Manual

Control Unit GFC 16

SIMATEK
Filter Technology

1400003_EN/04.2017

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NOTE! Figures shown inside square brackets [...] refer to positions on page 11.

CAUTION! Before use, read the instructions thoroughly to acquire sufficient knowledge of the product. For your convenience, keep this sheet as a quick reference.
Subject to change without notice.

	Note: The GFC 16 unit is to be installed by trained personnel only!

1. Main features

The Simatek GFC 16 has been designed to guarantee the control of diaphragm valves mounted on the pulse jet dust collector filters containing filter bags or cartridges.
The main features of the Simatek GFC 16 are:

- Manual selection of Pulse and Pause time.
- Can be operated by a remote pressure switch or PLC.
- SHUT DOWN CLEANING with selectable number of cleaning cycles.

2. Technical features

Enclosure	Grey ABS – transparent cover (option: 2 screws for transparent cover).
Grade of protection	IP65.
Dimensions	Simatek GFC 16: 4/ 8/ 12/ 16 outputs: case 213 x 185 x 113 mm.
Weight	Simatek GFC 16: approx. 2 kg.
Connections	Push in terminal blocks – with max. wire section of 2.5 mm².
Temperature	Storage: -20°C/+80°C. Operating: -10°C/+50°C, with duty cycle 30%.
Voltage available	Input: 230 V (±10%) – 50/60 Hz / Output: 115/230/24V AC, 24 V DC. Input: 115 V (±10%) – 50/60 Hz / Output: 115/24V AC, 24 V DC. See page 5, 6.1 Special version 24V DC/24V DC
Power consumption	Without output 2.5 VA. Output: 25 VA / AC or 20 W / DC.
Pulse time	0.01 – 9.99 sec.
Pause time	1 – 999 sec.
Max duty cycle	30%.
Remote control	Activated via external contact (normally open) free of power.
Shut down cleaning	1 – 99 cycles. To be operated from the normally closed contact of fan remote control switch.
Fuse	500 mA delayed 115 V / 230 V. 2 A delayed 24 V / 48 V.

	The device is to be disposed of in accordance with current European regulations

	The neutral of the power supply shall be connected to earth. If this is not the case an isolation transformer is to be installed and the neutral of the output to be earthed. Otherwise the filter control will be damaged.	

3. Installation guidelines

- Do not expose the control unit to direct sunlight in order to prevent overheating of the circuit board.
- Connect the control unit to a continually powered line to allow SHUT DOWN CLEANING when the fan stops.
- Protect the control unit from rain, water infiltration and humidity. Incomplete closing of the cover may causeinfiltration which can seriously damage the circuit board.
- Do not have cables entering via the upper part of the unit box.
- Do not install any electronic devices on vibrating structures.
- Use only cable glands with protection grade IP65 and of proper size (according to the cable used).

- A disconnecting switch has to be installed on the power line before the control unit.
- Do not attempt to repair the control unit – contact Simatek!
- All wiring has to be carried out by a qualified electrician to prevent any risk of fire and electrical shocks.
- The control unit wiring has to be performed in such a way that the different types of cables (power, relay'scontact, valve output, 4-20 mA output) are kept separated and not passing close by the PCB.
- Before opening the unit, make sure that the control unit is switched off (switch on/off [1] on 0 and wires onclamps [4] disconnected), including connection to alarm/signal relays.
- All the control unit electrical connections, including solenoid valves, have to use separate paths in respect to theother loads.
- Voltage selector jumpers have to be positioned only by skilled personnel and following the instructions.
- A wrong voltage selectors jumpers positioning may cause potential danger to the personnel safety.

4. Preliminary checks

1. Check that Simatek GFC 16 does not have power (on/off switch [1] on 0 and terminals [4] disconnected).
2. Check that the supply voltage indicated on the yellow label [22] as "IN", corresponds to the available powersupply (Voltage and Frequency).
3. Check that the supply voltage to valves indicated on the yellow label [22] as "OUT", corresponds to thevoltage/frequency as indicated on the coils.

5. Electrical connections

1. Unscrew and remove the terminals cover [20].
2. Check that Simatek GFC 16 does not have power (on/off switch [1] on 0 and terminals [4] disconnected).
3. Extract the removable terminals [2].
4. Check that the supply voltage to valves indicated on the yellow label [22] as "OUT" corresponds to the voltage/frequency as indicated on the coils.
5. Connect the valves to the terminal blocks [2], between terminal C and the numbered outputs.

- Earthing [3] of the valves is necessary when output voltage is ≥48 V.
- NEVER connect the Common or valve output to earth [3].
- The Commons are interconnected on the printed circuit board.
- The outputs are "static" type, with "zero crossing" command, to prevent electrical disturbances.

6. Check that the valve connections are correct and isolated in regard to earthing, by measuring the isolation between Ground [3] and Common with outputs terminal.
7. Replace the terminals cover and replace the screws [20].

6. Settings

6.1 Voltage selection

CHECK:
1. That Simatek GFC 16 does not have power (on/off switch [1] on 0 and terminals [4] disconnected).
2. That the supply voltage indicated on the yellow label [22] as "IN" corresponds to the available supply voltage.(Voltage and Frequency).
3. That the supply voltage to valves indicated on the yellow label [22] as "OUT" corresponds to the voltage/frequency as indicated on the coils.

If these 3 conditions are met, go to paragraph 6.2.
Otherwise, carefully follow the procedure below!

A. Supply voltage selection

1. Unscrew the two screws [21] (optional), and open the Simatek GFC 16 transparent cover.
2. Remove the 4 screws of the front panel. Lift the front panel (do not remove it as it is connected to the base of the enclosure!).
3. Check that the supply voltage selected by jumper [5], corresponds to the one available from the supply voltage(e.g. both 230 V).
4. Should the two voltages be different, move the jumper [5] in order to select the same supply voltage.
5. Go to point 6.1B.

B. Selection of power supply to the valves

1. Check that the supply voltage to the valves, selectable by jumpers [6] and [6A], corresponds to the supply voltage indicated on the coils of the valves (e.g. both 230 V).
   Jumper [6]: 1HV = 115 V; 2HV = 230 V; LV = 24 V
   Jumper [6A]: HV = 115 V / 230 V; LV = 24 V
2. Should the two voltages be different, replace the jumpers [6] and [6A] in order to select the same supply voltage as indicated on the coils.
   Jumper [6]: 1HV = 115 V; 2HV = 230 V; LV = 24 V
   Jumper [6A]: HV = 115 V / 230 V; LV = 24 V

CAUTION! Both jumpers [6] and [6A] must correspond to the same voltage!
3. Go to point 6.1C.

C. Selection of power supply frequency to the valves (AC/DC)

1. Make sure that the output frequency to the valves, selected by jumper [8], corresponds to the value indicated on the coils (e.g. both are set to AC).
2. Should the two frequencies be different, move the jumper [8] in order to select the same frequency as indicated on the coils.
3. Put the front panel back in place and fasten the 4 screws.
4. Close the transparent cover by means of the two screws [21] (Optional).

	Never select 115 or 230 V DC for output!	

6.2 Parameters selection

Connecting the power supply [4]:
L = phase, N = neutral

On/off switch [1] on 1. The display [7] will indicate for 3 seconds the release code of Simatek GFC 16.
Once the codes disappear, the display will show letter E (run) and the number of the valve which is going to be activated. LED OK [18] and REMOTE [35] are on.

1) Press SELECT MENU [9]:	1 will flash on display [7]: Using keys "+/-" [10] select the No. of valves, you wish to connect. Example: If you wish to connect 4 valves to Simatek GFC 16, select 4. Should you skip this step of the MENU, Simatek GFC 16 will automatically set No. of valves as if they were all connected (Simatek GFC 16:4) then 4 valves will be recognized, (Simatek GFC 16:12) then 12 valves will be recognized.
2) Press SELECT MENU [9]:	2 will flash on display [7]: Using keys "+/-" [10] select Pulse time (0.01 – 9.99 sec).
3) Press SELECT MENU [9]:	3 will flash on display [7]: Using keys "+/-" [10] select Pause time (1 – 999 sec).
4) Press SELECT MENU [9]:	4 will flash on display [7]: Using keys "+/-" [10] select No. of cycles of Shut down cleaning. Select 0 if you do not wish to have shut down cleaning. Pause time in Shut down cleaning is the same as the one selected at point 3).
5) Press SELECT MENU [9]:	E1 will flash on display [7] the cleaning cycle starts. LED 1 [11] will indicate that a valve is activated. LED 2 [12] will indicate that Simatek GFC 16 is waiting to activate the next valve.

NOTE!	– Valves are pulsed from output No. 1 onwards. – Check that during the first cleaning cycle every valve is activated. – We suggest setting the Simatek GFC 16 working parameters to clean the filter at the lowest possible frequency, thereby reducing the little dust escape arising during jet-pulsing, achieving a longer lifetime of filterbags/cartridges and reducing the compressed air consumption. – Pause time should allow an efficient filter cleaning in worst conditions, but should never be shorter than the time needed to re-pressurise the compressed-air tank. – While selecting parameters (in Select menu), Simatek GFC 16 will return to normal operation if no buttons are pressed within a 5 minutes interval. .

7. Remote

NOTE!
Simatek fits the Simatek GFC 16 unit with a connection on terminals Remote [26] and Common [37].
If you wish to operate Simatek GFC 16 with a remote switch, read instructions below.
If you do not wish to take advantage of this opportunity, do not remove the connection.

To activate Remote:
1. Unscrew and remove the terminals cover [20].
2. Remove the connection from terminals Remote [26] and Common [37].
3. Bring an external no-load and normally open (NO) contact to Remote [26] and Common [37] terminals from an external device (example: contact from DP monitor).
4. Replace and screw the terminals cover tight [20].
5. Close the contacts on the Remote [26] and Common [37] terminals in order to enable the Remote function.
6. Should you open the contact on Remote [26] and Common [37], Simatek GFC 16 will stop working, display will show SB (stand by) and LED Remote [35] and LED Pause [12] will be off. Close the contact in order to start the cleaning cycle again from the position it stopped.

8. Shut down cleaning

We suggest operating one or more cycles of Shut down cleaning at the end of each working session in order to remove the residual dust of the filter. Shut down cleaning is started each time the fan is switched off.

In order to activate Shut down cleaning:
1. Select the number of cycles in Shut down cleaning (see 6.2).
2. Unscrew and remove the terminals cover [20].
3. Bring an external no-load and normally closed (NC) contact to terminals Fan [36] and Common [37] from the fan switch.
4. Replace the terminals cover [20] and tighten the screws.
5. Close the contact on the Fan [36] and Common [37] terminals in order to start Shut down cleaning each time the fan is switched off. The present cleaning cycle will be considered as the first cycle of Shut down cleaning.

NOTE Should you have selected 0 at step 4) of point 6.2, Simatek GFC 16 will stop working as soon as the contact on terminals Fan [36] and Common [37] are closed.
- LED Shut down [33] will flash during Shut down cleaning.

6. At the end of Shut down cleaning LED Shut down [33] will remain on and the display will show E1. Switch the fan on in order to start cleaning cycle again and to switch LED Shut down [33] off.

9. Troubleshooting

Problem	Probable cause	Solution
Display is blank and all LEDs are off.	No power supply. .	Check the connections of the power supply terminals [4].
Display shows Sb.	The connection on terminals Remote and Common [26] is not connected.	Check the connection.
	Check fuse F1 [31].	Replace the fuse (see chapter 10).
Some valves are ignored. .	Wrong electrical connections between Simatek GFC 16 and coils.	Check connections [2].
	Coils are interrupted.	Check coils continuity.
Display shows the pulsing sequence but valves are not functioning.	The secondary of the transformer is interrupted.	Contact Simatek.
	Power circuit is damaged.	Contact Simatek.
	Supply voltage to valves is different from voltage indicated on the coils.	Check or re-select supply voltage. (See chapter 6.1).
	Wrong connection between Simatek GFC 16 and valves.	Check connections [2].
LED OK [18] is off.	Microprocessor failure.	Contact Simatek.

10. Fuse table

Name	Size	Value	Type	No. on drawing	Description
F3	5 x 20	500 mA	T	[23]	115 V/230 V Main supply fuse
F3	5 x 20	2 A	T	[23]	24 V/48 V Main supply fuse
F1	5 x 20	1,6 A	T	[31]	Output 24 V and fan – Rem
F2	5 x 20	630 mA	T	[32]	+5 V internal power supply

	In case of replacement you must respect the values above. .

11. Factory settings/Program menu

11.1 Pulse time
Simatek recommends a pulse time of 0.2 sec.

11.2 Pause time
By continuous cleaning, the pause time is calculated from a total cleaning time for the filter of 180 sec.
See recommended pause time by continuous cleaning for the current filter type. However, the pause time must correspond to the compressor capacity (compressor shall be able to fill the compressed-air tank between each pulse).

11.3 Shutdown cleaning cycles

Bag cleaning will continue during the set number of cycles (first valve to last valve) after connection between Fan [36] and Common [37], (fan stopped).
Any equipment for removal of the separated dust should run during shut down cleaning.
Simatek recommends 2-3 cycles, as the current cycle is regarded as the first shut down cycle. Therefore the first cycle will not necessarily be a full cycle.

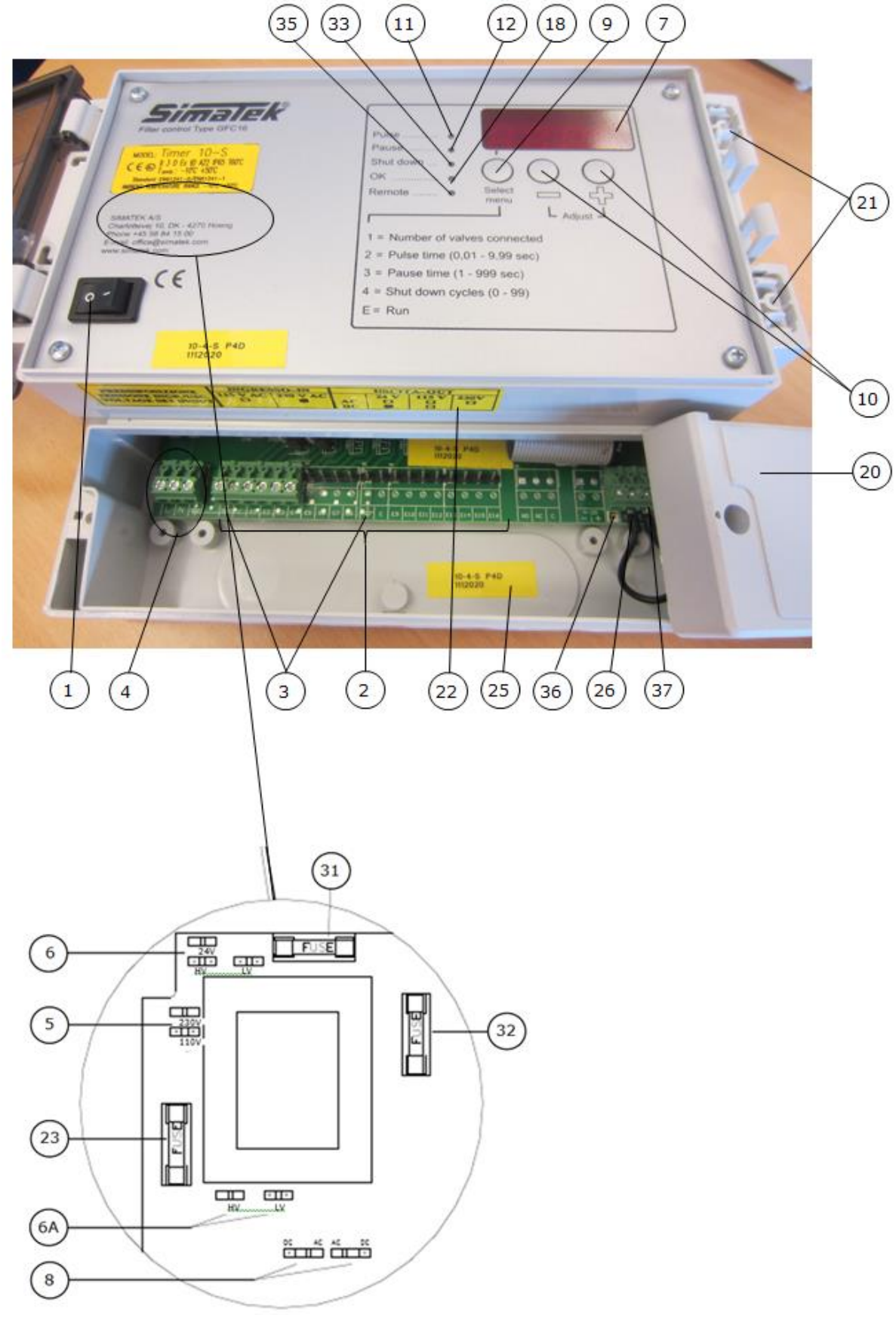
Recommended pause times **for SimPact® 4T/4T-R filters**

Filter type	Pause time
JM6-8, JM4-CIP	90 sec.
JM7-10-12, JM9-CIP	60 sec.
JM14, JM12-CIP	45 sec.
JM21	36 sec.
JM32	30 sec.
JM41, JM30-CIP	25 sec.
JM44-CIP	23 sec.
JM60-CIP	20 sec.
JM52	18 sec.
JM87-CIP	16 sec.
JM70	15 sec.
JM111-CIP	14 sec.
JM90, JM147-CIP	12 sec.
JM124	11 sec.
JM 146	10 sec.
JM 170, JM 198	9 sec.
JM 183-CIP, JM 255-CIP	8 sec.

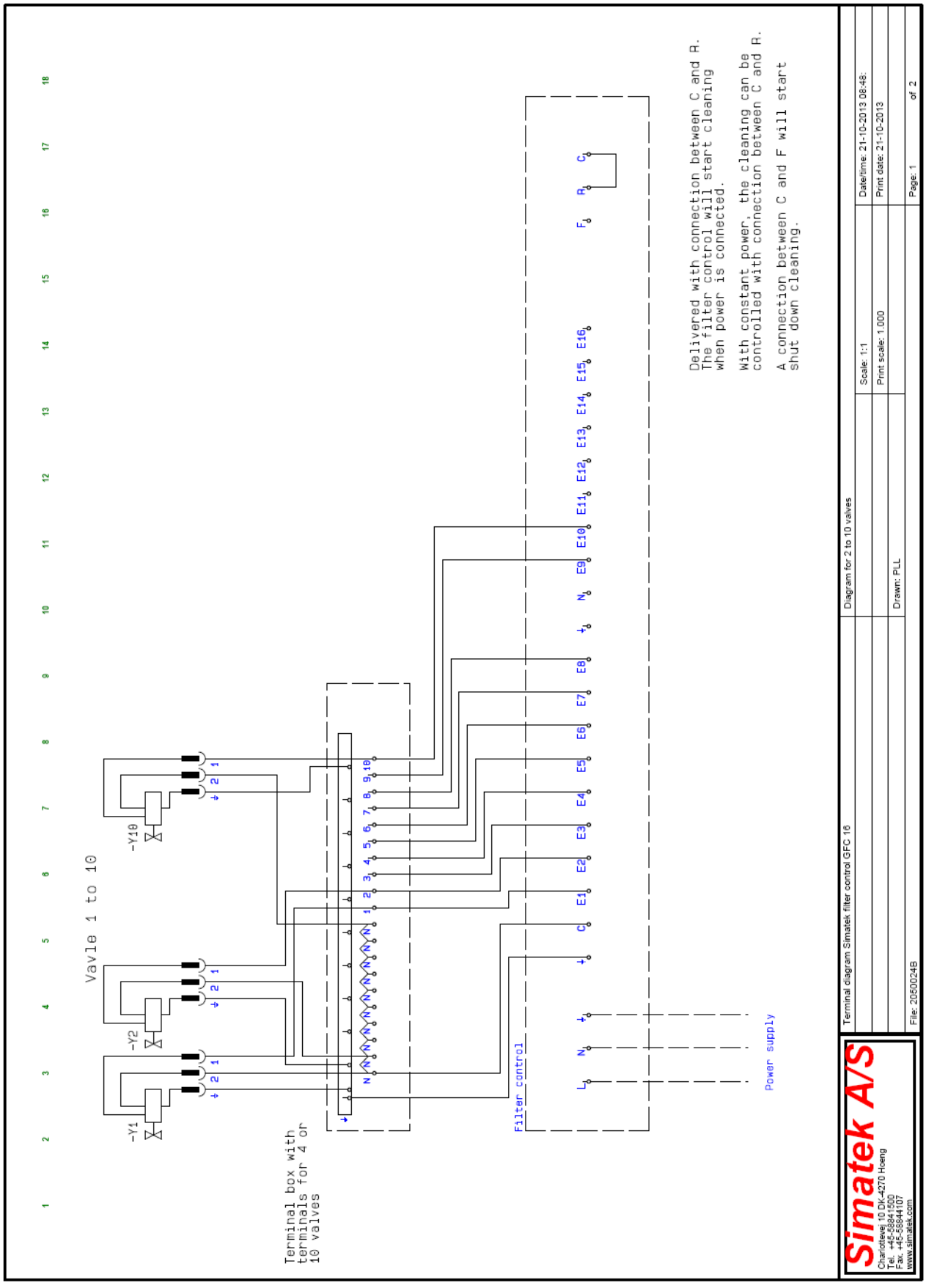
12. Legend

[1] On/off-switch
[2] Push in valves terminals
[3] Valves earthing
[4] Power supply terminals
[5] Jumper for inlet supply voltage selection
[6] Jumper for voltage selection to valves
[6A] Jumper for voltage selection to valves
[7] Display
[8] Jumper for the frequency selection to valves (AC/DC)
[9] Push button Select menu
[10] Push buttons +/-
[11] LED Pulse
[12] LED Pause
[18] LED OK
[20] Terminals cover
[21] Transparent cover fixing screws (optional)
[22] Yellow label indicating IN/OUT voltage-frequency
[23] Main fuse
[25] Product code and serial number
[26] Remote terminal
[31] Output fuse 24 V and Fan – Rem
[32] +5 V internal power supply fuse
[33] LED Shut down
[35] LED Remote
[36] FAN terminal
[37] Common-terminal

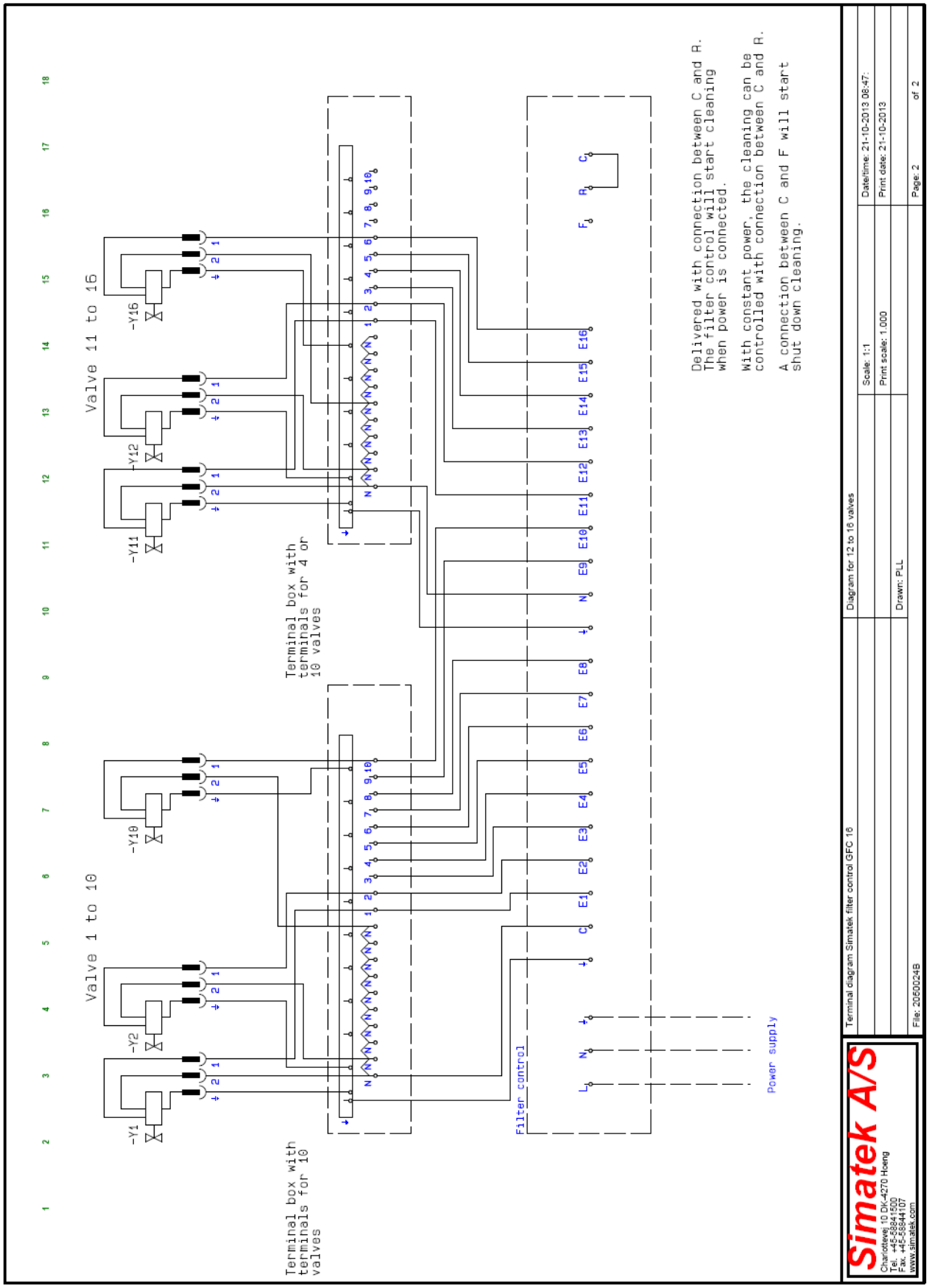
13. General assembly Simatek GFC 16: 2-16 valves



14. Electric diagram - Simatek GFC 16: 2–10 valves



15. Electric diagram - Simatek GFC 16: 12–16 valves



16. Declaration of conformity

Declaration of Conformity
ATEX Directive 2014/34/EU

Simatek A/S
Energiens Hus
Energivej 3
DK-4180 Soroe
Danmark

Simatek A/S hereby declares that the Control Unit types:

GFC 16
GFC 32
GFCD 16
GFCD 32

are in conformity with the provisions of the following EC Directives in their current form:

2014/34/EU	ATEX Directive (Potentially Explosive Atmospheres)
2014/30/EU	EMC Directive (Electromagnetic Compatibility Directive)
2014/35/EU	LVD Directive (Low Voltage Directive)

The following harmonised standards or standards documents were applied:

- EN 60079-31:2009 (Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t")
- EN 60529+A1:2002 (Degrees of protection provided by enclosures (IP Code))
- EN 60730-1:2001 + Amd. (Automatic electrical controls for household and similar use – Part 1: General requirements)

Type of protection: CE Ex **II 3 D Ex tc IIIC IP65 T60° C**
$T_{amb.}$ -10° C + 50° C

Place: Simatek A/S, Soroe, Denmark

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