VS slaves are connected but the slave is a VS compressor. or The BLS configuration states that VS slaves are connected but the slave is a FS compressor.
Not compatible (1)	The slave is not compatible. Please check the supported compressor controllers and required software versions in section 15.5 – "Supported Slave Compressor Controllers and Required Software Versions".

1) Not displayed for slaves controlled by the compressor module (STD).

15.8 Compressor Settings and Information Button

If the slave compressor is compatible and communicating with the master, compressor information can be obtained and configured by touching the compressor button. Depending on the slave controller type, some data are read out by the slave while others have to be set manually. Therefore, an appropriate button is provided instead of a simple indication.

Note

Correct compressor settings must be ensured in order for the BLS to operate faultlessly.

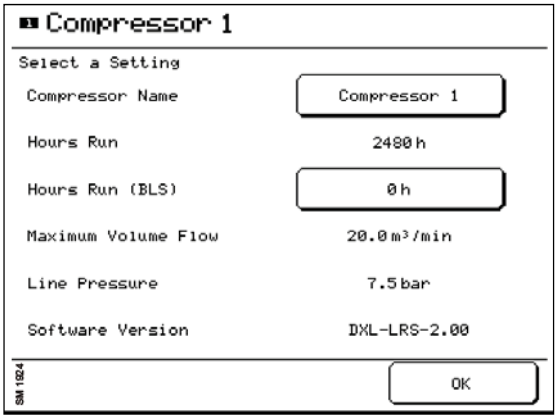


Fig. 59 Example compressor 1

1) Compressor Name

The compressor name can be modified as required to match the naming on site. Touch this button to open a keyboard.

2) Hours Run

Displays the actual operating hours (Hours run) of the slave.

For slaves controlled by the compressor module (STD), set the actual operating hours here by touching the button.

3) Hours Run (BLS)

The BLS sequence will be redefined regularly on the basis of the operating hours (BLS) shown here. See chapter 15.11.2.

If this setting differs from the actual operating hours on the compressor button, both values are displayed on the compressor button.

4) Maximum Volume Flow

FS: Displays the maximum volume flow as defined on the slave controller. For some slaves this setting must be configured manually. This can be done by touching the button.

VS: Displays the maximum volume flow available at current line pressure.

5) Line Pressure

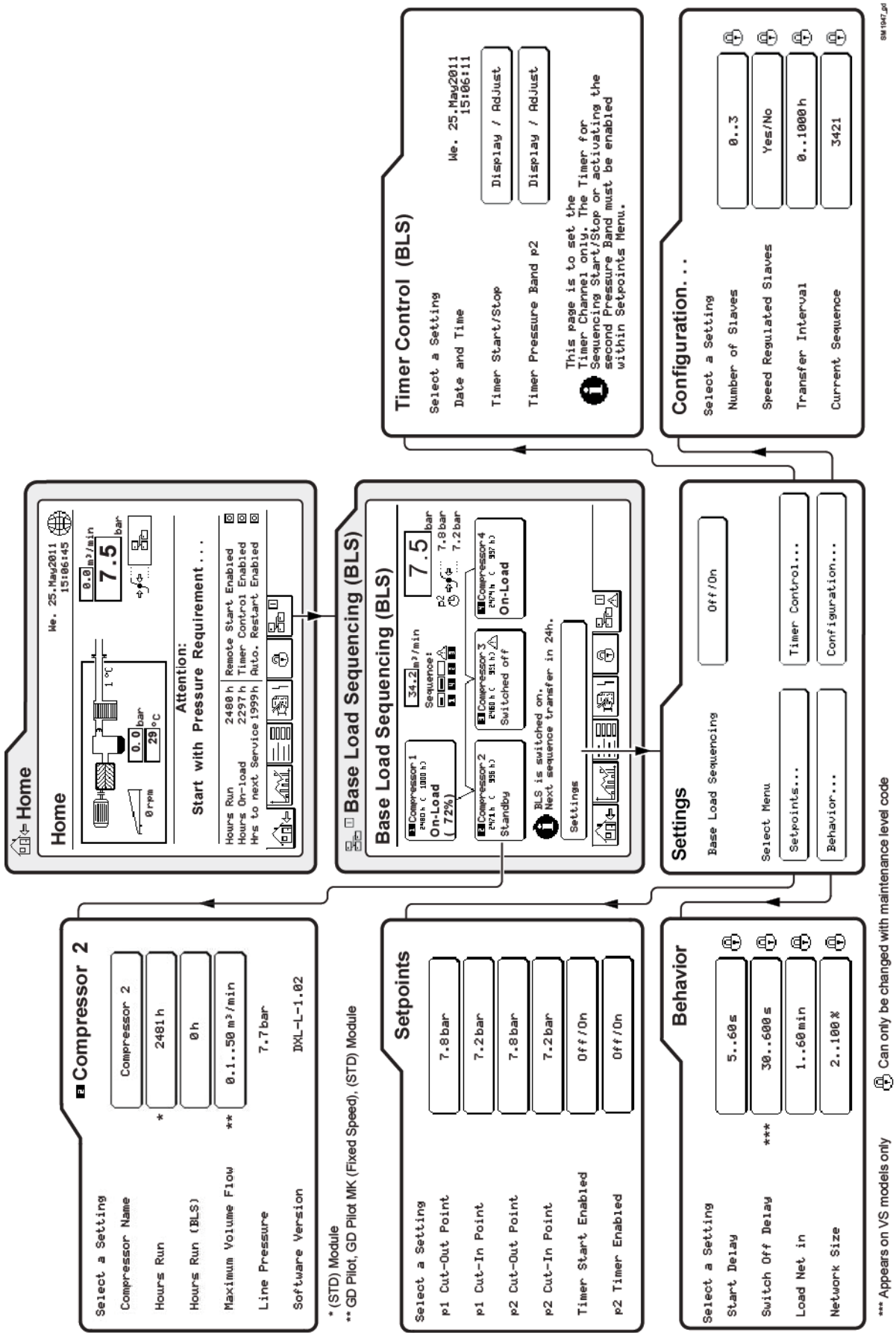
Displays the current line pressure measured by the slave.

This line is not displayed for slaves controlled by the compressor module (STD).

6) Software Version

Displays the software version of the slave.

15.9 Overview of BLS Menu Structure



15.10 BLS Settings Button

Touch the `Settings` button to view and adjust the BLS settings.

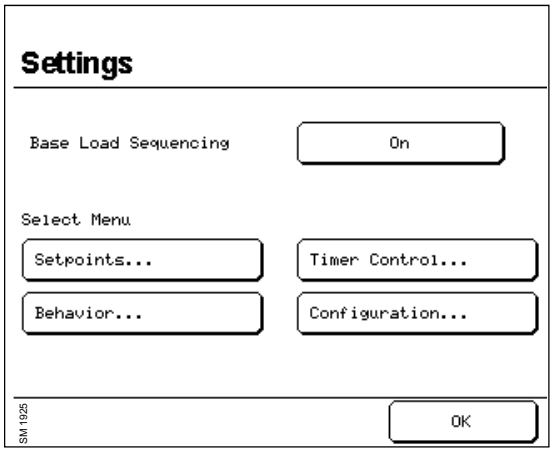


Fig. 60 `Settings` BLS button

15.10.1 Base Load Sequencing On/Off

BLS can only be turned on when the number of slaves is greater than zero. If base load sequencing is switched on, the slaves will be controlled by the master and will ignore their local setpoints.

If base load sequencing is switched off, the slaves will run independently from the master and will use their local setpoints. The BLS page will continue to display the group.

15.10.2 Setpoints…

1) p1 Cut-Out Point

Maximum line pressure at which the BLS will shut down the compressor on the far right in the sequence.

2) p1 Cut-In Point

Minimum line pressure at which the BLS will activate the next available compressor.

3) p2 Cut-Out Point

Maximum line pressure in 2nd pressure band at which the BLS will shut down the compressor on the far right in the sequence.

4) p2 Cut-In Point

Minimum line pressure in 2nd pressure band minimum at which the BLS will activate the next available compressor.

5) Timer Start Enabled On/Off

Enables the scheduled BLS timer Start/Stop settings to start or stop the whole BLS group, e.g. at the weekend.

6) p2 Timer Enabled On/Off

Enables the scheduled BLS timer settings for pressure band p2 to activate the 2nd pressure setting for the BLS.

15.10.3 Behaviour...

1) Start Delay

The first compressor is activated immediately but the next compressor will not be activated until the scheduled Start Delay time has elapsed.

2) VS: Switch Off Delay

When the master determines that the compressed-air requirement in the network has dropped sufficiently to allow for another slave to be switched off, a delay time is activated. If the compressed-air requirement stays low during this delay time, the next slave in the sequence is switched off and the remaining compressors satisfy the compressed-air requirement.

If the compressed-air requirement increases again before the scheduled Switch-Off Delay time has elapsed, the slave will not be shut down and the delay time will be reset. This is designed to prevent unnecessary compressor starts and stops.

3) Load Net in

If the BLS is activated manually or by the scheduled BLS timer, the net will be loaded within the set time by activating only as many compressors as required to load in the net within that time.

4) Network Size

Note

Only modify the default value in case of significant fluctuations in the compressed-air requirement.

The master controller utilises this figure to perform calculations while the line pressure is within the pressure band. The figure is used to calculate whether too many compressors are switched on (or off) to match the increase (or decrease) of line pressure.
If the line pressure drops and the controller calculates that, for example, more than two compressors will be needed to meet the current compressed-air requirement, one or more compressors will be started up immediately as a precaution, instead of waiting until the minimum line pressure is reached. The same happens in reverse in case of an increase of line pressure.

If the user enters a network size which is too high, the controller will activate (or shut down) more machines than are required to deal with the decrease (or increase) of pressure.

Enter a percentage (a (below)) based on a ratio of network volume size to total delivery volume flow available in the group, calculated on the basis of the following formula:

a = (100 * b) / c

where

a = network size (%)

b = network volume size (m^3)

c = total delivery volume (m^3/min)

Note

The network volume size (b) should only be equivalent to the volume of the compressed-air tank closest to the compressor group. All pipework and any other compressed-air tanks which may be installed further along the network should be ignored.

15.10.4 Configuration. . .

1) Number of Slaves

Key in the number of slaves connected to the master.

2) VS: Speed Regulated Slaves Yes/No

Select whether the slaves are rotational speed-regulated or not.

Note

All slaves must be of the same type.

3) Transfer Interval

Use this area to define the time interval at which the sequence is reconstructed on the basis of the operating hours (BLS) of the compressor. The transfer can be disabled by keying in 0 hours.

4) Current Sequence

The sequence can be defined manually, e.g. for test purposes, or if a specific sequence is to run for a longer period of time (Transfer interval = 0h).

15.10.5 Timer Control. . .

The scheduled BLS timer for Start/Stop and pressure band p2 can be set here. To learn about the procedure refer to chapter 11.

Note

These submenus are provided only for setting of the timer channels. The timer for Start/Stop or activating the second pressure band must be enabled in the `Setpoints` *Menu.*
(A BLS group which has been shut down by the timer can be activated using a programmable input (see chapter 10.1.11).
The p2 pressure band can also be activated using a programmable input (see chapter 10.1.12).

15.11 Function Description

15.11.1 Control Algorithm

As long as the BLS is manually switched off, the slaves will run independently from the master using their local setpoints. The BLS page will only display the group.

If the BLS is activated manually or by the scheduled BLS timer, the net will be pressurised within a set period (Load Net in), activating only as many compressors as required to pressurise the net within that time. After a power failure, this function is not activated, because in that case it is essential for the net to be pressurised as soon as possible.

In the event of a line pressure sensor fault (Fault E406), the master can no longer control the group and shuts off the BLS until the fault is removed and reset.

Note

If the master compressor shuts down because of a fault other than a line pressure sensor fault, or if it is shut down manually, the master will continue to control the sequencing.

Once the line pressure exceeds the defined maximum line pressure, the compressor at the far right in the sequence will be shut down. As long as the maximum line pressure is exceeded, the system will continue to shut down further compressors consecutively in short time intervals.

If the line pressure drops below the defined minimum line pressure, the next available compressor will be started up immediately, followed by more compressors in a set period of time (Start Delay) if the line pressure remains low.

VS: The rotational speed regulated compressor(s) regulate(s) the line pressure within the available rotational speed range, to be exactly between the minimum and the maximum line pressure. If the pressure band limits are reached, compressors are started up and shut down as described above.

Several VS compressors: Speed-regulated compressors will run approximately at the same rotational speed and load if their size is approximately the same. After a manual restart of a compressor (e.g. after service), the rotational speed may be asynchronous until the compressor has achieved its minimum or maximum rotational speed limit.

15.11.2 Establishing a new Sequence based on Operating Hours (BLS)

Whenever the transfer interval period has elapsed, the BLS master establishes a new sequence order on the basis of the operating hours (BLS) of the compressors. The compressor with the lowest operating hour count (BLS) is placed in first position in the sequence and so on.

Single VS compressor: For economic reasons, the speed-regulated compressor will always stay in first position, whereas the fixed-speed slaves will have their sequence order changed periodically.

The freely adjustable operating hour (BLS) counters can be used to manipulate the sequence if necessary, for example if a new compressor is installed alongside older ones.

Example 1

Example 1		
	Compressor 1	**Compressor 2**
Operating hours (actual)	1000 h	1 h
Operating hours (BLS)	1000 h	1 h

Operating hours (BLS) are set to the same figure as the actual operating hours. The new Compressor 2 will run on base load position for about 1000 h, as it has the lowest running hour (BLS) count. Afterwards, both compressors alternate in sequence.

Example 2

Example 2		
	Compressor 1	**Compressor 2**
Operating hours (actual)	1000 h	1 h
Operating hours (BLS)	1000 h	1000 h

Operating hours (BLS) were modified to integrate Compressor 2 and the alternating sequence for the two compressors starts immediately.

15.12 BLS Trend and Statistic Graphs

If the Base Load Sequencing feature is activated, two other pages can be viewed in the “Trends” tab  :

- Total delivered volume flow (BLS) of the group
- Statistical weekly profile (BLS) of the group

15.13 Installation and Activation - RS485:3 module

This chapter explains how to retrofit the RS485:3 module if it has not already been installed in the GD Pilot TS controller ex-factory. If the module is already installed, the “X08” connector will be visible at the back of the GD Pilot TS.

The RS485:3 module extends the GD Pilot TS by an additional 3rd RS485 interface.

Ordering information:

- Part number: ZS1075506
- Scope of supply: RS485:3 module
  Connector kit for slave controllers
  Installation instructions

15.13.1 Installation:

1) Please read the safety instructions (see chapter 2).
2) Switch off the compressor and isolate it from the power supply.
3) VS Wait a 10 minutes before touching electrical components.
4) Disconnect all connectors from the GD Pilot TS and remove the cover.
5) Plug the module into the provided socket. Ensure that all pins are in the socket and not beside it.
6) Close the cover, install all connectors and switch on the power supply.

15.13.2 Activation

Activate the Base Load Sequencing feature by entering the code **1234** once on the Access Code page.

Note

*If code **1234** is entered for a second time, the Base Load Sequencing feature will be deactivated again.*

The Base Load Sequencing feature can be activated even if the RS485:3 module is not installed. In this case, you will get a communication fault message because the master cannot establish communication with the slaves.

15.13.3 Wiring Method

We strongly recommend that you use shielded and twisted pair (TP) cables (types 2 x 2 x 0.25 to 0.75 mm^2).

Total bus wiring length must not exceed 1,200 m.

The RS485 interfaces of the master and the slave compressor controllers should form a bus structure, i.e. all compressors should be connected in series.

The following image shows examples of correct and incorrect wiring of the compressor station.

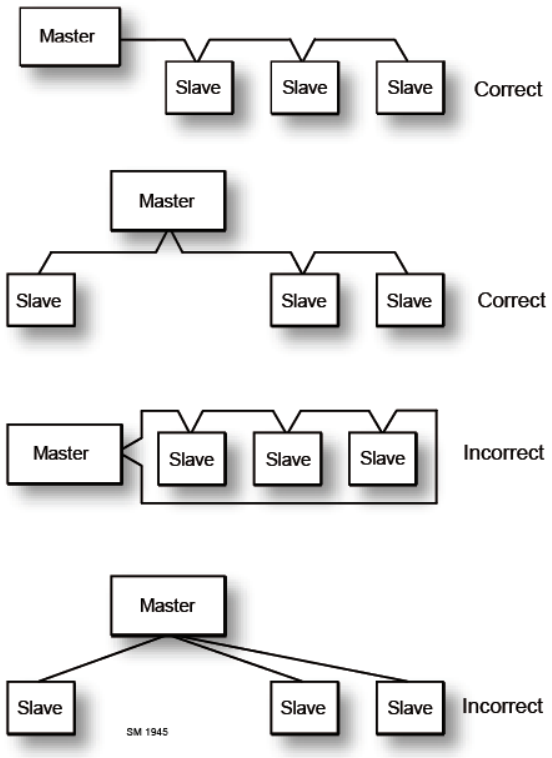


Fig. 61 Wiring of the compressor station

15.13.4 Circuit diagram

During installation, refer to the terminal numbers shown on the appropriate connector only, i.e. not to any other marking on the slaves. The following image shows examples of all supported hardware models. The GD Pilot TS can control up to a maximum of 3 slaves.

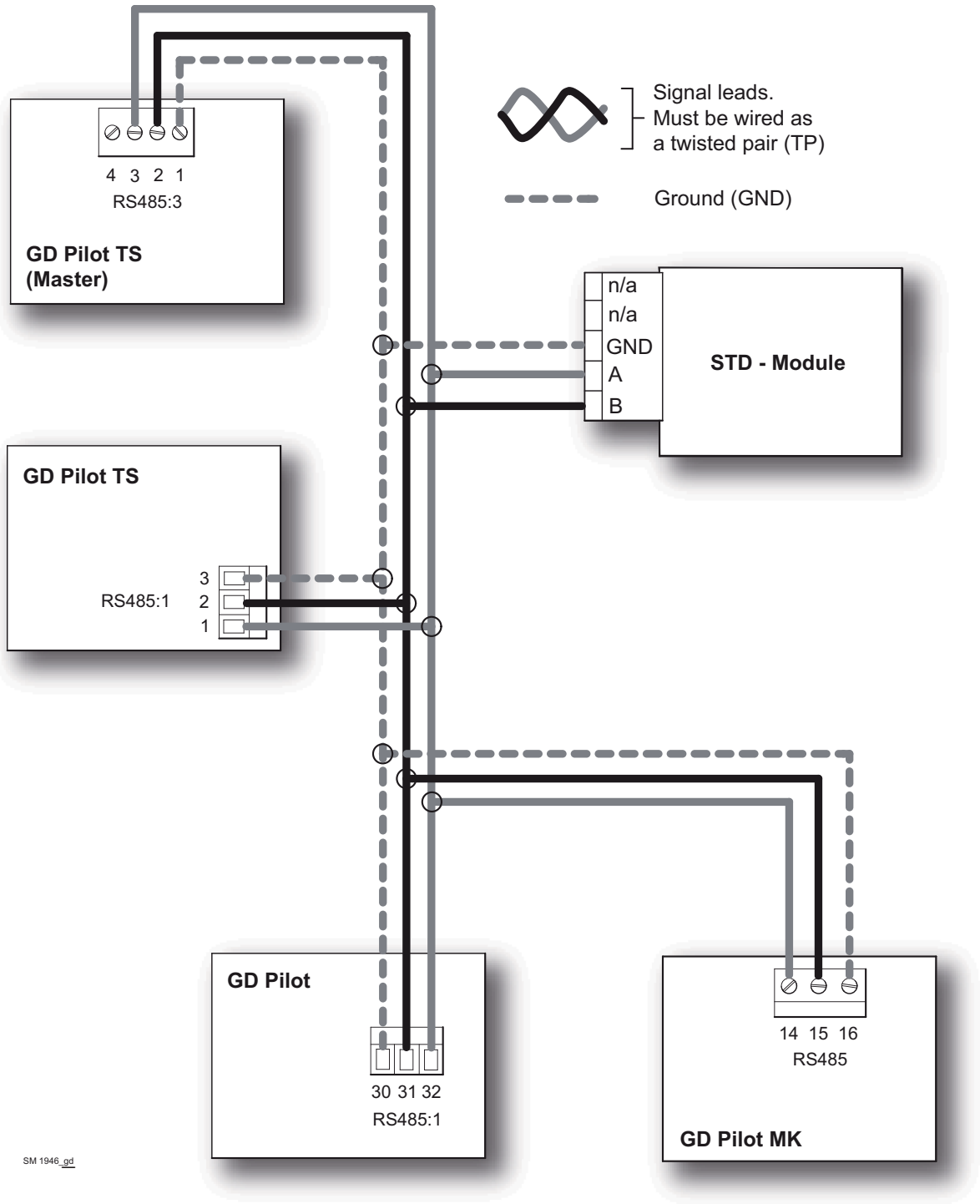


Fig. 62 Circuit diagram

15.13.5 Set Up the Slave Compressor Controller Communication Parameter

Note

The appropriate minimum required software version must be installed on the controllers in order for them to operate correctly. The minimum required software versions are listed in chapter 15.5.

Configure the correct communication parameters within the slave controllers as follows:

1) Adjust RS485 protocol to ModBus (where applicable).
2) Change the slave RS485 Baudrate from the default setting (19200 Baud) to 9600 Baud.
3) Change the slave RS485 address from the default value (1) to a unique address (2 to 4).

The compressor with address 2 will be located on the BLS Screen as compressor 2, compressor with address 3 will be located on the BLS Screen as compressor 3, and so on.

For information on how to configure the address of the compressor module (STD) see chapter 15.14.2.

15.14 Installation – Compressor Module (STD)

The compressor module (STD) is used to connect any other FS compressor other than GD Pilot TS, GD Pilot or GD Pilot MK to the GD Pilot TS master. The module is connected to the master via the integrated RS485 interface.

The status of the compressor is detected by digital inputs of the compressor module and sent to the master via its RS485 interface.

In addition, commands for the control of the compressor are transmitted from the master to the compressor module via the RS485 interface and are executed by the digital outputs.

Ordering information:

- Part number: 100016166
- Scope of supply: Compressor module (STD)
  RS485 connector

15.14.1 Technical Specification

Technical Specification	
Item	**Value**
Supply voltage	110..230 V AC/DC +/-10 %
Power consumption	1 VA
Digital inputs	24..230 V AC/DC +/-10 %
Digital outputs	Potential-free relay outputs, max. 240 V AC / 1 A
Ambient temperature	Operation 0 to 55° C Storage -25 to +75° C
Dimensions (W x H x D)	100 x 110 x 70 mm
Type of protection	IP30
Assembly	DIN rail TS35

15.14.2 Connections to the Slave Compressor

Danger

⚠ ⚠

Switch off the power supply to the compressor, before connecting the compressor module (STD) to the compressor controller.

Note

The connection of the compressor module (STD) shown in this document is compatible with the majority of compressor controllers. Some compressors differ in terms of operation and/or function; consult your compressor supplier/ specialist for advice.

Digital inputs

The module detects the compressor status via three digital inputs, which are indicated via three LEDs on the module. Each input may be connected to voltage of the range of 24 to 230 V AC or DC.

Each input has three terminals:

24 to 48 V UC terminal

110 to 230 V UC terminal

COM terminal

Note

Note that the signal voltage used must be routed to the appropriate terminal.

Caution

⚠

- **Do not connect voltages of more than 250 V.**
- **If the voltage exceeds 250 V, an auxiliary contact must be used to switch a suitable voltage to the inputs.**
- **The inputs may only be connected to power circuits with appropriate fuse protection.**

a) Digital input “Operation”

A signal must be connected to this input to indicate that the compressor is ready to produce compressed air after sending a remote load signal.

For compressor controls which do not have such signal, the input can be connected to the collective fault signal of the compressor.

This will indicate to the GD Pilot TS Master that there is no fault at the compressor.

b) Digital input “Motor”

Contacts A1 and A2 of a main contactor coil can be connected directly to this input.

If the compressor controller energises the coil of the main contactor, the compressor module detects the voltage over the coil and notifies the master that the motor is running.

For compressor controllers without a main contactor, any output can be used which indicates that the motor is running, e.g. a fan contactor or a soft starter signal.

c) Digital input “On-load”

The regulation valve coil can be connected directly to this input.

If the compressor controller energises the coil of the regulation valve, the compressor module detects the voltage over the coil and notifies the master that the motor is on load.

Any output which indicates that the compressor is on load could also be used.

Digital outputs

Danger

⚠⚠

When a compressor module (STD) is installed, the compressor's pressure switch can no longer provide over-pressure protection.
For compressors that are not equipped with independent over-pressure detection, we recommend that a pressure switch be incorporated in the compressor fault circuit(s) to ensure that any local over-pressure condition will stop the compressor independently from the GD Pilot TS Master.

The compressor is controlled by two or three digital outputs. The status of these outputs is indicated via three LEDs.

These digital outputs are change-over contacts and can be adapted to the requirements of the compressor controller by selecting the appropriate terminals.

a) Digital output “Remote load enabled”

Do not use this output to switch the compressor on and off.

This output should cause a change-over from internal regulation to control via the digital outputs of the compressor module.

b) Digital output “Remote load”

Do not use this output to switch the compressor on and off.

This output switches the compressor on load.

This remote load signal should be active when the “Remote load enabled” output is sent to the compressor controller.

c) Digital output “Remote half load”

This output is not used for this application.

Compressor Status Message Connections

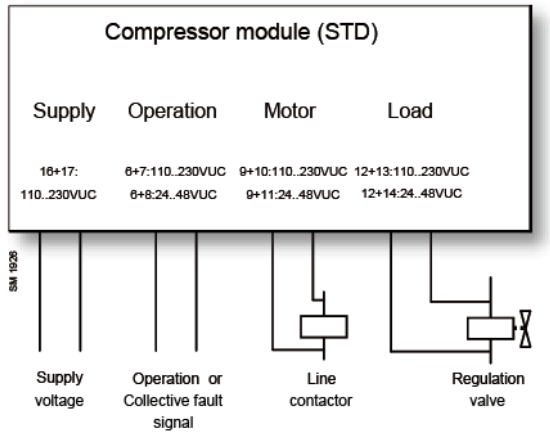


Fig. 63 Status message connections

Controlling a compressor with line pressure sensor and electronic compressor controller (example)

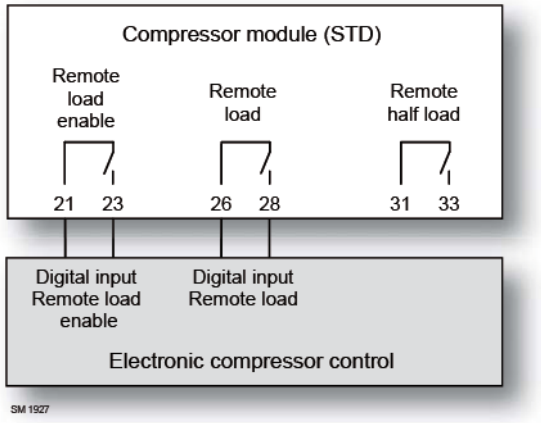


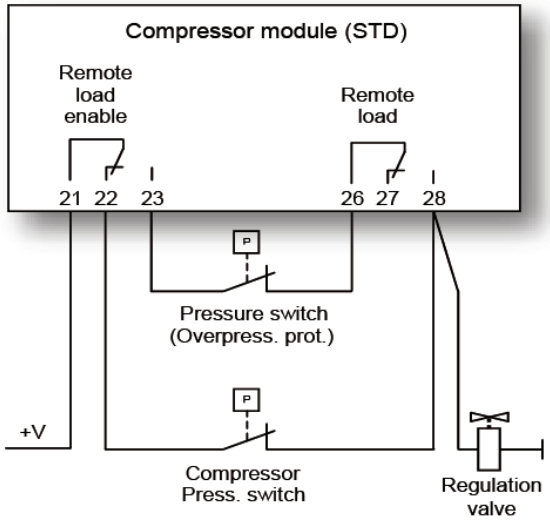
Fig. 64 Line pressure sensor and electronic compressor controller

Controlling a compressor with line pressure switch (example)

Danger

⚠ ⚠

When a compressor module (STD) is installed, the compressor's pressure switch can no longer provide over-pressure protection. For compressors that are not equipped with independent over-pressure detection, we recommend that a pressure switch be incorporated in the compressor fault circuit(s) to ensure that any local over-pressure condition will stop the compressor independently from the GD Pilot TS Master.



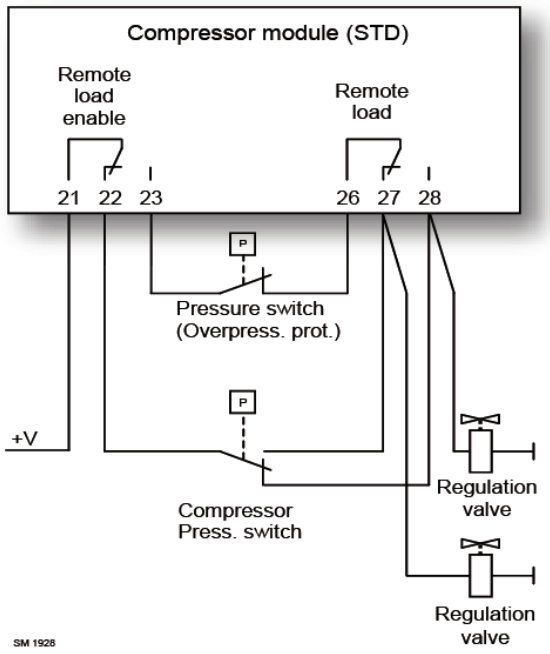


Fig. 65 Control via line pressure switch

15.14.3 Set Up Compressor Module (STD) Address

The DIP switches are located behind a cover on the right hand side of the module.

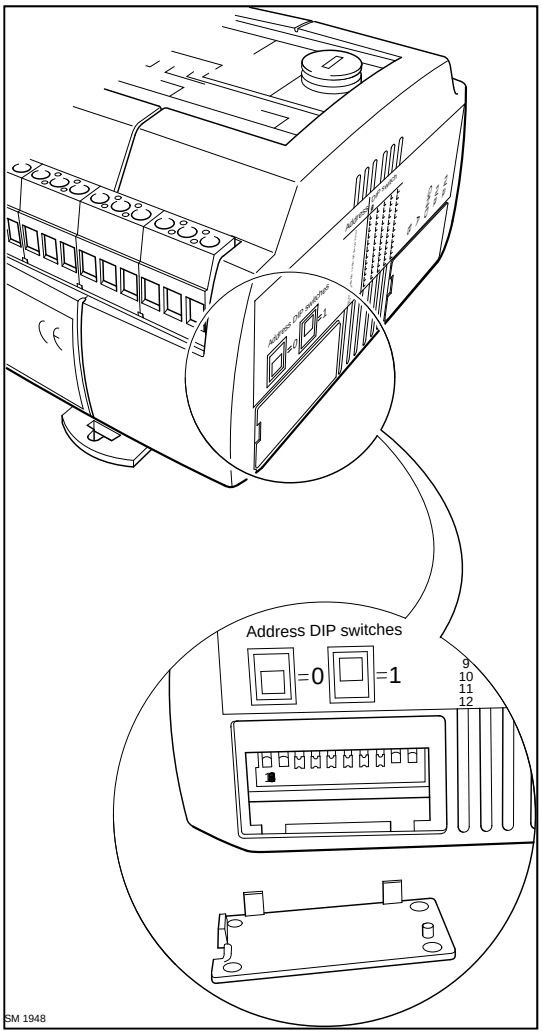


Fig. 66 Position of DIP switches

The following table shows the necessary and valid DIP switch settings for communicating with the GD Pilot TS master:

Compressor module (STD) DIP Switch Settings	
Address	**DIP switch**
	1.2.3.4.5.6.7.8.9.10
2	0.1.0.0.0.0.0.0.0.0
3	1.1.0.0.0.0.0.0.0.0
4	0.0.1.0.0.0.0.0.0.0

1 = On (up) 0 = Off (down)

15.14.4 Terminal Designations

Terminal Designations		
Terminal	**Function**	
1	Not used	
2		
3		
4		
5		
6	Digital input “Operation”	COM
7		110..230 V UC
8		24..48 V UC
9	Digital input “Motor”	COM
10		110..230 V UC
11		24..48 V UC
12	Digital input “On-Load”	COM
13		110..230 V UC
14		24..48 V UC
16	Power supply	(~)(+)
17	110..230 V AC/DC ± 10 %	(~) (-)
21	Digital output “Remote load enabled”	COM
22		NC
23		NO
26	Digital output “Remote load”	COM
27		NC
28		NO
29	Digital output “Remote half load”	COM
30		NC
31		NO

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