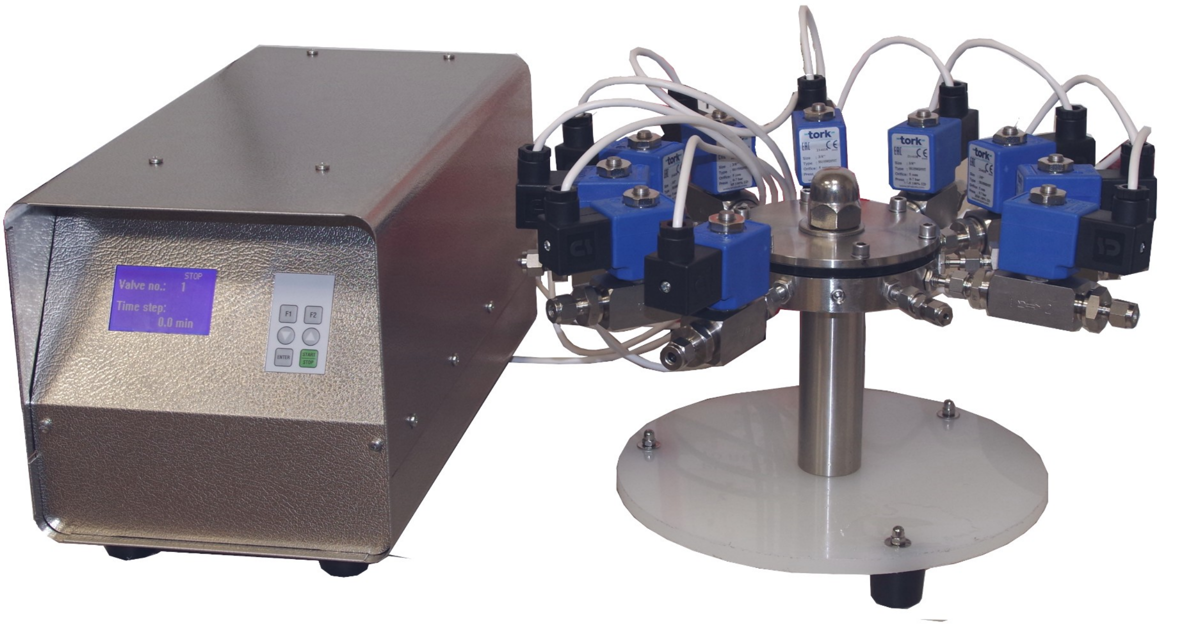
separlab

FRACTION COLLECTOR FOR LIQUID CHROMATOGRAPHY

SEPARFLOW FC 5-10



User manual

1. Use and function of the product

The SEPARFLOW FC 5-10 fraction collector is designed to capture fractions in preparative liquid chromatography. It is designed for liquids resistant to stainless steel 316L according AISI, PTFE and ultra high molecular weight polyethylene (UHMWPE). It may, however, be used in other devices where a programmed flow of fluid flow is required.

The FC 5-10 consists of electronics cabinet (containing valve actuators) and a circular segment with a radial groove to which the fluid inlet and ten solenoid valves outlets are connected. The time of opening individual valves is programmed using the keypad and the display on the front display of the cabinet. Valve outlets are to be connected to flexible hoses and containers in which the liquid is trapped (not supplied).

2. Product description

The hydraulic part of the SEPARFLOW FC 5-10 fraction collector is made of a stainless steel circular block with a 5x5 mm groove in the face of which there are 11 inlets. 10 of them are fitted with solenoid valves made of stainless steel, the sixth serves for fluid entry from the column by capillary O.D. 1/8“. On the solenoid valves outlet are screwed fittings designed for 1/8“ capillaries as well..

A circular plate made of UHMWPE seals the groove in the stainless steel block on the top of the circular block. The plastic plate is covered by thin stainless steel plate and the whole is connected by stainless steel bolts.

The instrument case is made of stainless steel. On the oblique front panel is a display and a membrane keypad. The main switch is placed on back panel of the case as well as the cables otputs.

3. Basic data of the collector

Number of outputs:	**10**
Channel diameter:	**5 mm**
Collector time:	**0.1-180 min**
Maximum flow:	**2000 ml / min**
Pressure limit:	**2 bar**
Power:	**100 W**
Dimensions of the case:	**250 x 250 x 300 mm**
Weight:	**8 kg**

4. Control of the collector

The FC 5-10 can be operated autonomously from the front panel keypad or externally via the RS232 serial line. With external control, it is possible to lock the input keypad, then it is possible to view the active fraction when the keyboard is operated. But the STOP button always works.

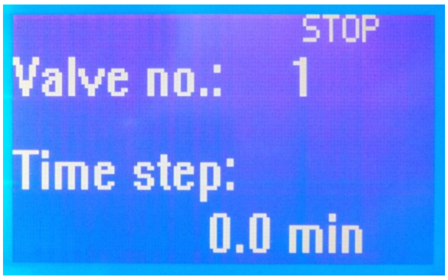
4.1 Keyboard and display description

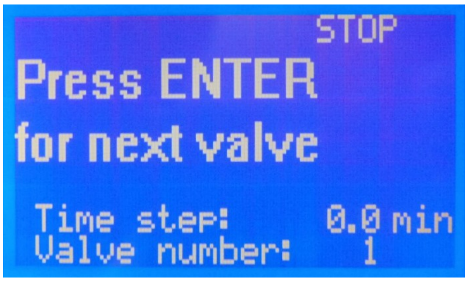
- F1 key: to move between display items down.
- F2 key: to move between display items up.
- DOWN ARROW key: Used to skip the set value.
- Up Arrow Key: Used to add a set value.
- ENTER key: Confirms the set value
- START / STOP key: Used to trigger and stop the collector.

4.2 Order of display items for pump control:

- Status display
- Next valve
- Settings Time (valve 1)
- ... .
- Settings Time (valve 5)

When you switch on the collector, the first display item is set. The top right corner shows the status of the collector (at this time STOP). The display shows the current valve (currently 1). After pushing the F1 key, we get to the second display operation, where you can manually control the collector by moving it to the next valve by ENTER. The manual "Next valve" control can be used anytime in the STOP, RUN or End state. In the RUN state, prematurely terminates the collection on the valve and begins to collect the following. In the END state continues to the next valve, so it is good to have all valves fitted with hoses and containers.





Press the F1 button again to check the set residence times on the valve, then "Settings Time 9". The time for the valve 10 is no longer set since the collector ends there when it is not stopped on the previous valve. If we do not want to use all the valves, the last used time is set = 0.0 min.

Example:

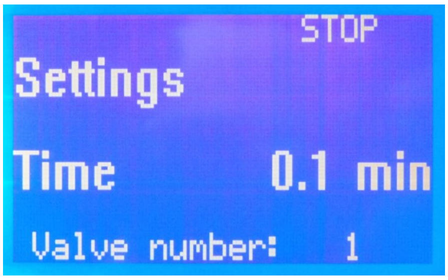
Settings time 1 = 10.0 min

Settings time 2 = 5.0 min

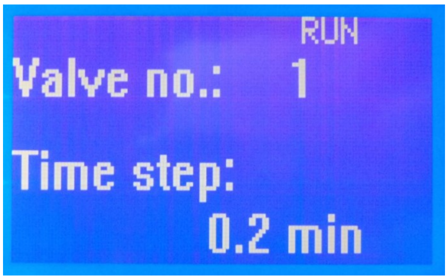
Settings time 3 = 5.0 min

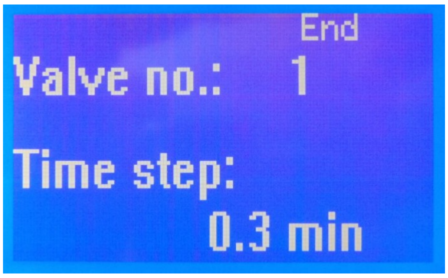
Settings time 4 = 0.0 min

The collector starts running and stops on valve 4 after 20 minutes.



After checking the set values, use the F2 button to return to the default item and start the START / STOP button. When pressed, the state in the upper right corner will change to RUN and the collector will begin counting the residence time on the individual valves.





Press the START / STOP button to stop the collector on the current valve ("End" appears in the top right corner). Pressing the START / STOP button again returns the collector to the starting valve 1.

4.3 Values setting

Use the F1 and F2 buttons to set the corresponding display item, then use the "Up Arrow" or "Down Arrow" button to adjust the value. If the key is pressed, the value will increase after approx. 0.8 s and increase the rate of increase after another approx. Then confirm it with the ENTER button, only at this point it is overwritten and executed. In the upper right corner of the display, enter ENTER for about 1 second. If this does not happen, autonomous control is probably blocked, and then the device will not be transcribed. If for some reason we do not want to write the changed value to the device, simply press the F1 key and then F2 to get to another display item and back again to retrieve the original set value.

External control is by serial line is described in the appendix. It is possible to set and read everything as an autonomous control, as well as blocking keyboard operation.

The collector can be cntrolled by ECOMAC software or CLARITYdatastation. For this control are issued individual manuals.

5. Manufactured by

Separlab s.r.o.

Radiova street 1, 102 00 Praha 10, CR

mail info@separlab.eu

www www.separlab.eu

Appendics 1

Separflow 5-10 - Communication via serial line

Basic parameters of the collector:

Number of steps (valves): (5 to 10)

Step time: 10800 s.

Speed: 9600Bd MODE COM1: 9600, N, 8.1

Command table

1zn	2,3 zn	……	……	Meaning of the report	Answer	Note
?	<CR>			Ask the device	FLOW_5<CR>	
F	00	<CR>		Instruction STOP	OK<CR>	
F	01	<CR>		Instruction START	OK<CR>	
F	02	<CR>		Ask the device on the state of programme	F02x<CR>	x = 0 stop on the beginning x = 1 running x = 2 stop on the end
F	05	<CR>		Instruction SWITCH OFF the keypad	OK<CR>	It is possible to see values, no change.
F	06	<CR>		Instruction SWITCH ON the keypad	OK<CR>	
F	07	<CR>		Instruction NEXT	OK<CR>	Jump to the next position

Note to the collector run: if the collector is running, after sending the STOP command, the collector will stop at the currently executed step (on the END display). By the second STOP command, the collector returns to the default step (step 1), and it is only from this initial step that the collector can be restarted. For this reason, it is a good idea to send a STOP header command twice before the picker starts, when the trailer stops (END) and then returns to the STOP. Eventually, STOP collectors do not affect the device.

If the collector stopped naturally due to the end of the picker program, then only one STOP collector would be able to return to the default step.

Value input table

1zn	2,3 zn	……	……	Means of message	Answer	Note
F	10	xxnnnn	<CR>	Enter step time	OK<CR>	Viz níž
F	40	xx	<CR>	Enter step	OK<CR>	

Explanation for F10:

The gradient can only be entered if the gradient is at the beginning (step 0), otherwise the data is rejected and the message is returned: ERROR-PG <CR>

xx ... 01-09 Picker step sequence number (decimal 1-9)

nnnn ... 0000-0708time gradient step in decimal minutes (decadicky0-1800)

Note 1: numbers are in hexadecimal

Note 2: Step 10 is not set (5-valve variant does not specify step 5, etc.)

The last step is the one for which zero time is entered (other inputs are ignored at runtime) or even the tenth step if all times are entered.

Explanation for F40:

Values can only be entered if the gradient is at the beginning (step 0) or at the end (END end = end of the program), otherwise the data is rejected and the message is returned: ERROR-PG <CR>

xx ... 01-09 Picker step sequence number (decimal 1-9)

If a valve other than 1 is selected, the program is in the END state (as when the program has reached the end) and does not start, then either the valve 1 has to be selected or the program must be terminated by the STOP command (this also selects the valve 1). If another valve is selected, it closes and the program is still in the END state.

Table of readings

1zn	2,3 zn	……	Meaning of the report	Answer	Note
F	20xx	<CR>	Query time step	F20xxnnnn<CR>	See above
F	30	<CR>	Ask for the current step	F30xx<CR>	01 - 0A
F	31	<CR>	Inquiry for the current gradient time	F31nnnn<CR>	

nnnn .... Hexadecimal number in the range 0 ... FFFFh expressed in ACSII characters (decimal range = 0 ... 65535)

xx .... Hexadecimal number in the range 0 ... FFh expressed in ACSII characters (decimal range = 0 ... 255)

Example: Decimal number 15 = hexadecimal number 000Fh = ASCII characters: 0,0,0, F = ASCII code: 30h, 30h, 30h, 46h.

Time is in tenths of a minute. For: 000Fh = 1.5 min

If the command is received and evaluated as unknown or incorrect, the message ERROR <CR> is returned

Runtime can not overwrite the steps of the collector step. The message ERROR-PG <CR> is sent back

The program evaluates both upper and lower case as well

For example, the F30000F <CR> command is the same as f30000f <CR> or F30000f <CR>

The program sends all the letters as large (the small alphabet is not used!)

For example, the answer to f50 <CR> is F50000F <CR>

The device uses a 256-character cache. The actual evaluation is done only after the "<CR>" ending character is received if more than 256 characters are received, so the characters from the beginning of the buffer are overwritten. For this reason, it is good to wait about 25ms to process the message in the device and then send a new message, or not to exceed this limit and then wait for the processing (about n x 15ms where n is the number of commands sent at one time).

After receiving any value, it is checked for the appropriate range of allowances and, if necessary, adjusted to this extent.