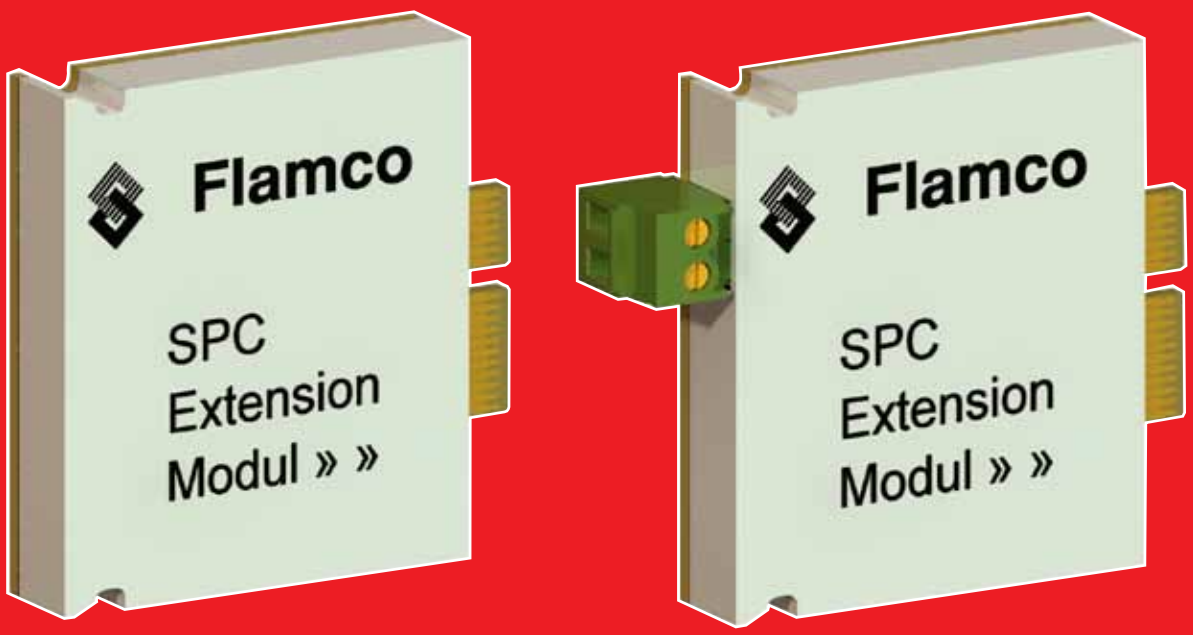
Flamco

KE KELIT®
CLIMATE CONTROL SYSTEMS

Flamcomat, Flexcon M-K Installation and operating instructions Supplementary document

ENG SPC module, volume / pressure analogue



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Contents

1. Appropriate use..... 4
2. Equipment, installation of module..... 4
3. Commissioning, use..... 5
4. Parameters, settings..... 7
5. Terminal plan, technical data..... 7
6. De-commissioning, disposal..... 9

The present document is a supplement to the Installation and Operating instructions: Flamcomat, Doc.no.: MC00018/08-2012/en; Flexcon M-K, Doc. no.: MC00019/11-2010/eng and must be used with these basic documents only. The general safety instructions contained therein apply in particular, as does the information on equipment, use and function. In each case the latest version is valid (for information, tel. +49 (0) 2052 887 69).

1. Appropriate use.

Electronic function assembly, expansion for an SPCx-lw / hw control unit for the activation of the 0-10V analogue signal for the available vessel capacity and actual pressure input signals to the external pressure unit with pump (Flamcomat) or compressor (M-K).
The declaration of conformity in the basic document is applicable. The usual use is to show and analyse this data in remote control centres for process logging, process evaluation and defining an error-management system. Signal processing units may include: programmable, two-channel display/evaluation unit with limit definition, tendency evaluation, relay switch points, digital/analogue display; data logger...

2. Equipment, installation of module

Original equipment: The module is an integral part of the control unit for external pressure (Fig. 1; 3; 8). Supplementary equipment: The packaging contains item 1a (fig. 4), the actions involved in fig. 7 and 8 may be carried out on switching off the power supply only. The extension (item 1b, figs. 2 and 5) is available for the use of control units for 3-phase operation (SPCx-hw) and original equipment with phase monitor. In this case, the socket connector (item 1.1) is the installed signal input (additional function).

1a	SPC module, volume / pressure analogue.	3	Control unit SPCx-lw.
1b	SPC module, volume / pressure analogue, phase monitor.	3.1	Phase monitor
1.1	Socket connector, contour-coded; phase monitor signal input.	4	SPC Terminal
1.2	Version type, back: SPC_ANA_V(...) . (...).	4.1	Sensor button: “Error message display”, active on backlighting red on.
1.3	LED green, housing illuminated (functioning).	5	Control unit SPCx.
1.4	LED red, housing illuminated (error).	5.1	Slots 1...4.
1.5	Connector strip	5.2	Breaking point field
2	Control unit SPCx-lw	5.3	Breaking point field opening
2.1	Information, note: Dangerous voltage! To be opened by qualified personnel only. Disconnect from power supply before opening the unit.	5.4	Slot 3
		5.5	Extra-low voltage terminals.

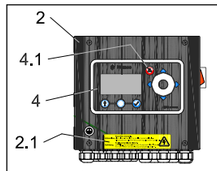
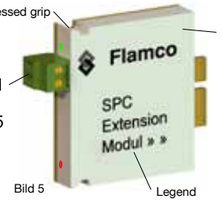


diagram 1
SPCx-lw

Bild 4



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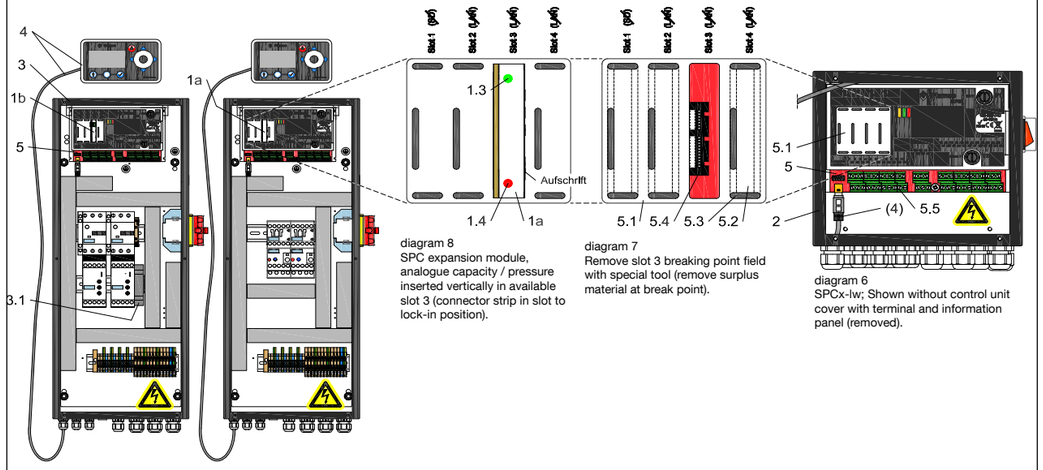


diagram 8
SPC expansion module, analogue capacity / pressure inserted vertically in available slot 3 (connector strip in slot to lock-in position).

diagram 7
Remove slot 3 breaking point field with special tool (remove surplus material at break point).

diagram 6
SPCx-lw; Shown without control unit cover with terminal and information panel (removed).

diagram 2
SPCx-hw; Shown without control unit cover with information panel (removed). Equipment shown: Soft-starter, 2 motors; phase monitor / analogue.

diagram 3
SPCx-hw; Shown without control unit cover with information panel (removed). Equipment shown: Direct start, 2 motors.

3. Commissioning, use

The expansion module in position on the fastened control unit cover, that allows the power supply and control unit to be switched "On" in place, menu [11-3-8] gives access to the version view of the following extension:

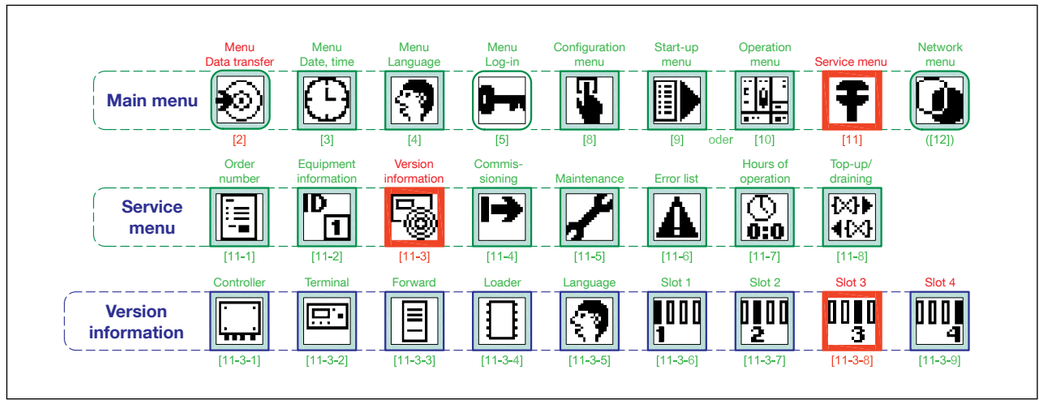
Service menu [11] » [11] » Version information [11-3] » [11-3] » slot 3 [08.03.11] » [11-3-8]

If the version number under [11-3-8] is missing, the module is not ready for operation (see page 6 - Internal and external error messages). The initialized module (ready for operation) enables the signal output from Start in the start menu [9-9] (equipment operational). Changes to the configuration that stop the control functions (in the menu navigation, confirming the question 'Stop system?') interrupt the Capacity signal output, pressure analogue.
To maintain the signal output, it is essential that the power supply is available, the control unit is switched on and the equipment sensors are functioning properly. To service the sensors, the requisite factory settings/initial conditions must be restored.

Note: Drawings of components may differ from actual parts supplied.

Commissioning, use

Location of data in menu:

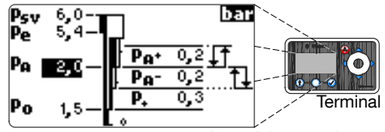


Internal messages; LED displays on the module (nos. 1.3 and 1.4);		
Status	**Description**	**measures**
Green "Off"	Module not recognised, not available, no access (version number under [11-3-8] not available).	Control unit, power supply; use indicated slot; clean contact surfaces of the connector strip.
Green "On"	Module recognised.	Function available.
Green "flashing"	Data transfer	-
Red "Off"	No errors.	-
Red "On"	Use of module blocked (Licensing of headings).	Use module on one of three previously used control units.
Red "intermittent"	Last action resulted in error.	Carry out positioning under initial conditions (see also: "External error message", 60 module).

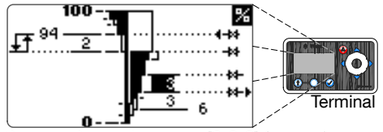
External error message; applicable error message after going to message display on terminal if error message shown:		
Display	**Description**	**measures**
60 Extension	Last external module action resulted in error (identical to LED red, flashing intermittently; no. 1.4). Important: Error not saved, not contained in menu [11-6] (Error history, analysis).	Acknowledgement deactivates the error message and the flashing red LED. (No consequences if the error is not acknowledged). Check module positioning (module may be removed).

4. Parameters, settings

As a result of the practical application, the parameters for evaluation depend on the control unit configuration and the parameter settings. The actual values of an active control unit are specified in the menu [8-1-1] (Pressure, customer access) and [8-2-3] (Capacity, access by qualified personnel). Further information is available from Flamco Support/Flamco Service on demand.
Recommended: If the expansion module control unit contains an SD - card, an appropriate configuration file for the situation at hand can be saved to a data carrier. The e-mail sent to Flamco Support / Service and the file attached must be an unambiguous communication.
Parameters, examples of the display of the terminal:



Display; Readout in menu [8-1-1] (pressure)



Display; Readout in menu [8-2-3] (volume)

Explanatory note:
Instances of excess pressure at the unit pressure sensor.

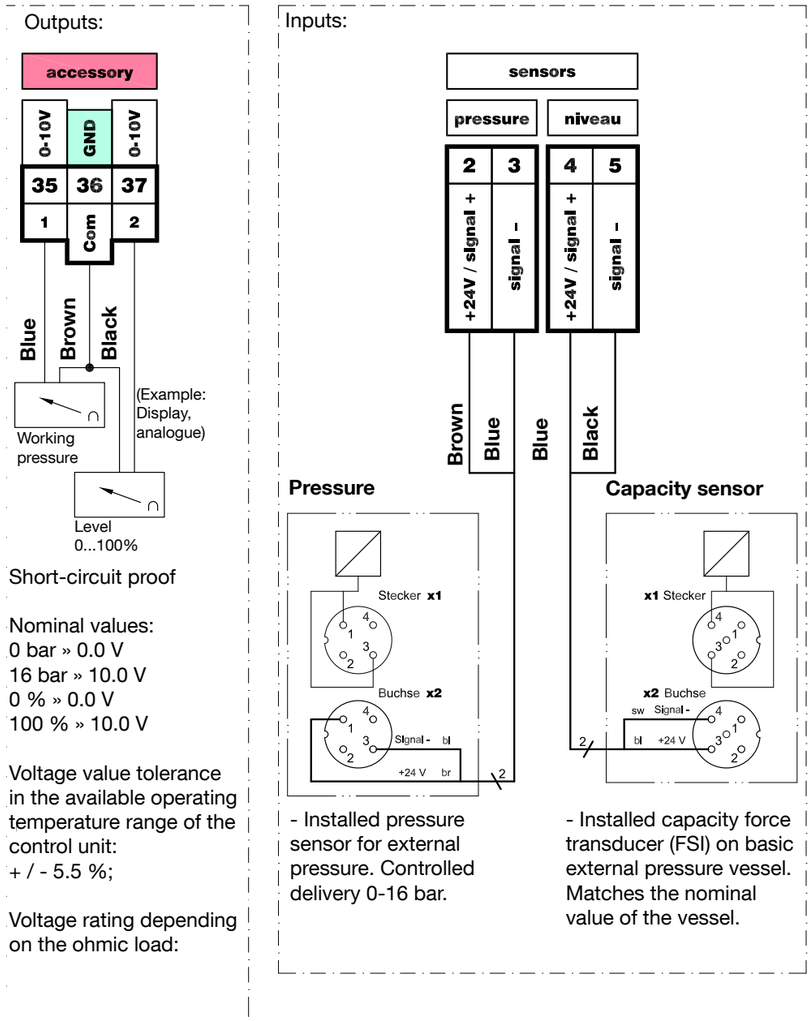
P_{sv}	6.0	Maximum possible pressure setting of the safety valve of the system (<=nominal pressure of the unit in question).
P_e	5.4	Maximum end pressure (upper limit of the working pressure range; $P_e = P_{sv}$ - closing pressure difference of the safety valve in question).
P_A+	0.2	Upper working pressure tolerance (hysteresis), pressure drop: 'On'.
P_A	2.0	Working pressure, pressure drop, -pressure increase: 'Off'.
P_A-	0.2	Lower working pressure tolerance (hysteresis), pressure increase: 'On'.
		» Working pressure range =1.8...2.2 bar
P+	0.3	Positive pressure, extra pressure to guarantee excess pressure.
P_O	1.5	Calculated display value: [P_A] - [P_A-] - [P+] (Minimum required excess pressure).

Explanatory note:
Values assigned to the actual pressures of the capacity sensor.

100	Vessel filled to capacity.
94	Draining value: 'On'.
2	Amount to be subtracted for draining: 'Off' (hysteresis), falling fill level (94-2=92).
3	Sum 1, topping up: 'Off', rising fill level (6+3+3=12; upper water feed value).
3	Sum 2, topping up: 'On', falling fill level (6+3=9).
6	Lower water feed value; Rise in pressure: 'On', falling fill level; [Rise in pressure: 'On'. Sum 2 minus 1, rising fill level (6+3-1=8)].
0	Operation balance value in start menu [9-6...7] (Empty vessel).

Note: Equipment for topping-up and draining may be optional extras.

5. Terminal plan, technical data



Short-circuit proof

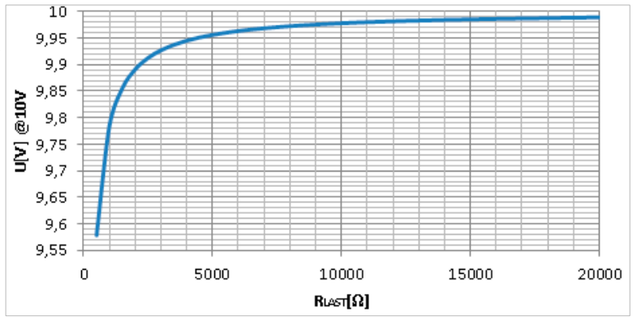
Nominal values:
0 bar » 0.0 V
16 bar » 10.0 V
0 % » 0.0 V
100 % » 10.0 V

Voltage value tolerance in the available operating temperature range of the control unit:
+ / - 5.5 %;

Voltage rating depending on the ohmic load:

- Installed pressure sensor for external pressure. Controlled delivery 0-16 bar.

- Installed capacity force transducer (FSI) on basic external pressure vessel. Matches the nominal value of the vessel.



6. De-commissioning, disposal.

Removal of the expansion module from the slot interrupts the signal transmission to the outputs (error no. 60 Expansion module, page 6). If this electronic component is to be disposed of, this must be performed in line with the requirements of the waste-disposal company in question.

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