

CONTROLPRO



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INTRODUCTION

ControlPro is an intelligent platform that controls a filter system MDB PRO, SCS PRO, MDB-Diluter PRO or SCS-Diluter PRO and the connected extraction fan. It contains an extensive feature package to monitor and arrange the RamAir™ pulse amplifier (filter cleaning system), the required airflow and the corresponding fan speed. By means of the user-friendly HMI you can program all desired parameters. The HMI gives a clear insight into the system status and performance at all times.

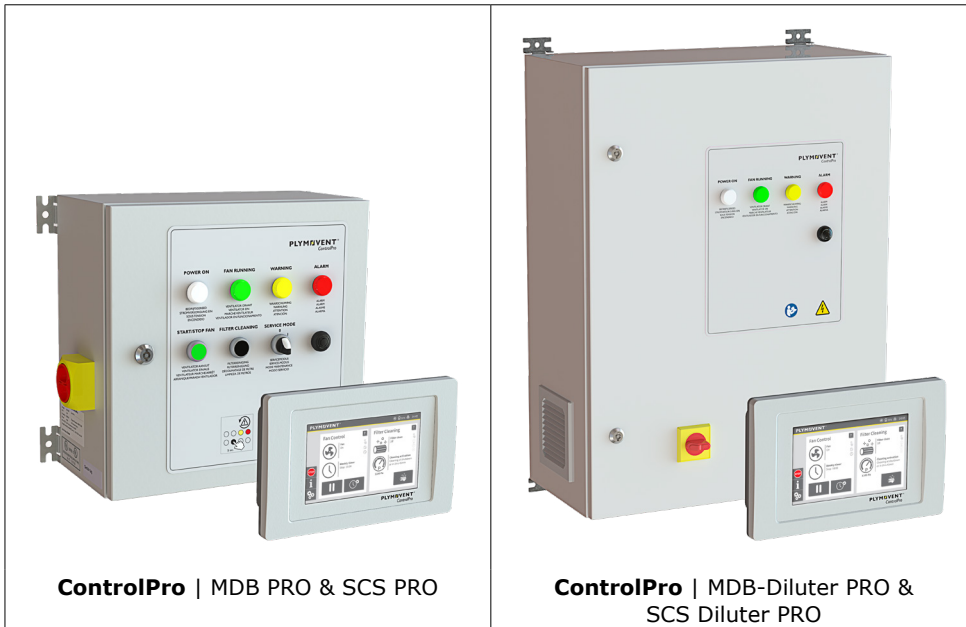


Fig. 0.1 ControlPro/Panel + ControlPro/HMI

Depending on the specific configuration and system settings on the HMI, you can activate the fan and cleaning system manually or have the entire system run fully automatically.

ControlPro allows for remote access via an ethernet connection.

In this manual	Means
Panel	ControlPro/Panel
HMI	ControlPro/HMI
Command: select	click on
	touch
	press

! In this manual we presume that all relevant settings were made in the Installation Wizard during commissioning of the system.

! For specific settings beyond the scope of this manual – and any other questions – contact your supplier.

! The online user manual ControlPro supplies extensive explanation (in English language): www.plymovent.com/manuals/controlpro

1 CONTROLPRO/PANEL





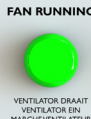



Fig. 1.1 ControlPro/Panel [Panel] of MDB PRO and SCS PRO






ControlPro/Panel [Panel] of MDB-Diluter PRO & SCS-Diluter PRO:
The buttons START/STOP FAN, FILTER CLEANING and SERVICE MODE are located on the inside of the Panel.





1.1 Controls and indicators

○ LED off * LED blinking ● LED on

Control / indicator	Description	Functionality
	Main switch	To energize and de-energize the Panel and HMI
	White LED POWER ON	<ul style="list-style-type: none"> ○ system is off * system is starting up ● system is ready
	Green LED FAN RUNNING	<ul style="list-style-type: none"> ○ fan is off * fan is ramping down ● fan is running
	Yellow LED WARNING	<ul style="list-style-type: none"> ○ no problem ● refer to the HMI for the cause of the warning [refer to section 7.1.1 for a list of possible warning codes]
	Red LED ALARM	<ul style="list-style-type: none"> ○ no problem ● refer to the HMI for the cause of the alarm [refer to section 7.2.1 for a list of possible alarm codes]
	Green button START/STOP FAN	To start and stop the fan manually [This button is disabled when the Homescreen is locked; refer to section 4.5]

Control / indicator	Description	Functionality
	Black button FILTER CLEANING	<p>To activate an additional filter cleaning cycle</p> <p>To suppress the buzzer (push and hold for 5 seconds)</p> <p><i>[This button is disabled when the Homescreen is locked; refer to section 4.5]</i></p>
	Rotary switch 0-I SERVICE MODE	<p>0: normal mode</p> <p>I: to lock the touch screen of the HMI for service purposes</p>
	Buzzer acoustic signal	<p>Together with the ALARM signal</p> <p>In some cases: together with the WARNING signal</p>

Two functions of the Panel are similar to the functions on the HMI: both can be operated either via the Panel or the HMI.

Panel	Equals to	HMI
	=	
	=	



2 CONTROLPRO/HMI







Fig. 2.1 ControlPro/HMI [HMI]

2.1 General buttons

The table below contains an overview of the main buttons in the graphical user interface of the ControlPro/HMI.

Button	Function/action
	To enable/disable a certain function; - pressed: status is active - suppressed: status is inactive <i>In this example Enabled is selected</i>
	Select the question mark for additional information and explanation

Button	Function/action
	Edit; select this button to open a list box
	Return to the previous screen
	Numeric keypad to select numbers, such as: - enter a PIN - go to a sub-menu - enter other values
	Empty input (clear all) Return to the previous screen (backspace) Enter the input (save/confirm)



Inactive buttons are always dimmed, which means that the button is not available or cannot be selected.

2.2 Homescreen

The **Homescreen** is the main operational window of the HMI and shows the current status of the **fan** and the **filters**, what is actual or which action is coming up.

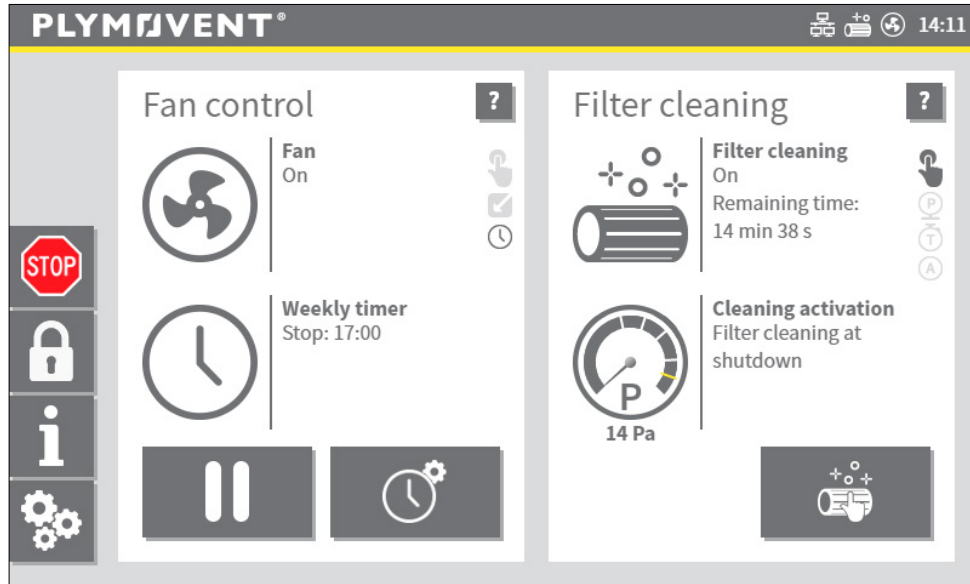


Fig. 2.2 Homescreen

The Homescreen consists of the following bars and windows, that are explained in the subsequent paragraphs:

- 2.2.1 STATUS bar | page 7
- 2.2.2 MENU bar | page 8
- 2.2.3 FAN CONTROL status window | page 9
- 2.2.4 FILTER CLEANING status window | page 10

LOCK MODE

Lock mode for Homescreen is an optional function, to prevent unauthorized use of several options at the Homescreen.

To enable the Lock mode, refer to section 4.5.

2.2.1 STATUS bar

The status bar displays the actual information of some important statuses on top of the window. The icons on the status bar are visible at all times¹.

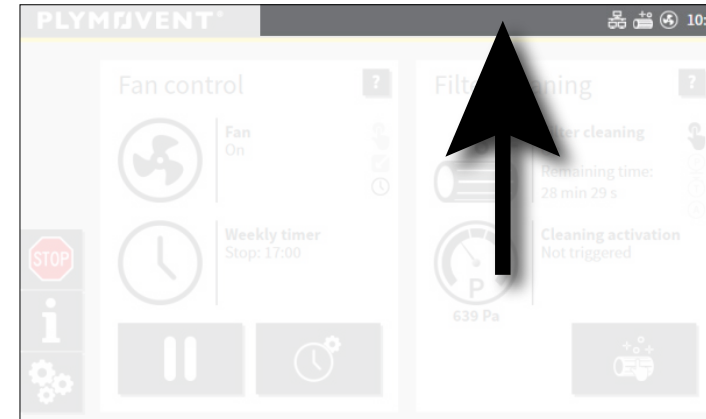



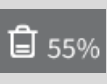


Fig. 2.3 Status bar

Possible icons on the status bar:

Icon	Means	Action needed
	WARNING and/or ALARM alert	Select the Warning or Alarm button in the <u>menu bar</u> , resolve the warning or alarm and when needed return to <u>Automatic Mode</u>
	The Homescreen locked	-
	The HMI is connected to a LAN network	-
	The filter cleaning process is running	-

¹ Except during the Installation Wizard

Icon	Means	Action needed
	The fan is running	-
	The dustbin is empty	-
	The dustbin is full	<u>Empty the dustbin</u>
	Dustbin level indication (in %)	Empty the dustbin in time (at a level of approx. 70%)

2.2.2 MENU bar

The menu bar contains buttons to navigate through sub-menus and when available, it also shows WARNING and ALARM buttons.

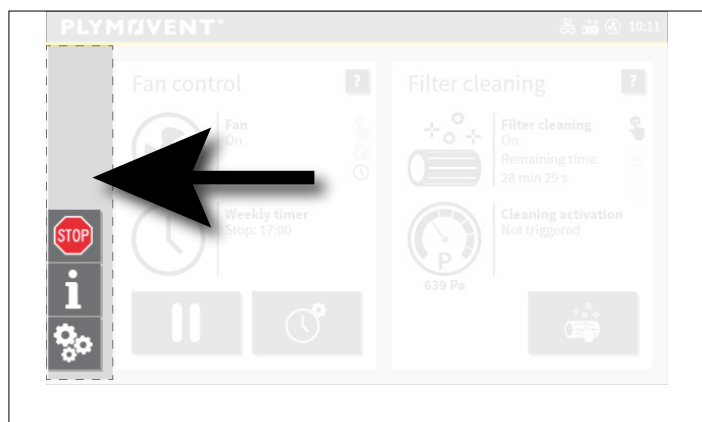









Fig. 2.4 Menu bar

Possible icons on the menu bar:

Icon	Explanation
	WARNING alert; in case of >1 alert it shows the number of alerts. Push the WARNING icon for more info. Refer to section 7.1.1 for a list of possible warning codes.
	ALARM alert; in case of >1 alert it shows the number of alerts. Push the ALARM icon more more info. Refer to section 7.2.1 for a list of possible alarm codes.
	STOP icon to immediately shut down the central filter system and switch to MANUAL mode
	To immediately lock the Homescreen. <i>[This icon is only visible when the Lock mode is enabled; refer to section 4.5]</i>
	This icon is only visible, when the Homescreen is in Lock mode. To unlock the Homescreen a PIN is required. The STOP button is not available!
	The operational information screen opens and shows the actual system status. Refer to chapter 6 for detailed info.
	To enter the Settings menu (PIN is required)

2.2.3 FAN CONTROL status window

The Homescreen shows statuses of the fan control. The statuses refer to actual settings and timers of the fan. It depends on these settings, which information appears on the Homescreen.

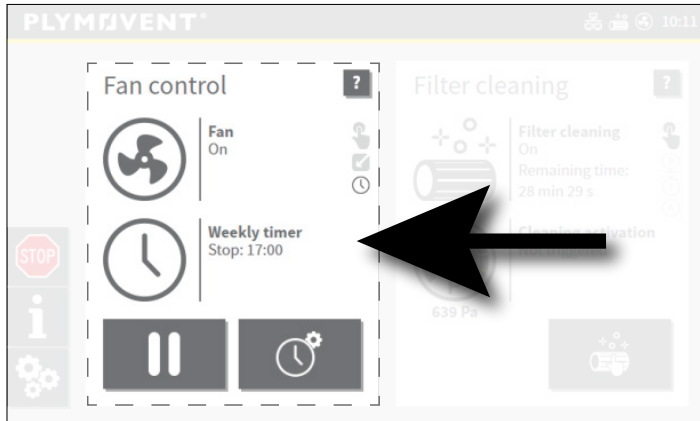



Fig. 2.5 Fan control status window





Possible icons and buttons on the fan control status window:

Icon	Fan Status	Additional info
	On	
	On Delayed stop in: #min. #s	The fan runs during set delay time after the external start/stop signal drops
	Opening sliding valves #s	SHIELD only; the fan starts after the valves are fully opened
	Ramping down #s	
	Off	
	Interrupted	Fan is stopped manually, while the weekly timer or external start signal is active

Icon	Fan trigger	Additional info
	Enabled (black): fan manually triggered Disabled (grey): not active	When more triggers control the fan, the manual trigger will be disabled. When the fan is stopped (or paused) manually, the icon remains active until the fan stops working.
	Enabled (black): external start/stop input signal trigger Disabled (grey): not active	The icon is only active when enabled in the Settings menu. The triggers External and Timer can be active at the same time, when both triggers are finished the fan will be stopped.
	Enabled (black): timer (weekly / overtime / extra) trigger Disabled (grey): not active	

Icon	Weekly timer Status	Additional info
	Stop: (dd) hr:min	Fan: On
	Next start: (dd) hr:min	Fan: Off
	Overruled by external signal	Fan: On
	Interrupted Next start: (dd) hr:min	Fan: Off Fan is stopped manually, while the weekly timer is active
	Holiday until dd:mm:yy	Fan: On
	Extra timer active Stop: (dd) hr:min	Fan: On
	Extra timer active Interrupted Next start (dd) hr:min	Fan: Off Fan is stopped manually, while the weekly timer is active
	Extra timer active Overruled by external signal	Fan: On

Icon	Weekly timer Status	Additional info
	Disabled	Fan: On/Off Weekly timer is disabled, or no time blocks are set

Button	Fan button Function	Additional info
	Start fan	
	Fan pause	Only applicable in an active time block or with an external start/stop signal (trigger)
	Stop fan	
	Add an extra timer for overtime Enable/disable the weekly timer	Refer to section 4.1.3

2.2.4 FILTER CLEANING status window

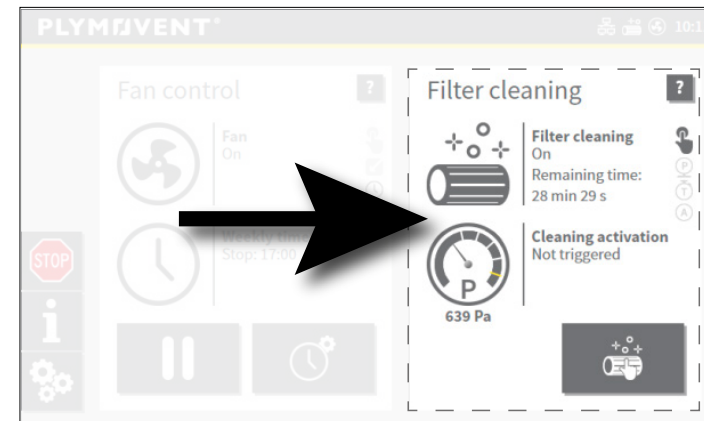










Fig. 2.6 Filter cleaning status window


Possible icons and buttons on the filter cleaning status window:

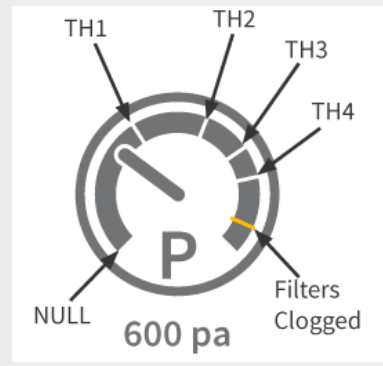
Icon	Filter cleaning Status	Additional info
	On Remaining time: hr:min	
	On Continuously	The filter pressure drop exceeds threshold level 4. The filter will be cleaned continuously until the pressure drops below the fall back pressure (automatic mode).
	On Opening sliding valves #s	Sliding valves are opening. Filter cleaning starts after the valves are fully opened (SHIELD only).
	Off	
	Off Suppressed for ##hr:##min	Filter cleaning is postponed, because new precoated filters are installed.

Icon	Filter cleaning activation trigger
	Manual
	Pressure controlled
	Timer controlled (weekly timer)
	Automatic

Icon	Filter cleaning activation	Additional info
	Filter cleaning at shutdown	
	Filter cleaning at shutdown or in ##hrs ##min	The filter pressure drop exceeds one of the threshold levels
	Continuously cleaning	The filter pressure drop exceeds threshold level 4. The filter will be cleaned continuously until the pressure drops below the fall back pressure (automatic mode).
	Next filter cleaning: (dd) hr:mm	
	Not triggered	
	Suppressed	Filter cleaning is postponed, because new precoated filters are installed.

Button	Filter cleaning button Status	Additional info
	Button active	AUTOMATIC MODE: start manual cleaning MANUAL MODE: continuously cleaning
	Button pressed	Only in MANUAL MODE

Button	Filter cleaning button Status	Additional info
	Button inactive	AUTOMATIC MODE: when manual cleaning is disabled ALARM SERVICE MODE

Pressure gauge	Additional info
	<p>The pressure gauge always shows the actual filter pressure drop via the position of the indicator (pointer). Furthermore, you can find the exact value underneath the gauge.</p> <p>Reach: between 0 (zero) and Filters Clogged</p>
<p>White marks: threshold level 1-4 Orange mark: filters clogged</p>	

3 SYSTEM MODES

3.1 AUTOMATIC mode

AUTOMATIC mode is the preferred mode. The ControlPro runs on pre-sets and timers for the fan control and the filter cleaning.

Example of the Homescreen in Automatic Mode:

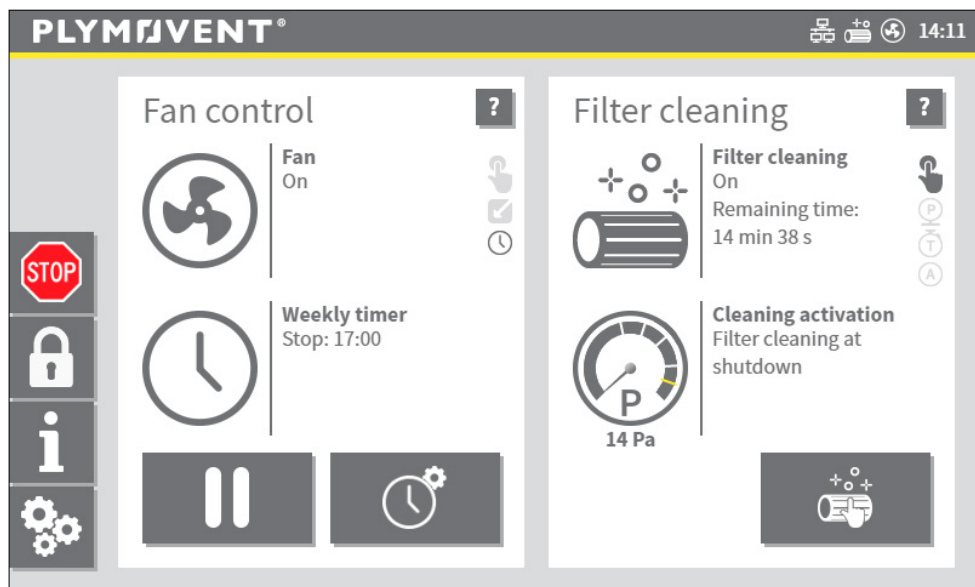


Fig. 3.1 Homescreen in Automatic Mode

3.2 MANUAL mode²

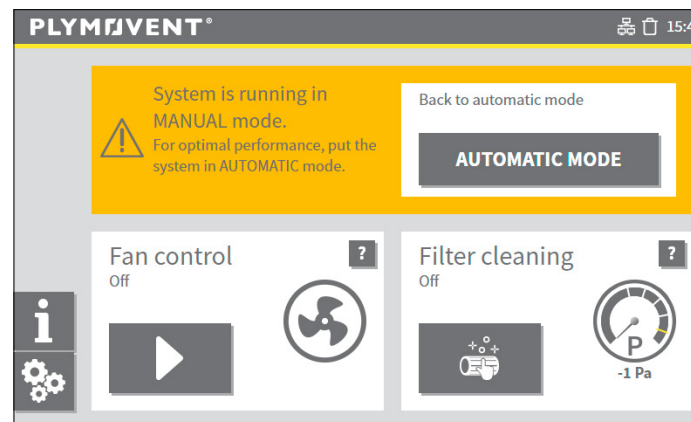


Fig. 3.2 MANUAL mode



In MANUAL Mode:

- automatic fan control is off
- automatic filter cleaning is off

Manual activated:

- **fan control** results in fan continuously on / off
- **filter cleaning control**: to switch continuous filter cleaning on / off

The HMI enters the MANUAL mode:

	- when you select the STOP button on the Homescreen
	- in case of an ALARM alert

² MANUAL Mode is also called Safety mode, when a technical, an electrical or a mechanical breakdown occurs.



In MANUAL mode all automatic controls are switched off, which means that the fan and filter cleaning will not start or stop automatically!

For safety reasons, the HMI always starts in MANUAL mode after an alarm.

AUTOMATIC MODE

Select this button to return to AUTOMATIC mode

3.3 SERVICE mode

You must put the Panel in SERVICE mode to create a safe mode for maintenance work.



Fig. 3.3 Service mode switch³

In SERVICE mode the HMI is locked, which means filter cleaning and fan control are disabled on the HMI.

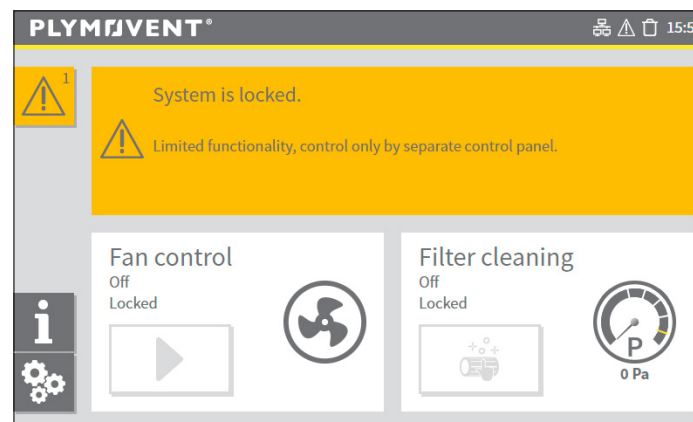


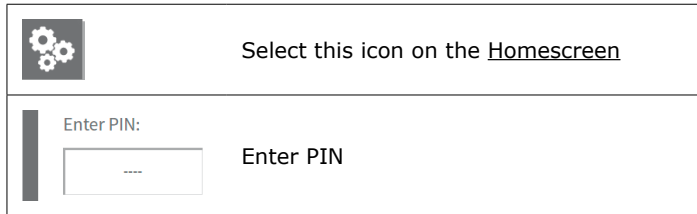
Fig. 3.4 HMI when Panel is in SERVICE mode

³ MDB-Diluter PRO | SCS-Diluter PRO: the service mode switch is located on the inside of the Panel

4 SYSTEM SETTINGS

The Settings menu provides options to change (default or factory) settings for the Fan control and Filter cleaning. The ControlPro was set up by the manufacturer with the default values. Additional specific settings were made in the [Installation Wizard](#) during commissioning of the system.

To avoid unintentional changes the Settings menu is PIN protected.



The Settings menu consists of 5 sub-menus.

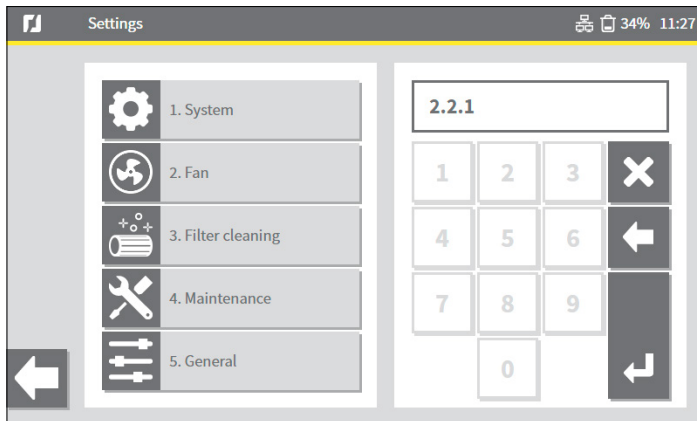


Fig. 4.1 Settings menu

From the Settings menu, you can go to a sub-menu in two different ways:

- select the menu button on the left, subsequently select the sub-menu
- type the sub-menu number on the numeric keyboard on the right side of the status window



Most settings are fixed and must not be changed, unless the system configuration has changed.



To prevent unauthorized actions on the [Homescreen](#), an option is to lock the Homescreen with an extra password. Refer to section 4.5.

4.1 Fan settings | menu 2

The Fan menu consists of three sub-menus in which you can set timer options for the fan;

- 2.1 Weekly timer fan; refer to section 4.1.1
- 2.2 Fan control⁴
- 2.3 External start/stop signal; refer to section 4.3

A brief summary on the left side of the status window shows some of the actual settings of the current menu.

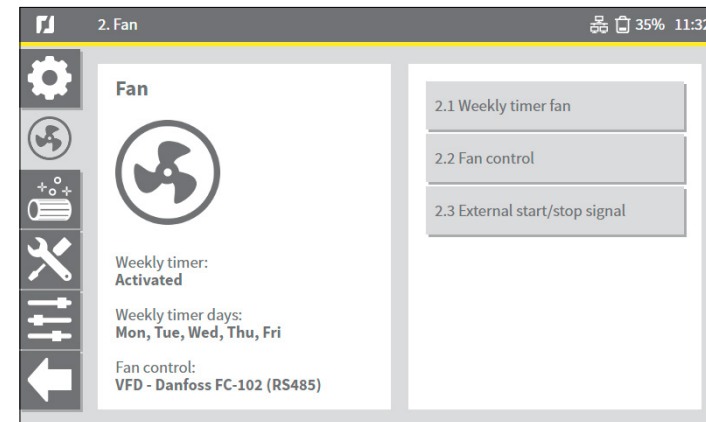


Fig. 4.2 Fan menu

⁴ The type of fan control is already set in the Installation Wizard

4.1.1 Weekly timer fan | menu 2.1

The automatic start/stop times of the fan are set in the weekly timer. Operating hours are set up in hours per day/week. You can set up a maximum of 4 time blocks (or time shifts) per day.

Fig. 4.3 shows a graphical view of a weekly timer setting and shows an operating block in the morning and in the afternoon, including a lunch break. For Friday(s) different settings are made.

The red horizontal line represents the current time⁵.

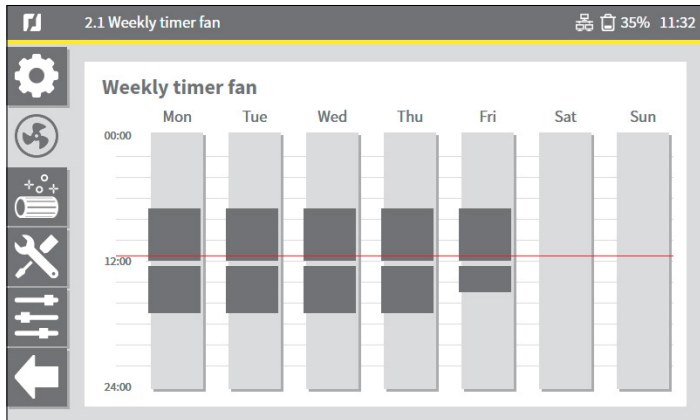


Fig. 4.3 Weekly timer setting (example)

Procedure to program the weekly timer:

Fig. 4.4

- Select the vertical bar Mon (Monday)⁶, which acts as a button (refer to Fig. 4.3).

The screen shows the current operating hours in two time blocks, in this example:

- from 07:00 to 12:00 h
- from 12:30 to 17:00 h

To copy time blocks to another day:

- Select the weekday(s) in question on the right side.

⁵ The status bar displays the current time as well: 11:32

⁶ Or any other day

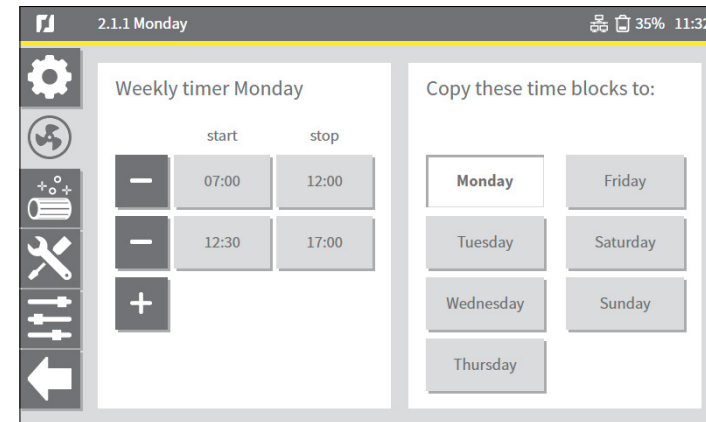

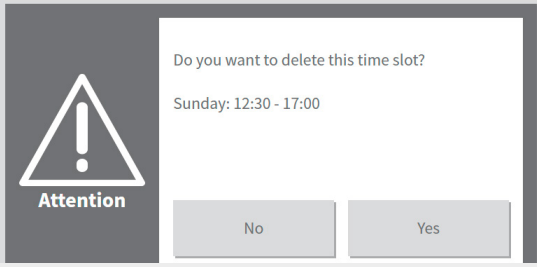
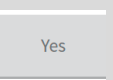


Fig. 4.4 Weekly timer Monday (example)

To add another time block:

Button	Display / Explanation																												
	<table border="1"> <thead> <tr> <th></th> <th>start</th> <th>stop</th> </tr> </thead> <tbody> <tr> <td></td> <td>07:00</td> <td>12:00</td> </tr> <tr> <td></td> <td>12:30</td> <td>17:00</td> </tr> <tr> <td></td> <td>--:--</td> <td>--:--</td> </tr> </tbody> </table> <table border="1"> <tbody> <tr> <td>1</td> <td>2</td> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td>5</td> <td>6</td> <td></td> </tr> <tr> <td>7</td> <td>8</td> <td>9</td> <td></td> </tr> <tr> <td>0</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		start	stop		07:00	12:00		12:30	17:00		--:--	--:--	1	2	3		4	5	6		7	8	9		0			
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	<table border="1"> <tbody> <tr> <td>1800</td> <td>Example: start at 18:00 h</td> </tr> </tbody> </table>	1800	Example: start at 18:00 h																										
1800	Example: start at 18:00 h																												
	Enter to confirm																												
	<table border="1"> <tbody> <tr> <td>2130</td> <td>Example: stop at 21:30 h</td> </tr> </tbody> </table>	2130	Example: stop at 21:30 h																										
2130	Example: stop at 21:30 h																												
	Enter to confirm																												

To delete a time block:


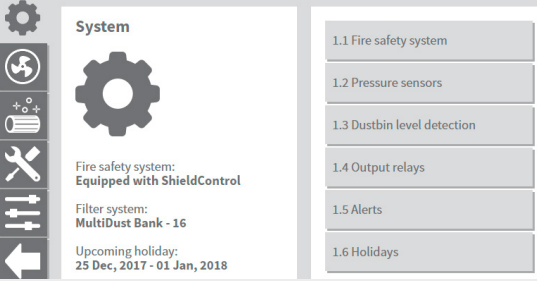
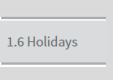
Button	Display / Explanation
	
	Yes to confirm No to cancel


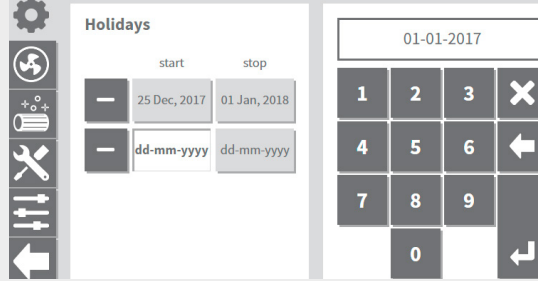



4.1.2 Holidays | menu 1.6

Holidays prevents the ControlPro/HMI to start/stop according to set timers.


A (holiday) period is one day or several days in a row. You can set a maximum of 4 holidays.

To set a holiday:

Button	Display / Explanation
	
	Select menu 1.6 Holidays

Button	Display / Explanation
	
	Enter to confirm Enter the start date of the holiday on the numeric keypad
	Enter to confirm Enter the stop date of the holiday on the numeric keypad
	Enter to confirm



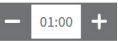
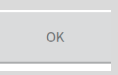
To delete a holiday:

Button	Display / Explanation
	Delete a holiday

4.1.3 Extra timer settings

The ControlPro operates in accordance with pre-set weekly timer settings.

To add an extra timer block, e.g. in case of overtime:

Button	Display / Explanation
	Select this icon on the <u>Homescreen</u>
	The display shows the first next occurrence the fan will stop. In this example: Wednesday at 18:00 h.
	Use the buttons + or - to increase the time. The interval is 15 minutes.
	Select OK to save your settings.

! An extra timer will be executed only once. It will start immediately, which means that the extra timer can also start before, during or after weekly timer settings.


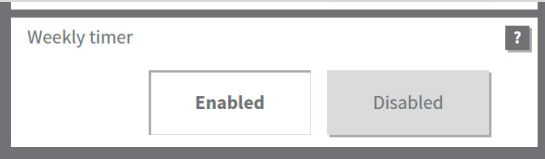
! In case you add a timer block while the fan is running, the extra time will be added to the actual running time.

4.1.4 Enable/disable the weekly timer

You can (temporarily) disable the weekly timer, e.g. in case of (national) holidays which you have not set in the holidays menu⁷ (refer to section 4.1.2).

⁷ In case you have not set any holiday at all, you can use this function as an alternative

To disable/enable the weekly timer:

Button	Display / Explanation
	Select this icon on the <u>Homescreen</u>
	

! Do not forget to enable the weekly timer again.

4.2 Filter cleaning settings | menu 3

The ControlPro offers several options to activate filter cleaning, such as pressure controlled cleaning, time controlled cleaning and manually activated cleaning.

Basically, the system strives for *offline* filter cleaning, which is the most effective way of cleaning.

In case of pressure controlled cleaning, reaching one of the threshold values triggers the cleaning system. It depends on the delay time when the cleaning system actually starts;

- as soon as the fan is off (offline cleaning)
- when the system has exceeded the delay time while the fan is still running (online cleaning)

In case of time controlled cleaning, filter cleaning takes places according to a pre-set weekly time schedule.

Fig. 4.5

A brief summary on the left side of the status window shows some of the actual settings of the current menu.

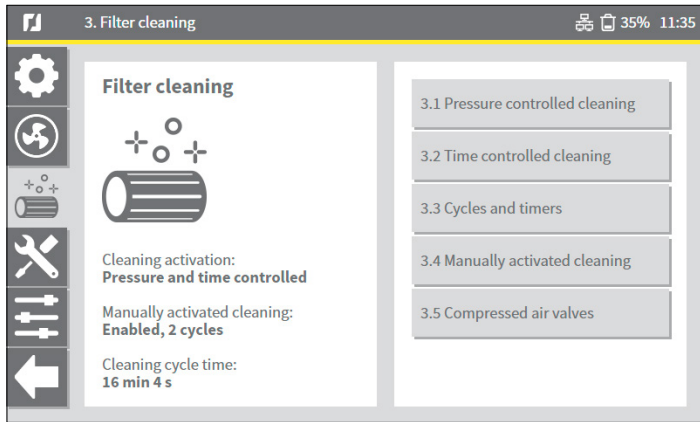


Fig. 4.5 Filter cleaning menu

! Pressure controlled and time controlled cleaning can run simultaneously.

4.2.1 Pressure controlled cleaning | menu 3.1

To optimize the filter lifespan while minimizing the required amount of compressed air, ControlPro applies progressive filter cleaning. This means that the filter cleaning intensity is adapted to the actual pressure over the filter cartridges, according to certain preset threshold values.

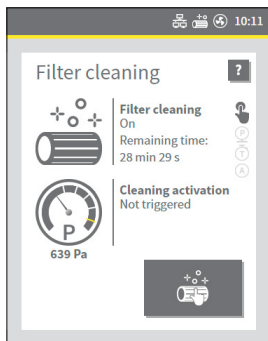
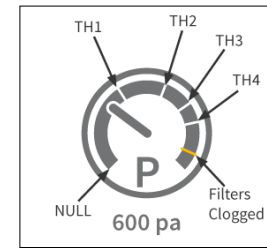


Fig. 4.6 Filter cleaning status window

The pressure gauge on the filter cleaning status window shows the actual filter pressure (example: 639 Pa).

The scale marks show the thresholds values that activate the filter cleaning system.

The pressure controlled cleaning cycles are activated in accordance with the set threshold values. If you want to change the cleaning frequency for some reason, you must adapt the threshold values.



White marks:

- TH1 = threshold value 1
- TH2 = threshold value 2
- TH3 = threshold value 3
- TH4 = threshold value 4

Orange mark:

- filters clogged

Fig. 4.7 Threshold values

The images below show the default settings.

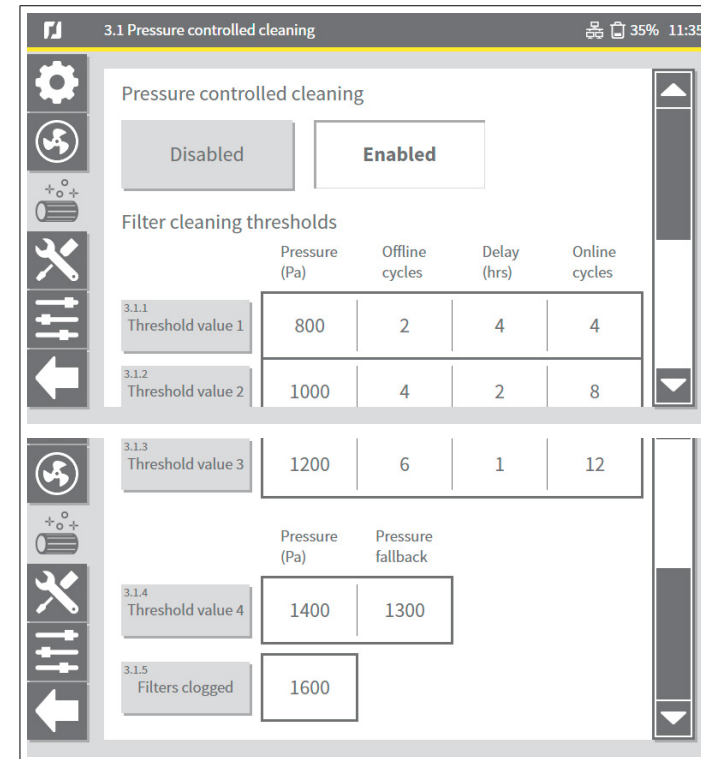


Fig. 4.8 Default settings

To *reduce* the cleaning frequency:
 - set the pressure (Pa) values *higher*

To *increase* the cleaning frequency:
 - set the pressure (Pa) *lower*

! We strongly recommend to maintain the default settings. If you do want to apply any change, contact your supplier for expert advice.

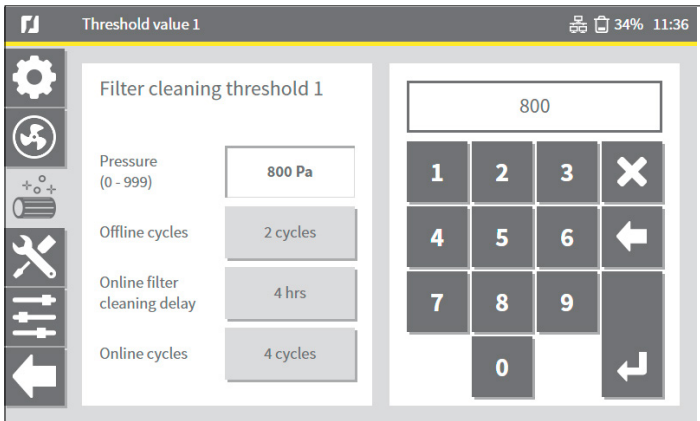


Fig. 4.9 Setting of threshold values

! Please be aware to select a higher amount of online cleaning cycles, compared to offline cleaning cycles, since the effectiveness of online cleaning is lower than offline cleaning.

4.2.2 Time controlled cleaning | menu 3.2

In this menu you can disable or enable time controlled filter cleaning settings. Time controlled filter cleaning is enabled by default, but no time blocks are set. When time controlled cleaning is enabled, you can set-up a weekly time schedule for filter cleaning.

To disable or enable time controlled cleaning:

Fig. 4.10

- Select *Disabled* to stop the time controlled cleaning function.
- Select *Enabled* to start the time controlled cleaning function.

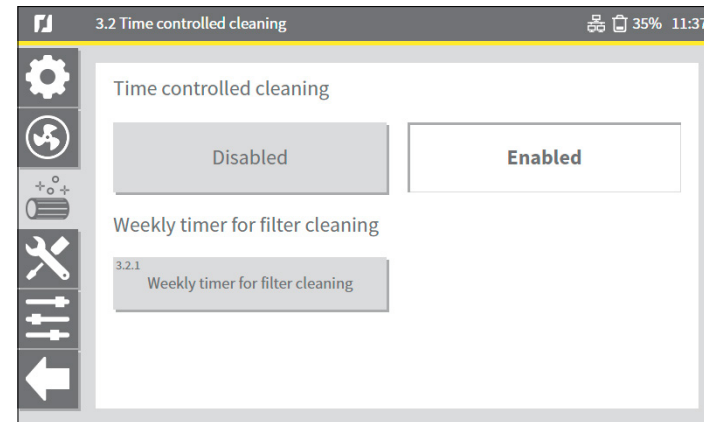


Fig. 4.10 Disable / enable time controlled cleaning

4.2.3 Cycles and timers | menu 3.3

The Cycles and timers menu enables options to set more specific filter cleaning settings, like precoat settings, forced filter cleaning and shut down settings.

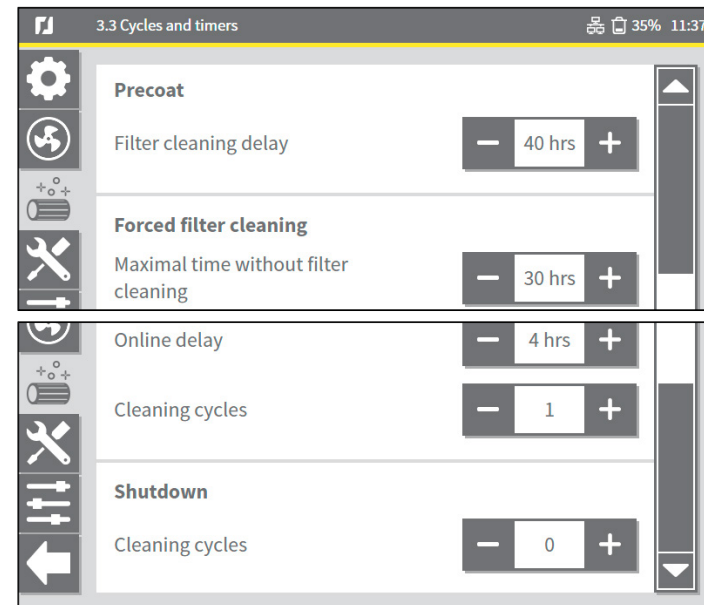


Fig. 4.11 Cycles and timers

Precoat

- When you use precoated filters, cleaning will be suspended for the first 40 hours by default.

Forced filter cleaning

- A built-in counter registers filter cleaning processes. The maximum amount of operating hours without filter cleaning is 30 hours.

Shutdown

- It is possible to clean the filters, every time the fan stops running.

4.3 External start/stop signal | menu 2.3

The external start/stop signal for the [fan control](#) can be enabled or disabled via the ControlPro/HMI. When enabled, the options are:

Fig. 4.12

Toggle on/off

- Select this option, when you connect a toggle switch or you want to start the fan with a continuous output signal from an external device⁸.

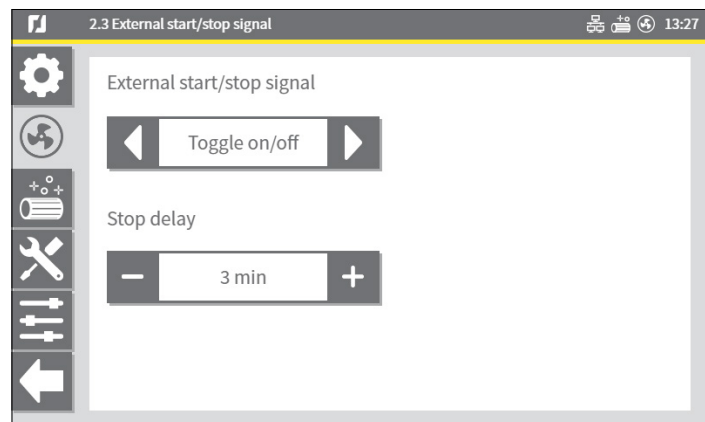


Fig. 4.12 External start/stop signal: Toggle on/off

Fig. 4.13

Pulse on/off

- Select this option, when you want to use a momentary switch to start/stop the fan or you use a pulsed output signal from an external device.

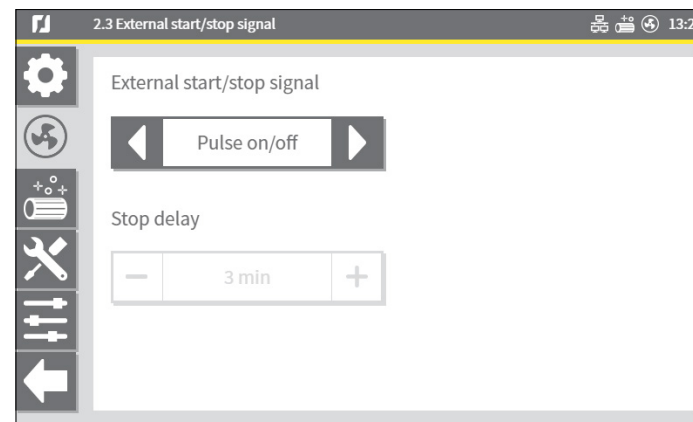


Fig. 4.13 External start/stop signal: Pulse on/off

Fig. 4.14

Pulse timer on

- Select this option, when you want to use a momentary switch to start the fan for a predefined amount of time, e.g. for overtime.

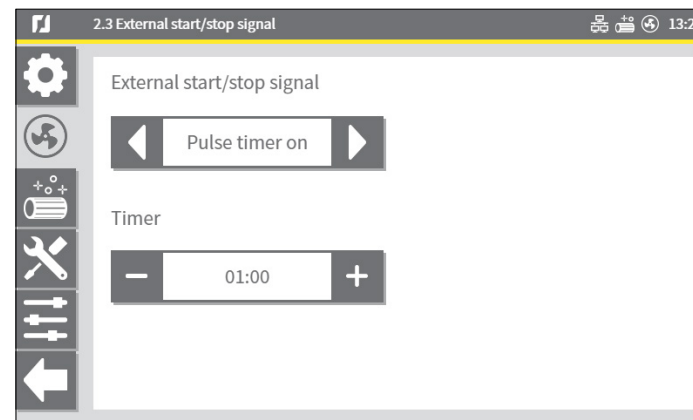


Fig. 4.14 External start/stop signal: Pulse timer on



Contact your supplier in case you need any help and/or more information.

⁸ E.g. from a welding robot or cutting table

4.4 Language | menu 5.1

During the **Installation Wizard** the ControlPro/HMI interface language has been set. In the menu Language, you can select or change the default language. Furthermore, there is also a possibility to import other languages.

To select a language:

Fig. 4.15

- Select the button **Edit** to open the list box. The Select language screen opens.
- Select one of the available languages from the list box.
- Select **OK** to save your selection and return to the previous menu, the new language settings are enabled immediately.

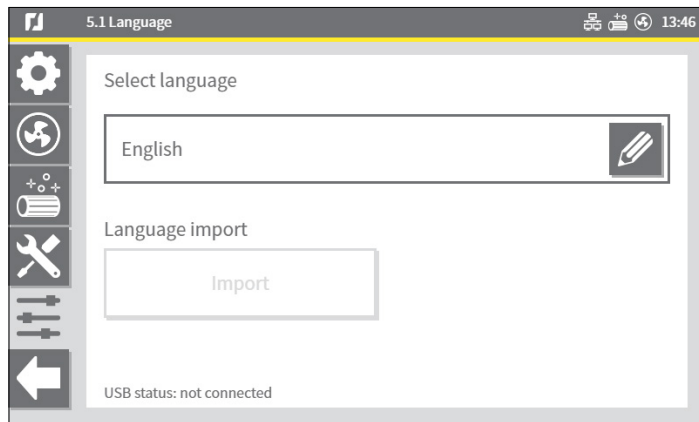


Fig. 4.15 Select language

4.4.1 Language import

To import a new language file, which is not available per default:

- The language file needed, is a file with a .mo file extension.
- Copy the language file to the root directory of an empty USB stick⁹.
- Connect the USB stick to the Panel¹⁰.
- The 5.1 Language window displays the message: USB status: connected.

⁹ Refer to section 6.5 for the USB stick requirements

¹⁰ The USB connector is located inside the Panel. *Future development is to connect the USB to the HMI.*

Fig. 4.16

- Select the button **Import**.

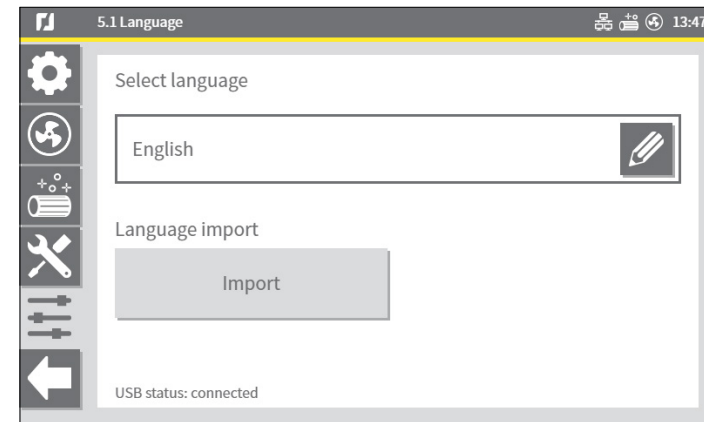


Fig. 4.16 Language import

An attention message appears:

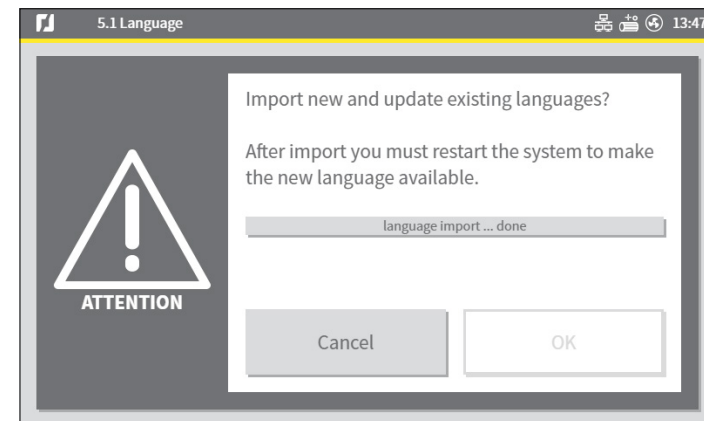


Fig. 4.17 Attention message

When the language import is finished, the message Done appears.

- Remove the USB stick from the Panel.
- Restart the ControlPro, to implement the new language settings to the HMI.
- Switch OFF and ON the ControlPro system via the Main Switch.
- Return to the menu 5.1 Language and select the new language from the list of available languages, as described above (Fig. 4.15).



Be aware that after a factory reset, imported language files will be deleted.

4.5 Lock mode | menu 5.7

To prevent unauthorized actions on the Homescreen, an option is to lock the Homescreen with an extra password.

After Lock mode has been enabled, it is possible to lock the following functions on the Homescreen:

- Start/stop fan
- Extra timer settings
- STOP
- Manual cleaning

The corresponding buttons will be dimmed and are not available anymore. The physical buttons¹¹ on the Panel will be disabled as well.

To unlock the Homescreen a PIN is required. This is an extra PIN and differs from the PIN needed, to Enter the Settings menu (refer to chapter 4).

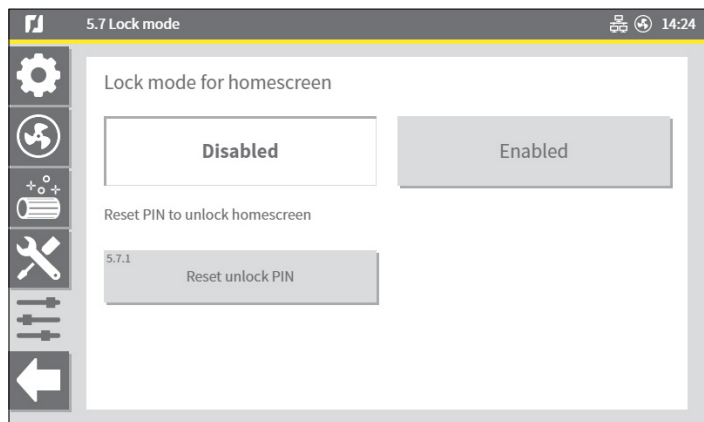


Fig. 4.18 Lock mode for Homescreen



NOTE: Lock mode default PIN is 0000

11 Green button START/STOP FAN | Black button FILTER CLEANING

4.6 Backup | menu 5.5

To create a backup of the all settings or to restore a backup to the system follow the backup procedure.

Fig. 4.19

- Connect a USB stick to the Panel^{12 13}.
- Select Create backup¹⁴.
- Select OK.

When the backup is finished, the message Done appears.

- Remove the USB stick.

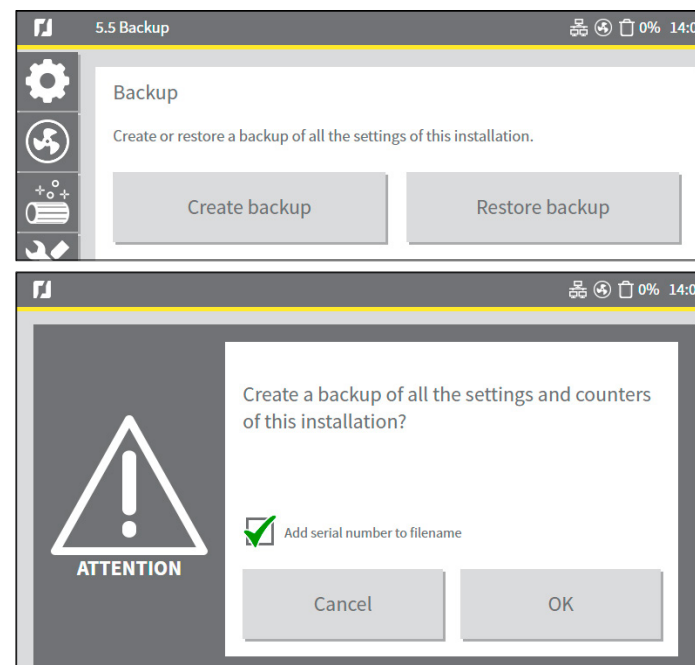


Fig. 4.19 Backup procedure

To restore a backup:

- Select Restore backup.
- Select OK.

12 The USB connector is located inside the Panel. *Future development is to connect the USB to the HMI.*

13 In case the USB stick is not recognized, the options Create backup and Restore backup are dimmed. Refer to section 6.5 for the USB stick requirements.

14 By default **Add serial number to filename** is selected. Multiple backup files on the same USB stick are possible.

5 MAINTENANCE | menu 4

The Maintenance menu offers settings for counters, logs, filter replacements, test modes and data exchange.

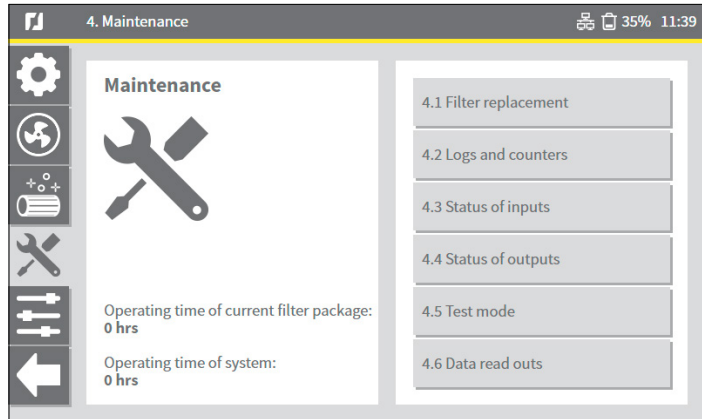


Fig. 5.1 Maintenance menu

- Select a button on the right side of the status window, to go to a sub-menu.

5.1 Filter replacement | menu 4.1



Refer to the manual of the filter system MDB / SCS / MDB-Diluter / SCS-Diluter for the physical filter replacement procedure.

5.1.1 Current filter package

The operating time of the current filter package and the latest filter replacement are displayed. After installing a new set of filter cartridges you have to confirm the replacement of the filter package manually here.

The operating time value of the current filter package will be set to 0 (zero) hours. Before you confirm filter replacement, you can select whether the filters are precoated; also refer to section 5.1.2.

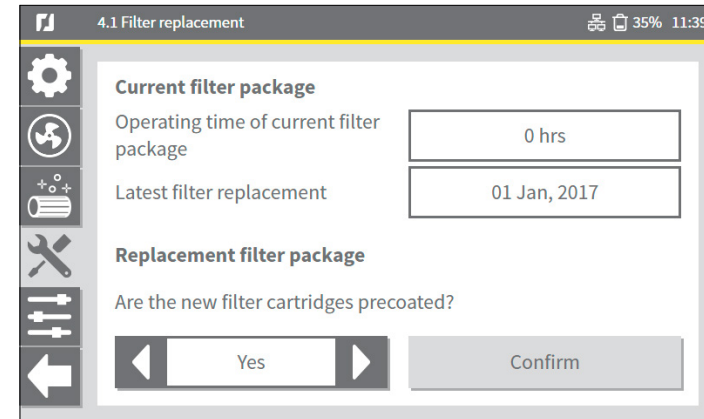


Fig. 5.2 Current & replacement filter package

Are the new filter cartridges precoated?

Button	Explanation
	Use the button to select Yes or No
	Select Confirm

If **Yes**, an attention message appears:

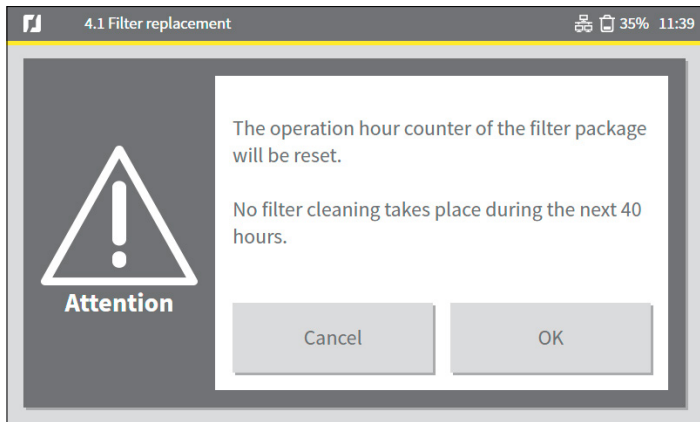


Fig. 5.3 Attention message

- Select **OK** to reset the operation hour counter of the filter package and return to the previous window.

! Precoated filters will delay filter cleaning for a preset number of hours.

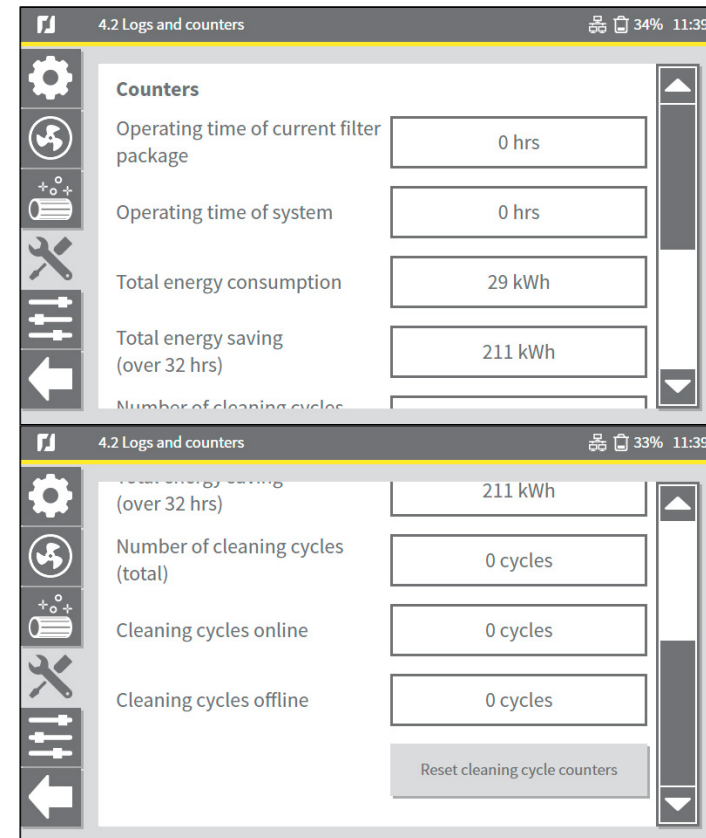
5.1.2 Replacement filter package

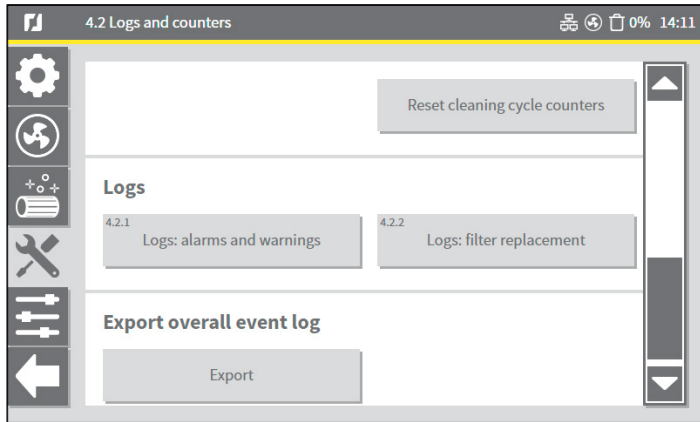
For efficiency and lifespan purposes it is recommended to apply precoat material on a certain number of filter cartridges:

Filter system: MDB		Filter system: SCS	
Filter cartridge	Precoat recommended	Filter cartridge	Precoat recommended
CART-D Premium Plus	✓	FCC-150	✓ (factory precoated)
CART-D Premium		FCC-150/HE	✗
CART-D Economy		FCC-110	✓
CART-C	✗		
CART-E			
CART-PTFE/10			
CART-PTFE/15			
CART-MB			

5.2 Logs and counters | menu 4.2

The logs and counters screen offers an overview of current settings, counters and logs. At the bottom of the window, the button Reset cleaning cycle counters resets all counters to zero.





5.2.1 Counters

Reset all cleaning cycles to 0 (zero):

- Select the button **Reset cleaning cycle counters**.

The following cycles are reset:

- Number of cleaning cycles (total)
- Cleaning cycles online
- Cleaning cycles offline

5.2.2 Logs

The two buttons at the bottom of the **Logs and counters** window open logs, respectively for Alarms and Warnings and for Filter replacement.

5.2.3 Export overall event log

The button **Export** will write a complete set of event logs and counter data as a file to a USB stick.

- Connect a USB stick¹⁵ to the Panel¹⁶.
- By default **Add serial number to filename** is selected, multiple Export logs and counters data files on the same USB stick are possible.
- Select **OK** to start exporting the data.


¹⁵ Refer to section 6.5 for the USB stick requirements

¹⁶ The USB connector is located inside the Panel. *Future development is to connect the USB to the HMI.*

When the export log is created, the message **export log ... done** appears.

- Remove the USB stick from the ControlPro/Panel.

6 OPERATIONAL INFORMATION

Button	Explanation
	The button <u>Information</u> on the Homescreen displays current status and actual data. Use the vertical scrollbar to view all settings.

6.1 Real-time data read out

Item	Unit	
Dustbin level detection		
Operating time of system	hrs	
Operating time of current filter package	hrs	
Latest filter replacement	date	
Filter pressure	Pa	
Motor power	kW	<i>In case of VFD/Panel (frequency inverter) connected by RS-485 cable</i>
Motor frequency	Hz	
Motor current	A	
PID setpoint	Pa	
Actual PID value	Pa	
Number of cleaning cycles (total)	# cycles	
Cleaning cycles online	# cycles	
Cleaning cycles offline	# cycles	
Total energy consumption	kWh	<i>In case of VFD/Panel (frequency inverter) connected by RS-485 cable</i>
Total energy saving	kWh	

6.2 System info - ControlPro/HMI

Item	Specification
Hardware version	
Firmware version	Firmware updates or new releases will be provided by Plymovent and can be downloaded from the Plymovent website.
Serial number	
MAC address	
IPv4 address	



All imported language files could be deleted during the firmware update. After updating the firmware, the language file can be imported again.



We advise you to always create a backup before updating; refer to section 4.6 for the backup procedure.

6.3 System info - ControlPro/Panel

Item	Specification
Hardware version	
Firmware version	Firmware updates or new releases will be provided by Plymovent and can be downloaded from the Plymovent website.
Serial number	
Firmware version slave boards (lowest)	

6.4 Logs

Item	Specification
Logs:	alarms and warnings
Logs:	filter replacement
Export overall event log	Export to USB stick

6.5 USB stick

To upload or download data from the HMI via USB, you need a USB stick 2.0/3.0.

Requirements of the USB stick are:

- formatted in FAT32 file system
- no other data on the USB
- always download data to the root directory¹⁷ of the USB stick

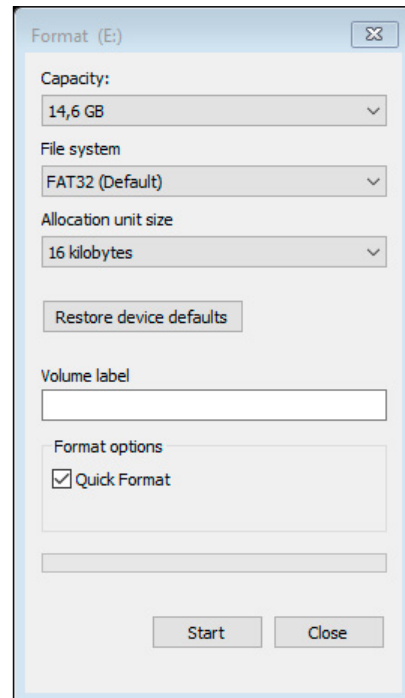


Fig. 6.1 Format USB stick

¹⁷ Root directory = highest level on the USB stick; no sub directories allowed

7 ALERTS



In the WARNING mode the fan/system continues to run.
In the ALARM mode the fan/system stops immediately.

7.1 Warnings

All WARNING alerts result in a full screen pop-up alert. Some warning alerts are accompanied by an acoustic signal (buzzer); refer to section 7.1.1, table column F.



Fig. 7.1 Example of a WARNING screen

After a warning has been solved, in most cases the warning will be reset automatically. Some warnings must be reset manually; refer to section 7.1.1, table column D.

There are two ways to suppress a WARNING alert (including the buzzer, if applicable):

1. Push the SUPPRESS button on the HMI
2. Push and hold the black button (FILTER CLEANING) on the Panel for 5 seconds

In case of a WARNING alert:

- Suppress the WARNING alert (+ buzzer).
- Solve the problem that is displayed on the screen.
- If applicable: Push the RESET button.

If you are unable to solve the problem immediately, you can temporarily suppress the WARNING alert. The WARNING screen will be minimized, but the yellow WARNING button remains visible on the Homescreen.

- Select the WARNING button on the Homescreen to show the warning details again and proceed as written above.

7.1.1 Warning codes

A	B	C	D	E	F
Code	Warning	Action	Reset Auto / Manual	Warning LED	Buzzer
W101	Dustbin almost full	The dustbin is almost full. Empty it.	A	✓	
W102	Dustbin full	The dustbin is full. Empty it.	A	✓	
W103	Filters clogged	The filter cartridges are saturated. Replace all filter cartridges.	M	✓	✓
W104	Compressed air	No compressed air. The filter cleaning system does not function. Reconnect the compressed air supply.	A	✓	
W105	Compressed air (cleaning active)	No compressed air. The filter cleaning system does not function. Reconnect to compressed air supply.	A	✓	✓
W106	Compressed air valve error	Repair or replace the compressed air valve. The address of the filter block and the relevant filter position is displayed.	M	✓	
W107	Fan Warning - Danfoss frequency inverter	Frequency inverter warning. Consult the Manufacturer's manual for more detailed information on the specific warning code.	A	✓	

A	B	C	D	E	F
Code	Warning	Action	Reset Auto / Manual	Warning LED	Buzzer
W109	Slave board(s)	The system cannot detect the amount of set filter cartridges. Check cable connections and dip switch positions on each slave board.	A	✓	✓
W110	External warning signal	Check external device.	A	✓	
W111	PID setpoint warning	The frequency inverter is unable to reach the PID setpoint. Lower the PID setpoint or replace the filter cartridges.	A	✓	✓
W112	Communication ControlPro/HMI		A	✓	✓
W113	Frequency inverter parameters changed	Critical parameters for communication with the frequency inverter are set incorrectly. Select the button to recover the communication parameters.	M	✓	
W114	External Sensor - Fan Pressure	Sensor connection fault. Examine the cable and connections and repair/replace if necessary.	A	✓	
W115	External Sensor - Filter pressure	Sensor connection fault. Examine the cable and connections and repair/replace if necessary.	A	✓	
W116	External Sensor - Dustbin Level	Sensor connection fault. Examine the cable and connections and repair/replace if necessary.	A	✓	
W117	Service Mode	The ControlPro/HMI is locked and the system is in service mode. Limited functionality, control only by separate ControlPro/Panel.	A	✓	

A	B	C	D	E	F
Code	Warning	Action	Reset Auto / Manual	Warning LED	Buzzer
W118	OilShield	The OilShield (limestone feeder) is not functioning properly. Check the cable and connections and repair/replace if necessary. Consult the OilShield manual for more detailed information on the specific warning code.	A	✓	

7.2 Alarms

All ALARM alerts result in a full screen pop-up alert and are accompanied by an acoustic signal (buzzer).



Fig. 7.1 Example of an ALARM screen

Alarms will cause the HMI to automatically switch to Manual Mode! When the problem, which causes the alarm has been solved, you can return to Automatic Mode.

There are two ways to suppress an ALARM alert (including the buzzer):

1. Push the SUPPRESS button on the HMI
2. Push and hold the black button (FILTER CLEANING) on the Panel for 5 seconds

In case of an ALARM alert:

- Suppress the ALARM alert + buzzer.
- Solve the problem that is displayed on the screen.
- Push the RESET button.

If you are unable to solve the problem immediately, you can temporarily suppress the ALARM alert. The ALARM screen will be minimized, but the red ALARM button remains visible on the Homescreen.

- Select the ALARM button on the Homescreen to show the alarm details again and proceed as written above.

7.2.1 Alarm codes

A	B	C	D	E	F
Code	Alarm	Action	Reset Auto / Manual	Alarm LED	Buzzer
A101	Fan Alarm	Repair possible fan defects.	M	✓	✓
A102	Fan Alarm - Danfoss frequency inverter	Frequency inverter alarm. Consult the Manufacturer's manual for more detailed information on the specific alarm code.	M	✓	✓
A103	Fan Alarm - Danfoss frequency inverter- Trip Locked	Trip lock frequency inverter alarm. To reset this alarm, switch off the power supply of the frequency inverter. Consult the Manufacturer's manual for more detailed information on the specific alarm code.	M	✓	✓
A105	FIRE ALARM	- EMERGENCY -	M	✓	✓
A106	Sliding valve not opened alarm	Sliding valve is not (fully) opened. Repair or replace sliding valve.	M	✓	✓

A	B	C	D	E	F
Code	Alarm	Action	Reset Auto / Manual	Alarm LED	Buzzer
A107	Sliding valve not closed alarm	Sliding valve is not (fully) closed. Increased risk of fire. Repair or replace sliding valve.	M	✓	✓
A108	External alarm signal		M	✓	✓
A109	Compressed air	No compressed air. The filter cleaning system does not function. Reconnect to compressed air supply.	M	✓	✓
A110	Communication frequency inverter	Frequency inverter communication fault. Check the cable and connections and repair/replace if necessary.	M	✓	✓
A111	Fan Alarm - VFD Danfoss - Manual Mode	The VFD is in "hand on" mode and cannot be controlled right now. Please set the VFD in automatic mode by pressing the button "Auto on".	M	✓	✓
A112	Fan Alarm - VFD Danfoss control	Undesired FAN control detected. Please restart the VFD.	M	✓	✓
A113	Hardware alarm	Missing a jumper wire on digital input 6 between IN6 and +24V. Only applicable in Filter Systems without SHIELD fire safety system.	M	✓	✓

8 DEFAULT / FACTORY SETTINGS

The table below shows default Factory preferred settings.

Menu screen	Settings description	Default value		
		MDB	SCS	
1.3	Dustbin level detection	Dustbin warning level (only for dustbin level sensor)	70%	70%
1.5	Alerts	Compressed air alert - type of alert	Warning	Warning
		Compressed air alert - delay	10 sec	10 sec
		PID setpoint warning - threshold value	90%	90%
		PID setpoint warning - delay	15 min.	15 min.
		External alert - type of alert	None	None
		External alert - trigger	Low	Low
		Fan alarm	High	High
1.5.1	Filters clogged pressure	Filters clogged	1600 Pa	2000 Pa
2.2	Fan control	Fan ramp down time (only for direct fan start: VFD other type, star-delta switch or direct online)	30 sec	30 sec
2.3	External start/stop signal	External start/stop signal	On	On
		External stop delay	3 min.	3 min.
3.1	Pressure controlled cleaning	Pressure controlled cleaning	Enabled	Enabled
3.1.1	Threshold 1	Threshold 1 - Pressure	800 Pa	1000 Pa
		Threshold 1 - Offline cycles	2 cycles	1 cycle
		Threshold 1 - Delay	4 hrs	4 hrs
		Threshold 1 - Online cycles	4 cycles	2 cycles

Menu screen	Settings description	Default value		
		MDB	SCS	
3.1.2	Threshold 2	Threshold 2 - Pressure	1000 Pa	1200 Pa
		Threshold 2 - Offline cycles	4 cycles	2 cycles
		Threshold 2 - Delay	2 hrs	2 hrs
		Threshold 2 - Online cycles	8 cycles	8 cycles
3.1.3	Threshold 3	Threshold 3 - Pressure	1200 Pa	1400 Pa
		Threshold 3 - Offline cycles	6 cycles	3 cycles
		Threshold 3 - Delay	1 hr	1 hr
		Threshold 3 - Online cycles	12 cycles	6 cycles
3.1.4	Threshold 4	Threshold 4 - Pressure	1400 Pa	1600 Pa
		Threshold 4 - Fallback pressure	1300 Pa	1500 Pa
3.1.5	Filters clogged pressure	Filters clogged (same as value in screen 1.5.1)	1600 Pa	2000 Pa
3.2	Time controlled cleaning	Precoat filter cleaning delay	40	40
		Forced cleaning timer	30	30
		Forced cleaning - online delay	4	4
		Forced cleaning - cycles	1	3
3.4	Manually activated cleaning	Shutdown cleaning cycles	0	2
		Manually activated cleaning	Enabled	Enabled
		Manually activated cleaning - cleaning cycles	1	1
3.5.2	Pulse and pause time	Compressed air valves - pause time	60 sec	60 sec
		Compressed air valves - pulse time	250 msec	600 msec
3.5.3	Simultaneous cleaning	Number of filter cartridges for simultaneous cleaning	1	n.a.
5.3	Display	Brightness	100%	100%
		Enable screen saver	30 min	30 min

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clean air at work

