AFLOWT

REMOTE COMPUTING
COMPLEX

AFLOWT RCC

VERSION
RCC-102

OPERATION MANUAL
PART II

ISO 9001:2015

TABLE OF CONTENTS

Page
INTRODUCTION 3
1. MANAGEMENT OF RCC 4
1.1. Display system 4
1.2. Input of set values 5
2. MENU SYSTEM 7
2.1. Settings 7
2.2. Menu Device clock 8
2.3. Menu Meas. settings 9
2.4. Menu Pressure 9
2.5. Menu Flow 9
2.6. Menu Time of archivation 10
2.7. Menu Discrete outputs 10
2.8. Communication via RS-232 (RS-485) 11
3. OPERATING PROCEDURE 12
3.1. Enabling display 12
3.2. Logs 12
4. POSSIBLE MALFUNCTIONS AND METHODS OF THEIR ELIMINATION 14
APPENDIX A. Display system 16
APPENDIX B. The parameters shown on the display 23
APPENDIX C. Keypad buttons 27

INTRODUCTION

This document covers “AFLOWT RCC” remote computing complex RCC-102 version and is intended as a guide for its proper use.

LIST OF ABBREVIATIONS

ER - Error
FRT - Flow rate transmitter
LCD - Liquid crystal display
PT - Pressure transmitter
RCC - Measuring and computing complex

NOTE. Words in the text marked in bold, for example, **Device clock** correspond to the items displayed on the device's screen.

1. MANAGEMENT OF RCC

Management of RCC in different modes can be done from the keyboard using the system menus and windows of different levels shown on the display or via a personal computer through serial interface RS-232 (RS-485).

1.1. Display system

1.1.1. Multi-level display system (see Appendix A) consists of a main menu, a submenu containing a list of options and individual settings windows. Content and structure of menus and windows are determined by the operation mode of RCC.

1.1.2. Keyboard of RCC consists of six buttons, function and designation of which are given in Appendix C.

Keyboard enables you to:

- Navigate multi-level menus and windows
- Manage the liquid crystal display (LCD)
- Enter the setup information
- Browse the contents of archives.

1.1.3. In the WORK mode, when you are not using the keyboard over 60 s LCD display turns off. To activate the display, press any button on the keyboard. The main menu will be displayed (Fig.1):

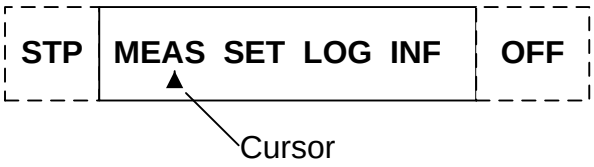

Fig.1. Main menu.

Explanation of the abbreviations of the main menu:

STP - Setup and calibration
MEAS - Measurement
SET - Setup
LOG - Logs
INF - Information
OFF - Display off

Menu **STP** is only displayed in SETUP mode.

In SERVICE and SETUP modes indication only forcibly turned off in the menu **OFF** by choosing **Turn off disp.** by pressing button (Appendix A, Fig.A.6), and also turns on by pressing any button.

The update period of displaying of parameter values is 4 s.

When in the main menu by pressing buttons and change the contrast of the indicator.

1.2. Input of set values

1.2.1. Bitwise numeric input

To change the setting, you must activate it by pressing the button.

Sign of display window of the bitwise input of numeric values of parameters is a blinking cursor < ▮ > in the lower digit of the number displayed (Fig.2).

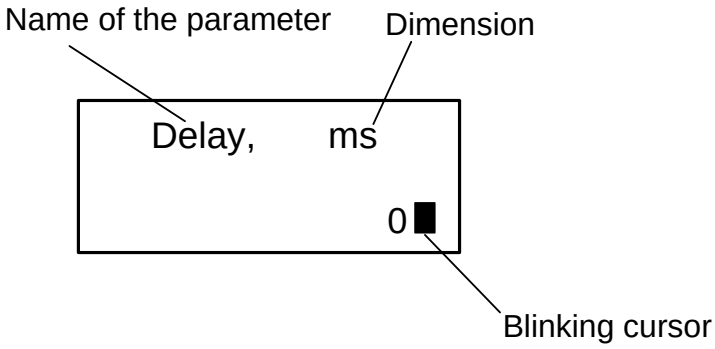

Fig.2. The window for bitwise input of numerical values of parameters.

Changing of the value is done by a bitwise changing digits with buttons, . Pressing the button ( ) once leads to increase (decrease) numeric value of the pointer digit by one.

Shifting the cursor to another rank (box) is done with, buttons.

Entering the set numeric value of the parameter is done by pressing the button, refusal of entry – by pressing the button.

1.2.2. Entering the values selected from the list

Next to the value of parameter which is being changed by selecting from a list the sign ▶ is displayed.

To change the setting, you must activate it by pressing the button.

A sign of the activation of the list of values of setup parameter is the appearance of angle brackets < >, inside of which the value of the parameter is shown (Fig.3).

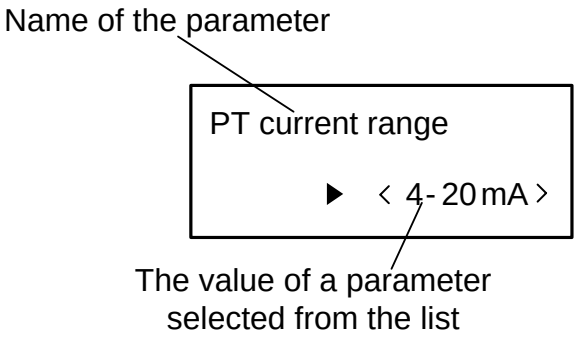

Fig.3. View window for entering the value selected from the list.

Changing the values is done by pressing a button ↑ or ↓. Enter the selected parameter value by pressing the button ↙, refuse the entry – by pressing the button ↖.

2. MENU SYSTEM

2.1. Settings

2.1.1 Configuration of RCC can be performed from the keyboard or via the external interface using a personal computer (PC) and the program “Viewer Aflowt RCC-102”. The program “Viewer Aflowt RCC-102” included in the software package “UBViewer ModBus” is posted on the website www.aflowt.com.

2.1.2. For entering the setup parameters (tab.1) from the keyboard of RCC it is necessary to enter the **SET** menu and set parameters in accordance with the recommendations of p. 2.2-2.8.

Table 1

Submenu	Parameter	Indication
Device clock	Device clock correction	**Time correct., s**
	Summer time mode applying	**DST routine off, on**
	Current time	**Current time hour:min data.month.year**
Meas. settings	Processing results time when in SETUP and SERVICE modes, as well as with external supply	**T proc. all modes power on, s: 1…3600**
	Processing results time when in the WORK mode, and when powered by battery	**T proc. mode Work power off, s: 1…3600**
	Accumulation mode	**Accumulation off, on**
	Reset accumulated values	**Clear accumulat. values: yes, no**
Pressure	Use of a pressure transducer (PT)	**Use PT yes, no**
	Working range of the current input	**PT current range 4-20 mA, 0-20 mA 0-5 mA**
	Minimum pressure measured by PT	**PT Pmin, kPa**
	Maximum pressure measured by PT	**PT Pmax, kPa**
	Factor for altitude difference between PT and pipeline	**PT δH, kPa**
	Serial number of PT	**PT serial num.**
Flow rate	Use of a flow rate transducer FRT1(2)	**Use FRT1(2) yes, no**
	Maximum input frequency from the flow rate transducer	**Fmax. FRT1(2), Hz 100 (pas. in.), 10 (act. in.)**
	Selection of the active level of flow rate transducer	**FRT1(2) active lvl. high/low**
	Power outage control time interval FRT1(2)	**T test FRT1(2), s**
	Input transformation ratio for FRT1(2)	**FRT1(2) Kc, pulse/l**

Cont. of table.1

Submenu	Parameter	Indication
Flow rate	Reaction of the complex to the flow rate smaller than minimum	**If Q1(2) < Qmin, Q no change / Q=0 / Q=Qmin**
	Minimum flow rate for FRT1(2)	**Q1(2) min, m^3/h**
	Maximum flow rate for FRT1(2)	**Q1(2) max, m^3/h**
	Serial number of FRT1(2)	**FRT1(2) serial num.**
Time of archivation	Time of logging (beginning and end) of the daily backup	**Daily archive hour:**
	Day of logging (beginning and end) of the monthly backup	**Monthly archive day of month:**
Discrete outputs	Mode / signal level for active state of output 1 (2)	**Outp. 1(2) act. lvl open / high, closed / low**
	Minimum pressure that triggers a discrete output 1 (2)	**Outp. 1(2) Pmin, kPa**
	Maximum pressure that triggers a discrete output 1 (2)	**Outp. 1(2) Pmax, kPa**
	Out of power alarm on the output 1(2) for FRT1	**Outp. 1(2) FRT1 err. on, off**
	Flow rate of the first channel beyond specified range alarm on the output 1(2)	**Outp. 1(2) range Q1 on, off**
	Out of power alarm on the output 1(2) for FRT2	**Outp. 1(2) FRT2 err. on, off**
	Flow rate of the second channel beyond specified range alarm on the output 1(2)	**Outp. 1(2) range Q2 on, off**
External module	The presence and function of external module	**External module empty / RS485**
Connection	Data transfer speed via interface	**Baud rate, bps 1200, 2400, 4800,**
	Network address of device	**Address**
	Response delay	**Delay, ms**
	External control interface	**Control no, unidirect., bidirect.**
	Connection with PC type	**Conn. type direct, modem**
	Number of rings at a modem connection	**Number of rings**

2.2. Menu Device clock

2.2.1. To set the instrument time window **SET / Device clock** is selected and activated.

2.2.2. Device clock correction is only in WORK mode and **SET / Device clock / Time correct.** window can be done**.** Current time may be adjusted for ± 60 s once a day only.

2.2.3. Enabling "summer" time mode is in the window **SET / Device clock / DST routine** done. By setting "**on**" switching to "summer" and "winter"

time is carried out by the device automatically, if you selected "**off**" the device works on "winter" time.

Dates of automatic switching to "summer" and "winter" time in the current year can be read in the window **DST routine** in **INF** menu by pressing button twice.

To view the dates of switching to "winter" and "summer" time in previous or subsequent years you must:

- Press button in the window **DST routine** in **INF** menu
- After appearance of blinking cursor <▮> set year in question by pressing buttons, , , and press again.

2.3. Menu Meas. settings

2.3.1. Processing time of measurement results can be set from 1 to 3600 s (with 1 s increment) in **SET / Meas. settings / T proc. all modes power on (T proc. mode Work power off)** window.

The update period of displaying of parameter values is 4 s.

2.3.2. In **SET / Meas. settings / Accumulation** window accumulation of data can be set on or off. If accumulation stopped, the sensor state counters also stop.

2.3.3. Reset data stored in **SET / Meas. settings / Clear accumulat. values** window can be done. The hourly, daily, monthly logging is stopped hereby (see sec.3.2.5).

2.4. Menu Pressure

2.4.1. In the **SET / Pressure / Use PT** enabling the appropriate pressure transducer is provided.

2.4.2. Depending on PT used the current input range (**PT current range**) and the minimum and maximum of the measured pressure (**PT Pmin** and **PT Pmax**) are set.

If necessary, factor for altitude difference between PT and pipeline **PT δH** can be set.

2.4.3. The serial number is entered in the PT **PT serial num.** window.

2.5. Menu Flow

2.5.1. In windows **SET / Flow / Use FRT1(2)** enabling of the corresponding flow transducer is managed.

2.5.2 In the window **Fmax. FRT1(2)** the maximum frequency on the inputs of RCC is set, which depends on the operation mode: **100 Hz** in passive mode and **10 Hz** in the active mode.

2.5.3. In the window **FRT1(2) active lvl.** the level is set: **high** or **low**, if active mode is set in prev. window (maximum frequency **10 Hz**).

2.5.4. In the windows of the **T test FRT1(2)** control time interval of the power outage of FRT is set. If the power outage time FRT1 (2) exceeds the set value, a message in the the menu **MEAS / Status meas.** appears (table.B.5).

2.5.5. To ensure proper operation of the flow rate channels of RCC it is necessary that the values of the flow rate transformation factors of RCC and of the plugged flow transducer coincided.

Setting of values of transformation factors is performed in the **FRT1(2) Kc, pulse/l** window. The value of the transformation factor can be set in the range from 0.0001 imp/L to 10000.0000 imp/L with the increment of 0.0001 pulse/L.

2.5.6. The minimum and maximum values of the flow rate of FRT1 and FRT2, when corresponding discrete output triggers (sec.2.7) are exhibited in the windows **Q1(2)min, Q1(2)max.**

2.5.7. The serial numbers of transducer are set in the **FRT1(2) serial num.** windows.

2.6. Menu Time of archivation

In **SET / Time of archivation** menu it is possible to set the starting hour of the daily and the day of monthly logging interval.

In the **Daily archive** window, starting hour is set the hour of the daily logging – from 0 to 23. In the **Monthly archive** window, the day of monthly logging – from 1 to 28 is set.

For example, setting in the window **Daily archive** of the figure 2 and in **Monthly archive** window figure 21 indicates that the daily logging will start at 2 o'clock and the monthly at 2 a.m. of the 21st.

2.7. Menu Discrete outputs

2.7.1. In windows **SET / Discrete outputs / Outp.1(2) act. lvl** can be chosen working mode of the terminal cascade of digital output / signal level (**open / high** or **closed / low**) corresponding to the output 1(2) active state.

2.7.2. In the windows **Discrete outputs / Outp.1(2) Pmin. (Pmax.)** discrete output 1(2) can be programmed to signal if the pressure is outside the ranges specified in those windows.

When the pressure is beyond of set ranges in **MEAS** window measured value of pressure is displayed yet.

The range limits of the pressure can be set with an increment of 0.01 kPa.

2.7.3. RCC digital outputs can also be programmed to output messages (form the signal of the active level **Outp.1(2) act. lvl.**) if the power supply of any FRT is off or when the flow rate values are outside the range set in window **SET / Flow / Q1(2) min (max).** The range limits can be set with an increment of 0.001 m^3/h.

When you choose **on** setting for several events that change of the state of an output (level signal) occurs upon the occurrence of any of these events.

Appointment of discrete outputs is done in **SET** / **Discrete outputs** / **Outp. 1(2) FRT1(2) err.** or **Outp. 1(2) range Q1(2)** windows.

ATTENTION! To avoid triggering of the digital outputs on the pressure transition beyond the target range, you need to set these boundaries (in the windows **Discrete outputs / Outp. 1(2) Pmin. (Out. 1(2) Rmax.)**) the same as in the windows **PT Pmin.** and **PT Rmax**.

2.8. Communication via RS-232 (RS-485)

For communication via RS-232 (RS-485) with PC you must set in the menu **SET / Connection** the data transfer speed, network address (if necessary), the response delay, type of control, type of connection and the number of rings before answering by modem (if using modem).

3. OPERATING PROCEDURE

3.1. Enabling display

3.1.1. Put into operation the RCC unit runs continuously in automatic mode. To activate the display, press any key on the keyboard hereby the display shows the main menu.

3.1.2. If requirements and recommendations of this manual are fulfilled a fully charged battery ensures serviceability of the RCC in the absence of external power for up to 14 days. After the restoration of external power, the battery starts to recharge. The duration of a full battery charge is not more than 4 hours.

ATTENTION! In the absence of external power for more than 14 days, the battery should be disconnected from the data processing module board.

3.1.3. Reading of the current values of measured parameters and contents of archives can be done either from the RCC display or using a personal computer via RS-232 (RS-485).

The list of options displayed in the WORK mode in the **MEAS** menu, their symbolic designations and measure units are listed in table.B.1 and B.2.

3.2. Logs

3.2.1. To view any archival record, you need select the log by activating **LOG in / Min (Hour, Day, Month)** menu. After entering the selected archive by clicking selection of recording time (the archiving interval) is performed as follows:

- Press the button
- After the appearance of the blinking cursor <▮> to set the desired hour, date, month and year press buttons , , ,
- Press the button .

If an archival record of the specified time and/or date exists, window of the archive settings is indicated. If the entry is absent, the nearest subsequent archive window opens.

To switch to another archival record in any parameter window:

- Press the button and go to the selection of archived records window
- Choose the desired recording with the buttons and
- Press to view selected archival record. It opens the window of parameter that was last viewed in the previous archive entry in this archive.

Parameter selection is done with buttons and .

It is also possible to view the values of the parameters, the system state and measurements for the current interval (interval from the beginning of the archive till the current time). To do this, while logged in to the archive press, the button that opens the first window of current values of parameters. Selection of parameters also can be done with buttons and .

3.2.2. Daily logs begin with the starting hour of daily archived interval (see sec.2.6).

Monthly logs begin with the starting date of monthly archived (see sec.2.6).

The list of parameters archived in hourly, daily, monthly archives are shown in table.B.3.

***ATTENTION! In the archives are recorded the values of cumulative volume, the pressure value is averaged over the interval*.**

3.2.3. After software changing of hour in the daily or day in monthly archive at the onset of the re-established hour or day the current backup interval ends, a corresponding archive record (daily or monthly), and the interval starts with a new hour (day).

3.2.4. When you restart the device the last recordings in the archives are fixed, current time checked. After device clock or accumulated values failure the message in the **System** s**tatus** window appears. The device continues routine operation, accumulation of data also continues.

3.2.5. When resetting cumulative values current recording in the hourly, daily, monthly archives stops, they are assigned corresponding numbers, and the end time. So in the following after reset archival record the following settings are reset:

- Pressure
- Emergency time (ER) for the interval.

In addition, in the menu **MEAS / Twork** the times are also reset.

***ATTENTION! Reset of the accumulated volumes while resetting device doesn't occur*.**

Thus, in current archival interval there will be two entries: from the beginning of the interval to reset time minus one second; from the reset time until the end of this interval.

3.2.6. At the beginning of the "summer time" an empty hour record is created for loose hour.

At the end of "summer time" the corresponding time interval has duration of 2 hours. Within this entry (and containing this interval daily, monthly entry) the message about transfer of time mode within the interval is created.

4. POSSIBLE MALFUNCTIONS AND METHODS OF THEIR ELIMINATION

4.1. In the operation of RCC diagnosis of the measurement channels of pressure and flow rate state is made. In case of breakdown or emergency situation corresponding message is displayed.

4.2. Faults and abnormal situations, diagnosed by RCC, indicated in the window **MEAS / Meas**. s**tatus**– in the form of status word (Fig.4).

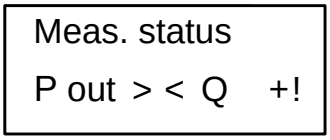

Fig.4. Status word of discrete pressure outputs and FRT1(2)

This word consists of two parts. The left part (**Pout** _ _) indicates the state of the pressure channels on both digital outputs (two characters). The right part (**Q** _ _) indicates the state of the flow rate channel.

Codes of the statuses words are shown in table.B.1.

4.3. In the window of **LOG / Hour, (Day), (Month) / System status** sign-position codes of operations are indicated in the form of string of 7 characters (table.B.4). In the **Meas**. **status** window displayed sign-position code of faults and abnormal situations, diagnosed RCC for the archive interval, in the form of string of 12 characters (table.B.5).

The presence of events, faults or errors is noted in the appropriate character space by symbol <X>, the lack of the symbol <–>. Character spaces are numbered from left to right.

To determine the type of event, malfunction or error, you must be logged in the **System status** window or **Meas**. **status** and press the button, and then opens the window, the view of which is shown in Fig.5. In case of multiple ER viewing of window information is performed by using buttons , .

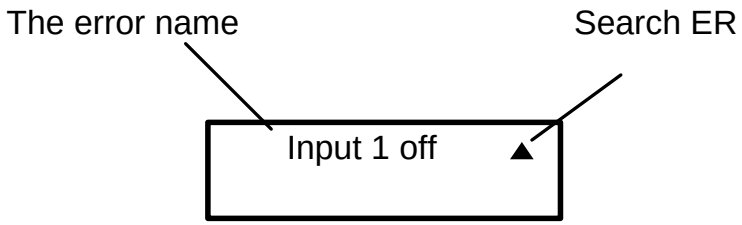

Fig.5. The window displaying information about events and faults.

The list of operations carried out by the user and displayed in the RCC **System status** window is given in table.B.4.

List of faults and abnormal situations, diagnosed RCC in the **Meas**. **status** window is given in table.B.5.

4.4. In the event of a malfunction, you should check:

- The presence and the voltage of the RCC power supply and the second power supply source
- The reliability of the connection of power circuits and communication lines
- Operability of FRT and PT
- The correctness of values of transformation factors, fixed points for the flow rate and limits of the ranges for pressure, if necessary, change their values.

In case of positive results of the above checks you should contact the manufacturer of the product to determine the possibility of its further operation.

4.5. The remote computing complex “AFLOWT RCC” of this version and subject to the operation conditions is regarded as the appliance, the repair of which is produced at the factory.

APPENDIX A. Display system

The system of menus and windows and links between them are shown in fig.A.1-A.6. List of symbols used in the drawings, are given in table.A.1.

Table A.1

Designation	Meaning
SET	Name of the main menu item.
Pressure	Name of the submenu item window or parameter.
X, XXX	Display-only numeric parameter value or editing is performed in another window.
▯.▯▯▯	Bitwise editable numeric parameter value.
Fr	The parameter value set by the device. The label shows one of the values or the essence of the semantic parameter.
▸ 4-20 mA	The parameter value is set by selecting it from the list. The inscription displays one of the parameter values.
↓, ↑	The pointer for the search of parameters.
(sc)	Window or menu (submenu) is displayed in modes SERVICE and SETUP.
(w)	Window or menu (submenu) is displayed in the mode only WORK.
(c)	Window or menu (submenu) is displayed in the SETUP mode.
Icon ○ of function mode is absent	Window or menu item (setting) is displayed in all modes: WORK, SERVICE, SETUP.
[sc]	Modification of the parameter (parameters) is possible in SERVICE mode and SETUP.
[w]	Modification of the parameter (parameters) is possible in WORK mode only.
[c]	Modification of the parameter (parameters) is possible and SETUP mode.
Icon □ of function mode is absent	Modification of the parameter (parameters) is possible in all modes: WORK, SERVICE, SETUP.
↔, ↕	Switch between windows.
←	Exit to the menu (window) of the upper level at the touch of a button ↖.
→	Entering the menu (window) of the lower level at the touch of a button ↙.
⇨ *Fig.A.1*	Pointer to switch to another image.

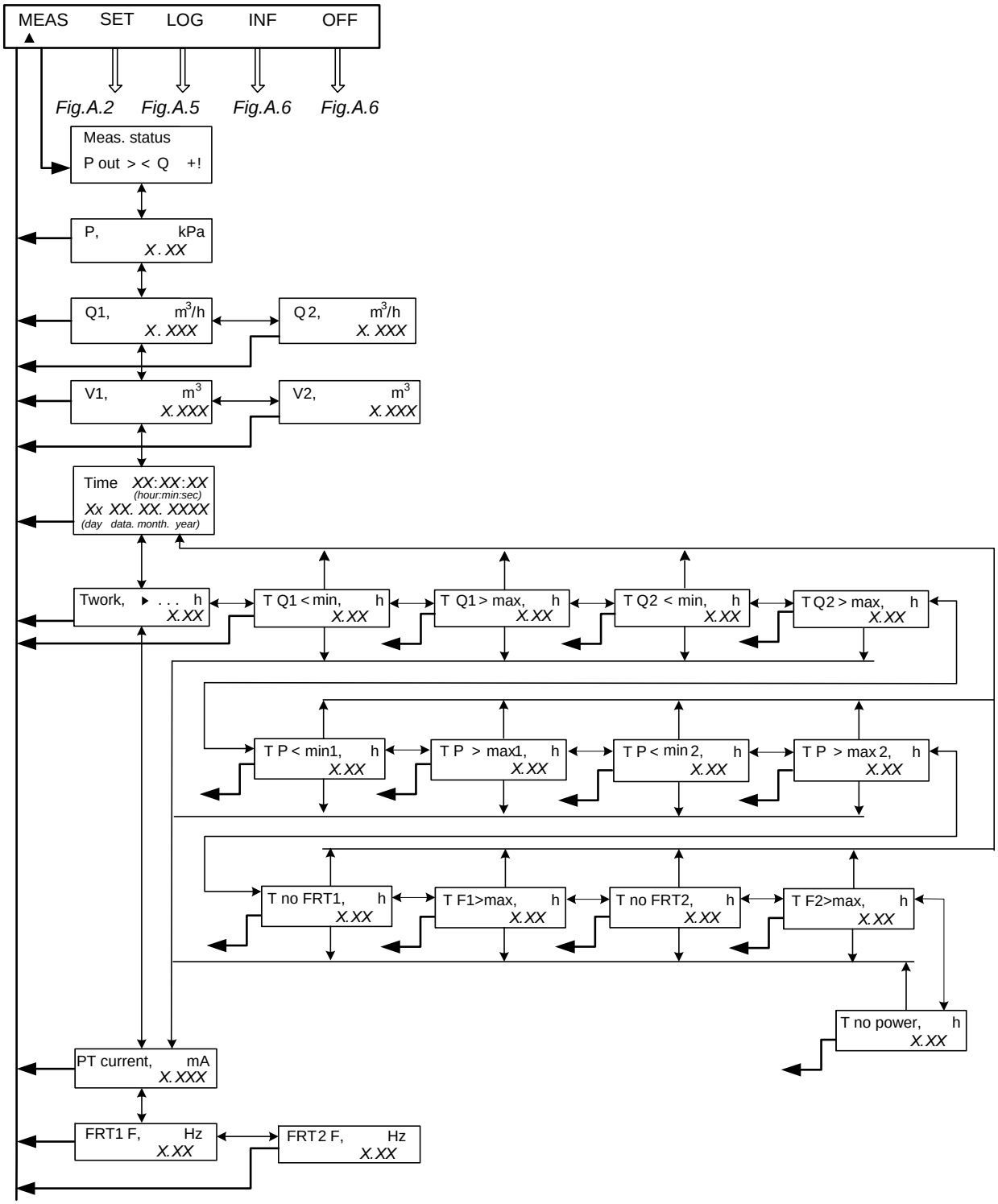

Fig.A.1. Main menu and menu “MEAS”.

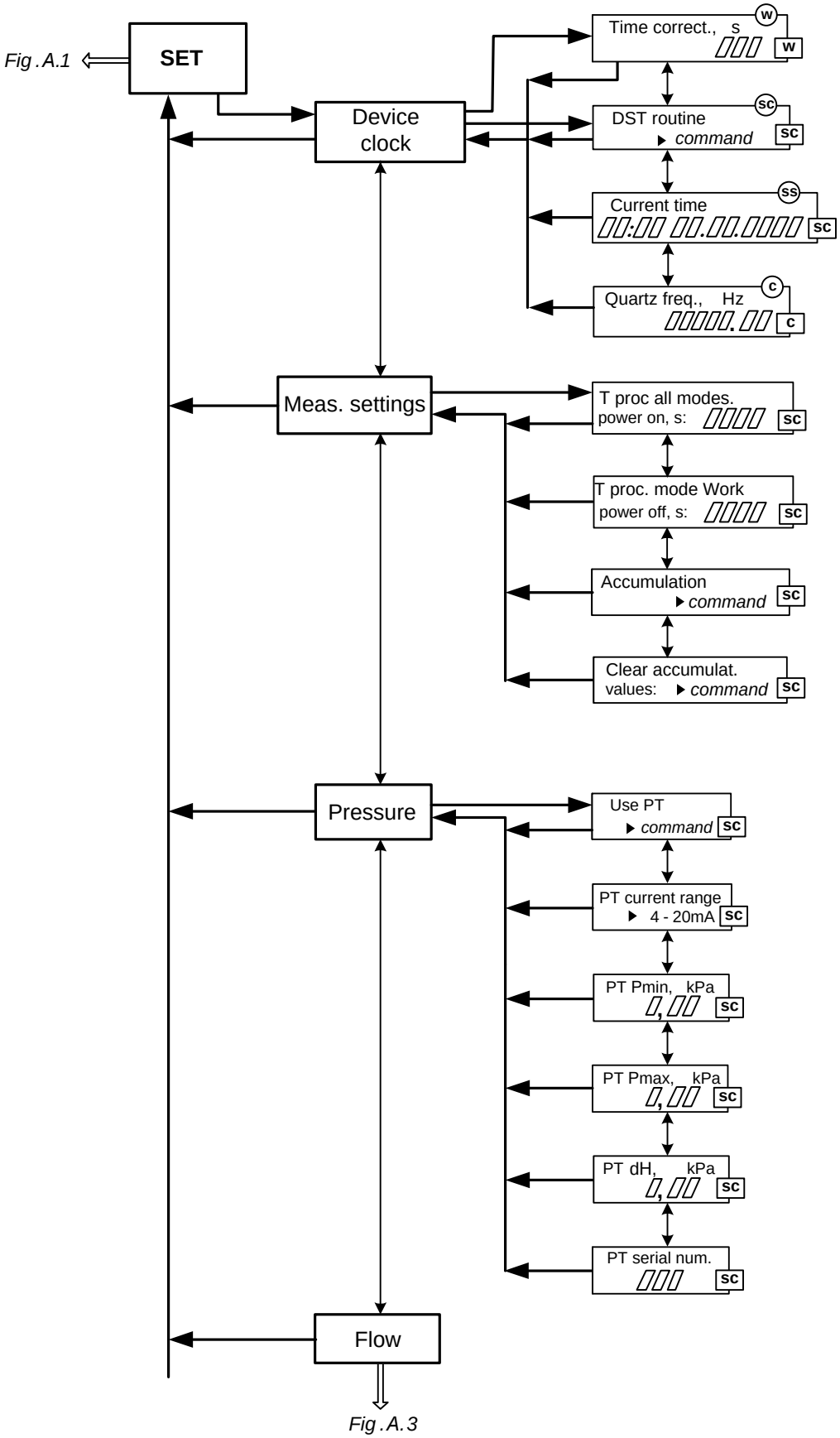

Fig.A.2. Menu “SET” and submenu “Device clock”, “Meas. setting”, “Pressure”.

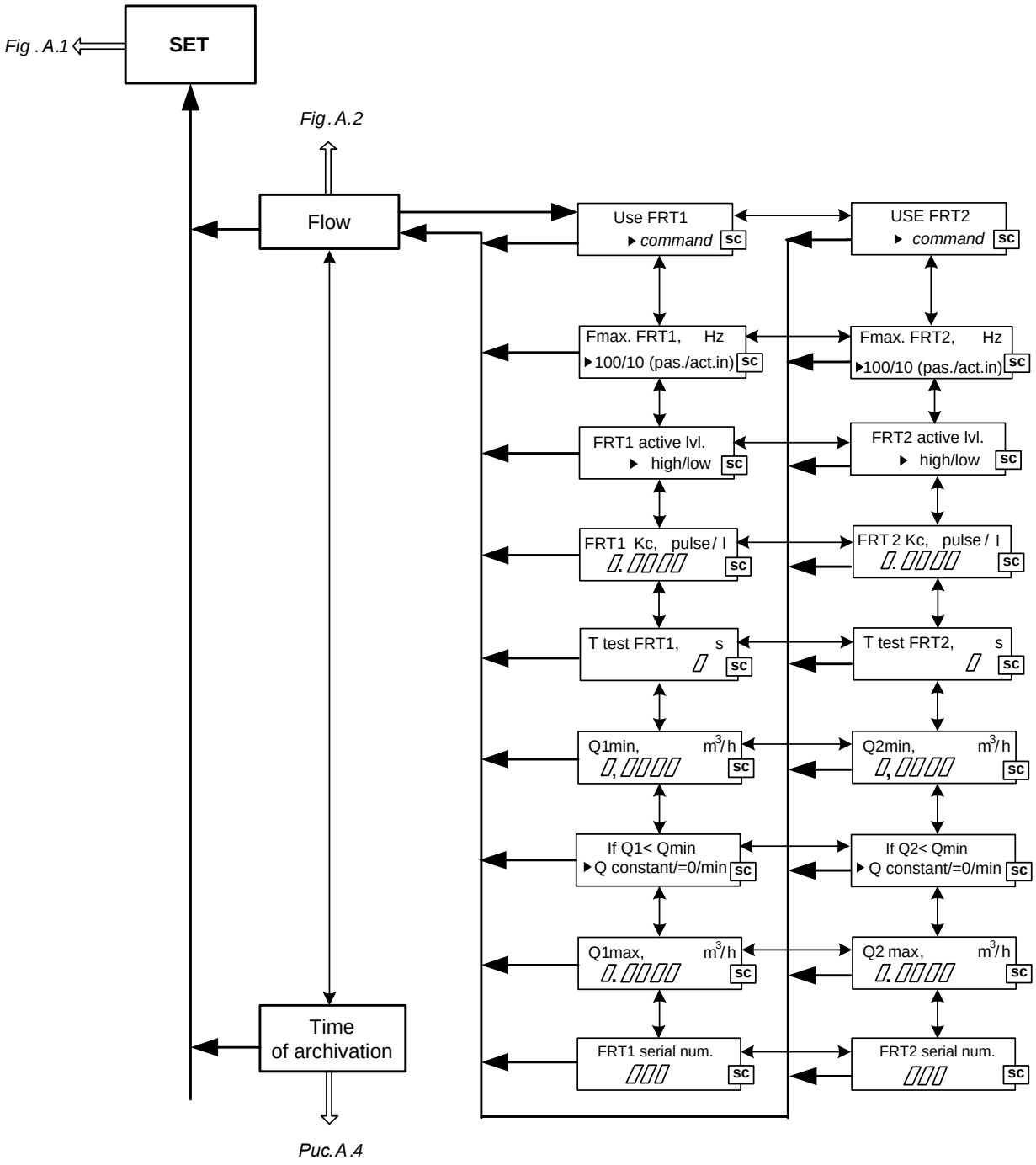

Fig.A.3. Menu “SET” and submenu “Flow”

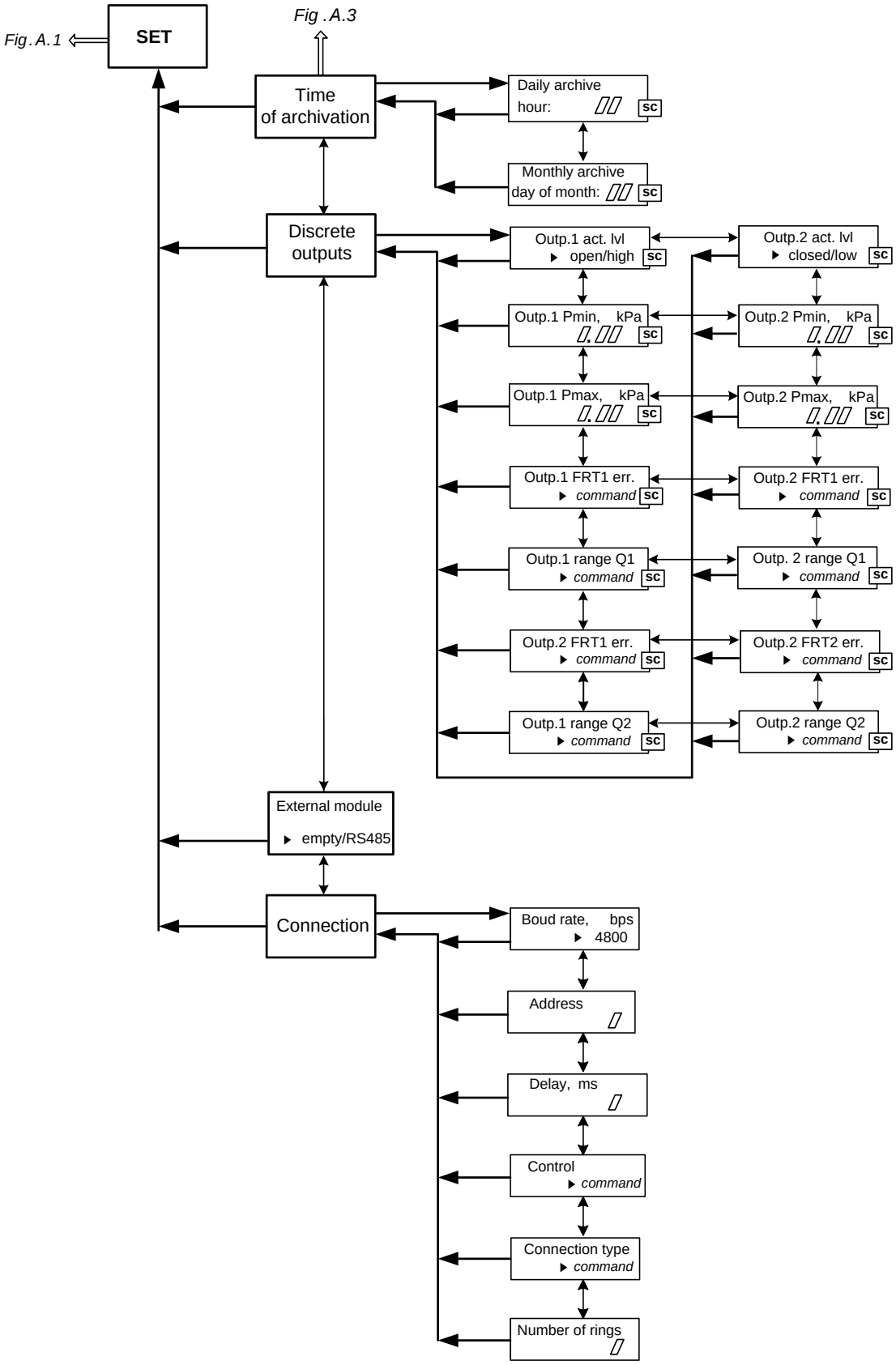

Fig.A.4. Menu “SET” and submenu “Time of archivation”, “Discrete outputs” and “Connection”.

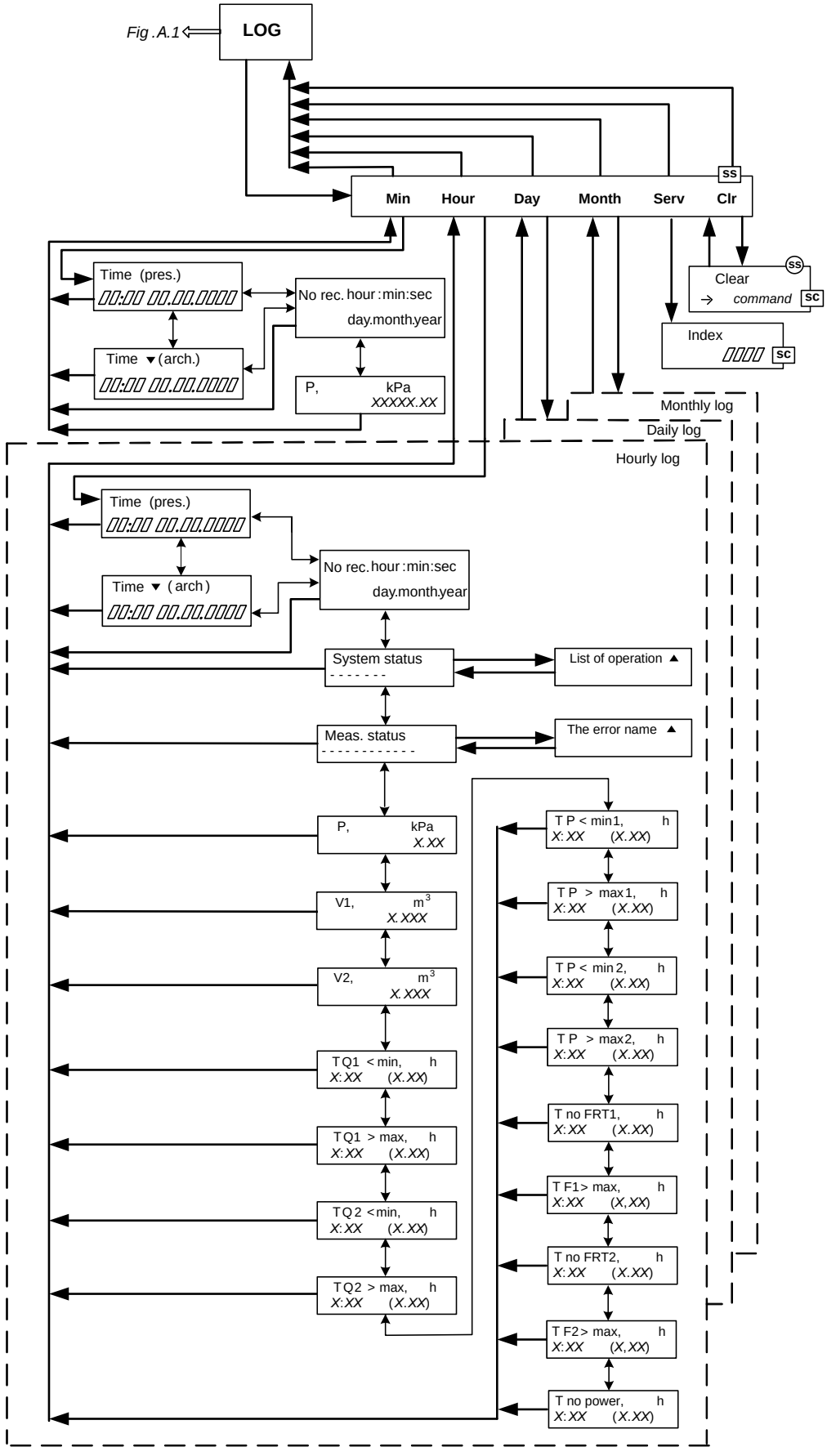

Fig.A.5. Menu “LOG”.

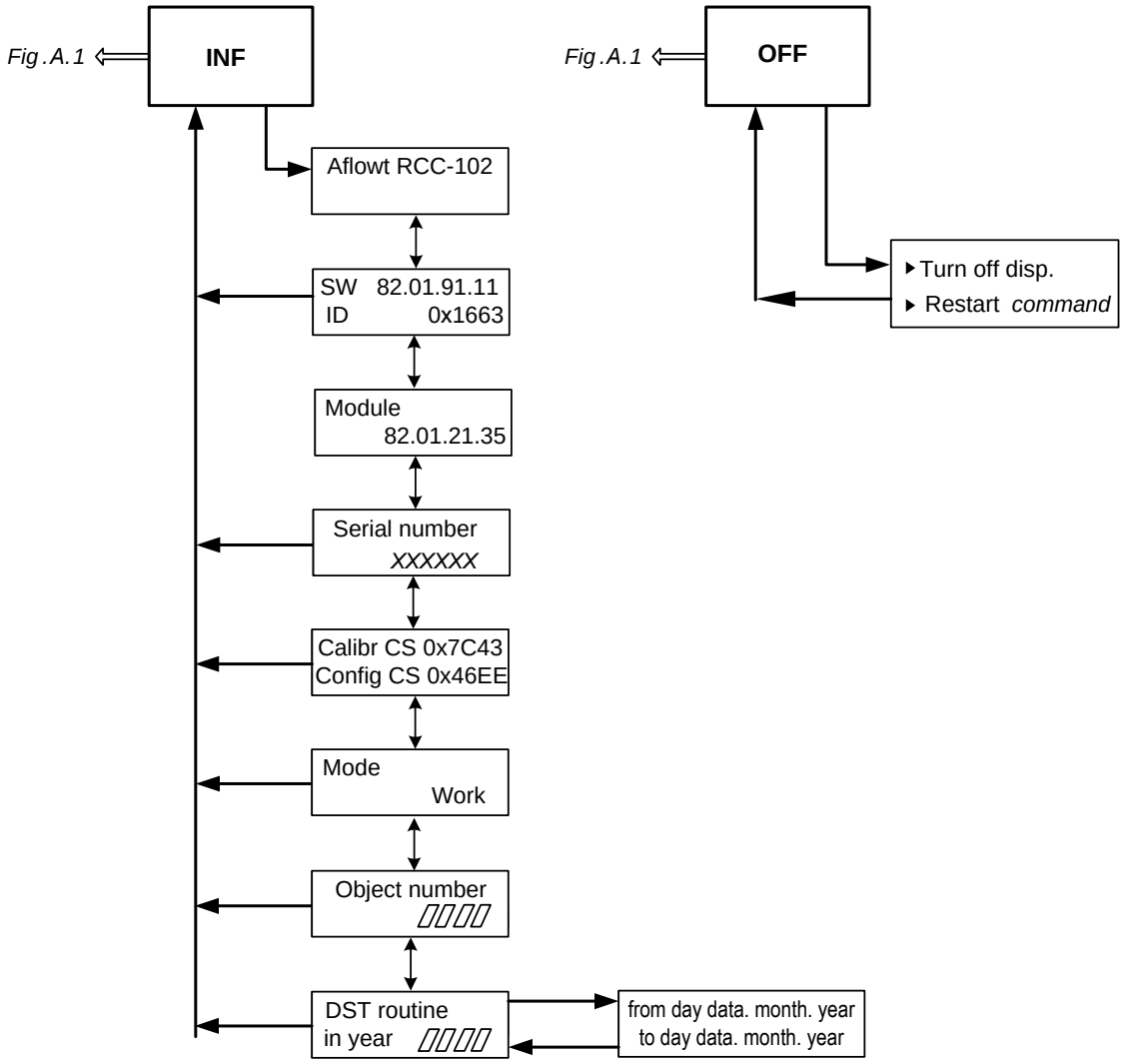

Fig.A.6. Menu “INF” and “OFF”.

APPENDIX B. The parameters shown on the display

Table B.1. The parameters indicated in the menu MEAS in WORK mode (switch buttons ↑, ↓)**.**

Parameter	Indication
Status word for pressure and flow measurement channels	P out > < Q +!
Pressure, kPa	**P kPa**
Volumetric flow rate of the first (second) channel	**Q1 (2)** **m^3/h**
Accumulated volume of the first (second) channel	**V1 (2)** **m^3**
Current time, hour:min:sec	**Time XX:XX:XX**
Day of the week and the current date:	**XX XX.XX.XXXX**
Operating time	**Twork h**

Meaning of symbols in the status word:

x – input deactivated by software

\+ – normal operation

> – above range

< – below range

! – out of power in FRT

Table B.2. Temporary parameters displayed in the menu MEAS (switching buttons →, ← from Twork window)**.**

Parameter	Indication
Operating time	**Twork, h**
Total time during which the flow rate of the first channel was below specified minimum value of the range	**T Q1 < min, h**
Total time during which the flow rate of the first channel was above specified minimum value of the range	**T Q1 > max, h**
Total time during which the flow rate of the second channel was below specified minimum value of the range	**T Q2 < min, h**
Total time during which the flow rate of the second channel was above specified minimum value of the range	**T Q2 > max, h**
Total time during which the pressure was below minimum value for triggering discrete output 1	**T P < min1, h**
Total time during which the pressure was above maximum value for triggering discrete output 1	**T P > max1, h**
Total time during which the pressure was below minimum value for triggering discrete output 2	**T P < min2, h**
Total time during which the pressure was above maximum value for triggering discrete output 2	**T P > max2, h**

Table B.3. List of parameters, displayed in the hourly (daily, monthly) log

Parameter	Indication
Finish time of logging	**No rec. hour:min:sec day.month.year**
Status system (see. Table B.4)	System status - - - - - - -
Status measurement (see. Table B.5)	Meas. status - - - - - - - - - - - -
Average pressure during logging interval	**P, kPa**
Total cumulative volume of the first (second) channel	**V1, (2) m^3**
Total time during logging when the flow rate of the first channel was below specified minimum value of the range	**T Q1 < min, h XX:XX (XX.XX)**
Total time during logging when the flow rate of the first channel was above specified minimum value of the range	**T Q1 > max, h XX:XX (XX.XX)**
Total time during logging when the flow rate of the second channel was below specified minimum value of the range	**T Q2 < min, h XX:XX (XX.XX)**
Total time during logging when the flow rate of the second channel was above specified minimum value of the range	**T Q2 > max, h XX:XX (XX.XX)**
Total time during logging when pressure was below minimum value for triggering discrete output 1	**T P < min1, h XX:XX (XX.XX)**
Total time during logging when pressure was above maximum value for triggering discrete output 1	**T P > max1, h XX:XX (XX.XX)**
Total time during logging when pressure was below minimum value for triggering discrete output 2	**T P < min2, h XX:XX (XX.XX)**
Total time during logging when pressure was above maximum value for triggering discrete output 2	**T P > max2, h XX:XX (XX.XX)**
Total time during logging when flow rate transducer 1 was not active level	**T no FRT1, h XX:XX (XX.XX)**
Total time during logging when frequency from flow rate transducer 1 was above maximum	**T F1 max, h XX:XX (XX.XX)**
Total time during logging when flow rate transducer 2 was not active level	**T no FRT2, h XX:XX (XX.XX)**
Total time during logging off external power supply	**T F2 max, h XX:XX (XX.XX)**
Status system (see. Table B.4)	**T no power, h XX:XX (XX.XX)**

The ER times are displayed in the archives in the format hours and minutes (hours, hundredths of hours), actual duration time of ER depends on the type of archive.

The 0:41 (0.68) indicates that the duration of ER amounted to:

- For hourly log – 0.68 hours or 0 hours 41 minutes
- For daily log – 16.32 hours (0.68x24) or 16 hours 19 minutes
- For monthly log – 505.92 hours (0.68x24x31) or 505 hours and 55 minutes.

Table B. 4. List of operations displayed in the System status window

Position number of the code on the indicator	Event	Indication
1	Reset logs for: - Pressure - Emergency situations for an interval. Resetting times of emergency situations in the menu **SET**.	**Clear accumulation**
2	Clock error	**Time error**
3	Device to SERVICE or SETUP mode	**Mode Service, Setup**
4	Clock adjustment	**The transfer time in the interval**
5	Reserve	
6	Reserve	
7	Switching to summer time mode or setting of time if new time is out of range of logging	**Empty record**

The presence of event is noted at the appropriate character position by sign <X>, the absence by the symbol <–>. Numbering of code positions from left to right.

Table B.5. List of faults and abnormal situations, diagnosed in the Meas. status window.

Position number of the code on the indicator	Event	Indication of ER
1	Absence of the power output on the first channel of the flow meter	**Input 1 off**
2	Impulse frequency of the first channel is above maximum *	**Input 1 excess frequency**
3	Absence of the power output on the second channel of the flow meter	**Input 2 off**
4	Impulse frequency of the second channel is above maximum *	**Input 2 excess frequency**
5	Flow rate of the first channel is above specified maximum value of the range	**Q1 high max.**
6	Flow rate of the first channel is below specified minimum value of the range	**Q1 low min.**
7	Flow rate of the second channel is above specified maximum value of the range	**Q2 high max.**
8	Flow rate of the second channel is above specified minimum value of the range	**Q2 low min.**
9	Pressure is above maximum value for triggering discrete output 1	**P high max. out 1**
10	Pressure is below minimum value for triggering discrete output 1	**P low min. out 1**
11	Pressure is above maximum value for triggering discrete output 2	**P high max. out 2**
12	Pressure is below minimum value for triggering discrete output 2	**P low min. out 2**

Numbering of code positions from left to right.

* - checking frequency excess is automatically done in the WORK mode: for the active input mode maximum frequency is 10 Hz, for the passive mode – 100 Hz.

APPENDIX C. Keypad buttons

Graphical symbol	Function
	1. When switching between windows, moving up. 2. When setting a character value – navigating up the list. 3. When set to a numeric value, the higher the value of the discharge.
	1. When switching between the windows is a move down. 2. When setting the character size – move down the list. 3. When set to a numeric value, the decreasing value of the discharge.
	1. In the main menu and the **LOG** menu – move the cursor on the menu bar to the left. 2. When switching between windows – move left. 3. When setting numeric values – moving the cursor to a field or bit of the number to the left. 4. When you select – the reduction of the index parameter.
	1. In the main menu and the **LOG** menu – move the cursor on the menu bar to the right. 2. When switching between windows – move to the right. 3. When setting numeric values – moving the cursor to a field or bit of the number to the right. 4. When you select the option – growth option.
	1. The transition to the selected menu/window of the lower level. 2. The entrance to the edit mode parameter. 3. Record set value of the parameter of the operation.
	1. Exit to the top level menu/window. 2. Refusal to enter the changed parameter value, perform the operation and exit from the parameter edit mode.