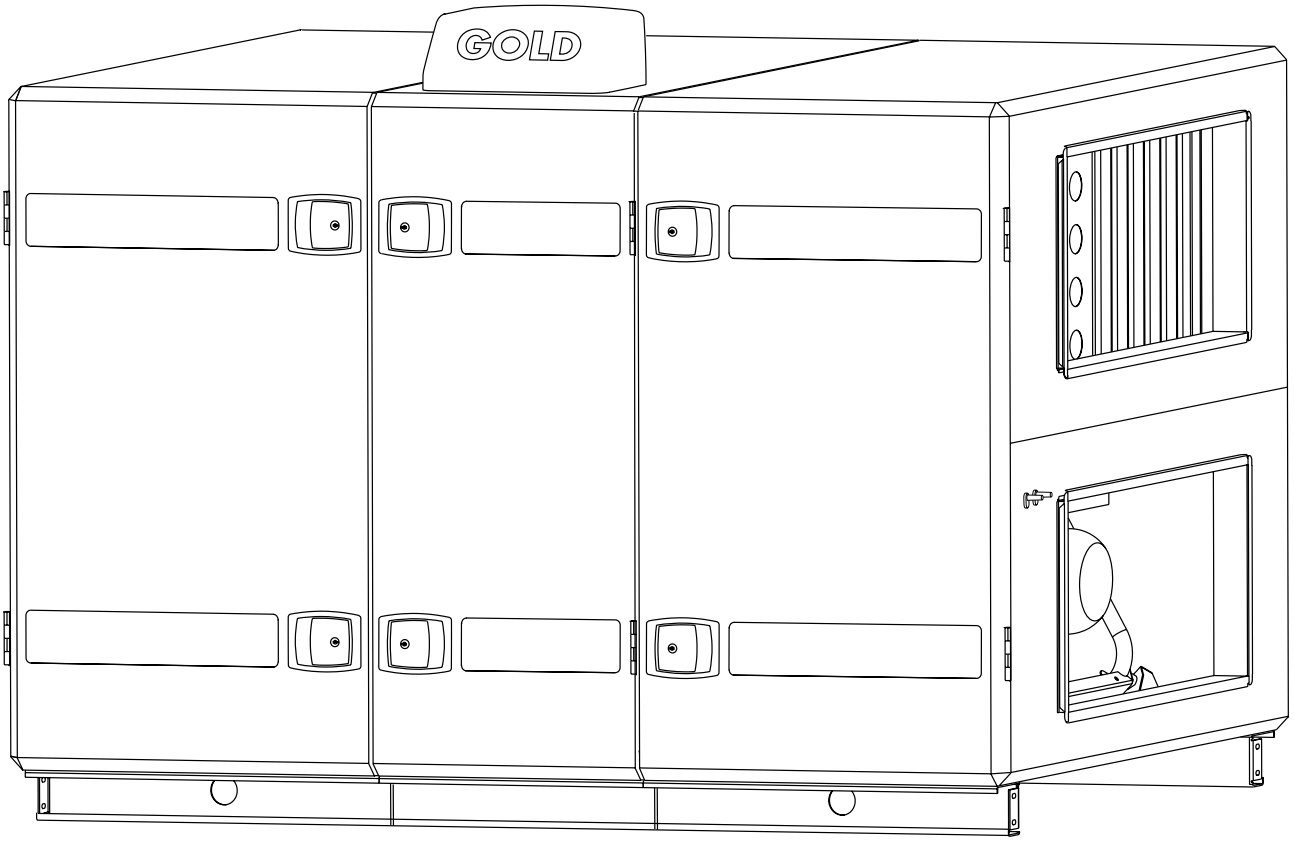
PM-LUFT

Operating and Maintenance Instructions for the GOLD Air Handling Unit, Sizes 11-32

Version A



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Contents

1. General

1.1 Field of Application

The GOLD Air handling system is designed for comfort ventilation, primarily in public buildings, such as offices, schools and day nurseries, municipal buildings, shops, etc.

The GOLD is also suitable for use in institutional kitchens and restaurants, for example, provided that the unit ventilates spaces in which similar activity is pursued.

It is important to consider the special features of the GOLD as you design it into the project, install, adjust and operate it in order to obtain all the benefits that GOLD System has to offer.

The unit in its basic version should be located indoors. For outdoor Installation, equip it with the TBTA accessory.

This Document
These operating and maintenance instructions apply to the size 11 – 32 PM-LUFT GOLD Air handling units, version A. This document shall be used for servicing the air handling unit.

Caution! Always read the safety precautions in Section 2 about general risks and what qualifications are required of service technicians, and carefully follow the installation instructions for each operation.

The identification label specifying the size designation, version and manufacture number is affixed on the upper right-hand corner of the air handling unit. It is especially important that you keep a record of these specifications and be able to refer to them whenever you get in touch with PM-LUFT.

1.2 Mechanical Design

The GOLD is available in models for six airflow ranges. The unit is manufactured in three physical sizes. Two fan sizes are available for each unit size.

The external sheet metal surfaces are painted in a shade of beige and the handles, junction hood and decorative parts are graphite grey. The material inside the unit is mostly aluminium-zinc-plated sheet steel. The sheet metal panels are 1 mm thick with 50 mm thick intervening insulation.

The air handling unit has supply air and exhaust air filters with Class F7 glass fibre medium. The rotary heat recovery section, of Turbo type, is variably speed controlled and has a temperature efficiency of up to 84%.

The supply and exhaust air fans are of GOLD Wing type, an axi-centrifugal fan with backward-curved blades. The fans are direct driven and have frequency converters for variable control.

1.3 Built-in Control System

The control system is a microprocessor-based system incorporated into the air handling unit. It controls and regulates the fans, heat exchanger, temperatures, airflows, operating times and a large number of internal and external functions as well as alarms.

1.4 Ready for Cooling and Reheating

The GOLD Air handling system is also well suited for cooling air. The control functions are ready to be activated in the control system and cooling equipment is available as an accessory.

The GOLD can be used without any downstream air heater in many applications. Its efficient heat recovery and its unique control functions make this possible.

Nevertheless, under certain conditions, it will be necessary to heat the supply air. The control system also includes ready-to-use control functions for this purpose. And equipment for heating the supply air is available as an accessory.

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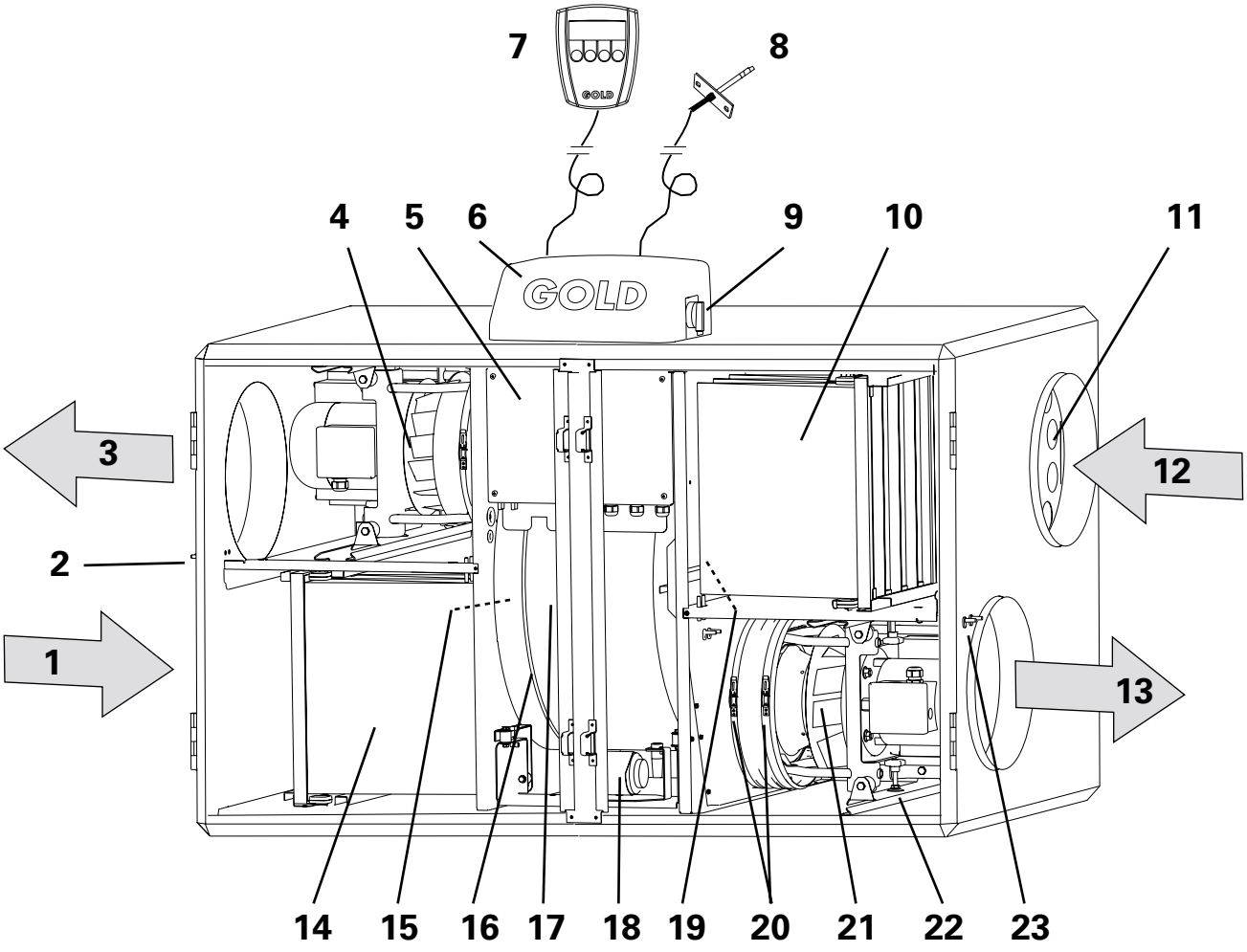
1.5 The GOLD Components

1.5.1 Size 11/12 units



The air handling unit is supplied as a right-hand unit, i.e. with the airflow directions indicated by the arrows in the illustration. If you alter the installation to obtain a left-hand flow configuration, the components marked with an asterisk exchange function and name (i.e. they must be renamed accordingly if their function is for supply air or for exhaust air).

Airflow Directions/Location and Name of the Component

1 OUTDOOR AIR* (Exhaust air – left-hand airflow config.)
2 Pressure measurement tappings (For internal pressure balance readings in a left-hand airflow config.)
3 EXTRACT AIR* (Supply air – left-hand airflow config.)
4 Exhaust air fan*
5 Fuse and control circuit board cubicle
6 Junction hood
7 Hand-held terminal
8 Supply air temperature sensor (to be fitted inside the supply air duct)
9 Main switch/Safety isolating switch
10 Exhaust air filter*
11 Adjustment plate (Located in left-hand filter section in a left-hand airflow configuration)
12 EXHAUST AIR* (Outdoor air – left-hand airflow config.)
13 SUPPLY AIR* (Extract air – left-hand airflow config.)
14 Supply air filter*
15 Outdoor air temperature sensor*
16 Drive belt of the heat recovery section
17 Heat recovery section
18 Drive motor for the heat recovery section
19 Exhaust air temperature sensor*
20 Clamps on flexible connection at fan inlet
21 Supply air fan*
22 Locking knob for withdrawable fan mount
23 Pressure measurement tappings (For internal pressure balance readings in a right-hand airflow config.)

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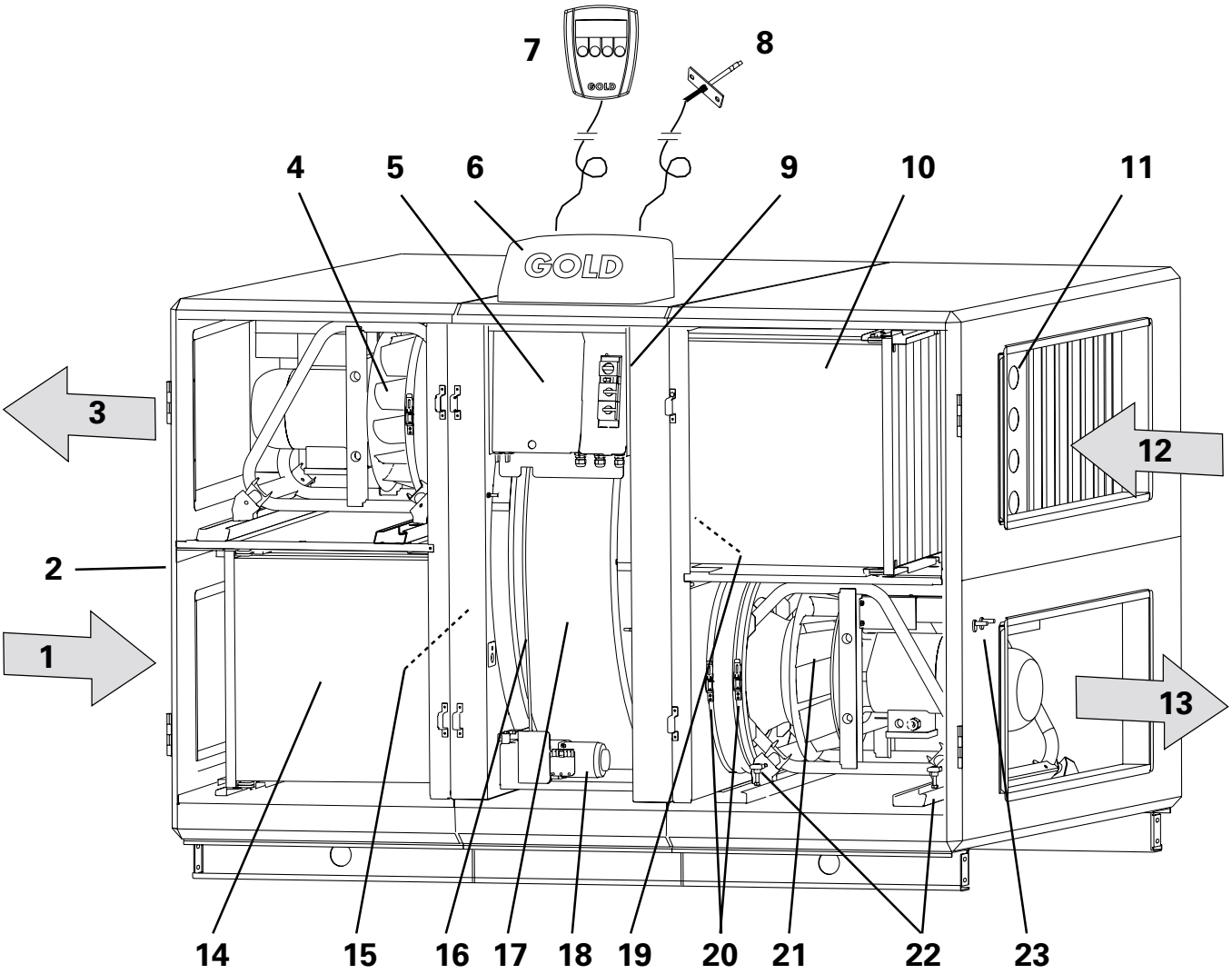
1.5.2 Size 21/22 and 31/32 units



The air handling unit is supplied as a right-hand unit, i.e. with the airflow directions indicated by the arrows in the illustration. If you alter the installation to obtain a left-hand flow configuration, the components marked with an asterisk exchange function and name (i.e. they must be renamed accordingly if their function is for supply air or for exhaust air).

Airflow Directions/Location and Name of the Component

1 OUTDOOR AIR* (Exhaust air – left-hand airflow config.)
2 Pressure measurement tappings (For internal pressure balance readings in a left-hand airflow config.)
3 EXTRACT AIR* (Supply air – left-hand airflow config.)
4 Exhaust air fan*
5 Fuse and control circuit board cubicle
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7 Hand-held terminal
8 Supply air temperature sensor (to be fitted inside the supply air duct)
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13 SUPPLY AIR* (Extract air – left-hand airflow config.)
14 Supply air filter*
15 Outdoor air temperature sensor*
16 Drive belt of the heat recovery section
17 Heat recovery section
18 Drive motor for the heat recovery section
19 Exhaust air temperature sensor*
20 Clamps on flexible connection at fan inlet
21 Supply air fan*
22 Locking knob for withdrawable fan mount
23 Pressure measurement tappings (For internal pressure balance readings in a right-hand airflow config.)

2. Safety Precautions

2.1 General

All staff concerned must acquaint themselves with these instructions before beginning any work on the unit. Any damages to the unit or its components caused by improper handling or misuse by the purchaser or fitter cannot be considered subject to guarantee if these instructions have not been followed.

2.2 Safety Isolating Switch/ Main Switch

Size 11/12: The safety isolating switch is situated high on the outside of the cubicle.

Sizes 21/21 and 31/32: The safety isolating switch is situated behind the inspection door of the heat recovery section (the door in the centre section).

The safety isolating switch must not be used for starting or stopping the unit. Use the stop button on the hand-held terminal to stop the unit.

Always switch off the safety isolating switch before servicing the unit if not otherwise specified in the pertinent instructions.

2.3 Risks

WARNING! Before carrying out any work, make sure that the power supply to the unit has been isolated.

Risk areas with rotating parts

Typical rotating parts are fan impellers and drive pulleys in the heat recovery section. The heat recovery section drive pulleys in the size 21, 22, 31 and 32 units are equipped with a guard. The lockable inspection doors serve as guards for the fans and for the heat recovery section drive pulleys in the size 11 and 12 units. If the fan outlets aren't connected to any duct, they must be fitted with a protective screen (steel wire mesh)

The inspection doors on the filter/fan sections must not be opened while the air handling unit is operating.

Under normal operating conditions, use the stop button on the hand-held terminal to stop the air handling unit.

Wait until the fans have stopped rotating before opening the inspection door.

Keep in mind that the air pressure inside the filter/fan section is positive.

Risk areas with energized components

Typical risk areas with exposed live components are power and control circuit boards inside the electrical cubicle. The cubicle cover panel secured by screws serves as a guard for these areas. Other electrical equipment and components are semi-protected.

2.4 Anti-contact Guards

The cubicle cover panel serves as an anti-contact guard.

The guard shall only be removed by a qualified electrician or trained service technicians.

Isolate the power supply to the air handling unit with the safety isolating switch before you remove the guard.

As long as the air handling unit is operating, the guards must always be secured, all the inspection doors must be closed and the junction hood on the top of the unit casing must be fitted.

2.5 Qualifications

Only qualified electricians or trained service technicians are authorized to unscrew fasteners and remove guards (protective panels) in conjunction with the electrical installation of the air handling unit or wiring external functions.

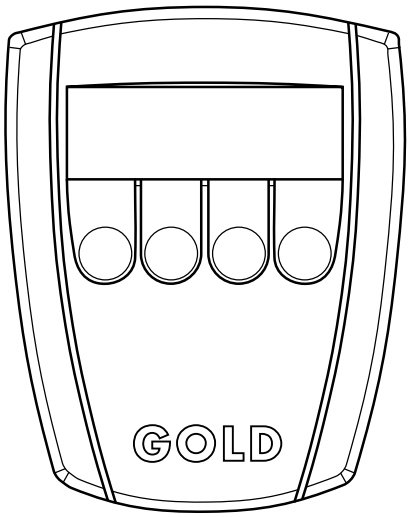
Only service technicians trained by PM-LUFT are authorized to modify the air handling unit in any way.

3. Commissioning

3.1 Basic settings and adjustments

The following is a description of the sequence for starting up the unit for the first time. NOTE! The hand-held terminal, air supply temperature sensor, adjusting plates, document pocket, decals and instructions are packaged in a separate carton inside the unit behind the left-hand inspection door.

The hand-held terminal is used for programming how the unit is to operate. The air handling unit control system has a factory adjustment that makes the unit ready-to-operate as soon as all the electrical wiring has been completed. The various keying operations on the hand-held terminal are described in detail in chapter 4.



Hand-held terminal

3.1.1 Commissioning Report

All the settings entered in the unit display, must be recorded in the Commissioning Report. See Section 3.4. The report can also be used as a checklist to determine which functions can be adjusted. The initial factory settings and reference to the section of the instructions, in which the relevant menu is described, are specified in the report.

3.1.2 Selecting the language

When the unit is connected and the main switch is switched on for the first time, a language menu will appear in the display of the hand-held terminal. (The menu is described in Subsection 6.2.9)

– Select the appropriate language.

SPRÅK / LANGUAGE
ENGLISH

↓ : ↑ : : RET : PROG

3.1.3 Selecting the operating mode

After you've selected a language, the menu image will switch to the main menu (described in Section 5.1).

The operating mode selected is displayed on third line in the menu. In this case STOP is displayed.

***GOLD* DAY 1 - 10:15**

STOP
MAN : AUTO : : S-CL : PROG

– To change to the desired operating mode, press the MAN or AUTO button.

Normally, the unit is meant to operate in the AUTO OP mode. In this mode, the switching clock manages all switching between high and low-speed operation.

3.1.4 Setting the switching clock

Press the S-CL button to advance to the switching clock menu (described in Section 5.2.).

– First program the correct day of the week, time and date.
– Then program the desired switch in and switch out times of the switching clock.

ACTUAL TIME
DAY 5 TIME 10:35,05
DATE 10/02 - 96
S-CL : : : RET : PROG

3.1.5 Further settings

Use the Commissioning Report as an aid for setting the desired air flows, temperatures, flow regulation, etc.

All functions are listed in alphabetic order in Section 4.4.

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3.2 Duct Calibration

The ducting must be calibrated after the ducting system and the pressure adjustment damper have been completely adjusted. NOTE! The filters have to be clean.

To activate the duct calibration mode, go to the start menu for function, test and cooling described in Section 6.1. Press and hold the FUNC button while you press the arrow-up button once to come to the menu described in Subsection 6.2.16.

3.3 To Adjust the Adjusting Damper

To adjust the pressure balance

The pressure balance in the unit should be adjusted by repositioning the adjustment damper plates to enable a leakage air flow from the supply air to the exhaust air.

There are two pressure measuring tappings on the outside of the filter/fan sections of the unit. One tapping is white (+) and the other is blue (–). See Fig. 2 below. The tappings are used to measure the negative pressure in the supply air and the exhaust air levels respectively.

– Connect the flow measurement tappings for + (white tapping) and – (blue tapping) to a manometer or other type of pressure gauge and measure both pressures.

  NOTE! Measure the negative pressure at both tappings!

Pressure readings

The negative pressure in the exhaust air passage (blue tapping) should be more negative or just as negative as that in the supply air passage (white tapping).

If the reading is correct

If the negative pressure in the exhaust air passage is just as negative or up to 20 Pa more negative than the negative pressure in the supply air passage, no further adjustment is needed.

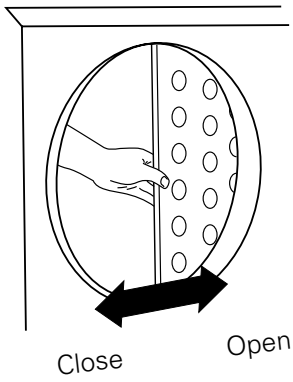
If the reading differs

If the negative pressure in the exhaust air passage (**–**) is less negative than that in the supply air passage (**+**), the adjustment damper must be fitted in the unit and then adjusted as follows:

– First switch off the unit with the stop button on the hand-held terminal.
– Wait until the fans have stopped before opening the inspection door (to avoid positive pressure).
– Open the safety switch to isolate the power supply to the unit.
– Open the inspection door of the exhaust air filter/supply air fan section.
– Slightly push the damper plates in the exhaust air intake toward one another.
– Close the inspection door.
– Start the unit by pressing the MAN or AUTO button.
– Measure the pressures. Repeat until the negative pressure in the exhaust air passage is just as negative or up to 20 Pa more negative than the negative pressure in the supply air passage (0-20 Pa).

Finish by calibrating the ducting!

Sizes 11/12



Sizes 21/22 and 31/32

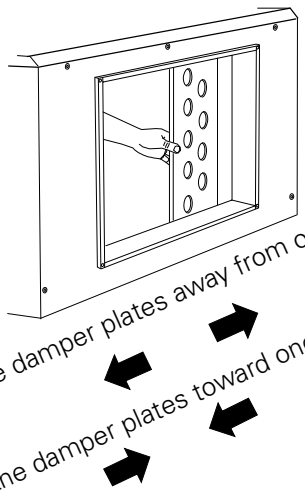
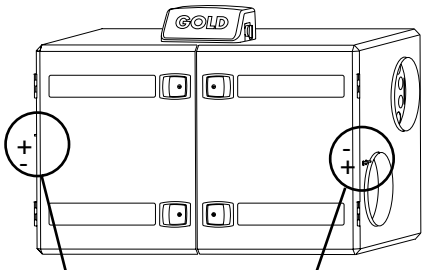


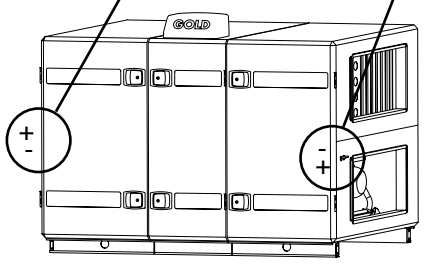
Fig. 1



Sizes 11–12

These pressure measurement tappings are used for a unit with a right-hand flow configuration. = Factory setting

(These pressure measurement tappings are used for a unit with a left-hand flow configuration.)



Sizes 21/22 and 31/32

Fig. 2

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3.4. Commissioning Report, Page 1

Item, location, air handling unit, etc.

.....

.....

.....

.....

Switching clock, current time preset ☐

Program version .....

Times for high level (high speed or low speed)

No. 1 .....– ..... DAY..... No. 6 .....– ..... DAY.....
No. 2 .....– ..... DAY..... No. 7 .....– ..... DAY.....
No. 3 .....– ..... DAY..... No. 8 .....– ..... DAY.....
No. 4 .....– ..... DAY..... No. 9 .....– ..... DAY.....
No. 5 .....– ..... DAY.....

The original factory settings are specified in this report. 0 denotes that the function has not been selected, 1 denotes that it has. A dash indicates that the setting has not been preset at the factory. The figures put in rectangular brackets indicate preset values when the function has been selected.

Function		Factory-preset value	Project design value	Adjusted value
Display	Language	English	.....	.....
Temperature	Regulation function	ERS	.....	.....
	Set point, °C	—	.....	.....
	Min. temp., °C	—	.....	.....
	Max. temp., °C	—	.....	.....
	Diff. temp., °C	3.0	.....	.....
	Increment	2	.....	.....
	Breakpoint, °C	22.0	.....	.....
		The values refer in their order of appearance to size 11,12,21,22,31,32 units:		
Air flows	High speed, m^3/s	0.28/0.44/0.78/1.2/2.0/2.7		
	Low speed, m^3/s	0.1/0.17/0.28/0.42/0.72/0.98		
	Max. speed, m^3/s	0.40/0.65/1.10/1.70/2.90/3.90		
	[VAV Set point]	[50%]		
Air flow regulation	Supply air	Air flow (Constant)	.....	.....
	Exhaust air	Air flow (Constant)	.....	.....
	[VAV/Boosted]	[SA+EA VAV/FORC]	.....	.....
Switching clock	Operation	Low speed — High speed	.....	.....

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3.4. Commissioning Report, Page 2

Function		Factory preset value	Project design value	Adjusted value
Functions	Summer night cooling	0	.....	.....
	Switches in at exhaust air temp:	22 °C	.....	.....
	Switches out at exhaust air temp:	16 °C	.....	.....
	Switches out at outdoor air temp:	10 °C	.....	.....
	Time	0.10	.....	.....
	Outdoor air temp. compensation	0	.....	.....
	Winter compensation	3 °C	.....	.....
	Summer compensation	2 °C	.....	.....
	Set point displacement	0	.....	.....
	External high/low speed input delayed switch out, hour:min.	0:00	.....	.....
	Time of filter test	22:59	.....	.....
	Service period, months	12	.....	.....
	Internal fire protection	0	.....	.....
	Exhaust air setting in the event of a fire	0	.....	.....
	Alarm block 1	0	.....	.....
	2	0	.....	.....
	3	0	.....	.....
	4	0	.....	.....
	5	0	.....	.....
	6	0	.....	.....
	7	0	.....	.....
	8	0	.....	.....
	Alarm limit – SA filter monitor	10 (units*)	.....	.....
	Alarm limit – EA filter monitor	10 (units*) *) Corresponds to. rec. final pressure drop	.....	.....
	Auto switch-over to summer time	1		
	Cooling			
	In service	1 = Stop		
	Function	1 = Cooling ON/OFF	.....	.....
	Boosted cooling	0	.....	.....
	Min. chilled air flow, m^3/s	0.0	.....	.....
	Restart time	10 min	.....	.....
	Neutral zone	2 °C	.....	.....
	Duct calibration completed	—	.....	.....

Comments:

.....

.....

.....

Installation work carried out by:

Date.....

Company .....

Name .....

Project design work carried out by:

Date.....

Company .....

Name .....

Adjustments carried out by:

Date.....

Company.....

Name .....

4. Programming and Managing the Menus

4.1 Hand-held terminal

4.1.1 General

The hand-held terminal consists of an encased control box designed for connection to the unit across a 3 m long cable with quick connector.

The hand held terminal has an illuminated display, 4 buttons and a red lamp for indicating alarms in one of the buttons.

4.1.2 Display and Buttons

All the air flow, control function, temperature and operating time settings, for example, can be read in plain text in the display.

The information is presented in various menu images.

The buttons are used to advance to various menus, and to alter settings or to activate functions in the various menus.

The main menu is normally displayed, if no other menu has been selected. If the operator doesn't revert to the main menu manually, the terminal will automatically return to the main menu after a 30-minute ineffective period.

The functions of the four buttons vary depending on which menu is displayed. The functions of the buttons are explained by the caption or symbol shown in the display just above each button. See Section 4.3.

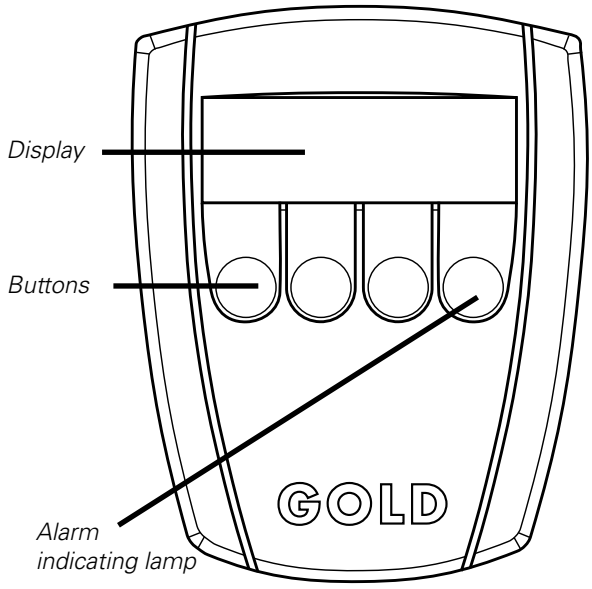
4.2 Menu Groups and Levels

The menus of the display are divided into various menu groups and levels. The structure of the menus and the order of their management are logical and only current parameters for the function selected are displayed.

All the accessible menus are described separately in Sections 5 and 6. The menus are described in their order of presentation in the display.

The menu groups are arranged according to their application. The structure of the menus is presented in the beginning of Sections 5 and 6.

There are several types of menus: the main menu, start menus, menu groups, menus and sub-menus.



4.3 Menu Button Captions and Symbols

The most commonly occurring button functions are described below. (Should the buttons have other functions in some separate menu, this will be explained in the section for the relevant menu).

🡻	Advance (1 step) to the next menu in the group.
🡹	Revert (1 step) to the previous menu in the group.
RET	Return to the previous menu level (main or start menu).
PROG	Switches over to the sub-menu of the menu displayed (alter-settings mode).
+	Increase the value of the flashing digits.
–	Decrease the value of the flashing digits.
🡺	Advance to new digits/line (flashing). If you advance past the last digits/line, the display will return to the read-only mode in the menu.
🡸	Revert to new digits/line (flashing). If you revert past the first digits/line, the display will return to the read-only mode in the menu.

Typical button captions and symbols

```
* FLOW LOW SPEED *
  SA    0.55 m³/s
  EA    0.55 m³/s
 🡻  :  🡹  : : RET  : PROG
```

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4.4 List of Functions

The list contains the control system functions arranged in alphabetical order with reference to the section in which the relevant menu is described.

5. Operating Mode, Temp. and Flow Menus

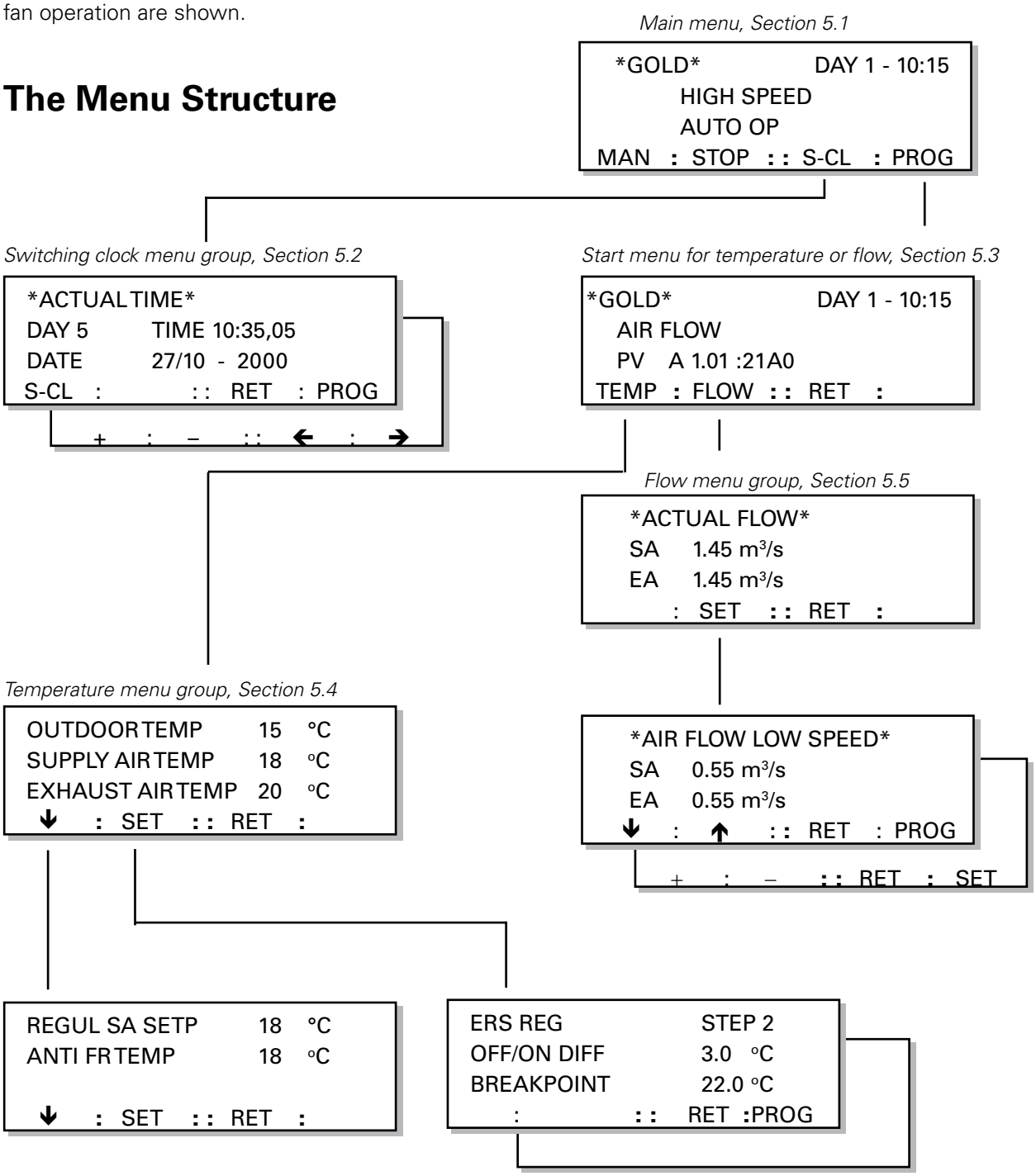
This menu section is also called the user level and is intended for use by the operating staff.

This section describes the menus that can be accessed from PROG (for temperatures and flows) and from S–CL in the main menu.

These menus enable you to control the unit (manual, auto operation mode or stop). See the actual (real) time and switching clock functions. The type of regulation and the flow setting options for low speed and high speed fan operation are shown.

N.B! *Unless otherwise specified in the relevant menu section, the menu buttons will function normally as described in Section 4.3.*

The Menu Structure



5.1 Main Menu

The contents in the menu vary depending on the type of operation selected, other functions that influence the current flow and any alarms that may have tripped.

The first line shows the day of the week (number) and the current time.

The second line shows how the unit is currently operating – HIGH SPEED or LOW SPEED – or if any other function affects the flow, i.e. filter test, summer night cooling, zero calibration, duct calibration, rotation monitor test, external high speed, external stop, etc.

The third line indicates the type of operation selected. STOP, AUTO OP or MANUAL OP.

To change the type of operation

The MAN button sets the unit in the MANUAL OP mode. This enables the unit to be operated manually. The switching clock will then be inactive: no automatic switching between high and low speed operation will occur.

The AUTO button sets the unit in the AUTOMATIC OP mode. The unit should normally operate in this mode. The integrated switching clock will then manage switching between high and low speed operation.

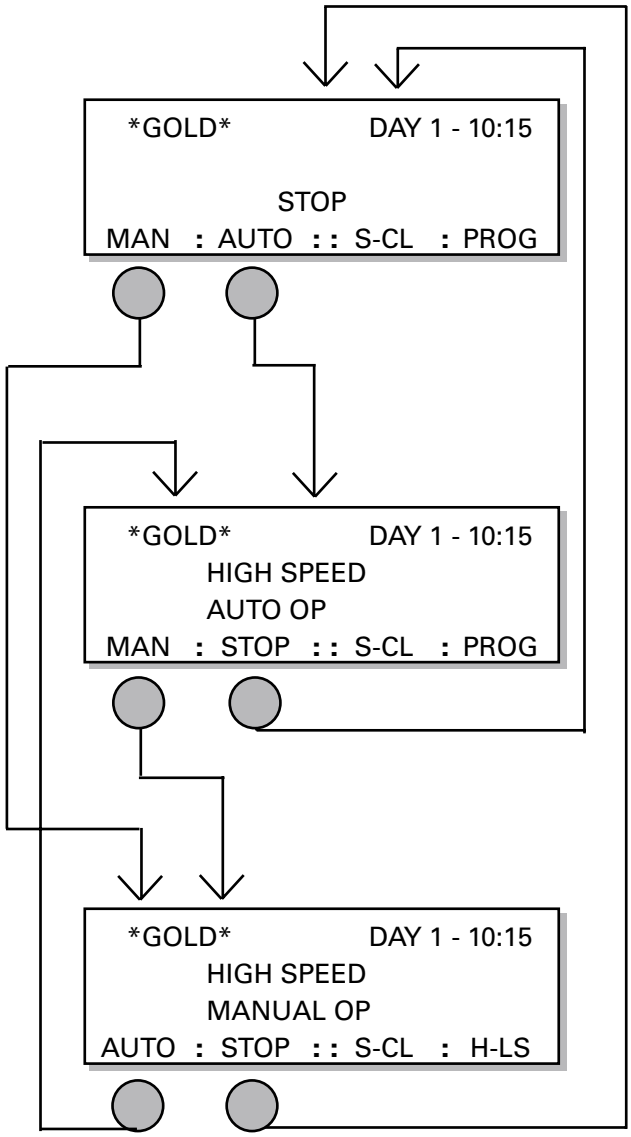
The STOP button shuts down the unit.

The H-LS button is used for switching between manual high speed and manual low speed operation.

To leave the menu

Press the **PROG** button, the image will then switch to a start menu (described in Section 5.3). From here, you can access the temp, flow, operating mode, test or cooling menus. PROG is not available while the unit is manually operated.

The S-CL button switches the image to the switching clock menu group. See Section 5.2.



5.2 Switching Clock Menu Group

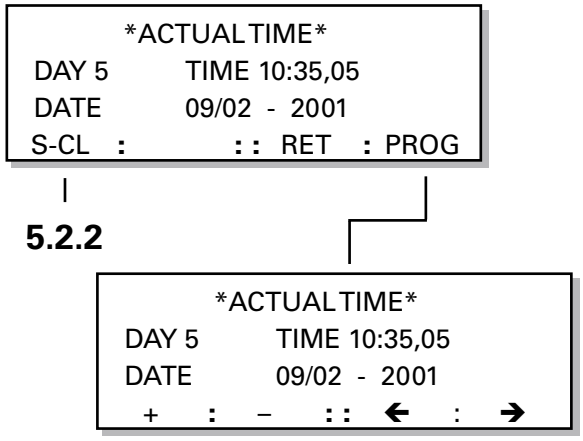
The menu group can be reached by pressing the S-CL button in the main menu. See Section 5.1.

5.2.1 Actual (current) Time

This menu shows the current time setting: the day of the week (1-7), time and date (day/month-year).

The switching clock automatically switches from summer time to winter time and vice versa; no adjustment is needed See Section 6.2.14.

Press the **PROG** button. The image will then switch to a sub-menu, in which new time settings can be entered.



5.2.2 Switching Clock

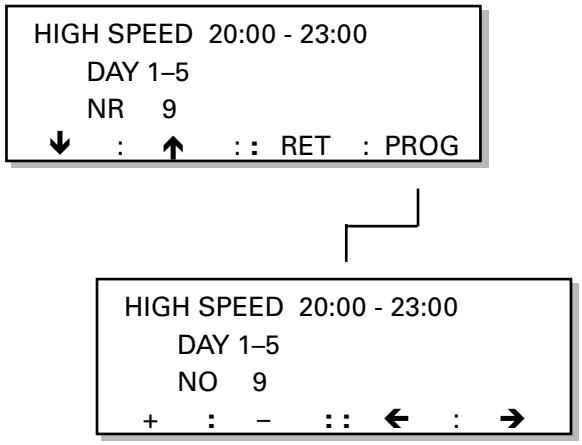
This menu shows the switch-in and switch-out times of the switching clock.

DAY indicates the day(s), to which the times entered in the program apply.

If SWITCHED OFF is displayed, this image is not active even if switching times have already been entered in the program.

If the S-CL FUNCTION for switching between low speed – high speed operation is selected, HIGH SPEED will be displayed next to the switching times. If stop – low speed switching is selected, LOW SPEED will be displayed. See the menu images to the right.

To select low speed – high speed or stop – low speed switching, see the S-CL FUNCTION menu in the menu group functions, Section 6.2.4.



To program the switching clock

The **PROG** button is used to switch the image to a sub-menu where the switch-in and switch-out times of the switching clock (timer) can be entered.

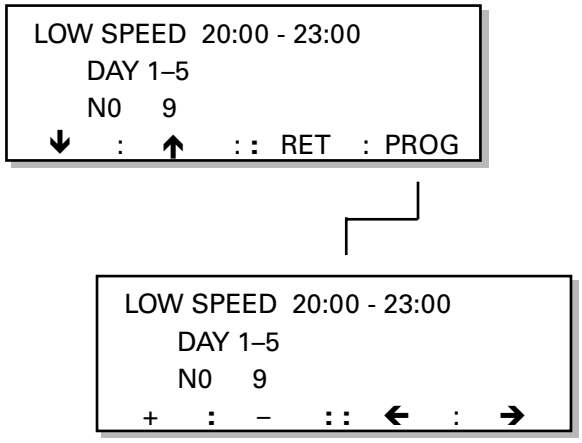
There are 9 programming images in which the switch-in and switch-out times as well as the day(s), to which the times apply, can be entered:

SWITCHED OFF

DAY 1-5; means Monday to Friday.

DAY 1-7; means the whole week.

DAY 1, 2, 3, 4, 5, 6 or 7 ; denote the relevant day of the week.



5.3 Start Menu for Temp. and Flow

(And the switchover menu for function/test)

The menu can be accessed by pressing the PROG button in the main menu. See Section 5.1.

Start Menu

This menu is used as a start menu for selecting menu groups for TEMP or FLOW, and for going on to the start menu for operating mode, test and cooling.

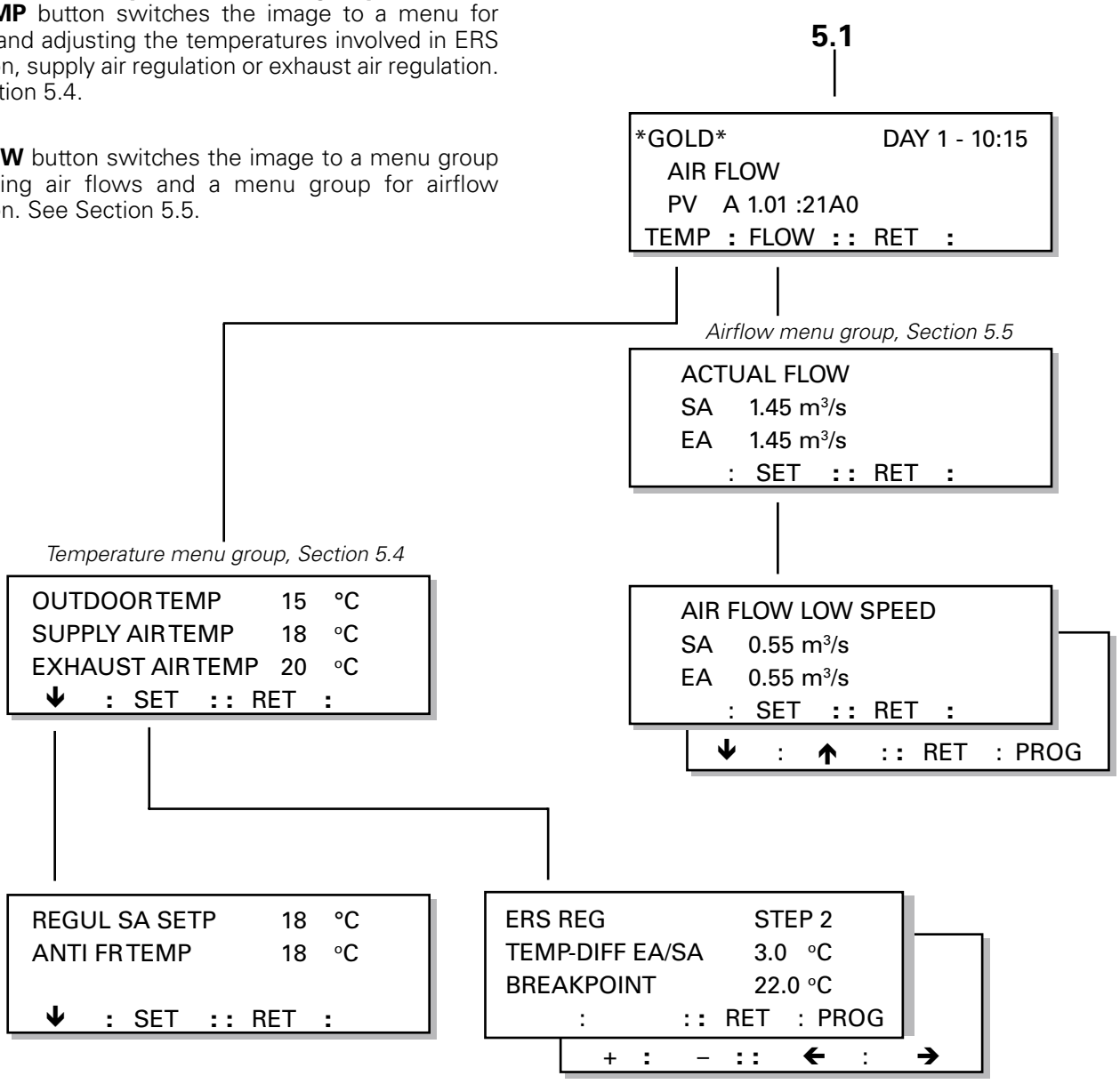
PV indicates the program version and language/text version being used.

No changes can be made in this menu.

To go on to the Temp or Flow menu group

The **TEMP** button switches the image to a menu for reading and adjusting the temperatures involved in ERS regulation, supply air regulation or exhaust air regulation. See Section 5.4.

The **FLOW** button switches the image to a menu group for reading air flows and a menu group for airflow regulation. See Section 5.5.



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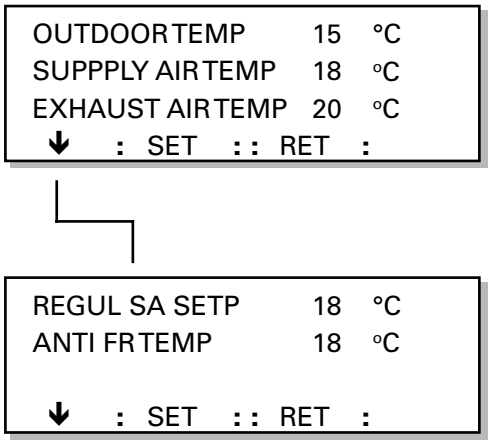
5.4 Temp. Menu Group

The menu group can be accessed by pressing the TEMP button in the start menu for temp and flow as described in Section 5.3.



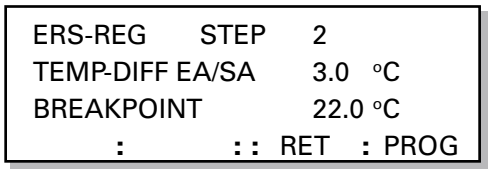
5.4.1 Temperature Menus, General

The current temperatures such as the outdoor air temperature, supply air temperature and exhaust air temperature can be read in the temperature menus. REGUL SA SETP indicates the temperature that the control unit tries to maintain in the supply air. ANTI FR TEMP shows the temperature in the return water pipe if an air reheater for hot water is connected.

The temperature can be regulated with any of following three separate functions; ERS regulation, supply air regulation or exhaust air regulation.

The temperature regulation function can be selected in the TEMP REG FUNCTION menu. See Section 6.2.1 in the functions menu group.

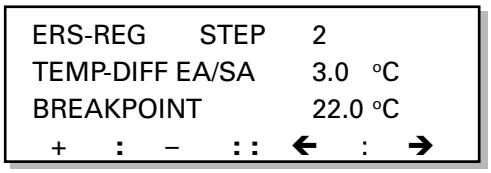
The temperature setting for the function selected can be entered in whichever of the following three menus that is available.



5.4.2 ERS Regulation

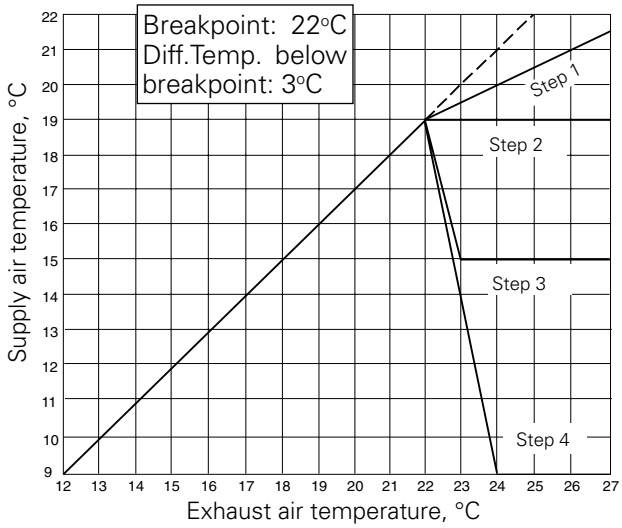
This menu is shown only if ERS regulation has been selected as described in the Menu Section 6.2.1 in the menu group for functions.

ERS regulation stands for **E**xhaust air temperature **R**elated **S**upply air temperature regulation. This involves regulating the supply air temperature in relation to the exhaust air temperature. The GOLD unit is primarily designed for operating with this type of regulation. **IMPORTANT!** If the SA flow has been preset almost as low as the min. permissible air flow of the unit, the supply air fan cannot be controlled to the minimum set point. See section 7.16.



STEP indicates the temperature curve selected. Step 1, 2, 3 or 4 can be selected by going into the chart in Fig. 3. Step 2 has been preset at the factory.

Fig. 3



OFF/ON-DIFF is the difference between supply air temperature and exhaust air temperature below the breakpoint in the chart. The chart has been plotted for a differential of 3°C.

The BREAK POINT is the point in the chart, from which the different steps radiate. It is defined from the exhaust air temperature. In the chart the breakpoint is 22°C.

To alter the settings

Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.

5.4.3 Exhaust Air Regulation

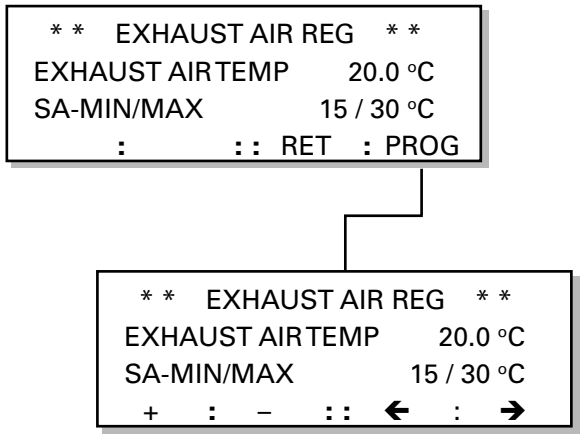
This menu is shown only if exhaust air regulation has been selected as described in the Menu Section 6.2.1 in the menu group for functions.

Exhaust air regulation involves maintaining a constant temperature in the exhaust air duct (premises) by raising and lowering the supply air temperature.

EXHAUST AIR TEMP indicates the temperature required in the exhaust air duct.

SA-MIN is the lowest permissible SA temperature and SA-MAX is the highest permissible SA temperature while the control unit is maintaining the exhaust air constant.

To alter the settings
Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.



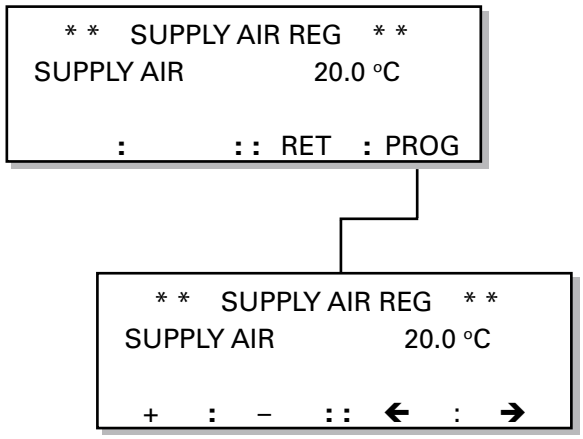
5.4.4 Supply Air Regulation

This menu is shown only if supply air regulation has been selected as described in the Menu Section 6.2.1 in the menu group for functions.

Supply air regulation involves maintaining a constant supply air temperature without taking the load in the premises into account.

SUPPLY AIR indicates the temperature required in the supply air duct. **IMPORTANT!** If the SA flow has been preset almost as low as the min. permissible air flow of the unit, the supply air fan cannot be controlled to the minimum set point. See section 7.16.

To alter the settings
Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.



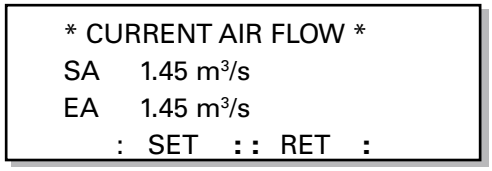
5.5 Flow Menu Group

This menu group can be reached by pressing the FLOW button in the start menu for temp. and flow. See Section 5.3.

Size	Min. flow		Max. flow		Shortest step in the display		Shortest step in reality
	m^3/h	m^3/s	m^3/h	m^3/s	m^3/h	m^3/s	m^3/s
GOLD 11	180	0.05	1450	0.40	10	0.01	0.0025
GOLD 12	290	0.08	2200	0.61	10	0.01	0.0025
GOLD 21	400	0.11	4000	1.10	50	0.01	0.014
GOLD 22	800	0.22	5750	1.60	50	0.01	0.014
GOLD 31	1400	0.40	10000	2.78	100	0.02	0.028
GOLD 32	2200	0.60	14000	3.90	100	0.02	0.028

5.5.1 Current Air Flow

Read-only menu for reading the current supply air and exhaust air flows. Press the SET button to enter new airflow settings or to read the preset air flows at the various levels in the program.

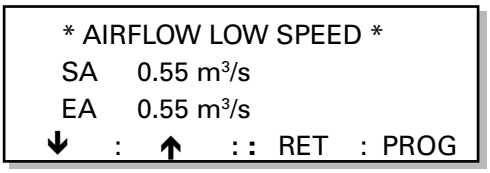


5.5.2 Air flow – Low-speed Operation

SA shows the preset supply air flow set point.

EA shows the preset exhaust air flow set point.

m^3/s shows preset airflow unit. To change to another unit of measurement, see Section 6.2.14.

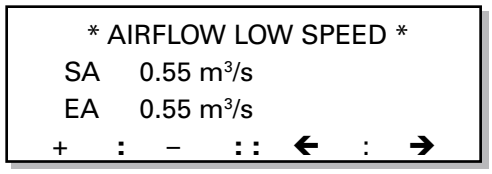


To alter the settings

Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.

The air flow generated when the fans are operating at low speed cannot be set higher than the air flow generated when the fans are operating at high speed.

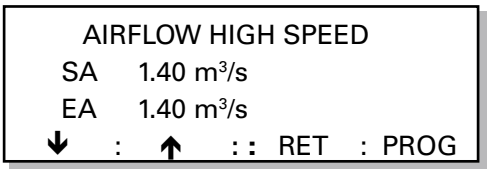
The low-speed air flow can also be set at 0 m^3/s. The fans will then be motionless during the programmed low speed period.



5.5.3 Air Flow – High-speed Operation

SA shows the preset supply air flow set point.

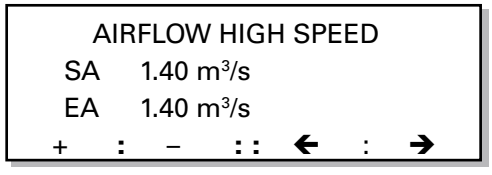
EA shows the preset exhaust air flow set point.



To alter the settings

Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.

The air flow generated when the fans are operating at high speed cannot be set lower than the air flow generated when the fans are operating at low speed.



5.5.4 Air Flow – Max. Speed Operation

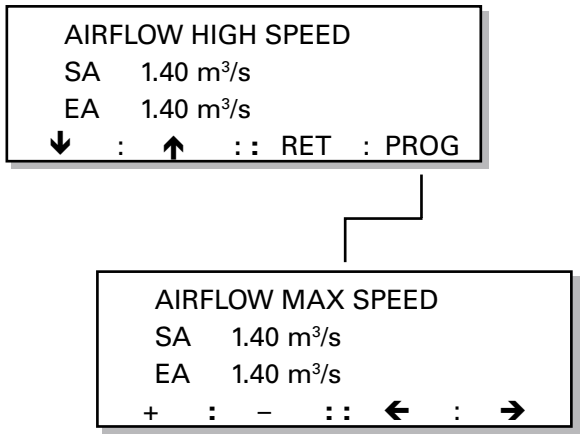
The menu is shown only if the VAV regulation or boosted air flow (forcing) function has been selected as described in Menu Section 6.2.2 under the Menu Group for Functions, or if the boosted (forced) cooling function has been selected in Menu Section 6.4.2 under the Cooling Menu Group.

SA indicates the preset supply air flow set point.

EA indicates the preset exhaust air flow set point.

To alter the settings
Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.

The max. air flow cannot be lower than the flow generated by the fans when they are operating at high speed.



5.5.5 VAV Regulation, Set Value (set point)

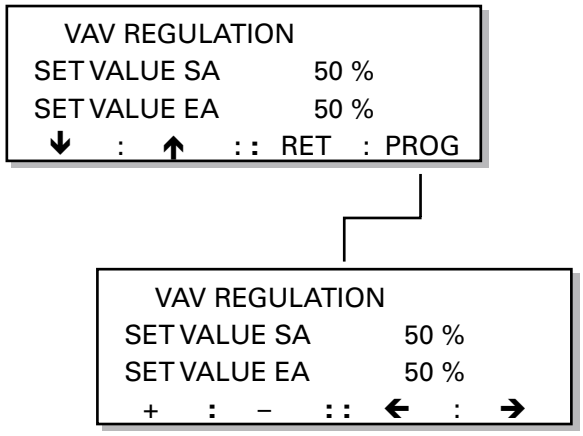
This menu is shown only if VAV regulation has been selected in Menu Section 6.2.2 under the Menu Group for Functions.

SET VALUE SA indicates the preset supply air set point.

SET VALUE EA indicates the preset exhaust air set point.

To alter the settings
Press the **PROG** button. The image will then switch to a sub-menu, in which new settings can be entered.

IMPORTANT! The preset max. airflow setting is the max. limit of the working range of the control unit.



6. Functions, Test and Cooling Menus

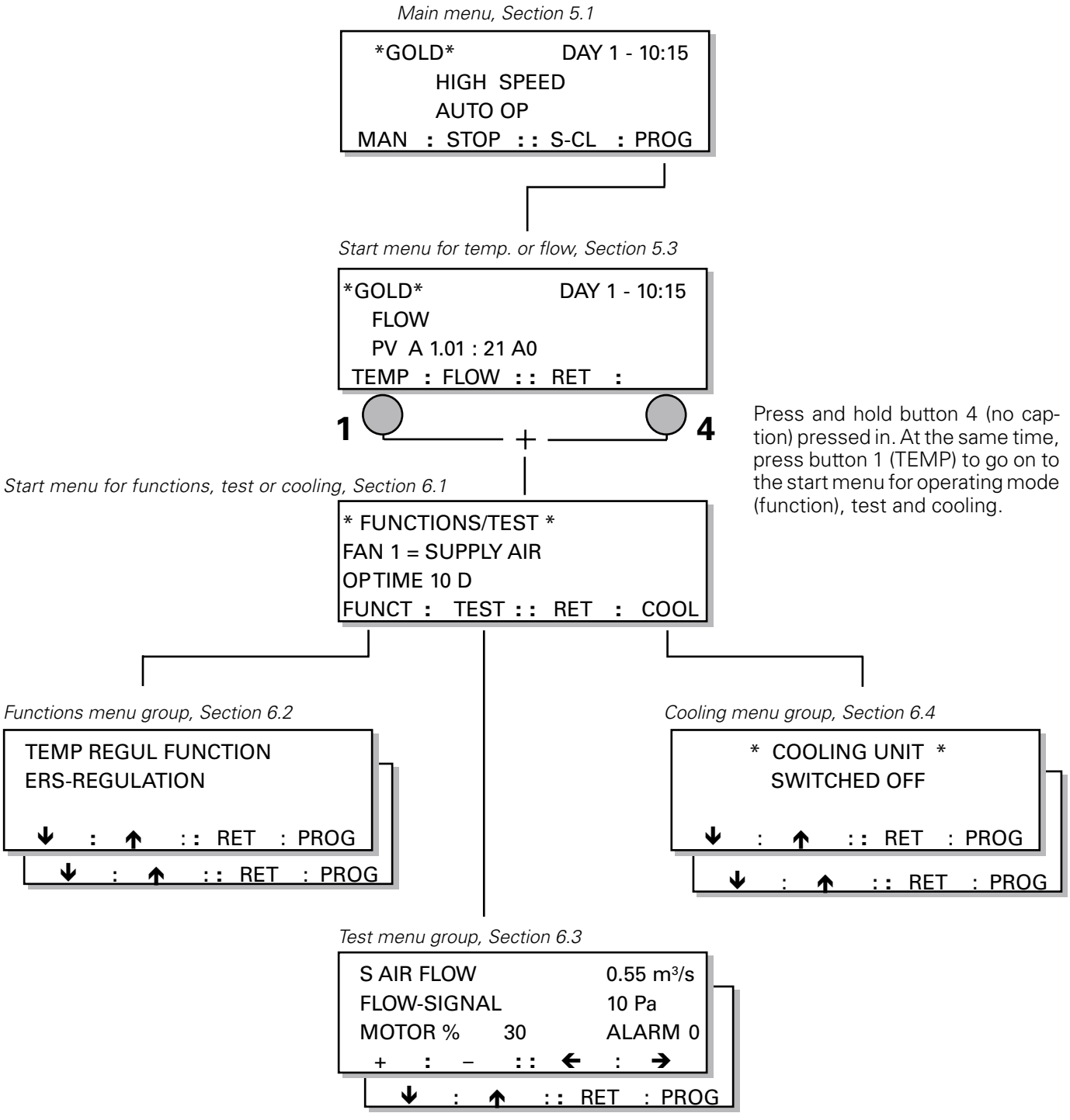
This menu level is intended for use by skilled technicians who have a thorough knowledge of the ventilation trade.

This section describes the menus that can be accessed from FUNCT, TEST AND COOL in the start menu.

This menu can be used for setting the various functions, entering the manual inputs and outputs, reading the operational status on all inputs, selecting the type of cooling function and boosting the cooling capacity.

CAUTION! *Unless otherwise specified in the relevant menu section, the function of the menu buttons will be normal, as described in Section 4.3.*

Menu Structure

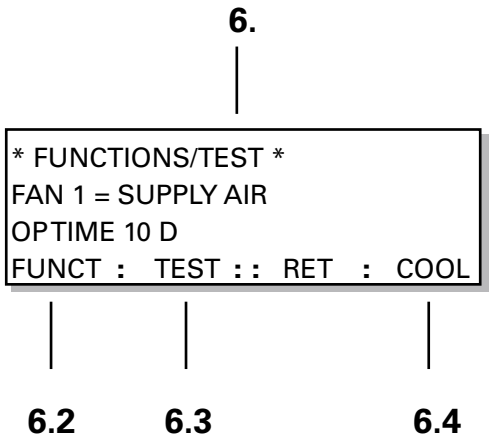


Press and hold button 4 (no caption) pressed in. At the same time, press button 1 (TEMP) to go on to the start menu for operating mode (function), test and cooling.

6.1 Start Menu for Operating Modes (functions), Test or Cooling

Start menu

This menu can be reached by pressing and holding button 4 pressed in (no caption) and then pressing button 1 (TEMP) in the start menu for temp and flow, as described in Section 6.



The start menu for three different menu groups will appear. The three groups are function, test and cooling respectively.

FAN indicates the air flow (direction) configuration selected.

OP TIME indicates the number of 24-hour days that the unit has been operating.

To go further

Select the FUNC, TEST or COOLING group.

FUNC is a menu group used for setting the various functions, i.e. summer night cooling and regulation functions. It is also possible to block or activate certain alarms and view sensor temperature readings and set points. This menu group is described in Section 6.2.

TEST is a menu group for manually entering inputs and outputs for, e.g. fans and heat exchangers as well as reading the operational status on all inputs. All regulation is switched out while you operate the unit manually. This menu group is described in Section 6.3.

COOLING is a menu group only for cooling functions. The type of cooling function and boosted (forced) cooling can be selected from this menu. This menu group is described in Section 6.4.

6.2 Functions Menu Group

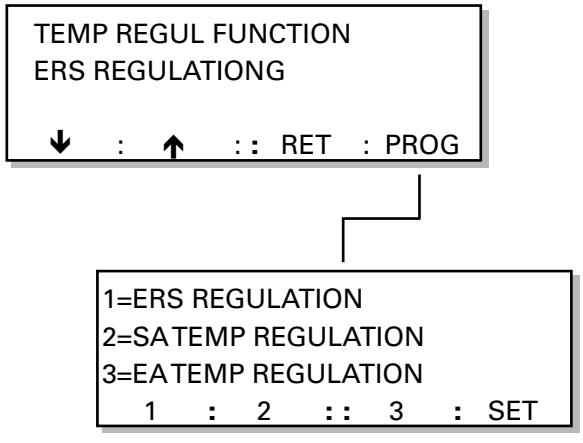
This menu Can be reached by pressing the FUNC button in the start menu for function, test or cooling, as described in Section 6.1.

6.2.1 Temperature regulation function

The menu shows the temp. regulation function selected.

To change the regulation function

Press the **PROG** button. The image will then switch to a sub-menu, in which a new regulation function can be selected.



Three different types of temperature regulation can be selected; ERS Regulation, Exhaust Air Regulation and Supply Air Regulation.

Press button **1**, **2** or **3** to select one of the functions.

Then press the **SET** button to confirm the change.

The current temperature set points within the type of regulation selected can be entered under the temp. menu group as described in Section 5.4.

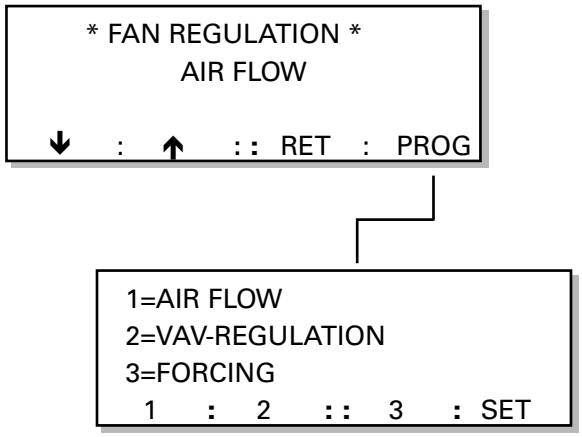
6.2.2 Fan Speed Regulation

This menu shows the function selected according to which the fans are controlled. For further particulars about air flow regulation, see Section 7.12.

When AIR FLOW (normal flow regulation) is indicated the flow is regulated so that adjusted value can be maintained.

When the unit is set in the VAV-REGULATION mode, the fans are controlled across an external signal. The unit then regulates the fan speed to maintain programmed percentages on each 0 – 10 V DC input.

If the unit is operating in the boosted air flow or FORCING mode, the fans are controlled across an external signal. The speed of each fan can then be controlled by means of a 0 – 10 V DC input.



To change the type of fan regulation

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.

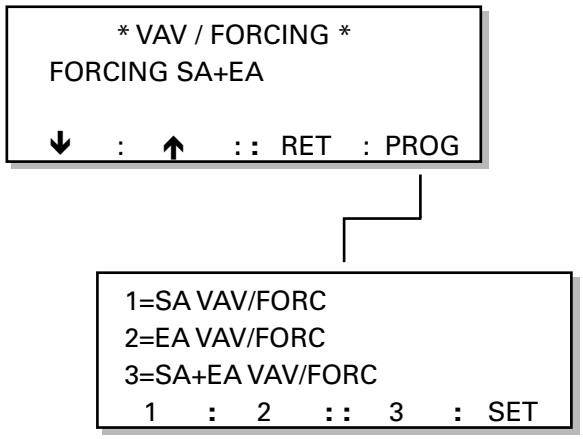
Three different types of regulation can be selected; Constant flow, VAV regulation or forcing (boosted air flow).

Press button **1**, **2** or **3** to select the appropriate function.

Then press the **SET** button to confirm the change.

IMPORTANT! If VAV regulation or forcing is selected, go on to the next menu VAV/FORCING, Section 6.2.3.

6.2.3 Fan Performance when VAV Regulation or Forcing (boosted air flow) has been selected



This menu is shown only if VAV regulation or forcing has been selected in the previous menu, section 6.2.2.

This menu shows the regulation function selected and which fan(s) is/are being controlled. Supply air fan (SA), exhaust air fan (EA) or both fans (SA+EA).

SA indicates that supply air fan has been selected for VAV regulation or forcing (boosted air flow). The exhaust air fan is then operated in the normal airflow regulation mode.

EA indicates that exhaust air fan has been selected for VAV regulation or forcing (boosted air flow). The supply air fan is then operated in the normal airflow regulation mode.

SA+EA indicates that both supply air fan and exhaust air fan have been selected for VAV regulation or forcing (boosted air flow).

To change the choice of fan

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.

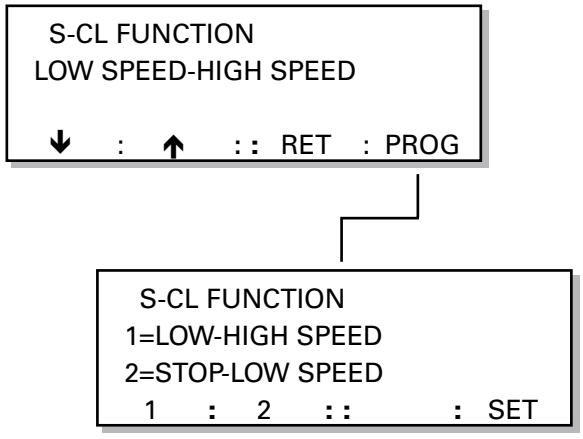
Press button **1**, **2** or **3** to select one of the fans or both fans.

Then press the **SET** button to confirm the change.

IMPORTANT! The flow settings (low, high and max speed) can be set in the menus under the Flow Function Group. See Section 5.5.

IMPORTANT! If VAV regulation has been selected, the SA and EA set points can be set in menus as described in Section 5.5.4 under the flow function group.

6.2.4 Switching Clock Function



This menu shows the function selected for the internal switching clock: low speed-high speed or stop-low speed.

LOW-HIGH SPEED indicates that the high speed – low speed operating mode has been selected.

STOP-LOW SPEED indicates that the stop – low speed operating mode has been selected.

To alter the settings in the function

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.

Press button **1**, **2** or **3** to select the appropriate function.

Then press the **SET** button to confirm the change.

6.2.5 Summer Night Cooling

The digit to the right of the SUMMER NIGHT COOLING caption indicates whether the function has been selected. To enable and set starting times and temperatures; press PROG, select SUMMER NIGHT COOLING = 1. Then press the button below the right-hand arrow to advance to the next menu.

1 = On (function selected).

0 = Off (function not selected).

The summer night cooling START TIME can be set between 00^{10} and 06^{59} hours.

EA denotes the minimum exhaust temperature required for the function to switch in.

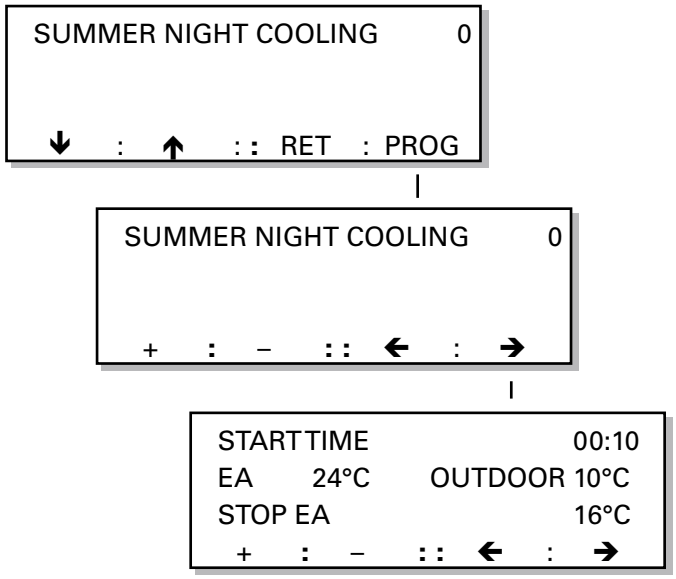
OUTDOOR denotes the minimum outdoor temperature required for enabling the function.

STOP EA denotes the exhaust air temperature at which summer night cooling operation will switch out.

For detailed particulars of summer night cooling, see Section 7.6.

To alter the settings in the function

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.



6.2.6 Outdoor Temperature Compensation

Outdoor air temperature compensation involves using the outdoor air temperature for altering the supply air or exhaust air temperature set point. The supply air temperature set point and the exhaust air temperature set point will be influenced by supply air or exhaust air temperature regulation respectively.

The temperature set point will be influenced if the outdoor air temperature drops below +10°C as indicated by the winter compensation curve and if it rises above +25°C as indicated by the summer compensation curve. See chart in Fig 4.

If ERS regulation is utilized, it will override this function.

Negative summer compensation can also be preset

The upper right-hand digit in the menu indicates whether any of the outdoor air temperature compensation functions has been selected.

1 = On (function selected).

0 = Off (function not selected).

OUTDOOR TEMPERATURE-COMP indicates whether the function has been selected. To enable and set the values, press PROG, select OUTDOOR TEMP COMP = 1. Then press the button with the right-hand arrow to advance one step to the next menu.

WINTER COMP denotes the temperature displacement that the breakpoint has at -20°C.

SUMMER COMP denotes the temperature displacement that the breakpoint has at +40°C. Adjustable between -10 °C – +10 °C.

To alter the settings in the function

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.

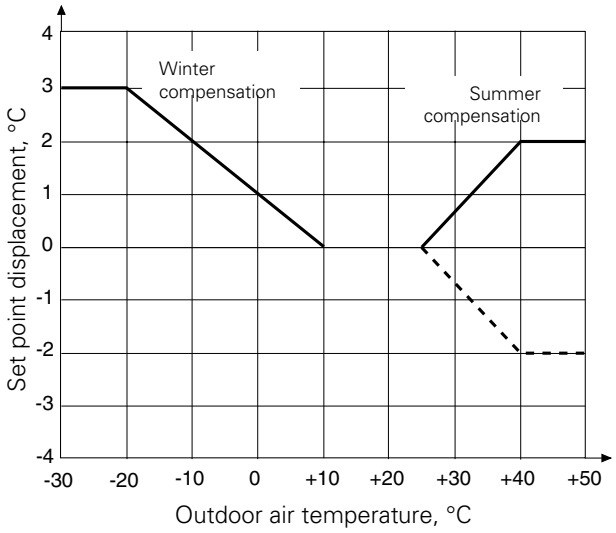
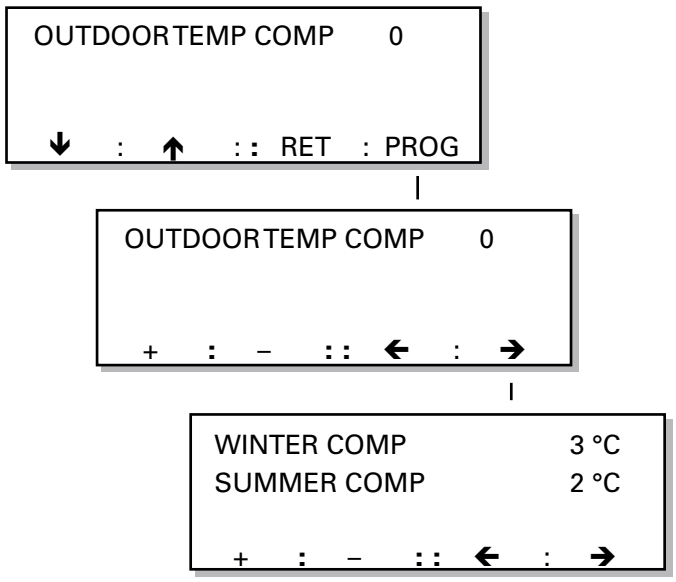


Fig. 4



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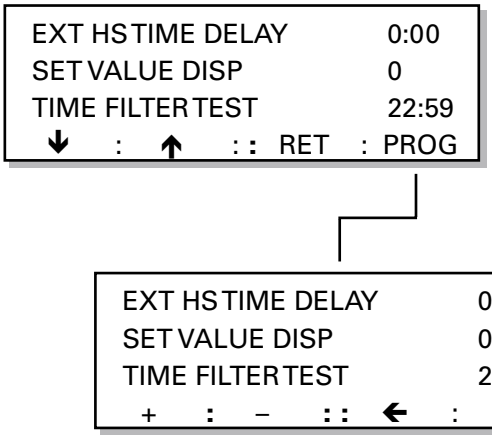
6.2.7 External HS Time Delay, Set Point Displacement and Filter Test Times

This menu shows time delay for external high speed, whether set point displacement is active, and when the filter test is to begin.



To alter the settings

On pressing the **PROG** button, the image will switch to a sub-menu, in which the function settings can be altered.

EXT HS TIME DELAY delays return to low speed operation when the input for external switching alternates between high speed and low speed. Typical applications are e.g. prolonged operation (keyed in) or overtime actuated by physical presence detectors.

The in-operation period can be set from 0:00 to 3:59; (hours and min.). The function won't be activated at 0:00 hours.

SET POINT DISP indicates whether the function has been selected. For more details about set point displacement, see Section 7.7.

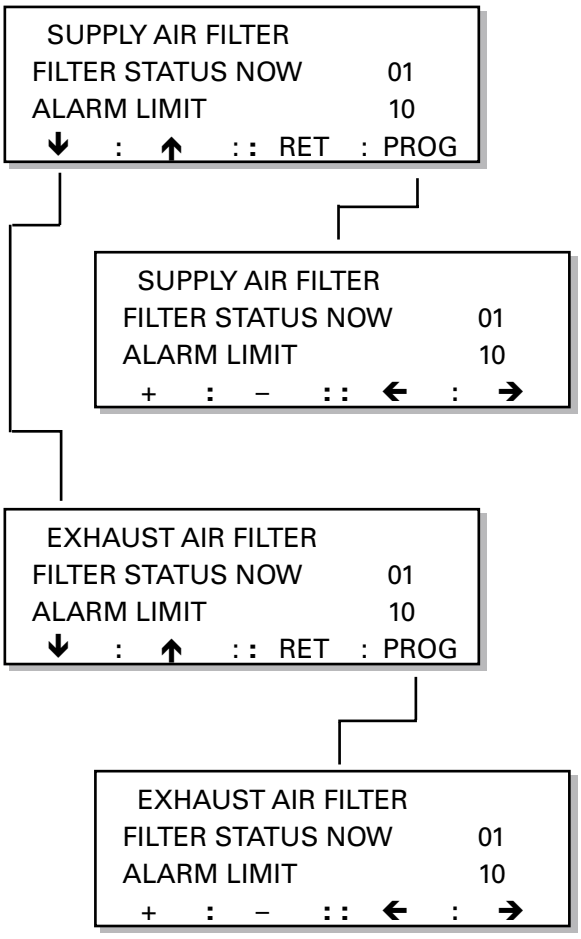
TIME FILTER TEST can be set between 07:00 and 22:59 (factory-preset starting time: 22:59). Select a time that will cause the occupants the least discomfort, since the unit must first be stopped and then be run at a fan speed that is suitable for testing the filters, no matter what air flow has been programmed.

The filter test is carried out once every 24-hour period to ascertain that the pressure drop in the system has not risen above the alarm limit. **No filter test will be carried out during while external stop is activated.**

The ducting system must have the same characteristics at the time of the daily filter test as when it was calibrated.

6.2.8 Filter Status

There are separate menus for the supply air filter and the exhaust air filter. The menus show the filter status and the preset alarm limit.



Filter test

The filter test is carried out once every 24 hours to ascertain that the pressure drop in the system hasn't exceeded the alarm limit.

The starting time for the filter test can be preset in the previous menu. See Section 6.2.7.

FILTER STATUS NOW indicates the degree of contamination in each filter registered during the previous test. The contamination level can be compared to the preset alarm limit level.

The ALARM LIMIT is the level of contamination that will initiate the filter alarm.

To alter the alarm limit

Press the **PROG** button to change the display over to a sub-menu, in which the alarm limit can be preset.

The alarm limit can be set between 0 and 99. The factory setting (10) is equivalent to a 10% reduction in air flow measured from the reading registered when the ducting was calibrated.

If the value displayed exceeds the alarm limit, this will trip the alarm. The LED in the hand-held terminal will then flash and a plain text in the display will indicate which filter is fouled.

6.2.9 Language

This menu indicates the languages available. The language displayed can be switched at any time between: Swedish, Norwegian, Danish, Finnish and English.

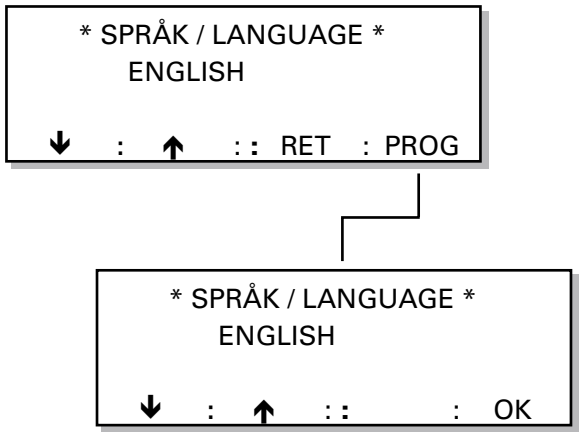
To switch to another language in the display

Press the **PROG** button to switch the display over to a sub-menu, in which the language can be altered.

Select the language by pressing the arrow buttons to advance upward or downward through the images.

Then press the **OK** button to confirm the change.

The new language will appear in the display you return to the main menu.



6.2.10 Service Period and Internal Fire Protection

SERVICE PERIOD indicates the number of months left until the period expired alarm trips.

Entering a new interval in months until the next scheduled service will reset the alarm.

INT FIRE PROT indicates whether the function is activated (=1) or not (=0).

If the int fire prot is activated:

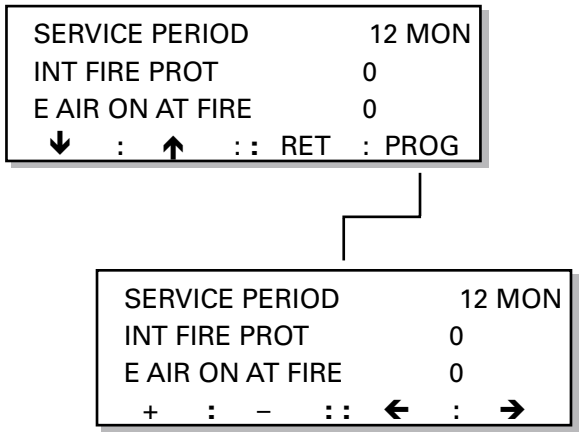
If the supply air temperature rises above 70°C or the exhaust air temperature rises above 50°C, the INT FIRE ALARM RELEASED alarm will be displayed and the unit stop.

If the EA on at fire is activated:

If this function is activated, the exhaust air fan will accelerate to max. rpm to operate as a smoke evacuation fan if the internal or external fire alarm has tripped.

To alter the settings

Press the **PROG** button. This will switch the display to a sub-menu, in which the functions selected can be altered.



6.2.11 Alarms and Alarm Blocks

ALARM indicates whether any alarm (Alarm No.) is beyond the alarm limit or is about to trip. In this case, the alarm is shown without any time delay. The group alarm is not energized. For particulars of each of the alarms, see Section 8.

ALARM BLOCK NO. indicates the alarm block (Group No. 1 – 8) and whether the alarm block is activated or blocked. If the alarm is blocked a "1" is displayed. If the alarm block is not blocked a "0" is displayed.

A list of the different alarms, arranged according to relevant alarm block, is given in Section 8.

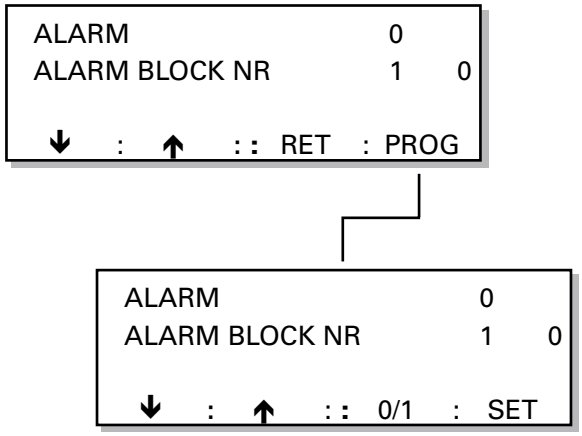
CAUTION! Only temporary blocking of alarms is permissible.

To alter the setting

Press the **PROG** button. This will switch the display to a sub-menu, in which alarm blocks can be altered. Under normal conditions, all of the groups should be set to "0" in order for the alarms to be activated.

Press the ↓ and ↑ buttons to advance upward or downward to the alarm block to be altered. Then press the **0 / 1** button to change the status.

Press the **SET** button to confirm the change. The image will then change back to the previous image.



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6.2.12 Alarm Limits for Temperature Alarms

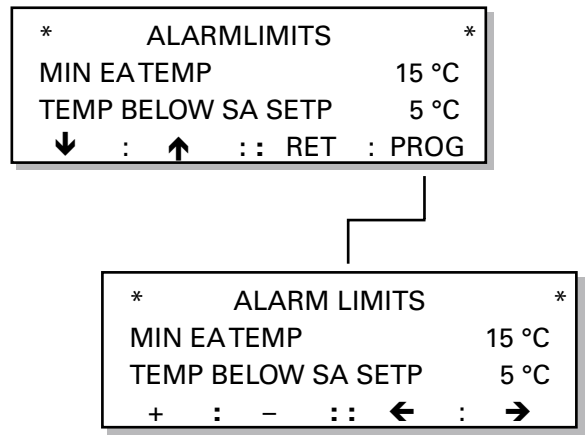
MIN EA TEMP denotes the min. permissible exhaust air temperature before an alarm is initiated and the unit stops.

TEMP BELOW SA SETP denotes how much the supply air temperature is permitted to drop below the its set point before an alarm is initiated and the unit stops.

To alter the setting

Press the **PROG** button. The image will then switch to a sub-menu, in which the alarm settings can be altered.

Press the **+** or **–** buttons to set the MIN EA TEMP or TEMP BELOW EA SETP to the temperature required.



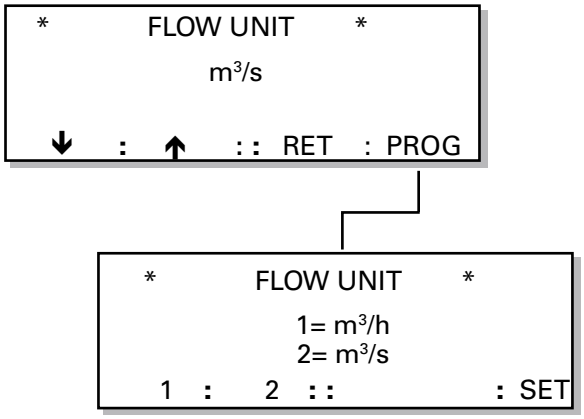
6.2.13 To Change the Flow Unit

This menu shows the preset unit of measurement for air flows.

To alter the setting

Press the **PROG** button. The image will then switch to a sub-menu, in which the setting can be altered.

Press button **1** or **2** to select m^3/h or m^3/s as the unit of measurement for air flows. Push **SET** to confirm the new setting.



6.2.14 Changeover between Summer and Winter Time

AUTO S/W TIME indicates whether the function for automatic changeover from summer to winter time and vice versa is enabled (= 1) or disabled (= 0).

If automatic changeover between summer and winter time is enabled:

The switching clock will automatically switch over from summer time to winter time and vice versa based on preset time (see Section 5.2.1), as follows:

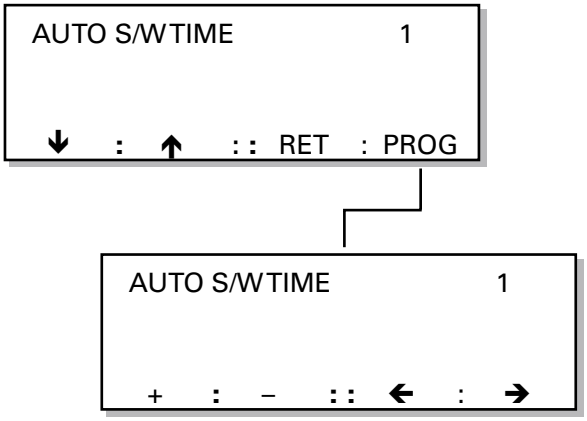
On the last Sunday in March, the clock will automatically set itself ahead one hour and on the last Sunday in October, the clock will automatically set itself back one hour.

If automatic changeover between summer and wintertime is disabled:

The switching clock will not automatically switch over from summer to winter time and vice versa. The preset time will remain the same (see Section 5.2.1).

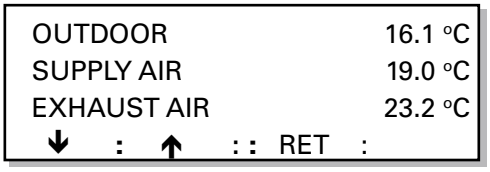
To alter the setting

Press the **PROG** button. The image will then switch to a sub-menu, in which changeover can be enabled. Press the **+** or **–** button to set AUTO S/W TIME.



6.2.15 Temperature Sensor, Read-only Menu

This menu shows the current outdoor air, supply air and exhaust air temperature readings transmitted from the sensors.
The menu is used only for reading.



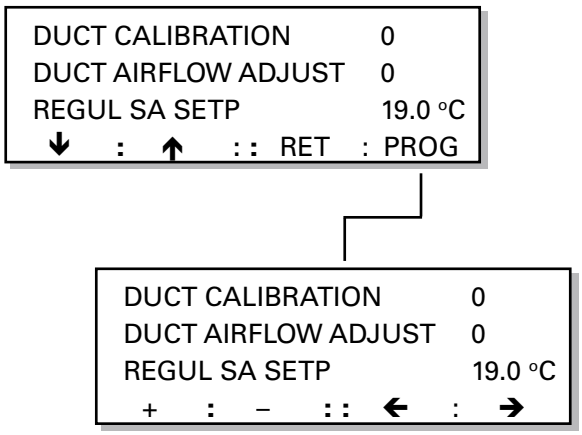
6.2.16 Duct Calibration, Airflow Adjustment and SA-Temp Set Point

The purpose of the duct calibration function in the GOLD unit is to determine the "zero value" for the filter tests.

Duct calibration must be carried out on all units when they are started up, adjusted and after new filters have been fitted. This can also be read in the Installation Instructions as well as in the Operating and Maintenance Instructions.

The duct calibration is carried out as follows:

- The fans are speeded up to 80% of their max. speed.
- The air flow of each fan is read.
- The air flow reading is saved as a reference for filter test flow readings.



DUCT CALIBRATION is normally set at 0 (off). If duct calibration is activated (1=on), the unit will run at a fixed calibration speed and the controller will measure where in the flow chart the unit is operating with regard to connected duct system. Duct calibration provides the reference for the alarm limit used in the filter tests. The unit must therefore have clean filters when duct calibration is begun.

If the unit is used for VAV regulation and dampers are fitted in the ventilation system, it is important that the ducting is calibrated with the damper blades set in the same position, as they were when the filter test was carried out.

The ducting must always be re-calibrated whenever the ducting system has been modified in any way or every time clean filters have been fitted.

AIR FLOW ADJUSTMENT is normally set at 0 (off). When air adjustments are carried out (1=on), the control unit locks on the current motor speed and all regulation ceases so that the air flow can be adjusted according to the principle of proportion.

SA TEMP SETP indicates the current SA temperature set point, at which the control equipment is working. Set point displacement, outdoor air compensation, summer night cooling and the influence of the neutral zone on the temperature set point can be read in this image.

To activate the function

Press the **PROG** button. This will switch the image to a sub-menu, in which the functions can be activated.

For duct calibration

Reset duct calibration to 1 and return to the main menu (Auto or Manual Operation).

The duct calibration is carried out and the one is automatically replaced with a zero when the unit has stored the calibration value. Then the unit will return to normal operation. (Duration approx. 5 min.)

For airflow adjustment

Reset the airflow adjustment to = 1. The function will lock the current motor speed and the motor will operate at this speed until the function is manually interrupted. Temperature regulation will continue but the speed of the supply air fan and all airflow regulation as well as high / low speed switching will be blocked.

IMPORTANT! The function will not be automatically cancelled. To cancel this function, press the stop button from the main menu of the hand-held terminal, or set AIRFLOW ADJUSTMENT to 0.

This function will also be cancelled in the event of a power failure.

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6.3 Test Menu Group

This menu can be reached by pressing the TEST button in the start menu for function, test or cooling. See Section 6.1.

The menu group contains menus for manual operation and test functions outside the normal regulation functions to facilitate checks and fault tracing. When TEST is activated, all the control functions are disabled. All outputs are controlled manually.

IMPORTANT! The responsibility for any discomfort caused unusual airflow or temperature conditions rests wholly on the person who has activated the function.

To step between the menus

Press the ➔ button to go on to the next menu, or press the ← button to go back to the previous menu.

6.3.1 S-Air flow

S-AIR FLOW shows the preset supply air flow.

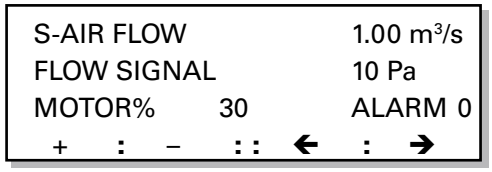
FLOW- SIGNAL shows the pressure sensed by the SA pressure transducer (air flow meter).

MOTOR shows the modulation as a percentage that the frequency converter calls for to maintain the preset air flow.

ALARM indicates whether or not the frequency converter indicates for any alarm function.

To alter the S-Air flow

Press the **+** button or the **–** button to set S-AIR FLOW at the supply air flow required.



6.3.2 E-Air Flow

E-AIR FLOW shows the preset exhaust air flow.

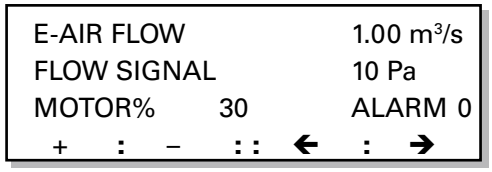
FLOW-SIGNAL shows the pressure sensed by the EA pressure transducer (the air flow meter).

MOTOR shows the modulation as a percentage that the frequency converter calls for to maintain the preset air flow.

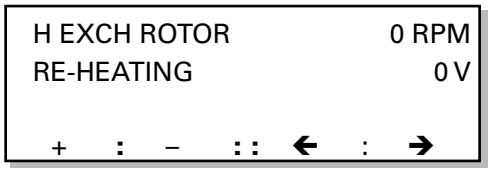
ALARM indicates whether or not the frequency converter indicates for any alarm function.

To alter the E-Air flow

Press the **+** button or the **–** button to set E-AIR FLOW at the exhaust air flow required.



6.3.3 Heat Exchanger Rotor and Reheating



H EXCH ROTOR shows the rotor speed required.

For size 11, 12, 21 and 22 GOLD units: 0 – 9 rpm.

For size 31 and 32 GOLD units: 0 – 6 rpm.

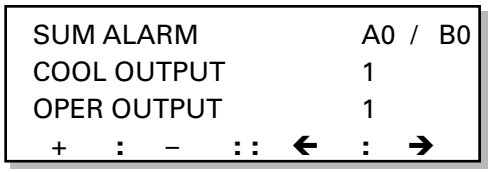
REHEATING shows the control signal setting desired for reheating. The signal can be preset in 1 V increments between 0 – 10 V.

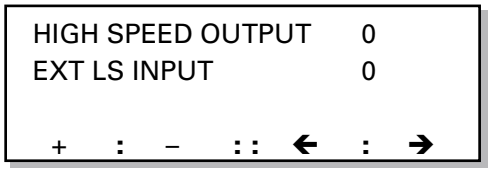
Note that the smaller electric air heater (TBLE 3 – 20 kW) is controlled by a pulsed 10 V signal from the GOLD unit. When these air heaters are tested the signal should be controlled to 10 V.

To alter the preset value
Press the ← button or the → button to advance to the function that is to be changed.

Then press the **+** button or the **–** button to alter the value.

6.3.4 Group Alarm





SUM ALARM (group alarm), COOL OUTPUT, OPER OUTPUT and HIGH SPEED OUTPUT respectively show the setting at the relevant relay output.

Value 1 = On (closed output).

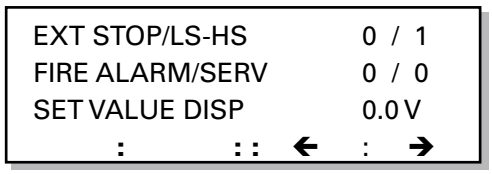
Value 0 = Off (open output).

If the group alarm is initiated, the red lamp on the hand-held terminal will light up.

To alter the preset value
Press the ← button or the → button to advance to the function that is to be changed.

Then press the **+** button or the **–** button to alter the value.

6.3.5 External Inputs



EXT LS INPUT, EXT STOP/LS-HS, FIRE ALARM/SERV show the status at these external inputs.

Value 1 = On (closed input)

Value 0 = Off (open input)

SET VALUE DISPL shows the voltage supplied (0 – 10.0 V DC).

No changes can be made in this menu.

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6.3.6 Input Values

ANTI-FR TEMP shows the temperature registered by the anti-frosting monitor sensor, if fitted. If no sensor or air reheater is connected, a reading of 0°C will be displayed.

Note that the anti-frosting monitor alarm can be activated in the main menu only from the hand-held terminal.

RE-HEAT EL/WA indicates whether or not the air reheater (electric or water air heater) is connected.

1 = Connected. 0 = Not connected

VAV% SA/EA shows the inputs for supply air and exhaust air respectively that control the VAV/Forcing input (VAV/Boosted air flow input).

0 – 10 V in = 0 – 100% display.

No changes can be made in this menu.

6.3.7 Output Values

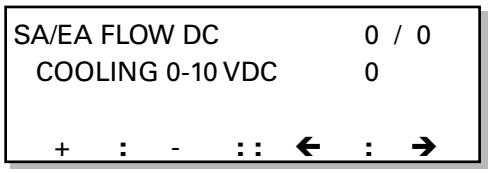
SA/EA FLOW DC shows the preset output voltage 0 – 10 V DC, which controls the outputs for flow readings. The signal can be controlled in increments of 1 V between 0 – 10V.

COOLING 0-10 V DC shows the preset output voltage for outputs, which control analog cooling. The signal can be controlled in increments of 1 V between 0 – 10 V.

To change the preset value

Press the ← button or the → button to go on to the function that is to be altered.

Then press the **+** button or the **–** button to change the value.



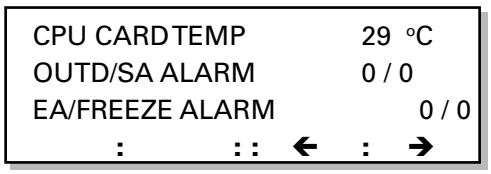
6.3.8 Control Circuit Board Temperature and Temp Sensor Alarm

CPU CARD TEMP shows the temperature on the control circuit board.

OUTD/SA ALARM; EA/FREEZE ALARM show the temperature sensor alarms.

The temperature alarm will be = 1 if any sensor input senses a temperature that is outside the working range of the sensor (below -70°C or above + 100°C).

No changes can be made in this menu.



6.3.9 Auxiliary Input and EEPROM Test

SPARE GATE (aux. input) shows the status for external alarm acknowledgement.

0 = Not activated input

1 = Activated input

EEPROM TEST is activated whenever you enter this menu. The rising digits: 0 through 128 in the display denote the lines in the EEPROM being checked. The test can be cancelled by leaving this menu.

6.4 Cooling Menu Group

The menu can be reached by pressing the COOL button in the start menu for function, test or cooling. See Section 6.1.

The menus are used for setting the cooling functions.

6.4.1 Cooling Function

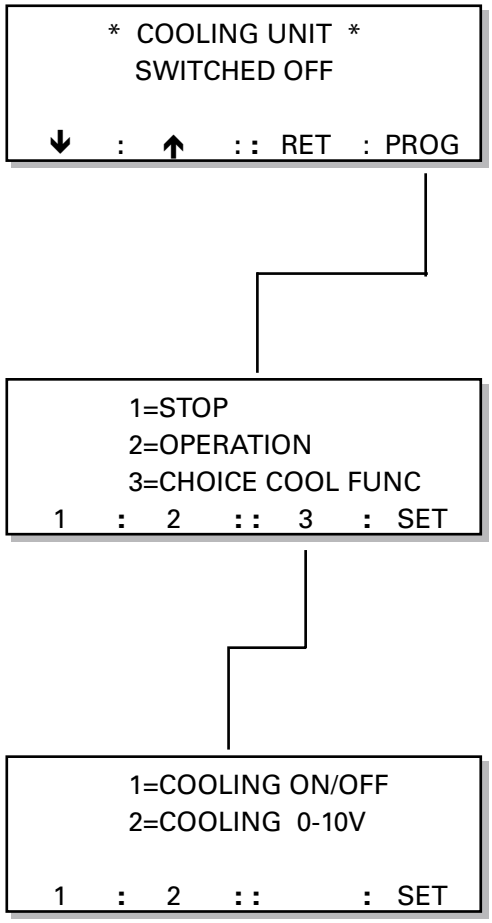
The menu indicates which cooling function has been selected.

To alter the cooling function

Press the **PROG** button to switch the image to a sub-menu, in which the cooling function can be activated.

To leave the menu

The other buttons of the menu have a normal function.



Choice of Cooling Operation Options

STOP, OPERATION or another CHOICE COOL FUNC can be selected in the sub-menu.

Choose the appropriate option: **1**, **2** or **3**. Then press the **SET** button to confirm the change.

If the 1=STOP or 2=OPERATION option is selected, the image will switch back to the previous menu.

If the 3=CHOICE COOL FUNC option is selected, the image will switch to another sub-menu where the type of cooling function can be changed.

Choice of Cooling Function Options

Press button **1** or **2** to choose the appropriate option. Then press the **SET** button to confirm the change.

If COOLING ON/OFF is selected, only the cooling relay will function. The relay is energized when the need for cooling arises and is de-energized when the room air or supply air temperature has dropped below the set point + neutral zone, or if the SA temp. drops below the minimum limit.

If COOLING 0 – 10 V is selected, the cooling relay is energized when cooling is needed and the 0 – 10 V DC output signal is modulated in relation to the current cooling load.

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6.4.2 Boosted Cooling, Restarting Time, Neutral Zone

COOLFORCING (boosted cooling) indicates which one of the boosted cooling options listed below is activated:

0 = No boosted cooling

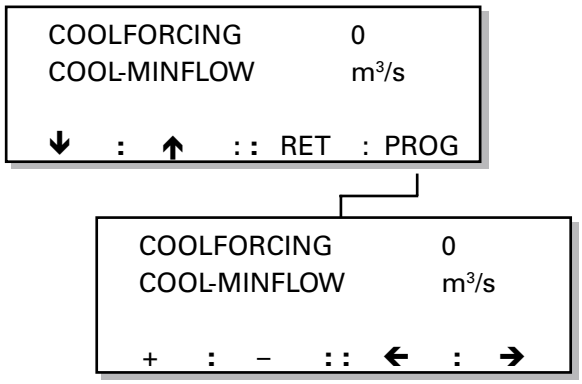
1 = Boosted cooling – comfort setting (the output of the cooling unit will be boosted before the air flow is boosted)

2 = Boosted cooling – economy setting (air flow will be boosted before the output of the cooling unit is boosted)

This function can only be used if exhaust air temperature regulation is employed.

The current air flow will be increased to the preset max. air flow rate. If boosted cooling has been activated, the AIRFLOW MAX SPEED setting will be available under FLOW.

When the function kicks in, the COOLFORCING caption and ordinary text will alternately flash in the display.

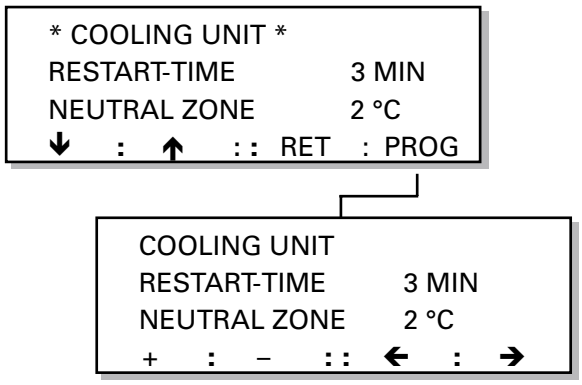


Boosted Cooling - Comfort Setting

If cooling is needed, the output to the cooling unit will be activated.

As the supply air temperature approaches the preset SA-MIN temperature, the flow rate will increase to transport more cooling energy without dropping below the min. permissible temperature.

If the cooling load is modest, the airflow will first be reduced to the normal rate.



Boosted Cooling - Economy Setting

If the cooling is needed, the air flow will slowly increase up to the preset FLOW MAX SPEED rate.

It the air flow rate is at max. and yet more cooling is required, the outputs to the cooling unit will be activated.

COOL-MINIFLOW indicates the preset min. exhaust air flow rate required for transmission of an output signal to start the cooling unit. This value can be set between 0 and the half of the AHU max. flow setting.

When this function is activated, the cooling function will be blocked if the air flow is less than the preset flow rate.

RESTART-TIME denotes the period from when the COOLING relay has been energised until it can be re-energised. It is delayed so that the cooling unit won't continuously start and stop, for instance.

NEUTRAL ZONE denotes the temperature at which the cooling set point is higher than the heating set point.

To alter the setting

Press the **PROG** button. The image will then switch to a sub-menu, in which the settings can be altered.

7. Description of Other Functions

7.1 Cooling Energy Recovery Function

Cooling energy recovery is an automatic function, which enables the unit to utilize the relative "cooling energy" that may be available indoors, when the outdoor temperature is high and cooling is required. The heat exchanger rotates at maximum speed and in this way recovers the relative cooling energy in the exhaust air.

Before this function can be activated, cooling energy must be required and the outdoor temperature must be 1°C higher than the exhaust air. This function will cease when cooling is no longer needed or when the outdoor temperature is the same as that of the exhaust air.

The COOL RECOVERY caption and ordinary text will alternately flash in the main menu.

7.2 Purging Function

The purpose of this function is to rotate the heat recovery rotor from time to time so that it won't remain in the same position in the air stream for a long period when heating isn't needed.

This function starts up, whenever the air handling unit has been operating for 3.5 hours without the heat recovery rotor rotating. The heat recovery unit then operates for 1 minute at a time to permit the air to pass through the rotor in both directions and remove dust, if any.

7.3 Heat Exchanger Speed Monitor

A rotation test is carried out in the heat recovery section once every 24-hour period followed by a filter test, if the prerequisites for the test are satisfied. The purpose of this test is to check performance and not the rotor speed.

Before the test can be carried out, the outdoor air must be warmer than -15°C, the output signal to the heat exchanger must be 100% and the differential temperature between the outdoor air and exhaust air must be 10°C.

The fans will maintain the current airflow rate during the test. If the low speed is set at = 0 or if the switching clock is disabled, the test won't be run. The test should be run while the unit is operating. The temperature regulation function will be locked at the current flow rate (regulation to min. set point and reheating). The rotor speed will be decelerated to stop in one minute. The supply air temperature should fall by at least 5°C within 10 minutes. Otherwise the alarm will trip. The test will end as soon as the SA temp. has fallen more than 5°C. After the test, the air handling unit will automatically carry out a filter test.

The rotation test function is always enabled and can be run whenever conditions permit. The tachosignal from the heat exchanger motor is also continuously tested. An alarm is initiated if the motor speed increases or decreases by more than 20 % from the set point. The motor will be switched out if no tachosignal is received within 4 minutes.

7.4 Zero Calibration

The zero setting of the pressure transmitters is checked immediately before the ducting is calibrated or the filters are tested. The ZERO SET CALIBR caption flashes in the main menu while the control unit conducts a new calibration. The fans cannot start up during the calibration.

7.5 Low-speed/high-speed Switching

There are three ways to switch between preset low airflow and high airflow operation:

1 Manual switching in the main menu, see Section 5.1.

2 Programmed switching in the switching clock integrated in the control unit. See Section 5.2.

3 Remote switching across the external contact function input on terminals 10 and 11.

Manual switching between low speed and high speed operation has precedence over the switching clock (timer) and switching input signals from an external source. A manually entered low speed setting switches the unit to low speed operation.

High-speed operation activated from an external source has precedence over the stop or low-speed setting switched in by the switching clock. For particulars of prolonged operation, see Section 7.9.

7.6 Summer Night Cooling

To activate the function, see Section 6.2.5.

The summer night cooling function uses the lower outdoor air temperature at night to cool the building structure. This lowers the cooling load during the day.

If the summer night cooling function is activated, the fans in the unit operate at high speed to supply 10°C air (set point) from the preset start time until the prerequisites for switching out the function have been met.

The outdoor air temp., start/stop (switch-in/switch-out), exhaust air temperature and start-up time settings can be altered in the summer night cooling sub-menu. The start-up time can be preset between 00.10 and 06.59 hours.

Conditions that must be satisfied before the summer night cooling function will start up at the preset time:

– The exhaust air temperature must be above the preset value (+24°C).

– The exhaust air temperature is at least 2°C warmer than the outdoor air.

– The outdoor air temperature must be above the preset value (+10°C).

– No heating has been required between 12.00–23.00 hours.

– The unit must not operate at high speed or be shut down from a remote terminal or manually from the hand-held terminal.

Conditions that must be satisfied before the summer night cooling function will stop:

– The exhaust air temperature drops below the preset value (+16°C).

– The outdoor temperature drops below the preset value (10°C).

– The switching clock or external input calls for high-speed operation.

– The buttons on the hand-held terminal are enabled.

7.7 Set Point Displacement

To activate the function, see Subsection 6.2.5

Set point displacement is used for altering the supply air and exhaust air temperature set points by means of an external 0 – 10 V DC signal. The set point can be influenced by +/-5°C.

If supply air regulation has been selected, the function will offset the supply air temperature and if exhaust air regulation has been selected, the function will offset the exhaust air temperature.

When the function is activated, the set point will be displaced as illustrated in the adjacent chart. 0 V DC will decrease the temperature set point by 5°C, a 5 V DC signal will not alter the set point and a 10 V DC signal will raise the set point by 5°C.See the chart in Fig 5.

If ERS regulation has been selected, this function will affect the SA/EA differential. This differential cannot be lower than 0°C. As the input signal increases, the SA/EA differential will drop.

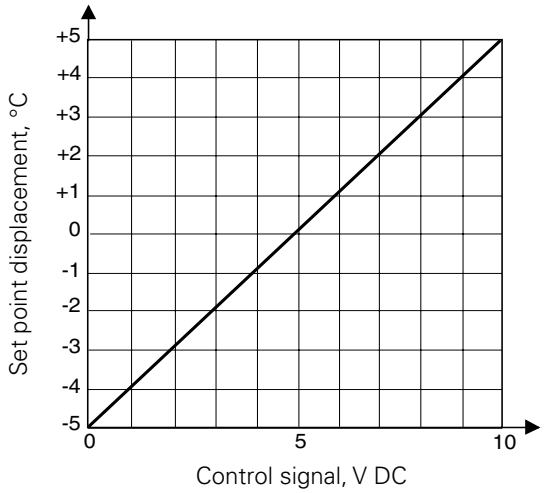


Fig. 5

7.8 High-speed Fan Operation Indication

The HIGH SPEED relay output will be energized whenever the air handling unit is operated in the high speed, summer night cooling, VAV regulation or the boosted air flow mode.

7.9 External Input for High-Speed Operation

If the air handling unit is operating at low speed or if it has been switched out by the switching clock (timer), a closure at the EXT HS INPUT will cause the unit to operate at HIGH SPEED.

7.10 External Input for Low-speed Operation

If the switching clock has switched out the unit (stop - low speed operation), a closure at the EXT LS INPUT will cause the unit to operate at LOW SPEED.

7.11 Anti-frosting Monitor Function

The anti-frosting monitor function is always active if the ventilation system includes an air heater for hot water.

When the function is active, the water temperature in the air heater will be kept at 13°C while the air handling unit is operating and at 25°C while the unit is shut down. The function contains a monitor that will switch out the unit and initiate an alarm if the temperature sensor senses a water temperature below 7°C.

7.12 Three Types of Airflow Regulation

Constant flow

To activate the function, see Subsection 6.2.2.

Constant flow (referred to only as FLOW in the menu) implies that the GOLD unit maintains a constant preset airflow rate. The control equipment automatically controls the speed of the fans to enable correct air flow as the filters begin to be clogged, air devices become blocked, etc.

Keeping the air flow constant is of great benefit to the user because the air flow always remains as it was preset when the unit was commissioned.

You should however be aware that any condition that increases the pressure drop in the ventilation system, such as the blanking off of air devices, will also automatically cause the fans to operate at a higher rpm. This will in turn increase the amount of power consumed and can also give rise to indoor comfort problems such as draughts and excessive noise.

VAV Regulation

To activate the function, see Subsection 6.2.2.

VAV stands for Variable Air Volume. The control equipment maintains constant pressure in the ducting via a 0–10 V input signal from an external in-duct pressure sensor. The pressure required (set point) can be preset in the menu as a percentage of the range of the pressure sensor (Subsection 5.5.4).

The pressure transmitter function can be restricted so that the flow will not exceed or be lower than the preset values in the menu (section 5.5.3).

VAV regulation will not have any effect at the preset low-speed times, such as at night.

The supply air fan or exhaust air fan or both fans can be operated in the VAV regulation mode (Subsection 6.2.3). If only one of the fans is operated in the VAV regulation mode, the other fan will be regulated to provide a constant air flow.

Boosted Air Flow

To activate the function, see Subsection 6.2.2.

The control equipment controls the speed of the fans between two flow rates on receiving input signals from

an external sensor (e.g. air quality sensor).

The basic air flow can be preset in the High-speed menu (section 5.5.2). Max. air flow can be preset in the Max-speed menu (Subsection 5.5.3).

During periods when the fans are set to run at low speed, such as at night, the forcing (boosted air flow) function will not have any effect.

The supply air fan, exhaust air fan or both fans can be operated in the forced air flow mode (Subsection 6.2.3). If only one of the fans is selected for forcing (boosted air flow), the other will be regulated to provide a constant air flow.

7.13 Accessing the Service Level

This level can only be reached after a special authorisation code has been entered. Its use is only intended for PM-LUFT service technicians or other technicians trained by PM-LUFT.

The following functions can be modified and set.

- The limit values for presetting the set points.
- Set points and the curves of specific functions can be altered.
- The calibration of temperature sensors.
- The calibration of pressure transmitters.

7.14 Communication

The GOLD can be connected to a master system, either across external inputs and outputs or with a GOLD LON adapter across a LonWorks network.

7.15 Recooling the Reheater

If the reheater is switched out, the fans will operate for 3 minutes at min. airflow speed to cool off the air heater, even if a stop order is keyed on the hand-held terminal.
RECOOLING will flash on the second line in the display.

7.16 Supply Air Flow Regulation to Min. Set Point

Supply airflow control to the minimum set point is linked as the final stage in the heat control sequence. Whenever heating is required, the heat exchanger will first start up. The air reheater, if fitted, will be switched in and its output will be modulated to max. If the air temperature sensed by the supply air sensor is still too low, the control system will decelerate the supply air fan. This will regulate the flow of supply air down to the minimum set point.

Only the supply air flow can be regulated in this manner. The purpose of this function is to alter the relationship between the supply air and the exhaust air flows in order to enhance the efficiency of the heat exchanger. The correct supply air temperature is given precedence over the programmed air flow.

This function regulates the supply air flow from the current programmed flow rate (high speed or low speed operation), down to half of this flow rate. The function is also limited by the min. flow setting of the unit. If the low speed air flow setting is close to the min. flow rate, regulation to the min. set point will have little effect.

Prerequisites for enabling this function:

Fan regulation must be set at FLOW. The supply air flow cannot be regulated to the min. set point if the unit is set at VAV or FORCING.

Temperature regulation must be set at SA or ERS regulation. The supply air flow cannot be regulated to the min. set point if Exhaust Air Regulation has been selected.

8. Alarms

Alarms are displayed in plain text in the terminal display. A red flashing lamp in button no. 4 on the hand-held terminal also indicates an alarm.

A typical alarm text in the display menu:

***** ALARM 24 *****
SUPPLY AIR FILTER
DIRTY

Explanation of the alarms

All the alarm texts for Alarms 1 through 48 are described and the following information is given about them on the next pages:

Group A or group B alarms:
Group A alarms: The air handling unit is shut down.

Group B alarms: The AHU continues to operate.

Resetting the alarms:
"Must be manually reset" implies that the RES button on the hand-held terminal must be pressed after the fault has been corrected, unless otherwise specified.

"Resets itself automatically" implies that the alarm will reset itself as soon as the fault has been corrected.

Delay:
Delay impies that the alarm will not immediately trip when a fault is registered, but after it has existed for a specific period or has reoccurred a certain number of times.

Remedial action:
The cause of the alarm and, if possible, a few simple fault tracing points to check are displayed.

Caution! *If the fault still cannot be corrected, get in touch with PM-LUFT Service.*

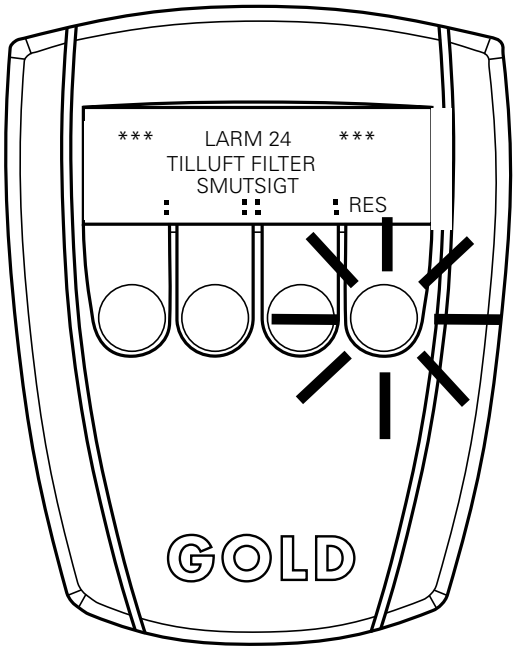
Alarms can be interrupted while faults still remain. If buttons no. 1, 2 and 3 are all pressed at the same time while an alarm is displayed, this will delay the alarm for up to 4 minutes. The operator will then have time to enter the function menu group and block the alarm, making it easier to trace the fault.

The alarm delay will automatically return to normal.

Other particulars:
The alarms are not activated in the programming menus.

The fire alarm is the only alarm that is active in all the menu images. The other alarms are active only in the in the main images.

For particulars of how to block alarms, see 6.2.11.



Hand-held terminal with flashing alarm lamp

Alarm blocks

Some of the alarms that are divided into groups can be blocked.

ALARM BLOCK 1 (Communication): Alarm no. 1

ALARM BLOCK 2 (Temperature sensor): Alarm nos. 5 – 9

ALARM BLOCK 3 (Temp. min/max limits): Alarm nos. 10 – 13

ALARM BLOCK 4 (Frequency converter): Alarm nos. 41 – 42

ALARM BLOCK 5 (Reheater): Alarm nos. 22 – 23

ALARM BLOCK 6 (Flow): Alarm nos. 26 – 29

ALARM BLOCK 7 (Heat exchanger): Alarm nos. 30 – 32

ALARM BLOCK 8 (Filters): Alarm nos. 24 – 25

Alarm 1
SWITCHING CLOCK RELEASED

Group A alarm. Resets itself automatically. Delayed 10 times. Trips if communication with the internal clock circuit hasn't been established after 10 attempts.

Alarm 5
OUTDOOR TEMP SENSOR DEFECT

Group A alarm. Resets itself automatically. Delayed 3 seconds. The temperature sensor has been damaged or has measured a temperature below –70°C or above +100°C.

Alarm 6
SA TEMP SENSOR DEFECT

Group A alarm. Resets itself automatically. Delayed 3 seconds. The temperature sensor has been damaged or has measured a temperature below –70°C or above +100°C.

Alarm 7
EA TEMP SENSOR DEFECT

Group A alarm. Resets itself automatically. Delayed 3 seconds. The temperature sensor has been damaged or has measured a temperature below –70°C or above +100°C.

Alarm 8
ANTI FR G SENS DEFECT

Group A alarm. Resets itself automatically. Delayed 3 seconds. Trips if a water coil is connected, the anti-frosting monitor is activated and the transducer input senses a value below -70°C or above +100°C.

Alarm 9
CONTROL CARD SENSOR FAULTY

Group A alarm. Resets itself automatically. Delayed 3 seconds. Trips if the transducer input senses a value below -37°C or above 120°C.

Alarm 10
TEMPERATURE BELOW ALARM LIMIT

Group A alarm. Must be manually reset. Delayed 20 min. Trips if the exhaust air fan motor is running and the exhaust air transducer senses a temperature below the alarm limit (factory preset at 15°C). The MIN EA TEMP can be preset under FUNC.

Alarm 11
TEMPERATURE BELOW SET VALUE

Group A alarm. Must be manually reset. Delayed 20 min. Trips if the supply air fan motor is running and the supply air transducer senses a temperature below the alarm limit (factory preset at 5°C). The TEMP BELOW SA SETP can be preset under FUNC.

See Subsection 9.2.3 To clean the heat recovery system.

Alarm 12
CONT CARD SENS BELOW ALARM LIMIT

Group A alarm. Resets itself automatically. Delayed 20 min. Trips if the sensor on the control circuit board senses a constant temperature below 0°C. Resets itself and starts the unit when the temperature has risen above zero. Occurs only after a power failure of long duration.

Alarm 13
CONT CARD SENS ABOVE ALARM LIMIT

Group A alarm. Must be manually reset. Delayed 20 min. Trips if the sensor on the control circuit board senses a constant temperature above 60°C.

Alarm 22
ANTI FR G W COIL RELEASED

Group A alarm. Must be manually reset. Delayed 3 seconds. Trips of a water coil is connected, the anti-frosting monitor function is activated and the anti-frosting monitor senses a temperature below 7°C.

Check the water temperature and the water flow rate.

Alarm 23
HIGH TEMP EL HEATER RELEASED

Group A alarm. Must be manually reset. Delayed 3 seconds. Trips if an electric air heater is connected and transducer input senses an "interruption". This interruption arises if the overheating protection has tripped or if no power is supplied to the air heater.

Find the cause of the fault and remedy it. If the overheating protection has tripped, it must be reset at the air heater as well.

Alarm 24
SUPPLY AIR FILTER DIRTY

Group B alarm. Must be manually reset. Delayed 3 seconds. Trips if the amount of dust collected in the filter has exceeded the alarm limit (FILTER STATUS NOW exceeds ALARM LIMIT). The flow pressure is measured at fan test rpm. The alarm can also trip if the unit is new and the ducting system hasn't been calibrated.

Check the filters. Fit new filters if required. If new filters have recently been fitted, also check whether the ducting system needs cleaning. If the ducting wasn't calibrated when the air handling system was commissioned, calibrate the ducting.

See Subsections 6.2.16 and 9.2.2.

Alarm 25
EXHAUST AIR FILTER IS DIRTY

For an explanation and remedial measures for the exhaust air filter, see Alarm 24 for the supply air filters.

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Alarm 26
SA FLOW BELOW SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the SA fan motor is running and the flow is constantly less than 90% of the set point.

Check that the flow rate selected isn't too high in relation to the pressure drop in the ducting. Check the condition of the hoses to the supply air pressure meters and whether the SA fan and motor are running correctly. Check whether the modulation and the pressure are synchronized. See under TEST in Subsection 6.3.1.

Alarm 27
SA FLOW ABOVE SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the SA fan motor is running and the flow is constantly more than 110% of the set point.

Check the condition of the hoses to the supply air pressure meters and whether the supply air fan motor is running correctly. See also Section 7.16.

Alarm 28
EA FLOW BELOW SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the EA fan motor is running and the flow is constantly 10% less than the set point.

Check that the flow rate selected isn't too high in relation to the pressure drop in the ducting. Check the condition of the hoses to the exhaust air pressure meters and whether the EA fan and motor are running correctly. Check whether the modulation and the pressure are synchronized. See under TEST in Subsection 6.3.1.

Alarm 29
EA FLOW ABOVE SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the exhaust air fan motor is running and the flow is constantly 10 % more than the set point.

Check the condition of the hoses to the exhaust air pressure meters and whether the supply air fan motor is running correctly. See also Section 7.16.

Alarm 30
ROTATION GUARD RELEASED

Whenever a heat exchanger test is carried out, a type A or type B alarm will be initiated, depending on the outdoor air temperature at the time of the test. If the outdoor air temperature is lower than 0 °C, a type A alarm will be initiated and if the outdoor air temperature is above 0 °C a type B alarm will be initiated. Must be manually reset. Delayed 3 seconds. Trips if the supply air temperature hasn't dropped by 5°C within 10 minutes during the test.

Check the condition of the drive belt, the heat exchanger motor and the flow rate.

Alarm 31
HEAT EX SPEED BELOW SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the heat exchanger motor is running and its rpm is constantly 20% below the set point.

See Subsection 9.2.3 To clean the heat recovery system.

Alarm 32
HEAT EX SPEED ABOVE SET VALUE

Group B alarm. Must be manually reset. Delayed 4 min. Trips if the heat exchanger motor is running and its rpm is constantly 20% above the set point.

Alarm 41
SA FAN MOTOR TRIPPED

Group A alarm. Must be manually reset. Delayed 10 seconds. Trips if the group alarm relay in the supply air fan motor has tripped.

Check whether the motor cables are correctly wired and whether 400 V power is supplied to the motor. Also check the 24 V power supply.

Alarm 42
EA FAN MOTOR TRIPPED

Group A alarm. Must be manually reset. Delayed 10 seconds. Trips if the group alarm relay in the exhaust air fan motor has tripped.

Check whether the motor cables are correctly wired and whether 400 V power is supplied to the motor. Also check the 24 V power supply.

Alarm 43
INT FIRE ALARM RELEASED

Group A alarm. Must be manually reset. Delayed 3 seconds. Trips if INTERNAL FIRE PROTECTION is activated and the supply air temp. sensor senses a temperature above +70°C or the exhaust air transducer senses a temperature above +50°C.

Alarm 44
EXT FIRE ALARM RELEASED

Group A alarm. Must be manually reset. Delayed 3 seconds. Trips if the external fire alarm input between terminals 14 and 15 has been opened.

Check the fire and smoke detector, if necessary.

Alarm 46
SERVICE ALARM FIRE RELEASED

Group B alarm. Must be manually reset. Delayed 3 seconds. Trips if the normally open contact between terminals 16 and 17 closes.

Alarm 47
SERVICE PERIOD ABOVE ALARM LIMIT

Group B alarm. Must be manually reset. Delayed 3 seconds. Trips when the preset time-remaining countdown until the next service visit has reached 0.

Press the RES button to reset the alarm for 7 days. Call a service technician who on having completed servicing will enter a new time (months remaining until the next visit).

Alarm 48
S-CL FUNCTION FAULTY

Group A alarm. Resets itself automatically. Delayed 3 seconds.

Check that thermal fuse on the 24 V-trafo hasn't tripped.

9. Maintenance

The safety precautions are given in Section 2.

9.1 To change filters

9.1.1 General

If a filter alarm has been activated, the filters must be replaced.

The filters are disposable and must be replaced with new Class F7(F85) bag filters.

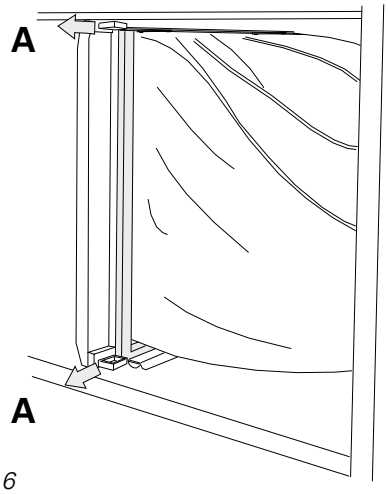


Fig. 6

9.1.2 To remove the filters

> **WARNING!** First stop the unit by pressing the STOP button on the hand-held terminal.
> Then open the safety isolating switch to isolate the power supply to the unit!

- Wait until the fans have stopped rotating before you open the inspection doors (to avoid overpressure).
- Open the inspection door of the filter/fan section.
- Pull the handles (**A** in Fig. 6) at the upper and lower edges of the filter mounting bracket outward, to open the off-centre guide.
- Remove the filters.

It is advisable to clean inside the filter section before new filters are fitted. See Section 9.2.2.

Sizes 11/12: Make sure that there is a vertical sealing strip that seals between the two filters.

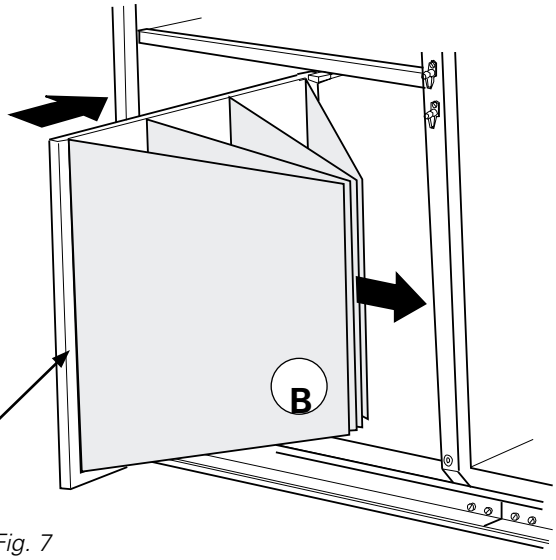


Fig. 7

9.1.3 To fit new filters

- Fit new filters.

  Replacement filters (set):
  For the size 11/12 GOLD units: TBFZ-1-01-10-7
  For the size 21/22 GOLD units: TBFZ-1-01-20-7
  For the size 31/32 GOLD units: TBFZ-1-01-30-7.

  CAUTION! When inserting new filters, it's important to stretch the filter bags (**B** in Fig. 7), so they won't catch, become damaged or fold.
- Push each filter frame as far as you can into the section. Slightly press the filter frames to make them fit tightly against one another.
- Push in the handles (**C** in Fig. 8) at the upper and lower edges of the filter mounting bracket, to close the off-centre guide.
- Close the inspection door of the filter/fan section.
- Press the AUTO or MAN button on hand-held terminal to start the unit.
- **ALWAYS CALIBRATE THE DUCTING SYSTEM AFTER FITTING NEW FILTERS. See Section 6.2.16.**

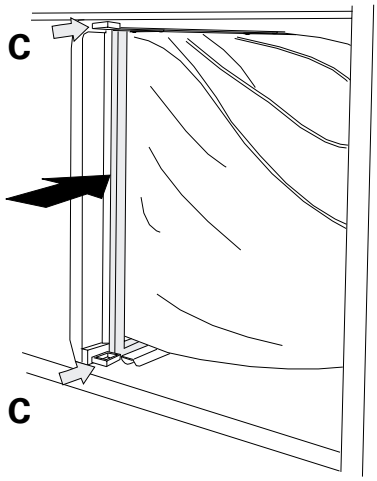


Fig. 8

9.2 Cleaning

WARNING! Before cleaning:
First stop the unit by pressing the STOP button on the hand-held terminal.
Then open the safety isolating switch to isolate the power supply to the unit!

9.2.1 General

Clean the inside of the unit whenever needed.

Check the unit every time you change the filters or at least once every six months.

9.2.2 To clean the filter space

Clean the surfaces inside the filter section whenever you remove the old filters to replace them, as described in Subsection 9.1.2.

- Stop the air handling unit and then open the safety isolating switch.
- Wait until the fans have stopped rotating before you open the inspection doors (to avoid overpressure).
- Open the inspection door of the filter/fan section.
- Vacuum clean the surfaces inside the filter section.

9.2.3 To clean the heat recovery system

- Stop the air handling unit and then open the safety isolating switch.
- Wait until the fans have stopped rotating before you open the inspection doors (to avoid overpressure).
- Open the inspection door of the filter/fan sections.
- The heat recovery system should preferably be vacuum cleaned using a soft nozzle, so as not to harm the rotor surfaces.

  Clean the rotor surfaces from the filter spaces. Rotate the rotor by hand to reach all around it.

  If the rotor is clogged, blow it clean with compressed air.
- To check and clean the leather fabric seal (sizes 11/12): Lift up the edge of the leather fabric and check the underside. If it is in need of cleaning, turn the edge of the leather fabric up over the rotor, brush it clean and then turn it back.

  If the leather fabric is worn or extremely dirty, replace it. Do not lubricate the leather fabric seal.
- Checking the belt tension:
  If the belt feels slack or worn, and if it slips whenever it meets slight resistance, get in touch with service technicians trained by PM-LUFT.
- Check that the rotor faultlessly rotates in its direction of rotation, indicated by the arrow on the label.

Should the need arise, the rotor can be withdrawn out of the unit. This must only be done by service technicians trained by PM-LUFT.

If the rotor has been withdrawn out of the unit, it can be washed in a solution containing a degreasing agent that will not corrode its aluminium foil structure. We recommend using PM-LUFT cleaning compound sold by PM-LUFT Service.

9.2.4 To clean the fans

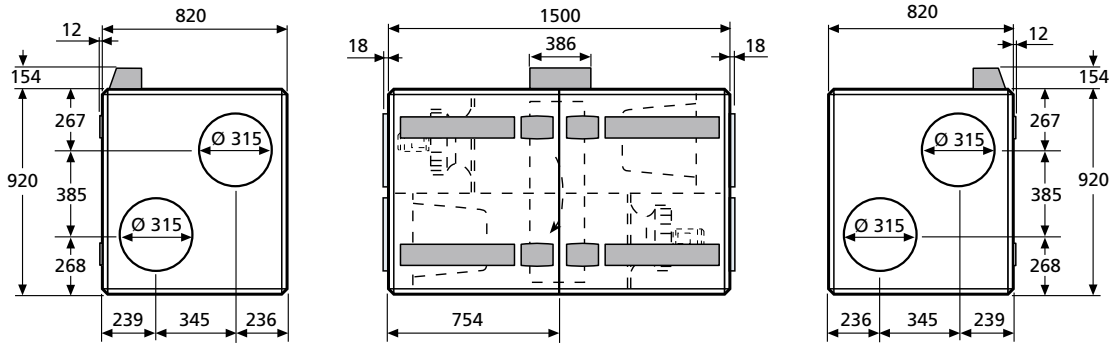
Cleaning

- Stop the air handling unit and then open the safety isolating switch.
- Wait until the fans have stopped rotating before you open the inspection doors (to avoid overpressure).
- Open the inspection door of the filter/fan section.
- Preferably vacuum clean the impeller surfaces .
- Remove any dirt deposits on the impeller blades.
- Check that the impellers aren't out of balance.
- Vacuum clean the fan motor or brush it clean. It can also be cleaned by carefully wiping it with a damp cloth that has been dipped in a solution of water and dish washing detergent.

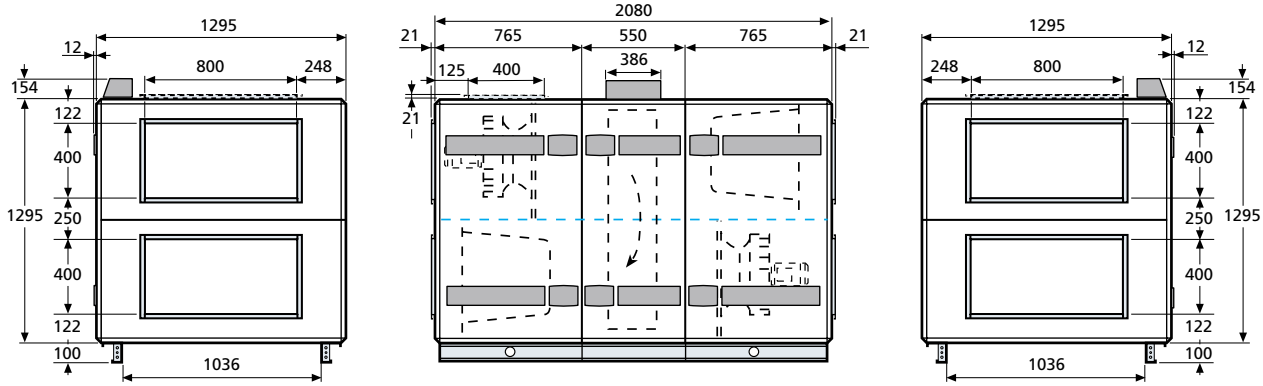
10. Technical Data

10.1 Dimensions

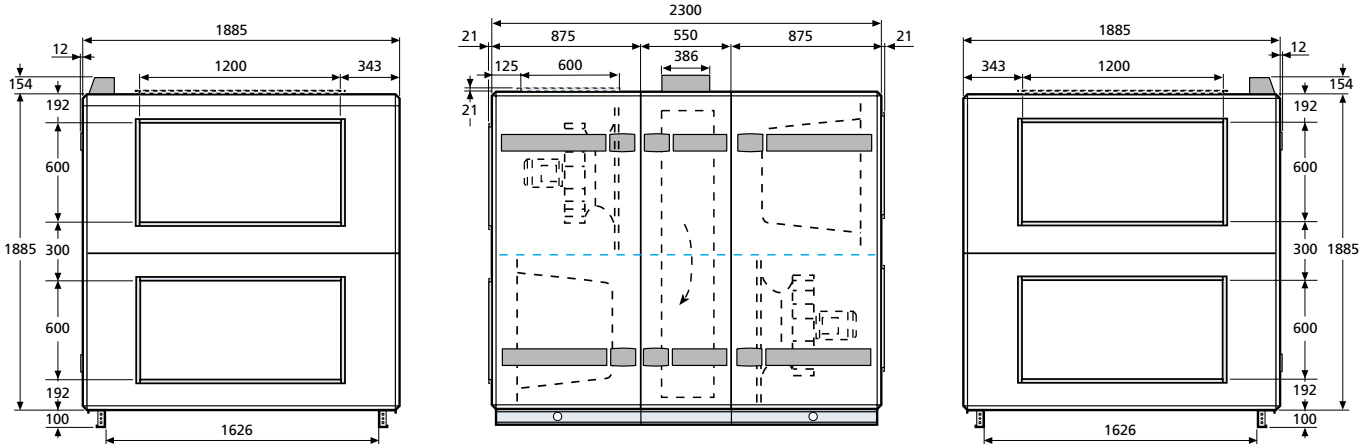
Sizes 11/12



Sizes 21/22



Sizes 31/32



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10.2 Electrical Data

Air Handling Unit

The electrical connections and the wiring of external functions must be carried out across the junction box on top of the air handling unit.

CAUTION! To be carried out by a qualified electrician.

The power supply required is as follows:

GOLD 11: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 10 AT.
GOLD 12: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 10 AT.
GOLD 21: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 16 AT.
GOLD 22: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 16 AT.
GOLD 31: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 25 AT.
GOLD 32: 3-phase, 5-wire, 400 V ±10%, 50 Hz, 32 AT.

Fans

GOLD 11: 3 x 400 V, 50 Hz, 0.55 kW
GOLD 12: 3 x 400 V, 50 Hz, 1.1 kW
GOLD 21: 3 x 400 V, 50 Hz, 1.5 kW
GOLD 22: 3 x 400 V, 50 Hz, 2.2 kW
GOLD 31: 3 x 400 V, 50 Hz, 4.0 kW
GOLD 32: 3 x 400 V, 50 Hz, 5.5 kW

Heat recovery section

GOLD 11/12: Drive motor: 1 x 230 V, 25 W, 50 Hz, 1.2 µF.
GOLD 21/22: Drive motor: 1 x 230 V, 40 W, 50 Hz, 2.0 µF.
GOLD 31/32: Drive motor: 1 x 230 V, 70 W, 50 Hz, 6.0 µF.

Electrical cubicle

Safety isolating switches:

Sizes 11/12	**25 A**
Sizes 21/22	**25 A**
Sizes 31/32	**40 A**

Fuses in the electrical cubicle inside the unit casing:

Sizes 11/12	None
Sizes 21/22	Two 3-pole, 6 A fuses (for the fans) One 1-pole, 10 A fuse (for control + h. exch.)
Sizes 31/32	Two protective motor switches 10–16 A (Fans in size 31 units, setting: 10 A) (Fans in size 32 units, setting: 12 A) One 1-pole, 10 A fuse (control + h. exch.)

Fuses on the power circuit board in the electrical cubicle inside the air handling unit:

F1	2 AT	Heat exchanger motor
F2	63 mAT	Control

Control System

The control system is completely integrated into the air handling unit. The microprocessor-based equipment controls and regulates all the motors, temperatures, air flows and other functions. A large number of functions are incorporated in the system and can easily be activated.

The air handling unit is designed to be automatically controlled between stop and the operating modes (stop, low speed and high speed) across the integrated switching clock function. The unit can also be operated manually.

Control inaccuracy:

Temperature ± 1°C.
Air flow ± 5%.

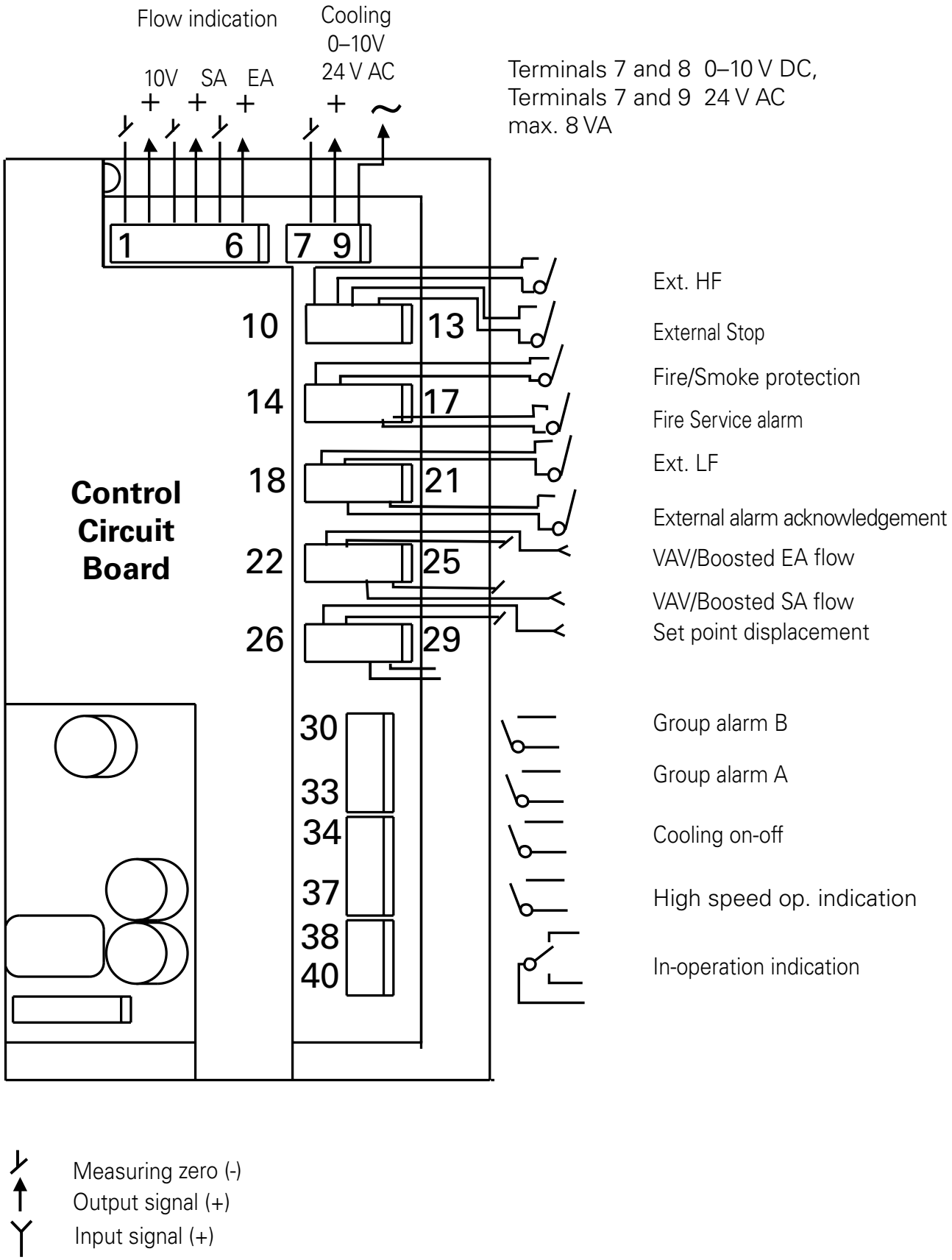
Power efficiency

The design and performance of the air handling unit enable it to meet the demand on maximum permissible power-efficiency of 2.5 kW per m^3/s.

EMC

The air handling unit meets the provisions of the EMC Directive and has been tested in accordance with EN 50081-1 and EN 61000-6-2.

10.3 Wiring Diagram, sizes 11-32



Measuring zero (-)
Output signal (+)
Input signal (+)

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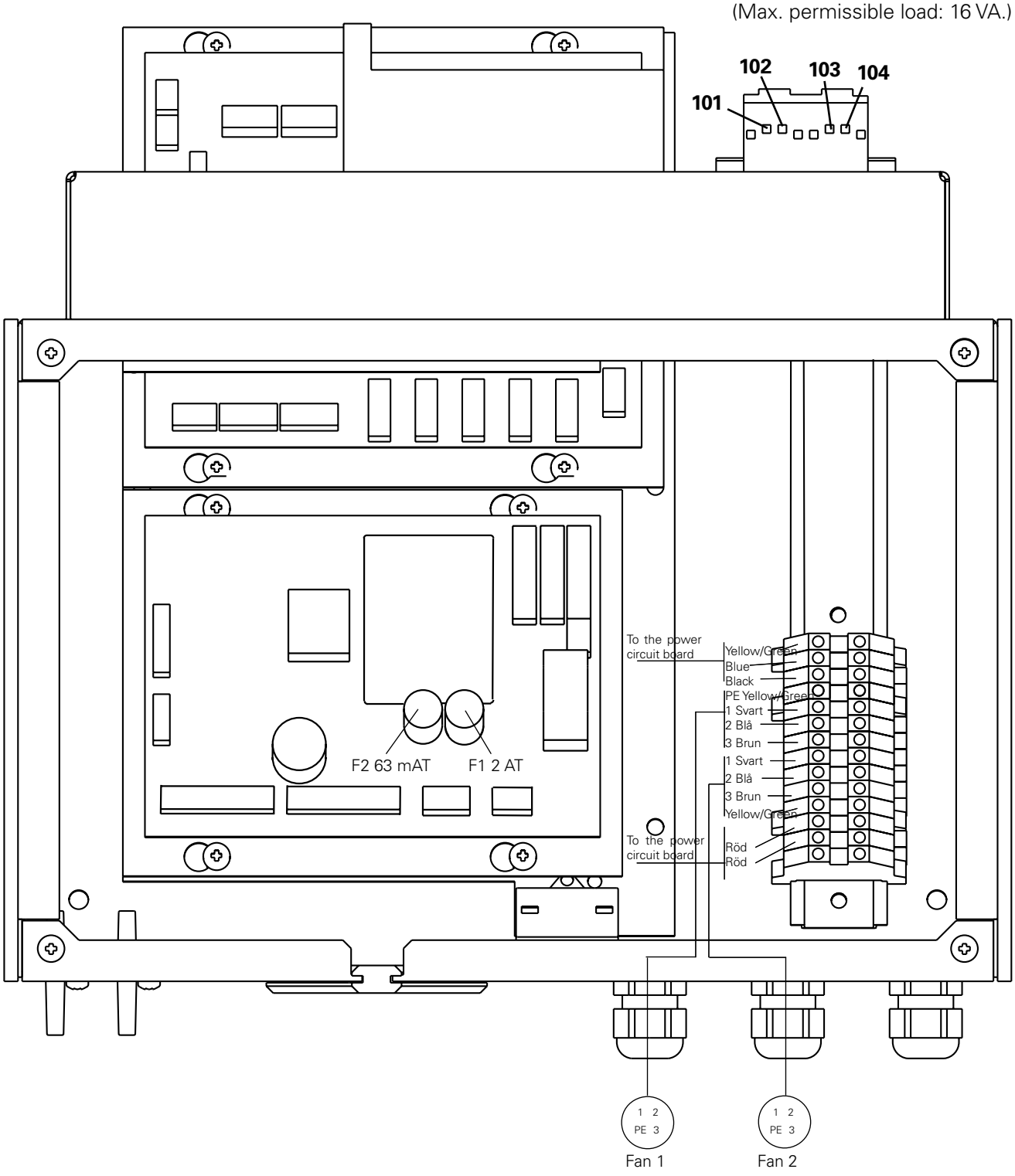
10.4 Electrical Cubicle containing the Control Circuit Board, etc., sizes 11/12

230 V, 24 V at terminals
<u>230 V</u>
Terminals 101 (N) and 102 (phase)
<u>24 V</u>
Terminals 103 (G0) and 104 (G).
(Max. permissible load: 16 VA.)



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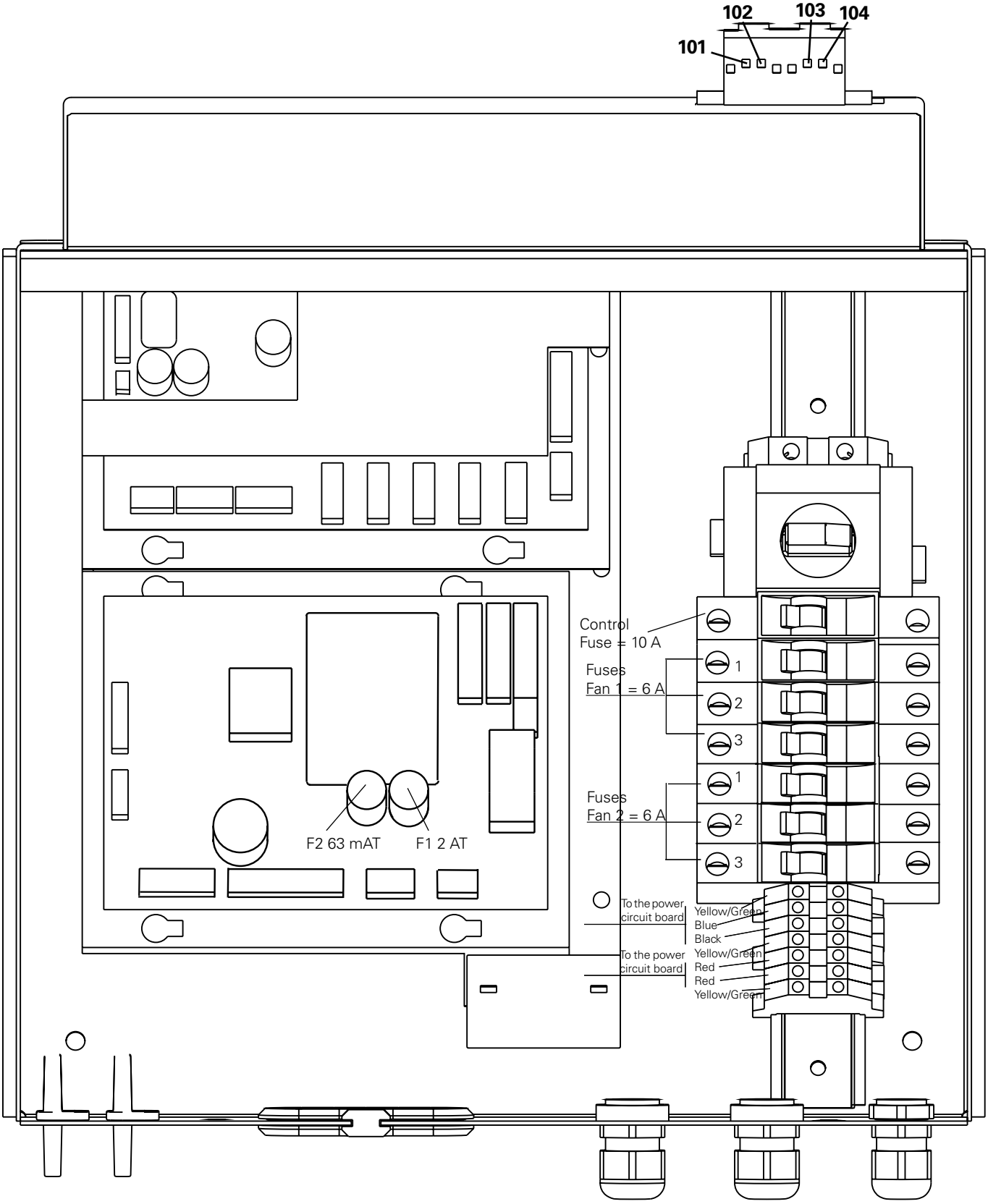
10.5 Electrical Cubicle containing the Control Circuit Board, etc., sizes 21/22

230 V, 24 V at terminals
230 V
Terminals 101 (N) and 102 (phase)
24 V
Terminals 103 (G0) and 104 (G)
(Max. permissible load: 16 VA.)



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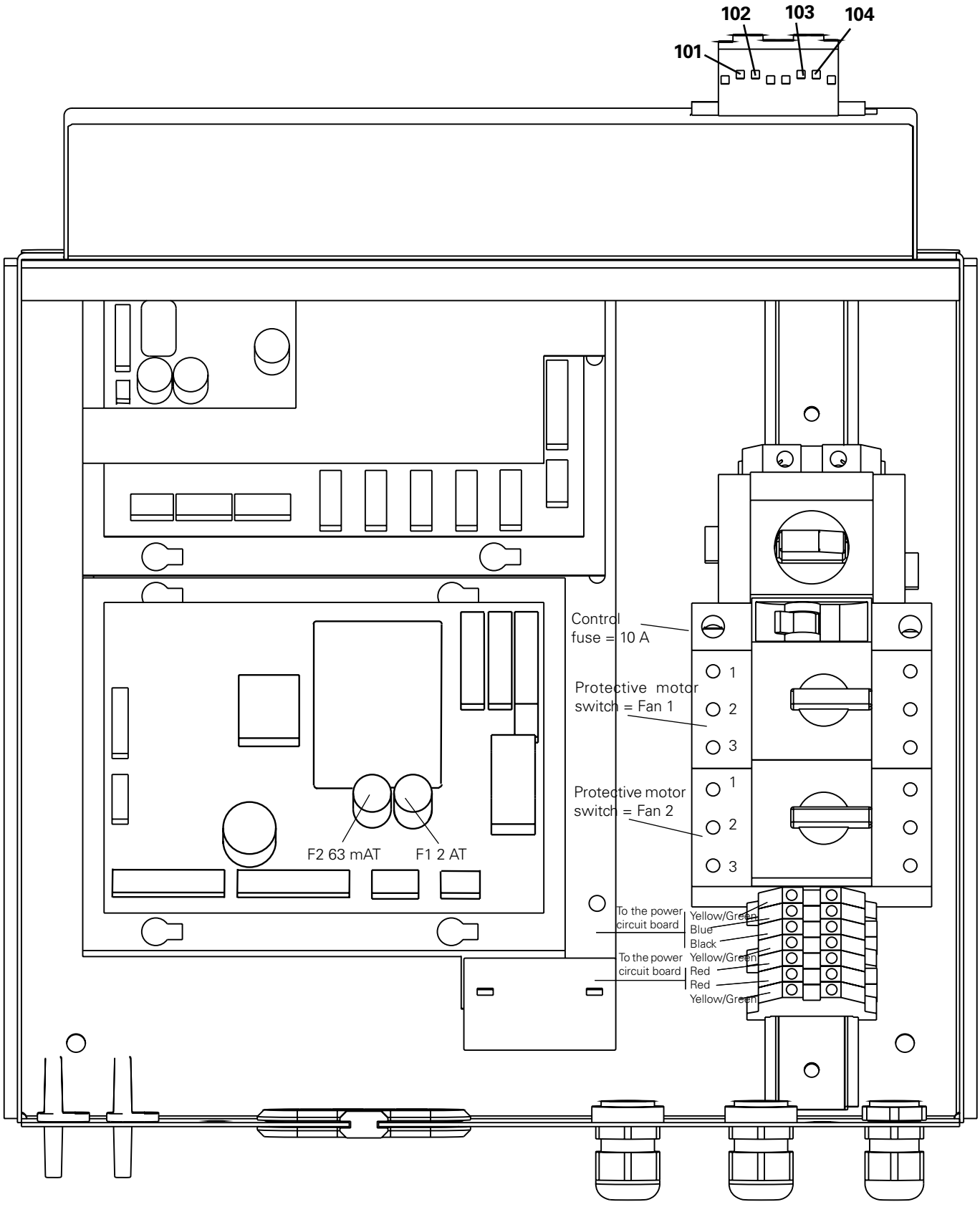
10.6 Electrical Cubicle containing the Control Circuit Board, etc., sizes 31/32

230 V, 24 V at terminals
230 V
Terminals 101 (N) and 102 (phase)
24 V
Terminals 103 (G0) and 104 (G)
(Max. permissible load: 16 VA.)



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10.7 Cable connections, sizes 11-32