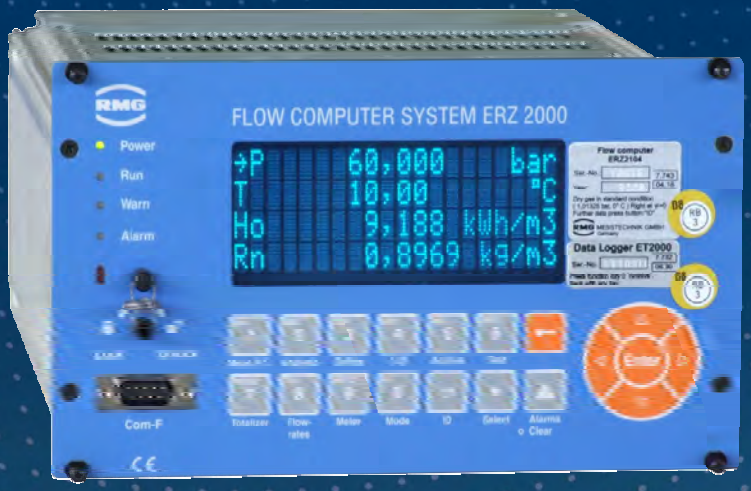
Multistream Flow Computer ERZ 2404



OPERATING INSTRUCTIONS

Reliable Measurement of Gas

STATUS MARCH 2010 V 1.2

Note:

Unfortunately, paperwork does not automatically update itself but technical developments are constantly being made. Therefore, we reserve the right to change the descriptions and statements contained in our operating instructions without prior notice. However, you can conveniently download the most recent version of this manual (and those of other devices) from our website **www.rmg.com**.

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1 Introduction

1.1 Overview of functions

The ERZ 2404 is a further development of the proven ERZ 2000 concept. Just like the ERZ 2000, the ERZ 2404 consists of two functional groups. The base module provides data logging, all inputs and outputs, all interfaces and manual operation via the front panel. The actual calculations and corrector functions are managed by the second module, which is the arithmetic logic unit (ALU). It is an embedded PC with a high-performance CPU. Thus, the device is capable of making even more complex calculations with short computing cycles.

The base module is used for neutral measurements of all inputs similar to a multimeter, but no calculations or assignments to physical units are made. Therefore, the base module only deals with analogue values, frequencies and meter contents without knowing the meaning of the individual values. The measured values are transmitted to the arithmetic logic unit where they are assigned to the appropriate physical quantities and converted into usable data. The base module also operates all outputs and the data interfaces. Another task is reading the keys and outputting texts and results on the display. For hardware extensions and future requirements, there are three spare slots.

The arithmetic logic unit, which represents the central functional module of the ERZ 2404, consists of a powerful microprocessor system based on an AMD 586 with an associated program memory (flash memory), random access memory and data memory.

The random access memory contains the variables, fields, buffers, etc. required for running the system software and the (changeable) device parameters of all functional modules. The device parameters are protected by means of a checksum which is automatically verified with each new start of the device.

The program memory contains the operating program of the device. A CRC checksum has been calculated via the source code and deposited as reference value. The correctness of the checksum can be verified under **Software ID** in the coordinates of column SJ.

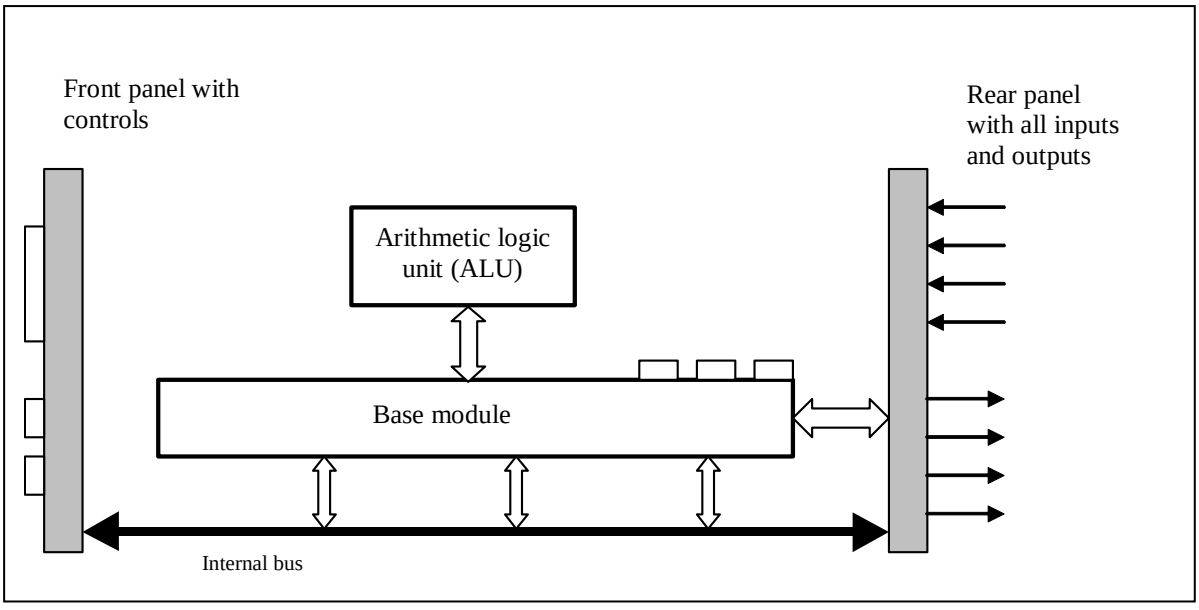


Figure 1: Overview of the system structure

1.2 Field of application

The general field of application of the ERZ 2404 includes the recording and metering of quantities in natural gas flow measurement technology for custody transfer applications together with the USZ 08 Ultrasonic meter. Calculation of the K coefficient is in accordance with GERG 88 S, AGA NX 19 or AGA 8 92 DC.

One Flowcomputer for multiple meter runs.

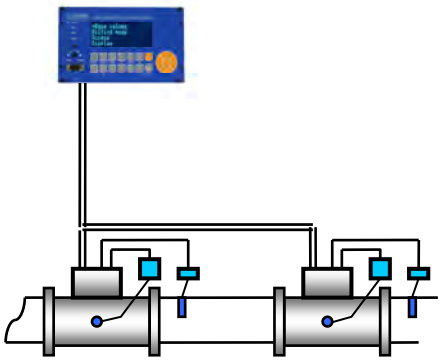
2

In special cases up to 4 USZ 08 devices can be connected via RS 485 bus-system and communicate with COM 1 port of ERZ 2404. Because of the ultrasonic meter ability to measure in both directions the ERZ 2404 provides 8 Flowcomputer units.

The assignment is free selectable by the user, a typical assignment can be:
The 1st unit is for meter run #1 in forward mode.
The 2nd unit is for meter run #1 in reverse mode.
The 3rd unit is for meter run #2 in forward mode.
The 4th unit is for meter run #2 in reverse mode.
The 5th unit is for meter run #3 in forward mode.
The 6th unit is for meter run #3 in reverse mode.
The 7th unit is for meter run #4 in forward mode.
The 8th unit is for meter run #4 in reverse mode.

Another typical assignment can be:
The 1st unit is for meter run #1 in forward mode.
The 2nd unit is for meter run #2 in forward mode.
The 3rd unit is for meter run #3 in forward mode.
The 4th unit is for meter run #4 in forward mode.
The 5th unit is for meter run #1 in reverse mode.
The 6th unit is for meter run #2 in reverse mode.
The 7th unit is for meter run #3 in reverse mode.
The 8th unit is for meter run #4 in reverse mode.

Typical application with meter redundancy:
Multiple meter run mode used in redundancy conceptions with two ultrasonic meters in series.
The 1st unit is for ultrasonic meter #1 in forward mode.
The 2nd unit is for ultrasonic meter #1 in reverse mode.
The 3rd unit is for ultrasonic meter #2 in forward mode.
The 4th unit is for ultrasonic meter #2 in reverse mode.



Designations and device variants of the ERZ 2000 system family

The thousands place describes the system name.
The hundreds place defines special versions like calculation of energy or multi stream functions.
The tens place defines the function of the orifice-plate computer.
The ones place defines the correction of state, temperature or density (1 = temperature, 2 = density, 3 = spare, 4 = pressure / temperature).
The extension behind the family name points to special versions (e.g. ERZ 2404).

Examples:

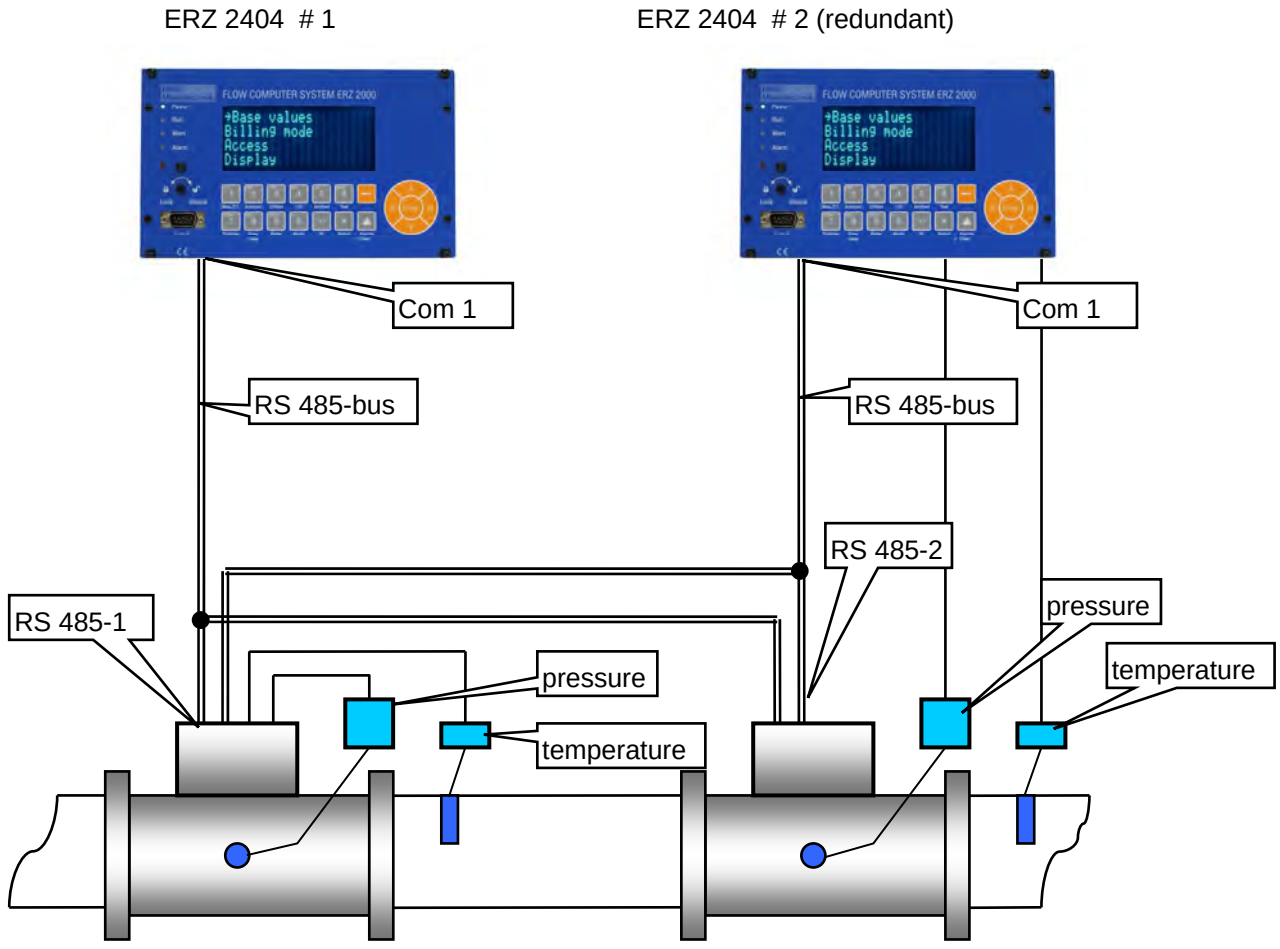
Multistream Flowcomputer with communication to USZ 08	**ERZ 2404**

Other versions only available with standard ERZ 2000 deigned for one meter run:

PTZ corrector	ERZ 2004
Superior calorific value corrector	ERZ 2104
Density corrector	ERZ 2002
Density corrector – energy	ERZ 2102
PTZ corrector with ultrasonic controller	ERZ 2004 USC
Superior calorific value corrector with ultrasonic controller	ERZ 2104 USC
Density corrector with ultrasonic controller	ERZ 2002 USC
Density corrector – energy with ultrasonic controller	ERZ 2102 USC
PTZ corrector with mass calculation	ERZ 2004M
Superior calorific value corrector with mass calculation	ERZ 2104M
Density corrector with mass calculation	ERZ 2002M
Density corrector – energy with mass calculation	ERZ 2102M
Orifice-plate Flowcomputer with P and T	ERZ 2014
Orifice-plate Flowcomputer with density	ERZ 2012
Orifice-plate Flowcomputer with P and T - energy	ERZ 2114
Orifice-plate Flowcomputer with density - energy	ERZ 2112

1.3 Typical Application of ERZ 2404

A typical application is a 2-stream redundant arrangement with two ultrasonic meters and pressure and temperature measurement integrated in the meter head (see left Flow Computer), or pressure and temperature are in transmitter-mode connected via 4...20mA (see right Flow Computer).
For more information see the following block diagram:



Both ERZ 2404 are running in Modbus-Master mode, both ultrasonic meters are running in Modbus-Slave mode. The used protocol in ERZ 2404 is DZU master, in USZ 08 is DZU slave. Installed in both ERZ 2404 are 2 real Flow computers and 2 virtual Flow computers. The real type is used at forward gas-flow the virtual type is used at reversed gas-flow. The information about forward or reverse flow is embedded in the DZU protocol. In this case only one RS 485 bus connection delivers all needed information for a 4-stream Flowcomputer system.

For typical wiring and terminal numbers see chapter ***Terminal diagrams*** at the end of this documentation.

1.4 Performance features

- 19" design; plug-in unit with 42 depth units (half the width of 19")
- 4-line fluorescent display in blue colour
- Control keyboard with 19 keys of which the numbered keys from 0 to 9 have more than one function: they are function keys in normal display mode (here the marking below the relevant key applies) and in input mode, they are used to input digits or, in extended mode, letters for entering texts.
- System status, warning and alarm indications (LEDs) on the front panel
- Sealable calibration switch
- Serial data interfaces on the front and rear panels
- TCP/IP Ethernet interface on the rear side
- RS 485 bus interfaces for MODBUS and special protocols
- 8 analogue inputs comprising pressure- and temperature-measuring inputs for analogue signals and the HART protocol, one temperature-measuring input for 4-wire resistance measurement, and spare inputs.
- 4 dispatcher pulse outputs
- 4 analogue current outputs
- Time system with automatic switching to daylight saving time and back and with an external synchronization input (Modbus or contact input).
- 8 signal inputs for special purposes
- Uploading operating programs is possible if the calibration switch has been opened (in superuser mode)

1.5 Device structure

The ERZ 2404 system is characterized by a simple structure comprising only a few components. There is a distinct separation between the individual functions: data logging, volume correction, recording and basic tasks.

Hardware – Measurement – Accuracy

The base module is responsible for ensuring accuracy with volume calculation tasks. All parameters relevant to accuracy are assigned to this card and are also stored on this card. This card defines the base functionality of the device with its accuracy and resolution of inputs and outputs and its temperature sensitivity.

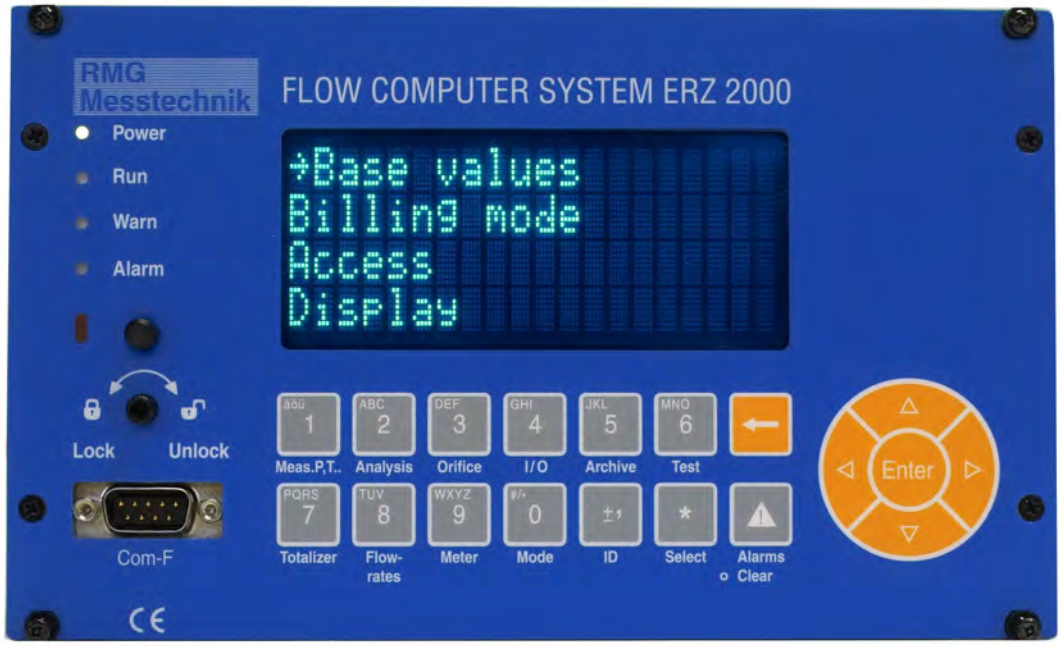
The **digital data interfaces** are located on the base module. These interfaces can be used for:

- Service interface
- Modbus for external data transmissions
- Ethernet TCP/IP network connections

Visualization is performed jointly for all functional modules. The function keys and the display are available to the various entities.

2 Getting started / operation

2.1 System overview



Keys 0 to 9 have more than one function. The current function depends on the operating condition. In normal display mode, the text below the key applies and allows measured values or chapter headings and functions to be directly or indirectly accessed. In input mode, the text on the key itself applies. You can enter numbers and, in extended mode, also letters. Entering letters is similar to the method used for mobile phones.

Function keys	Key legend
▪ Measured values P,T..	1
▪ Analysis	2
▪ Orifice (not used in 2404 mode)	3
▪ I/O (inputs/outputs)	4
▪ Archive	5
▪ Test	6
▪ Totalizer	7
▪ Flow rates	8
▪ Meter	9
▪ Mode	0
▪ ID	± ,
▪ Select (selects a chapter)	*
▪ Backspace function	←
▪ Alarms (displays or clears messages)	△

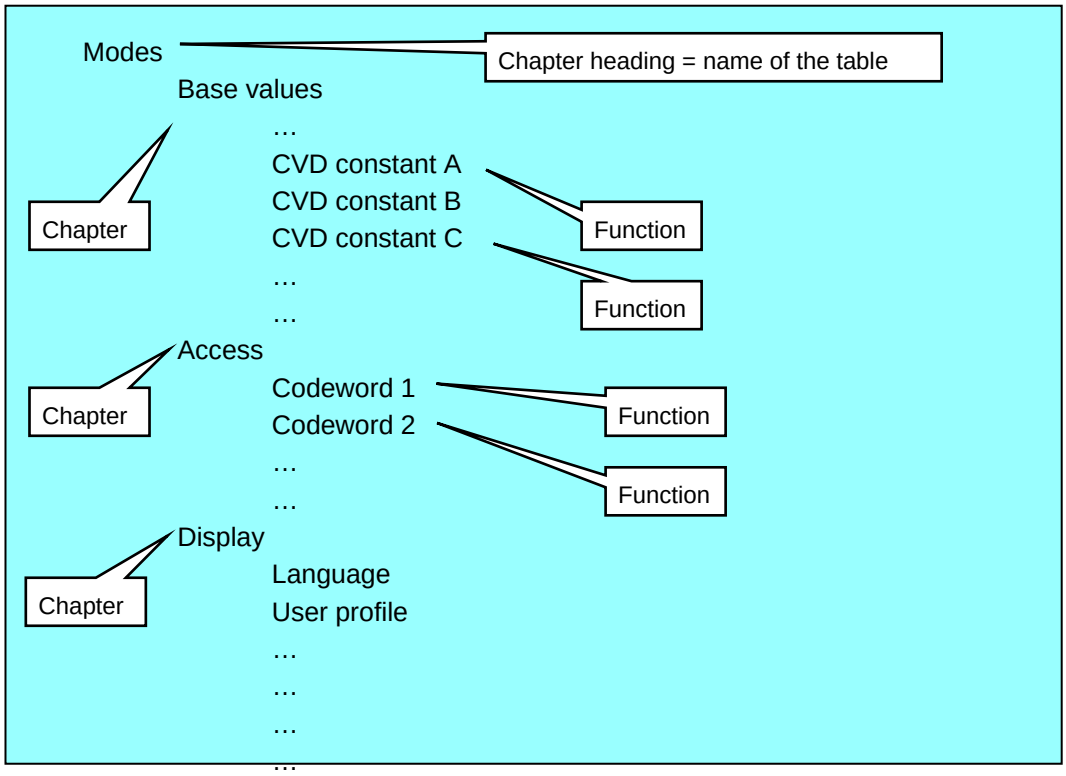
Use the keys 1, 2, 7 and 8 to directly display the most important measured values. Use the keys 3, 4, 5, 6, 9 and 0 to access the relevant headings and chapter overviews. The * key for "Select" will always show the current chapter. Use the ← key to go back to the last 50 times you have pressed a key.

2.2 Coordinate system, levels and rights of access, visibility levels

2.2.1 Coordinate system

All variables and measured and calculated values are grouped into several tables in order to show associated functions. Each table represents a matrix with fields from AA 01 to AZ 99, or BA 01 to BZ 99, or CA 01 to CZ 99, etc. All tables together form the coordinate system.

Tabular structure:
Each table has a name which appears as chapter heading.
Each column has a chapter name, while the fields (coordinates) are the functions.
Example:



The ***<0> Mode*** key shown in the example above enables central access to the chapter headings. When you press the ***<0>*** key, the ERZ 2404 will jump to table S and display the first chapter **Base values** and the following chapters which can be browsed through using the ***Cursor Up*** or ***Down*** key. When you browse through the chapters, an arrow → appearing in front of the chapter selected is used for orientation. Press ***Enter*** to access the functions of the chapter to which the arrow points.

Starting from the table S which you access by pressing the ***Mode*** key, you can easily browse through all tables from the beginning (A) to the end (P) using the ***Cursor Right*** or ***Left*** key.

The **<*>** ***Select*** key fulfils an important function as it helps you orient yourself in the coordinate system and select the desired chapter. Using this key, you can switch back from any location in the coordinate system to the current chapter with heading, etc. If you press the **<*>** key once again, you are referred back to the function (coordinate) where you came from.

Whenever the device shows a view with a chapter heading, you can access all chapters of the entire system by pressing the ***Cursor Right*** or ***Left*** key. When you have reached the desired chapter heading, press the ***Cursor Up*** or ***Down*** key to access the chapter or press ***Enter*** to activate the function.

If you are inside a chapter (i.e. in a column of the table with the functions), you can also browse through all chapters of the complete coordinate system by pressing the ***Cursor Right*** or ***Left*** key. During the time you are browsing, the current coordinate is displayed for approx. 2 seconds in the fourth line.

Further guidance is provided by the option of permanently showing the coordinate of the current field together with each value displayed. To do this, press ***<0> Mode*** and browse downwards to **Display**. Then press ***Enter*** and the ***Cursor Up*** or ***down*** key to access the **Coordinates** function and set the parameter to **"Yes"**. Now all fields will be displayed together with their coordinates. Since the 4-character coordinates will then appear, long texts exceeding 20 characters per line will be truncated on the display.

2.2.2 Access and display of data for more than one meter run

Because the ERZ 2404 is able to calculate “in parallel” up to 4 real and additional 4 virtual converters, there are some special functions of the display to consider.
Unique values and parameters are accountable for all meter runs (streams) and multiple values and parameters are assigned to a dedicated meter run.
Multiple values (meter run dedicated) are:

Values at measurement conditions (examples for access with browser via Ethernet TCP/IP):

AA Flow computer 1 measurement condition

Access	Line	Name	Value	Unit	Variable
A §	1	Temperature	10.00	°C	U1TmpB
A §	3	Absolute pressure	42.000	bar	U1DrkB
A §	4	Operating density	31.3063	kg/m3	U1RhoB
A §	10	Compress.factor	0.914234		U1ZB
A §	11	k-Number	0.91642		U1KZ
A §	12	Conversion factor	43.6339		U1Zu
A §	13	Volume flow	0.000	m3/h	U1Qb
A §	14	Volume fl. corr.	0.000	m3/h	U1Qbc

Values at based conditions

AB Flow computer 1 base conditions

Access	Line	Name	Value	Unit	Variable
E §	1	Temperature	0 °C		U1TmpN
E §	2	Ref. temp. Hs	25 °C		U1ThoN
E §	3	Standard pressure	1.01325 bar		U1DrkN
A §	4	Standard density	0.7175	kg/m3	U1RhoN
A §	5	Calorific value	11.064	kWh/m3	U1HoN
A §	6	Carbondioxide	0.000	mol-%	U1CO2N
A §	7	Hydrogen	0.000	mol-%	U1H2N
A §	8	Nitrogen	0.000	mol-%	U1N2N
A §	9	Reletive density	0.5549		U1DV
A §	10	Compress.factor	0.997617		U1ZN
A §	13	Volume flow	0.000	m3/h	U1Qn
A §	14	Energy flow	0.000	kW	U1Qe
A §	15	Mass flow	0.000	kg/h	U1Qm

Settings for meter run 1

AC Flow computer 1 settings

Access	Line	Name	Value	Unit	Variable
E §	1	Temperature	Temperature A		U1QTmp
E §	3	Absolute pressure	Pressure A		U1QDrk
E §	4	gas quality	Table A		U1QGbh
E §	5	GQ-calculation	ISO 6976		U1GbhBF
E §	10	Equation of state	GERG 88 S Set A		U1EOS
E §	13	Volume/Flow	USE 09 A forward		U1QVol
B	14	Name	Stream 1		
B	15	Condition	1		U1E…
E §	20	Activation	on		U1Mode
Y	30	reset function	do nothing		U1ClrCmd

Line 14 Name serves 2 functions:
Title in the file tree

A Stream 1
AA FC1 meas. condit.
AB FC1 base condition
AC FC1 settings
AD FC1 status
… …
… …
… …

Title in the printout

With the function in line 20 ***Activation*** the Flow Computer can be switched On and Off.

With the function in line 15 ***Condition*** the user is able to define an expression to start and stop the flow measurement. Default is 1 that means always running.
Example: hoMbA **> 10.5** that means the flow measurement should start when the calorific input value (e.g. coming from Modbus A) is greater than 10.5. To create such expressions please use the variable names that are shown under user profile ***developer*** in the column on the right-hand side of the menues.

Please consider using input values and not derived and calculated values from flow measurement, otherwise you will get a blockade!

Status information of meter run 1

AD Flow computer 1 status

Access	Line	Name	Value	Unit	Variable
A *	1	Temperature	**okay**		U1TempOk
A *	3	Absolute pressure	**okay**		U1DrkaOk
A *	4	gas quality	**okay**		U1GbhOk
A *	10	Equation of state	**okay**		U1EOSOk
A *	13	Volume input	**okay**		U1VolOk
A *	15	Conversion	**okay**		U1Ok
D	16	Operation	Running		U1Run

All units of meter run 1

AE Flow computer 1 units

Access	Line	Name	Value	Unit	Variable
E §	1	Temperature	°C		U1TDim
E §	3	Absolute pressure	bar		U1PDim
E §	4	Density	kg/m3		U1RhDim
E §	5	Calorific value	kWh/m3		U1HoDim
E §	6	Components	mol-%		U1KmpDim
E §	13	Volume flow	m3/h		U1QvDim
E §	14	Energy flow	kW		U1QeDim
E §	15	Mass flow	kg/h		U1QmDim
E §	30	Unit Vb	·100 m3		U1vnDim
E §	31	Unit Vm	m3		U1vbDim
E §	32	Unit E	MWh		U1eDim
E §	33	Unit M	kg		U1mDim

All displayed number representations (formats) of meter run 1

AF Flow computer 1 formats

Access	Line	Name	Value	Unit	Variable
E §	1	Temperature	%.2f		U1TFrm
E §	3	Absolute pressure	%.3f		U1PFrm
E §	4	Density	%.4f		U1RhFrm
E §	5	Calorific value	%.3f		U1HoFrm
E §	6	Components	%.3f		U1KmpFrm
E §	7	Relative density	%.4f		U1DVFrm
E §	13	Volume flow	%.3f		U1QvFrm
E §	14	Energy flow	%.3f		U1QeFrm
E §	15	Mass flow	%.3f		U1QmFrm
E §	16	Quantities	%.4f		U1MngFrm

All quantities of the last hour of meter run 1

AG Flow computer 1 hourly quantities

Access	Line	Name	Value	Unit	Variable
Z §	1	Vm	0.0000	m3	HU1Vb
Z §	2	DVm	0.0000	m3	HU1SVb
Z §	3	Vmc	0.0000	m3	HU1Vbc
Z §	4	DVmc	0.0000	m3	HU1SVbc
Z §	5	Vb	0.0000	·100 m3	HU1Vn
Z §	6	DVb	0.0000	·100 m3	HU1SVn
Z §	7	E	0.0000	MWh	HU1E
Z §	8	DE	0.0000	MWh	HU1SE
Z §	9	M	0.0000	kg	HU1M
Z §	10	DM	0.0000	kg	HU1SM
D	11	last hr. Vm	0.0000	m3	IHU1Vb
D	12	last hr. DVm	0.0000	m3	IHU1SVb
D	13	last hr. Vmc	0.0000	m3	IHU1Vbc
D	14	last hr. DVmc	0.0000	m3	IHU1SVbc

D	15	last hr. Vb	0.0000	·100 m3	IHU1Vn
D	16	last hr. DVb	0.0000	·100 m3	IHU1SVn
D	17	last hr. E	0.0000	MWh	IHU1E
D	18	last hr. DE	0.0000	MWh	IHU1SE
D	19	last hr. M	0.0000	kg	IHU1M
D	20	last hr. DM	0.0000	kg	IHU1SM

>> All quantities of the last day and month are arranged in the same way.

Totalizer

AJ Flow computer 1 totalizer

Access	Line	Name	Value	Unit	Variable
Z §	1	Vm	0.00000	m3	U1Vb
Z §	2	DVm	0.00000	m3	U1SVb
Z §	3	Vmc	0.00000	m3	U1Vbc
Z §	4	DVmc	0.00000	m3	U1SVbc
Z §	5	Vb	0.00000	·100 m3	U1Vn
Z §	6	DVb	0.00000	·100 m3	U1SVn
Z §	7	E	0.00000	MWh	U1E
Z §	8	DE	0.00000	MWh	U1SE
Z §	9	M	0.00000	kg	U1M
Z §	10	DM	0.00000	kg	U1SM
D	11	Yesterday Vm	0.00000	m3	IU1Vb
D	12	Yesterday DVm	0.00000	m3	IU1SVb
D	13	Yesterday Vmc	0.00000	m3	IU1Vbc
D	14	Yesterday DVmc	0.00000	m3	IU1SVbc
D	15	Yesterday Vb	0.00000	·100 m3	IU1Vn
D	16	Yesterday DVb	0.00000	·100 m3	IU1SVn
D	17	Yesterday E	0.00000	MWh	IU1E
D	18	Yesterday DE	0.00000	MWh	IU1SE
D	19	Yesterday M	0.00000	kg	IU1M
D	20	Yesterday DM	0.00000	kg	IU1SM

Average values

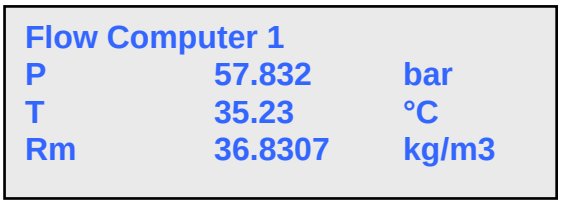
AK Flow computer 1 average values

Access	Line	Name	Value	Unit	Variable
D	1	T second	10.00	°C	U1TmpBs
D	2	T minute	10.00	°C	U1TmpBm
D	3	T hour	10.00	°C	U1TmpBh
D	4	T day	0.00	°C	U1TmpBd
D	5	P second	42.000	bar	U1DrkBs
D	6	P minute	42.000	bar	U1DrkBm
D	7	P hour	42.000	bar	U1DrkBh
D	8	P day	0.000	bar	U1DrkBd
D	9	Hs second	11.064	kWh/m3	U1HoNs
D	10	Hs minute	11.064	kWh/m3	U1HoNm
D	11	Hs hour	11.064	kWh/m3	U1HoNh
D	12	Hs day	0.000	kWh/m3	U1HoNd
D	13	Rd second	0.5549		U1DVs
D	14	Rd minute	0.5549		U1DVm
D	15	Rd hour	0.5549		U1DVh
D	16	Rd day	0.0000		U1DVd
D	17	Qm second	0.000	m3/h	U1Qbs
D	18	Qm minute	0.000	m3/h	U1Qbm
D	19	Qm hour	0.000	m3/h	U1Qbh
D	20	Qm day	0.000	m3/h	U1Qbd
D	21	Qb second	0.000	m3/h	U1Qns
D	22	Qb minute	0.000	m3/h	U1Qnm
D	23	Qb hour	0.000	m3/h	U1Qnh
D	24	Qb day	0.000	m3/h	U1Qnd
D	25	Qe second	0.000	kW	U1Qes
D	26	Qe minute	0.000	kW	U1Qem
D	27	Qe hour	0.000	kW	U1Qeh
D	28	Qe day	0.000	kW	U1Qed

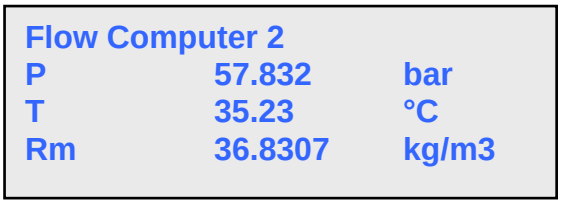
All other values are unique and accountable for the overall functions of the Flowcomputer ERZ 2404.

Differentiation of meter-run data on display:

The first row of the display is used to show if a set of parameters or values is allocated to a meter run. After pressing key 1 the first time the display shows pressure, temperature and density of meter run No. 1.



Pressing the same key again, the display shows the same values but for meter run No. 2.



And so on.

2.2.3 Levels and rights of access

The ERZ 2404 system provides three access levels to change parameters or device settings.
The lowest level is the user level which is protected by code. It is marked B, C or P in the following documentation.
The second level is protected by the official calibration lock in the form of a sealable turn switch. It is marked E in the following documentation.
The third and highest level is the special-purpose level ("superuser level") which is reserved for type changes, etc. The special-purpose level can be reached by entering the code and by additionally opening the calibration lock. It is marked S in the following documentation.
A symbol (point, rhombus or blank) indicates whether a value displayed can be edited. The symbol is located between the line information and the text, e.g.

Any column, line 2:
02 Input value
↖ Blank: Value cannot be edited

Any column, line 9:
09 • Lower alarm limit
↖ Point: Value can be edited but is locked by means of the user code or the official calibration lock.

09 ♦ Lower alarm limit
↖ Rhombus: Value has been enabled for editing.

2.2.4 Visibility levels

Dynamic hiding or showing of displays in the coordinate system depends on several factors. Firstly, the device type set (ERZ 2004, ERZ 2002, ERZ 2104, etc.) determines which parts of the coordinate system are relevant and only those are shown.

This manual describes only the ERZ 2404 type no other device types are selectable.

Secondly, there are visibility levels which can make further restrictions. These levels have been given names which correspond to the scope or range of displays shown.

The lowest level is the "Gas meter reader" who can access only a few useful displays or overviews via the keyboard while the rest cannot be accessed by him/her. This level can be selected by the user if outside access is to be prevented.

The next level up is the **standard setting** and is named "User". With this setting, all measured values, parameters, auxiliary quantities, etc. which is useful for the selected device type and the chosen operating modes are visible and can be edited. The device automatically shows only the coordinates or columns which are required.

Above this level there is another level which is called "Service". At the service level, there is no dynamic hiding or showing as with the "User" level and the service staff can view all values even those which are not needed in the current operating mode.

The topmost level is the "Developer". In this mode, additional auxiliary quantities and intermediate values are shown which may be useful for diagnostic purposes if a fault occurs.

You can select the visibility level with the ***<0> Mode*** key in the **Display** chapter.

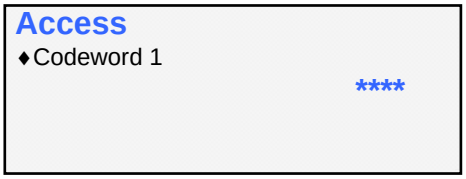
We would recommend setting the visibility level at "Service" before you start to parameterize the device.

2.2.5 Entering the user code

The lowest access level is protected by the user code. The code is divided into two 4-character parts and has to be entered in two subsequent coordinates. In the operating instructions, the relevant data are marked (for user lock). A special case is the marking C for the user code itself.
To enter the user code, press ***<0> Mode*** and enter the code in the **Access** chapter under the **Codeword 1** and **Codeword 2** functions.

The arrow is already located on the third line on Access. In this example, pressing ***Enter*** will select the correct chapter. A new window will open with the **Access** heading. Use the ***Cursor Down*** key to select the first codeword.

Then the following text appears:



The rhombus indicates that code entry has been enabled. The four asterisks stand for the first part of the 8-character code. After you have pressed ***Enter***, the display will turn a bit darker and the four asterisks will disappear. Now you have to enter the first four characters of the code correctly in the third line. Press ***Enter*** to terminate your inputs and use the ***Cursor Down*** key to browse to codeword 2. Now press ***Enter*** again to switch over the display to input mode (darker) and enter the second part of the codeword.

If the code has been entered correctly, the Power LED at the top left of the front panel will start to flash.

2.3 Device type

The device description in this manual refers only to the versions TANCY Instruments and Petronas. No other types are selectable. These are two typical user defined applications at the moment. The System is growing and will be developed to future functionality. TANCY is the first or older version, Petronas the current version.

2.3.1 Description of the update procedure

- Connect the front interface of the ERZ 2404 to your PC's serial interface using a null modem cable.
- Start a terminal emulation program, e.g. under Windows Start / All Programs / Accessories / Communications / HyperTerminal. At the first start, establish a new connection with 115200, 8, no parity, 1, no handshake and save this setting.
- Set the ERZ 2404 to superuser mode.
  Enter codeword 1.
  Enter codeword 2.
  Open the calibration lock.
  Follow the above sequence of operations.
- Now transfer the new application into the ERZ 2404. The program consists of a set of files which were packed in a ZIP archive. Select the ZIP archive under "Transfer/Send File" in HyperTerminal and send it using the "Ymodem" transfer protocol. Watch the progress bar in HyperTerminal and the associated display on the ERZ.
- After the transfer is complete, the ERZ 2404 checks the ZIP file for validity and consistency and reports the result on the HyperTerminal display. If the result is negative, the ZIP file will be destroyed in the ERZ so that the previous file is preserved. If the result is positive, the unpacking process will be integrated into the booting-up procedure of the ERZ 2404. So the new application will be automatically unpacked and activated with the next restart of the ERZ 2404.
- The ERZ 2404 will perform this restart automatically.

2.3.2 Activating the device again after a software update

Every software package contains an activation key which has to be communicated to the ERZ 2404 after a software update. The device verifies the key together with the new check number of the software and the ERZ 2404 will not be ready for normal operation until it has yielded a positive result. If the activation key is missing or is incorrect, the ERZ 2404 switches to permanent operation under fault conditions and thus signals that there is no activation. Corrector functions are performed normally, but only the disturbance totalizers are running.

Example:
Together with the new software, you also receive the new activation key which has to be entered as follows:

- Press ***<0>*** to select **Mode** and then press the ***Cursor Down*** key to browse to the **Software-ID** chapter.
- Select the chapter with the ***Enter*** key and press the ***Cursor Down*** key until you reach the **Activation** function. Here you can find the old activation key which is no longer valid for the new software.
- After you have opened the calibration lock, press ***Enter*** again (the display will turn darker and indicate input mode). The old activation key will disappear and the ERZ 2404 will be waiting for the new key to be entered.
- Enter the new activation key and terminate your inputs with ***Enter***.
- Now the device should no longer be under fault conditions but operate without any trouble.

An important function of the activation key is the verification of the program code which represents the official functions for custody transfer metering. The activation key is used for verifying the check number cyclically. The program can immediately detect a change in the official kernel whether it is caused by an unacceptable program version or a defect of the program memory which results in a modified check number.
This function is important in order to separate the program into an official part for custody transfer metering and into an application part.

2.4 Adjusting the device to the transmitter data

2.4.1 Pressure sensor

The data of the pressure sensor used have to be communicated to the corrector as transmitter data. Apart from the parameters for measurement, the type, manufacturer, serial number, etc., have to be entered in the Absolute pressure chapter as well. Then these data appear automatically in the ID display.
Example for data entry:

Press ***<1> Meas. P,T..*** In the first line below the Flow Computer No. appears the value of pressure, then temperature, density etc. for the dedicated meter-run. Press ***Cursor right*** for access to format and unit and again ***Cursor right*** for access to all parameters and relevant values of **pressure sensor A** and enter the data.

Meter-run 1 is combined with pressure-A, meter-run 2 with pressure-B, meter-run 3 with pressure-C and meter-run 4 with pressure-D. The combination can be changed in the chapter of Flow Computer settings.

Example: press ***Enter*** to access data for measurement conditions then ***Cursor right*** for base conditions and again ***Cursor right*** for access to **FC(n) Settings**. All important settings for the desired meter-run must be done here.

There are the following operating modes for transmitting measured values:

OFF	No measurement, input is switched off.
Default	No measurement, fixed value.
Measured value=source value	HART on 4-20 mA loop in combination with a current input.
Polynomial 1st order	Coefficient 0 defines the polynomial.
Polynomial 2nd order	Coefficients 0 and 1 define the polynomial.
Polynomial 3rd order	Coefficients 0, 1 and 2 define the polynomial.
4-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
0-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
4-20mA limit	The min. and max. limits define the assignment of mA to pressure.
0-20mA limit	The min. and max. limits define the assignment of mA to pressure.
USE 09	The pressure is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.

Preferred mode in ERZ 2404 TANCY:

USE 09	**The pressure is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.**

Preferred mode in ERZ 2404 Petronas:

Measured value=source value	**HART on 4-20 mA loop in combination with a current input.**

Use the cursor key up/down to browse to the ***Operating mode*** function in ***OB 03***. Set the desired operating mode there after you have opened the calibration lock.

If the pressure sensor is to be operated using the HART protocol, make sure that the operating mode is set to **"Measured value=source value"** and a current input combined with the HART function is selected as source. If the pressure sensor is operated as a transmitter, make sure that its power supply is switched on in the associated menu of the current input.
The menu of the data sources comprises all metrological options of an input irrespective of whether or not these signals (e.g. current or frequency signal analogous to the measured quantity) exist for the selected transmitter.

For access to pressure transmitters B, C and D use again ***Cursor right.***

2.4.2 Temperature sensor

The data of the temperature sensor used have to be communicated to the corrector as transmitter data. Apart from the parameters for measurement, the type, manufacturer, serial number, etc., have to be entered in the Gas Temperature chapter as well. Then these data appear automatically in the ID display.
Example for data entry:

Press ***<1> Meas. P,T..*** In the first line below the Flow Computer No. appears the value of pressure, then temperature, density etc. for the dedicated meter-run. Press 6 times ***Cursor right*** for access to format and unit and again ***Cursor right*** for access to all parameters and relevant values of temperature A and enter the data.

Meter-run 1 is combined with temperature-A, meter-run 2 with temperature-B, meter-run 3 with temperature-C and meter-run 4 with temperature-D. The combination can be changed in the chapter of Flow Computer settings.

Example: press ***Enter*** to access data for measurement conditions then ***Cursor right*** for base conditions and again ***Cursor right*** for access to **FC(n) Settings**. All important settings for the desired meter-run must be done here.

There are the following operating modes for transmitting measured values:

OFF	No measurement, input is switched off.
Default	Fixed value, no measurement.
PT100, 500, 1000	Polynomial according to Callendar van Dusen
Measured value=source value	HART on 4-20 mA loop in combination with a current input.
Polynomials 1st order	Coefficient 0 defines the polynomial.
Polynomials 2nd order	Coefficients 0 and 1 define the polynomial.
Polynomials 3rd order	Coefficients 0, 1 and 2 define the polynomial.
4-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
0-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
4-20mA limit	The min. and max. limits define the assignment of mA to temperature.
0-20mA limit	The min. and max. limits define the assignment of mA to temperature.
USE 09	The temperature is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.

Preferred mode in ERZ 2404 TANCY:

USE 09	**The temperature is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.**

Preferred mode in ERZ 2404 Petronas:

Measured value=source value	**HART on 4-20 mA loop in combination with a current input.**

Use the cursor key up/down to browse to the ***Operating mode*** function in ***PB 03***. Set the desired operating mode there after you have opened the calibration lock.

If the temperature sensor is to be operated using the HART protocol, make sure that the operating mode is set to **"Measured value = source value"** and a current input combined with the HART function is selected as source. If the temperature sensor is operated as a transmitter, make sure that its power supply is switched on in the associated menu of the current input.

The menu of the data sources comprises all metrological options of an input irrespective of whether or not these signals (e.g. current or frequency signal analogous to the measured quantity) exist for the selected transmitter.

For access to temperature transmitters B, C and D use again ***Cursor right.***

2.4.3 Gas meter / volume data logging

The data of the gas meter used have to be communicated to the corrector as transmitter data. Apart from the parameters for measurement, the type, manufacturer, serial number, etc., have to be entered in the Meter chapter as well. Then these data appear automatically in the ID display.

The following operating modes are available:

USE 09 A forward	Vm of meter run #1 is supplied via DZU protocol
USE 09 A reverse	Vm of meter run #1 is supplied via DZU protocol
USE 09 B forward	Vm of meter run #2 is supplied via DZU protocol
USE 09 B reverse	Vm of meter run #2 is supplied via DZU protocol
USE 09 C forward	Vm of meter run #3 is supplied via DZU protocol
USE 09 C reverse	Vm of meter run #3 is supplied via DZU protocol
USE 09 D forward	Vm of meter run #4 is supplied via DZU protocol
USE 09 D reverse	Vm of meter run #4 is supplied via DZU protocol

2.4.4 Gas quality data (see chapter Q with browser)

There are different ways of measuring and transmitting the gas quality data like superior calorific value, standard density and the individual components.

Important notice:
ERZ 2404 uses the standard density (rhon) for K coefficient calculations.

Press ***<2> Analyze*** and locate the arrow (➔) on the desired function. Press ***Enter*** and then the ***Cursor Down*** key to access the functions (coordinates) and enter the relevant data.

Selectable modes in ERZ 2404:

Table	Gas quality data is taken from a table as a fixed value. *
Modbus	Gas quality data is written in the ERZ 2404 by the Modbus master **
RMG bus	Gas quality data is supplied by a chromatograph (GC 9000) per interface ***

** Table*
There are four tables with fixed values which can be written manually on the device. Table A, B, C or D can be selected in each of the 8 (virtual) correctors. **Standard density (rhon) is used for K coefficient calculations.**

*** Modbus*
A Modbus master (PLC) can write gas quality data via Modbus RTU (RS 232 serial interface or RS 485 bus) into ERZ 2404. **Standard density (rhon) is used for K coefficient calculations.**

**** RMG bus*
This is a RMG-specific protocol on the basis of MODBUS useable together with GC 9000. The PGC 9000 is the master and the ERZ 2404 is a slave. Up to 32 slaves can receive gas quality data at the same time by broadcasting.

If Modbus is selected

New normalization mode in line 24:
Methane-balanced = All components will be retained, only methane will be adjusted.
=> Methane (mol%) = 100 – other components

QF Modbus A gas quality

Access	Line	Name	Value	Unit	Variable
M	1	Standard density	0.8969	kg/m3	rhonMbA
M	2	Calorific value	9.188	kWh/m3	hoMbA
M	3	Methane original	0.000	mol-%	methMoA
M	4	Carbondioxide	0.000	mol-%	co2MbA
M	5	Hydrogen	0.000	mol-%	h2MbA
M	6	Nitrogen	0.000	mol-%	n2MbA
M	7	Ethane	0.000	mol-%	ethMbA
M	8	Propane	0.000	mol-%	propMbA
M	9	N-Butane	0.000	mol-%	nbutMbA
M	10	I-Butane	0.000	mol-%	ibutMbA
M	11	N-Pentane	0.000	mol-%	npenMbA

M	12	I-Pentane	0.000	mol-%	ipenMbA
M	13	Hexane	0.000	mol-%	hexaMbA
M	14	Heptane	0.000	mol-%	heptMbA
M	15	Octane	0.000	mol-%	octMbA
M	16	Nonane	0.000	mol-%	nonMbA
M	17	Decane	0.000	mol-%	decMbA
M	18	Hydrogen sulphide	0.000	mol-%	h2sMbA
M	19	Vapor	0.000	mol-%	h2oMbA
M	20	Helium	0.000	mol-%	heMbA
M	21	Oxygen	0.000	mol-%	o2MbA
M	22	Carbonmonoxide	0.000	mol-%	coMbA
M	23	Argon	0.000	mol-%	argMbA
A *	24	Methane balanced	100.000	mol-%	methMbA

Selectable calculations for calorific value in ERZ 2404:

Press ***<1> Meas. P,T..*** In the first line below the Flow Computer No. appears the value of pressure, then temperature, density etc. for the dedicated meter-run. Press ***Enter*** to access data for measurement conditions then ***Cursor right*** for base conditions and again ***Cursor right*** for access to **FC(n) Settings.** All important settings for the desired meter-run must be done here. For example the calculation of Superior calorific value:

ISO 6976	Superior calorific value is calculated from the components.
GPA 2172-96	Another (US) calculation rules for Hs and rd at 60°F and under 14.696 psia.
Source value	No calculation is performed, the original value as transmitted will be used.

3 Operating the gas volume corrector (Flowcomputer)

3.1 Description of function keys

3.1.1 Coordinate structure

All measured and calculated values, parameters and functions are organized in a coordinate system. There are several tables with columns and lines as with a spreadsheet. There is a heading for each table where all chapters are combined which are logically connected to each other. The chapters correspond to the columns of a table, while the fields within a table (lines) are the functions or coordinates. Counting within a table is made using combinations of letters and digits starting with AA = first column, 01 = first line. Chapters which belong together are combined under the first letter: AA, AB, AC, AD... / BA, BB, BC, ... / CA, CB, CC, CD... In the present documentation, the function of a key is indicated in bold Italic typeface, e.g. ***Enter***, ***Totalizer***, ***Analysis***, etc.

You can directly access an overview of measured values and results if you use the following four keys:
<1> Meas. P, T..
<7> Totalizer
<8> Flow rates

Multiple pressing the same key switches from Flow Computer 1 to 2 to 3 ...

Since there are more columns used in the coordinate system than there are keys on the front panel, some data can only be accessed indirectly.
Indirect access is made by selecting the generic term e.g. by pressing the ***Meas. P,T..*** key. The 4-line display shows the first three measured values. If you now press ***Enter*** the display will jump to the Flow Computer's No. (meter-run No.) relevant chapters. Browse through the chapters with ***Cursor right*** and through the functions with ***Cursor up/down.***

Depending on the device type and setting of operating modes, complete chapters (columns) or individual coordinates are hidden in the coordinate system. Only such values are displayed which are relevant to the device type selected. In addition, there are also functions or coordinates which are meant for service or verification purposes only. Depending on the visibility level and the device type chosen, it is not possible to see all parameters and data all the time.

The structure of the coordinate system has been designed in such a way that comparable displays and functions of all chapters (columns) always appear in the same line. If you are within a column, e.g. at the "Min. range" parameter, you can use the ◀ ▶ keys to jump to the neighbouring columns on the same line level where you will also reach the "Min. range" parameter.

3.1.2 Examples for accessing and showing parameters

The best way for accessing data can be achieved by pressing **<*>** ***Select*** and then the ***Cursor Right*** or ***Left*** key to browse through all chapters. As soon as you have reached the desired chapter heading, press the ***Cursor Up*** or ***Down*** key to access the chapter and press ***Enter*** to activate the function.

But there are other direct or indirect methods for accessing and showing parameters:

Example: Measured and calculated values

Key

Meas. P,T..

Press ***<1> Meas. P,T..*** In the first line below the Flow Computer No. appears the value of pressure, then temperature, density etc. for the dedicated meter-run.

Now the next steps depend on the desired access.

For pressure values: Press ***Cursor right*** for access to format and unit and again ***Cursor right*** for access to all parameters and relevant values of **pressure sensor A** and enter the data.

For temperature values: Press 6 times ***Cursor right*** for access to format and unit and again ***Cursor right*** for access to all parameters and relevant values of temperature A and enter the data.

For access to all data of measurement conditions: Press ***Enter*** and browse through the functions.

For access to all data of base conditions: Press ***Enter*** and ***Cursor right*** and browse through the functions.

Example:

Press <1> Meas. PT.. to display the following overview.

Flow Computer 1		
P	**16.257**	**bar**
T	8.231	°C
Rm	0.7786	kg/m3

Example: Totalizers

Key

7

Totalizer

Press ***<7> Totalizer*** key. In the first line below the Flow Computer No. (meter-run No.) the display will show all available totalizers of this meter-run. Browse with ***Cursor up/down*** through the totalizers energy (E), volume at base conditions (Vb), volume at measurement conditions (Vm), disturbance energy (DE), disturbance volume at base conditions (Vb), and disturbance volume at measurement conditions (Vm). Multiple pressing this key will show the totalizers of all possible meter-runs and the 4 results of meter-run summations. The appearance of totalizers in this overview is always without fraction and unit. The complete value can be seen by pressing the ***Enter*** key at the desired meter-run. Now all values are shown completely with 14 digits, the adjusted fraction and the selected unit.
Volume at measurement conditions corrected (Vmc and DVmc) are not used in the current ERZ 2404 version. In future versions together with turbine meters it will be available.

Totalizer presentation in the browser view:

AJ Flow computer 1 totalizer

Access	Line	Name	Value	Unit	Variable
Z set	1	Vm	0.00000	m3	U1Vb
Z set	2	DVm	0.00000	m3	U1SVb
Z set	3	Vmc	0.00000	m3	U1Vbc
Z set	4	DVmc	0.00000	m3	U1SVbc
Z set	5	Vb	0.00000	·100 m3	U1Vn
Z set	6	DVb	0.00000	·100 m3	U1SVn
Z set	7	E	0.00000	MWh	U1E
Z set	8	DE	0.00000	MWh	U1SE
Z set	9	M	0.00000	kg	U1M
Z set	10	DM	0.00000	kg	
D	11	Yesterday Vm	0.00000	m3	IU1Vb
D	12	Yesterday DVm	0.00000	m3	IU1SVb
D	13	Yesterday Vmc	0.00000	m3	IU1Vbc
D	14	Yesterday DVmc	0.00000	m3	IU1SVbc
D	15	Yesterday Vb	0.00000	·100 m3	IU1Vn
D	16	Yesterday DVb	0.00000	·100 m3	IU1SVn

In superuser level appears the expression set and that indicates that an access to all totalizers is possible. Each totalizer can be set individually.

D	17	Yesterday E	0.00000	MWh	IU1E
D	18	Yesterday DE	0.00000	MWh	IU1SE
D	19	Yesterday M	0.00000	kg	IU1M
D	20	Yesterday DM	0.00000	kg	IU1SM

After clicking set at the desired position the browser shows:

ZD Counter Reset

Access	Line	Name	Value	Unit	Variable
D	1	Symbol	U1E		cedtSym
D	2	Current value -> AJ07	7889999.990	MWh	cedtOrg
Y	3	Set value	7889999.990	MWh	cedtVal

The selected totalizer can be set in line 3

Example: Analytical values

Key

2

Analysis

If you press ***<2> Analysis***, the display will jump to showing all available values which are directly or indirectly connected to gas quality. The number of values is determined dynamically in accordance with the mode settings and the state of the device. There is an arrow ➔ displayed in front of the short designation of the first value which can be moved upwards or downwards using the cursor keys. If the arrow is located on ***Table A*** for example, you can now press ***Enter*** to directly jump to the **content of table A**. Here you can reach the functions (coordinates) of interest to you using the cursor keys **up** and **down**.

Example: Flow rate values

Key

8

Flow rates

If you press ***<8> Flow rates***, the display will jump to showing all available flow rate results of Flow Computer 1. The number of values is determined dynamically in accordance with the mode settings and the state of the device. Multiple pressing of the ***<8> Flow rates*** key will show all flows of all meter-runs.

Remaining keys:

<3> Orifice **No function available in ERZ 2404 mode.**
<4> I/O **Directly accesses outputs and by pressing the Cursor Right key inputs.**
<5> Archive **Directly accesses archive groups and by pressing the Cursor Right key once summation values and twice subtraction values.**
<6> Test **Accesses test functions such as Freeze, file system and Boolean functions.**
<9> Totalizer **Accesses the data of the totalizer of all meter-runs.**
<0> Mode **Accesses general settings.**
<±> ID Displays **ID data (electronic type plate).**
<*> Select **Displays the currently selected chapter.**

3.1.3 The <0> Mode key

If you press ***<0> Mode***, the display will jump to the **Mode** coordinate system and the select arrow will point to **Base values**.

Mode
➔Base values
Access
Display

From here, you have two options for proceeding further on: You can press either the ***Cursor Down*** key to access all chapters under the **Mode** heading which have something to do with operating modes, device settings, base values, etc., or you can press the ***Cursor Right*** or ***Left*** key to scroll through the whole system on the heading level.
As soon as you have reached the desired position, select the relevant chapter by moving the select arrow ➔. When the arrow is located on the desired chapter, press ***Enter*** to jump into this chapter onto the first active function (line).

3.2 General information

3.2.1 Summation

The function summation can be used to add results of meter-runs. Only flows and totalizers can be added together, temperature and pressure values of the selected meter-run summands represent an average value. The results can be used in a similar manner as each other measured value or result for analogue output or pulse output or as a parameter in the formula editor by using the variable name in the last row.

LA Summation 1

Access	Line	Name	Value	Unit	Variable
A §	1	Vol.flow base cond	0.000	m3/h	S1Qn
A §	2	Vol.flow meas.cond	0.000	m3/h	S1Qb
A §	3	C-Vol.flow meas.	0.000	m3/h	S1Qbc
A §	4	Energy flow	0.000	kW	S1Qe
A §	5	Mass flow	0.000	kg/h	S1Qm
D	6	Temperature average	10.00	°C	S1TmpB
D	7	Abs. press. average	28.000	bar	S1DrkB
Z set	10	Vb	0.00000	·100 m3	S1Vn
Z set	11	DVb	0.00000	·100 m3	S1SVn
Z set	12	Vm	0.00000	m3	S1Vb
Z set	13	DVm	0.00000	m3	S1SVb
Z set	14	Vmc	0.00000	m3	S1Vbc
Z set	15	DVmc	0.00000	m3	S1SVbc
Z set	16	E	0.00000	MWh	S1E
Z set	17	DE	0.00000	MWh	S1SE
Z set	18	M	0.00000	kg	S1M
Z set	19	DM	0.00000	kg	S1SM
E §	20	Flow computer 1	yes		S1U1
E §	21	Flow computer 2	yes		S1U2
E §	22	Flow computer 3	no		S1U3
E §	23	Flow computer 4	no		S1U4
E §	24	Flow computer 5	no		S1U5
E §	25	Flow computer 6	no		S1U6
E §	26	Flow computer 7	no		S1U7

Results of summation

Select the summands

Define the units of the results

E §	27	Flow computer 8	no		S1U8
E §	30	Unit volume flow	m3/h		S1QvDim
E §	31	Unit energy flow	kW		S1QeDim
E §	32	Unit mass flow	kg/h		S1QmDim
E §	33	Unit temperature	°C		S1TDim
E §	34	Unit pressure	bar		S1PDim
E §	35	Unit Vb	·100 m3		S1vnDim
E §	36	Unit Vm,Vmc	m3		S1vbDim
E §	37	Unit E	MWh		S1eDim
E §	38	Unit M	kg		S1mDim
E §	40	Format volume fl.	%.3f		S1QvFrm
E §	41	Format energyflow	%.3f		S1QeFrm
E §	42	Format mass flow	%.3f		S1QmFrm
B	43	Format temperature	%.2f		S1TFrm
B	44	Format pressure	%.3f		S1PFrm
Y	45	Reset function	do nothing		S1ClrCmd

Define the format of the results

3.2.2 Subtraction

Similar to Summation:

The function subtraction can be used to subtract results of meter-runs and results of summations. The results can be used in a similar manner as each other measured value or result for analogue output or pulse output or as a parameter in the formula editor by using the variable name in the last row.

MA Subtraction 1

Access	Line	Name	Value	Unit	Variable
D	1	Vol.flow base cond	0.000	m3/h	M1Qn
D	2	Energy flow	0.000	kW	M1Qe
D	3	Temperature	0.00	°K	M1TmpB
D	4	Absolute pressure	0.000	bar	M1DrkB
D	5	Dev. vol.fl.base	0.00	%	M1AQn

D	6	Dev. energy flow	0.00	%	M1AQe
D	7	Dev. temperature	0.00	%	M1ATmpB
D	8	Dev. pressure	0.00	%	M1ADrkB
Z §	10	Vb	0	m3	M1Vn
Z §	16	E	0	kWh	M1E
B	20	Minuend	off		M1Minu
B	21	Subtrahend	off		M1Subt
B	30	Unit volume flow	m3/h		M1QvDim
B	31	Unit Vb	m3		M1vnDim
B	33	Unit energy flow	kW		M1QeDim
B	34	Unit E	kWh		M1eDim
B	35	Unit temperature	°K		M1TDim
B	36	Unit pressure	bar		M1PDim
B	40	Format volume flow	%.3f		M1QvFrm
B	41	Format energy flow	%.3f		M1QeFrm
B	42	Format temperature	%.2f		M1TFrm
B	43	Format pressure	%.3f		M1PFrm
Y	44	Reset function	do nothing		M1ClrCmd

Minuend is selectable:
- Off
- Flow Computer 1 to 8
- Sum 1 to 4

Subtrahend is selectable:
- Off
- Flow Computer 1 to 8
- Sum 1 to 4

3.2.3 How to change over totalizers to another unit

Press ***<1> Meas. P,T..*** to access the overview of meter-run # 1. Then press ***Enter*** and 4 times ***Cursor right***. The display now shows in the first line Flow Computer 1 (FC1) units. Use Cursor down to select the desired totalizer and change the unit. (Open the sealed switch, press ***Enter***, select the desired unit with ***Cursor up/down*** and press ***Enter*** again, close the sealable switch). The standard setting of Vm and Vb totalizers is m^3 with 14 digits being displayed without fraction.

Note! As soon as the new unit is set, the totalizer increments are calculated with the new unit and added to the previous totalizer reading (thus, mixed values are formed).

AE Flow computer 1 units

Access	Line	Name	Value	Unit	Variable
E §	1	Temperature	°C		U1TDim
E §	3	Absolute pressure	bar		U1PDim
E §	4	Density	kg/m3		U1RhDim
E §	5	Calorific value	kWh/m3		U1HoDim
E §	6	Components	mol-%		U1KmpDim
E §	13	Volume flow	m3/h		U1QvDim
E §	14	Energy flow	kW		U1QeDim
E §	15	Mass flow	kg/h		U1QmDim
E §	30	Unit Vb	·100 m3		U1vnDim
E §	31	Unit Vm	m3		U1vbDim
E §	32	Unit E	MWh		U1eDim
E §	33	Unit M	kg		U1mDim

Set the totalizer units here

3.2.4 How to change over totalizers to another format

All totalizers can be changed together to the desired format. The format function defines the number of digits of the fraction displayed.
The function can be found in the display menu in line 18.

SE Display

Access	Line	Name	Value	Unit	Variable
B	1	Language	english		sprache
B	2	User profile	Developer		profil
B	3	Screensaver	86400	s	schonZeit
B	4	Information line	no		infoLine
B	5	Display refresh	frequently		dspUpd
E §	6	Decimal point	Decimal point		dezpkt
E §	7	Legal symbol	Paragraph		epZeichen
B	8	Buzzer mode	Alarm		buzzMod

B	9	Message line	no		errLine
B	13	Coordinates	yes		kooAnz
D	15	Brightness	100		brightness
S	17	Display version	CU20049SCPB-W2J		lcdType
E §	18	Fraction totalizer	3		zwkNk

3.2.5 How to change over measured values to another unit

Measured values, such as pressure, temperature, superior calorific value, etc., can be changed over to another unit without an automatic conversion being performed. In contrast to totalizers, the assignment of the minimum and maximum values determines the calculation of the physical quantity from the input value. Thus, changing the unit means merely changing the text.
For example, you want to change the pressure at measurement conditions displayed from bar to psi (activate the superuser access level, i.e. input the user code and open the calibration lock).

Press ***<1> Meas. P,T..*** In the first line below the Flow Computer No. appears the value of pressure, then temperature, density etc. for the dedicated meter-run.

For pressure values: Press ***Cursor right*** for access to format and unit of **pressure sensor A** and enter the data.

Use the Cursor Down key to browse to the **Unit** function. Then press ***Enter*** to change over to input mode and select the desired unit using the cursor keys. Press ***Enter*** to terminate your entries and close the calibration lock again. All the other functions and displays related to the pressure value will have been changed over to the new unit automatically.

This is the same access but via browser:

OA Absolute pressure format and unit

Access	Line	Name	Value	Unit	Variable
E *	4	Unit	bar		drkDim
E *	30	Format	%.3f		drkFrm

If you want to change custody transfer parameters, you have to remove the official seal and set the calibration switch to the "Unlock" position. As soon as the first parameter has been changed, this is entered in the logbook together with the "Calibration lock open +" entry. The Flow Computer will stop correcting immediately and will not supply current measured values until the calibration switch has been set to the "Lock" position again.

3.2.6 Activating inputs and/or outputs

In chapter **SI Configuration** under the ***<0> Mode*** key (superuser protection), you can activate the required inputs and/or outputs. The principle according to which this is to be done is explained by the example of the inputs:
The number of activated inputs decides on whether the corrector samples the relevant terminals in order to determine the measured value. If the input for the number of resistance measurements is at 0, no measurement will be taken. If you intend to connect a PT 100, you have to differentiate whether the explosion protection is external or internal, since this decides whether terminal X 4 or X 10 is to be used for connection. In the case of an Ex-d protected PT 100 at X 4, line 1 (resistance measurement number) is to be set at 1, while in the case of an Ex-i PT 100 at X 10, line 31 (Ex resistance number) is to be set at 1.
In the case of frequency inputs, you should note the following: frequencies F1, F2, F3 and F4 are dedicated for volume measurements. The standard assignments are as follows: F1 for the measuring channel and F2 for the reference channel. Frequencies F5, F6, F7 and F8 are reserved for the density, standard density and velocity of sound. This frequency measurement feature has another time base and is able to measure frequencies more accurately and with a higher resolution. When activating frequency inputs, make sure that frequencies 1 to 4 (volume) are always included in counting.
Example: Gas volume corrector with HF 2 and 3, density and standard density. Seven frequency inputs are to be activated (1 to 4 for the volume, 5 for the density, 6 and 7 for the standard density).

3.2.7 Information about parameters for the volume at measurement conditions

With ERZ 2404 only the operating mode USE 09 (DZU-Master) together with an USZ 08 working as DZU-Slave is possible. The eight selectable alternatives are:

USE 09 A	for meter run #1 in forward mode
USE 09 A	for meter run #1 in reverse mode
USE 09 B	for meter run #2 in forward mode
USE 09 B	for meter run #2 in reverse mode
USE 09 C	for meter run #3 in forward mode
USE 09 C	for meter run #3 in reverse mode
USE 09 D	for meter run #4 in forward mode
USE 09 D	for meter run #4 in reverse mode

The USZ 08 ultrasonic meter must be Software Version C with main totalizer function and DZU-Slave Modbus protocol. Transmission of totalizers and flow rates takes place with the DZU protocol. Formats and units can be parameterized in ERZ 2404 independent of the parameters in USE 09 measurement unit of USZ 08.
For information about this protocol, see separate documentation.

Example USE 09 A is also representative for B, C and D:

RA Volume sensor format and unit

Access	Line	Name	Value	Unit	Variable
E *	1	Unit qm	m3/h		qbDim
E *	2	Format qm	%.3f		qbFrm
E *	4	Unit Vm	m3		vbDim

RF Ultrasonic meter A type USE 09

Access	Line	Name	Value	Unit	Variable
I	1	Main-tot. forward	.000	m3	usAZwF
I	2	Dist-tot. forward	.000	m3	usAZwFs
I	3	Main-tot. reverse	.000	m3	usAZwB
I	4	Dist-tot. reverse	.000	m3	usAZwBs
I	5	Flow	0.000	m3/h	usAQ
I	6	Direction	0		usAFw
I	7	Status	0		usASt
I	8	Temperature	-273	°C	usATmp
I	9	Absolute pressure	0	bar	usADrk
I	10	Vel. of sound	0	m/s	usAVos
E *	20	DZU-Slaveadr.	1		usAAdr
E *	21	Format	%.3f		usAZwFrm
D	30	Timeout	0	s	usATimCnt
D	40	frac. main.forward	.000	m3	zmAZwF
D	41	frac. dist.forward	.000	m3	zmAZwFs
D	42	frac. main.reverse	.000	m3	zmAZwB
D	43	frac. dist.reverse	.000	m3	zmAZwBs
D	44	last Status	0		lsASt
D	45	disturbed	0		isAStoer

All important values coming from the USE 09 measurement unit are displayed here, main totalizers in forward- and reverse-mode as well as disturbed totalizers (lines 1 to 4).
Line 5 = flow
Line 6 = flow direction
Line 7 = status
Line 8 = temperature if direct connected with the USE 09 unit.
Line 9 = pressure if direct connected with the USE 09 unit.
Line 10 = velocity of sound
Line 20 = slave address of USZ 08
Line 21 = format of totalizer

3.2.8 Information about pressure / parameters

The pressure input can be parameterized for 12 different *operating modes*:

OFF	No measurement, input is switched off.
Default	No measurement, fixed value.
Measured value=source value	HART on 4-20 mA loop in combination with a current input.
Polynomials 1st order	Coefficient 0 defines the polynomial.
Polynomials 2nd order	Coefficients 0 and 1 define the polynomial.
Polynomials 3rd order	Coefficients 0, 1 and 2 define the polynomial.
4-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
0-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
4-20mA limit	The min. and max. limits define the assignment of mA to pressure.
0-20mA limit	The min. and max. limits define the assignment of mA to pressure.
USE 09	The pressure is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.

Preferred mode in ERZ 2404 TANCY:

USE 09	**The pressure is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.**

Preferred mode in ERZ 2404 Petronas:

Measured value=source value	**HART on 4-20 mA loop in combination with a current input.**

The incoming measured quantity (i.e. current input) is assigned to the *operating mode*, imposed with a correction value and shown with the correct unit.
If there is a fault, the *default value* is used for further calculations and is shown as an *absolute value*.

If the pressure sensor is to be operated using the HART protocol, make sure that the operating mode is set to **"Measured value = source value"** and a current input combined with the HART function is selected as source. If the pressure sensor is operated as a transmitter, make sure that its power supply is switched on in the associated menu of the current input.

The menu of the data sources comprises all metrological options of an input irrespective of whether or not these signals (e.g. current or frequency signal analogous to the measured quantity) exist for the selected transmitter.

In *0* or *4–20 mA limit* mode, the alarm limit parameters include also an assignment (0 mA or 4 mA) to the lower adjusting value or an assignment (20 mA) to the upper adjusting value. If alarm limits and range limits are to be set separately from each other, use the *0* or *4-20mA coefficient* operating mode.

3.2.8.1 Signal processing of the HART input – pressure at measurement conditions

Base functions of the HART input:

- Reading the measured value
- Reading the measured value in burst mode
- Searching the address
- Evaluating faults
- Evaluating "Config-Flag"
- Multimaster protocol
- Analogue and digital communications are possible at the same time.

3.2.9 Information about temperature / parameters

The temperature input can be parameterized for 14 different *operating modes*:

OFF	No measurement, input is switched off.
Default	Fixed value, no measurement.
PT100,500,1000	Polynomial according to Callendar van Dusen
Measured value=source value	HART on 4-20 mA loop in combination with a current input.
Polynomials 1st order	Coefficient 0 defines the polynomial.
Polynomials 2nd order	Coefficients 0 and 1 define the polynomial.
Polynomials 3rd order	Coefficients 0, 1 and 2 define the polynomial.
4-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
0-20mA coefficient	Coefficient 0 defines the min. range, coefficient 1 defines the max. range.
4-20mA limit	The min. and max. limits define the assignment of mA to temperature.
0-20mA limit	The min. and max. limits define the assignment of mA to temperature.
USE 09	The temperature is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.

Preferred mode in ERZ 2404 TANCY:

USE 09	**The temperature is measured by an ultrasonic measuring head (USE 09) and transmitted via the DZU protocol.**

Preferred mode in ERZ 2404 Petronas:

Measured value=source value	**HART on 4-20 mA loop in combination with a current input.**

Use the cursor key to browse to the **Operating mode** function. Set the desired operating mode there after you have opened the calibration lock.

The incoming measured quantity (i.e. current input) is assigned to the *operating mode*, imposed with a *correction value* and shown with the correct unit. There is a *correction value* for the Pt100 sensor and another one for the current transmitters. The definition of PT 100 or PT 500 or PT 1000 is to be made in the **Operating mode** function in the **Gas temperature** chapter.
If there is a fault, the *default value* is used for further calculations.
If the temperature sensor is to be operated using the HART protocol, make sure that the operating mode is set to **"Measured value = source value"** and a current input combined with the HART function is selected

as source. If the temperature sensor is operated as a transmitter, make sure that its power supply is switched on in the associated menu of the current input.

The menu of the data sources comprises all metrological options of an input irrespective of whether or not these signals (e.g. current or frequency signal analogous to the measured quantity) exist for the selected transmitter.

In *0* or *4–20 mA limit* mode, the alarm limit parameters include also an assignment (0 mA or 4 mA) to the lower adjusting value or an assignment (20 mA) to the upper adjusting value. If alarm limits and range limits are to be set separately from each other, use the *0* or *4-20mA coefficient* operating mode.

3.2.9.1 Signal processing of the HART input – temperature

Base functions of the HART input:

- Reading the measured value
- Reading the measured value in burst mode
- Searching the address
- Evaluating faults
- Evaluating "Config-Flag"
- Multimaster protocol
- Analogue and digital communications are possible at the same time.

3.2.9.2 Reference temperature/temperature at base conditions

If the K coefficient is calculated in accordance with GERG 88S or AGA NX 19 with H group gas, the *temperature at base conditions* can only be changed step by step according to the ISO table of countries (0, 15, 20, 25 degrees C).

From: ISO/DIS 12213-3, page 32

Reference pressure = 101.325 kPa = 1.01325 bar_{abs}

Country	Hs reference temperature °C combustion	Temperature at base conditions °C gas measurement
User-specific setting	0, 15, 20, 25	0, 15, 20, 25

If the K coefficient is calculated in accordance with GERG 88S or if K = constant is selected, the *Hs reference temperature* can be changed only step by step according to the ISO table of countries (0, 15, 20, 25 degrees C).

Example: ISO/DIS 12213-3, page 32

Reference pressure = 101.325 kPa = 1.01325 bar_{abs}

Country	Hs reference temperature °C combustion	Temperature at base conditions °C gas measurement
User-specific setting	0, 15, 20, 25	0, 15, 20, 25

3.2.10 Information about the K coefficient / gas quality

There are different ways of calculating the K coefficient of a gas.
K calculated for ideal gas.
K calculated via GERG 88S Set A
K calculated via GERG 88S Set B
K calculated via GERG 88S Set C
K calculated via AGA NX 19 L and H.
K calculated via AGA 8 92 DC.
K calculated via AGA 8 Gross M1.
K calculated via AGA 8 Gross M2.

Important notice:
ERZ 2404 uses the standard density (rhon) for K coefficient calculations.

Equation GPA 2172-96 can be used for calculating the superior calorific value and the relative density at 60°F and under 14.696 psia (US reference values). The relevant displays can be found under DL GPA 2172-96. Parameterization can be made in the menu under superior calorific value or relative density.

3.2.11 Information about the ID display

You can access the device data by pressing the ***<±> ID*** key. They can only be displayed here. There is no option for inputting data if the ID display is shown. If you want to enter values, you have to enter them together with the parameters of the associated transmitter device in the appropriate chapter (or column of the coordinate system). For example, the ID display data of the pressure sensor have to be entered in the **Pressure** chapter, while those of the temperature sensor have to be entered in the **Temperature** chapter, etc.

3.2.12 Information about test functions

Under the ***< 6> Test*** key, all chapters and functions for checking the device are combined. There are the following functions:
Freeze, Computing cycle, Hardware test, and information about the file system, Boolean functions and Test cabinet (internal).

3.2.12.1 Freeze

If manual freeze has been set in Freeze mode, a freeze procedure is started every time the ***Test*** key is pressed. All values marked F.. are stored synchronously when the ***Test*** key is pressed. The measured values stored will be retained until the next freeze procedure is initiated. The following freeze modes are possible: OFF / Manual / Contact / Cyclic / Gas day / Every day / Every hour / Every second / Every minute. For the "Cyclic" operating mode, it is possible to set the interval.

3.2.12.2 Computing cycle

This function displays running times of software loop and is only for diagnostic purposes.

3.2.12.3 Hardware test

Option for testing all inputs and outputs of the device:
If the function is set to *Inactive*, the momentary status of the display, the LEDs and the signal inputs and/or outputs is shown while browsing.
If the function is set to *Active*, the input or output displayed is affected while browsing. E.g. the alarm contacts are operated and the current outputs are set to fixed values: current output 1 to 10mA, 2 to 11 mA, 3 to 12mA, 4 to 13mA and the pulse outputs are operated: pulse output 1 with 1 pulse per sec., 2 with 2 pulses per sec., 3 with 3 pulses per sec., 4 with 4 pulses per sec.

3.2.12.4 Test cabinet

This function is only for internal use during the manufacturing process.

3.2.12.5 File system

Information about the file system on compact flash card is shown here.

TJ File system

Access	Line	Name	Value	Unit	Variable
D	1	Percentage free	88.153	%	dspace
B	2	Warning limit	5.000	%	dsWGwu
D	3	CF total memory	129.7347	MByte	cfTotal
D	4	CF free memory	114.3644	MByte	cfAvail

3.2.12.6 TK Boolean functions

Boolean functions are for monitoring internal events. The value is set to 1 when the condition is executed. The 1 can only be observed for 1 display cycle. Theoretically are such functions able to act as a trigger for writing a record in an archive or as parameter in the formula editor.

3.2.13 Information about inputs and outputs

3.2.13.1 Current outputs

Press ***<4> I/O*** to reach the **Current output 1 to 4** chapters. There all important values for parameterization and display are combined. By using the relevant features, all appropriate data, calculated values, etc., can be selected and thus mapped on the current output.

Outputs
Overview
➔**Current output 1**
Current output 2

The arrow is located on the third line and can be moved upwards or downwards using the cursor keys. In this example, pressing ***Enter*** will select the **Current output 1** chapter. A new window will open with the **Current output 1** heading. The contents of this chapter can be browsed using the cursor keys.

There are two parameters for assigning a measured value to an output quantity:
1st assignment optimizes the pressure, temperature and all flow rate values for control purposes.
2nd assignment extended selection of all the other values which can be mapped as a current output.
The selection of a parameter takes place by typing in the coordinate together with its appropriate variable name e.g. **AA01:U1TmpB**. A better way is to work with the browser and the mouse and copy and paste. If a parameter is selected under *Assignment*, it will be shown under *Physical value* together with its correct unit. Its output value is seized by a correction factor calculated from the *lower* and *upper calibration values* which is mapped on its limit ranges (*upper and lower mapping*) and the *operating mode* set. If the *physical value* exceeds the defined value, a warning is generated. There is an option to output a constant current *(test current)* for test purposes which is independent of a measured value. Enter the desired value in the *Test current* parameter and activate it under *Operating mode*.

XB Current output channel 1 terminal X4-1, X4-2

Access	Line	Name	Value	Unit	Variable
D	1	Act. current	13.9465	mA	I1out
D	2	Physical value -> XL01	124.335		I1Org
D	3	Smoothed org.val	124.332		I1OrgG
I	4	D/A-converter value	A247	hex	I1BinMu
B	6	Assignment	XL01:D1Value		I1More
B	7	Lower mapping	0		I1Abbu
B	8	Upper mapping	200		I1Abbo
B	9	Averaging factor	0		I1MiwFakt
B	10	Operating mode	4-20mA		I1MdBtr
B	13	Default current	0.0000	mA	I1Vg
B	14	Test current	10.0000	mA	I1Eich
S	15	lower calib.value	4.0000	mA	I1Kalu
S	16	upper calib.value	20.0000	mA	I1Kalo

D1Value assigned to analogue output #1

The same is valid for current outputs 2, 3 and 4.

3.2.13.2 Pulse outputs

Press ***<4> I/O*** and browse downwards until you reach the **Pulse output 1 to 4** chapters. There all important values for parameterization and display are combined. By using the relevant features, all appropriate data, calculated values, etc. can be selected and thus mapped on the pulse output.

Outputs
➔Pulse output 1
Pulse output 2
Pulse output 3

The arrow is located on the second line and can be moved upwards or downwards using the cursor keys. In this example, pressing ***Enter*** will select the **Pulse output 1** chapter. A new window will open with the **Pulse output 1** heading. The contents of this chapter can be browsed using the cursor keys.

The same is valid for pulse outputs 2, 3 and 4.

There are the following *Selection options*:

- Volume at measurement conditions
- Corrected volume at measurement conditions
- Volume at base conditions
- Energy flow rate
- Test pulses (duration)
- Test pulses (groups)
- OFF

Test pulses:
There are two options for outputting test pulses:
1. A specified number of pulses per second are permanently outputted (duration).
2. A specified number of pulses is outputted once with the set output frequency and is then stopped (group).

3.2.13.3 Other outputs

The **Contact outputs 1 to 8** chapter is a special one:
The contact outputs can be defined as a reaction of a result e.g. a logical expression or something else. For details see the description in the chapter of the formula editor.
In the Example below the output contact # 1 will switch over to 1 if meter-run # 1 is okay.
All other contacts # 2 to 8 will switch over to 1 if the appropriate meter-run is not okay. Lines 9 to 16 defines the function, lines 1 to 8 shows the result.
U1Ok is the variable name of the meter-run # 1 conversion status.
! is the symbol for negation.

XJ Contact outputs terminal X1,X2

Access	Line	Name	Value	Unit	Variable
D	1	Contact 1 position	1		K1Out
D	2	Contact 2 position	0		K2Out
D	3	Contact 3 position	0		K3Out
D	4	Contact 4 position	0		K4Out
D	5	Contact 5 position	0		K5Out
D	6	Contact 6 position	0		K6Out
D	7	Contact 7 position	0		K7Out
D	8	Contact 8 position	0		K8Out
B	9	Contact 1 express.	U1Ok		K1Expr
B	10	Contact 2 express.	!U2Ok		K2Expr
B	11	Contact 3 express.	!U3Ok		K3Expr
B	12	Contact 4 express.	!U4Ok		K4Expr
B	13	Contact 5 express.	!U5Ok		K5Expr

B	14	Contact 6 express.	!U6Ok		K6Expr
B	15	Contact 7 express.	!U7Ok		K7Expr
B	16	Contact 8 express.	!U8Ok		K8Expr

3.2.13.4 Inputs

Press ***<4> I/O*** and the ***Cursor Right*** key to reach the **Current inputs 1 to 8, Resistance inputs 1 & 2, Frequency inputs 1 to 8 and Contact inputs** chapters. There all important values for parameterization and display are combined. By using the relevant features, all appropriate data, calculated values, etc., can be selected.

3.2.14 Determining the correction factors for calibrating the current inputs

The current inputs for measuring the pressure, temperature, etc., are processed by an A/D converter with an upstream measuring-point selector. The adjustment on the mA side is performed in the factory. Any subsequent corrections are made by directly offsetting the input quantities of pressure, temperature, etc.

Example:
You want to determine the correction factor for the input of the pressure at measurement conditions which is to be measured in a range from 20 to 70 bar.

1st step	Parameterize the *lower alarm limit* at 20 bar (assigned to the metrological zero 0 or 4 mA).
2nd step	Parameterize the *upper alarm limit* at 70 bar (assigned to the metrological upper range value of 20 mA).
3rd step	Parameterize the offset correction at 0.
4th step	Apply the pressure signal or check the current input with a calibrated measuring instrument and read the measured quantity (display of the measured pressure input in bar).
5th step	Form the difference between the actually supplied measuring signal and the measured quantity displayed.
6th step	Enter this difference as offset in the offset correction parameter.
7th step	Check the display for pressure as measured quantity.

The same procedure applies to all analogue inputs.

3.2.15 Formula editor

In ERZ 2404 a formula editor is integrated. Formulas can be helpful for measurement units conversions, special comparisons or limit checking etc. The statements are evaluated each converting cycle and are displayed on the front panel. They are useful for trigger definitions (archives), for D/A output or digital output.
The order of precedence is: Power, Multiply & Divide, Add & Subtract. Where operators have the same precedence the order is left to right. It can be helpful to use brackets ( ).

Abbreviation: RH = right hand variable, LH = left hand variable.

Symbol	Function	Example
( )	Bracket	(expression)
+	Add the two variables or constants	expression + expression
-	Subtract the RH variable or constant from LH	expression - expression
*	Multiply the two variables or constants	expression * expression
/	Divide the two variables or constants	expression / expression
%	modulo	expression % expression
^	Power (X^Y)	expression ^ expression
-	Leading sign	- expression
!	Negation	! expression e.g. 0 will be 1, unequal 0 will be 0
<	Comparative (less)	expression < expression
>	Comparative (greater)	expression > expression
>=	Comparative (greater equal)	expression >= expression
<=	Comparative (less equal)	expression <= expression
==	Comparative (equal)	expression == expression
!=	Comparative (unequal)	expression != expression
&&	logic AND	expression && expression
II	logic OR	expression || expression
? :	Conditional	expression ? expression: expression (if then else)
0..9	the number is interpreted as a constant	format = floating point double precision

Examples:

E.g. conditional: (X>1)? Y : Z

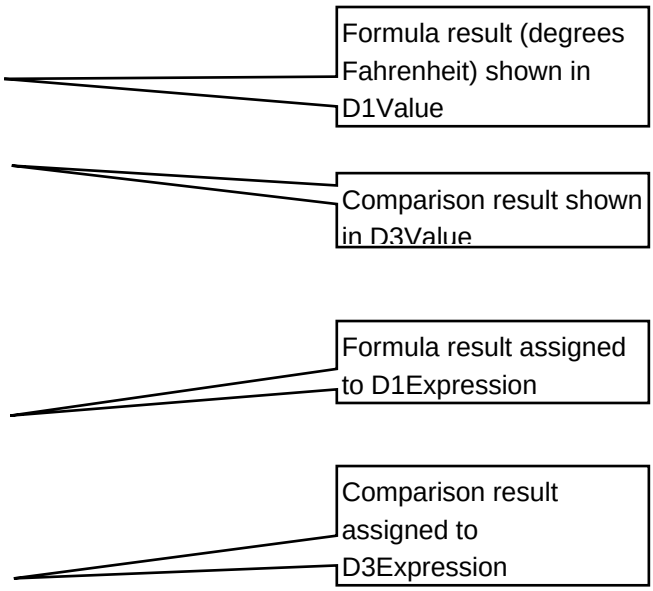
E.g. square root: 2^(1/2)

E.g. Assumed the temperature of the meter run is represented in *degrees Celsius*.

1. **To provide *degrees Fahrenheit* we multiply the *degrees Celsius* variable by 1.8 and add to the result 32.**
2. **The value should be used as an analogue output on I1**
3. **If the result is less then 60 degrees it should trigger a record in an archive.**

XL Formula evaluation

Access	Line	Name	Value	Unit	Variable
D	1	Value 1	124.336		D1Value
D	2	Value 2	1.41421		D2Value
D	3	Value 3	0		D3Value
D	4	Value 4	0		D4Value
D	5	Value 5	0		D5Value
D	6	Value 6	0		D6Value
D	7	Value 7	0		D7Value
D	8	Value 8	0		D8Value
B	9	Expression 1	U1TmpB*1.8+32		D1Expr
B	10	Expression 2	2^(1/2)		D2Expr
B	11	Expression 3	D1Value<60		D3Expr
B	12	Expression 4	0		D4Expr
B	13	Expression 5	0		D5Expr
B	14	Expression 6	0		D6Expr
B	15	Expression 7	0		D7Expr
B	16	Expression 8	0		D8Expr



3.2.16 Triggering a freeze procedure

A switch is connected to an unassigned pulse input. Then the freeze function is assigned to this input (Contact input 1 in this example). To activate a freeze procedure, the switch must be closed.

TC Freeze

Access	Line	Name	Value	Unit	Variable
D	1	Time last Freeze	DD-MM-YYYY hh:mm:ss		frzTime
D	2	Freeze contact	off		ktkFreeze
B	3	Freeze mode	Contact		frzMode
B	4	Freeze interval	30	s	frzInterval
B	5	Source freeze cntct	Contactinp. 1		kzoFreeze

There is another alternative to activate a freeze procedure directly during accessing the freeze function via the browser by clicking the mouse button.

4 Archives

4.1 Coordinate IA group 1 to IH group 8

There are 8 archive groups that can be customized as special archives. In theory an archive consists of unlimited numbers of records with 25 entries each. The first entry is always the time stamp so 24 entries remain for data. The contents and recording cycle can be chosen by the user. For storing data, the complete range of all measured values and results the ERZ 2404 can deliver are available via direct input of the variable name.

The following triggers are selectable for a recording cycle:
Every minute
Every 2nd minute
Every 3rd minute
Every 4th minute
Every 5th minute
Every 6th minute
Every 12th minute
Every 15th minute
Every 20th minute
Every 30th minute
Every hour
Every day

Gas day
As defined in **WA Times line** 14 billing hour

Every month
At midnight of the last day of the month

Gas month
Once per month, at the first day at the time of gas day as defined in ***WA Times*** line 14.

Parameter change
At each parameter change a record is written, the first entry is the changed parameter itself.

Value change
D1Value, D2Value, D3Value, D4Value, D5Value, D6Value, D7Value and D8Value are possible triggers for a record. DxValue is the result of an expression in the formula editor.

Error appears/disappears
Error messages consist of a number and a sign. The number represents the error message, the sign represents the appearance (+) and disappearance (-) of an error. The sign can be used as a trigger to write a record in the archive. The first entry in the record is the sign (trigger) the 2nd entry is the corresponding error message number.

Definition of a record

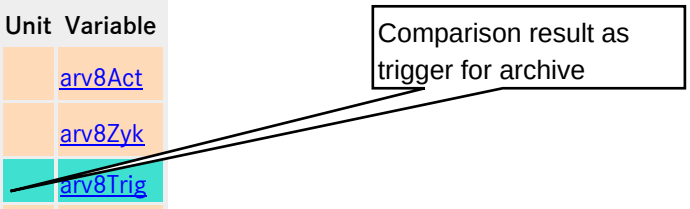
The user can determine the content of a record. A record includes a time stamp in first position and followed by 24 values. It is free to the user to mix together all formats (floating point, integer etc.) in one archive group or to arrange all floating point numbers in archive group 1 and all integer values in archive group 2 and so on.

All recorded values are internal stored as text so it is easy to read and understand for the user and an export as *.csv is possible.

The definition is easy to make with a PC connected to the ERZ 2404 over TCP/IP. With the use of the browser and copy and paste function the desired values can be selected and placed in the record. Each value or parameter has a variable name. To see and use this names please change the visibility level in ***SE Display line 2*** to developer. After changing to developer all variable names are displayed in the rightmost column.

IH Archive group 8

Access	Line	Name	Value	Unit	Variable
B	1	Active	yes		arv8Act
B	2	Recording	Change of value		arv8Zyk
S	3	Trigger field	D3Value		arv8Trig
B	4	Container	Day		arv8Con
B	10	Field 1	empty		arv8Sy01
B	11	Field 2	empty		arv8Sy02
B	12	Field 3	empty		arv8Sy03
B	13	Field 4	empty		arv8Sy04
B	14	Field 5	empty		arv8Sy05
B	15	Field 6	empty		arv8Sy06
B	16	Field 7	empty		arv8Sy07
B	17	Field 8	empty		arv8Sy08
B	18	Field 9	empty		arv8Sy09
B	19	Field 10	empty		arv8Sy10
B	20	Field 11	empty		arv8Sy11
B	21	Field 12	empty		arv8Sy12
B	22	Field 13	empty		arv8Sy13
B	23	Field 14	empty		arv8Sy14
B	24	Field 15	empty		arv8Sy15
B	25	Field 16	empty		arv8Sy16
B	26	Field 17	empty		arv8Sy17



B	27	Field 18	empty		arv8Sy18
B	28	Field 19	empty		arv8Sy19
B	29	Field 20	empty		arv8Sy20
B	30	Field 21	empty		arv8Sy21
B	31	Field 22	empty		arv8Sy22
B	32	Field 23	empty		arv8Sy23
B	33	Field 24	empty		arv8Sy24

Example of a record definition:
Assumed the first entry in the record should be the pressure, the 2nd value the temperature, the 3rd value the flow at measurement conditions.

First step: change the visibility level to developer.
Second step: Select the desired value for pressure of meter run #1. Therefore browse to ***AA Flow Computer 1 measurement conditions*** and select in line 2 the variable name U1DrkB with your cursor (mouse).
Third step: Copy the value with Ctrl+C.
Fourth step: Browse to the desired archive group and paste with Ctrl+V at the desired position in the record.
Fifth step: Repeat step 2 to 4 with the temperature variable.
Sixth step: Repeat step 2 to 4 with the flow variable.

Remark: it is also possible to type in the variable names but it is easier to work with copy and paste.

Access to archives via browser:

The access to archived data can be achieved as described in the next chapter (structure) with clicking at the link on end of page and then at desired year, month, day and hour.

4.2 Structure of archives and maximum storage

4.2.1 Structure of long-term archives

In each archive group consist a “container” (line 4 in archive group menu). Dimension of the container should be selected dependent on the trigger definition e.g. for minutely triggered data the container should be of type ***hour***, for hourly triggered data it should be of type ***day*** and so on. If the container is filled (end of hour or end of day ...) a new container is created. Each filled container represents a file in the memory structure and the name of the file represents the time and date when the container was closed.
At the end of the archive group menu is a link to the archive structure arranged. With a mouse click in browser mode at that link all closed containers are accessible.

The arrangement is like a file tree:
Year n-2
Year n-1
Year n

A click at Year n opens a tree with months:
01
02
03
04
..

A click at a month opens a tree with days:
01
02
..
06 d060909.tsv << data of day 06, of September 2009
07 d070909.tsv << data of day 07, of September 2009
08 d080909.tsv << data of day 08, of September 2009
..
31

A click at a day opens a tree with hours:
01
02
03
..
24

A click at the desired day or hour opens the file and the values are displayed in readable text form (*.tsv = data represented in tab separated values). Data can be read with a standard editor or with spread sheet functions like Microsoft Excel.

4.2.2 Maximum storage

The usage of a flash disc in ERZ 2404 allows storage of big data ranges. No upper limit is defined and older records will not be overwritten. The flash memory should be sufficient for storing data for several years. Nevertheless it is important to use the archive functions carefully and not to define too much data for recording. A warning can be set to get a message if flash memory reaches a lower limit.
If the limit message appears the user must clear memory to enable further recordings.

In ***TJ File system*** the limit can be set and the remaining memory space is displayed.

Example of a maximum record length and the corresponding memory space:
In archive group 1 all 24 entries are set to totalizers with 20 bytes each.
In this case we get 500 bytes per record. Now the trigger is set to each minute and we get 60 records per hour. This will be: 20 *24*60 = 28800 bytes per hour or 691200 bytes per day. With a free memory space of 1 GByte memory will be full after ~ 1000 days.

This is an example of how it should not be. Please be careful when defining records and trigger events.

4.2.3 Clearing of archives

A special function is integrated at the file tree that enables the clearing of memory space. This function is only visible in super user mode and only useable with browser access. Checkboxes appear to select the desired file for resetting.

Example of a file tree in normal mode:
Contents of A01/2009/09 (two files)

d070909.tsv << data of day 07, of September 2009
d080909.tsv << data of day 08, of September 2009

Example of a file tree in superuser mode where checkboxes appear:
Contents of A01/2009/09 (two files)

☑ d070909.tsv << data of day 07, of September 2009
☑ d080909.tsv << data of day 08, of September 2009

Checkboxes can be clicked on and the appropriate file can be deleted with clicking **enter/reset** button.

4.2.4 Changing record entries in a running archive

If in an existing and running archive changing is made, the archive structure will be damaged. The archive must be cleared.

5 Interfaces

5.1 Description

5.1.1 Front panel Com-F

Com-F interface: RS 232 reserved for program updates (flash) only. In normal operating mode, the interface is switched off and has no function whatsoever. Only if "Program update" mode is selected will the computer terminate the correction program and activate the interface.

5.1.2 Rear panel COM 1 to COM 5

COM 1 interface: Fixed to RS 485, MODBUS-Master DZU protocol for connection to an ultrasonic flowmeter USZ 08. Optionally, MODBUS ASCII / RTU can be offered as standard Modbus drivers for RS 485 interfaces.

OFF
Test
Modbus RTU
Modbus ASCII

COM 2 interface: RS 232, not switch able

OFF
Test
Modbus RTU
Modbus ASCII
GPS 170
RMG View

COM 3 interface: Switchable from RS 232 with handshake to RS 485. A second Modbus protocol can be assigned, parameters as with COM 1.

OFF
Test
Modbus RTU
Modbus ASCII

COM 4 interface: Switchable from RS 232 without handshake to RS 485. RMG bus function can be assigned.

OFF
Test
RMG bus

COM 5 interface: RS 232 with handshake plus carrier plus ring. For analogue MODEM, dedicated line (GPRS), or Petronas-Mode for seriell printer with fixed printout.

5.1.3 Petronas protocol

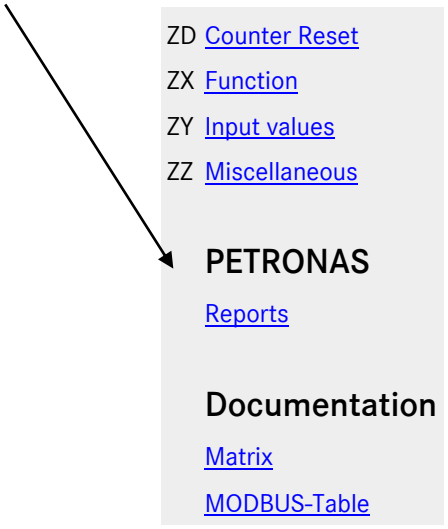
ERZ 2404 in Petronas Mode is able to printout a special protocol on an EPSON printer. This is a typical customer application.
In the first line there is a time-lapse test function under superuser access. If started, each hour will last only 5 seconds, so it is easy to simulate a complete day and test the printout. The printout is triggered with parameter ***billing hour*** in coordinate WA times line 14. This function starts in the last 5 seconds of the current hour. After finishing this test please do not forget to set the correct time and date in ***WA times.***

UE Petronas protocol

Access	Line	Name	Value	Unit	Variable
Y	1	Time simulation	no		timSim
Q	2	Print once more	no		reprint
Q	3	Page	8		page
B	4	Width of columne	10		clwid
B	5	Fraction quants.	1		totfrc
B	6	Fraction averages	2		avgfrc
B	7	Page length	12	Inch	pagelen
B	8	Print speed	47	cps	repspeed

Below this menu there is a link Reports .
Clicking on this opens the access to all existing reports (created in the past).

The same access can be found here outside the coordinate system.



5.1.4 Rear panel Ethernet

On the rear panel is a RJ 45 Network connection for various applications. It is useful for linking of devices, integration into customer networks (Intranet) or, as important issues, the remote operation and visualization of the ERZ 2404 with a laptop.
Here a separate description is available (see the operating instructions for the ***ERZ 2000_Remote_Operation***).

MODBUS RTU on TCP/IP is available with the same parameters of COM 1 or COM 3 settings. Example of access via Modbus TCP/IP see chapter Modbus.

5.2 Remote control / parameterization

5.2.1 Connecting a notebook

Apart from operating the device via the front panel, there is another very convenient option for operating or parameterize it either locally or remotely with a PC or notebook. Independently of separate operating software, operation can be made using the PC's browser (e.g. Internet Explorer or Netscape). The ERZ 2404 operates as the server, while the PC operates as a client. For local connection without a hub, a crossover network cable is required. The ERZ 2404 can also be included in an existing network.

For more information, see separate description of standard ERZ 2000. Consider that coordinate names and numbers can be different to ERZ 2404 but the functions are the same.

5.2.2 Setting the addresses

To ensure that the network connection functions properly, you have to make the necessary settings in the **TCP/IP Network** chapter which you can find under the **Communications** heading.
To access to this function press ***<0> Mode*** and then two times the ***Cursor Right*** key.

For more information, see separate description of standard ERZ 2000. Consider that coordinate names and numbers can be different to ERZ 2404 but the functions are the same.

6 Time system

6.1 Quartz clock

The time system consists of a battery-backed quartz-controlled real time clock (RTC) module which provides the time basis for the ERZ 2404.
The clock module can be synchronized by a higher-level timing element (external synchronization input). The internal time basis can be changed via the keyboard or the Modbus interface but only within the scope of the relevant access rights.

Other operating modes are possible. See the relevant function, press ***<0> Mode*** and then four times the ***Cursor Right*** key to browse to the **Times** chapter.
In ***WA Times***, there are the general displays and parameters.
In ***WB Time contact signal to external devices***, there are all displays and parameters which are important for the time signal to external devices; i.e. if the ERZ 2404 itself is the source for the time signal.
In ***WC External time signal***, there are all displays and parameters which are important for receiving the time signal.

The clock operates on the UTC (coordinated universal time) basis and the volume corrector converts the time into local time. For this reason, the correct time zone has to be set on the device. The selection menu comprises all time zones of the world. The time is changed automatically from normal time to daylight saving time and vice versa in accordance with the currently applicable official rules of the time zone set. If "Europe / Berlin" has been set for Germany, time is changed from CET to CEST on the last Sunday of March at 2 o'clock and thus the clock is put forward one hour. The time is changed from CEST to CET on the last Sunday of October at 3 o'clock and thus the clock is put back one hour.

6.2 Example for setting time and date in a foreign country

Country: China
Set **ASIA/SHANGHAI** mode and the ERZ 2404 converts UTC into local time of Shanghai. The time is changed automatically from normal time to daylight saving time and vice versa in accordance with the currently applicable official rules of the time zone set. If automatic switching to daylight saving time is not desired, the difference to UTC has to be set as: **ETC/GMT-8 (or ETC/GMT-7).**

Country Greece
Set **EUROPE/ATHENS** mode and the ERZ 2404 converts UTC into local time of Greece. The time is changed automatically from normal time to daylight saving time and vice versa in accordance with the currently applicable official rules of the time zone set. If automatic switching to daylight saving time is not desired, the difference to UTC has to be set as: **ETC/GMT-3 (or ETC/GMT-2).**

6.3 Setting the time and date

The time and date are to be set in the **Times** chapter.

Press the ***<0> Mode*** key and then the ***Cursor Right*** key until the arrow points to the ***WA Times*** chapter. Then press ***Enter*** to access the **Times** chapter and make your settings directly at the **Date and time** function. If you want to change the settings manually, you will have to open the user lock in any case.

You can enter the date and time directly via the numerical keyboard. After you have pressed ***Enter***, the time and/or date will be accepted. Non-permissible inputs will be disregarded.

6.4 Time synchronizations

Modbus registers 10 to 16 are reserved for time synchronization.
Time and date can be set by writing onto such registers.

Register	Bytes	Data type	Access	Column	Line	Group	Designation
10	2	unsigned integer 16-bit	R/W	WC	40	Time input	Modb.sync year
11	2	unsigned integer 16-bit	R/W	WC	41	Time input	Modb.sync month
12	2	unsigned integer 16-bit	R/W	WC	42	Time input	Modb.sync day
13	2	unsigned integer 16-bit	R/W	WC	43	Time input	Modb.sync hour
14	2	unsigned integer 16-bit	R/W	WC	44	Time input	Modb.sync minute
15	2	unsigned integer 16-bit	R/W	WC	45	Time input	Modb.sync second
16	2	unsigned integer 16-bit	R/W	WC	46	Time input	Modb.sync trigger

Setting the values

To trigger the take over = register 16 set to 1

When the trigger in register 16 is set to 1 it is important to use UTC; the ERZ 2404 calculates the local time as defined in the selected time zone. It is also possible to set trigger-register 16 to 2, but then register 10...15 are interpreted as local time. All other values in register 16 (0, 3, 4,...65535) have no impact on the trigger function.

Another option is to connect GPS receiver modules of any manufacturer to the COM 2 interface. The ERZ 2404 knows the following protocols:
NMEA 0183, Meinberg Standard, SAT Standard, Uni Erlangen, ABB SPA, Computime and RACAL

6.5 Determining the ON time for the display

To allow the display to be read under optimum conditions, it has been permanently set to maximum brightness. In input mode, the line to be edited will turn darker to indicate that input mode is active. To increase the service life of the display, the ERZ 2404 switches its display dark as soon as a settable period of time has elapsed after the last key was pressed.
You can find the function where you can set this time under the ***<0> Mode*** key, **Display** chapter, **Screen saver** function.

7 Deleting Archives, Logbooks, Modification Memories, etc.

The **Erasing procedures** chapter can be found under the ***<0> Mode*** key heading. Here you can selectively reset stored values. There are the following functions:

SM Reset functions

Access	Line	Name	Value	Unit	Variable
Y	10	Reset log	no		logbClr
Y	11	Reset param.log	no		pchgClr
Y	12	Reset hourly quant.	no		hMngClr
Y	13	Reset daily quant.	no		dMngClr
Y	14	Reset monthly quant	no		mMngClr

- Reset log — Deletes the contents of the logbook
- Reset parameter log — Deletes the contents of the memory which documents all changes of parameters
- Reset hourly quantities — Deletes the current accumulated hourly values
- Reset daily quantities — Deletes the current accumulated daily values
- Reset monthly quantities — Deletes the current accumulated monthly values

Deletions are only possible on the **superuser** access level.

8 Modbus

8.1 Parameter of the MODBUS Interface:

ERZ 2404 is always MODBUS Slave to an external SCADA System.
The device address is settable from 1 to 247.

8.1.1 COM 1:

An exception is the connection to the ultrasonic meter USZ 08, in this case ERZ 2404 acts as a Modbus master and can address several USZ 08 slaves. This is an internal interface running DZU protocol and not useable for 3rd party applications. The connection to USZ 08 has to be made with COM 1. The DZU protocol is only available on COM 1.

There should be a factory set of COM 1 parameters, please do not change this parameters.
Factory set is: 38400 / 8N1 / DZU-bus

UB Serial interfaces

Access	Line	Name	Value	Unit	Variable
B	1	COM1 baudrate	38400		baudC0
B	2	COM1 B/P/S	8N1		bpsC0
B	3	COM1 operating mode	DZU-bus		modeC0

The slave address of each connected Ultrasonic meter has to be set in coordinates of the volume sensor chapter.
Example for the first meter in coordinate RF 20:

RF Ultrasonic meter A type USE 09

Access	Line	Name	Value	Unit	Variable
I	1	Main-tot. forward	.000	m3	usAZwF
I	2	Dist-tot. forward	.000	m3	usAZwFs
I	3	Main-tot. reverse	.000	m3	usAZwB
I	4	Dist-tot. reverse	.000	m3	usAZwBs
I	5	Flow	0.000	m3/h	usAQ
I	6	Direction	0		usAFw
I	7	Status	0		usASt
I	8	Temperature	-273	°C	usATmp
I	9	Absolute pressure	0	bar	usADrk
I	10	Vel. of sound	0	m/s	usAVos
E §	20	DZU-Slaveadr.	1		usAAdr

Slave address

E §	21	Format	%.3f		usAZwFrm
D	30	Timeout	0	s	usATimCnt
D	40	frac. main.forward	.000	m3	zmAZwF
D	41	frac. dist.forward	.000	m3	zmAZwFs
D	42	frac. main.reverse	.000	m3	zmAZwB
D	43	frac. dist.reverse	.000	m3	zmAZwBs
D	44	last Status	0		lsASt
D	45	disturbed	0		isAStoer

Slave address for the second meter: coordinate RG 20
Slave address for the third meter: coordinate RH 20
Slave address for the fourth meter: coordinate RI 20

8.1.2 COM 2, COM 3, COM 4:

Other Modbus communication ports are COM 2 and COM 3, COM 4 is reserved for RMG Bus (Connection to a GC 9000 Chromatograph).

8.2 Modbus TCP/IP

Modbus is not only available on RS 485, Modbus RTU is also available on Ethernet TCP/IP.

Programming example:

```
Open socket to TCP/IP Modbusserver                                  ;( Server = ERZ 2404)

SERVER_IP_ADRESS=192.6.10.100                                       ; Example of an IP address
MOD_PORT_NUM=502                                                    ; reserved port for Modbus
tcpmodbusclient = New TcpClient(SERVER_IP_ADRESS, MOD_PORT_NUM)     ; try connection to server
tcpmodbusclient.ReceiveTimeout = 2500                               ; ms
tcpmodbusclient.SendTimeout = 2500                                  ; ms

; Send Modbus query to server (ERZ 2404)
; e.g. Functioncode 3, reading 50 register starting with address 200

;————————————— PID – TID – bytes-adr-fkc-regs. anz.reg
fct3request_200_50() As Byte = {12, 34, 56, 78, 0, 6, 2, 3, 0, 200, 0, 50}
tcpmodbusclient.GetStream.Write(fct3request_200_50, 0, fct3request_200_50.Length) '
```

```
; Waiting for the answer

If tcpmodbusclient.GetStream.DataAvailable = True Then                    ; read data
  receivecount =tcpmodbusclient.GetStream.Read(receivebuffer,0,CInt(receivebuffer.Length))

End If

close socket

tcpmodbusclient.Close()
```

More information at www.modbus.com

8.3 Access to data

Reading Modbus register with function code 03
Writing Modbus register with function code 16

Register address:

All addresses are based on the user specific offset defined in UB serial interfaces line 17. Therefore the register must be accessed with the given address plus offset and not with address -1 as described in Specification Reference Guide PI-MBUS 300).

Example for Floating Point Notation (Modbus RTU) reading the energy flow:
Device address = 05, read register 1030, energy flow = 548254.1 kW (49 05 D9 E1 Hex)
05 03 04 06 00 02 CRC1 CRC2
Transmission:
05 03 04 49 05 D9 E1 CRC1 CRC2
Transmission order: first exponent, then mantissa high, then mantissa, then mantissa low.

8.4 Access to archives

With the new software release (version 1.1) it is possible to get Modbus access to all archives with standard function codes.

All records in the archives are named with a file name e.g. d080909.tsv.
The meaning is: daily record from September 08 in 2009 and the abbreviation tsv mean tab separated values.

Example: reading a record of archive group 2
Modbus slave device address = 5
The daily record from the first of January in 2008 at 11:00:00 should be read.

Modbus master writes into the following addresses the desired values and defines herewith the file name:

Address 30000 = group number of selected archive	2
Address 30001 = year (according file name)	2008
Address 30002 = month (according file name)	09
Address 30003 = day (according file name)	01
Address 30004 = hour (according file name)	11
Address 30005 = minute (according file name)	00
Address 30006 = second (according file name)	00

Address 30007 = this is a command the Modbus master sends to the slave. The master writes a “one” (1) into register 30007 to signalise the slave to search a record with the defined time stamp.

Address 30008 = data length, the slave answers with the number of bytes of the detected record.

Address 30009 = status of slave (ERZ 2404) it will be 1 if the selected file is found and ready for sending. Now the record can be read with standard function code 3.

Address 30010 = the slave prepares the content of the selected record beginning with this register and the record can be read from the master.

30000	2	unsigned integer 16-bit	R/W	II	1	Modb. arch. query	Group	0
30001	2	unsigned integer 16-bit	R/W	II	2	Modb. arch. query	Year	0
30002	2	unsigned integer 16-bit	R/W	II	3	Modb. arch. query	Month	0
30003	2	unsigned integer 16-bit	R/W	II	4	Modb. arch. query	Day	0
30004	2	unsigned integer 16-bit	R/W	II	5	Modb. arch. query	Hour	0
30005	2	unsigned integer 16-bit	R/W	II	6	Modb. arch. query	Minute	0
30006	2	unsigned integer 16-bit	R/W	II	7	Modb. arch. query	Second	0
30007	2	unsigned integer 16-bit	R/W	II	8	Modb. arch. query	Command	0
30008	2	unsigned integer 16-bit	R	II	9	Modb. arch. query	Data length	0
30009	2	unsigned integer 16-bit	R	II	10	Modb. arch. query	Data ready	0
30010	763		R	II	11	Modb. arch. query	Data buffer	(...)

All reading and writing takes place with standard function codes 03 and 16.

Example of a first access to an archive (to find the first record in the archive)

1. Master: set the time stamp of the desired archive group at an early date in the past e.g. 1. January 1970 in register 30000 to 30006.
2. Master: set register 30007 to 1
3. Slave: overwrite register 30000 to 30006 with the time stamp of the first record found in this archive and set register 30009 to 1.
4. Master: read register 30009, if content = 1 the slave has finished the search for a record, if content = 0 the slave is not ready and searching for records is still in work.
5. Master: read and store this time stamp in own memory as a starting point
6. Master: read register 30008 with the number of bytes of detected record (if number of bytes = 0 no record has been found).

Now the master can read the record and step to the next record, read again step to the next record, and so on. There are 2 methods to do this.

Increase the second of the time stamp (register 30006) and proceed as in the above example for first access.

Method 1:

Depending on the trigger definitions for the selected archive group it is possible that more than one record exist with the same time stamp. This occurs when an error message is used as trigger definition, because the ERZ 2404 can detect up to 3 different messages per second, in this case it is possible that 3 records exist with the same time stamp. The recommendation is: use method 2.

Method 2:

Use register 30007 as a switch to the next record e.g. set a 2 that means **next record.** Wait for 30009 = 1 and 30008 = number of bytes and read the record ..... and so on. If 30009 will remain 1 and 30008 will be 0 no further records can be found (newest entry in archive).

Register 30007 can be used as a feedback for the master; it will be set to 0 immediately after the slave has accepted the time stamp.

Example of a standard access to an archive

1. Master: set the time stamp of the selected archive group at the desired date in register 30000 to 30006.
2. Master: set register 30007 to 1
3. Slave: overwrite register 30000 to 30006 with the time stamp of the record found in this archive with a time stamp equal or greater and set register 30009 to 1.
4. Master: read register 30009, if content = 1 the slave has prepared the record for reading, if content = 0 the slave is not ready and searching for records is still in work.
5. Master: read register 30008 with the number of bytes of detected record (if number of bytes = 0 no record has been found).

Now the master can read the record and step to the next record, read again step to the next record, and so on. There are 2 methods to do this.

Method 1:

Increase the second of the time stamp (register 30006) and proceed as in the above example.

Depending on the trigger definitions for the selected archive group it is possible that more than one record exist with the same time stamp. This occurs when an error message is used as trigger definition, because the ERZ 2404 can detect up to 3 different messages per second, in this case it is possible that 3 records exist with the same time stamp. The recommendation is: use method 2.

Method 2:

Use register 30007 as a switch to the next record e.g. set a 2 that means **next record.** Wait for 30009 = 1 and 30008 = number of bytes and read the record ..... and so on. If 30009 will remain 1 and 30008 will be 0 no further records can be found (newest entry in archive).

Register 30007 can be used as a feedback for the master; it will be set to 0 immediately after the slave has accepted the time stamp.

Example: a record from archive group 2 with time stamp of September 1st 2008 at 11:00:00 should be read

Request from master; set parameter for the desired record
05 10 75 30 00 08 10 00 02 07 0D 00 09 00 01 00 0B 00 00 00 00 00 01 +CRC

Explanation (Hex notation):
05 = device address
10 = function code 16 write data
75 30 = Start register 30000
00 08 = number of registers
10 = number of bytes
00 02 = archive group
07 0D = year 2008
00 09 = month September
00 01 = day first of September
00 0B = hour 11
00 00 = minutes = 0
00 00 = seconds = 0
00 01 = trigger = 1

Response from slave; standard acknowledgement
05 10 75 30 00 08 +CRC

Explanation (Hex notation):
05 = device address
10 = function code 16 write data
75 30 = Start register 30000
00 08 = number of registers

Request from master; number of registers in the selected record?
05 03 75 38 00 02 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
75 38 = register 30008
00 02 = read 2 registers

Response from slave; number of registers in the selected record = 96
05 03 04 00 60 00 01 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
04 = number of following bytes
00 60 = number of registers in the record = 96
00 01 = content of register 30009 = 1 = ready

Request from master; read 96 registers
05 03 75 3A 00 60 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
75 3A = register 30010
00 60 = number of registers = 96

Response from slave; transmission of data
05 03 C0 (data, data…..) +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
C0 = number of bytes = 192

Example for access to next record according method 2:

Request from master; switch to next record in current archive
05 10 75 37 00 01 02 00 02 +CRC

Explanation (Hex notation):
05 = device address
10 = function code 16 write data
75 37 = register 30007 command to switch to the next record
00 01 = number of registers
02 = number of bytes
00 02 = command switch to next record

Response from slave; standard acknowledgement
05 10 75 37 00 01 +CRC

Explanation (Hex notation):
05 = device address
10 = function code 16 write data
75 37 = register 30007
00 01 = number of registers

Request from master; number of registers in the record?
05 03 75 38 00 02 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
75 38 = register 30008
00 02 = read 2 registers

Response from slave; number of registers in the selected record = 88
05 03 04 00 58 00 01 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
04 = number of following bytes
00 58 = number of registers in the record = 88
00 01 = content of register 30009 = 1 = ready

Request from master; read 88 registers
05 03 75 3A 00 58 +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
75 3A = register 30010
00 58 = number of registers = 88 (58 Hex)

Response from slave; transmission of data
05 03 B0 (data, data.....) +CRC

Explanation (Hex notation):
05 = device address
03 = function code 3 read data
B0 = number of bytes = 176

If a record is defined with entries that exceed the 250 Byte (125 registers) maximum length of a Modbus block, the master must take care for maximum length in the query.

This picture appears with browser access to ERZ 2404.

II Modbus archive query

Access	Line	Name	Value	Unit	Variable
M	1	Group	0		archGr
M	2	Year	0		archYY
M	3	Month	0		archMO
M	4	Day	0		archDD
M	5	Hour	0		archHH
M	6	Minute	0		archMI
M	7	Second	0		archSS

M	8	Command	0		archTrg
I	9	Data length	0		archLen
I	10	Data ready	0		archRdy
I	11	Data buffer	(...)		archBuf
D	12	Archive stamp	DD-MM-YYYY hh:mm:ss		archLocT

The last line displays the time stamp in standard date and time formats, this is not available on a Modbus register.

8.5 Modbus time synchronisation

WC external time signal input

Access	Line	Name	Value	Unit	Variable
T	1	Sync.mode input	Full minute		zeitSyncMode
T	2	timesync.tolerance	1	s	syncZul
B	4	Retrigger success	90000	s	ptbOk
B	5	Retrigger fault	300	s	ptbNok
Q	6	PTB trigger	0	s	ptbCall
D	7	Clock free wheel	20657	s	freiLauf
A §	20	Timesync.-contact	**off**		ktkSyncClk
E §	21	Source time contact	**Contactinp. 1**		kzoSyncClk
I	30	GPS time (UTC)	01-01-1970 00:00:00		gpsTime
I	31	time protocol	off		gpsStrg
M	40	Modb.sync year	0		modwYY
M	41	Modb.sync month	0		modwMO
M	42	Modb.sync day	0		modwDD
M	43	Modb.sync hour	0		modwHH
M	44	Modb.sync minute	0		modwMI
M	45	Modb.sync second	0		modwSS
M	46	Modb.sync trigger	0		modwTimTrig

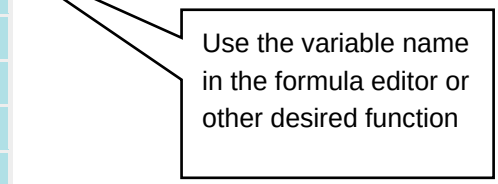
Line 46 Modbus sync. Trigger can serve two functions: if set to 1 the time preset in lines 40 to 45 must be UTC, if set to 2 the time preset in lines 40 to 45 must be local time.
These are Modbus registers 10 to 16, further description see manual of ERZ 2404.

8.5.1 Special function registers:

Ten 16 Bit register and ten 32 Bit floating-point register are designed for the use of a SCADA system to write values into the ERZ 2404. Each register value can be a parameter in a formula (see **XL Formula evaluation**), or can be a trigger for a record, or can be a value for analogue output etc.
This registers start at address 40 with the 2 Byte integer format and at address 50 with the 4 Byte floating point format.

UD Modbus input values

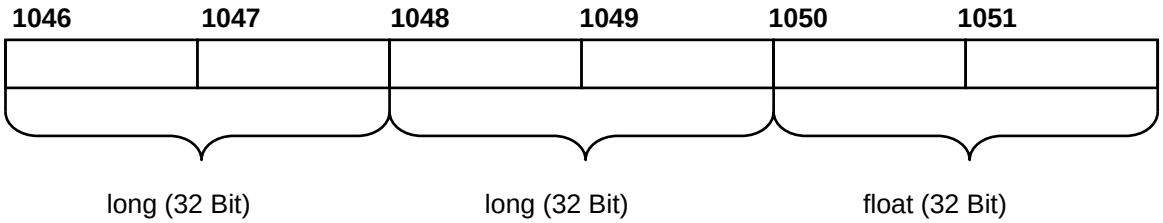
Access	Line	Name	Value	Unit	Variable
M	1	unsigned short 0	0		mbius0
M	2	unsigned short 1	0		mbius1
M	3	unsigned short 2	0		mbius2
M	4	unsigned short 3	0		mbius3
M	5	unsigned short 4	0		mbius4
M	6	unsigned short 5	0		mbius5
M	7	unsigned short 6	0		mbius6
M	8	unsigned short 7	0		mbius7
M	9	unsigned short 8	0		mbius8
M	10	unsigned short 9	0		mbius9
M	11	float 0	0		mbifl0
M	12	float 1	0		mbifl1
M	13	float 2	0		mbifl2
M	14	float 3	0		mbifl3
M	15	float 4	0		mbifl4
M	16	float 5	0		mbifl5
M	17	float 6	0		mbifl6
M	18	float 7	0		mbifl7
M	19	float 8	0		mbifl8
M	20	float 9	0		mbifl9



8.5.2 Special format expression

Because of the length of totalizers a special format expression is given in the following tables: Long / long / float
The meaning is that 6 registers are used to represent one totalizer value.

Example register address 1046 (totalizer for volume at measurement conditions):



8.6 Address structure of Modbus registers:

Register	0 to 9	Reserved
Register	10 to 16	Time input for synchronisation from SCADA (Master)
Register	17 to 19	Reserved
Register	20 to 35	Time output for information to SCADA (Master)
Register	40 to 68	Special function register
Register	100 to 113	Bits for error messaging
Register	114 to 149	Error messages reserved for further functions
Register	150 to 999	Reserved
Register	1000 to 1654	Values of Flow Computer # 1
Register	1655 to 1999	Reserved
Register	2000 to 2654	Values of Flow Computer # 2
Register	2655 to 2999	Reserved
Register	3000 to 3654	Values of Flow Computer # 3
Register	3655 to 3999	Reserved
Register	4000 to 4654	Values of Flow Computer # 4
Register	4655 to 4999	Reserved
Register	5000 to 5654	Values of Flow Computer # 5
Register	5655 to 5999	Reserved
Register	6000 to 6654	Values of Flow Computer # 6
Register	6655 to 6999	Reserved
Register	7000 to 7654	Values of Flow Computer # 7
Register	7655 to 7999	Reserved
Register	8000 to 8654	Values of Flow Computer # 8
Register	8655 to 8999	Reserved
Register	9000 to 9044	Gas quality A via Modbus
Register	9045 to 9099	Reserved
Register	9100 to 9144	Gas quality B via Modbus
Register	9145 to 9199	Reserved
Register	9200 to 9244	Gas quality C via Modbus
Register	9245 to 9299	Reserved
Register	9300 to 9344	Gas quality D via Modbus
Register	9345 to 9899	Reserved
Register	9900 to 9904	Units and formats of gas quality
Register	9911 to 10999	Reserved
Register	11000 to 11068	Results of summation # 1
Register	11516 to 11532	Units of summation # 1
Register	11533 to 11999	Reserved
Register	12000 to 12068	Results of summation # 2
Register	12516 to 12532	Units of summation # 2
Register	12533 to 12999	Reserved

Register	13000 to 13068	Results of summation # 3
Register	13516 to 13532	Units of summation # 3
Register	13533 to 13999	Reserved
Register	14000 to 14068	Results of summation # 4
Register	14516 to 14532	Units of summation # 4
Register	14533 to 14999	Reserved
Register	21000 to 21018	Results of subtraction # 1
Register	21524 to 21534	Units of subtraction # 1
Register	21543 to 21999	Reserved
Register	22000 to 22018	Results of subtraction # 2
Register	22524 to 22534	Units of subtraction # 2
Register	22543 to 22999	Reserved
Register	23000 to 23018	Results of subtraction # 3
Register	23524 to 23534	Units of subtraction # 3
Register	23543 to 23999	Reserved
Register	24000 to 24018	Results of subtraction # 4
Register	24524 to 24534	Units of subtraction # 4
Register	30000 to 30010	Modbus archive query

8.7 Detailed Modbus register overview

Register for time synchronisation: address 10 to 16 (with write access) according R/W.

Register	Bytes	Data type	Access	Column	Line	Group	Designation	Value (display)	Value (Modbus)
10	2	unsigned integer 16-bit	R/W	WC	40	Time input	Modb.sync year	0	00 00
11	2	unsigned integer 16-bit	R/W	WC	41	Time input	Modb.sync month	0	00 00
12	2	unsigned integer 16-bit	R/W	WC	42	Time input	Modb.sync day	0	00 00
13	2	unsigned integer 16-bit	R/W	WC	43	Time input	Modb.sync hour	0	00 00
14	2	unsigned integer 16-bit	R/W	WC	44	Time input	Modb.sync minute	0	00 00
15	2	unsigned integer 16-bit	R/W	WC	45	Time input	Modb.sync second	0	00 00
16	2	unsigned integer 16-bit	R/W	WC	46	Time input	Modb.sync trigger	0	00 00
20	2	unsigned integer 16-bit	R	WB	40	Time output	UTC year	2009	07 D9
21	2	unsigned integer 16-bit	R	WB	41	Time output	UTC month	9	00 09
22	2	unsigned integer 16-bit	R	WB	42	Time output	UTC day	8	00 08
23	2	unsigned integer 16-bit	R	WB	43	Time output	UTC hour	7	00 07
24	2	unsigned integer 16-bit	R	WB	44	Time output	UTC minute	45	00 2D
25	2	unsigned integer 16-bit	R	WB	45	Time output	UTC second	4	00 04
30	2	unsigned integer 16-bit	R	WB	50	Time output	Local time year	2009	07 D9
31	2	unsigned integer 16-bit	R	WB	51	Time output	Local time month	9	00 09
32	2	unsigned integer 16-bit	R	WB	52	Time output	Local time day	8	00 08
33	2	unsigned integer 16-bit	R	WB	53	Time output	Local time hour	9	00 09
34	2	unsigned integer 16-bit	R	WB	54	Time output	Local time minute	45	00 2D
35	2	unsigned integer 16-bit	R	WB	55	Time output	Local time second	4	00 04

Special function register

Reading and writing is possible according R/W. External Modbus master (SCADA sytems) can set these values as parameter for equations in the formula editor, or as value for current output, or as trigger event etc.

40	2	unsigned integer 16-bit	R/W	UD 1	Modbus input values	unsigned short 0	0 00 00
41	2	unsigned integer 16-bit	R/W	UD 2	Modbus input values	unsigned short 1	0 00 00
42	2	unsigned integer 16-bit	R/W	UD 3	Modbus input values	unsigned short 2	0 00 00
43	2	unsigned integer 16-bit	R/W	UD 4	Modbus input values	unsigned short 3	0 00 00
44	2	unsigned integer 16-bit	R/W	UD 5	Modbus input values	unsigned short 4	0 00 00
45	2	unsigned integer 16-bit	R/W	UD 6	Modbus input values	unsigned short 5	0 00 00
46	2	unsigned integer 16-bit	R/W	UD 7	Modbus input values	unsigned short 6	0 00 00
47	2	unsigned integer 16-bit	R/W	UD 8	Modbus input values	unsigned short 7	0 00 00
48	2	unsigned integer 16-bit	R/W	UD 9	Modbus input values	unsigned short 8	0 00 00
49	2	unsigned integer 16-bit	R/W	UD 10	Modbus input values	unsigned short 9	0 00 00
50	4	float IEEE 754	R/W	UD 11	Modbus input values	float 0	0 00 00 00 00
52	4	float IEEE 754	R/W	UD 12	Modbus input values	float 1	0 00 00 00 00
54	4	float IEEE 754	R/W	UD 13	Modbus input values	float 2	0 00 00 00 00
56	4	float IEEE 754	R/W	UD 14	Modbus input values	float 3	0 00 00 00 00
58	4	float IEEE 754	R/W	UD 15	Modbus input values	float 4	0 00 00 00 00
60	4	float IEEE 754	R/W	UD 16	Modbus input values	float 5	0 00 00 00 00
62	4	float IEEE 754	R/W	UD 17	Modbus input values	float 6	0 00 00 00 00
64	4	float IEEE 754	R/W	UD 18	Modbus input values	float 7	0 00 00 00 00
66	4	float IEEE 754	R/W	UD 19	Modbus input values	float 8	0 00 00 00 00
68	4	float IEEE 754	R/W	UD 20	Modbus input values	float 9	0 00 00 00 00

Register representing message bits:
Beginning at register address 100

100 2 unsigned integer 16-bit R VB 1	Message registers	Message 0...15	0000 hex	00 00
	A10-1	FC1 T failure	= BIT-0	
	A10-2	FC2 T failure	= BIT-1	
	A10-3	FC3 T failure	= BIT-2	
	A10-4	FC4 T failure	= BIT-3	
	A10-5	FC5 T failure	= BIT-4	
	A10-6	FC6 T failure	= BIT-5	
	A10-7	FC7 T failure	= BIT-6	
	A10-8	FC8 T failure	= BIT-7	
	A11-1	FC1 P failure	= BIT-8	
	A11-2	FC2 P failure	= BIT-9	
	A11-3	FC3 P failure	= BIT-10	
	A11-4	FC4 P failure	= BIT-11	
	A11-5	FC5 P failure	= BIT-12	
	A11-6	FC6 P failure	= BIT-13	
	A11-7	FC7 P failure	= BIT-14	
	A11-8	FC8 P failure	= BIT-15	
101 2 unsigned integer 16-bit R VB 2	Message registers	Message 16...31	0000 hex	00 00
	A12-1	FC1 GQ failure	= BIT-0	
	A12-2	FC2 GQ failure	= BIT-1	
	A12-3	FC3 GQ failure	= BIT-2	
	A12-4	FC4 GQ failure	= BIT-3	
	A12-5	FC5 GQ failure	= BIT-4	
	A12-6	FC6 GQ failure	= BIT-5	
	A12-7	FC7 GQ failure	= BIT-6	
	A12-8	FC8 GQ failure	= BIT-7	
	A13-1	FC1 EOS failure	= BIT-8	
	A13-2	FC2 EOS failure	= BIT-9	
	A13-3	FC3 EOS failure	= BIT-10	
	A13-4	FC4 EOS failure	= BIT-11	
	A13-5	FC5 EOS failure	= BIT-12	
	A13-6	FC6 EOS failure	= BIT-13	
	A13-7	FC7 EOS failure	= BIT-14	
	A13-8	FC8 EOS failure	= BIT-15	
102 2 unsigned integer 16-bit R VB 3	Message registers	Message 32...47	0000 hex	00 00
	A14-1	FC1 Vol.failure	= BIT-0	
	A14-2	FC2 Vol.failure	= BIT-1	
	A14-3	FC3 Vol.failure	= BIT-2	

		A14-4	FC4 Vol.failure	= BIT-3	
		A14-5	FC5 Vol.failure	= BIT-4	
		A14-6	FC6 Vol.failure	= BIT-5	
		A14-7	FC7 Vol.failure	= BIT-6	
		A14-8	FC8 Vol.failure	= BIT-7	
		A40-0	Def.tot.	= BIT-8	
		A40-1	CAN timeout	= BIT-9	
		A40-2	illegal	= BIT-10	
		A40-3	Corrupt code	= BIT-11	
		A40-4	Inval.act.key	= BIT-12	
		R50-0	Rebooted	= BIT-13	
		R50-1	RTC defective	= BIT-14	
		R50-2	Power OFF	= BIT-15	
103	2 unsigned integer 16-bit R VB 4	Message registers	Message 48...65	0000 hex	00 00
		R50-3	NMA ADC	= BIT-0	
		R50-4	NMA overload	= BIT-1	
		R50-5	NMA OC PT100	= BIT-2	
		R50-6	NMA OC mainch.	= BIT-3	
		R50-7	NMA OC ref.ch.	= BIT-4	
		R50-8	NMA OC ENCO	= BIT-5	
		R50-9	NMB ADC	= BIT-6	
		R51-0	NMB overload	= BIT-7	
		R51-1	NMB OC PT100	= BIT-8	
		R51-2	NMB OC Messk.	= BIT-9	
		R51-3	NMB OC Vgl.k.	= BIT-10	
		R51-4	NMB OC ENCO	= BIT-11	
		R51-5	F1 failure	= BIT-12	
		R51-6	F2 failure	= BIT-13	
		R51-7	F3 failure	= BIT-14	
		R51-8	F4 failure	= BIT-15	
104	2 unsigned integer 16-bit R VB 5	Message registers	Message 64...79	0000 hex	00 00
		R51-9	F5 failure	= BIT-0	
		R52-0	F6 failure	= BIT-1	
		R52-1	F7 failure	= BIT-2	
		R52-2	F8 failure	= BIT-3	
		R52-3	I1 failure	= BIT-4	
		R52-4	I2 failure	= BIT-5	
		R52-5	I3 failure	= BIT-6	
		R52-6	I4 failure	= BIT-7	
		R52-7	I5 failure	= BIT-8	
		R52-8	I6 failure	= BIT-9	

	R52-9	I7 failure	= BIT-10		
	R53-0	I8 failure	= BIT-11		
	R53-1	I9 failure	= BIT-12		
	R53-2	I10 failure	= BIT-13		
	R53-3	I11 failure	= BIT-14		
	R53-4	I12 failure	= BIT-15		
105 2 unsigned integer 16-bit R VB 6	Message registers	Message 80...95	0000 hex	00 00	
	R53-5	PT1 failure	= BIT-0		
	R53-6	PT2 failure	= BIT-1		
	R53-7	PT3 failure	= BIT-2		
	R53-8	PT4 failure	= BIT-3		
	R53-9	HART1 failure	= BIT-4		
	R54-0	HART2 failure	= BIT-5		
	R54-1	HART3 failure	= BIT-6		
	R54-2	HART4 failure	= BIT-7		
	R54-3	HART5 failure	= BIT-8		
	R54-4	HART6 failure	= BIT-9		
	R54-5	HART9 failure	= BIT-10		
	R54-6	HART10 failure	= BIT-11		
	R54-7	HART11 failure	= BIT-12		
	R54-8	HART12 failure	= BIT-13		
	R54-9	Def.cont.inp.	= BIT-14		
	R55-0	Math.problem	= BIT-15		
106 2 unsigned integer 16-bit R VB 7	Message registers	Message 96..111	0000 hex	00 00	
	R55-1	Corrupt param.	= BIT-0		
	W60-0	Master clock	= BIT-1		
	W60-1	Pulse 1 >max	= BIT-2		
	W60-2	Pulse 2 >max	= BIT-3		
	W60-3	Pulse 3 >max	= BIT-4		
	W60-4	Pulse 4 >max	= BIT-5		
	W60-5	I1 outp.<min	= BIT-6		
	W60-6	I2 outp.<min	= BIT-7		
	W60-7	I3 outp.<min	= BIT-8		
	W60-8	I4 outp.<min	= BIT-9		
	W60-9	I1 outp.>max	= BIT-10		
	W61-0	I2 outp.>max	= BIT-11		
	W61-1	I3 outp.>max	= BIT-12		
	W61-2	I4 outp.>max	= BIT-13		
	W61-3	FC-BIOS old	= BIT-14		
	W61-4	ERR_fordel002	= BIT-15		
107 2 unsigned integer 16-bit R VB 8	Message registers	Message 112..127	000C hex	00 0C	

		W61-5	filesys. full	= BIT-0	
		M70-0	Factory state	= BIT-1	
		M70-1	Calibr. lock	= BIT-2 active	
		M70-2	User lock	= BIT-3 active	
		H80-0	TA loss	= BIT-4	
		H80-1	TA< l.alarm	= BIT-5	
		H80-2	TA> up.alarm	= BIT-6	
		H80-3	TA param.error	= BIT-7	
		H80-4	TB loss	= BIT-8	
		H80-5	TB< l.alarm	= BIT-9	
		H80-6	TB> up.alarm	= BIT-10	
		H80-7	TB param.error	= BIT-11	
		H80-8	TC loss	= BIT-12	
		H80-9	TC< l.alarm	= BIT-13	
		H81-0	TC> up.alarm	= BIT-14	
		H81-1	TC param.error	= BIT-15	
108	2 unsigned integer 16-bit R VB 9	Message registers	Message 128..143	0000 hex	00 00
		H81-2	TD loss	= BIT-0	
		H81-3	TD< l.alarm	= BIT-1	
		H81-4	TD> up.alarm	= BIT-2	
		H81-5	TD param.error	= BIT-3	
		H81-6	PA loss	= BIT-4	
		H81-7	PA< l.alarm	= BIT-5	
		H81-8	PA> up.alarm	= BIT-6	
		H81-9	PA param.error	= BIT-7	
		H82-0	PB loss	= BIT-8	
		H82-1	PB< l.alarm	= BIT-9	
		H82-2	PB> up.alarm	= BIT-10	
		H82-3	PB param.error	= BIT-11	
		H82-4	PC loss	= BIT-12	
		H82-5	PC< l.alarm	= BIT-13	
		H82-6	PC> up.alarm	= BIT-14	
		H82-7	PC param.error	= BIT-15	
109	2 unsigned integer 16-bit R VB 10	Message registers	Message 144..159	0000 hex	00 00
		H82-8	PD loss	= BIT-0	
		H82-9	PD< l.alarm	= BIT-1	
		H83-0	PD> up.alarm	= BIT-2	
		H83-1	PD param.error	= BIT-3	
		H83-2	I1 inp.param.	= BIT-4	
		H83-3	I2 inp.param.	= BIT-5	
		H83-4	I3 inp.param.	= BIT-6	

		H83-5	I4 inp.param.	= BIT-7	
		H83-6	I5 inp.param.	= BIT-8	
		H83-7	I6 inp.param.	= BIT-9	
		H83-8	I7 inp.param.	= BIT-10	
		H83-9	I8 inp.param.	= BIT-11	
		H84-0	I9 inp.param.	= BIT-12	
		H84-1	I10 inp.param.	= BIT-13	
		H84-2	I11 inp.param.	= BIT-14	
		H84-3	I12 inp.param.	= BIT-15	
110	2 unsigned integer 16-bit R	VB 11	Message registers	Message 160..175 0000 hex	00 00
		H84-4	PT1 inp.param.	= BIT-0	
		H84-5	PT2 inp.param.	= BIT-1	
		H84-6	PT3 inp.param.	= BIT-2	
		H84-7	PT4 inp.param.	= BIT-3	
		H84-8	I1 outp.param.	= BIT-4	
		H84-9	I2 outp.param.	= BIT-5	
		H85-0	I3 outp.param.	= BIT-6	
		H85-1	I4 outp.param.	= BIT-7	
		H85-2	K1 outp.param.	= BIT-8	
		H85-3	K2 outp.param.	= BIT-9	
		H85-4	K3 outp.param.	= BIT-10	
		H85-5	K4 outp.param.	= BIT-11	
		H85-6	K5 outp.param.	= BIT-12	
		H85-7	K6 outp.param.	= BIT-13	
		H85-8	K7 outp.param.	= BIT-14	
		H85-9	K8 outp.param.	= BIT-15	
111	2 unsigned integer 16-bit R	VB 12	Message registers	Message 176..191 0000 hex	00 00
		H86-0	Malloc error	= BIT-0	
		H86-1	CAN fault	= BIT-1	
		H86-2	CAN overflow	= BIT-2	
		H86-3	Cont.param.err	= BIT-3	
		H86-4	PT1 open circ.	= BIT-4	
		H86-5	PT2 open circ.	= BIT-5	
		H86-6	CAN check	= BIT-6	
		H86-7	Old time	= BIT-7	
		H86-8	New time	= BIT-8	
		H86-9	TCPIP fault	= BIT-9	
		H87-0	buggy software	= BIT-10	
		H87-1	file system	= BIT-11	
		H87-2	Module 1A false	= BIT-12	
		H87-3	Module 1B false	= BIT-13	

		H87-4	Module 2A false	= BIT-14	
		H87-5	Module 2B false	= BIT-15	
112	2 unsigned integer 16-bit R	VB 13	Message registers	Message 192..207	0000 hex	00 00
		H87-6	Module 3A false	= BIT-0	
		H87-7	Module 3B false	= BIT-1	
		H87-8	HART1 status	= BIT-2	
		H87-9	HART2 status	= BIT-3	
		H88-0	HART3 status	= BIT-4	
		H88-1	HART4 status	= BIT-5	
		H88-2	HART5 status	= BIT-6	
		H88-3	HART6 status	= BIT-7	
		H88-4	HART9 status	= BIT-8	
		H88-5	HART10 status	= BIT-9	
		H88-6	HART11 status	= BIT-10	
		H88-7	HART12 status	= BIT-11	
		H88-8	param.ignored	= BIT-12	
		H88-9	LCD-Type/lang.	= BIT-13	
		H89-0	HART-Ver. old	= BIT-14	
		H89-1	EXI-Ver. old	= BIT-15	
113	2 unsigned integer 16-bit R	VB 14	Message registers	Message 208..223	0000 hex	00 00
		H89-2	Def.display	= BIT-0	
		H89-3	ERR_fordel001	= BIT-1	
		H89-4	TCP after boot	= BIT-2	
		H89-5	Adjusted float	= BIT-3	

Register 114 to 149 are reserved for further error messages.

Register 1000 to 1654 represent all values of Flow Computer 1 (meter-run #1). Reading and writing is possible according R or R/W.

1000	4	float IEEE 754	R	AA	1	FC1 meas. condit.	Temperature	10.00 °C	41 20 00 00
1002	4	float IEEE 754	R	AA	3	FC1 meas. condit.	Absolute pressure	42.000 bar	42 28 00 00
1004	4	float IEEE 754	R	AA	4	FC1 meas. condit.	Operating density	31.3063 kg/m3	41 FA 73 53
1006	4	float IEEE 754	R	AA	10	FC1 meas. condit.	Compress.factor	0.914234	3F 6A 0B 3E
1008	4	float IEEE 754	R	AA	11	FC1 meas. condit.	k-Number	0.91642	3F 6A 9A 64
1010	4	float IEEE 754	R	AA	12	FC1 meas. condit.	Conversion factor	43.6339	42 2E 89 11
1012	4	float IEEE 754	R	AA	13	FC1 meas. condit.	Volume flow	0.000 m3/h	00 00 00 00
1014	4	float IEEE 754	R	AA	14	FC1 meas. condit.	Volume fl. corr.	0.000 m3/h	00 00 00 00
1016	4	float IEEE 754	R	AB	4	FC1 base condition	Standard density	0.7175 kg/m3	3F 37 AC 9C
1018	4	float IEEE 754	R	AB	5	FC1 base condition	Calorific value	11.064 kWh/m3	41 31 06 B5
1020	4	float IEEE 754	R	AB	6	FC1 base condition	Carbondioxide	0.000 mol-%	00 00 00 00
1022	4	float IEEE 754	R	AB	7	FC1 base condition	Hydrogen	0.000 mol-%	00 00 00 00
1024	4	float IEEE 754	R	AB	8	FC1 base condition	Nitrogen	0.000 mol-%	00 00 00 00
1026	4	float IEEE 754	R	AB	10	FC1 base condition	Compress.factor	0.997617	3F 7F 63 CC
1028	4	float IEEE 754	R	AB	13	FC1 base condition	Volume flow	0.000 m3/h	00 00 00 00
1030	4	float IEEE 754	R	AB	14	FC1 base condition	Energy flow	0.000 kW	00 00 00 00
1032	4	signed integer 32-bit	R	AD	1	FC1 status	Temperature	Error	00 00 00 00
							Options:	Error	= 0
								okay	= 1
1034	4	signed integer 32-bit	R	AD	3	FC1 status	Absolute pressure	Error	00 00 00 00
							Options:	Error	= 0
								okay	= 1
1036	4	signed integer 32-bit	R	AD	4	FC1 status	gas quality	okay	00 00 00 01
							Options:	Error	= 0
								okay	= 1
1038	4	signed integer 32-bit	R	AD	10	FC1 status	Equation of state	okay	00 00 00 01
							Options:	Error	= 0
								okay	= 1
1040	4	signed integer 32-bit	R	AD	13	FC1 status	Volume input	okay	00 00 00 01
							Options:	Error	= 0
								okay	= 1
1042	4	signed integer 32-bit	R	AD	15	FC1 status	Conversion	Error	00 00 00 00
							Options:	Error	= 0
								okay	= 1
1044	4	signed integer 32-bit	R	AD	16	FC1 status	Operation	Running	00 00 00 01
							Options:	At rest	= 0
								Running	= 1
								Syntax	= 2

1046	12	long/long/float	R	AJ	1	FC1 totalizer	Vm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1052	12	long/long/float	R	AJ	2	FC1 totalizer	DVm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1058	12	long/long/float	R	AJ	3	FC1 totalizer	Vmc	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1064	12	long/long/float	R	AJ	4	FC1 totalizer	DVmc	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1070	12	long/long/float	R	AJ	5	FC1 totalizer	Vb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
1076	12	long/long/float	R	AJ	6	FC1 totalizer	DVb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
1082	12	long/long/float	R	AJ	7	FC1 totalizer	E	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
1088	12	long/long/float	R	AJ	8	FC1 totalizer	DE	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
1100	4	float IEEE 754	R	AG	1	FC1 hourly quant.	Vm	0.0000 m3	00 00 00 00
1102	4	float IEEE 754	R	AG	2	FC1 hourly quant.	DVm	0.0000 m3	00 00 00 00
1104	4	float IEEE 754	R	AG	3	FC1 hourly quant.	Vmc	0.0000 m3	00 00 00 00
1106	4	float IEEE 754	R	AG	4	FC1 hourly quant.	DVmc	0.0000 m3	00 00 00 00
1108	4	float IEEE 754	R	AG	5	FC1 hourly quant.	Vb	0.0000 ·100 m3	00 00 00 00
1110	4	float IEEE 754	R	AG	6	FC1 hourly quant.	DVb	0.0000 ·100 m3	00 00 00 00
1112	4	float IEEE 754	R	AG	7	FC1 hourly quant.	E	0.0000 MWh	00 00 00 00
1114	4	float IEEE 754	R	AG	8	FC1 hourly quant.	DE	0.0000 MWh	00 00 00 00
1116	4	float IEEE 754	R	AH	1	FC1 daily quant.	Vm	0.0000 m3	00 00 00 00
1118	4	float IEEE 754	R	AH	2	FC1 daily quant.	DVm	0.0000 m3	00 00 00 00
1120	4	float IEEE 754	R	AH	3	FC1 daily quant.	Vmc	0.0000 m3	00 00 00 00
1122	4	float IEEE 754	R	AH	4	FC1 daily quant.	DVmc	0.0000 m3	00 00 00 00
1124	4	float IEEE 754	R	AH	5	FC1 daily quant.	Vb	0.0000 ·100 m3	00 00 00 00
1126	4	float IEEE 754	R	AH	6	FC1 daily quant.	DVb	0.0000 ·100 m3	00 00 00 00
1128	4	float IEEE 754	R	AH	7	FC1 daily quant.	E	0.0000 MWh	00 00 00 00
1130	4	float IEEE 754	R	AH	8	FC1 daily quant.	DE	0.0000 MWh	00 00 00 00
1132	4	float IEEE 754	R	AI	1	FC1 monthly quant	Vm	0.0000 m3	00 00 00 00
1134	4	float IEEE 754	R	AI	2	FC1 monthly quant	DVm	0.0000 m3	00 00 00 00
1136	4	float IEEE 754	R	AI	3	FC1 monthly quant	Vmc	0.0000 m3	00 00 00 00
1138	4	float IEEE 754	R	AI	4	FC1 monthly quant	DVmc	0.0000 m3	00 00 00 00

1140	4	float IEEE 754	R	AI	5	FC1 monthly quant	Vb	0.0000 ·100 m3	00 00 00 00
1142	4	float IEEE 754	R	AI	6	FC1 monthly quant	DVb	0.0000 ·100 m3	00 00 00 00
1144	4	float IEEE 754	R	AI	7	FC1 monthly quant	E	0.0000 MWh	00 00 00 00
1146	4	float IEEE 754	R	AI	8	FC1 monthly quant	DE	0.0000 MWh	00 00 00 00
1148	4	float IEEE 754	R	AG	9	FC1 hourly quant.	M	0.0000 kg	00 00 00 00
1150	4	float IEEE 754	R	AG	10	FC1 hourly quant.	DM	0.0000 kg	00 00 00 00
1152	4	float IEEE 754	R	AH	9	FC1 daily quant.	M	0.0000 kg	00 00 00 00
1154	4	float IEEE 754	R	AH	10	FC1 daily quant.	DM	0.0000 kg	00 00 00 00
1156	4	float IEEE 754	R	AI	9	FC1 monthly quant	M	0.0000 kg	00 00 00 00
1158	4	float IEEE 754	R	AI	10	FC1 monthly quant	DM	0.0000 kg	00 00 00 00
1200	4	float IEEE 754	R	AB	15	FC1 base condition	Mass flow	0.000 kg/h	00 00 00 00
1202	12	long/long/float	R	AJ	9	FC1 totalizer	M	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00
1208	12	long/long/float	R	AJ	10	FC1 totalizer	DM	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00
1214	4	float IEEE 754	R	AK	1	FC1 average	T second	10.00 °C	41 20 00 00
1216	4	float IEEE 754	R	AK	2	FC1 average	T minute	10.00 °C	41 20 00 00
1218	4	float IEEE 754	R	AK	3	FC1 average	T hour	0.00 °C	00 00 00 00
1220	4	float IEEE 754	R	AK	4	FC1 average	T day	0.00 °C	00 00 00 00
1222	4	float IEEE 754	R	AK	5	FC1 average	P second	42.000 bar	42 28 00 00
1224	4	float IEEE 754	R	AK	6	FC1 average	P minute	42.000 bar	42 28 00 00
1226	4	float IEEE 754	R	AK	7	FC1 average	P hour	0.000 bar	00 00 00 00
1228	4	float IEEE 754	R	AK	8	FC1 average	P day	0.000 bar	00 00 00 00
1230	4	float IEEE 754	R	AB	9	FC1 base condition	Reletive density	0.5549	3F 0E 0F AF
1232	4	float IEEE 754	R	AK	9	FC1 average	Hs second	11.064 kWh/m3	41 31 06 B5
1234	4	float IEEE 754	R	AK	10	FC1 average	Hs minute	11.064 kWh/m3	41 31 06 B5
1236	4	float IEEE 754	R	AK	11	FC1 average	Hs hour	0.000 kWh/m3	00 00 00 00
1238	4	float IEEE 754	R	AK	12	FC1 average	Hs day	0.000 kWh/m3	00 00 00 00
1240	4	float IEEE 754	R	AK	13	FC1 average	Rd second	0.5549	3F 0E 0F AF
1242	4	float IEEE 754	R	AK	14	FC1 average	Rd minute	0.5549	3F 0E 0F AF
1244	4	float IEEE 754	R	AK	15	FC1 average	Rd hour	0.0000	00 00 00 00
1246	4	float IEEE 754	R	AK	16	FC1 average	Rd day	0.0000	00 00 00 00
1248	4	float IEEE 754	R	AK	17	FC1 average	Qm second	0.000 m3/h	00 00 00 00
1250	4	float IEEE 754	R	AK	18	FC1 average	Qm minute	0.000 m3/h	00 00 00 00
1252	4	float IEEE 754	R	AK	19	FC1 average	Qm hour	0.000 m3/h	00 00 00 00
1254	4	float IEEE 754	R	AK	20	FC1 average	Qm day	0.000 m3/h	00 00 00 00
1256	4	float IEEE 754	R	AK	21	FC1 average	Qb second	0.000 m3/h	00 00 00 00
1258	4	float IEEE 754	R	AK	22	FC1 average	Qb minute	0.000 m3/h	00 00 00 00
1260	4	float IEEE 754	R	AK	23	FC1 average	Qb hour	0.000 m3/h	00 00 00 00

1262	4	float IEEE 754	R	AK	24	FC1 average	Qb day	0.000 m3/h	00 00 00 00
1264	4	float IEEE 754	R	AK	25	FC1 average	Qe second	0.000 kW	00 00 00 00
1266	4	float IEEE 754	R	AK	26	FC1 average	Qe minute	0.000 kW	00 00 00 00
1268	4	float IEEE 754	R	AK	27	FC1 average	Qe hour	0.000 kW	00 00 00 00
1270	4	float IEEE 754	R	AK	28	FC1 average	Qe day	0.000 kW	00 00 00 00
1300	12	long/long/float	R	AJ	11	FC1 totalizer	Yesterday Vm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1306	12	long/long/float	R	AJ	12	FC1 totalizer	Yesterday DVm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1312	12	long/long/float	R	AJ	13	FC1 totalizer	Yesterday Vmc	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1318	12	long/long/float	R	AJ	14	FC1 totalizer	Yesterday DVmc	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
1324	12	long/long/float	R	AJ	15	FC1 totalizer	Yesterday Vb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
1330	12	long/long/float	R	AJ	16	FC1 totalizer	Yesterday DVb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
1336	12	long/long/float	R	AJ	17	FC1 totalizer	Yesterday E	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
1342	12	long/long/float	R	AJ	18	FC1 totalizer	Yesterday DE	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
1348	12	long/long/float	R	AJ	19	FC1 totalizer	Yesterday M	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00
1354	12	long/long/float	R	AJ	20	FC1 totalizer	Yesterday DM	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00
1518	4	signed integer 32-bit	R/W	AE	1	FC1 units	Temperature	°C	00 00 00 00
							Options:	°C	= 0
								°F	= 1
								°K	= 2
								°Ra	= 3
1520	4	signed integer 32-bit	R/W	AE	3	FC1 units	Absolute pressure	bar	00 00 00 00
							Options:	bar	= 0
								kp/cm2	= 1
								psi	= 2

								MPa	= 3
								atm	= 4
								kPa	= 5
								torr	= 6
								bara	= 7
1522	4	signed integer 32-bit	R/W	AE	4	FC1 units	Density	kg/m3	00 00 00 00
							Options:	kg/m3	= 0
								lb/ft3	= 1
1524	4	signed integer 32-bit	R/W	AE	5	FC1 units	Calorific value	kWh/m3	00 00 00 00
							Options:	kWh/m3	= 0
								Mcal/m3	= 1
								MJ/m3	= 2
								Btu/ft3	= 3
								kcal/m3	= 4
1526	4	signed integer 32-bit	R/W	AE	6	FC1 units	Components	mol-%	00 00 00 00
							Options:	mol-%	= 0
1528	4	signed integer 32-bit	R/W	AE	13	FC1 units	Volume flow	m3/h	00 00 00 00
							Options:	m3/h	= 0
								yd3/h	= 1
								ft3/h	= 2
								gal/h	= 3
								m3/s	= 4
								yd3/s	= 5
								ft3/s	= 6
								gal/s	= 7
								MCF/h	= 8
1530	4	signed integer 32-bit	R/W	AE	14	FC1 units	Energy flow	kW	00 00 00 00
							Options:	kW	= 0
								MW	= 1
								Btu/s	= 2
								kcal/s	= 3
								hp	= 4
								GW	= 5
								MJ/h	= 6
								GJ/h	= 7
								TJ/h	= 8
								kBtu/h	= 9
								kBtu/s	= 10
								MMBtu/h	= 11
1532	4	signed integer 32-bit	R/W	AE	30	FC1 units	Unit Vb	·100 m3	00 00 00 07
							Options:	m3	= 0

				yd3	= 1
				ft3	= 2
				gal	= 3
				hl	= 4
				l	= 5
				·10 m3	= 6
				·100 m3	= 7
				·1000 m3	= 8
				cm3	= 9
				MSCF	= 10
				MMSCF	= 11
1534	4	signed integer 32-bit	R/W	Unit Vm	m3	00 00 00 00
				Options:	m3	= 0
					yd3	= 1
					ft3	= 2
					gal	= 3
					hl	= 4
					l	= 5
					·10 m3	= 6
					·100 m3	= 7
					·1000 m3	= 8
					cm3	= 9
					MCF	= 10
					MMCF	= 11
1536	4	signed integer 32-bit	R/W	Unit E	MWh	00 00 00 03
				Options:	kWh	= 0
					MJ	= 1
					GJ	= 2
					MWh	= 3
					Btu	= 4
					ton TNT	= 5
					th	= 6
					hph	= 7
					·10 kWh	= 8
					·100 kWh	= 9
					·10 MWh	= 10
					·100 MWh	= 11
					kcal	= 12
					Mcal	= 13
					GWh	= 14
					TJ	= 15

							MMBtu	= 16
							GBtu	= 17
1538	4	signed integer 32-bit	R/W	AE	33	FC1 units	Unit M	kg	00 00 00 00
							Options:	kg	= 0
								g	= 1
								lb	= 2
								ton	= 3
								Mg	= 4
								oz	= 5
								·10 kg	= 6
								·100 kg	= 7
								slug	= 8
1540	4	signed integer 32-bit	R/W	AE	15	FC1 units	Mass flow	kg/h	00 00 00 00
							Options:	kg/h	= 0
								lb/h	= 1
								kg/s	= 2
								lb/s	= 3
1600	4	float IEEE 754	R	AG	11	FC1 hourly quant.	last hr. Vm	0.0000 m3	00 00 00 00
1602	4	float IEEE 754	R	AG	12	FC1 hourly quant.	last hr. DVm	0.0000 m3	00 00 00 00
1604	4	float IEEE 754	R	AG	13	FC1 hourly quant.	last hr. Vmc	0.0000 m3	00 00 00 00
1606	4	float IEEE 754	R	AG	14	FC1 hourly quant.	last hr. DVmc	0.0000 m3	00 00 00 00
1608	4	float IEEE 754	R	AG	15	FC1 hourly quant.	last hr. Vb	0.0000 ·100 m3	00 00 00 00
1610	4	float IEEE 754	R	AG	16	FC1 hourly quant.	last hr. DVb	0.0000 ·100 m3	00 00 00 00
1612	4	float IEEE 754	R	AG	17	FC1 hourly quant.	last hr. E	0.0000 MWh	00 00 00 00
1614	4	float IEEE 754	R	AG	18	FC1 hourly quant.	last hr. DE	0.0000 MWh	00 00 00 00
1616	4	float IEEE 754	R	AH	11	FC1 daily quant.	Yesterday Vm	0.0000 m3	00 00 00 00
1618	4	float IEEE 754	R	AH	12	FC1 daily quant.	Yesterday DVm	0.0000 m3	00 00 00 00
1620	4	float IEEE 754	R	AH	13	FC1 daily quant.	Yesterday Vmc	0.0000 m3	00 00 00 00
1622	4	float IEEE 754	R	AH	14	FC1 daily quant.	Yesterday DVmc	0.0000 m3	00 00 00 00
1624	4	float IEEE 754	R	AH	15	FC1 daily quant.	Yesterday Vb	0.0000 ·100 m3	00 00 00 00
1626	4	float IEEE 754	R	AH	16	FC1 daily quant.	Yesterday DVb	0.0000 ·100 m3	00 00 00 00
1628	4	float IEEE 754	R	AH	17	FC1 daily quant.	Yesterday E	0.0000 MWh	00 00 00 00
1630	4	float IEEE 754	R	AH	18	FC1 daily quant.	Yesterday DE	0.0000 MWh	00 00 00 00
1648	4	float IEEE 754	R	AG	19	FC1 hourly quant.	last hr. M	0.0000 kg	00 00 00 00
1650	4	float IEEE 754	R	AG	20	FC1 hourly quant.	last hr. DM	0.0000 kg	00 00 00 00
1652	4	float IEEE 754	R	AH	19	FC1 daily quant.	Yesterday M	0.0000 kg	00 00 00 00
1654	4	float IEEE 754	R	AH	20	FC1 daily quant.	Yesterday DM	0.0000 kg	00 00 00 00

All other Flow Computer numbers are arranged in the same manner.

Registers 2000 to 2654 represents Flow Computer # 2 values (meter-run # 1)
Registers 3000 to 3654 represents Flow Computer # 3 values (meter-run # 2)
Registers 4000 to 4654 represents Flow Computer # 4 values (meter-run # 2)
Registers 5000 to 5654 represents Flow Computer # 5 values (meter-run # 3)
Registers 6000 to 6654 represents Flow Computer # 6 values (meter-run # 3)
Registers 7000 to 7654 represents Flow Computer # 7 values (meter-run # 4)
Registers 8000 to 8654 represents Flow Computer # 8 values (meter-run # 4)

Beginning with register address 9000 are gas quality data listed for Modbus access A. Reading and writing is possible. This data can be used for Flow Computer 1 and 2 (the first meter-run).

9000	4 float IEEE 754 R/W QF 1	Modbus A Standard density	0.8969 kg/m3	3F 65 9B 3D
9002	4 float IEEE 754 R/W QF 2	Modbus A Calorific value	9.188 kWh/m3	41 13 02 0C
9004	4 float IEEE 754 R/W QF 3	Modbus A Methane original	0.000 mol-%	00 00 00 00
9006	4 float IEEE 754 R/W QF 4	Modbus A Carbondioxide	0.000 mol-%	00 00 00 00
9008	4 float IEEE 754 R/W QF 5	Modbus A Hydrogen	0.000 mol-%	00 00 00 00
9010	4 float IEEE 754 R/W QF 6	Modbus A Nitrogen	0.000 mol-%	00 00 00 00
9012	4 float IEEE 754 R/W QF 7	Modbus A Ethane	0.000 mol-%	00 00 00 00
9014	4 float IEEE 754 R/W QF 8	Modbus A Propane	0.000 mol-%	00 00 00 00
9016	4 float IEEE 754 R/W QF 9	Modbus A N-Butane	0.000 mol-%	00 00 00 00
9018	4 float IEEE 754 R/W QF 10	Modbus A I-Butane	0.000 mol-%	00 00 00 00
9020	4 float IEEE 754 R/W QF 11	Modbus A N-Pentane	0.000 mol-%	00 00 00 00
9022	4 float IEEE 754 R/W QF 12	Modbus A I-Pentane	0.000 mol-%	00 00 00 00
9024	4 float IEEE 754 R/W QF 13	Modbus A Hexane	0.000 mol-%	00 00 00 00
9026	4 float IEEE 754 R/W QF 14	Modbus A Heptane	0.000 mol-%	00 00 00 00
9028	4 float IEEE 754 R/W QF 15	Modbus A Octane	0.000 mol-%	00 00 00 00
9030	4 float IEEE 754 R/W QF 16	Modbus A Nonane	0.000 mol-%	00 00 00 00
9032	4 float IEEE 754 R/W QF 17	Modbus A Decane	0.000 mol-%	00 00 00 00
9034	4 float IEEE 754 R/W QF 18	Modbus A Hydrogen sulphide	0.000 mol-%	00 00 00 00
9036	4 float IEEE 754 R/W QF 19	Modbus A Vapor	0.000 mol-%	00 00 00 00
9038	4 float IEEE 754 R/W QF 20	Modbus A Helium	0.000 mol-%	00 00 00 00
9040	4 float IEEE 754 R/W QF 21	Modbus A Oxygen	0.000 mol-%	00 00 00 00
9042	4 float IEEE 754 R/W QF 22	Modbus A Carbonmonoxide	0.000 mol-%	00 00 00 00
9044	4 float IEEE 754 R/W QF 23	Modbus A Argon	0.000 mol-%	00 00 00 00

Beginning with register address 9100 are gas quality data listed for Modbus access B. Reading and writing is possible. This data can be used for Flow Computer 3 and 4 (the second meter-run).
Beginning with register address 9200 are gas quality data listed for Modbus access C. Reading and writing is possible. This data can be used for Flow Computer 5 and 6 (the third meter-run).
Beginning with register address 9300 are gas quality data listed for Modbus access D. Reading and writing is possible. This data can be used for Flow Computer 7 and 8 (the fourth meter-run).

From address 9900 to 9904 are units and formats for the above gas quality data listed:

9900	4	signed integer 32-bit	R/W	QA 1	Format and unit
					Options:
9902	4	signed integer 32-bit	R/W	QA 2	Format and unit
					Options:
9904	4	signed integer 32-bit	R/W	QA 3	Format and unit
					Options:

Unit calor.val.	kWh/m3	00 00 00 00
	kWh/m3	= 0
	Mcal/m3	= 1
	MJ/m3	= 2
	Btu/ft3	= 3
	kcal/m3	= 4
Unit stand.density	kg/m3	00 00 00 00
	kg/m3	= 0
	lb/ft3	= 1
Unit component	mol-%	00 00 00 00
	mol-%	= 0

Beginning with address 11000 all data of the summation results No 1 are listed. Reading is possible according R.

11000	4	float IEEE 754	R	LA 1	Summation 1	Vol.flow base cond	0.000 m3/h	00 00 00 00
11002	4	float IEEE 754	R	LA 2	Summation 1	Vol.flow meas.cond	0.000 m3/h	00 00 00 00
11004	4	float IEEE 754	R	LA 3	Summation 1	C-Vol.flow meas.	0.000 m3/h	00 00 00 00
11006	4	float IEEE 754	R	LA 4	Summation 1	Energy flow	0.000 kW	00 00 00 00
11008	4	float IEEE 754	R	LA 6	Summation 1	Temperature average	10.00 °C	41 20 00 00
11010	4	float IEEE 754	R	LA 7	Summation 1	Abs. press. average	28.000 bar	41 E0 00 B4
11012	12	long/long/float	R	LA 10	Summation 1	Vb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
11018	12	long/long/float	R	LA 11	Summation 1	DVb	0.00000 ·100 m3	00 00 00 00 00 00 00 00 00 00 00 00
11024	12	long/long/float	R	LA 12	Summation 1	Vm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
11030	12	long/long/float	R	LA 13	Summation 1	DVm	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
11036	12	long/long/float	R	LA 14	Summation 1	Vmc	0.00000 m3	00 00 00 00 00 00 00 00 00 00 00 00
11042	12	long/long/float	R	LA 15	Summation 1	DVmc	0.00000 m3	00 00 00 00 00 00 00 00

									00 00 00 00
11048	12	long/long/float	R	LA	16	Summation 1	E	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
11054	12	long/long/float	R	LA	17	Summation 1	DE	0.00000 MWh	00 00 00 00 00 00 00 00 00 00 00 00
11060	4	float IEEE 754	R	LA	5	Summation 1	Mass flow	0.000 kg/h	00 00 00 00
11062	12	long/long/float	R	LA	18	Summation 1	M	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00
11068	12	long/long/float	R	LA	19	Summation 1	DM	0.00000 kg	00 00 00 00 00 00 00 00 00 00 00 00

Beginning with register address 12000 are data of summation results No 2 listed. Reading is possible according R.
Beginning with register address 13000 are data of summation results No 3 listed. Reading is possible according R.
Beginning with register address 14000 are data of summation results No 5 listed. Reading is possible according R.

Beginning with register address 11516 are the units of summation results No 1 listed. Reading and writing is possible according R or R/W.

11516	4	signed integer 32-bit	R/W	LA	30	Summation 1	Unit volume flow	m3/h	00 00 00 00
							Options:	m3/h	= 0
								yd3/h	= 1
								ft3/h	= 2
								gal/h	= 3
								m3/s	= 4
								yd3/s	= 5
								ft3/s	= 6
								gal/s	= 7
								MCF/h	= 8
11518	4	signed integer 32-bit	R/W	LA	35	Summation 1	Unit Vb	·100 m3	00 00 00 07
							Options:	m3	= 0
								yd3	= 1
								ft3	= 2
								gal	= 3
								hl	= 4
								l	= 5

			·10 m3	= 6
			·100 m3	= 7
			·1000 m3	= 8
			cm3	= 9
			MSCF	= 10
			MMSCF	= 11
11520	4 signed integer 32-bit R/W LA 36 Summation 1	Unit Vm,Vmc	m3	00 00 00 00
		Options:	m3	= 0
			yd3	= 1
			ft3	= 2
			gal	= 3
			hl	= 4
			l	= 5
			·10 m3	= 6
			·100 m3	= 7
			·1000 m3	= 8
			cm3	= 9
			MCF	= 10
			MMCF	= 11
11522	4 signed integer 32-bit R/W LA 31 Summation 1	Unit energy flow	kW	00 00 00 00
		Options:	kW	= 0
			MW	= 1
			Btu/s	= 2
			kcal/s	= 3
			hp	= 4
			GW	= 5
			MJ/h	= 6
			GJ/h	= 7
			TJ/h	= 8
			kBtu/h	= 9
			kBtu/s	= 10
			MMBtu/h	= 11
11524	4 signed integer 32-bit R/W LA 37 Summation 1	Unit E	MWh	00 00 00 03
		Options:	kWh	= 0
			MJ	= 1
			GJ	= 2
			MWh	= 3
			Btu	= 4
			ton TNT	= 5
			th	= 6
			hph	= 7

								·10 kWh	= 8
								·100 kWh	= 9
								·10 MWh	= 10
								·100 MWh	= 11
								kcal	= 12
								Mcal	= 13
								GWh	= 14
								TJ	= 15
								MMBtu	= 16
								GBtu	= 17
11526	4	signed integer 32-bit	R/W	LA	33	Summation 1	Unit temperature	°C	00 00 00 00
							Options:	°C	= 0
								°F	= 1
								°K	= 2
								°Ra	= 3
11528	4	signed integer 32-bit	R/W	LA	34	Summation 1	Unit pressure	bar	00 00 00 00
							Options:	bar	= 0
								kp/cm2	= 1
								psi	= 2
								MPa	= 3
								atm	= 4
								kPa	= 5
								torr	= 6
								bara	= 7
11530	4	signed integer 32-bit	R/W	LA	32	Summation 1	Unit mass flow	kg/h	00 00 00 00
							Options:	kg/h	= 0
								lb/h	= 1
								kg/s	= 2
								lb/s	= 3
11532	4	signed integer 32-bit	R/W	LA	38	Summation 1	Unit M	kg	00 00 00 00
							Options:	kg	= 0
								g	= 1
								lb	= 2
								ton	= 3
								Mg	= 4
								oz	= 5
								·10 kg	= 6
								·100 kg	= 7
								slug	= 8

Beginning with register address 12516 are the units of summation results No 2 listed. Reading and writing is possible according R or R/W.
Beginning with register address 13516 are the units of summation results No 3 listed. Reading and writing is possible according R or R/W.
Beginning with register address 14516 are the units of summation results No 4 listed. Reading and writing is possible according R or R/W.

Beginning with register address 21000 are data of subtraction results No 1 listed. Reading of data is possible according R.

21000 4 float IEEE 754 R MA 1	Subtraction 1	Vol.flow base cond	0.000 m3/h	00 00 00 00
21002 4 float IEEE 754 R MA 2	Subtraction 1	Energy flow	0.000 kW	00 00 00 00
21004 4 float IEEE 754 R MA 3	Subtraction 1	Temperature	0.00 °K	00 00 00 00
21006 4 float IEEE 754 R MA 4	Subtraction 1	Absolute pressure	0.000 bar	00 00 00 00
21008 4 float IEEE 754 R MA 5	Subtraction 1	Dev. vol.fl.base	0.00 %	00 00 00 00
21010 4 float IEEE 754 R MA 6	Subtraction 1	Dev. energy flow	0.00 %	00 00 00 00
21012 4 float IEEE 754 R MA 7	Subtraction 1	Dev. temperature	0.00 %	00 00 00 00
21014 4 float IEEE 754 R MA 8	Subtraction 1	Dev. pressure	0.00 %	00 00 00 00
21016 4 float IEEE 754 R MA 10	Subtraction 1	Vb	0 m3	00 00 00 00
21018 4 float IEEE 754 R MA 16	Subtraction 1	E	0 kWh	00 00 00 00

Beginning with register address 22000 are data of subtraction results No 2 listed. Reading of data is possible according R.
Beginning with register address 23000 are data of subtraction results No 3 listed. Reading of data is possible according R.
Beginning with register address 24000 are data of subtraction results No 4 listed. Reading of data is possible according R.

Beginning with register address 21524 are the units of subtraction results No 1 listed. Reading and writing is possible according R or R/W.

21524 4 signed integer 32-bit R/W MA 30	Subtraction 1	Unit volume flow	m3/h	00 00 00 00
		Options:	m3/h	= 0
			yd3/h	= 1
			ft3/h	= 2
			gal/h	= 3
			m3/s	= 4
			yd3/s	= 5
			ft3/s	= 6
			gal/s	= 7

			MCF/h	= 8
21526	4 signed integer 32-bit	R/W MA 31	Subtraction 1 Unit Vb	m3	00 00 00 00
			Options:	m3	= 0
				yd3	= 1
				ft3	= 2
				gal	= 3
				hl	= 4
				l	= 5
				·10 m3	= 6
				·100 m3	= 7
				·1000 m3	= 8
				cm3	= 9
				MSCF	= 10
				MMSCF	= 11
21528	4 signed integer 32-bit	R/W MA 33	Subtraction 1 Unit energy flow	kW	00 00 00 00
			Options:	kW	= 0
				MW	= 1
				Btu/s	= 2
				kcal/s	= 3
				hp	= 4
				GW	= 5
				MJ/h	= 6
				GJ/h	= 7
				TJ/h	= 8
				kBtu/h	= 9
				kBtu/s	= 10
				MMBtu/h	= 11
21530	4 signed integer 32-bit	R/W MA 34	Subtraction 1 Unit E	kWh	00 00 00 00
			Options:	kWh	= 0
				MJ	= 1
				GJ	= 2
				MWh	= 3
				Btu	= 4
				ton TNT	= 5
				th	= 6
				hph	= 7
				·10 kWh	= 8
				·100 kWh	= 9
				·10 MWh	= 10
				·100 MWh	= 11
				kcal	= 12

								Mcal	= 13
								GWh	= 14
								TJ	= 15
								MMBtu	= 16
								GBtu	= 17
21532	4	signed integer 32-bit	R/W	MA 35	Subtraction 1	Unit temperature		°K	00 00 00 00
						Options:		°K	= 0
								°Ra	= 1
21534	4	signed integer 32-bit	R/W	MA 36	Subtraction 1	Unit pressure		bar	00 00 00 00
						Options:		bar	= 0
								kp/cm2	= 1
								psi	= 2
								MPa	= 3
								atm	= 4
								kPa	= 5
								torr	= 6
								bara	= 7

Beginning with register address 22524 are the units of summation results No 2 listed. Reading and writing is possible according R or R/W.
Beginning with register address 23524 are the units of summation results No 3 listed. Reading and writing is possible according R or R/W.
Beginning with register address 24524 are the units of summation results No 4 listed. Reading and writing is possible according R or R/W.

Special function register for access to archives

30000	2	unsigned integer 16-bit	R/W	II 1	Modb. arch. query Group	0	00 00
30001	2	unsigned integer 16-bit	R/W	II 2	Modb. arch. query Year	0	00 00
30002	2	unsigned integer 16-bit	R/W	II 3	Modb. arch. query Month	0	00 00
30003	2	unsigned integer 16-bit	R/W	II 4	Modb. arch. query Day	0	00 00
30004	2	unsigned integer 16-bit	R/W	II 5	Modb. arch. query Hour	0	00 00
30005	2	unsigned integer 16-bit	R/W	II 6	Modb. arch. query Minute	0	00 00
30006	2	unsigned integer 16-bit	R/W	II 7	Modb. arch. query Second	0	00 00
30007	2	unsigned integer 16-bit	R/W	II 8	Modb. arch. query Command	0	00 00
30008	2	unsigned integer 16-bit	R	II 9	Modb. arch. query Data length	0	00 00
30009	2	unsigned integer 16-bit	R	II 10	Modb. arch. query Data ready	0	00 00
30010	763		R	II 11	Modb. arch. query Data buffer	(...)	

9 Alarms and warnings / Acknowledging events

9.1 Functioning of alarms and warnings

Warnings and alarms are indicated by a yellow (warning) or red (alarm) LED on the front of the device. The warning relay or alarm relay closes parallel to this.
The active message is indicated by a flashing LED. If the message goes, the LED will turn to steady light. If there is more than one message at the same time, the flashing light prevails. For one-valued messages, there is only the state: *"Message is active".* No coming or going is indicated, and therefore, the active state of these messages is retained until they are acknowledged.
The warning or alarm relay picks up as soon as a message comes and releases again if all messages are gone. In the case of one-valued messages, the relays remain picked up until the messages are acknowledged.

9.2 Acknowledging events

Warnings and alarms have to be acknowledged by pressing the ***Alarms*** key.

Symbol on the ***Alarms*** key: 

All messages which have not been acknowledged will be displayed. If there are no more events, the following text will appear: "*No fault".*

9.3 Fault numbers / fault texts

running No.	Fault category	Fault number	Short text	Long text	Valence	Input enabled
0	A	10-1	FC1 T failure	Flow computer 1 temperature failed	2	no
1	A	10-2	FC2 T failure	Flow computer 2 temperature failed	2	no
2	A	10-3	FC3 T failure	Flow computer 3 temperature failed	2	no
3	A	10-4	FC4 T failure	Flow computer 4 temperature failed	2	no
4	A	10-5	FC5 T failure	Flow computer 5 temperature failed	2	no
5	A	10-6	FC6 T failure	Flow computer 6 temperature failed	2	no
6	A	10-7	FC7 T failure	Flow computer 7 temperature failed	2	no
7	A	10-8	FC8 T failure	Flow computer 8 temperature failed	2	no
8	A	11-1	FC1 P failure	Flow computer 1 pressure failed	2	no
9	A	11-2	FC2 P failure	Flow computer 2 pressure failed	2	no
10	A	11-3	FC3 P failure	Flow computer 3 pressure failed	2	no
11	A	11-4	FC4 P failure	Flow computer 4 pressure failed	2	no
12	A	11-5	FC5 P failure	Flow computer 5 pressure failed	2	no
13	A	11-6	FC6 P failure	Flow computer 6 pressure failed	2	no
14	A	11-7	FC7 P failure	Flow computer 7 pressure failed	2	no
15	A	11-8	FC8 P failure	Flow computer 8 pressure failed	2	no
16	A	12-1	FC1 GQ failure	Flow computer 1 gas quality failed	2	no
17	A	12-2	FC2 GQ failure	Flow computer 2 gas quality failed	2	no
18	A	12-3	FC3 GQ failure	Flow computer 3 gas quality failed	2	no
19	A	12-4	FC4 GQ failure	Flow computer 4 gas quality failed	2	no
20	A	12-5	FC5 GQ failure	Flow computer 5 gas quality failed	2	no
21	A	12-6	FC6 GQ failure	Flow computer 6 gas quality failed	2	no
22	A	12-7	FC7 GQ failure	Flow computer 7 gas quality failed	2	no
23	A	12-8	FC8 GQ failure	Flow computer 8 gas quality failed	2	no
24	A	13-1	FC1 EOS failure	Flow computer 1 failure in calculation of EOS	2	no
25	A	13-2	FC2 EOS failure	Flow computer 2 failure in calculation of EOS	2	no
26	A	13-3	FC3 EOS failure	Flow computer 3 failure in calculation of EOS	2	no
27	A	13-4	FC4 EOS failure	Flow computer 4 failure in calculation of EOS	2	no
28	A	13-5	FC5 EOS failure	Flow computer 5 failure in calculation of EOS	2	no
29	A	13-6	FC6 EOS failure	Flow computer 6 failure in calculation of	2	no

			EOS		
30 A	13-7	FC7 EOS failure	Flow computer 7 failure in calculation of EOS	2	no
31 A	13-8	FC8 EOS failure	Flow computer 8 failure in calculation of EOS	2	no
32 A	14-1	FC1 Vol.failure	Flow computer 1 volume failed	2	no
33 A	14-2	FC2 Vol.failure	Flow computer 2 volume failed	2	no
34 A	14-3	FC3 Vol.failure	Flow computer 3 volume failed	2	no
35 A	14-4	FC4 Vol.failure	Flow computer 4 volume failed	2	no
36 A	14-5	FC5 Vol.failure	Flow computer 5 volume failed	2	no
37 A	14-6	FC6 Vol.failure	Flow computer 6 volume failed	2	no
38 A	14-7	FC7 Vol.failure	Flow computer 7 volume failed	2	no
39 A	14-8	FC8 Vol.failure	Flow computer 8 volume failed	2	no
40 A	40-0	Def.tot.	Totalizer is defective	1	no
41 A	40-1	CAN timeout	CAN bus timeout	2	no
42 A	40-2	illegal	Illegal operating mode	2	no
43 A	40-3	Corrupt code	corrupt code detected	2	no
44 A	40-4	Inval.act.key	Invalid activation key	2	no
45 A(R)	50-0	Rebooted	Restart performed	1	no
46 A(R)	50-1	RTC defective	Real time clock is defective	2	no
47 A(R)	50-2	Power OFF	Supply voltage failure	2	no
48 A(R)	50-3	NMA ADC	Namur module A analog/digital-converter	1	no
49 A(R)	50-4	NMA overload	Namur module A overload	1	no
50 A(R)	50-5	NMA OC PT100	Namur module A open circuit PT100	1	no
51 A(R)	50-6	NMA OC mainch.	Namur module A open circuit main channel	1	no
52 A(R)	50-7	NMA OC ref.ch.	Namur module A open circuit reference channel	1	no
53 A(R)	50-8	NMA OC ENCO	Namur module A open circuit ENCO	1	no
54 A(R)	50-9	NMB ADC	Namur module B analog/digital-converter	1	no
55 A(R)	51-0	NMB overload	Namur module B overload	1	no
56 A(R)	51-1	NMB OC PT100	Namur module B open circuit PT100	1	no
57 A(R)	51-2	NMB OC Messk.	Namur module B open circuit main channel	1	no
58 A(R)	51-3	NMB OC Vgl.k.	Namur module B open circuit reference channel	1	no
59 A(R)	51-4	NMB OC ENCO	Namur module B open circuit ENCO	1	no
60 A(R)	51-5	F1 failure	Frequency measurement 1 failed	2	no
61 A(R)	51-6	F2 failure	Frequency measurement 2 failed	2	no

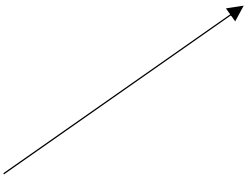
62 A(R)	51-7	F3 failure	Frequency measurement 3 failed	2	no
63 A(R)	51-8	F4 failure	Frequency measurement 4 failed	2	no
64 A(R)	51-9	F5 failure	Frequency measurement 5 failed	2	no
65 A(R)	52-0	F6 failure	Frequency measurement 6 failed	2	no
66 A(R)	52-1	F7 failure	Frequency measurement 7 failed	2	no
67 A(R)	52-2	F8 failure	Frequency measurement 8 failed	2	no
68 A(R)	52-3	I1 failure	Current measurement 1 failed	2	no
69 A(R)	52-4	I2 failure	Current measurement 2 failed	2	no
70 A(R)	52-5	I3 failure	Current measurement 3 failed	2	no
71 A(R)	52-6	I4 failure	Current measurement 4 failed	2	no
72 A(R)	52-7	I5 failure	Current measurement 5 failed	2	no
73 A(R)	52-8	I6 failure	Current measurement 6 failed	2	no
74 A(R)	52-9	I7 failure	Current measurement 7 failed	2	no
75 A(R)	53-0	I8 failure	Current measurement 8 failed	2	no
76 A(R)	53-1	I9 failure	Current measurement 9 failed	2	no
77 A(R)	53-2	I10 failure	Current measurement 10 failed	2	no
78 A(R)	53-3	I11 failure	Current measurement 11 failed	2	no
79 A(R)	53-4	I12 failure	Current measurement 12 failed	2	no
80 A(R)	53-5	PT1 failure	Resistance measurement 1 failed	2	no
81 A(R)	53-6	PT2 failure	Resistance measurement 2 failed	2	no
82 A(R)	53-7	PT3 failure	Resistance measurement 3 failed	2	no
83 A(R)	53-8	PT4 failure	Resistance measurement 4 failed	2	no
84 A(R)	53-9	HART1 failure	HART 1 input failed	2	no
85 A(R)	54-0	HART2 failure	HART 2 input failed	2	no
86 A(R)	54-1	HART3 failure	HART 3 input failed	2	no
87 A(R)	54-2	HART4 failure	HART 4 input failed	2	no
88 A(R)	54-3	HART5 failure	HART 5 input failed	2	no
89 A(R)	54-4	HART6 failure	HART 6 input failed	2	no
90 A(R)	54-5	HART9 failure	HART 9 input failed	2	no
91 A(R)	54-6	HART10 failure	HART 10 input failed	2	no
92 A(R)	54-7	HART11 failure	HART 11 input failed	2	no
93 A(R)	54-8	HART12 failure	HART 12 input failed	2	no
94 A(R)	54-9	Def.cont.inp.	Contact input failed	2	no
95 A(R)	55-0	Math.problem	Mathematical error	1	yes
96 A(R)	55-1	Corrupt param.	corrupted parameter detected	1	no
97 W	60-0	Master clock	Master clock shows unexpected behaviour	2	no
98 W	60-1	Pulse 1 >max	Pulse output 1 overflow	2	yes
99 W	60-2	Pulse 2 >max	Pulse output 2 overflow	2	yes

100 W	60-3	Pulse 3 >max	Pulse output 3 overflow	2	yes
101 W	60-4	Pulse 4 >max	Pulse output 4 overflow	2	yes
102 W	60-5	I1 outp.<min	Current output 1 below minimum	2	yes
103 W	60-6	I2 outp.<min	Current output 2 below minimum	2	yes
104 W	60-7	I3 outp.<min	Current output 3 below minimum	2	yes
105 W	60-8	I4 outp.<min	Current output 4 below minimum	2	yes
106 W	60-9	I1 outp.>max	Current output 1 exceeds maximum	2	yes
107 W	61-0	I2 outp.>max	Current output 2 exceeds maximum	2	yes
108 W	61-1	I3 outp.>max	Current output 3 exceeds maximum	2	yes
109 W	61-2	I4 outp.>max	Current output 4 exceeds maximum	2	yes
110 W	61-3	FC-BIOS old	Flowcomputer bios version is to old	1	no
111 W	61-4	ERR_fordel002	Langtext zu 'ERR_fordel002'	1	no
112 W	61-5	filesys. full	filesystem no disc-space	2	no
113 M	70-0	Factory state	Device which has not been tested.	1	no
114 M	70-1	Calibr. lock	Calibration lock is open	1	no
115 M	70-2	User lock	User lock is open	1	no
116 H	80-0	TA loss	Loss of temperature A	2	no
117 H	80-1	TA< l.alarm	Temperature A below lower alarm limit	2	no
118 H	80-2	TA> up.alarm	Temperature A exceeds upper alarm limit	2	no
119 H	80-3	TA param.error	Inconsistent parameterization, temperature A	1	no
120 H	80-4	TB loss	Loss of temperature B	2	no
121 H	80-5	TB< l.alarm	Temperature B below lower alarm limit	2	no
122 H	80-6	TB> up.alarm	Temperature B exceeds upper alarm limit	2	no
123 H	80-7	TB param.error	Inconsistent parameterization, temperature B	1	no
124 H	80-8	TC loss	Loss of temperature C	2	no
125 H	80-9	TC< l.alarm	Temperature C below lower alarm limit	2	no
126 H	81-0	TC> up.alarm	Temperature C exceeds upper alarm limit	2	no
127 H	81-1	TC param.error	Inconsistent parameterization, temperature C	1	no
128 H	81-2	TD loss	Loss of temperature D	2	no
129 H	81-3	TD< l.alarm	Temperature D below lower alarm limit	2	no
130 H	81-4	TD> up.alarm	Temperature D exceeds upper alarm limit	2	no
131 H	81-5	TD param.error	Inconsistent parameterization, temperature D	1	no
132 H	81-6	PA loss	Loss of absolute pressure A	2	no
133 H	81-7	PA< l.alarm	Absolute pressure A below lower alarm limit	2	no

134 H	81-8	PA> up.alarm	Absolute pressure A exceeds upper alarm limit	2	no
135 H	81-9	PA param.error	Inconsistent parameterization, absolute pressure A	1	no
136 H	82-0	PB loss	Loss of absolute pressure B	2	no
137 H	82-1	PB< l.alarm	Absolute pressure B below lower alarm limit	2	no
138 H	82-2	PB> up.alarm	Absolute pressure B exceeds upper alarm limit	2	no
139 H	82-3	PB param.error	Inconsistent parameterization, absolute pressure B	1	no
140 H	82-4	PC loss	Loss of absolute pressure C	2	no
141 H	82-5	PC< l.alarm	Absolute pressure C below lower alarm limit	2	no
142 H	82-6	PC> up.alarm	Absolute pressure C exceeds upper alarm limit	2	no
143 H	82-7	PC param.error	Inconsistent parameterization, absolute pressure C	1	no
144 H	82-8	PD loss	Loss of absolute pressure D	2	no
145 H	82-9	PD< l.alarm	Absolute pressure D below lower alarm limit	2	no
146 H	83-0	PD> up.alarm	Absolute pressure D exceeds upper alarm limit	2	no
147 H	83-1	PD param.error	Inconsistent parameterization, absolute pressure D	1	no
148 H	83-2	I1 inp.param.	Current input 1 parameterization error	2	no
149 H	83-3	I2 inp.param.	Current input 2 parameterization error	2	no
150 H	83-4	I3 inp.param.	Current input 3 parameterization error	2	no
151 H	83-5	I4 inp.param.	Current input 4 parameterization error	2	no
152 H	83-6	I5 inp.param.	Current input 5 parameterization error	2	no
153 H	83-7	I6 inp.param.	Current input 6 parameterization error	2	no
154 H	83-8	I7 inp.param.	Current input 7 parameterization error	2	no
155 H	83-9	I8 inp.param.	Current input 8 parameterization error	2	no
156 H	84-0	I9 inp.param.	Current input 9 parameterization error	2	no
157 H	84-1	I10 inp.param.	Current input 10 parameterization error	2	no
158 H	84-2	I11 inp.param.	Current input 11 parameterization error	2	no
159 H	84-3	I12 inp.param.	Current input 12 parameterization error	2	no
160 H	84-4	PT1 inp.param.	Resistance input 1 parameterization error	2	no
161 H	84-5	PT2 inp.param.	Resistance input 2 parameterization error	2	no
162 H	84-6	PT3 inp.param.	Resistance input 3 parameterization error	2	no

163 H	84-7	PT4 inp.param.	Resistance input 4 parameterization error	2	no
164 H	84-8	I1 outp.param.	Current output 1 parameterization error	1	no
165 H	84-9	I2 outp.param.	Current output 2 parameterization error	1	no
166 H	85-0	I3 outp.param.	Current output 3 parameterization error	1	no
167 H	85-1	I4 outp.param.	Current output 4 parameterization error	1	no
168 H	85-2	K1 outp.param.	Contact output 1 parameterization error	1	no
169 H	85-3	K2 outp.param.	Contact output 2 parameterization error	1	no
170 H	85-4	K3 outp.param.	Contact output 3 parameterization error	1	no
171 H	85-5	K4 outp.param.	Contact output 4 parameterization error	1	no
172 H	85-6	K5 outp.param.	Contact output 5 parameterization error	1	no
173 H	85-7	K6 outp.param.	Contact output 6 parameterization error	1	no
174 H	85-8	K7 outp.param.	Contact output 7 parameterization error	1	no
175 H	85-9	K8 outp.param.	Contact output 8 parameterization error	1	no
176 H	86-0	Malloc error	Dynamic memory allocation error	1	no
177 H	86-1	CAN fault	CAN bus malfunction	2	no
178 H	86-2	CAN overflow	CAN bus overflow	1	no
179 H	86-3	Cont.param.err	Parameterization of contact input, double seizing	1	no
180 H	86-4	PT1 open circ.	Resistance measurement 1 shows open circuit	2	no
181 H	86-5	PT2 open circ.	Resistance measurement 2 shows open circuit	2	no
182 H	86-6	CAN check	CAN bus plausibilization	1	no
183 H	86-7	Old time	Time immediately before time adjustment	1	no
184 H	86-8	New time	Time immediately after time adjustment	1	no
185 H	86-9	TCPIP fault	can't initialize TCPIP sockets	2	no
186 H	87-0	buggy software	low grade software code detected	1	no
187 H	87-1	file system	file system unexpected behaviour	1	no
188 H	87-2	Module 1A false	Module 1A assembly inplausible	2	no
189 H	87-3	Module 1B false	Module 1B assembly inplausible	2	no
190 H	87-4	Module 2A false	Module 2A assembly inplausible	2	no
191 H	87-5	Module 2B false	Module 2B assembly inplausible	2	no
192 H	87-6	Module 3A false	Module 3A assembly inplausible	2	no
193 H	87-7	Module 3B false	Module 3B assembly inplausible	2	no
194 H	87-8	HART1 status	HART 1 status reports trouble	1	no
195 H	87-9	HART2 status	HART 2 status reports trouble	1	no
196 H	88-0	HART3 status	HART 3 status reports trouble	1	no
197 H	88-1	HART4 status	HART 4 status reports trouble	1	no
198 H	88-2	HART5 status	HART 5 status reports trouble	1	no

199 H	88-3	HART6 status	HART 6 status reports trouble	1	no
200 H	88-4	HART9 status	HART 9 status reports trouble	1	no
201 H	88-5	HART10 status	HART 10 status reports trouble	1	no
202 H	88-6	HART11 status	HART 11 status reports trouble	1	no
203 H	88-7	HART12 status	HART 12 status reports trouble	1	no
204 H	88-8	param.ignored	Parameterization ignored	1	no
205 H	88-9	LCD-Type/lang.	Language setting not possible with this LCD-type	1	no
206 H	89-0	HART-Ver. old	Software version HART-card is to old	1	no
207 H	89-1	EXI-Ver. old	Software version EXI-card is to old	1	no
208 H	89-2	Def.display	Display is defective	2	no
209 H	89-3	ERR_fordel001	Langtext zu 'ERR_fordel001'	2	no
210 H	89-4	TCP after boot	Changed TCP configuration: restart is necessary	1	no
211 H	89-5	Adjusted float	Floating point parameter adjusted to floating-point notation	1	no



Legend

A = Alarm
W = Warning
H = Hint
R = Internal computer error
M = Message

1/2
1 = one-valued message (only comes)
2 = two-valued message (comes and goes)

In the case of a hint (H), a warning can be sent (this depends on the setting in coordinate VA-7); in the case of a message (M), this is not possible.

10 Characteristic data

10.1 Specifications of the corrector

10.1.1 Analog inputs

Current measurement

Range	0/4 to 25 mA
Resolution	20 bits
U max	2.5 V
Ri	250 Ω
Tc	20 ppm
Measuring period	50 ms
Overvoltage protection	6.8 V

Resistance measurement

Type	PT 100 4-conductor design
Range	-20°C to +60°C
Resolution	0.01°C
Accuracy	0.05°C
Measuring period	50 ms

10.1.2 Frequency inputs

HF input of the measuring channel, volume (not available in ERZ 2404 mode)
HF input of reference channel, volume (not available in ERZ 2404 mode)

10.1.3 Counting inputs

HF input, volume input (not available in ERZ 2404 mode)
LF volume input (not available in ERZ 2404 mode)
Input for the digital Vo totalizer (not available in ERZ 2404 mode)

10.1.4 Other inputs

Digital status inputs
All inputs are electrically isolated from the computer but not from each other. The following signal generators can be used: Contact, Open collector / drain, Active push/pull
-U max = 5V
-I max = 13 mA
f max = 10 Hz
Overvoltage protection 6.8 V

10.1.5 HART protocol, connection of the SMART transmitter (optional)

2-conductor system
Simultaneous analog and digital communications
Multimaster protocol
3 inputs on the HART card, of these two are reserved for pressure and temperature, can be extended to 6 inputs. If the isolating card is used, another 2 HART inputs are available.

10.1.6 Analog outputs

Current outputs	Number	4
	Range	**0-20 mA or 4-20 mA**
	Resolution	12 bits
	Burden	700 Ω
	Overvoltage protection from	33 V, electrically isolated

10.1.7 Other outputs

Signal outputs	Number	8
	U max	24 V DC
	P max	150 mW
	Ic	100 mA
	U_{CE}sat	1.2V or Rhon = 50 Ω
	F max	400 Hz
	Overvoltage protection	33 V, electrically isolated
Pulse outputs	Number	4
	tmin OFF	16 ms
	tmax OFF	230 ms
	tmin ON	16 ms
	tmax ON	230 ms
	Ic	100 mA
	U_{CE}sat	1.2V or Rhon = 50 Ω
	F max	400 Hz
	Overvoltage protection	33 V, electrically isolated
Status outputs, alarm and warning		
	U max	24 V DC
	I max	100 mA
	P max	100 mW
	R_{DS}on	<= 50 Ω
	Photomos relay	
	Ic	100 mA
	U_{CE}sat	1.2V or Rhon = 50 Ω
	F max	400 Hz
	Overvoltage protection	33 V, electrically isolated

Power supply	Input voltage	24 V DC –10% / +15%
	Typical current input	0.7 A (depending on the components used)
	Max. power	24 W

Interference suppression **EN50081-1**

Noise immunity **EN50082-2**

10.1.8 Specifications of the embedded PC MOD520C

Microcontroller AMD Elan SC520 with 586 CPU
Integrated FPU (Floating Point Unit)

Power supply 2.5 V, 3.3 V and 5 V
CPU clock, 133 MHz
PCI controller, 32 bits
SDRAM controller for up to 256 Mbytes, max. 64 Mbytes on board
GP (general purpose) bus
ROM/flash controller for 16 Mbytes
32 I/O ports
256 bytes EEPROM for BIOS
DMA controller
2 x UARTs for serial interfaces
2 x CAN ports
Fast Ethernet controller for 10/100Mbps
RTC real time clock

11 Electrical connections

11.1 Configuration variants

Due to the compact structure of the ERZ 2404, the assignment of terminals is mainly fixed. There is a zone for spare terminals which requires a different definition of terminal assignments depending on the expansion module used. For information about the locations of expansion cards and the assignment to multipoint connectors, please see the data sheet for the device.

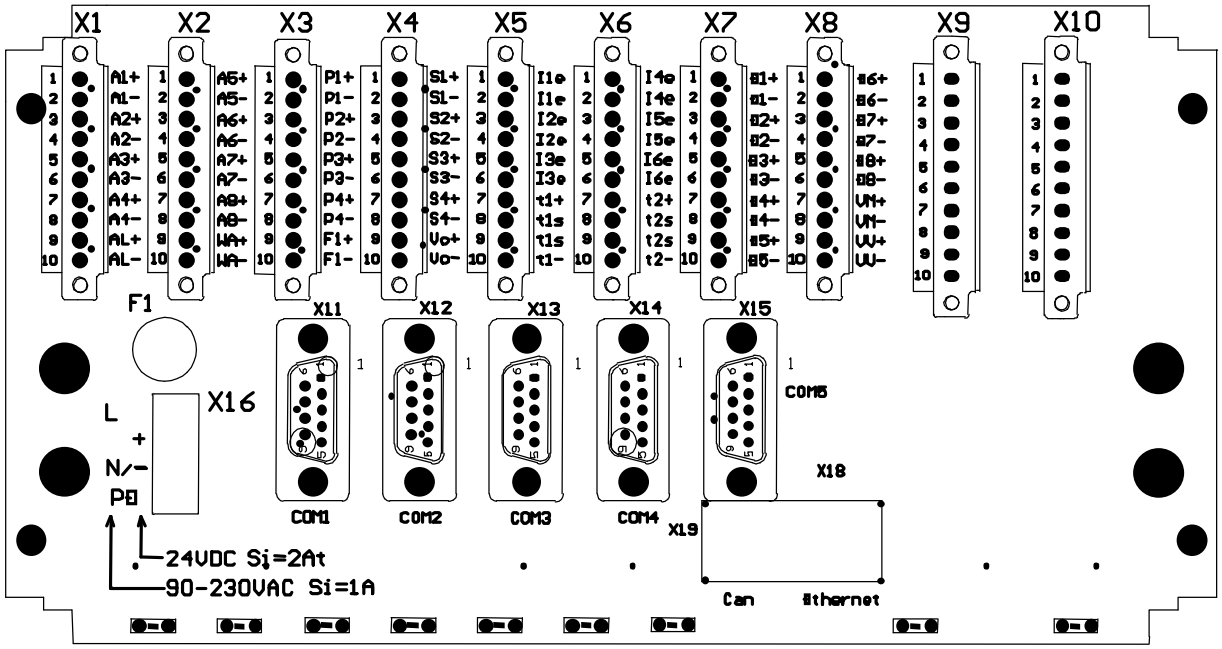
The unassigned slots can optionally be used for the following expansion cards:

HART-Master card, single for three transmitters or dual for up to 6 transmitters

11.2 Terminal diagrams

11.2.1 Rear panel of the device

Since the device has been designed for universal use, there are more terminals than the individual device (e.g. a PTZ corrector) requires. There is a standard assignment of terminals which from the point of view of the numbering always uses the first pins; all the other pins are spare pins or can be assigned via the software. It is also possible to connect the pressure transmitter to one of the unassigned spare inputs and to select it via the software.



11.2.2 Assignment of terminals

X 16 Connection of the supply voltage
In accordance with the device design,
either alternating voltage 90 to 230 V to L, N and PE, with fuse 1 A
or direct voltage 24 V to +, - and PE, with fuse 2 At
is to be connected to X 16

The following assignment of terminals applies to the ERZ 2404 without an internal isolating device Ex1-NAMUR-2/V1 or V2

X 1	Terminal 1	Transistor output 1 +
	Terminal 2	Transistor output 1 -
	Terminal 3	Transistor output 2 +
	Terminal 4	Transistor output 2 -
	Terminal 5	Transistor output 3 +
	Terminal 6	Transistor output 3 -
	Terminal 7	Transistor output 4 +
	Terminal 8	Transistor output 4 -
	Terminal 9	Alarm contact + polarized solid-state relay, closed if de-energized
	Terminal 10	Alarm contact – polarized solid-state relay, closed if de-energized

X 2	Terminal 1	Transistor output 5 +
	Terminal 2	Transistor output 5 -
	Terminal 3	Transistor output 6 +
	Terminal 4	Transistor output 6 -
	Terminal 5	Transistor output 7 +
	Terminal 6	Transistor output 7 -
	Terminal 7	Frequency output + (higher priority) / or transistor output 8 + (only standard ERZ 2000)
	Terminal 8	Frequency output - (higher priority) / or transistor output 8 - (only standard ERZ 2000)
	Terminal 9	Transistor output warning +
	Terminal 10	Transistor output warning -

X 3	Terminal 1	Pulse output 1 +	Dispatcher or totalizer pulses
	Terminal 2	Pulse output 1 -	Dispatcher or totalizer pulses
	Terminal 3	Pulse output 2 +	Dispatcher or totalizer pulses
	Terminal 4	Pulse output 2 -	Dispatcher or totalizer pulses
	Terminal 5	Pulse output 3 +	Dispatcher or totalizer pulses
	Terminal 6	Pulse output 3 -	Dispatcher or totalizer pulses
	Terminal 7	Pulse output 4 +	Dispatcher or totalizer pulses
	Terminal 8	Pulse output 4 –	Dispatcher or totalizer pulses
	Terminal 9	Spare 2nd Input for Vo with external isolating device + (only standard ERZ 2000)	
	Terminal 10	Spare 2nd Input for Vo with external isolating device - (only standard ERZ 2000)	

X 4	Terminal 1	Current output 1 +
	Terminal 2	Current output 1 -
	Terminal 3	Current output 2 +
	Terminal 4	Current output 2 -
	Terminal 5	Current output 3 +
	Terminal 6	Current output 3 -
	Terminal 7	Current output 4 +
	Terminal 8	Current output 4 -
	Terminal 9	Input for Vo with external isolating device + (only standard ERZ 2000)
	Terminal 10	Input for Vo with external isolating device - (only standard ERZ 2000)

X 5	Terminal 1	Current input 1, active or passive, note the polarity (see examples of connection)	
	Terminal 2	Current input 1, active or passive, note the polarity (see examples of connection)	
	Terminal 3	Current input 2, active or passive, note the polarity (see examples of connection)	
	Terminal 4	Current input 2, active or passive, note the polarity (see examples of connection)	
	Terminal 5	Current input 3, active or passive, note the polarity (see examples of connection)	
	Terminal 6	Current input 3, active or passive, note the polarity (see examples of connection)	
	Terminal 7	PT 100/500/1000 # 1 supply ++	standard connection
	Terminal 8	PT 100/500/1000 # 1 sense +	standard connection
	Terminal 9	PT 100/500/1000 # 1 sense -	standard connection
	Terminal 10	PT 100/500/1000 # 1 supply –	standard connection

X 6	Terminal 1	Current input 4, active or passive, note the polarity (see examples of connection)
	Terminal 2	Current input 4, active or passive, note the polarity (see examples of connection)
	Terminal 3	Current input 5, active or passive, note the polarity (see examples of connection)
	Terminal 4	Current input 5, active or passive, note the polarity (see examples of connection)
	Terminal 5	Current input 6, active or passive, note the polarity (see examples of connection)
	Terminal 6	Current input 6, active or passive, note the polarity (see examples of connection)
	Terminal 7	Current input 7, Note: Polarity vs. 1 to 6 reversed, or spare PT 100*
	Terminal 8	Current input 7, Note: Polarity vs. 1 to 6 reversed, or spare PT 100*
	Terminal 9	Current input 8, Note: Polarity vs. 1 to 6 reversed, or spare PT 100*
	Terminal 10	Current input 8, Note: Polarity vs. 1 to 6 reversed, or spare PT 100*

* You can determine the setting, i.e. either spare PT 100 or current input 7 or 8, via hardware coding (jumper). The setting made in the factory is current input 7 or 8.

X 7	Terminal 1	Signal input 1 +	to be assigned via software
	Terminal 2	Signal input 1 -	to be assigned via software
	Terminal 3	Signal input 2 +	to be assigned via software
	Terminal 4	Signal input 2 -	to be assigned via software
	Terminal 5	Signal input 3 +	to be assigned via software
	Terminal 6	Signal input 3 -	to be assigned via software
	Terminal 7	Signal input 4 +	to be assigned via software
	Terminal 8	Signal input 4 -	to be assigned via software
	Terminal 9	Signal input 5 +	to be assigned via software
	Terminal 10	Signal input 5 -	to be assigned via software

X 8	Terminal 1	Signal input 6 +	to be assigned via software
	Terminal 2	Signal input 6 -	to be assigned via software
	Terminal 3	Signal input 7 +	(only standard ERZ 2000)
	Terminal 4	Signal input 7 -	(only standard ERZ 2000)
	Terminal 5	Signal input 8 +	(only standard ERZ 2000)
	Terminal 6	Signal input 8 -	(only standard ERZ 2000)
	Terminal 7	Volume input measuring channel (HFX) +	(only standard ERZ 2000)
	Terminal 8	Volume input measuring channel (HFX) -	(only standard ERZ 2000)
	Terminal 9	Volume input reference channel (HFY) +	(only standard ERZ 2000)
	Terminal 10	Volume input reference channel (HFY) -	(only standard ERZ 2000)

Data interfaces

X 11 COM 1 interface, connection to USE 09 (USZ 08 interface)

X 12 COM 2 interface RS 232

X 13 COM 3 interface RS 485

X 14 COM 4 interface RS 485

X 15 COM 5 interface for external modem or seriell printer

X 18 Ethernet network connection (for remote operation or Modbus IP)

11.2.3 Pin assignments for COM 1, COM 2, COM 3, COM 4 and COM 5:

COM 1

Pin	*RS 232 mode*	*RS422 mode*	*RS 485 mode*
1	+U (+5V DC)	+U (+5V DC)	+U (+5V DC)
2	RxD	TxD-A	-
3	TxD	-	R/TA A data
4	-	RxD-A	-
5	GND	GND	SGND Signal ground
6	-	TxD-B	-
7	-	-	-
8	-	RxD-B	R/TN B data
9	-	-	-

COM 2 (RS 232)

Pin	
1	-
2	RxD
3	TxD
4	-
5	GND
6	-
7	-
8	-
9	-

COM 3

Pin	*RS 485 mode*		*RS 232 mode*
1	+U	Power supply (+5V DC)	-
2	(GND)*	Reference potential (GND)	RxD
3	R/TA	A data	TxD
4	-	Unassigned	DTR
5	SGND	GND	GND
6	(-U)*	GND	-
7	(GND)*	GND	RTS
8	R/TN	B data	CTS
9	-	Unassigned	-

*** Only used if switched ON with DIL-switch in case of DSfG (pin 2 and 3). Switch behind aperture on rear part of device top cover.**

COM 4

Pin	*RS 485 mode*		*RS 232 mode*	
1	+U	Power supply (+5V DC)	-	
2	(GND)**		Reference potential (GND)	RxD
3	R/TA	A data	TxD	
4	-	Unassigned	-	
5	SGND	GND	GND	
6	(-U)**	GND	-	
7	(GND)**		GND	-
8	R/TN	B data	-	
9	-	Unassigned	-	

**** Only used if switched ON with DIL-switch in case of DSfG (pin 2 and 3). Switch behind aperture on rear part of device top cover.**

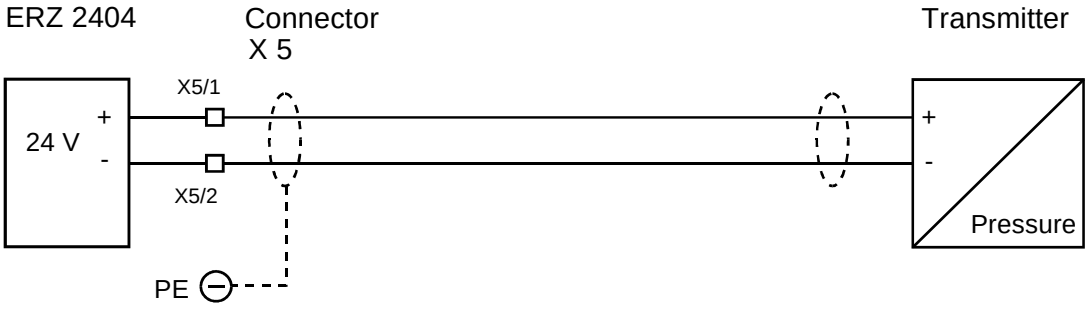
COM 5 (modem) RS 232

Pin	
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

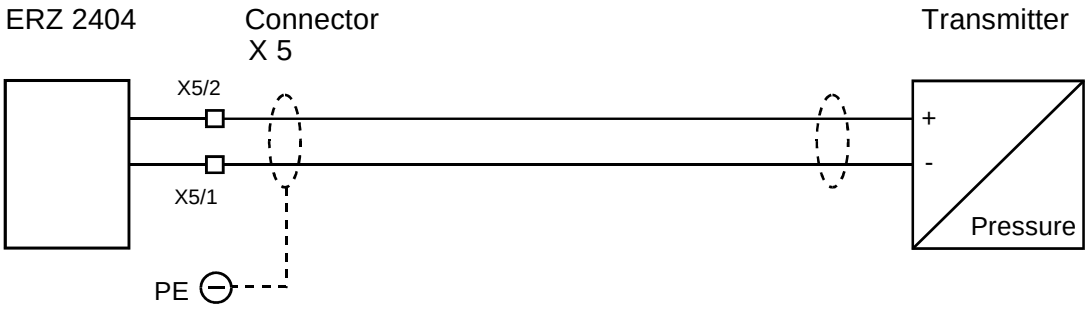
11.2.4 Wiring examples, standard assignments

11.2.4.1 Input of pressure transmitter

Current input, passive (transmitter)

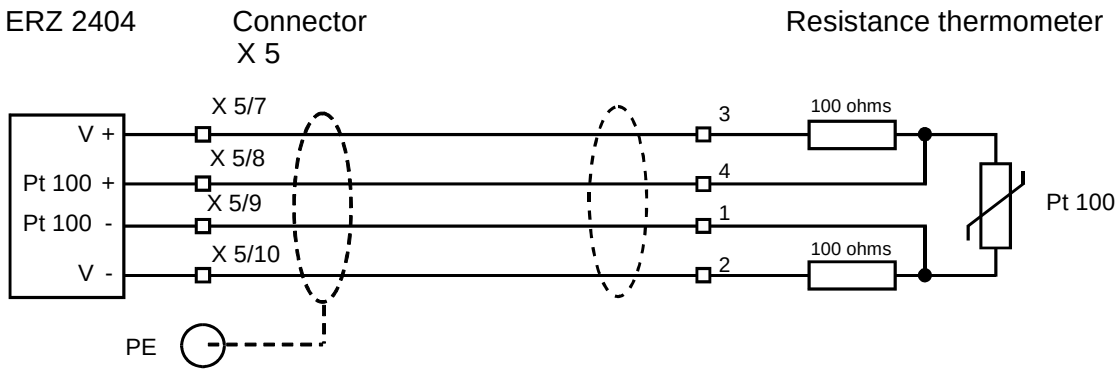


Current input, active e.g. 4 to 20mA

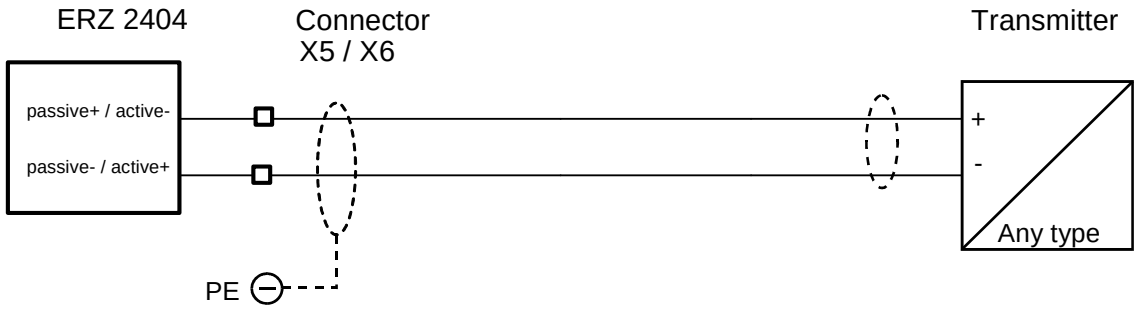


11.2.4.2 Input of resistance thermometer

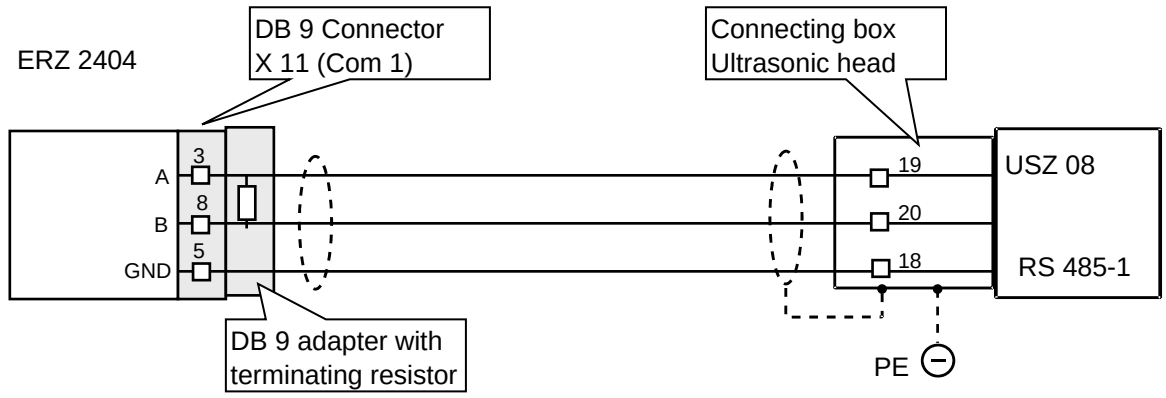
PT 100



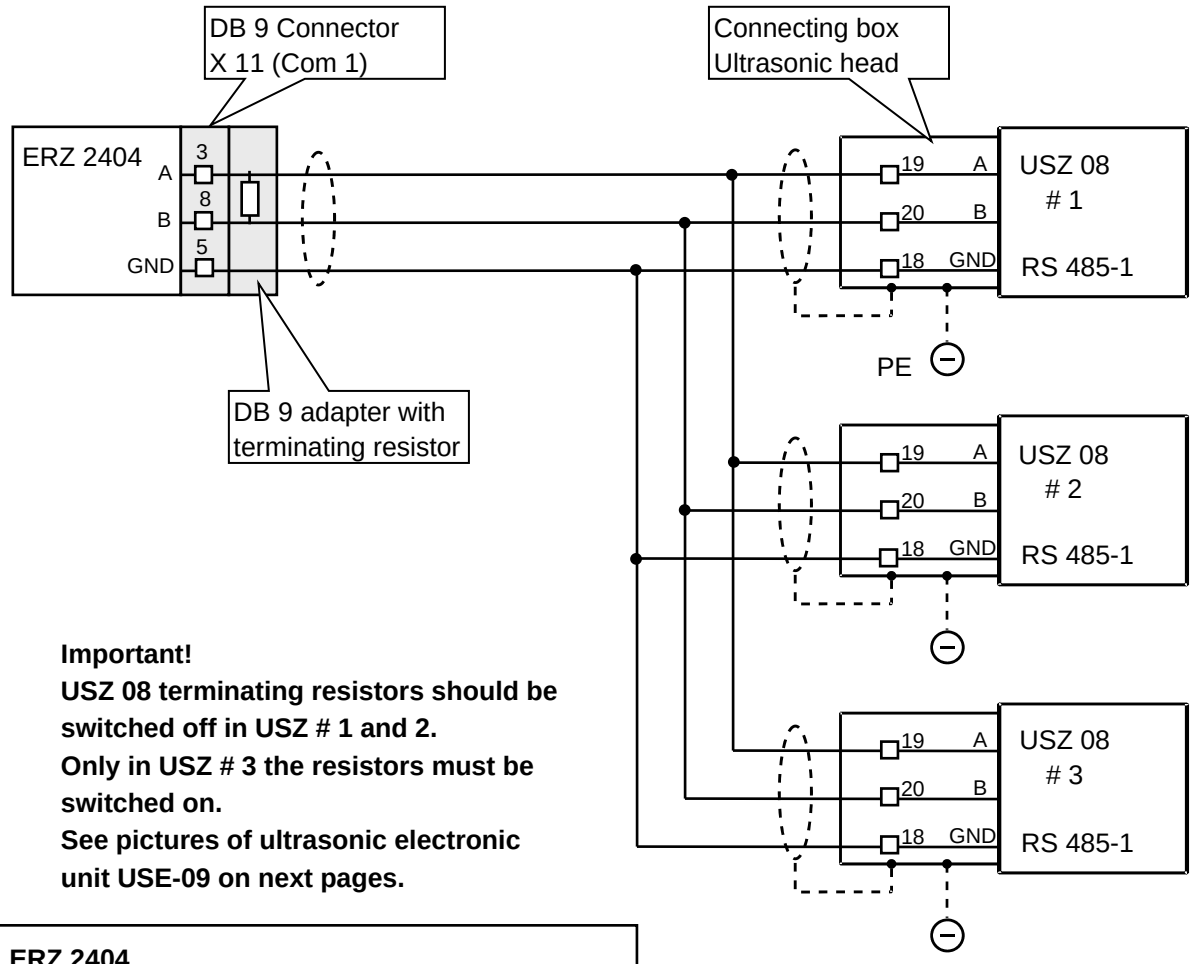
11.2.4.3 Spare inputs, active / passive e.g. differential-pressure sensor, temperature ...



11.2.4.4 Ultrasonic flowmeter single stream



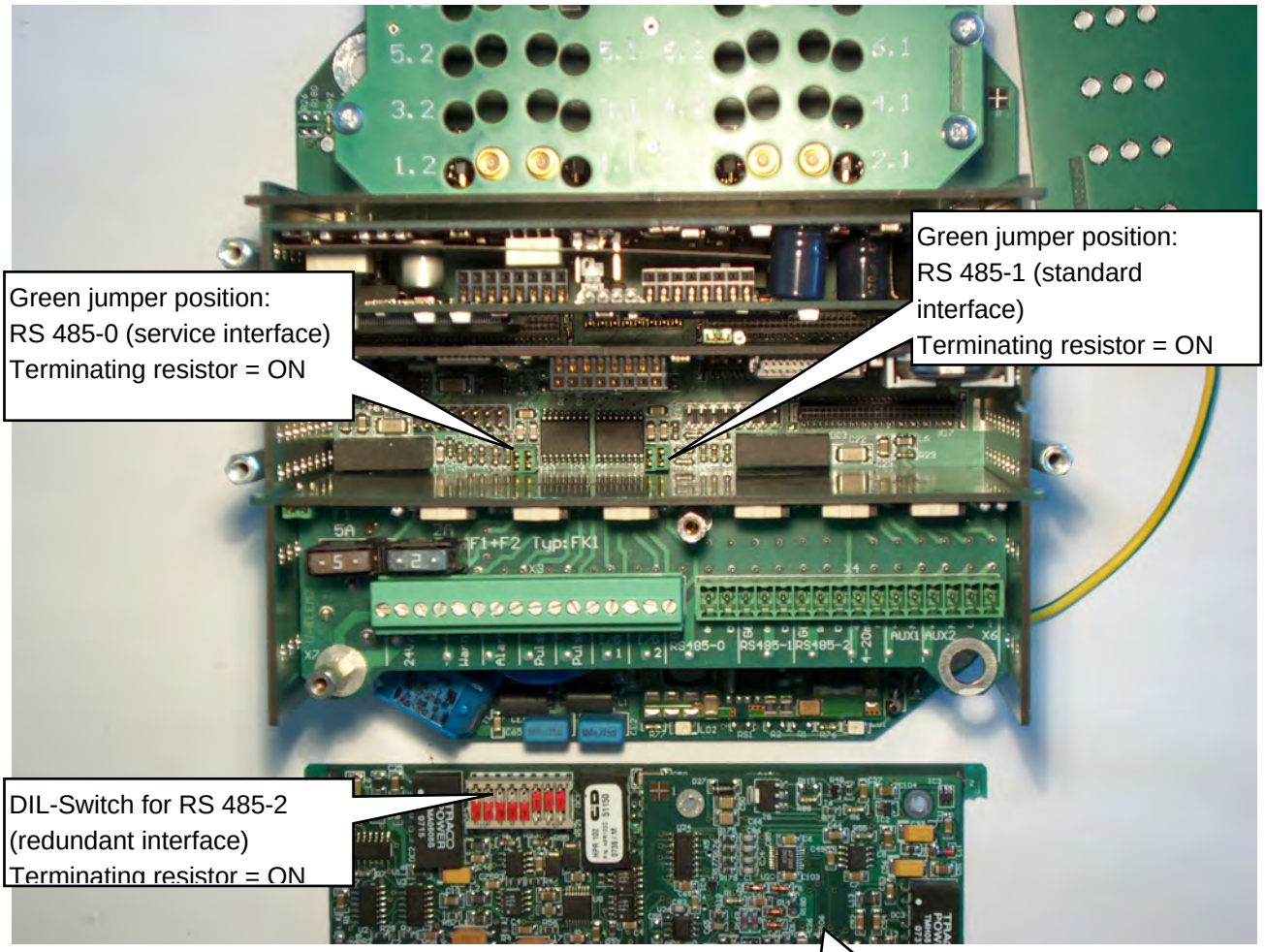
11.2.4.5 Ultrasonic flowmeter multi stream (example 3-stream)

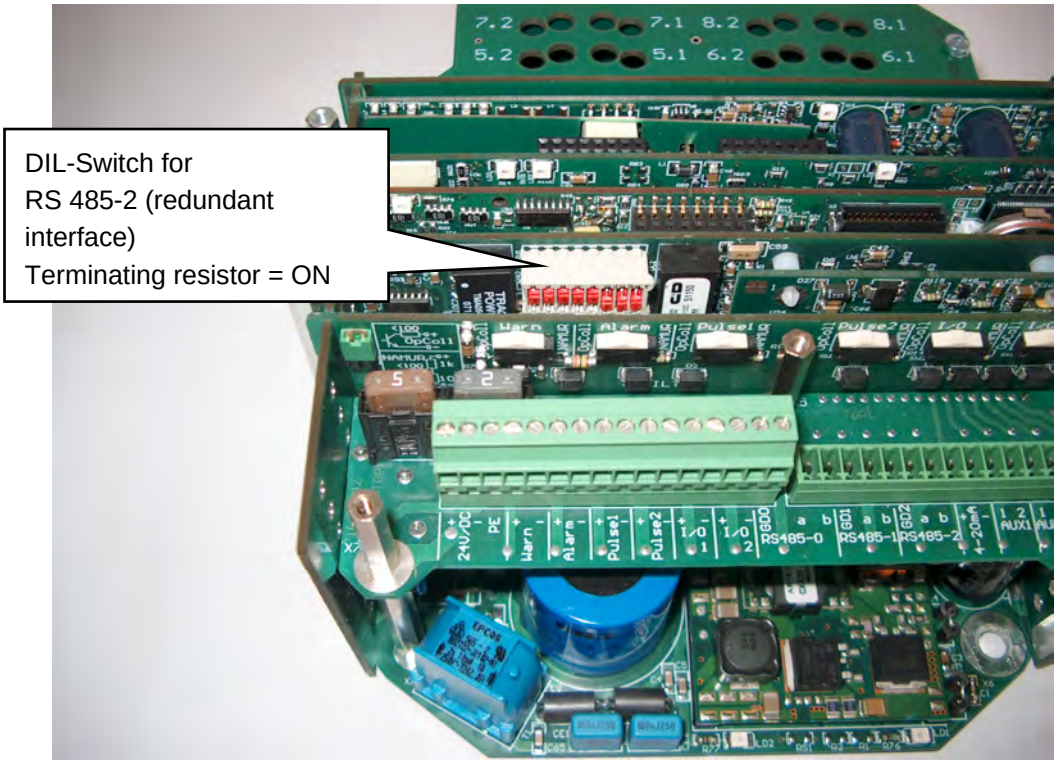


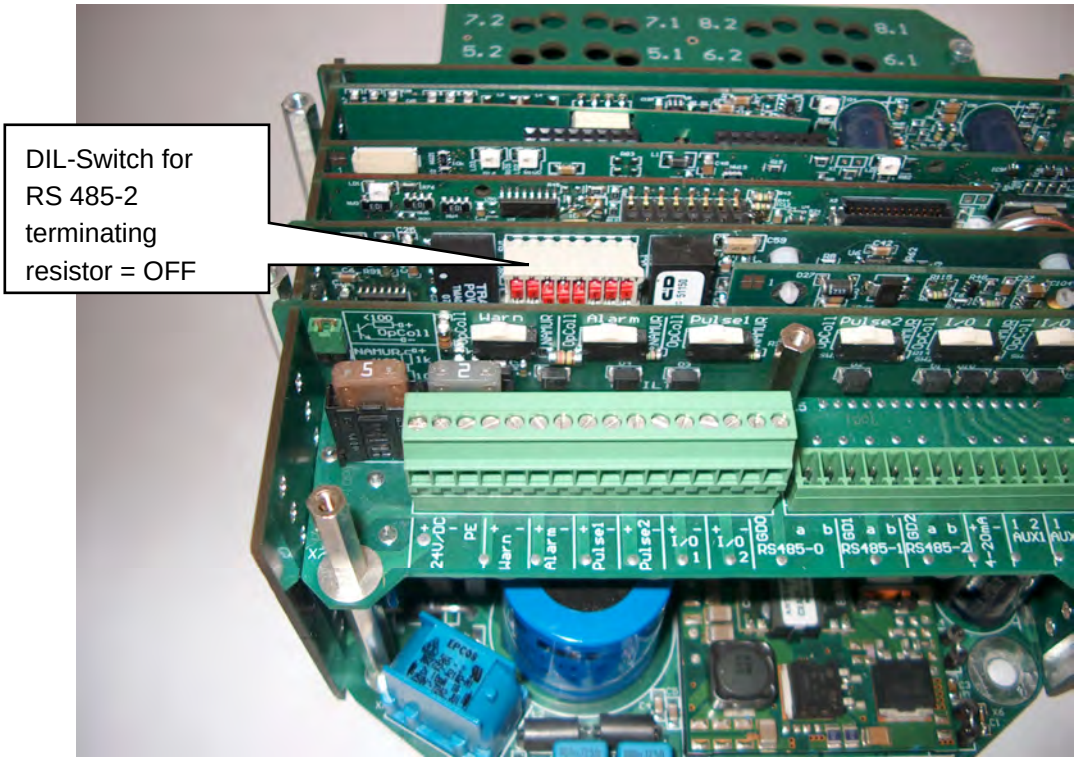
Important!
USZ 08 terminating resistors should be switched off in USZ # 1 and 2.
Only in USZ # 3 the resistors must be switched on.
See pictures of ultrasonic electronic unit USE-09 on next pages.

ERZ 2404
COM 1 parameter: 38400 / 8N1 / DZU-bus

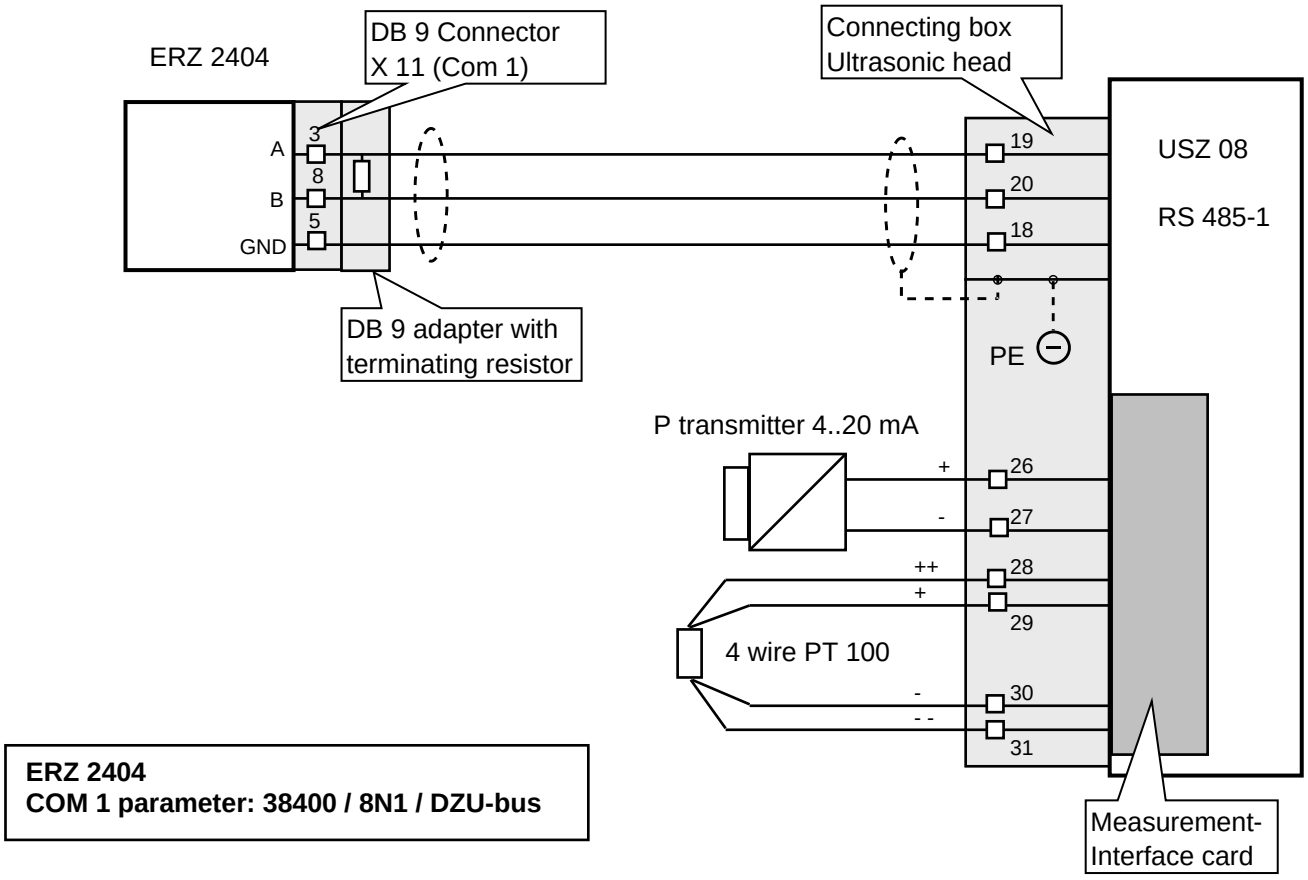
The following pictures show the USE 09 electronic part of USZ 08 ultrasonic meter




DIL-Switch for
RS 485-2 (redundant
interface)
Terminating resistor = ON

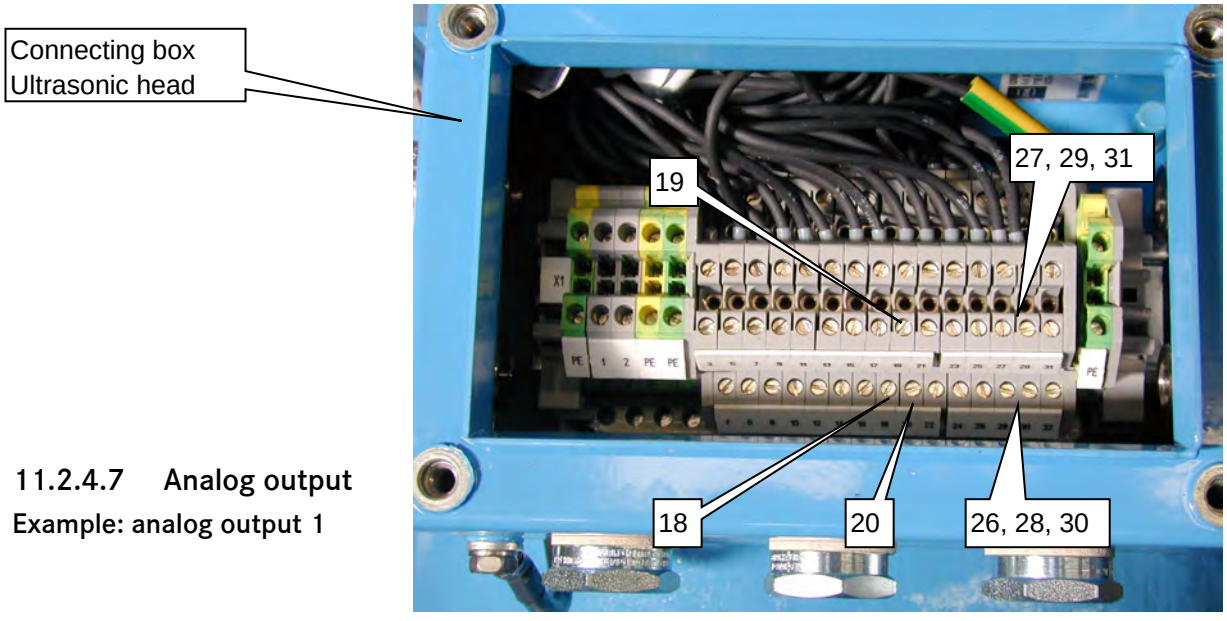

DIL-Switch for
RS 485-2
terminating
resistor = OFF

11.2.4.6 Pressure and temperature sensors with direct connection to ultrasonic head (preferred TANCY application).



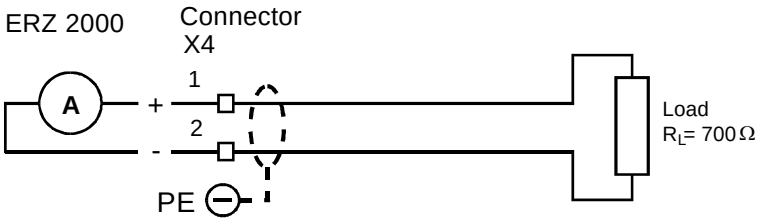
ERZ 2404
COM 1 parameter: 38400 / 8N1 / DZU-bus

Pressure and temperature are measured at an additional interface card.
Transmission of pressure and temperature measured values to ERZ 2404 TANCY via DZU protocol, together with flow and totalizer information.

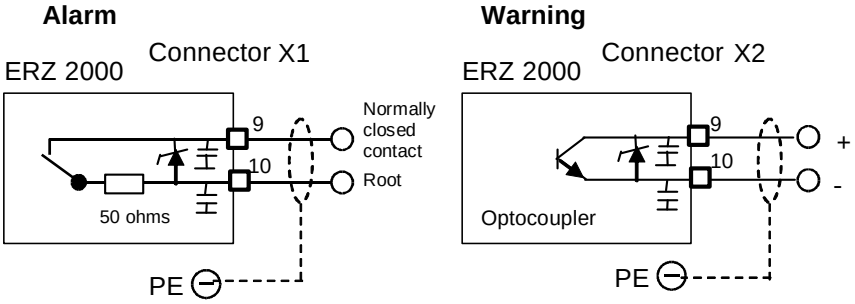


11.2.4.7 Analog output

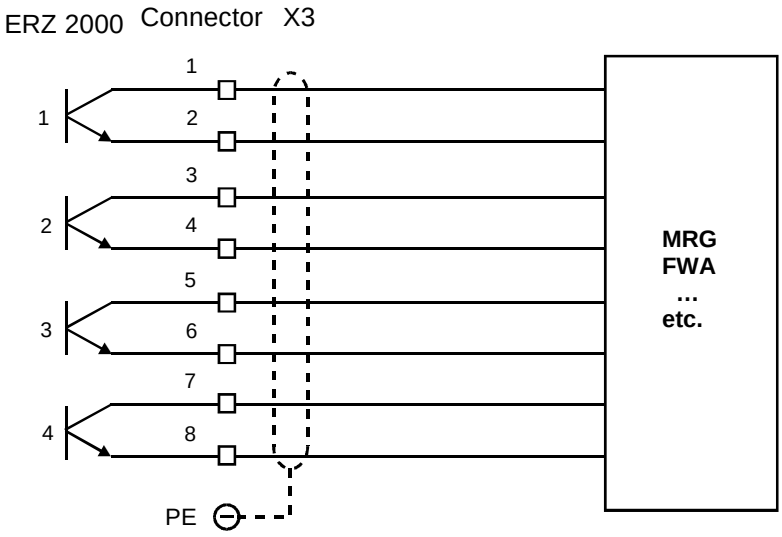
Example: analog output 1



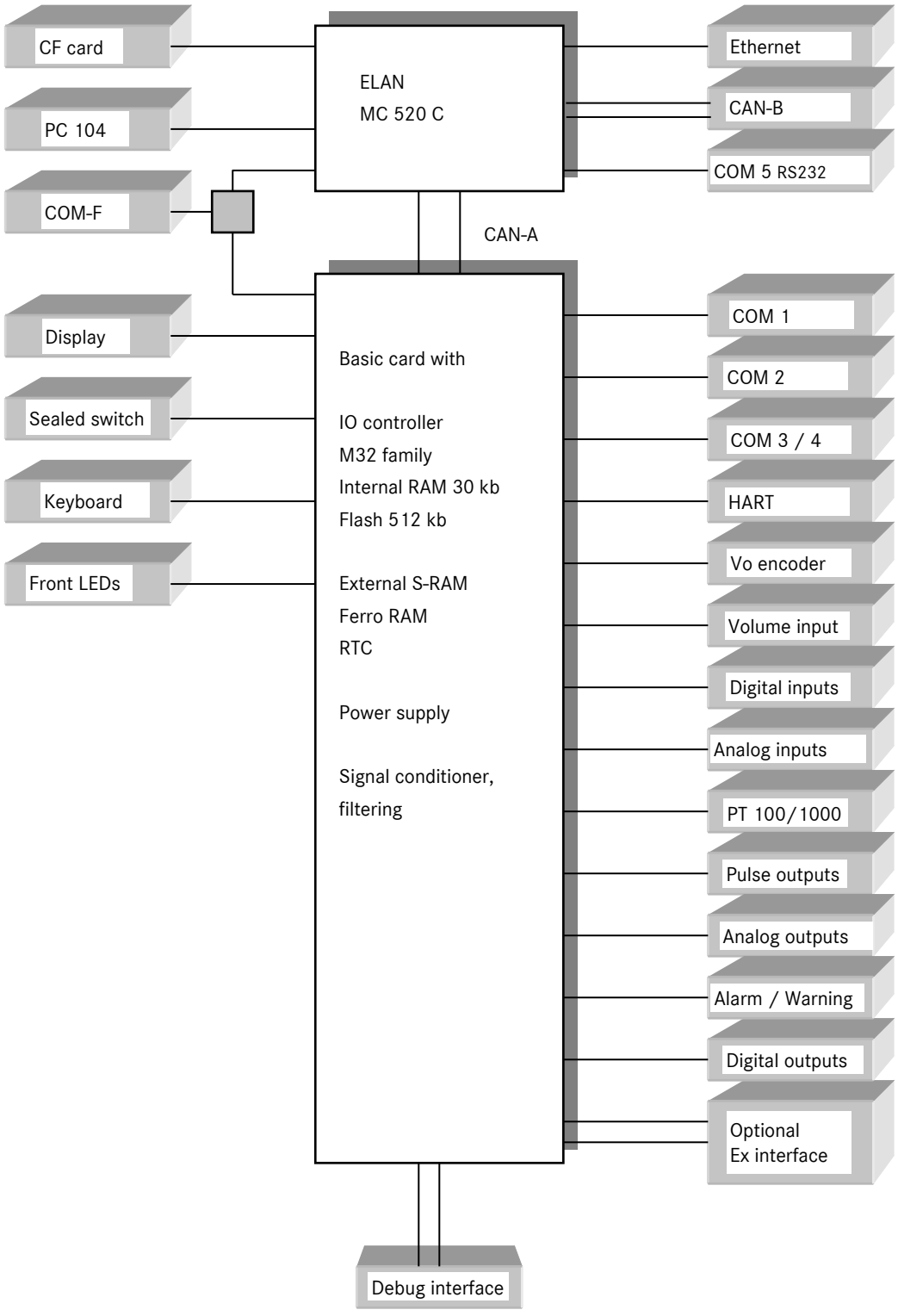
11.2.4.8 Outputs (alarm, warning)



11.2.4.9 Pulse outputs (1 to 4) internal wiring as with warning



11.3 Block diagram



Annex

A) Parameter overview

A.1 Flow computer 1 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	AA	1	Temperature			var.	Unit see AE 1
A	AA	3	Absolute pressure			var.	Unit see AE 3
A	AA	4	Operating density			var.	Unit see AE 4
A	AA	10	Compress.factor			none	
A	AA	11	k-Number			none	
A	AA	12	Conversion factor			none	
A	AA	13	Volume flow			var.	Unit see AE 13
A	AA	14	Volume fl. corr.			var.	Unit see AE 13

A.2 Flow computer 1 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**AB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**AB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**AB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	AB	4	Standard density			var.	Unit see AE 4
A	AB	5	Calorific value			var.	Unit see AE 5
A	AB	6	Carbondioxide			var.	Unit see AE 6
A	AB	7	Hydrogen			var.	Unit see AE 6
A	AB	8	Nitrogen			var.	Unit see AE 6
A	AB	9	Reletive density			none	
A	AB	10	Compress.factor			none	
A	AB	13	Volume flow			var.	Unit see AE 13
A	AB	14	Energy flow			var.	Unit see AE 14
A	AB	15	Mass flow			var.	Unit see AE 15

A.3 Flow computer 1 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**AC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**AC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**AC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus

							Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**AC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**AC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**AC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**AC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**AC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**AC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**AC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.4 Flow computer 1 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	AD	1	Temperature	Discrete texts		none	Error; okay;
A	AD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	AD	4	gas quality	Discrete texts		none	Error; okay;
A	AD	10	Equation of state	Discrete texts		none	Error; okay;
A	AD	13	Volume input	Discrete texts		none	Error; okay;
A	AD	15	Conversion	Discrete texts		none	Error; okay;
D	AD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.5 Flow computer 1 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**AE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**AE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**AE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**AE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**AE**	**6**	**Components**	Menu		**none**	mol-%;
E	**AE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**AE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**AE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**AE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3;

							cm3; MSCF; MMSCF;
E	**AE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**AE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**AE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.6 Flow computer 1 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**AF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**AF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.7 Flow computer 1 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	AG	1	Vm			var.	Unit see AE 31
Z	AG	2	DVm			var.	Unit see AE 31
Z	AG	3	Vmc			var.	Unit see AE 31
Z	AG	4	DVmc			var.	Unit see AE 31
Z	AG	5	Vb			var.	Unit see AE 30
Z	AG	6	DVb			var.	Unit see AE 30
Z	AG	7	E			var.	Unit see AE 32
Z	AG	8	DE			var.	Unit see AE 32
Z	AG	9	M			var.	Unit see AE 33
Z	AG	10	DM			var.	Unit see AE 33
D	AG	11	last hr. Vm			var.	Unit see AE 31
D	AG	12	last hr. DVm			var.	Unit see AE 31
D	AG	13	last hr. Vmc			var.	Unit see AE 31
D	AG	14	last hr. DVmc			var.	Unit see AE 31
D	AG	15	last hr. Vb			var.	Unit see AE 30
D	AG	16	last hr. DVb			var.	Unit see AE 30
D	AG	17	last hr. E			var.	Unit see AE 32

D	AG	18	last hr. DE			var.	Unit see AE 32
D	AG	19	last hr. M			var.	Unit see AE 33
D	AG	20	last hr. DM			var.	Unit see AE 33

A.8 Flow computer 1 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	AH	1	Vm			var.	Unit see AE 31
Z	AH	2	DVm			var.	Unit see AE 31
Z	AH	3	Vmc			var.	Unit see AE 31
Z	AH	4	DVmc			var.	Unit see AE 31
Z	AH	5	Vb			var.	Unit see AE 30
Z	AH	6	DVb			var.	Unit see AE 30
Z	AH	7	E			var.	Unit see AE 32
Z	AH	8	DE			var.	Unit see AE 32
Z	AH	9	M			var.	Unit see AE 33
Z	AH	10	DM			var.	Unit see AE 33
D	AH	11	Yesterday Vm			var.	Unit see AE 31
D	AH	12	Yesterday DVm			var.	Unit see AE 31
D	AH	13	Yesterday Vmc			var.	Unit see AE 31
D	AH	14	Yesterday DVmc			var.	Unit see AE 31
D	AH	15	Yesterday Vb			var.	Unit see AE 30
D	AH	16	Yesterday DVb			var.	Unit see AE 30
D	AH	17	Yesterday E			var.	Unit see AE 32
D	AH	18	Yesterday DE			var.	Unit see AE 32
D	AH	19	Yesterday M			var.	Unit see AE 33
D	AH	20	Yesterday DM			var.	Unit see AE 33

A.9 Flow computer 1 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	AI	1	Vm			var.	Unit see AE 31
Z	AI	2	DVm			var.	Unit see AE 31
Z	AI	3	Vmc			var.	Unit see AE 31
Z	AI	4	DVmc			var.	Unit see AE 31
Z	AI	5	Vb			var.	Unit see AE 30
Z	AI	6	DVb			var.	Unit see AE 30
Z	AI	7	E			var.	Unit see AE 32
Z	AI	8	DE			var.	Unit see AE 32
Z	AI	9	M			var.	Unit see AE 33
Z	AI	10	DM			var.	Unit see AE 33

A.10 Flow computer 1 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	AJ	1	Vm			var.	Unit see AE 31
Z	AJ	2	DVm			var.	Unit see AE 31
Z	AJ	3	Vmc			var.	Unit see AE 31
Z	AJ	4	DVmc			var.	Unit see AE 31
Z	AJ	5	Vb			var.	Unit see AE 30
Z	AJ	6	DVb			var.	Unit see AE 30
Z	AJ	7	E			var.	Unit see AE 32
Z	AJ	8	DE			var.	Unit see AE 32
Z	AJ	9	M			var.	Unit see AE 33
Z	AJ	10	DM			var.	Unit see AE 33
D	AJ	11	Yesterday Vm			var.	Unit see AE 31
D	AJ	12	Yesterday DVm			var.	Unit see AE 31
D	AJ	13	Yesterday Vmc			var.	Unit see AE 31
D	AJ	14	Yesterday DVmc			var.	Unit see AE 31
D	AJ	15	Yesterday Vb			var.	Unit see AE 30
D	AJ	16	Yesterday DVb			var.	Unit see AE 30
D	AJ	17	Yesterday E			var.	Unit see AE 32
D	AJ	18	Yesterday DE			var.	Unit see AE 32
D	AJ	19	Yesterday M			var.	Unit see AE 33
D	AJ	20	Yesterday DM			var.	Unit see AE 33

A.11 Flow computer 1 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	AK	1	T second			var.	Unit see AE 1
D	AK	2	T minute			var.	Unit see AE 1
D	AK	3	T hour			var.	Unit see AE 1
D	AK	4	T day			var.	Unit see AE 1
D	AK	5	P second			var.	Unit see AE 3
D	AK	6	P minute			var.	Unit see AE 3
D	AK	7	P hour			var.	Unit see AE 3
D	AK	8	P day			var.	Unit see AE 3
D	AK	9	Hs second			var.	Unit see AE 5
D	AK	10	Hs minute			var.	Unit see AE 5
D	AK	11	Hs hour			var.	Unit see AE 5
D	AK	12	Hs day			var.	Unit see AE 5
D	AK	13	Rd second			none	
D	AK	14	Rd minute			none	
D	AK	15	Rd hour			none	
D	AK	16	Rd day			none	

D	AK	17	Qm second			var.	Unit see AE 13
D	AK	18	Qm minute			var.	Unit see AE 13
D	AK	19	Qm hour			var.	Unit see AE 13
D	AK	20	Qm day			var.	Unit see AE 13
D	AK	21	Qb second			var.	Unit see AE 13
D	AK	22	Qb minute			var.	Unit see AE 13
D	AK	23	Qb hour			var.	Unit see AE 13
D	AK	24	Qb day			var.	Unit see AE 13
D	AK	25	Qe second			var.	Unit see AE 14
D	AK	26	Qe minute			var.	Unit see AE 14
D	AK	27	Qe hour			var.	Unit see AE 14
D	AK	28	Qe day			var.	Unit see AE 14

A.12 Flow computer 2 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	BA	1	Temperature			var.	Unit see BE 1
A	BA	3	Absolute pressure			var.	Unit see BE 3
A	BA	4	Operating density			var.	Unit see BE 4
A	BA	10	Compress.factor			none	
A	BA	11	k-Number			none	
A	BA	12	Conversion factor			none	
A	BA	13	Volume flow			var.	Unit see BE 13
A	BA	14	Volume fl. corr.			var.	Unit see BE 13

A.13 Flow computer 2 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**BB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**BB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**BB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	BB	4	Standard density			var.	Unit see BE 4
A	BB	5	Calorific value			var.	Unit see BE 5
A	BB	6	Carbondioxide			var.	Unit see BE 6
A	BB	7	Hydrogen			var.	Unit see BE 6
A	BB	8	Nitrogen			var.	Unit see BE 6
A	BB	9	Reletive density			none	
A	BB	10	Compress.factor			none	
A	BB	13	Volume flow			var.	Unit see BE 13
A	BB	14	Energy flow			var.	Unit see BE 14
A	BB	15	Mass flow			var.	Unit see BE 15

A.14 Flow computer 2 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**BC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**BC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**BC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**BC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**BC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**BC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**BC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**BC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**BC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**BC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.15 Flow computer 2 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	BD	1	Temperature	Discrete texts		none	Error; okay;
A	BD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	BD	4	gas quality	Discrete texts		none	Error; okay;
A	BD	10	Equation of state	Discrete texts		none	Error; okay;
A	BD	13	Volume input	Discrete texts		none	Error; okay;
A	BD	15	Conversion	Discrete texts		none	Error; okay;
D	BD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.16 Flow computer 2 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**BE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**BE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**BE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**BE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;

E	**BE**	**6**	**Components**	Menu		**none**	mol-%;
E	**BE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**BE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**BE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**BE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**BE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**BE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**BE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.17 Flow computer 2 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**BF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**BF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.18 Flow computer 2 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	BG	1	Vm			var.	Unit see BE 31
Z	BG	2	DVm			var.	Unit see BE 31
Z	BG	3	Vmc			var.	Unit see BE 31
Z	BG	4	DVmc			var.	Unit see BE 31
Z	BG	5	Vb			var.	Unit see BE 30
Z	BG	6	DVb			var.	Unit see BE 30
Z	BG	7	E			var.	Unit see BE 32
Z	BG	8	DE			var.	Unit see BE 32
Z	BG	9	M			var.	Unit see BE 33
Z	BG	10	DM			var.	Unit see BE 33

D	BG	11	last hr. Vm			var.	Unit see BE 31
D	BG	12	last hr. DVm			var.	Unit see BE 31
D	BG	13	last hr. Vmc			var.	Unit see BE 31
D	BG	14	last hr. DVmc			var.	Unit see BE 31
D	BG	15	last hr. Vb			var.	Unit see BE 30
D	BG	16	last hr. DVb			var.	Unit see BE 30
D	BG	17	last hr. E			var.	Unit see BE 32
D	BG	18	last hr. DE			var.	Unit see BE 32
D	BG	19	last hr. M			var.	Unit see BE 33
D	BG	20	last hr. DM			var.	Unit see BE 33

A.19 Flow computer 2 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	BH	1	Vm			var.	Unit see BE 31
Z	BH	2	DVm			var.	Unit see BE 31
Z	BH	3	Vmc			var.	Unit see BE 31
Z	BH	4	DVmc			var.	Unit see BE 31
Z	BH	5	Vb			var.	Unit see BE 30
Z	BH	6	DVb			var.	Unit see BE 30
Z	BH	7	E			var.	Unit see BE 32
Z	BH	8	DE			var.	Unit see BE 32
Z	BH	9	M			var.	Unit see BE 33
Z	BH	10	DM			var.	Unit see BE 33
D	BH	11	Yesterday Vm			var.	Unit see BE 31
D	BH	12	Yesterday DVm			var.	Unit see BE 31
D	BH	13	Yesterday Vmc			var.	Unit see BE 31
D	BH	14	Yesterday DVmc			var.	Unit see BE 31
D	BH	15	Yesterday Vb			var.	Unit see BE 30
D	BH	16	Yesterday DVb			var.	Unit see BE 30
D	BH	17	Yesterday E			var.	Unit see BE 32
D	BH	18	Yesterday DE			var.	Unit see BE 32
D	BH	19	Yesterday M			var.	Unit see BE 33
D	BH	20	Yesterday DM			var.	Unit see BE 33

A.20 Flow computer 2 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	BI	1	Vm			var.	Unit see BE 31
Z	BI	2	DVm			var.	Unit see BE 31
Z	BI	3	Vmc			var.	Unit see BE 31
Z	BI	4	DVmc			var.	Unit see BE 31

Z	BI	5	Vb			var.	Unit see BE 30
Z	BI	6	DVb			var.	Unit see BE 30
Z	BI	7	E			var.	Unit see BE 32
Z	BI	8	DE			var.	Unit see BE 32
Z	BI	9	M			var.	Unit see BE 33
Z	BI	10	DM			var.	Unit see BE 33

A.21 Flow computer 2 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	BJ	1	Vm			var.	Unit see BE 31
Z	BJ	2	DVm			var.	Unit see BE 31
Z	BJ	3	Vmc			var.	Unit see BE 31
Z	BJ	4	DVmc			var.	Unit see BE 31
Z	BJ	5	Vb			var.	Unit see BE 30
Z	BJ	6	DVb			var.	Unit see BE 30
Z	BJ	7	E			var.	Unit see BE 32
Z	BJ	8	DE			var.	Unit see BE 32
Z	BJ	9	M			var.	Unit see BE 33
Z	BJ	10	DM			var.	Unit see BE 33
D	BJ	11	Yesterday Vm			var.	Unit see BE 31
D	BJ	12	Yesterday DVm			var.	Unit see BE 31
D	BJ	13	Yesterday Vmc			var.	Unit see BE 31
D	BJ	14	Yesterday DVmc			var.	Unit see BE 31
D	BJ	15	Yesterday Vb			var.	Unit see BE 30
D	BJ	16	Yesterday DVb			var.	Unit see BE 30
D	BJ	17	Yesterday E			var.	Unit see BE 32
D	BJ	18	Yesterday DE			var.	Unit see BE 32
D	BJ	19	Yesterday M			var.	Unit see BE 33
D	BJ	20	Yesterday DM			var.	Unit see BE 33

A.22 Flow computer 2 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	BK	1	T second			var.	Unit see BE 1
D	BK	2	T minute			var.	Unit see BE 1
D	BK	3	T hour			var.	Unit see BE 1
D	BK	4	T day			var.	Unit see BE 1
D	BK	5	P second			var.	Unit see BE 3
D	BK	6	P minute			var.	Unit see BE 3
D	BK	7	P hour			var.	Unit see BE 3
D	BK	8	P day			var.	Unit see BE 3

D	BK	9	Hs second			var.	Unit see BE 5
D	BK	10	Hs minute			var.	Unit see BE 5
D	BK	11	Hs hour			var.	Unit see BE 5
D	BK	12	Hs day			var.	Unit see BE 5
D	BK	13	Rd second			none	
D	BK	14	Rd minute			none	
D	BK	15	Rd hour			none	
D	BK	16	Rd day			none	
D	BK	17	Qm second			var.	Unit see BE 13
D	BK	18	Qm minute			var.	Unit see BE 13
D	BK	19	Qm hour			var.	Unit see BE 13
D	BK	20	Qm day			var.	Unit see BE 13
D	BK	21	Qb second			var.	Unit see BE 13
D	BK	22	Qb minute			var.	Unit see BE 13
D	BK	23	Qb hour			var.	Unit see BE 13
D	BK	24	Qb day			var.	Unit see BE 13
D	BK	25	Qe second			var.	Unit see BE 14
D	BK	26	Qe minute			var.	Unit see BE 14
D	BK	27	Qe hour			var.	Unit see BE 14
D	BK	28	Qe day			var.	Unit see BE 14

A.23 Flow computer 3 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	CA	1	Temperature			var.	Unit see CE 1
A	CA	3	Absolute pressure			var.	Unit see CE 3
A	CA	4	Operating density			var.	Unit see CE 4
A	CA	10	Compress.factor			none	
A	CA	11	k-Number			none	
A	CA	12	Conversion factor			none	
A	CA	13	Volume flow			var.	Unit see CE 13
A	CA	14	Volume fl. corr.			var.	Unit see CE 13

A.24 Flow computer 3 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**CB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**CB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**CB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	CB	4	Standard density			var.	Unit see CE 4
A	CB	5	Calorific value			var.	Unit see CE 5
A	CB	6	Carbondioxide			var.	Unit see CE 6

A	CB	7	Hydrogen			var.	Unit see CE 6
A	CB	8	Nitrogen			var.	Unit see CE 6
A	CB	9	Reletive density			none	
A	CB	10	Compress.factor			none	
A	CB	13	Volume flow			var.	Unit see CE 13
A	CB	14	Energy flow			var.	Unit see CE 14
A	CB	15	Mass flow			var.	Unit see CE 15

A.25 Flow computer 3 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**CC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**CC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**CC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**CC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**CC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**CC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**CC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**CC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**CC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**CC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.26 Flow computer 3 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	CD	1	Temperature	Discrete texts		none	Error; okay;
A	CD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	CD	4	gas quality	Discrete texts		none	Error; okay;
A	CD	10	Equation of state	Discrete texts		none	Error; okay;
A	CD	13	Volume input	Discrete texts		none	Error; okay;
A	CD	15	Conversion	Discrete texts		none	Error; okay;
D	CD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.27 Flow computer 3 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	CE	1	Temperature	Menu		none	°C; °F; °K; °Ra;
E	CE	3	Absolute pressure	Menu		none	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	CE	4	Density	Menu		none	kg/m3; lb/ft3;
E	CE	5	Calorific value	Menu		none	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	CE	6	Components	Menu		none	mol-%;
E	CE	13	Volume flow	Menu		none	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	CE	14	Energy flow	Menu		none	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	CE	15	Mass flow	Menu		none	kg/h; lb/h; kg/s; lb/s;
E	CE	30	Unit Vb	Menu		none	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	CE	31	Unit Vm	Menu		none	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	CE	32	Unit E	Menu		none	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	CE	33	Unit M	Menu		none	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.28 Flow computer 3 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	CF	1	Temperature	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	3	Absolute pressure	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	4	Density	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	5	Calorific value	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	6	Components	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	7	Relative density	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	13	Volume flow	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	14	Energy flow	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	15	Mass flow	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	CF	16	Quantities	Menu		none	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.29 Flow computer 3 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	CG	1	Vm			var.	Unit see CE 31
Z	CG	2	DVm			var.	Unit see CE 31
Z	CG	3	Vmc			var.	Unit see CE 31
Z	CG	4	DVmc			var.	Unit see CE 31
Z	CG	5	Vb			var.	Unit see CE 30
Z	CG	6	DVb			var.	Unit see CE 30
Z	CG	7	E			var.	Unit see CE 32
Z	CG	8	DE			var.	Unit see CE 32
Z	CG	9	M			var.	Unit see CE 33
Z	CG	10	DM			var.	Unit see CE 33
D	CG	11	last hr. Vm			var.	Unit see CE 31
D	CG	12	last hr. DVm			var.	Unit see CE 31
D	CG	13	last hr. Vmc			var.	Unit see CE 31
D	CG	14	last hr. DVmc			var.	Unit see CE 31
D	CG	15	last hr. Vb			var.	Unit see CE 30
D	CG	16	last hr. DVb			var.	Unit see CE 30
D	CG	17	last hr. E			var.	Unit see CE 32
D	CG	18	last hr. DE			var.	Unit see CE 32
D	CG	19	last hr. M			var.	Unit see CE 33
D	CG	20	last hr. DM			var.	Unit see CE 33

A.30 Flow computer 3 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	CH	1	Vm			var.	Unit see CE 31
Z	CH	2	DVm			var.	Unit see CE 31
Z	CH	3	Vmc			var.	Unit see CE 31
Z	CH	4	DVmc			var.	Unit see CE 31
Z	CH	5	Vb			var.	Unit see CE 30
Z	CH	6	DVb			var.	Unit see CE 30
Z	CH	7	E			var.	Unit see CE 32
Z	CH	8	DE			var.	Unit see CE 32
Z	CH	9	M			var.	Unit see CE 33
Z	CH	10	DM			var.	Unit see CE 33
D	CH	11	Yesterday Vm			var.	Unit see CE 31
D	CH	12	Yesterday DVm			var.	Unit see CE 31
D	CH	13	Yesterday Vmc			var.	Unit see CE 31
D	CH	14	Yesterday DVmc			var.	Unit see CE 31
D	CH	15	Yesterday Vb			var.	Unit see CE 30
D	CH	16	Yesterday DVb			var.	Unit see CE 30

D	CH	17	Yesterday E			var.	Unit see CE 32
D	CH	18	Yesterday DE			var.	Unit see CE 32
D	CH	19	Yesterday M			var.	Unit see CE 33
D	CH	20	Yesterday DM			var.	Unit see CE 33

A.31 Flow computer 3 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	CI	1	Vm			var.	Unit see CE 31
Z	CI	2	DVm			var.	Unit see CE 31
Z	CI	3	Vmc			var.	Unit see CE 31
Z	CI	4	DVmc			var.	Unit see CE 31
Z	CI	5	Vb			var.	Unit see CE 30
Z	CI	6	DVb			var.	Unit see CE 30
Z	CI	7	E			var.	Unit see CE 32
Z	CI	8	DE			var.	Unit see CE 32
Z	CI	9	M			var.	Unit see CE 33
Z	CI	10	DM			var.	Unit see CE 33

A.32 Flow computer 3 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	CJ	1	Vm			var.	Unit see CE 31
Z	CJ	2	DVm			var.	Unit see CE 31
Z	CJ	3	Vmc			var.	Unit see CE 31
Z	CJ	4	DVmc			var.	Unit see CE 31
Z	CJ	5	Vb			var.	Unit see CE 30
Z	CJ	6	DVb			var.	Unit see CE 30
Z	CJ	7	E			var.	Unit see CE 32
Z	CJ	8	DE			var.	Unit see CE 32
Z	CJ	9	M			var.	Unit see CE 33
Z	CJ	10	DM			var.	Unit see CE 33
D	CJ	11	Yesterday Vm			var.	Unit see CE 31
D	CJ	12	Yesterday DVm			var.	Unit see CE 31
D	CJ	13	Yesterday Vmc			var.	Unit see CE 31
D	CJ	14	Yesterday DVmc			var.	Unit see CE 31
D	CJ	15	Yesterday Vb			var.	Unit see CE 30
D	CJ	16	Yesterday DVb			var.	Unit see CE 30
D	CJ	17	Yesterday E			var.	Unit see CE 32
D	CJ	18	Yesterday DE			var.	Unit see CE 32
D	CJ	19	Yesterday M			var.	Unit see CE 33
D	CJ	20	Yesterday DM			var.	Unit see CE 33

A.33 Flow computer 3 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	CK	1	T second			var.	Unit see CE 1
D	CK	2	T minute			var.	Unit see CE 1
D	CK	3	T hour			var.	Unit see CE 1
D	CK	4	T day			var.	Unit see CE 1
D	CK	5	P second			var.	Unit see CE 3
D	CK	6	P minute			var.	Unit see CE 3
D	CK	7	P hour			var.	Unit see CE 3
D	CK	8	P day			var.	Unit see CE 3
D	CK	9	Hs second			var.	Unit see CE 5
D	CK	10	Hs minute			var.	Unit see CE 5
D	CK	11	Hs hour			var.	Unit see CE 5
D	CK	12	Hs day			var.	Unit see CE 5
D	CK	13	Rd second			none	
D	CK	14	Rd minute			none	
D	CK	15	Rd hour			none	
D	CK	16	Rd day			none	
D	CK	17	Qm second			var.	Unit see CE 13
D	CK	18	Qm minute			var.	Unit see CE 13
D	CK	19	Qm hour			var.	Unit see CE 13
D	CK	20	Qm day			var.	Unit see CE 13
D	CK	21	Qb second			var.	Unit see CE 13
D	CK	22	Qb minute			var.	Unit see CE 13
D	CK	23	Qb hour			var.	Unit see CE 13
D	CK	24	Qb day			var.	Unit see CE 13
D	CK	25	Qe second			var.	Unit see CE 14
D	CK	26	Qe minute			var.	Unit see CE 14
D	CK	27	Qe hour			var.	Unit see CE 14
D	CK	28	Qe day			var.	Unit see CE 14

A.34 Flow computer 4 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	DA	1	Temperature			var.	Unit see DE 1
A	DA	3	Absolute pressure			var.	Unit see DE 3
A	DA	4	Operating density			var.	Unit see DE 4
A	DA	10	Compress.factor			none	
A	DA	11	k-Number			none	
A	DA	12	Conversion factor			none	
A	DA	13	Volume flow			var.	Unit see DE 13
A	DA	14	Volume fl. corr.			var.	Unit see DE 13

A.35 Flow computer 4 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**DB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**DB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**DB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	DB	4	Standard density			var.	Unit see DE 4
A	DB	5	Calorific value			var.	Unit see DE 5
A	DB	6	Carbondioxide			var.	Unit see DE 6
A	DB	7	Hydrogen			var.	Unit see DE 6
A	DB	8	Nitrogen			var.	Unit see DE 6
A	DB	9	Reletive density			none	
A	DB	10	Compress.factor			none	
A	DB	13	Volume flow			var.	Unit see DE 13
A	DB	14	Energy flow			var.	Unit see DE 14
A	DB	15	Mass flow			var.	Unit see DE 15

A.36 Flow computer 4 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**DC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**DC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**DC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**DC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**DC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**DC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**DC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**DC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**DC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**DC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.37 Flow computer 4 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	DD	1	Temperature	Discrete texts		none	Error; okay;
A	DD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	DD	4	gas quality	Discrete texts		none	Error; okay;
A	DD	10	Equation of state	Discrete texts		none	Error; okay;
A	DD	13	Volume input	Discrete texts		none	Error; okay;
A	DD	15	Conversion	Discrete texts		none	Error; okay;
D	DD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.38 Flow computer 4 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**DE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**DE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**DE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**DE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**DE**	**6**	**Components**	Menu		**none**	mol-%;
E	**DE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**DE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**DE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**DE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**DE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**DE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**DE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.39 Flow computer 4 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**DF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

E	**DF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**DF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.40 Flow computer 4 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	DG	1	Vm			var.	Unit see DE 31
Z	DG	2	DVm			var.	Unit see DE 31
Z	DG	3	Vmc			var.	Unit see DE 31
Z	DG	4	DVmc			var.	Unit see DE 31
Z	DG	5	Vb			var.	Unit see DE 30
Z	DG	6	DVb			var.	Unit see DE 30
Z	DG	7	E			var.	Unit see DE 32
Z	DG	8	DE			var.	Unit see DE 32
Z	DG	9	M			var.	Unit see DE 33
Z	DG	10	DM			var.	Unit see DE 33
D	DG	11	last hr. Vm			var.	Unit see DE 31
D	DG	12	last hr. DVm			var.	Unit see DE 31
D	DG	13	last hr. Vmc			var.	Unit see DE 31
D	DG	14	last hr. DVmc			var.	Unit see DE 31
D	DG	15	last hr. Vb			var.	Unit see DE 30
D	DG	16	last hr. DVb			var.	Unit see DE 30
D	DG	17	last hr. E			var.	Unit see DE 32
D	DG	18	last hr. DE			var.	Unit see DE 32
D	DG	19	last hr. M			var.	Unit see DE 33
D	DG	20	last hr. DM			var.	Unit see DE 33

A.41 Flow computer 4 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	DH	1	Vm			var.	Unit see DE 31
Z	DH	2	DVm			var.	Unit see DE 31
Z	DH	3	Vmc			var.	Unit see DE 31

Z	DH	4	DVmc			var.	Unit see DE 31
Z	DH	5	Vb			var.	Unit see DE 30
Z	DH	6	DVb			var.	Unit see DE 30
Z	DH	7	E			var.	Unit see DE 32
Z	DH	8	DE			var.	Unit see DE 32
Z	DH	9	M			var.	Unit see DE 33
Z	DH	10	DM			var.	Unit see DE 33
D	DH	11	Yesterday Vm			var.	Unit see DE 31
D	DH	12	Yesterday DVm			var.	Unit see DE 31
D	DH	13	Yesterday Vmc			var.	Unit see DE 31
D	DH	14	Yesterday DVmc			var.	Unit see DE 31
D	DH	15	Yesterday Vb			var.	Unit see DE 30
D	DH	16	Yesterday DVb			var.	Unit see DE 30
D	DH	17	Yesterday E			var.	Unit see DE 32
D	DH	18	Yesterday DE			var.	Unit see DE 32
D	DH	19	Yesterday M			var.	Unit see DE 33
D	DH	20	Yesterday DM			var.	Unit see DE 33

A.42 Flow computer 4 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	DI	1	Vm			var.	Unit see DE 31
Z	DI	2	DVm			var.	Unit see DE 31
Z	DI	3	Vmc			var.	Unit see DE 31
Z	DI	4	DVmc			var.	Unit see DE 31
Z	DI	5	Vb			var.	Unit see DE 30
Z	DI	6	DVb			var.	Unit see DE 30
Z	DI	7	E			var.	Unit see DE 32
Z	DI	8	DE			var.	Unit see DE 32
Z	DI	9	M			var.	Unit see DE 33
Z	DI	10	DM			var.	Unit see DE 33

A.43 Flow computer 4 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	DJ	1	Vm			var.	Unit see DE 31
Z	DJ	2	DVm			var.	Unit see DE 31
Z	DJ	3	Vmc			var.	Unit see DE 31
Z	DJ	4	DVmc			var.	Unit see DE 31
Z	DJ	5	Vb			var.	Unit see DE 30
Z	DJ	6	DVb			var.	Unit see DE 30
Z	DJ	7	E			var.	Unit see DE 32

Z	DJ	8	DE			var.	Unit see DE 32
Z	DJ	9	M			var.	Unit see DE 33
Z	DJ	10	DM			var.	Unit see DE 33
D	DJ	11	Yesterday Vm			var.	Unit see DE 31
D	DJ	12	Yesterday DVm			var.	Unit see DE 31
D	DJ	13	Yesterday Vmc			var.	Unit see DE 31
D	DJ	14	Yesterday DVmc			var.	Unit see DE 31
D	DJ	15	Yesterday Vb			var.	Unit see DE 30
D	DJ	16	Yesterday DVb			var.	Unit see DE 30
D	DJ	17	Yesterday E			var.	Unit see DE 32
D	DJ	18	Yesterday DE			var.	Unit see DE 32
D	DJ	19	Yesterday M			var.	Unit see DE 33
D	DJ	20	Yesterday DM			var.	Unit see DE 33

A.44 Flow computer 4 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	DK	1	T second			var.	Unit see DE 1
D	DK	2	T minute			var.	Unit see DE 1
D	DK	3	T hour			var.	Unit see DE 1
D	DK	4	T day			var.	Unit see DE 1
D	DK	5	P second			var.	Unit see DE 3
D	DK	6	P minute			var.	Unit see DE 3
D	DK	7	P hour			var.	Unit see DE 3
D	DK	8	P day			var.	Unit see DE 3
D	DK	9	Hs second			var.	Unit see DE 5
D	DK	10	Hs minute			var.	Unit see DE 5
D	DK	11	Hs hour			var.	Unit see DE 5
D	DK	12	Hs day			var.	Unit see DE 5
D	DK	13	Rd second			none	
D	DK	14	Rd minute			none	
D	DK	15	Rd hour			none	
D	DK	16	Rd day			none	
D	DK	17	Qm second			var.	Unit see DE 13
D	DK	18	Qm minute			var.	Unit see DE 13
D	DK	19	Qm hour			var.	Unit see DE 13
D	DK	20	Qm day			var.	Unit see DE 13
D	DK	21	Qb second			var.	Unit see DE 13
D	DK	22	Qb minute			var.	Unit see DE 13
D	DK	23	Qb hour			var.	Unit see DE 13
D	DK	24	Qb day			var.	Unit see DE 13

D	DK	25	Qe second			var.	Unit see DE 14
D	DK	26	Qe minute			var.	Unit see DE 14
D	DK	27	Qe hour			var.	Unit see DE 14
D	DK	28	Qe day			var.	Unit see DE 14

A.45 Flow computer 5 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	EA	1	Temperature			var.	Unit see EE 1
A	EA	3	Absolute pressure			var.	Unit see EE 3
A	EA	4	Operating density			var.	Unit see EE 4
A	EA	10	Compress.factor			none	
A	EA	11	k-Number			none	
A	EA	12	Conversion factor			none	
A	EA	13	Volume flow			var.	Unit see EE 13
A	EA	14	Volume fl. corr.			var.	Unit see EE 13

A.46 Flow computer 5 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**EB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**EB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**EB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	EB	4	Standard density			var.	Unit see EE 4
A	EB	5	Calorific value			var.	Unit see EE 5
A	EB	6	Carbondioxide			var.	Unit see EE 6
A	EB	7	Hydrogen			var.	Unit see EE 6
A	EB	8	Nitrogen			var.	Unit see EE 6
A	EB	9	Reletive density			none	
A	EB	10	Compress.factor			none	
A	EB	13	Volume flow			var.	Unit see EE 13
A	EB	14	Energy flow			var.	Unit see EE 14
A	EB	15	Mass flow			var.	Unit see EE 15

A.47 Flow computer 5 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**EC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**EC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**EC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus

							Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**EC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**EC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**EC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**EC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**EC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**EC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**EC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.48 Flow computer 5 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	ED	1	Temperature	Discrete texts		none	Error; okay;
A	ED	3	Absolute pressure	Discrete texts		none	Error; okay;
A	ED	4	gas quality	Discrete texts		none	Error; okay;
A	ED	10	Equation of state	Discrete texts		none	Error; okay;
A	ED	13	Volume input	Discrete texts		none	Error; okay;
A	ED	15	Conversion	Discrete texts		none	Error; okay;
D	ED	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.49 Flow computer 5 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**EE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**EE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**EE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**EE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**EE**	**6**	**Components**	Menu		**none**	mol-%;
E	**EE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**EE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**EE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**EE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;

E	**EE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**EE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**EE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.50 Flow computer 5 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**EF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**EF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.51 Flow computer 5 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	EG	1	Vm			var.	Unit see EE 31
Z	EG	2	DVm			var.	Unit see EE 31
Z	EG	3	Vmc			var.	Unit see EE 31
Z	EG	4	DVmc			var.	Unit see EE 31
Z	EG	5	Vb			var.	Unit see EE 30
Z	EG	6	DVb			var.	Unit see EE 30
Z	EG	7	E			var.	Unit see EE 32
Z	EG	8	DE			var.	Unit see EE 32
Z	EG	9	M			var.	Unit see EE 33
Z	EG	10	DM			var.	Unit see EE 33

D	EG	11	last hr. Vm			var.	Unit see EE 31
D	EG	12	last hr. DVm			var.	Unit see EE 31
D	EG	13	last hr. Vmc			var.	Unit see EE 31
D	EG	14	last hr. DVmc			var.	Unit see EE 31
D	EG	15	last hr. Vb			var.	Unit see EE 30
D	EG	16	last hr. DVb			var.	Unit see EE 30
D	EG	17	last hr. E			var.	Unit see EE 32
D	EG	18	last hr. DE			var.	Unit see EE 32
D	EG	19	last hr. M			var.	Unit see EE 33
D	EG	20	last hr. DM			var.	Unit see EE 33

A.52 Flow computer 5 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	EH	1	Vm			var.	Unit see EE 31
Z	EH	2	DVm			var.	Unit see EE 31
Z	EH	3	Vmc			var.	Unit see EE 31
Z	EH	4	DVmc			var.	Unit see EE 31
Z	EH	5	Vb			var.	Unit see EE 30
Z	EH	6	DVb			var.	Unit see EE 30
Z	EH	7	E			var.	Unit see EE 32
Z	EH	8	DE			var.	Unit see EE 32
Z	EH	9	M			var.	Unit see EE 33
Z	EH	10	DM			var.	Unit see EE 33
D	EH	11	Yesterday Vm			var.	Unit see EE 31
D	EH	12	Yesterday DVm			var.	Unit see EE 31
D	EH	13	Yesterday Vmc			var.	Unit see EE 31
D	EH	14	Yesterday DVmc			var.	Unit see EE 31
D	EH	15	Yesterday Vb			var.	Unit see EE 30
D	EH	16	Yesterday DVb			var.	Unit see EE 30
D	EH	17	Yesterday E			var.	Unit see EE 32
D	EH	18	Yesterday DE			var.	Unit see EE 32
D	EH	19	Yesterday M			var.	Unit see EE 33
D	EH	20	Yesterday DM			var.	Unit see EE 33

A.53 Flow computer 5 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	EI	1	Vm			var.	Unit see EE 31
Z	EI	2	DVm			var.	Unit see EE 31
Z	EI	3	Vmc			var.	Unit see EE 31
Z	EI	4	DVmc			var.	Unit see EE 31

Z	EI	5	Vb			var.	Unit see EE 30
Z	EI	6	DVb			var.	Unit see EE 30
Z	EI	7	E			var.	Unit see EE 32
Z	EI	8	DE			var.	Unit see EE 32
Z	EI	9	M			var.	Unit see EE 33
Z	EI	10	DM			var.	Unit see EE 33

A.54 Flow computer 5 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	EJ	1	Vm			var.	Unit see EE 31
Z	EJ	2	DVm			var.	Unit see EE 31
Z	EJ	3	Vmc			var.	Unit see EE 31
Z	EJ	4	DVmc			var.	Unit see EE 31
Z	EJ	5	Vb			var.	Unit see EE 30
Z	EJ	6	DVb			var.	Unit see EE 30
Z	EJ	7	E			var.	Unit see EE 32
Z	EJ	8	DE			var.	Unit see EE 32
Z	EJ	9	M			var.	Unit see EE 33
Z	EJ	10	DM			var.	Unit see EE 33
D	EJ	11	Yesterday Vm			var.	Unit see EE 31
D	EJ	12	Yesterday DVm			var.	Unit see EE 31
D	EJ	13	Yesterday Vmc			var.	Unit see EE 31
D	EJ	14	Yesterday DVmc			var.	Unit see EE 31
D	EJ	15	Yesterday Vb			var.	Unit see EE 30
D	EJ	16	Yesterday DVb			var.	Unit see EE 30
D	EJ	17	Yesterday E			var.	Unit see EE 32
D	EJ	18	Yesterday DE			var.	Unit see EE 32
D	EJ	19	Yesterday M			var.	Unit see EE 33
D	EJ	20	Yesterday DM			var.	Unit see EE 33

A.55 Flow computer 5 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	EK	1	T second			var.	Unit see EE 1
D	EK	2	T minute			var.	Unit see EE 1
D	EK	3	T hour			var.	Unit see EE 1
D	EK	4	T day			var.	Unit see EE 1
D	EK	5	P second			var.	Unit see EE 3
D	EK	6	P minute			var.	Unit see EE 3
D	EK	7	P hour			var.	Unit see EE 3
D	EK	8	P day			var.	Unit see EE 3

D	EK	9	Hs second			var.	Unit see EE 5
D	EK	10	Hs minute			var.	Unit see EE 5
D	EK	11	Hs hour			var.	Unit see EE 5
D	EK	12	Hs day			var.	Unit see EE 5
D	EK	13	Rd second			none	
D	EK	14	Rd minute			none	
D	EK	15	Rd hour			none	
D	EK	16	Rd day			none	
D	EK	17	Qm second			var.	Unit see EE 13
D	EK	18	Qm minute			var.	Unit see EE 13
D	EK	19	Qm hour			var.	Unit see EE 13
D	EK	20	Qm day			var.	Unit see EE 13
D	EK	21	Qb second			var.	Unit see EE 13
D	EK	22	Qb minute			var.	Unit see EE 13
D	EK	23	Qb hour			var.	Unit see EE 13
D	EK	24	Qb day			var.	Unit see EE 13
D	EK	25	Qe second			var.	Unit see EE 14
D	EK	26	Qe minute			var.	Unit see EE 14
D	EK	27	Qe hour			var.	Unit see EE 14
D	EK	28	Qe day			var.	Unit see EE 14

A.56 Flow computer 6 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	FA	1	Temperature			var.	Unit see FE 1
A	FA	3	Absolute pressure			var.	Unit see FE 3
A	FA	4	Operating density			var.	Unit see FE 4
A	FA	10	Compress.factor			none	
A	FA	11	k-Number			none	
A	FA	12	Conversion factor			none	
A	FA	13	Volume flow			var.	Unit see FE 13
A	FA	14	Volume fl. corr.			var.	Unit see FE 13

A.57 Flow computer 6 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**FB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**FB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**FB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	FB	4	Standard density			var.	Unit see FE 4
A	FB	5	Calorific value			var.	Unit see FE 5
A	FB	6	Carbondioxide			var.	Unit see FE 6

A	FB	7	Hydrogen			var.	Unit see FE 6
A	FB	8	Nitrogen			var.	Unit see FE 6
A	FB	9	Reletive density			none	
A	FB	10	Compress.factor			none	
A	FB	13	Volume flow			var.	Unit see FE 13
A	FB	14	Energy flow			var.	Unit see FE 14
A	FB	15	Mass flow			var.	Unit see FE 15

A.58 Flow computer 6 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**FC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**FC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**FC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**FC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**FC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**FC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**FC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**FC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**FC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**FC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.59 Flow computer 6 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	FD	1	Temperature	Discrete texts		none	Error; okay;
A	FD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	FD	4	gas quality	Discrete texts		none	Error; okay;
A	FD	10	Equation of state	Discrete texts		none	Error; okay;
A	FD	13	Volume input	Discrete texts		none	Error; okay;
A	FD	15	Conversion	Discrete texts		none	Error; okay;
D	FD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.60 Flow computer 6 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**FE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**FE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**FE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**FE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**FE**	**6**	**Components**	Menu		**none**	mol-%;
E	**FE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**FE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**FE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**FE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**FE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**FE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**FE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.61 Flow computer 6 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**FF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**FF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.62 Flow computer 6 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	FG	1	Vm			var.	Unit see FE 31
Z	FG	2	DVm			var.	Unit see FE 31
Z	FG	3	Vmc			var.	Unit see FE 31
Z	FG	4	DVmc			var.	Unit see FE 31
Z	FG	5	Vb			var.	Unit see FE 30
Z	FG	6	DVb			var.	Unit see FE 30
Z	FG	7	E			var.	Unit see FE 32
Z	FG	8	DE			var.	Unit see FE 32
Z	FG	9	M			var.	Unit see FE 33
Z	FG	10	DM			var.	Unit see FE 33
D	FG	11	last hr. Vm			var.	Unit see FE 31
D	FG	12	last hr. DVm			var.	Unit see FE 31
D	FG	13	last hr. Vmc			var.	Unit see FE 31
D	FG	14	last hr. DVmc			var.	Unit see FE 31
D	FG	15	last hr. Vb			var.	Unit see FE 30
D	FG	16	last hr. DVb			var.	Unit see FE 30
D	FG	17	last hr. E			var.	Unit see FE 32
D	FG	18	last hr. DE			var.	Unit see FE 32
D	FG	19	last hr. M			var.	Unit see FE 33
D	FG	20	last hr. DM			var.	Unit see FE 33

A.63 Flow computer 6 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	FH	1	Vm			var.	Unit see FE 31
Z	FH	2	DVm			var.	Unit see FE 31
Z	FH	3	Vmc			var.	Unit see FE 31
Z	FH	4	DVmc			var.	Unit see FE 31
Z	FH	5	Vb			var.	Unit see FE 30
Z	FH	6	DVb			var.	Unit see FE 30
Z	FH	7	E			var.	Unit see FE 32
Z	FH	8	DE			var.	Unit see FE 32
Z	FH	9	M			var.	Unit see FE 33
Z	FH	10	DM			var.	Unit see FE 33
D	FH	11	Yesterday Vm			var.	Unit see FE 31
D	FH	12	Yesterday DVm			var.	Unit see FE 31
D	FH	13	Yesterday Vmc			var.	Unit see FE 31
D	FH	14	Yesterday DVmc			var.	Unit see FE 31
D	FH	15	Yesterday Vb			var.	Unit see FE 30
D	FH	16	Yesterday DVb			var.	Unit see FE 30

D	FH	17	Yesterday E			var.	Unit see FE 32
D	FH	18	Yesterday DE			var.	Unit see FE 32
D	FH	19	Yesterday M			var.	Unit see FE 33
D	FH	20	Yesterday DM			var.	Unit see FE 33

A.64 Flow computer 6 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	FI	1	Vm			var.	Unit see FE 31
Z	FI	2	DVm			var.	Unit see FE 31
Z	FI	3	Vmc			var.	Unit see FE 31
Z	FI	4	DVmc			var.	Unit see FE 31
Z	FI	5	Vb			var.	Unit see FE 30
Z	FI	6	DVb			var.	Unit see FE 30
Z	FI	7	E			var.	Unit see FE 32
Z	FI	8	DE			var.	Unit see FE 32
Z	FI	9	M			var.	Unit see FE 33
Z	FI	10	DM			var.	Unit see FE 33

A.65 Flow computer 6 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	FJ	1	Vm			var.	Unit see FE 31
Z	FJ	2	DVm			var.	Unit see FE 31
Z	FJ	3	Vmc			var.	Unit see FE 31
Z	FJ	4	DVmc			var.	Unit see FE 31
Z	FJ	5	Vb			var.	Unit see FE 30
Z	FJ	6	DVb			var.	Unit see FE 30
Z	FJ	7	E			var.	Unit see FE 32
Z	FJ	8	DE			var.	Unit see FE 32
Z	FJ	9	M			var.	Unit see FE 33
Z	FJ	10	DM			var.	Unit see FE 33
D	FJ	11	Yesterday Vm			var.	Unit see FE 31
D	FJ	12	Yesterday DVm			var.	Unit see FE 31
D	FJ	13	Yesterday Vmc			var.	Unit see FE 31
D	FJ	14	Yesterday DVmc			var.	Unit see FE 31
D	FJ	15	Yesterday Vb			var.	Unit see FE 30
D	FJ	16	Yesterday DVb			var.	Unit see FE 30
D	FJ	17	Yesterday E			var.	Unit see FE 32
D	FJ	18	Yesterday DE			var.	Unit see FE 32
D	FJ	19	Yesterday M			var.	Unit see FE 33
D	FJ	20	Yesterday DM			var.	Unit see FE 33

A.66 Flow computer 6 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	FK	1	T second			var.	Unit see FE 1
D	FK	2	T minute			var.	Unit see FE 1
D	FK	3	T hour			var.	Unit see FE 1
D	FK	4	T day			var.	Unit see FE 1
D	FK	5	P second			var.	Unit see FE 3
D	FK	6	P minute			var.	Unit see FE 3
D	FK	7	P hour			var.	Unit see FE 3
D	FK	8	P day			var.	Unit see FE 3
D	FK	9	Hs second			var.	Unit see FE 5
D	FK	10	Hs minute			var.	Unit see FE 5
D	FK	11	Hs hour			var.	Unit see FE 5
D	FK	12	Hs day			var.	Unit see FE 5
D	FK	13	Rd second			none	
D	FK	14	Rd minute			none	
D	FK	15	Rd hour			none	
D	FK	16	Rd day			none	
D	FK	17	Qm second			var.	Unit see FE 13
D	FK	18	Qm minute			var.	Unit see FE 13
D	FK	19	Qm hour			var.	Unit see FE 13
D	FK	20	Qm day			var.	Unit see FE 13
D	FK	21	Qb second			var.	Unit see FE 13
D	FK	22	Qb minute			var.	Unit see FE 13
D	FK	23	Qb hour			var.	Unit see FE 13
D	FK	24	Qb day			var.	Unit see FE 13
D	FK	25	Qe second			var.	Unit see FE 14
D	FK	26	Qe minute			var.	Unit see FE 14
D	FK	27	Qe hour			var.	Unit see FE 14
D	FK	28	Qe day			var.	Unit see FE 14

A.67 Flow computer 7 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	GA	1	Temperature			var.	Unit see GE 1
A	GA	3	Absolute pressure			var.	Unit see GE 3
A	GA	4	Operating density			var.	Unit see GE 4
A	GA	10	Compress.factor			none	
A	GA	11	k-Number			none	
A	GA	12	Conversion factor			none	
A	GA	13	Volume flow			var.	Unit see GE 13
A	GA	14	Volume fl. corr.			var.	Unit see GE 13

A.68 Flow computer 7 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**GB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**GB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**GB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	GB	4	Standard density			var.	Unit see GE 4
A	GB	5	Calorific value			var.	Unit see GE 5
A	GB	6	Carbondioxide			var.	Unit see GE 6
A	GB	7	Hydrogen			var.	Unit see GE 6
A	GB	8	Nitrogen			var.	Unit see GE 6
A	GB	9	Reletive density			none	
A	GB	10	Compress.factor			none	
A	GB	13	Volume flow			var.	Unit see GE 13
A	GB	14	Energy flow			var.	Unit see GE 14
A	GB	15	Mass flow			var.	Unit see GE 15

A.69 Flow computer 7 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**GC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**GC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**GC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C; RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**GC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**GC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**GC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**GC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**GC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**GC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**GC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.70 Flow computer 7 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	GD	1	Temperature	Discrete texts		none	Error; okay;
A	GD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	GD	4	gas quality	Discrete texts		none	Error; okay;
A	GD	10	Equation of state	Discrete texts		none	Error; okay;
A	GD	13	Volume input	Discrete texts		none	Error; okay;
A	GD	15	Conversion	Discrete texts		none	Error; okay;
D	GD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.71 Flow computer 7 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**GE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**GE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**GE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**GE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**GE**	**6**	**Components**	Menu		**none**	mol-%;
E	**GE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**GE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**GE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**GE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**GE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**GE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**GE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.72 Flow computer 7 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**GF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

E	**GF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**GF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.73 Flow computer 7 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	GG	1	Vm			var.	Unit see GE 31
Z	GG	2	DVm			var.	Unit see GE 31
Z	GG	3	Vmc			var.	Unit see GE 31
Z	GG	4	DVmc			var.	Unit see GE 31
Z	GG	5	Vb			var.	Unit see GE 30
Z	GG	6	DVb			var.	Unit see GE 30
Z	GG	7	E			var.	Unit see GE 32
Z	GG	8	DE			var.	Unit see GE 32
Z	GG	9	M			var.	Unit see GE 33
Z	GG	10	DM			var.	Unit see GE 33
D	GG	11	last hr. Vm			var.	Unit see GE 31
D	GG	12	last hr. DVm			var.	Unit see GE 31
D	GG	13	last hr. Vmc			var.	Unit see GE 31
D	GG	14	last hr. DVmc			var.	Unit see GE 31
D	GG	15	last hr. Vb			var.	Unit see GE 30
D	GG	16	last hr. DVb			var.	Unit see GE 30
D	GG	17	last hr. E			var.	Unit see GE 32
D	GG	18	last hr. DE			var.	Unit see GE 32
D	GG	19	last hr. M			var.	Unit see GE 33
D	GG	20	last hr. DM			var.	Unit see GE 33

A.74 Flow computer 7 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	GH	1	Vm			var.	Unit see GE 31
Z	GH	2	DVm			var.	Unit see GE 31
Z	GH	3	Vmc			var.	Unit see GE 31

Z	GH	4	DVmc			var.	Unit see GE 31
Z	GH	5	Vb			var.	Unit see GE 30
Z	GH	6	DVb			var.	Unit see GE 30
Z	GH	7	E			var.	Unit see GE 32
Z	GH	8	DE			var.	Unit see GE 32
Z	GH	9	M			var.	Unit see GE 33
Z	GH	10	DM			var.	Unit see GE 33
D	GH	11	Yesterday Vm			var.	Unit see GE 31
D	GH	12	Yesterday DVm			var.	Unit see GE 31
D	GH	13	Yesterday Vmc			var.	Unit see GE 31
D	GH	14	Yesterday DVmc			var.	Unit see GE 31
D	GH	15	Yesterday Vb			var.	Unit see GE 30
D	GH	16	Yesterday DVb			var.	Unit see GE 30
D	GH	17	Yesterday E			var.	Unit see GE 32
D	GH	18	Yesterday DE			var.	Unit see GE 32
D	GH	19	Yesterday M			var.	Unit see GE 33
D	GH	20	Yesterday DM			var.	Unit see GE 33

A.75 Flow computer 7 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	GI	1	Vm			var.	Unit see GE 31
Z	GI	2	DVm			var.	Unit see GE 31
Z	GI	3	Vmc			var.	Unit see GE 31
Z	GI	4	DVmc			var.	Unit see GE 31
Z	GI	5	Vb			var.	Unit see GE 30
Z	GI	6	DVb			var.	Unit see GE 30
Z	GI	7	E			var.	Unit see GE 32
Z	GI	8	DE			var.	Unit see GE 32
Z	GI	9	M			var.	Unit see GE 33
Z	GI	10	DM			var.	Unit see GE 33

A.76 Flow computer 7 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	GJ	1	Vm			var.	Unit see GE 31
Z	GJ	2	DVm			var.	Unit see GE 31
Z	GJ	3	Vmc			var.	Unit see GE 31
Z	GJ	4	DVmc			var.	Unit see GE 31
Z	GJ	5	Vb			var.	Unit see GE 30
Z	GJ	6	DVb			var.	Unit see GE 30
Z	GJ	7	E			var.	Unit see GE 32

Z	GJ	8	DE			var.	Unit see GE 32
Z	GJ	9	M			var.	Unit see GE 33
Z	GJ	10	DM			var.	Unit see GE 33
D	GJ	11	Yesterday Vm			var.	Unit see GE 31
D	GJ	12	Yesterday DVm			var.	Unit see GE 31
D	GJ	13	Yesterday Vmc			var.	Unit see GE 31
D	GJ	14	Yesterday DVmc			var.	Unit see GE 31
D	GJ	15	Yesterday Vb			var.	Unit see GE 30
D	GJ	16	Yesterday DVb			var.	Unit see GE 30
D	GJ	17	Yesterday E			var.	Unit see GE 32
D	GJ	18	Yesterday DE			var.	Unit see GE 32
D	GJ	19	Yesterday M			var.	Unit see GE 33
D	GJ	20	Yesterday DM			var.	Unit see GE 33

A.77 Flow computer 7 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	GK	1	T second			var.	Unit see GE 1
D	GK	2	T minute			var.	Unit see GE 1
D	GK	3	T hour			var.	Unit see GE 1
D	GK	4	T day			var.	Unit see GE 1
D	GK	5	P second			var.	Unit see GE 3
D	GK	6	P minute			var.	Unit see GE 3
D	GK	7	P hour			var.	Unit see GE 3
D	GK	8	P day			var.	Unit see GE 3
D	GK	9	Hs second			var.	Unit see GE 5
D	GK	10	Hs minute			var.	Unit see GE 5
D	GK	11	Hs hour			var.	Unit see GE 5
D	GK	12	Hs day			var.	Unit see GE 5
D	GK	13	Rd second			none	
D	GK	14	Rd minute			none	
D	GK	15	Rd hour			none	
D	GK	16	Rd day			none	
D	GK	17	Qm second			var.	Unit see GE 13
D	GK	18	Qm minute			var.	Unit see GE 13
D	GK	19	Qm hour			var.	Unit see GE 13
D	GK	20	Qm day			var.	Unit see GE 13
D	GK	21	Qb second			var.	Unit see GE 13
D	GK	22	Qb minute			var.	Unit see GE 13
D	GK	23	Qb hour			var.	Unit see GE 13
D	GK	24	Qb day			var.	Unit see GE 13

D	GK	25	Qe second			var.	Unit see GE 14
D	GK	26	Qe minute			var.	Unit see GE 14
D	GK	27	Qe hour			var.	Unit see GE 14
D	GK	28	Qe day			var.	Unit see GE 14

A.78 Flow computer 8 measurement condition

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	HA	1	Temperature			var.	Unit see HE 1
A	HA	3	Absolute pressure			var.	Unit see HE 3
A	HA	4	Operating density			var.	Unit see HE 4
A	HA	10	Compress.factor			none	
A	HA	11	k-Number			none	
A	HA	12	Conversion factor			none	
A	HA	13	Volume flow			var.	Unit see HE 13
A	HA	14	Volume fl. corr.			var.	Unit see HE 13

A.79 Flow computer 8 base conditions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**HB**	**1**	**Temperature**	Menu		**none**	0 °C; 15 °C; 59 °F; 60 °F; 20 °C;
E	**HB**	**2**	**Ref. temp. Hs**	Menu		**none**	0 °C; 15 °C; 20 °C; 60 °F; 25 °C;
E	**HB**	**3**	**Standard pressure**	Menu		**none**	1.01325 bar; 14.73 psi; 1 bar; 14.696 psi; 14.503 psi;
A	HB	4	Standard density			var.	Unit see HE 4
A	HB	5	Calorific value			var.	Unit see HE 5
A	HB	6	Carbondioxide			var.	Unit see HE 6
A	HB	7	Hydrogen			var.	Unit see HE 6
A	HB	8	Nitrogen			var.	Unit see HE 6
A	HB	9	Reletive density			none	
A	HB	10	Compress.factor			none	
A	HB	13	Volume flow			var.	Unit see HE 13
A	HB	14	Energy flow			var.	Unit see HE 14
A	HB	15	Mass flow			var.	Unit see HE 15

A.80 Flow computer 8 settings

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**HC**	**1**	**Temperature**	Menu		**none**	Temperature A; Temperature B; Temperature C; Temperature D;
E	**HC**	**3**	**Absolute pressure**	Menu		**none**	Pressure A; Pressure B; Pressure C; Pressure D;
E	**HC**	**4**	**gas quality**	Menu		**none**	Table A; Table B; Table C; Table D; RMG-Bus Stream A; RMG-Bus Stream B; RMG-Bus Stream C;

							RMG-Bus Stream D; Modbus A; Modbus B; Modbus C; Modbus D;
E	**HC**	**5**	**GQ-calculation**	Menu		**none**	ISO 6976; GPA 2172-96; Source value;
E	**HC**	**10**	**Equation of state**	Menu		**none**	Ideal gas; GERG 88 S Set A; GERG 88 S Set B; GERG 88 S Set C; AGA8 Gross M1; AGA8 Gross M2; AGA NX 19 L; AGA NX 19 H; AGA8 DC92;
E	**HC**	**13**	**Volume/Flow**	Menu		**none**	off; USE 09 A forward; USE 09 A reverse; USE 09 B forward; USE 09 B reverse; USE 09 C forward; USE 09 C reverse; USE 09 D forward; USE 09 D reverse; Volume pulse A; Volume pulse B; Volume pulse C; Volume pulse D;
B	**HC**	**14**	**Name**	Unlimited	Unlimited	**none**	
B	**HC**	**15**	**Condition**	Unlimited	Unlimited	**none**	
E	**HC**	**20**	**Activation**	Menu		**none**	off; on;
Y	**HC**	**30**	**reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.81 Flow computer 8 status

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	HD	1	Temperature	Discrete texts		none	Error; okay;
A	HD	3	Absolute pressure	Discrete texts		none	Error; okay;
A	HD	4	gas quality	Discrete texts		none	Error; okay;
A	HD	10	Equation of state	Discrete texts		none	Error; okay;
A	HD	13	Volume input	Discrete texts		none	Error; okay;
A	HD	15	Conversion	Discrete texts		none	Error; okay;
D	HD	16	Operation	Discrete texts		none	At rest; Running; Syntax;

A.82 Flow computer 8 units

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**HE**	**1**	**Temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**HE**	**3**	**Absolute pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**HE**	**4**	**Density**	Menu		**none**	kg/m3; lb/ft3;
E	**HE**	**5**	**Calorific value**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**HE**	**6**	**Components**	Menu		**none**	mol-%;
E	**HE**	**13**	**Volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**HE**	**14**	**Energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**HE**	**15**	**Mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**HE**	**30**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;

E	**HE**	**31**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**HE**	**32**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**HE**	**33**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;

A.83 Flow computer 8 formats

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**HF**	**1**	**Temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**3**	**Absolute pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**4**	**Density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**5**	**Calorific value**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**6**	**Components**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**7**	**Relative density**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**13**	**Volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**14**	**Energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**15**	**Mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**HF**	**16**	**Quantities**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.84 Flow computer 8 hourly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	HG	1	Vm			var.	Unit see HE 31
Z	HG	2	DVm			var.	Unit see HE 31
Z	HG	3	Vmc			var.	Unit see HE 31
Z	HG	4	DVmc			var.	Unit see HE 31
Z	HG	5	Vb			var.	Unit see HE 30
Z	HG	6	DVb			var.	Unit see HE 30
Z	HG	7	E			var.	Unit see HE 32
Z	HG	8	DE			var.	Unit see HE 32
Z	HG	9	M			var.	Unit see HE 33
Z	HG	10	DM			var.	Unit see HE 33

D	HG	11	last hr. Vm			var.	Unit see HE 31
D	HG	12	last hr. DVm			var.	Unit see HE 31
D	HG	13	last hr. Vmc			var.	Unit see HE 31
D	HG	14	last hr. DVmc			var.	Unit see HE 31
D	HG	15	last hr. Vb			var.	Unit see HE 30
D	HG	16	last hr. DVb			var.	Unit see HE 30
D	HG	17	last hr. E			var.	Unit see HE 32
D	HG	18	last hr. DE			var.	Unit see HE 32
D	HG	19	last hr. M			var.	Unit see HE 33
D	HG	20	last hr. DM			var.	Unit see HE 33

A.85 Flow computer 8 daily quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	HH	1	Vm			var.	Unit see HE 31
Z	HH	2	DVm			var.	Unit see HE 31
Z	HH	3	Vmc			var.	Unit see HE 31
Z	HH	4	DVmc			var.	Unit see HE 31
Z	HH	5	Vb			var.	Unit see HE 30
Z	HH	6	DVb			var.	Unit see HE 30
Z	HH	7	E			var.	Unit see HE 32
Z	HH	8	DE			var.	Unit see HE 32
Z	HH	9	M			var.	Unit see HE 33
Z	HH	10	DM			var.	Unit see HE 33
D	HH	11	Yesterday Vm			var.	Unit see HE 31
D	HH	12	Yesterday DVm			var.	Unit see HE 31
D	HH	13	Yesterday Vmc			var.	Unit see HE 31
D	HH	14	Yesterday DVmc			var.	Unit see HE 31
D	HH	15	Yesterday Vb			var.	Unit see HE 30
D	HH	16	Yesterday DVb			var.	Unit see HE 30
D	HH	17	Yesterday E			var.	Unit see HE 32
D	HH	18	Yesterday DE			var.	Unit see HE 32
D	HH	19	Yesterday M			var.	Unit see HE 33
D	HH	20	Yesterday DM			var.	Unit see HE 33

A.86 Flow computer 8 monthly quantities

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	HI	1	Vm			var.	Unit see HE 31
Z	HI	2	DVm			var.	Unit see HE 31
Z	HI	3	Vmc			var.	Unit see HE 31
Z	HI	4	DVmc			var.	Unit see HE 31

Z	HI	5	Vb			var.	Unit see HE 30
Z	HI	6	DVb			var.	Unit see HE 30
Z	HI	7	E			var.	Unit see HE 32
Z	HI	8	DE			var.	Unit see HE 32
Z	HI	9	M			var.	Unit see HE 33
Z	HI	10	DM			var.	Unit see HE 33

A.87 Flow computer 8 totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Z	HJ	1	Vm			var.	Unit see HE 31
Z	HJ	2	DVm			var.	Unit see HE 31
Z	HJ	3	Vmc			var.	Unit see HE 31
Z	HJ	4	DVmc			var.	Unit see HE 31
Z	HJ	5	Vb			var.	Unit see HE 30
Z	HJ	6	DVb			var.	Unit see HE 30
Z	HJ	7	E			var.	Unit see HE 32
Z	HJ	8	DE			var.	Unit see HE 32
Z	HJ	9	M			var.	Unit see HE 33
Z	HJ	10	DM			var.	Unit see HE 33
D	HJ	11	Yesterday Vm			var.	Unit see HE 31
D	HJ	12	Yesterday DVm			var.	Unit see HE 31
D	HJ	13	Yesterday Vmc			var.	Unit see HE 31
D	HJ	14	Yesterday DVmc			var.	Unit see HE 31
D	HJ	15	Yesterday Vb			var.	Unit see HE 30
D	HJ	16	Yesterday DVb			var.	Unit see HE 30
D	HJ	17	Yesterday E			var.	Unit see HE 32
D	HJ	18	Yesterday DE			var.	Unit see HE 32
D	HJ	19	Yesterday M			var.	Unit see HE 33
D	HJ	20	Yesterday DM			var.	Unit see HE 33

A.88 Flow computer 8 average values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	HK	1	T second			var.	Unit see HE 1
D	HK	2	T minute			var.	Unit see HE 1
D	HK	3	T hour			var.	Unit see HE 1
D	HK	4	T day			var.	Unit see HE 1
D	HK	5	P second			var.	Unit see HE 3
D	HK	6	P minute			var.	Unit see HE 3
D	HK	7	P hour			var.	Unit see HE 3
D	HK	8	P day			var.	Unit see HE 3

D	HK	9	Hs second			var.	Unit see HE 5
D	HK	10	Hs minute			var.	Unit see HE 5
D	HK	11	Hs hour			var.	Unit see HE 5
D	HK	12	Hs day			var.	Unit see HE 5
D	HK	13	Rd second			none	
D	HK	14	Rd minute			none	
D	HK	15	Rd hour			none	
D	HK	16	Rd day			none	
D	HK	17	Qm second			var.	Unit see HE 13
D	HK	18	Qm minute			var.	Unit see HE 13
D	HK	19	Qm hour			var.	Unit see HE 13
D	HK	20	Qm day			var.	Unit see HE 13
D	HK	21	Qb second			var.	Unit see HE 13
D	HK	22	Qb minute			var.	Unit see HE 13
D	HK	23	Qb hour			var.	Unit see HE 13
D	HK	24	Qb day			var.	Unit see HE 13
D	HK	25	Qe second			var.	Unit see HE 14
D	HK	26	Qe minute			var.	Unit see HE 14
D	HK	27	Qe hour			var.	Unit see HE 14
D	HK	28	Qe day			var.	Unit see HE 14

A.89 Archive group 1

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IA**	**1**	**Active**	Menu		**none**	no; yes;
B	**IA**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IA**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IA**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IA**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IA**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IA**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IA**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IA**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IA**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IA**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IA**	**17**	**Field 8**	Unlimited	Unlimited	**none**	

B	**IA**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IA**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IA**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IA**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IA**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IA**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IA**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IA**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IA**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IA**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IA**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IA**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IA**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IA**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IA**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IA**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.90 Archive group 2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IB**	**1**	**Active**	Menu		**none**	no; yes;
B	**IB**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IB**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IB**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IB**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IB**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IB**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IB**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IB**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IB**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IB**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IB**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IB**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IB**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IB**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IB**	**21**	**Field 12**	Unlimited	Unlimited	**none**	

B	**IB**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IB**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IB**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IB**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IB**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IB**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IB**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IB**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IB**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IB**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IB**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IB**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.91 Archive group 3

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IC**	**1**	**Active**	Menu		**none**	no; yes;
B	**IC**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IC**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IC**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IC**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IC**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IC**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IC**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IC**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IC**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IC**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IC**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IC**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IC**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IC**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IC**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IC**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IC**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IC**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IC**	**25**	**Field 16**	Unlimited	Unlimited	**none**	

B	**IC**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IC**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IC**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IC**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IC**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IC**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IC**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IC**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.92 Archive group 4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**ID**	**1**	**Active**	Menu		**none**	no; yes;
B	**ID**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**ID**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**ID**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**ID**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**ID**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**ID**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**ID**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**ID**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**ID**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**ID**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**ID**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**ID**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**ID**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**ID**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**ID**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**ID**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**ID**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**ID**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**ID**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**ID**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**ID**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**ID**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**ID**	**29**	**Field 20**	Unlimited	Unlimited	**none**	

B	**ID**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**ID**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**ID**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**ID**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.93 Archive group 5

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IE**	**1**	**Active**	Menu		**none**	no; yes;
B	**IE**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IE**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IE**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IE**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IE**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IE**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IE**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IE**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IE**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IE**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IE**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IE**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IE**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IE**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IE**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IE**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IE**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IE**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IE**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IE**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IE**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IE**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IE**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IE**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IE**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IE**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IE**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.94 Archive group 6

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IF**	**1**	**Active**	Menu		**none**	no; yes;
B	**IF**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IF**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IF**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IF**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IF**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IF**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IF**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IF**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IF**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IF**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IF**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IF**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IF**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IF**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IF**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IF**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IF**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IF**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IF**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IF**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IF**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IF**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IF**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IF**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IF**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IF**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IF**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.95 Archive group 7

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IG**	**1**	**Active**	Menu		**none**	no; yes;
B	**IG**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IG**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IG**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IG**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IG**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IG**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IG**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IG**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IG**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IG**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IG**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IG**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IG**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IG**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IG**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IG**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IG**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IG**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IG**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IG**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IG**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IG**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IG**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IG**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IG**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IG**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IG**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.96 Archive group 8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IH**	**1**	**Active**	Menu		**none**	no; yes;
B	**IH**	**2**	**Recording**	Menu		**none**	Every minute; every 2. minute; every 3. minute; every 4. minute; every 5. minute; every 6. minute; every 10. minute; every 12. minute; every 15. minute; every 20. minute; every 30. minute; every hour; every day; Gas day; Every month; Gas month; Changes; Change of value; Error +/-;
S	**IH**	**3**	**Trigger field**	Unlimited	Unlimited	**none**	
B	**IH**	**4**	**Container**	Menu		**none**	Hour; Day; Month; Year;
B	**IH**	**10**	**Field 1**	Unlimited	Unlimited	**none**	
B	**IH**	**11**	**Field 2**	Unlimited	Unlimited	**none**	
B	**IH**	**12**	**Field 3**	Unlimited	Unlimited	**none**	
B	**IH**	**13**	**Field 4**	Unlimited	Unlimited	**none**	
B	**IH**	**14**	**Field 5**	Unlimited	Unlimited	**none**	
B	**IH**	**15**	**Field 6**	Unlimited	Unlimited	**none**	
B	**IH**	**16**	**Field 7**	Unlimited	Unlimited	**none**	
B	**IH**	**17**	**Field 8**	Unlimited	Unlimited	**none**	
B	**IH**	**18**	**Field 9**	Unlimited	Unlimited	**none**	
B	**IH**	**19**	**Field 10**	Unlimited	Unlimited	**none**	
B	**IH**	**20**	**Field 11**	Unlimited	Unlimited	**none**	
B	**IH**	**21**	**Field 12**	Unlimited	Unlimited	**none**	
B	**IH**	**22**	**Field 13**	Unlimited	Unlimited	**none**	
B	**IH**	**23**	**Field 14**	Unlimited	Unlimited	**none**	
B	**IH**	**24**	**Field 15**	Unlimited	Unlimited	**none**	
B	**IH**	**25**	**Field 16**	Unlimited	Unlimited	**none**	
B	**IH**	**26**	**Field 17**	Unlimited	Unlimited	**none**	
B	**IH**	**27**	**Field 18**	Unlimited	Unlimited	**none**	
B	**IH**	**28**	**Field 19**	Unlimited	Unlimited	**none**	
B	**IH**	**29**	**Field 20**	Unlimited	Unlimited	**none**	
B	**IH**	**30**	**Field 21**	Unlimited	Unlimited	**none**	
B	**IH**	**31**	**Field 22**	Unlimited	Unlimited	**none**	
B	**IH**	**32**	**Field 23**	Unlimited	Unlimited	**none**	
B	**IH**	**33**	**Field 24**	Unlimited	Unlimited	**none**	

A.97 Modbus archive query

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	II	1	Group			none	
M	II	2	Year			none	
M	II	3	Month			none	
M	II	4	Day			none	
M	II	5	Hour			none	
M	II	6	Minute			none	
M	II	7	Second			none	
M	II	8	Command			none	
I	II	9	Data length			none	
I	II	10	Data ready			none	
I	II	11	Data buffer			none	
D	II	12	Archive stamp			none	

A.98 Aliases for archive groups

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**IJ**	**1**	**Archive Group 1**	Unlimited	Unlimited	**none**	
B	**IJ**	**2**	**Archive Group 2**	Unlimited	Unlimited	**none**	
B	**IJ**	**3**	**Archive Group 3**	Unlimited	Unlimited	**none**	
B	**IJ**	**4**	**Archive Group 4**	Unlimited	Unlimited	**none**	
B	**IJ**	**5**	**Archive Group 5**	Unlimited	Unlimited	**none**	
B	**IJ**	**6**	**Archive Group 6**	Unlimited	Unlimited	**none**	
B	**IJ**	**7**	**Archive Group 7**	Unlimited	Unlimited	**none**	
B	**IJ**	**8**	**Archive Group 8**	Unlimited	Unlimited	**none**	

A.99 Summation 1

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	LA	1	Vol.flow base cond			var.	Unit see LA 30
A	LA	2	Vol.flow meas.cond			var.	Unit see LA 30
A	LA	3	C-Vol.flow meas.			var.	Unit see LA 30
A	LA	4	Energy flow			var.	Unit see LA 31
A	LA	5	Mass flow			var.	Unit see LA 32
D	LA	6	Temperature average			var.	Unit see LA 33
D	LA	7	Abs. press. average			var.	Unit see LA 34
Z	LA	10	Vb			var.	Unit see LA 35

Z	LA	11	DVb			var.	Unit see LA 35
Z	LA	12	Vm			var.	Unit see LA 36
Z	LA	13	DVm			var.	Unit see LA 36
Z	LA	14	Vmc			var.	Unit see LA 36
Z	LA	15	DVmc			var.	Unit see LA 36
Z	LA	16	E			var.	Unit see LA 37
Z	LA	17	DE			var.	Unit see LA 37
Z	LA	18	M			var.	Unit see LA 38
Z	LA	19	DM			var.	Unit see LA 38
E	**LA**	**20**	**Flow computer 1**	Menu		**none**	no; yes;
E	**LA**	**21**	**Flow computer 2**	Menu		**none**	no; yes;
E	**LA**	**22**	**Flow computer 3**	Menu		**none**	no; yes;
E	**LA**	**23**	**Flow computer 4**	Menu		**none**	no; yes;
E	**LA**	**24**	**Flow computer 5**	Menu		**none**	no; yes;
E	**LA**	**25**	**Flow computer 6**	Menu		**none**	no; yes;
E	**LA**	**26**	**Flow computer 7**	Menu		**none**	no; yes;
E	**LA**	**27**	**Flow computer 8**	Menu		**none**	no; yes;
E	**LA**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**LA**	**31**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**LA**	**32**	**Unit mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**LA**	**33**	**Unit temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**LA**	**34**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**LA**	**35**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**LA**	**36**	**Unit Vm,Vmc**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**LA**	**37**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**LA**	**38**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;
E	**LA**	**40**	**Format volume fl.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LA**	**41**	**Format energyflow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LA**	**42**	**Format mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LA**	**43**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LA**	**44**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**LA**	**45**	**Reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.100 Summation 2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	LB	1	Vol.flow base cond			var.	Unit see LB 30
A	LB	2	Vol.flow meas.cond			var.	Unit see LB 30
A	LB	3	C-Vol.flow meas.			var.	Unit see LB 30
A	LB	4	Energy flow			var.	Unit see LB 31
A	LB	5	Mass flow			var.	Unit see LB 32
D	LB	6	Temperature average			var.	Unit see LB 33
D	LB	7	Abs. press. average			var.	Unit see LB 34
Z	LB	10	Vb			var.	Unit see LB 35
Z	LB	11	DVb			var.	Unit see LB 35
Z	LB	12	Vm			var.	Unit see LB 36
Z	LB	13	DVm			var.	Unit see LB 36
Z	LB	14	Vmc			var.	Unit see LB 36
Z	LB	15	DVmc			var.	Unit see LB 36
Z	LB	16	E			var.	Unit see LB 37
Z	LB	17	DE			var.	Unit see LB 37
Z	LB	18	M			var.	Unit see LB 38
Z	LB	19	DM			var.	Unit see LB 38
E	**LB**	**20**	**Flow computer 1**	Menu		**none**	no; yes;
E	**LB**	**21**	**Flow computer 2**	Menu		**none**	no; yes;
E	**LB**	**22**	**Flow computer 3**	Menu		**none**	no; yes;
E	**LB**	**23**	**Flow computer 4**	Menu		**none**	no; yes;
E	**LB**	**24**	**Flow computer 5**	Menu		**none**	no; yes;
E	**LB**	**25**	**Flow computer 6**	Menu		**none**	no; yes;
E	**LB**	**26**	**Flow computer 7**	Menu		**none**	no; yes;
E	**LB**	**27**	**Flow computer 8**	Menu		**none**	no; yes;
E	**LB**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**LB**	**31**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**LB**	**32**	**Unit mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**LB**	**33**	**Unit temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**LB**	**34**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**LB**	**35**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**LB**	**36**	**Unit Vm,Vmc**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;

E	**LB**	**37**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**LB**	**38**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;
E	**LB**	**40**	**Format volume fl.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LB**	**41**	**Format energyflow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LB**	**42**	**Format mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LB**	**43**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LB**	**44**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**LB**	**45**	**Reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.101 Summation 3

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	LC	1	Vol.flow base cond			var.	Unit see LC 30
A	LC	2	Vol.flow meas.cond			var.	Unit see LC 30
A	LC	3	C-Vol.flow meas.			var.	Unit see LC 30
A	LC	4	Energy flow			var.	Unit see LC 31
A	LC	5	Mass flow			var.	Unit see LC 32
D	LC	6	Temperature average			var.	Unit see LC 33
D	LC	7	Abs. press. average			var.	Unit see LC 34
Z	LC	10	Vb			var.	Unit see LC 35
Z	LC	11	DVb			var.	Unit see LC 35
Z	LC	12	Vm			var.	Unit see LC 36
Z	LC	13	DVm			var.	Unit see LC 36
Z	LC	14	Vmc			var.	Unit see LC 36
Z	LC	15	DVmc			var.	Unit see LC 36
Z	LC	16	E			var.	Unit see LC 37
Z	LC	17	DE			var.	Unit see LC 37
Z	LC	18	M			var.	Unit see LC 38
Z	LC	19	DM			var.	Unit see LC 38
E	**LC**	**20**	**Flow computer 1**	Menu		**none**	no; yes;
E	**LC**	**21**	**Flow computer 2**	Menu		**none**	no; yes;
E	**LC**	**22**	**Flow computer 3**	Menu		**none**	no; yes;
E	**LC**	**23**	**Flow computer 4**	Menu		**none**	no; yes;

E	**LC**	**24**	**Flow computer 5**	Menu		**none**	no; yes;
E	**LC**	**25**	**Flow computer 6**	Menu		**none**	no; yes;
E	**LC**	**26**	**Flow computer 7**	Menu		**none**	no; yes;
E	**LC**	**27**	**Flow computer 8**	Menu		**none**	no; yes;
E	**LC**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**LC**	**31**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**LC**	**32**	**Unit mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**LC**	**33**	**Unit temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**LC**	**34**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**LC**	**35**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**LC**	**36**	**Unit Vm,Vmc**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**LC**	**37**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**LC**	**38**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;
E	**LC**	**40**	**Format volume fl.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LC**	**41**	**Format energyflow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LC**	**42**	**Format mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LC**	**43**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LC**	**44**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**LC**	**45**	**Reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.102 Summation 4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	LD	1	Vol.flow base cond			var.	Unit see LD 30
A	LD	2	Vol.flow meas.cond			var.	Unit see LD 30
A	LD	3	C-Vol.flow meas.			var.	Unit see LD 30
A	LD	4	Energy flow			var.	Unit see LD 31
A	LD	5	Mass flow			var.	Unit see LD 32
D	LD	6	Temperature average			var.	Unit see LD 33
D	LD	7	Abs. press. average			var.	Unit see LD 34

Z	LD	10	Vb			var.	Unit see LD 35
Z	LD	11	DVb			var.	Unit see LD 35
Z	LD	12	Vm			var.	Unit see LD 36
Z	LD	13	DVm			var.	Unit see LD 36
Z	LD	14	Vmc			var.	Unit see LD 36
Z	LD	15	DVmc			var.	Unit see LD 36
Z	LD	16	E			var.	Unit see LD 37
Z	LD	17	DE			var.	Unit see LD 37
Z	LD	18	M			var.	Unit see LD 38
Z	LD	19	DM			var.	Unit see LD 38
E	**LD**	**20**	**Flow computer 1**	Menu		**none**	no; yes;
E	**LD**	**21**	**Flow computer 2**	Menu		**none**	no; yes;
E	**LD**	**22**	**Flow computer 3**	Menu		**none**	no; yes;
E	**LD**	**23**	**Flow computer 4**	Menu		**none**	no; yes;
E	**LD**	**24**	**Flow computer 5**	Menu		**none**	no; yes;
E	**LD**	**25**	**Flow computer 6**	Menu		**none**	no; yes;
E	**LD**	**26**	**Flow computer 7**	Menu		**none**	no; yes;
E	**LD**	**27**	**Flow computer 8**	Menu		**none**	no; yes;
E	**LD**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**LD**	**31**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
E	**LD**	**32**	**Unit mass flow**	Menu		**none**	kg/h; lb/h; kg/s; lb/s;
E	**LD**	**33**	**Unit temperature**	Menu		**none**	°C; °F; °K; °Ra;
E	**LD**	**34**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**LD**	**35**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
E	**LD**	**36**	**Unit Vm,Vmc**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;
E	**LD**	**37**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
E	**LD**	**38**	**Unit M**	Menu		**none**	kg; g; lb; ton; Mg; oz; ·10 kg; ·100 kg; slug;
E	**LD**	**40**	**Format volume fl.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LD**	**41**	**Format energyflow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**LD**	**42**	**Format mass flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LD**	**43**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**LD**	**44**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**LD**	**45**	**Reset function**	Menu		**none**	do nothing; all reset; reset disturb tot.; Vmc=Vm;

A.103 Subtraction 1

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	MA	1	Vol.flow base cond			var.	Unit see MA 30
D	MA	2	Energy flow			var.	Unit see MA 33
D	MA	3	Temperature			var.	Unit see MA 35
D	MA	4	Absolute pressure			var.	Unit see MA 36
D	MA	5	Dev. vol.fl.base			%	
D	MA	6	Dev. energy flow			%	
D	MA	7	Dev. temperature			%	
D	MA	8	Dev. pressure			%	
Z	MA	10	Vb			var.	Unit see MA 31
Z	MA	16	E			var.	Unit see MA 34
B	**MA**	**20**	**Minuend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MA**	**21**	**Subtrahend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MA**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
B	**MA**	**31**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
B	**MA**	**33**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
B	**MA**	**34**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
B	**MA**	**35**	**Unit temperature**	Menu		**none**	°K; °Ra;
B	**MA**	**36**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
B	**MA**	**40**	**Format volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MA**	**41**	**Format energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MA**	**42**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MA**	**43**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**MA**	**44**	**Reset function**	Menu		**none**	do nothing; all reset;

A.104 Subtraction 2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	MB	1	Vol.flow base cond			var.	Unit see MB 30
D	MB	2	Energy flow			var.	Unit see MB 33
D	MB	3	Temperature			var.	Unit see MB 35
D	MB	4	Absolute pressure			var.	Unit see MB 36
D	MB	5	Dev. vol.fl.base			%	
D	MB	6	Dev. energy flow			%	
D	MB	7	Dev. temperature			%	
D	MB	8	Dev. pressure			%	
Z	MB	10	Vb			var.	Unit see MB 31
Z	MB	16	E			var.	Unit see MB 34
B	**MB**	**20**	**Minuend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MB**	**21**	**Subtrahend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MB**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
B	**MB**	**31**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
B	**MB**	**33**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
B	**MB**	**34**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
B	**MB**	**35**	**Unit temperature**	Menu		**none**	°K; °Ra;
B	**MB**	**36**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
B	**MB**	**40**	**Format volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MB**	**41**	**Format energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MB**	**42**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MB**	**43**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**MB**	**44**	**Reset function**	Menu		**none**	do nothing; all reset;

A.105 Subtraction 3

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	MC	1	Vol.flow base cond			var.	Unit see MC 30
D	MC	2	Energy flow			var.	Unit see MC 33
D	MC	3	Temperature			var.	Unit see MC 35
D	MC	4	Absolute pressure			var.	Unit see MC 36
D	MC	5	Dev. vol.fl.base			%	
D	MC	6	Dev. energy flow			%	
D	MC	7	Dev. temperature			%	
D	MC	8	Dev. pressure			%	
Z	MC	10	Vb			var.	Unit see MC 31
Z	MC	16	E			var.	Unit see MC 34
B	**MC**	**20**	**Minuend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MC**	**21**	**Subtrahend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MC**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
B	**MC**	**31**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
B	**MC**	**33**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
B	**MC**	**34**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
B	**MC**	**35**	**Unit temperature**	Menu		**none**	°K; °Ra;
B	**MC**	**36**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
B	**MC**	**40**	**Format volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MC**	**41**	**Format energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MC**	**42**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MC**	**43**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**MC**	**44**	**Reset function**	Menu		**none**	do nothing; all reset;

A.106 Subtraction 4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	MD	1	Vol.flow base cond			var.	Unit see MD 30
D	MD	2	Energy flow			var.	Unit see MD 33
D	MD	3	Temperature			var.	Unit see MD 35
D	MD	4	Absolute pressure			var.	Unit see MD 36
D	MD	5	Dev. vol.fl.base			%	
D	MD	6	Dev. energy flow			%	
D	MD	7	Dev. temperature			%	
D	MD	8	Dev. pressure			%	
Z	MD	10	Vb			var.	Unit see MD 31
Z	MD	16	E			var.	Unit see MD 34
B	**MD**	**20**	**Minuend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MD**	**21**	**Subtrahend**	Menu		**none**	off; Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**MD**	**30**	**Unit volume flow**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
B	**MD**	**31**	**Unit Vb**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MSCF; MMSCF;
B	**MD**	**33**	**Unit energy flow**	Menu		**none**	kW; MW; Btu/s; kcal/s; hp; GW; MJ/h; GJ/h; TJ/h; kBtu/h; kBtu/s; MMBtu/h;
B	**MD**	**34**	**Unit E**	Menu		**none**	kWh; MJ; GJ; MWh; Btu; ton TNT; th; hph; ·10 kWh; ·100 kWh; ·10 MWh; ·100 MWh; kcal; Mcal; GWh; TJ; MMBtu; GBtu;
B	**MD**	**35**	**Unit temperature**	Menu		**none**	°K; °Ra;
B	**MD**	**36**	**Unit pressure**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
B	**MD**	**40**	**Format volume flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MD**	**41**	**Format energy flow**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MD**	**42**	**Format temperature**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
B	**MD**	**43**	**Format pressure**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
Y	**MD**	**44**	**Reset function**	Menu		**none**	do nothing; all reset;

A.107 Function key flows

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	NB	1	Anchor 01	Visible types		var.	
D	NB	2	Anchor 02	Visible types		var.	
D	NB	3	Anchor 03	Visible types		var.	
D	NB	4	Anchor 04	Visible types		var.	

A.108 Function key Totalizer

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	NC	1	Anchor 1	Visible types		var.	
D	NC	2	Anchor 2	Visible types		var.	
D	NC	3	Anchor 3	Visible types		var.	
D	NC	4	Anchor 4	Visible types		var.	
D	NC	5	Anchor 5	Visible types		var.	
D	NC	6	Anchor 6	Visible types		var.	
D	NC	7	Anchor 7	Visible types		var.	
D	NC	8	Anchor 8	Visible types		var.	

A.109 Absolute pressure format and unit

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**OA**	**4**	**Unit**	Menu		**none**	bar; kp/cm2; psi; MPa; atm; kPa; torr; bara;
E	**OA**	**30**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.110 Absolute Pressure A

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	OB	1	Measured value			var.	Unit see OA 4
A	OB	2	Input value			var.	Unit see OB 19
E	**OB**	**3**	**Operation mode**	Menu		**none**	off; Default; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**OB**	**5**	**Default value**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OB**	**8**	**Lower alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OB**	**9**	**Upper alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OB**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**OB**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**OB**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	

E	**OB**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**OB**	**19**	**Source**	Menu		**none**	off; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12;
E	**OB**	**21**	**Correction value**	-5.000 bar	5.000 bar	**var.**	Unit see OA 4
D	OB	24	Base value			var.	Unit see OA 4
E	**OB**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**OB**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**OB**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	OB	61	Measured value			var.	Unit see OB 1
F	OB	62	Input value			var.	Unit see OB 2

A.111 Absolute Pressure B

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	OC	1	Measured value			var.	Unit see OA 4
A	OC	2	Input value			var.	Unit see OC 19
E	**OC**	**3**	**Operation mode**	Menu		**none**	off; Default; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**OC**	**5**	**Default value**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OC**	**8**	**Lower alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OC**	**9**	**Upper alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OC**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**OC**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**OC**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**OC**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**OC**	**19**	**Source**	Menu		**none**	off; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10;

							Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12;
E	**OC**	**21**	**Correction value**	-5.000 bar	5.000 bar	**var.**	Unit see OA 4
D	OC	24	Base value			var.	Unit see OA 4
E	**OC**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**OC**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**OC**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	OC	61	Measured value			var.	Unit see OC 1
F	OC	62	Input value			var.	Unit see OC 2

A.112 Absolute Pressure C

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	OD	1	Measured value			var.	Unit see OA 4
A	OD	2	Input value			var.	Unit see OD 19
E	**OD**	**3**	**Operation mode**	Menu		**none**	off; Default; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**OD**	**5**	**Default value**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OD**	**8**	**Lower alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OD**	**9**	**Upper alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OD**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**OD**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**OD**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**OD**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**OD**	**19**	**Source**	Menu		**none**	off; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12;
E	**OD**	**21**	**Correction value**	-5.000 bar	5.000 bar	**var.**	Unit see OA 4
D	OD	24	Base value			var.	Unit see OA 4
E	**OD**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**OD**	**51**	**Device type**	Unlimited	Unlimited	**none**	

E	**OD**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	OD	61	Measured value			var.	Unit see OD 1
F	OD	62	Input value			var.	Unit see OD 2

A.113 Absolute Pressure D

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	OE	1	Measured value			var.	Unit see OA 4
A	OE	2	Input value			var.	Unit see OE 19
E	**OE**	**3**	**Operation mode**	Menu		**none**	off; Default; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**OE**	**5**	**Default value**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OE**	**8**	**Lower alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OE**	**9**	**Upper alarm limit**	0.000 bar	600.000 bar	**var.**	Unit see OA 4
E	**OE**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**OE**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**OE**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**OE**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**OE**	**19**	**Source**	Menu		**none**	off; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12;
E	**OE**	**21**	**Correction value**	-5.000 bar	5.000 bar	**var.**	Unit see OA 4
D	OE	24	Base value			var.	Unit see OA 4
E	**OE**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**OE**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**OE**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	OE	61	Measured value			var.	Unit see OE 1
F	OE	62	Input value			var.	Unit see OE 2

A.114 Temperature format and unit

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**PA**	**4**	**Unit**	Menu		**none**	°C; °F; °K; °Ra;
E	**PA**	**30**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.115 Gas Temperature A

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	PB	1	Measured value			var.	Unit see PA 4
A	PB	2	Input value			var.	Unit see PB 19
E	**PB**	**3**	**Operation mode**	Menu		**none**	off; Default; PT100,500,1000; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**PB**	**5**	**Default value**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PB**	**8**	**Lower alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PB**	**9**	**Upper alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PB**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**PB**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**PB**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**PB**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**PB**	**19**	**Source**	Menu		**none**	off; Resistance 1; Resistance 2; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12; Resistance 3; Resistance 4;
E	**PB**	**21**	**Correction value**	-5.00 °C	5.00 °C	**var.**	Unit see PA 4
D	PB	24	Base value			var.	Unit see PA 4
E	**PB**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**PB**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**PB**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	PB	61	Measured value			var.	Unit see PB 1
F	PB	62	Input value			var.	Unit see PB 2

A.116 Gas Temperature B

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	PC	1	Measured value			var.	Unit see PA 4
A	PC	2	Input value			var.	Unit see PC 19
E	**PC**	**3**	**Operation mode**	Menu		**none**	off; Default; PT100,500,1000; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**PC**	**5**	**Default value**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PC**	**8**	**Lower alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PC**	**9**	**Upper alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PC**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**PC**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**PC**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**PC**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**PC**	**19**	**Source**	Menu		**none**	off; Resistance 1; Resistance 2; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12; Resistance 3; Resistance 4;
E	**PC**	**21**	**Correction value**	-5.00 °C	5.00 °C	**var.**	Unit see PA 4
D	PC	24	Base value			var.	Unit see PA 4
E	**PC**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**PC**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**PC**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	PC	61	Measured value			var.	Unit see PC 1
F	PC	62	Input value			var.	Unit see PC 2

A.117 Gas Temperature C

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	PD	1	Measured value			var.	Unit see PA 4
A	PD	2	Input value			var.	Unit see PD 19
E	**PD**	**3**	**Operation mode**	Menu		**none**	off; Default; PT100,500,1000; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;

B	**PD**	**5**	**Default value**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PD**	**8**	**Lower alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PD**	**9**	**Upper alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PD**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**PD**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**PD**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	
E	**PD**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**PD**	**19**	**Source**	Menu		**none**	off; Resistance 1; Resistance 2; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12; Resistance 3; Resistance 4;
E	**PD**	**21**	**Correction value**	-5.00 °C	5.00 °C	**var.**	Unit see PA 4
D	PD	24	Base value			var.	Unit see PA 4
E	**PD**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**PD**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**PD**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	PD	61	Measured value			var.	Unit see PD 1
F	PD	62	Input value			var.	Unit see PD 2

A.118 Gas Temperature D

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	PE	1	Measured value			var.	Unit see PA 4
A	PE	2	Input value			var.	Unit see PE 19
E	**PE**	**3**	**Operation mode**	Menu		**none**	off; Default; PT100,500,1000; meas.v.=source v.; Polynomial degree 1; Polynomial degree 2; Polynomial degree 3; 4-20mA coeff.; 0-20mA coeff.; 4-20mA limit; 0-20mA limit; USE09;
B	**PE**	**5**	**Default value**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PE**	**8**	**Lower alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PE**	**9**	**Upper alarm limit**	-60.00 °C	90.00 °C	**var.**	Unit see PA 4
E	**PE**	**10**	**Coefficient 0**	Unlimited	Unlimited	**none**	
E	**PE**	**11**	**Coefficient 1**	Unlimited	Unlimited	**none**	
E	**PE**	**12**	**Coefficient 2**	Unlimited	Unlimited	**none**	

E	**PE**	**13**	**Coefficient 3**	Unlimited	Unlimited	**none**	
E	**PE**	**19**	**Source**	Menu		**none**	off; Resistance 1; Resistance 2; Current 1; Current 2; Current 3; Current 4; Current 5; Current 6; Current 7; Current 8; Frequency 1; Frequency 2; Frequency 3; Frequency 4; Frequency 5; Frequency 6; Frequency 7; Frequency 8; HART-I1; HART-I2; HART-I3; HART-I4; HART-I5; HART-I6; Current 9; Current 10; Current 11; Current 12; HART-I9; HART-I10; HART-I11; HART-I12; Resistance 3; Resistance 4;
E	**PE**	**21**	**Correction value**	-5.00 °C	5.00 °C	**var.**	Unit see PA 4
D	PE	24	Base value			var.	Unit see PA 4
E	**PE**	**50**	**Manufacturer**	Unlimited	Unlimited	**none**	
E	**PE**	**51**	**Device type**	Unlimited	Unlimited	**none**	
E	**PE**	**52**	**Serial number**	Unlimited	Unlimited	**none**	
F	PE	61	Measured value			var.	Unit see PE 1
F	PE	62	Input value			var.	Unit see PE 2

A.119 gas quality format and unit

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**QA**	**1**	**Unit calor.val.**	Menu		**none**	kWh/m3; Mcal/m3; MJ/m3; Btu/ft3; kcal/m3;
E	**QA**	**2**	**Unit stand.density**	Menu		**none**	kg/m3; lb/ft3;
E	**QA**	**3**	**Unit component**	Menu		**none**	mol-%;
E	**QA**	**4**	**Format calor.val.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**QA**	**5**	**Format stand.dens.**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**QA**	**6**	**Format component**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

A.120 Table A gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
T	**QB**	**1**	**Standard density**	0.0500 kg/m3	100.0000 kg/m3	**var.**	Unit see QA 2
T	**QB**	**2**	**Calorific value**	0.000 kWh/m3	100.000 kWh/m3	**var.**	Unit see QA 1
A	QB	3	Methane			var.	Unit see QA 3
T	**QB**	**4**	**Carbondioxide**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**5**	**Hydrogen**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**6**	**Nitrogen**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**7**	**Ethane**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**8**	**Propane**	0.000 mol-%	3.500 mol-%	**var.**	Unit see QA 3
T	**QB**	**9**	**N-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3

T	**QB**	**10**	**I-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QB**	**11**	**N-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QB**	**12**	**I-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QB**	**13**	**Hexane**	0.000 mol-%	0.300 mol-%	**var.**	Unit see QA 3
T	**QB**	**14**	**Heptane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QB**	**15**	**Octane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QB**	**16**	**Nonane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QB**	**17**	**Decane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QB**	**18**	**Hydrogen sulphide**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**19**	**Vapor**	0.000 mol-%	0.015 mol-%	**var.**	Unit see QA 3
T	**QB**	**20**	**Helium**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QB**	**21**	**Oxygen**	0.000 mol-%	7.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**22**	**Carbonmonoxide**	0.000 mol-%	3.000 mol-%	**var.**	Unit see QA 3
T	**QB**	**23**	**Argon**	0.000 mol-%	1.000 mol-%	**var.**	Unit see QA 3

A.121 Table B gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
T	**QC**	**1**	**Standard density**	0.0500 kg/m3	100.0000 kg/m3	**var.**	Unit see QA 2
T	**QC**	**2**	**Calorific value**	0.000 kWh/m3	100.000 kWh/m3	**var.**	Unit see QA 1
A	QC	3	Methane			var.	Unit see QA 3
T	**QC**	**4**	**Carbondioxide**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**5**	**Hydrogen**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**6**	**Nitrogen**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**7**	**Ethane**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**8**	**Propane**	0.000 mol-%	3.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**9**	**N-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**10**	**I-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**11**	**N-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**12**	**I-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**13**	**Hexane**	0.000 mol-%	0.300 mol-%	**var.**	Unit see QA 3
T	**QC**	**14**	**Heptane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QC**	**15**	**Octane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QC**	**16**	**Nonane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QC**	**17**	**Decane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QC**	**18**	**Hydrogen sulphide**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**19**	**Vapor**	0.000 mol-%	0.015 mol-%	**var.**	Unit see QA 3
T	**QC**	**20**	**Helium**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QC**	**21**	**Oxygen**	0.000 mol-%	7.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**22**	**Carbonmonoxide**	0.000 mol-%	3.000 mol-%	**var.**	Unit see QA 3
T	**QC**	**23**	**Argon**	0.000 mol-%	1.000 mol-%	**var.**	Unit see QA 3

A.122 Table C gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
T	**QD**	**1**	**Standard density**	0.0500 kg/m3	100.0000 kg/m3	**var.**	Unit see QA 2
T	**QD**	**2**	**Calorific value**	0.000 kWh/m3	100.000 kWh/m3	**var.**	Unit see QA 1
A	QD	3	Methane			var.	Unit see QA 3
T	**QD**	**4**	**Carbondioxide**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**5**	**Hydrogen**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**6**	**Nitrogen**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**7**	**Ethane**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**8**	**Propane**	0.000 mol-%	3.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**9**	**N-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**10**	**I-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**11**	**N-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**12**	**I-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**13**	**Hexane**	0.000 mol-%	0.300 mol-%	**var.**	Unit see QA 3
T	**QD**	**14**	**Heptane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QD**	**15**	**Octane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QD**	**16**	**Nonane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QD**	**17**	**Decane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QD**	**18**	**Hydrogen sulphide**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**19**	**Vapor**	0.000 mol-%	0.015 mol-%	**var.**	Unit see QA 3
T	**QD**	**20**	**Helium**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QD**	**21**	**Oxygen**	0.000 mol-%	7.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**22**	**Carbonmonoxide**	0.000 mol-%	3.000 mol-%	**var.**	Unit see QA 3
T	**QD**	**23**	**Argon**	0.000 mol-%	1.000 mol-%	**var.**	Unit see QA 3

A.123 Table D gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
T	**QE**	**1**	**Standard density**	0.0500 kg/m3	100.0000 kg/m3	**var.**	Unit see QA 2
T	**QE**	**2**	**Calorific value**	0.000 kWh/m3	100.000 kWh/m3	**var.**	Unit see QA 1
A	QE	3	Methane			var.	Unit see QA 3
T	**QE**	**4**	**Carbondioxide**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**5**	**Hydrogen**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**6**	**Nitrogen**	0.000 mol-%	20.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**7**	**Ethane**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**8**	**Propane**	0.000 mol-%	3.500 mol-%	**var.**	Unit see QA 3
T	**QE**	**9**	**N-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QE**	**10**	**I-Butane**	0.000 mol-%	1.500 mol-%	**var.**	Unit see QA 3
T	**QE**	**11**	**N-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QE**	**12**	**I-Pentane**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3

T	**QE**	**13**	**Hexane**	0.000 mol-%	0.300 mol-%	**var.**	Unit see QA 3
T	**QE**	**14**	**Heptane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QE**	**15**	**Octane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QE**	**16**	**Nonane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QE**	**17**	**Decane**	0.000 mol-%	0.050 mol-%	**var.**	Unit see QA 3
T	**QE**	**18**	**Hydrogen sulphide**	0.000 mol-%	10.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**19**	**Vapor**	0.000 mol-%	0.015 mol-%	**var.**	Unit see QA 3
T	**QE**	**20**	**Helium**	0.000 mol-%	0.500 mol-%	**var.**	Unit see QA 3
T	**QE**	**21**	**Oxygen**	0.000 mol-%	7.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**22**	**Carbonmonoxide**	0.000 mol-%	3.000 mol-%	**var.**	Unit see QA 3
T	**QE**	**23**	**Argon**	0.000 mol-%	1.000 mol-%	**var.**	Unit see QA 3

A.124 Modbus A gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	QF	1	Standard density			var.	Unit see QA 2
M	QF	2	Calorific value			var.	Unit see QA 1
M	QF	3	Methane original			var.	Unit see QA 3
M	QF	4	Carbondioxide			var.	Unit see QA 3
M	QF	5	Hydrogen			var.	Unit see QA 3
M	QF	6	Nitrogen			var.	Unit see QA 3
M	QF	7	Ethane			var.	Unit see QA 3
M	QF	8	Propane			var.	Unit see QA 3
M	QF	9	N-Butane			var.	Unit see QA 3
M	QF	10	I-Butane			var.	Unit see QA 3
M	QF	11	N-Pentane			var.	Unit see QA 3
M	QF	12	I-Pentane			var.	Unit see QA 3
M	QF	13	Hexane			var.	Unit see QA 3
M	QF	14	Heptane			var.	Unit see QA 3
M	QF	15	Octane			var.	Unit see QA 3
M	QF	16	Nonane			var.	Unit see QA 3
M	QF	17	Decane			var.	Unit see QA 3
M	QF	18	Hydrogen sulphide			var.	Unit see QA 3
M	QF	19	Vapor			var.	Unit see QA 3
M	QF	20	Helium			var.	Unit see QA 3
M	QF	21	Oxygen			var.	Unit see QA 3
M	QF	22	Carbonmonoxide			var.	Unit see QA 3
M	QF	23	Argon			var.	Unit see QA 3
A	QF	24	Methane balanced			var.	Unit see QA 3

A.125 Modbus B gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	QG	1	Standard density			var.	Unit see QA 2
M	QG	2	Calorific value			var.	Unit see QA 1
M	QG	3	Methane original			var.	Unit see QA 3
M	QG	4	Carbondioxide			var.	Unit see QA 3
M	QG	5	Hydrogen			var.	Unit see QA 3
M	QG	6	Nitrogen			var.	Unit see QA 3
M	QG	7	Ethane			var.	Unit see QA 3
M	QG	8	Propane			var.	Unit see QA 3
M	QG	9	N-Butane			var.	Unit see QA 3
M	QG	10	I-Butane			var.	Unit see QA 3
M	QG	11	N-Pentane			var.	Unit see QA 3
M	QG	12	I-Pentane			var.	Unit see QA 3
M	QG	13	Hexane			var.	Unit see QA 3
M	QG	14	Heptane			var.	Unit see QA 3
M	QG	15	Octane			var.	Unit see QA 3
M	QG	16	Nonane			var.	Unit see QA 3
M	QG	17	Decane			var.	Unit see QA 3
M	QG	18	Hydrogen sulphide			var.	Unit see QA 3
M	QG	19	Vapor			var.	Unit see QA 3
M	QG	20	Helium			var.	Unit see QA 3
M	QG	21	Oxygen			var.	Unit see QA 3
M	QG	22	Carbonmonoxide			var.	Unit see QA 3
M	QG	23	Argon			var.	Unit see QA 3
A	QG	24	Methane balanced			var.	Unit see QA 3

A.126 Modbus C gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	QH	1	Standard density			var.	Unit see QA 2
M	QH	2	Calorific value			var.	Unit see QA 1
M	QH	3	Methane original			var.	Unit see QA 3
M	QH	4	Carbondioxide			var.	Unit see QA 3
M	QH	5	Hydrogen			var.	Unit see QA 3
M	QH	6	Nitrogen			var.	Unit see QA 3
M	QH	7	Ethane			var.	Unit see QA 3
M	QH	8	Propane			var.	Unit see QA 3
M	QH	9	N-Butane			var.	Unit see QA 3
M	QH	10	I-Butane			var.	Unit see QA 3
M	QH	11	N-Pentane			var.	Unit see QA 3

M	QH	12	I-Pentane			var.	Unit see QA 3
M	QH	13	Hexane			var.	Unit see QA 3
M	QH	14	Heptane			var.	Unit see QA 3
M	QH	15	Octane			var.	Unit see QA 3
M	QH	16	Nonane			var.	Unit see QA 3
M	QH	17	Decane			var.	Unit see QA 3
M	QH	18	Hydrogen sulphide			var.	Unit see QA 3
M	QH	19	Vapor			var.	Unit see QA 3
M	QH	20	Helium			var.	Unit see QA 3
M	QH	21	Oxygen			var.	Unit see QA 3
M	QH	22	Carbonmonoxide			var.	Unit see QA 3
M	QH	23	Argon			var.	Unit see QA 3
A	QH	24	Methane balanced			var.	Unit see QA 3

A.127 Modbus D gas quality

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	QI	1	Standard density			var.	Unit see QA 2
M	QI	2	Calorific value			var.	Unit see QA 1
M	QI	3	Methane original			var.	Unit see QA 3
M	QI	4	Carbondioxide			var.	Unit see QA 3
M	QI	5	Hydrogen			var.	Unit see QA 3
M	QI	6	Nitrogen			var.	Unit see QA 3
M	QI	7	Ethane			var.	Unit see QA 3
M	QI	8	Propane			var.	Unit see QA 3
M	QI	9	N-Butane			var.	Unit see QA 3
M	QI	10	I-Butane			var.	Unit see QA 3
M	QI	11	N-Pentane			var.	Unit see QA 3
M	QI	12	I-Pentane			var.	Unit see QA 3
M	QI	13	Hexane			var.	Unit see QA 3
M	QI	14	Heptane			var.	Unit see QA 3
M	QI	15	Octane			var.	Unit see QA 3
M	QI	16	Nonane			var.	Unit see QA 3
M	QI	17	Decane			var.	Unit see QA 3
M	QI	18	Hydrogen sulphide			var.	Unit see QA 3
M	QI	19	Vapor			var.	Unit see QA 3
M	QI	20	Helium			var.	Unit see QA 3
M	QI	21	Oxygen			var.	Unit see QA 3
M	QI	22	Carbonmonoxide			var.	Unit see QA 3
M	QI	23	Argon			var.	Unit see QA 3
A	QI	24	Methane balanced			var.	Unit see QA 3

A.128 RMG-Bus Stream A

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	QJ	1	Calorific value			var.	Unit see QA 1
A	QJ	2	Standard density			var.	Unit see QA 2
A	QJ	3	Methane			var.	Unit see QA 3
A	QJ	4	Ethane			var.	Unit see QA 3
A	QJ	5	Propane			var.	Unit see QA 3
A	QJ	6	I-Butane			var.	Unit see QA 3
A	QJ	7	N-Butane			var.	Unit see QA 3
A	QJ	8	I-Pentane			var.	Unit see QA 3
A	QJ	9	N-Pentane			var.	Unit see QA 3
A	QJ	10	Neo-Pentane			var.	Unit see QA 3
A	QJ	11	Hexane+			var.	Unit see QA 3
A	QJ	12	Carbondioxide			var.	Unit see QA 3
A	QJ	13	Nitrogen			var.	Unit see QA 3

A.129 RMG-Bus Stream B

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	QK	1	Calorific value			var.	Unit see QA 1
A	QK	2	Standard density			var.	Unit see QA 2
A	QK	3	Methane			var.	Unit see QA 3
A	QK	4	Ethane			var.	Unit see QA 3
A	QK	5	Propane			var.	Unit see QA 3
A	QK	6	I-Butane			var.	Unit see QA 3
A	QK	7	N-Butane			var.	Unit see QA 3
A	QK	8	I-Pentane			var.	Unit see QA 3
A	QK	9	N-Pentane			var.	Unit see QA 3
A	QK	10	Neo-Pentane			var.	Unit see QA 3
A	QK	11	Hexane+			var.	Unit see QA 3
A	QK	12	Carbondioxide			var.	Unit see QA 3
A	QK	13	Nitrogen			var.	Unit see QA 3

A.130 RMG-Bus Stream C

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	QL	1	Calorific value			var.	Unit see QA 1
A	QL	2	Standard density			var.	Unit see QA 2
A	QL	3	Methane			var.	Unit see QA 3
A	QL	4	Ethane			var.	Unit see QA 3
A	QL	5	Propane			var.	Unit see QA 3
A	QL	6	I-Butane			var.	Unit see QA 3

A	QL	7	N-Butane			var.	Unit see QA 3
A	QL	8	I-Pentane			var.	Unit see QA 3
A	QL	9	N-Pentane			var.	Unit see QA 3
A	QL	10	Neo-Pentane			var.	Unit see QA 3
A	QL	11	Hexane+			var.	Unit see QA 3
A	QL	12	Carbondioxide			var.	Unit see QA 3
A	QL	13	Nitrogen			var.	Unit see QA 3

A.131 RMG-Bus Stream D

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	QM	1	Calorific value			var.	Unit see QA 1
A	QM	2	Standard density			var.	Unit see QA 2
A	QM	3	Methane			var.	Unit see QA 3
A	QM	4	Ethane			var.	Unit see QA 3
A	QM	5	Propane			var.	Unit see QA 3
A	QM	6	I-Butane			var.	Unit see QA 3
A	QM	7	N-Butane			var.	Unit see QA 3
A	QM	8	I-Pentane			var.	Unit see QA 3
A	QM	9	N-Pentane			var.	Unit see QA 3
A	QM	10	Neo-Pentane			var.	Unit see QA 3
A	QM	11	Hexane+			var.	Unit see QA 3
A	QM	12	Carbondioxide			var.	Unit see QA 3
A	QM	13	Nitrogen			var.	Unit see QA 3

A.132 Volume sensor format and unit

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**RA**	**1**	**Unit qm**	Menu		**none**	m3/h; yd3/h; ft3/h; gal/h; m3/s; yd3/s; ft3/s; gal/s; MCF/h;
E	**RA**	**2**	**Format qm**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
E	**RA**	**3**	**Unit kv**	Menu		**none**	l/m3; l/ft3; l/yd3; l/gal;
E	**RA**	**4**	**Unit Vm**	Menu		**none**	m3; yd3; ft3; gal; hl; l; ·10 m3; ·100 m3; ·1000 m3; cm3; MCF; MMCF;

A.133 Volume pulse emitter A

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	RB	1	Flow at op.cnd.crr.			var.	Unit see RA 1
A	RB	2	Flow at op.cond.			var.	Unit see RA 1
A	RB	3	Qm,percental			%	
A	RB	4	Input signal			Hz	

E	**RB**	**5**	**Source of signal**	Menu		**none**	Frequency 1; Frequency 2; Frequency 3; Frequency 4;
E	**RB**	**6**	**Qm,max**	0.001 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RB**	**7**	**Qm,min**	0.000 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RB**	**8**	**characteristic**	Menu		**none**	off; Straatsma; RMG;
E	**RB**	**9**	**Pulse factor**	0.00001 l/m3	Unlimited	**var.**	Unit see RA 3
A	RB	10	Errorcorr.factor			none	
A	RB	11	Correction fact.			none	
E	**RB**	**12**	**Correction range**	Unlimited	Unlimited	**none**	
E	**RB**	**13**	**Straatsma A0**	Unlimited	Unlimited	**none**	
E	**RB**	**14**	**Straatsma A1**	Unlimited	Unlimited	**none**	
E	**RB**	**15**	**Straatsma A2**	Unlimited	Unlimited	**none**	
E	**RB**	**16**	**Straatsma A3**	Unlimited	Unlimited	**none**	
E	**RB**	**17**	**RMG R-1**	Unlimited	Unlimited	**none**	
E	**RB**	**18**	**RMG R-2**	Unlimited	Unlimited	**none**	
E	**RB**	**19**	**RMG R0**	Unlimited	Unlimited	**none**	
E	**RB**	**20**	**RMG R1**	Unlimited	Unlimited	**10^4**	
E	**RB**	**21**	**RMG R2**	Unlimited	Unlimited	**10^8**	
D	RB	22	Vm cycl.quant.			var.	Unit see RA 4
D	RB	23	Vmc cycl.quant.			var.	Unit see RA 4

A.134 Volume pulse emitter B

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	RC	1	Flow at op.cnd.crr.			var.	Unit see RA 1
A	RC	2	Flow at op.cond.			var.	Unit see RA 1
A	RC	3	Qm,percental			%	
A	RC	4	Input signal			Hz	
E	**RC**	**5**	**Source of signal**	Menu		**none**	Frequency 1; Frequency 2; Frequency 3; Frequency 4;
E	**RC**	**6**	**Qm,max**	0.001 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RC**	**7**	**Qm,min**	0.000 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RC**	**8**	**characteristic**	Menu		**none**	off; Straatsma; RMG;
E	**RC**	**9**	**Pulse factor**	0.00001 l/m3	Unlimited	**var.**	Unit see RA 3
A	RC	10	Errorcorr.factor			none	
A	RC	11	Correction fact.			none	
E	**RC**	**12**	**Correction range**	Unlimited	Unlimited	**none**	
E	**RC**	**13**	**Straatsma A0**	Unlimited	Unlimited	**none**	
E	**RC**	**14**	**Straatsma A1**	Unlimited	Unlimited	**none**	

E	**RC**	**15**	**Straatsma A2**	Unlimited	Unlimited	**none**	
E	**RC**	**16**	**Straatsma A3**	Unlimited	Unlimited	**none**	
E	**RC**	**17**	**RMG R-1**	Unlimited	Unlimited	**none**	
E	**RC**	**18**	**RMG R-2**	Unlimited	Unlimited	**none**	
E	**RC**	**19**	**RMG R0**	Unlimited	Unlimited	**none**	
E	**RC**	**20**	**RMG R1**	Unlimited	Unlimited	**10^4**	
E	**RC**	**21**	**RMG R2**	Unlimited	Unlimited	**10^8**	
D	RC	22	Vm cycl.quant.			var.	Unit see RA 4
D	RC	23	Vmc cycl.quant.			var.	Unit see RA 4

A.135 Volume pulse emitter C

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	RD	1	Flow at op.cnd.crr.			var.	Unit see RA 1
A	RD	2	Flow at op.cond.			var.	Unit see RA 1
A	RD	3	Qm,percental			%	
A	RD	4	Input signal			Hz	
E	**RD**	**5**	**Source of signal**	Menu		**none**	Frequency 1; Frequency 2; Frequency 3; Frequency 4;
E	**RD**	**6**	**Qm,max**	0.001 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RD**	**7**	**Qm,min**	0.000 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RD**	**8**	**characteristic**	Menu		**none**	off; Straatsma; RMG;
E	**RD**	**9**	**Pulse factor**	0.00001 l/m3	Unlimited	**var.**	Unit see RA 3
A	RD	10	Errorcorr.factor			none	
A	RD	11	Correction fact.			none	
E	**RD**	**12**	**Correction range**	Unlimited	Unlimited	**none**	
E	**RD**	**13**	**Straatsma A0**	Unlimited	Unlimited	**none**	
E	**RD**	**14**	**Straatsma A1**	Unlimited	Unlimited	**none**	
E	**RD**	**15**	**Straatsma A2**	Unlimited	Unlimited	**none**	
E	**RD**	**16**	**Straatsma A3**	Unlimited	Unlimited	**none**	
E	**RD**	**17**	**RMG R-1**	Unlimited	Unlimited	**none**	
E	**RD**	**18**	**RMG R-2**	Unlimited	Unlimited	**none**	
E	**RD**	**19**	**RMG R0**	Unlimited	Unlimited	**none**	
E	**RD**	**20**	**RMG R1**	Unlimited	Unlimited	**10^4**	
E	**RD**	**21**	**RMG R2**	Unlimited	Unlimited	**10^8**	
D	RD	22	Vm cycl.quant.			var.	Unit see RA 4
D	RD	23	Vmc cycl.quant.			var.	Unit see RA 4

A.136 Volume pulse emitter D

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	RE	1	Flow at op.cnd.crr.			var.	Unit see RA 1
A	RE	2	Flow at op.cond.			var.	Unit see RA 1
A	RE	3	Qm,percental			%	
A	RE	4	Input signal			Hz	
E	**RE**	**5**	**Source of signal**	Menu		**none**	Frequency 1; Frequency 2; Frequency 3; Frequency 4;
E	**RE**	**6**	**Qm,max**	0.001 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RE**	**7**	**Qm,min**	0.000 m3/h	Unlimited	**var.**	Unit see RA 1
E	**RE**	**8**	**characteristic**	Menu		**none**	off; Straatsma; RMG;
E	**RE**	**9**	**Pulse factor**	0.00001 l/m3	Unlimited	**var.**	Unit see RA 3
A	RE	10	Errorcorr.factor			none	
A	RE	11	Correction fact.			none	
E	**RE**	**12**	**Correction range**	Unlimited	Unlimited	**none**	
E	**RE**	**13**	**Straatsma A0**	Unlimited	Unlimited	**none**	
E	**RE**	**14**	**Straatsma A1**	Unlimited	Unlimited	**none**	
E	**RE**	**15**	**Straatsma A2**	Unlimited	Unlimited	**none**	
E	**RE**	**16**	**Straatsma A3**	Unlimited	Unlimited	**none**	
E	**RE**	**17**	**RMG R-1**	Unlimited	Unlimited	**none**	
E	**RE**	**18**	**RMG R-2**	Unlimited	Unlimited	**none**	
E	**RE**	**19**	**RMG R0**	Unlimited	Unlimited	**none**	
E	**RE**	**20**	**RMG R1**	Unlimited	Unlimited	**10^4**	
E	**RE**	**21**	**RMG R2**	Unlimited	Unlimited	**10^8**	
D	RE	22	Vm cycl.quant.			var.	Unit see RA 4
D	RE	23	Vmc cycl.quant.			var.	Unit see RA 4

A.137 Ultrasonic meter A type USE 09

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	RF	1	Main-tot. forward			var.	Unit see RA 4
I	RF	2	Dist-tot. forward			var.	Unit see RA 4
I	RF	3	Main-tot. reverse			var.	Unit see RA 4
I	RF	4	Dist-tot. reverse			var.	Unit see RA 4
I	RF	5	Flow			var.	Unit see RA 1
I	RF	6	Direction			none	
I	RF	7	Status			none	
I	RF	8	Temperature			°C	
I	RF	9	Absolute pressure			bar	

I	RF	10	Vel. of sound			m/s	
E	**RF**	**20**	**DZU-Slaveadr.**	0	99	**none**	
E	**RF**	**21**	**Format**	Menu		**none**	%.1f; %.2f; %.3f; %.4f; %.5f; %.6f;
D	RF	30	Timeout			s	
D	RF	40	frac. main.forward			var.	Unit see RA 4
D	RF	41	frac. dist.forward			var.	Unit see RA 4
D	RF	42	frac. main.reverse			var.	Unit see RA 4
D	RF	43	frac. dist.reverse			var.	Unit see RA 4
D	RF	44	last Status			none	
D	RF	45	disturbed			none	

A.138 Ultrasonic meter B type USE 09

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	RG	1	Main-tot. forward			var.	Unit see RA 4
I	RG	2	Dist-tot. forward			var.	Unit see RA 4
I	RG	3	Main-tot. reverse			var.	Unit see RA 4
I	RG	4	Dist-tot. reverse			var.	Unit see RA 4
I	RG	5	Flow			var.	Unit see RA 1
I	RG	6	Direction			none	
I	RG	7	Status			none	
I	RG	8	Temperature			°C	
I	RG	9	Absolute pressure			bar	
I	RG	10	Vel. of sound			m/s	
E	**RG**	**20**	**DZU-Slaveadr.**	0	99	**none**	
E	**RG**	**21**	**Format**	Menu		**none**	%.1f; %.2f; %.3f; %.4f; %.5f; %.6f;
D	RG	30	Timeout			s	
D	RG	40	frac. main.forward			var.	Unit see RA 4
D	RG	41	frac. dist.forward			var.	Unit see RA 4
D	RG	42	frac. main.reverse			var.	Unit see RA 4
D	RG	43	frac. dist.reverse			var.	Unit see RA 4
D	RG	44	last Status			none	
D	RG	45	disturbed			none	

A.139 Ultrasonic meter C type USE 09

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	RH	1	Main-tot. forward			var.	Unit see RA 4
I	RH	2	Dist-tot. forward			var.	Unit see RA 4
I	RH	3	Main-tot. reverse			var.	Unit see RA 4
I	RH	4	Dist-tot. reverse			var.	Unit see RA 4
I	RH	5	Flow			var.	Unit see RA 1

I	RH	6	Direction			none	
I	RH	7	Status			none	
I	RH	8	Temperature			°C	
I	RH	9	Absolute pressure			bar	
I	RH	10	Vel. of sound			m/s	
E	**RH**	**20**	**DZU-Slaveadr.**	0	99	**none**	
E	**RH**	**21**	**Format**	Menu		**none**	%.1f; %.2f; %.3f; %.4f; %.5f; %.6f;
D	RH	30	Timeout			s	
D	RH	40	frac. main.forward			var.	Unit see RA 4
D	RH	41	frac. dist.forward			var.	Unit see RA 4
D	RH	42	frac. main.reverse			var.	Unit see RA 4
D	RH	43	frac. dist.reverse			var.	Unit see RA 4
D	RH	44	last Status			none	
D	RH	45	disturbed			none	

A.140 Ultrasonic meter D type USE 09

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	RI	1	Main-tot. forward			var.	Unit see RA 4
I	RI	2	Dist-tot. forward			var.	Unit see RA 4
I	RI	3	Main-tot. reverse			var.	Unit see RA 4
I	RI	4	Dist-tot. reverse			var.	Unit see RA 4
I	RI	5	Flow			var.	Unit see RA 1
I	RI	6	Direction			none	
I	RI	7	Status			none	
I	RI	8	Temperature			°C	
I	RI	9	Absolute pressure			bar	
I	RI	10	Vel. of sound			m/s	
E	**RI**	**20**	**DZU-Slaveadr.**	0	99	**none**	
E	**RI**	**21**	**Format**	Menu		**none**	%.1f; %.2f; %.3f; %.4f; %.5f; %.6f;
D	RI	30	Timeout			s	
D	RI	40	frac. main.forward			var.	Unit see RA 4
D	RI	41	frac. dist.forward			var.	Unit see RA 4
D	RI	42	frac. main.reverse			var.	Unit see RA 4
D	RI	43	frac. dist.reverse			var.	Unit see RA 4
D	RI	44	last Status			none	
D	RI	45	disturbed			none	

A.141 Base values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
S	**SB**	**11**	**CVD-constant A**	Unlimited	Unlimited	**1/°C**	
S	**SB**	**12**	**CVD-constant B**	Unlimited	Unlimited	**°C-2**	
S	**SB**	**13**	**CVD-constant C**	Unlimited	Unlimited	**°C-4**	
W	**SB**	**14**	**Gas constant**	8.3140000 J/mol*K	8.3150000 J/mol*K	**J/mol*K**	
W	**SB**	**15**	**Molar vol. id. gas**	22.4130000 L/Mol	22.4150000 L/Mol	**L/Mol**	
W	**SB**	**16**	**Avogadro constant**	6.0210000 10^23/Mol	6.0230000 10^23/Mol	**10^23/Mol**	
S	**SB**	**17**	**Device state**	Menu		**none**	Brand new; Function tested; officially tested; Function started;
A	SB	18	Device family	Discrete texts		none	ERZ 2000; ERZ 2000 GC;
W	**SB**	**19**	**Device type**	Menu		**none**	Tancy Instrument; PETRONAS;

A.142 Access

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
C	**SD**	**2**	**Codeword 1**	0000	9999	**none**	
C	**SD**	**3**	**Codeword 2**	0000	9999	**none**	
A	SD	4	Current access	Discrete texts		none	closed; single code; double code; input switch; Superuser;
D	SD	7	Remaining time			s	
B	**SD**	**8**	**Maximum time**	600 s	14400 s	**s**	
D	SD	9	Changed parameter			none	
D	SD	10	Changed value			var.	

A.143 Display

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**SE**	**1**	**Language**	Menu		**none**	german; english;
B	**SE**	**2**	**User profile**	Menu		**none**	gas meter reader; User; Service; Developer; data input;
B	**SE**	**3**	**Screensaver**	60 s	604800 s	**s**	
B	**SE**	**4**	**Information line**	Menu		**none**	no; yes;
B	**SE**	**5**	**Display refresh**	Menu		**none**	frequently; Moderate; low;
E	**SE**	**6**	**Decimal point**	Menu		**none**	Decimal point; Comma;

E	**SE**	**7**	**Legal symbol**	Menu		**none**	none; Paragraph; Rhombus; Star; Cross;
B	**SE**	**8**	**Buzzer mode**	Menu		**none**	off; Alarm; Every minute; Key;
B	**SE**	**9**	**Message line**	Menu		**none**	no; yes;
B	**SE**	**13**	**Coordinates**	Menu		**none**	no; yes;
D	SE	15	Brightness	Discrete texts		none	25; 50; 75; 100; blinking;
S	**SE**	**17**	**Display version**	Menu		**none**	CU20049SCPB-W2J; CU20049SCPB-W2A;
E	**SE**	**18**	**Fraction totalizer**	1	6	**none**	

A.144 ID Display

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	SG	1	Device			none	
A	SG	2	Legal kernel			none	
A	SG	3	Application			none	
A	SG	4	Flowcomputer Bios			none	
A	SG	5	Time stamps			none	
A	SG	15	Absolute pressure			none	
A	SG	16	Temperature			none	
A	SG	17	Absolute pressure			none	
A	SG	18	Temperature			none	
A	SG	19	Absolute pressure			none	
A	SG	20	Temperature			none	
A	SG	21	Absolute pressure			none	
A	SG	22	Temperature			none	
A	SG	30	TCP-IP			none	

A.145 Module assembly

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
S	**SH**	**1**	**MOD 1A should be**	Menu		**none**	Unknown; COM3+4-card; ignore;
I	SH	2	MOD 1A assembly	Discrete texts		none	Unknown; passive; active;
I	SH	3	MOD 1A Id			none	
I	SH	4	MOD 1A version			none	
I	SH	5	MOD 1A status 1			hex	
I	SH	6	MOD 1A status 2			hex	
I	SH	7	MOD 1A status 3			hex	
I	SH	8	MOD 1A status 4			hex	
S	**SH**	**11**	**MOD 1B should be**	Menu		**none**	Unknown; ignore;
I	SH	12	MOD 1B assembly	Discrete texts		none	Unknown; passive; active;
I	SH	13	MOD 1B Id			none	
I	SH	14	MOD 1B version			none	

I	SH	15	MOD 1B status 1			hex	
I	SH	16	MOD 1B status 2			hex	
I	SH	17	MOD 1B status 3			hex	
I	SH	18	MOD 1B status 4			hex	
S	**SH**	**21**	**MOD 2A should be**	Menu		**none**	Unknown; HART; ignore;
I	SH	22	MOD 2A assembly	Discrete texts		none	Unknown; passive; active;
I	SH	23	MOD 2A Id			none	
I	SH	24	MOD 2A version			none	
I	SH	25	MOD 2A status 1			hex	
I	SH	26	MOD 2A status 2			hex	
I	SH	27	MOD 2A status 3			hex	
I	SH	28	MOD 2A status 4			hex	
S	**SH**	**31**	**MOD 2B should be**	Menu		**none**	Unknown; HART; ignore;
I	SH	32	MOD 2B assembly	Discrete texts		none	Unknown; passive; active;
I	SH	33	MOD 2B Id			none	
I	SH	34	MOD 2B version			none	
I	SH	35	MOD 2B status 1			hex	
I	SH	36	MOD 2B status 2			hex	
I	SH	37	MOD 2B status 3			hex	
I	SH	38	MOD 2B status 4			hex	
S	**SH**	**41**	**MOD 3A should be**	Menu		**none**	Unknown; Exi-card; F58-card; GC6000; ignore;
I	SH	42	MOD 3A assembly	Discrete texts		none	Unknown; passive; active;
I	SH	43	MOD 3A Id			none	
I	SH	44	MOD 3A version			none	
I	SH	45	MOD 3A status 1			hex	
I	SH	46	MOD 3A status 2			hex	
I	SH	47	MOD 3A status 3			hex	
I	SH	48	MOD 3A status 4			hex	
I	SH	49	Namur status M3A			hex	
S	**SH**	**51**	**MOD 3B should be**	Menu		**none**	Unknown; Exi-card; ignore;
I	SH	52	MOD 3B assembly	Discrete texts		none	Unknown; passive; active;
I	SH	53	MOD 3B Id			none	
I	SH	54	MOD 3B version			none	
I	SH	55	MOD 3B status 1			hex	
I	SH	56	MOD 3B status 2			hex	
I	SH	57	MOD 3B status 3			hex	
I	SH	58	MOD 3B status 4			hex	
I	SH	59	Namur status M3B			hex	

A.146 Configuration

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
S	SI	1	No of Non-Ex Resis.	0	2	none	
S	SI	2	No. of Non-Ex inp.	0	8	none	
S	SI	3	Frequency channels	0	8	none	
S	SI	4	No. of curr. outp	0	4	none	
S	SI	6	No. of pulse outp	0	4	none	
S	SI	7	No. of freq. outp.	0	1	none	
S	SI	8	FPGA-Quartzfreq.	9000000 Hz	59000000 Hz	Hz	
W	SI	9	Quartz Bios-CPU	16000000 Hz	32000000 Hz	Hz	
S	SI	10	Calibr. L current	-5.0000 mA	25.0000 mA	mA	
S	SI	11	Calibr. U current	-5.0000 mA	25.0000 mA	mA	
S	SI	12	Calibr. L Ohm(T)	-100.0000 °C	500.0000 °C	°C	
S	SI	13	Calibr. U Ohm(T)	-100.0000 °C	500.0000 °C	°C	
S	SI	15	Meas. value limits	Menu		none	no; yes;
S	SI	18	Show base values	Menu		none	no; yes;
S	SI	19	Flow limits active	Menu		none	no; yes;
S	SI	20	Compon. lim. active	Menu		none	no; yes;
W	SI	22	ADC ref.-voltage	1.00 mV	Unlimited	mV	
W	SI	23	Rref currentmeas.	1.00 Ω	Unlimited	Ω	
W	SI	24	Rref PT100-Meas.	1.00 Ω	Unlimited	Ω	
W	SI	25	Rref PT1000-Meas.	1.00 Ω	Unlimited	Ω	
W	SI	26	Rref KTY-Meas.	1.00 Ω	Unlimited	Ω	
S	SI	29	Volumfreq. source	Menu		none	off; f1/f2; f3/f4;
S	SI	31	No of Exi resist.	0	2	none	
S	SI	32	No. of Exi-inputs	0	4	none	
S	SI	33	Freq.1/5-Source	Menu		none	F1-X8 / F5-X9; F1-X9 / F5-X8;
S	SI	34	Freq.2/6-Source	Menu		none	F2-X8 / F6-X9; F2-X9 / F6-X8;
S	SI	35	Freq.3/7-Source	Menu		none	F3-X8 / F7-X9; F3-X10 / F7-X8;
S	SI	36	Freq.4/8-Source	Menu		none	F4-X8 / F8-X9; F4-X10 / F8-X8;
S	SI	37	ENCO source	Menu		none	Term. X4-9,X4-10; Term. X9-1,X9-2;
B	SI	38	deadman button	10 s	1000 s	s	
B	SI	39	Use TIMER-ISR	Menu		none	no; yes;

A.147 Identification of Software

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	SJ	3	Version legal kernel			none	
A	SJ	4	Checks. Kernel			hex	
A	SJ	5	Time legal kernel			none	
D	SJ	6	Version application			none	

D	SJ	7	Checks. application			hex	
D	SJ	8	Time application			none	
E	**SJ**	**9**	**Release key**	Unlimited	Unlimited	**none**	
Y	**SJ**	**10**	**Software update**	Menu		**none**	no; yes;
A	SJ	11	Parameter checksum			none	
D	SJ	12	Binary code CRC			hex	
D	SJ	13	Code checks			none	

A.148 Identification of Hardware

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
J	SK	1	Version FC-Bios			none	
J	SK	2	Checks. FC-Bios			hex	
J	SK	3	Time FC-Bios			none	
S	**SK**	**6**	**Manufacturer**	Menu		**none**	RMG Messtechnik; RMG REGEL+MESS; Bryan Donkin CA; Bryan Donkin UK; RMG GASELAN; ZUG GAZOMET;
S	**SK**	**7**	**Year of constr.**	1970	2069	**none**	
S	**SK**	**8**	**Manufacturer No.**	Unlimited	Unlimited	**none**	
S	**SK**	**9**	**Hardware ID**	Unlimited	Unlimited	**none**	
W	**SK**	**10**	**Layout/BOM**	Unlimited	Unlimited	**none**	
I	SK	11	MAC-Address			none	
S	**SK**	**12**	**Comment**	Unlimited	Unlimited	**none**	
D	SK	13	CAN device	Discrete texts		none	Bosch; Infineon;

A.149 Description site

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**SL**	**2**	**Name of station**	Unlimited	Unlimited	**none**	
B	**SL**	**3**	**Usage site**	Unlimited	Unlimited	**none**	
B	**SL**	**11**	**Time of commission**	Unlimited	Unlimited	**none**	
E	**SL**	**15**	**Last off. calib.**	Unlimited	Unlimited	**none**	

A.150 Reset functions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Y	**SM**	**10**	**Reset log**	Menu		**none**	no; yes;
Y	**SM**	**11**	**Reset param.log**	Menu		**none**	no; yes;
Y	**SM**	**12**	**Reset hourly quant.**	Menu		**none**	no; yes;
Y	**SM**	**13**	**Reset daily quant.**	Menu		**none**	no; yes;
Y	**SM**	**14**	**Reset monthly quant**	Menu		**none**	no; yes;

A.151 Namur sensor adjustment

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
E	**SN**	**1**	**Sensor type A**	Menu		**none**	RMG-Sensor; Standard Namur; manual adjust;
E	**SN**	**2**	**Sensor type B**	Menu		**none**	RMG-Sensor; Standard Namur; manual adjust;
S	**SN**	**3**	**Trig. RMG sensor**	0	255	**none**	
S	**SN**	**4**	**Hyst. RMG-Sensor**	0	255	**none**	
S	**SN**	**5**	**Trig. stnd. Namur**	0	255	**none**	
S	**SN**	**6**	**Hyst. Stnd. Namur**	0	255	**none**	
E	**SN**	**7**	**Trig. man. adjust**	0	255	**none**	
E	**SN**	**8**	**Hyst. man. adjust.**	0	255	**none**	

A.152 Test of ERZ2000 Front panel

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	TA	1	Sealable switch			none	
D	TA	2	Power-LED	Discrete texts		none	off; on; blinking;
D	TA	3	Run-LED	Discrete texts		none	off; on; blinking;
D	TA	4	Warn-LED	Discrete texts		none	off; on; blinking;
D	TA	5	Alarm-LED	Discrete texts		none	off; on; blinking;
D	TA	6	LED-colors	Discrete texts		none	Green; Orange; Yellow; Red;
D	TA	7	Key check			none	

A.153 Freeze

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	TC	1	Time last Freeze			none	
D	TC	2	Freeze contact	Discrete texts		none	off; Freeze;
B	**TC**	**3**	**Freeze mode**	Menu		**none**	off; every second; Every minute; every hour; every day; Gas day; cyclic; Contact; Manually; Every month; Gas month; DSfG;
B	**TC**	**4**	**Freeze interval**	1 s	Unlimited	**s**	
B	**TC**	**5**	**Source freeze cntct**	Menu		**none**	off; Contactinp. 1; Contactinp. 2; Contactinp. 3; Contactinp. 4; Contactinp. 5; Contactinp. 6; Contactinp. 7; Contactinp. 8;

A.154 Conversion cycle

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	TD	1	Converting time			s	
D	TD	2	Program cycles			1/s	
D	TD	3	Cycle counter			none	
S	**TD**	**4**	**Sleep time**	0 ·10 ms	50 ·10 ms	**·10 ms**	

A.155 Hardwaretest

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Y	**TG**	**1**	**active**	Menu		**none**	no; yes;
I	TG	2	Alarmcontact			none	
I	TG	3	Warning contact			none	
I	TG	4	Contact output			hex	
D	TG	5	Displaytest upper			none	
D	TG	6	Displaytest lower			none	
D	TG	7	Power-LED	Discrete texts		none	off; on; blinking;
D	TG	8	Measure-LED	Discrete texts		none	off; on; blinking;
D	TG	9	Warning-LED	Discrete texts		none	off; on; blinking;
D	TG	10	Alarm-LED	Discrete texts		none	off; on; blinking;
D	TG	13	HFX test counter			Pulse	
D	TG	14	HFY test counter			Pulse	
D	TG	15	HFX-HFY-diff.			Pulse	
I	TG	16	Frequency input 1			var.	
I	TG	17	Frequency input 2			var.	
I	TG	18	Frequency input 3			var.	
I	TG	19	Frequency input 4			var.	
I	TG	20	Frequency input 5			var.	
I	TG	21	Frequency input 6			var.	
I	TG	22	Frequency input 7			var.	
I	TG	23	Frequency input 8			var.	
I	TG	24	Current input 1			var.	
I	TG	25	Current input 2			var.	
I	TG	26	Current input 3			var.	
I	TG	27	Current input 4			var.	
I	TG	28	Current input 5			var.	
I	TG	29	Current input 6			var.	
I	TG	30	Current input 7			var.	
I	TG	31	Current input 8			var.	
I	TG	32	Current input 9			var.	
I	TG	33	Current input 10			var.	
I	TG	34	Current input 11			var.	
I	TG	35	Current input 12			var.	
I	TG	36	Device temperature			var.	
I	TG	37	Resistance 1			var.	
I	TG	38	Resistance 2			var.	
I	TG	39	Resistance 3			var.	
I	TG	40	Resistance 4			var.	

I	TG	41	Contact input			hex	
Y	**TG**	**43**	**Help func. test**	Menu		**none**	off; calibration help;

A.156 Test cabinet

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	TI	1	Test cabinet disp.	Discrete texts		none	At rest; Running;
Q	**TI**	**2**	**Refresh time**	2 s	30 s	**s**	

A.157 File system

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	TJ	1	Percentage free			%	
B	**TJ**	**2**	**Warning limit**	0.000 %	100.000 %	**%**	
D	TJ	3	CF total memory			MByte	
D	TJ	4	CF free memory			MByte	

A.158 Boolean functions

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	TK	15	Parameter flag			none	
D	TK	16	New key			none	
D	TK	17	New warning			none	
D	TK	18	New alarm			none	
D	TK	19	New second			none	
D	TK	20	New second 30			none	
D	TK	21	New minute			none	
D	TK	22	New hour			none	
D	TK	23	New day			none	
D	TK	24	New gas day			none	
D	TK	25	New month			none	
D	TK	26	New gas month			none	
D	TK	27	New year			none	
D	TK	28	New gas year			none	

A.159 TCP/IP Network

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**UA**	**1**	**Own IP4-address**	Unlimited	Unlimited	**none**	
B	**UA**	**2**	**Port HTTP**	0	65535	**none**	
B	**UA**	**13**	**Netmask**	Unlimited	Unlimited	**none**	
B	**UA**	**14**	**Gateway**	Unlimited	Unlimited	**none**	
B	**UA**	**15**	**DHCP**	Menu		**none**	no; yes;

B	**UA**	**16**	**Inactiv. timeout**	0 s	3600 s	**s**	
B	**UA**	**17**	**Data timeout**	0 s	3600 s	**s**	
B	**UA**	**19**	**max. block size**	512 Byte	2048 Byte	**Byte**	
B	**UA**	**21**	**DNS**	Unlimited	Unlimited	**none**	

A.160 Serial interfaces

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**UB**	**1**	**COM1 baudrate**	Menu		**none**	300; 600; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200;
B	**UB**	**2**	**COM1 B/P/S**	Menu		**none**	8N1; 8E1; 8O1; 7N1; 7E1; 7O1; 8N2; 8E2; 8O2; 7N2; 7E2; 7O2;
B	**UB**	**3**	**COM1 operating mode**	Menu		**none**	off; Test; Modbus-RTU; Modbus-ASCII; do not use; do not use; do not use; do not use; do not use; DZU-bus;
B	**UB**	**4**	**COM2 baudrate**	Menu		**none**	300; 600; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200;
B	**UB**	**5**	**COM2 B/P/S**	Menu		**none**	8N1; 8E1; 8O1; 7N1; 7E1; 7O1; 8N2; 8E2; 8O2; 7N2; 7E2; 7O2;
B	**UB**	**6**	**COM2 operating mode**	Menu		**none**	off; Test; do not use; Modbus-RTU; Modbus-ASCII; GPS170; RMGView;
B	**UB**	**7**	**COM3 baudrate**	Menu		**none**	300; 600; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200;
B	**UB**	**8**	**COM3 B/P/S**	Menu		**none**	8N1; 8E1; 8O1; 7N1; 7E1; 7O1; 8N2; 8E2; 8O2; 7N2; 7E2; 7O2;
B	**UB**	**9**	**COM3 operating mode**	Menu		**none**	off; Test; do not use; Modbus-RTU; Modbus-ASCII; do not use;
B	**UB**	**10**	**COM4 baudrate**	Menu		**none**	300; 600; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200;
B	**UB**	**11**	**COM4 B/P/S**	Menu		**none**	8N1; 8E1; 8O1; 7N1; 7E1; 7O1; 8N2; 8E2; 8O2; 7N2; 7E2; 7O2;
B	**UB**	**12**	**COM4 operating mode**	Menu		**none**	off; Test; do not use; RMG-Bus; do not use;
B	**UB**	**13**	**Vo baudrate**	Menu		**none**	600; 1200; 2400; 4800; 9600;
B	**UB**	**14**	**Vo B/P/S**	Menu		**none**	7E1;
B	**UB**	**15**	**Vo operating mode**	Menu		**none**	Vo;
B	**UB**	**17**	**Register offset**	-50000	50000	**none**	
B	**UB**	**18**	**Modbus-address**	1	249	**none**	
B	**UB**	**19**	**COM5 baudrate**	Menu		**none**	38400; 19200; 9600;
B	**UB**	**20**	**COM5 B/P/S**	Menu		**none**	8N1; 8E1; 8O1; 7N1; 7E1; 7O1; 8N2; 8E2; 8O2; 7N2; 7E2; 7O2;
B	**UB**	**21**	**COM5 operating mode**	Menu		**none**	Modem; Dedicated line; PETRONAS;

B	**UB**	**22**	**Modbus-addr.COM1**	0	249	**none**	
B	**UB**	**23**	**Modbus-addr.COM2**	0	249	**none**	
B	**UB**	**24**	**Modbus-addr.COM3**	0	249	**none**	
B	**UB**	**25**	**DZU-bus timeout**	7 s	20 s	**s**	

A.161 RMG-bus

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	UC	2	Current stream			none	
I	UC	3	Current state	Discrete texts		none	Analysis; Revision; calibration; invalid;
I	UC	4	Current status	Discrete texts		none	okay; Alarm;
D	UC	5	Interpretation	Discrete texts		none	Analyzing run; Control gas; calibration gas; Flushing; RMGBus-protocol; undefined; retained value; Start up value;
I	UC	6	GC tg: Hs			var.	Unit see QA 1
I	UC	7	GC tg: sd			var.	Unit see QA 2
I	UC	8	GC tg: rd			none	
I	UC	9	GC tg: C1			var.	Unit see QA 3
I	UC	10	GC tg: C2			var.	Unit see QA 3
I	UC	11	GC tg: C3			var.	Unit see QA 3
I	UC	12	GC tg: I-C4			var.	Unit see QA 3
I	UC	13	GC tg: N-C4			var.	Unit see QA 3
I	UC	14	GC tg: I-C5			var.	Unit see QA 3
I	UC	15	GC tg: N-C5			var.	Unit see QA 3
I	UC	16	GC tg: Neo-C5			var.	Unit see QA 3
I	UC	17	GC tg: C6+			var.	Unit see QA 3
I	UC	18	GC tg: CO2			var.	Unit see QA 3
I	UC	19	GC tg: N2			var.	Unit see QA 3
D	UC	20	Time stamp			s	
D	UC	21	Counter of telegr.			none	

A.162 Modbus input values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
M	UD	1	unsigned short 0			none	
M	UD	2	unsigned short 1			none	
M	UD	3	unsigned short 2			none	

M	UD	4	unsigned short 3			none	
M	UD	5	unsigned short 4			none	
M	UD	6	unsigned short 5			none	
M	UD	7	unsigned short 6			none	
M	UD	8	unsigned short 7			none	
M	UD	9	unsigned short 8			none	
M	UD	10	unsigned short 9			none	
M	UD	11	float 0			none	
M	UD	12	float 1			none	
M	UD	13	float 2			none	
M	UD	14	float 3			none	
M	UD	15	float 4			none	
M	UD	16	float 5			none	
M	UD	17	float 6			none	
M	UD	18	float 7			none	
M	UD	19	float 8			none	
M	UD	20	float 9			none	

A.163 Petronas protocol

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
Y	**UE**	**1**	**Time simulation**	Menu		**none**	no; yes;
Q	**UE**	**2**	**printf once more**	Menu		**none**	no; yes;
Q	**UE**	**3**	**Page**	0	65535	**none**	
B	**UE**	**4**	**Width of columne**	7	16	**none**	
B	**UE**	**5**	**Fraction quants.**	0	6	**none**	
B	**UE**	**6**	**Fraction averages**	0	6	**none**	
B	**UE**	**7**	**Page length**	0 Inch	22 Inch	**Inch**	
B	**UE**	**8**	**Print speed**	47 cps	400 cps	**cps**	

A.164 Error messages

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	VA	1	Current messages			none	
D	VA	2	Alarms/Reset			none	
D	VA	3	No. of alarms			none	
D	VA	4	No. of Warnings			none	
D	VA	5	No. of Hints			none	
E	**VA**	**6**	**Device error**	Menu		**none**	are alarms; are warnings;
B	**VA**	**7**	**Hints**	Menu		**none**	are hints; are warnings;
Q	**VA**	**8**	**Error reset flag**	0	1	**none**	
E	**VA**	**11**	**Q=0 error suppress**	Menu		**none**	show; Suppress;

D	VA	14	AG21 Error text			none	
D	VA	18	First alarm			none	
D	VA	19	Last alarm			none	
D	VA	20	First warning			none	
D	VA	21	last warning			none	
E	**VA**	**22**	**Alarm contact mode**	Menu		**none**	Real time; Elongated; Sustain;
B	**VA**	**23**	**Warn contact mode**	Menu		**none**	Real time; Elongated; Sustain;
B	**VA**	**24**	**Elongation**	2 s	60 s	**s**	
Q	**VA**	**26**	**Error simulation**	-1	10000	**none**	
D	VA	27	Time error quit			none	
D	VA	28	Msg. error archive			none	
D	VA	29	+/- error archive			none	

A.165 Message registers

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	VB	1	Message 0...15			hex	
D	VB	2	Message 16...31			hex	
D	VB	3	Message 32...47			hex	
D	VB	4	Message 48...65			hex	
D	VB	5	Message 64...79			hex	
D	VB	6	Message 80...95			hex	
D	VB	7	Message 96..111			hex	
D	VB	8	Message 112..127			hex	
D	VB	9	Message 128..143			hex	
D	VB	10	Message 144..159			hex	
D	VB	11	Message 160..175			hex	
D	VB	12	Message 176..191			hex	
D	VB	13	Message 192..207			hex	
D	VB	14	Message 208..223			hex	
D	VB	15	Message 224..239			hex	
D	VB	16	Message 240..255			hex	
D	VB	17	Message 256..271			hex	
D	VB	18	Message 272..287			hex	
D	VB	19	Message 288..303			hex	
D	VB	20	Message 304..319			hex	
D	VB	21	Message 320..335			hex	
D	VB	22	Message 336..351			hex	
D	VB	23	Message 352..367			hex	
D	VB	24	Message 368..383			hex	
D	VB	25	Message 384..399			hex	

D	VB	26	Message 400..415			hex	
D	VB	27	Message 416..431			hex	
D	VB	28	Message 432..447			hex	
D	VB	29	Message 448..465			hex	
D	VB	30	Message 464..479			hex	
D	VB	31	Message 480..495			hex	
D	VB	32	Message 496..511			hex	
D	VB	33	Message 512..527			hex	
D	VB	34	Message 528..543			hex	
D	VB	35	Message 544..559			hex	
D	VB	36	Message 560..575			hex	
D	VB	37	Message 576..591			hex	
D	VB	38	Message 592..607			hex	
D	VB	39	Message 608..623			hex	
D	VB	40	Message 624..639			hex	
D	VB	41	Message 640..655			hex	
D	VB	42	Message 656..671			hex	
D	VB	43	Message 672..687			hex	
D	VB	44	Message 688..703			hex	
D	VB	45	Message 704..719			hex	
D	VB	46	Message 720..735			hex	
D	VB	47	Message 736..751			hex	
D	VB	48	Message 752..767			hex	
D	VB	49	Message 768..783			hex	
D	VB	50	Message 784..799			hex	
B	**VB**	**51**	**Message behaviour**	Menu		**none**	active; passive;

A.166 Debugging

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
B	**VD**	**1**	**Software debug**	Menu		**none**	no; yes;
D	VD	2	Debug code			none	
D	VD	3	Debug time stamp			none	
D	VD	4	Debug counter			none	
B	**VD**	**10**	**WATTCP-lib Debug**	0	9	**none**	
D	VD	11	Network error	Discrete texts		none	NO_ERROR; ILL_DOSX; NO_MEM; NO_DRIVER; PKT_ERROR; BOOTP_FAIL; DHCP_FAIL; RARP_FAIL; NO_IPADDR; PPPOE_DISC; Unexpected;

D	VD	12	Socket1-status			none	
D	VD	13	Socket2-status			none	
D	VD	14	Socket3-status			none	
D	VD	15	Socket4-status			none	
D	VD	20	C1:Modbus-Telegr.			none	
D	VD	21	C2:Modbus-Telegr.			none	
D	VD	22	C3:Modbus-Telegr.			none	
D	VD	23	IP:Modbus-Telegr.			none	

A.167 Times

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
P	**WA**	**1**	**Date/time**	Unlimited	Unlimited	**none**	
D	WA	2	UTC			none	
D	WA	3	Difference to UTC			s	
D	WA	4	Day of week	Discrete texts		none	Sunday; Monday; Tuesday; Wednesday; Thursday; Friday; Saturday;
D	WA	5	Seconds since start			s	
D	WA	7	Time zone change			none	
D	WA	9	Timezonename			none	
T	**WA**	**13**	**Time zone**	AFRICA/ABIDJAN	ZULU	**none**	
B	**WA**	**14**	**Billing hour**	0 h	23 h	**h**	
T	**WA**	**15**	**time event mode**	Menu		**none**	UTC; Local time;
D	WA	27	Gas day start			none	
D	WA	28	Gas month start			none	
D	WA	29	Gas year start			none	
D	WA	30	CMOS clock offset			s	
D	WA	34	Base timer			s	
D	WA	35	Masterclock			s	
D	WA	36	Masterclock running			none	
D	WA	37	DOS-clock			s	
D	WA	38	Time plausibility			s	
Q	**WA**	**45**	**Problem with clock**	Unlimited	Unlimited	**s**	

A.168 external time signal output

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	WB	1	Time contact			s	
B	**WB**	**2**	**Time contact durat.**	1 s	86400 s	**s**	
B	**WB**	**3**	**Time contact mode**	Menu		**none**	off; Every minute; at second 30; every hour; at minute 30; every day; Gas day; Every month; Every year; Gas month; Gas year;
D	WB	20	DSfG-time			s	
D	WB	30	UTC FC-Bios			none	
D	WB	40	UTC year			none	
D	WB	41	UTC month			none	
D	WB	42	UTC day			none	
D	WB	43	UTC hour			none	
D	WB	44	UTC minute			none	
D	WB	45	UTC second			none	
D	WB	50	Local time year			none	
D	WB	51	Local time month			none	
D	WB	52	Local time day			none	
D	WB	53	Local time hour			none	
D	WB	54	Local time minute			none	
D	WB	55	Local time second			none	
D	WB	60	Time GC6000			min	

A.169 external time signal input

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
T	**WC**	**1**	**Sync.mode input**	Menu		**none**	off; Full minute; In second 30; Full hour; In minute 30; GPS170; Modbus;
T	**WC**	**2**	**timesync.tolerance**	0 s	9 s	**s**	
B	**WC**	**4**	**Retrigger success**	3600 s	2678400 s	**s**	
B	**WC**	**5**	**Retrigger fault**	180 s	86400 s	**s**	
Q	**WC**	**6**	**PTB trigger**	Unlimited	Unlimited	**s**	
D	WC	7	Clock free wheel			s	
A	WC	20	Timesync.-contact	Discrete texts		none	off; synchronizing;
E	**WC**	**21**	**Source time contact**	Menu		**none**	off; Contactinp. 1; Contactinp. 2; Contactinp. 3; Contactinp. 4; Contactinp. 5; Contactinp. 6; Contactinp. 7; Contactinp. 8;
I	WC	30	GPS time (UTC)			none	
I	WC	31	time protocol	Discrete texts		none	off; Error; Meinberg Std.; NMEA; Computime; ABB SPA; Uni Erlangen; SAT; Racal;
M	WC	40	Modb.sync year			none	

M	WC	41	Modb.sync month			none	
M	WC	42	Modb.sync day			none	
M	WC	43	Modb.sync hour			none	
M	WC	44	Modb.sync minute			none	
M	WC	45	Modb.sync second			none	
M	WC	46	Modb.sync trigger			none	

A.170 Current output channel 1 terminal X4-1, X4-2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XB	1	Act. current			mA	
D	XB	2	Physical value			var.	
D	XB	3	Smoothed org.val			var.	Unit see XB 2
I	XB	4	D/A-converter value			hex	
B	**XB**	**6**	**Assignment**	Numerical types	without parameters	**none**	
B	**XB**	**7**	**Lower mapping**	Unlimited	Unlimited	**var.**	Unit see XB 2
B	**XB**	**8**	**Upper mapping**	Unlimited	Unlimited	**var.**	Unit see XB 2
B	**XB**	**9**	**Averaging factor**	0	0.99999	**none**	
B	**XB**	**10**	**Operating mode**	Menu		**none**	off; 0-20mA; 4-20mA; Default; Test current; const. 0 mA; const. 4 mA; const. 12 mA; const. 20 mA; calib. lower; calib. upper; Test stair; Warm up;
B	**XB**	**13**	**Default current**	0.0000 mA	25.0000 mA	**mA**	
B	**XB**	**14**	**Test current**	0.0000 mA	25.0000 mA	**mA**	
S	**XB**	**15**	**lower calib.value**	0.0000 mA	11.0000 mA	**mA**	
S	**XB**	**16**	**upper calib.value**	13.0000 mA	25.0000 mA	**mA**	

A.171 Current output channel 2 terminal X4-3, X4-4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XC	1	Act. current			mA	
D	XC	2	Physical value			var.	
D	XC	3	Smoothed org.val			var.	Unit see XC 2
I	XC	4	D/A-converter value			hex	
B	**XC**	**6**	**Assignment**	Numerical types	without parameters	**none**	

B	**XC**	**7**	**Lower mapping**	Unlimited	Unlimited	**var.**	Unit see XC 2
B	**XC**	**8**	**Upper mapping**	Unlimited	Unlimited	**var.**	Unit see XC 2
B	**XC**	**9**	**Averaging factor**	0	0.99999	**none**	
B	**XC**	**10**	**Operating mode**	Menu		**none**	off; 0-20mA; 4-20mA; Default; Test current; const. 0 mA; const. 4 mA; const. 12 mA; const. 20 mA; calib. lower; calib. upper; Test stair; Warm up;
B	**XC**	**13**	**Default current**	0.0000 mA	25.0000 mA	**mA**	
B	**XC**	**14**	**Test current**	0.0000 mA	25.0000 mA	**mA**	
S	**XC**	**15**	**lower calib.value**	0.0000 mA	11.0000 mA	**mA**	
S	**XC**	**16**	**upper calib.value**	13.0000 mA	25.0000 mA	**mA**	

A.172 Current output channel 3 terminal X4-5, X4-6

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XD	1	Act. current			mA	
D	XD	2	Physical value			var.	
D	XD	3	Smoothed org.val			var.	Unit see XD 2
I	XD	4	D/A-converter value			hex	
B	**XD**	**6**	**Assignment**	Numerical types	without parameters	**none**	
B	**XD**	**7**	**Lower mapping**	Unlimited	Unlimited	**var.**	Unit see XD 2
B	**XD**	**8**	**Upper mapping**	Unlimited	Unlimited	**var.**	Unit see XD 2
B	**XD**	**9**	**Averaging factor**	0	0.99999	**none**	
B	**XD**	**10**	**Operating mode**	Menu		**none**	off; 0-20mA; 4-20mA; Default; Test current; const. 0 mA; const. 4 mA; const. 12 mA; const. 20 mA; calib. lower; calib. upper; Test stair; Warm up;
B	**XD**	**13**	**Default current**	0.0000 mA	25.0000 mA	**mA**	
B	**XD**	**14**	**Test current**	0.0000 mA	25.0000 mA	**mA**	
S	**XD**	**15**	**lower calib.value**	0.0000 mA	11.0000 mA	**mA**	
S	**XD**	**16**	**upper calib.value**	13.0000 mA	25.0000 mA	**mA**	

A.173 Current output channel 4 terminal X4-7, X4-8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XE	1	Act. current			mA	
D	XE	2	Physical value			var.	
D	XE	3	Smoothed org.val			var.	Unit see XE 2
I	XE	4	D/A-converter value			hex	
B	**XE**	**6**	**Assignment**	Numerical types	without parameters	**none**	
B	**XE**	**7**	**Lower mapping**	Unlimited	Unlimited	**var.**	Unit see XE 2
B	**XE**	**8**	**Upper mapping**	Unlimited	Unlimited	**var.**	Unit see XE 2
B	**XE**	**9**	**Averaging factor**	0	0.99999	**none**	
B	**XE**	**10**	**Operating mode**	Menu		**none**	off; 0-20mA; 4-20mA; Default; Test current; const. 0 mA; const. 4 mA; const. 12 mA; const. 20 mA; calib. lower; calib. upper; Test stair; Warm up;
B	**XE**	**13**	**Default current**	0.0000 mA	25.0000 mA	**mA**	
B	**XE**	**14**	**Test current**	0.0000 mA	25.0000 mA	**mA**	
S	**XE**	**15**	**lower calib.value**	0.0000 mA	11.0000 mA	**mA**	
S	**XE**	**16**	**upper calib.value**	13.0000 mA	25.0000 mA	**mA**	

A.174 Pulse output channel 1 terminal X3-1, X3-2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	XF	1	Counter			Pulse	
A	XF	2	Part.exec.puls			Pulse	
A	XF	3	Buffer			Pulse	
A	XF	4	Frequency			Hz	
I	XF	5	Hardw. buffer			Pulse	
E	**XF**	**10**	**Assignm. meas.val.**	Menu		**none**	off; Test cont. pulses; Test pulspackage; Volume at base; Volume at meas.; Corr.vol.at.meas; Energy;
E	**XF**	**11**	**Assignm. main/dist.**	Menu		**none**	only undisturbed; only disturbed; always;
E	**XF**	**12**	**Assignm. device**	Menu		**none**	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;

E	**XF**	**13**	**Pulse value**	1e-05	1e+09	**Variable**	
E	**XF**	**14**	**Max. pulse freq.**	1 Hz	400 Hz	**Hz**	
Q	**XF**	**20**	**Pulses for testing**	0.00 Pulse	1000000.00 Pulse	**Pulse**	

A.175 Pulse output channel 2 terminal X3-3, X3-4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	XG	1	Counter			Pulse	
A	XG	2	Part.exec.puls			Pulse	
A	XG	3	Buffer			Pulse	
A	XG	4	Frequency			Hz	
I	XG	5	Hardw. buffer			Pulse	
E	**XG**	**10**	**Assignm. meas.val.**	Menu		**none**	off; Test cont. pulses; Test pulspackage; Volume at base; Volume at meas.; Corr.vol.at.meas; Energy;
E	**XG**	**11**	**Assignm. main/dist.**	Menu		**none**	only undisturbed; only disturbed; always;
E	**XG**	**12**	**Assignm. device**	Menu		**none**	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
E	**XG**	**13**	**Pulse value**	1e-05	1e+09	**Variable**	
E	**XG**	**14**	**Max. pulse freq.**	1 Hz	400 Hz	**Hz**	
Q	**XG**	**20**	**Pulses for testing**	0.00 Pulse	1000000.00 Pulse	**Pulse**	

A.176 Pulse output channel 3 terminal X3-5, X3-6

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XH	1	Counter			Pulse	
D	XH	2	Part.exec.puls			Pulse	
D	XH	3	Buffer			Pulse	
D	XH	4	Frequency			Hz	
I	XH	5	Hardw. buffer			Pulse	
B	**XH**	**10**	**Assignm. meas.val.**	Menu		**none**	off; Test cont. pulses; Test pulspackage; Volume at base; Volume at meas.; Corr.vol.at.meas; Energy;
B	**XH**	**11**	**Assignm. main/dist.**	Menu		**none**	only undisturbed; only disturbed; always;
B	**XH**	**12**	**Assignm. device**	Menu		**none**	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow

							computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**XH**	**13**	**Pulse value**	1e-05	1e+09	**Variable**	
B	**XH**	**14**	**Max. pulse freq.**	1 Hz	400 Hz	**Hz**	
Q	**XH**	**20**	**Pulses for testing**	0.00 Pulse	1000000.00 Pulse	**Pulse**	

A.177 Pulse output channel 4 terminal X3-7, X3-8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XI	1	Counter			Pulse	
D	XI	2	Part.exec.puls			Pulse	
D	XI	3	Buffer			Pulse	
D	XI	4	Frequency			Hz	
I	XI	5	Hardw. buffer			Pulse	
B	**XI**	**10**	**Assignm. meas.val.**	Menu		**none**	off; Test cont. pulses; Test pulspackage; Volume at base; Volume at meas.; Corr.vol.at.meas; Energy;
B	**XI**	**11**	**Assignm. main/dist.**	Menu		**none**	only undisturbed; only disturbed; always;
B	**XI**	**12**	**Assignm. device**	Menu		**none**	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
B	**XI**	**13**	**Pulse value**	1e-05	1e+09	**Variable**	
B	**XI**	**14**	**Max. pulse freq.**	1 Hz	400 Hz	**Hz**	
Q	**XI**	**20**	**Pulses for testing**	0.00 Pulse	1000000.00 Pulse	**Pulse**	

A.178 Contact outputs terminal X1,X2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XJ	1	Contact 1 position			none	
D	XJ	2	Contact 2 position			none	
D	XJ	3	Contact 3 position			none	
D	XJ	4	Contact 4 position			none	
D	XJ	5	Contact 5 position			none	
D	XJ	6	Contact 6 position			none	
D	XJ	7	Contact 7 position			none	
D	XJ	8	Contact 8 position			none	

B	**XJ**	**9**	**Contact 1 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**10**	**Contact 2 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**11**	**Contact 3 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**12**	**Contact 4 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**13**	**Contact 5 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**14**	**Contact 6 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**15**	**Contact 7 express.**	Unlimited	Unlimited	**none**	
B	**XJ**	**16**	**Contact 8 express.**	Unlimited	Unlimited	**none**	

A.179 Frequency output channel 1 Terminal X2-7, X2-8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	XK	1	Current frequency			Hz	
A	XK	2	Physical value			var.	
E	**XK**	**6**	**Assignment**	Numerical types	without parameters	**none**	
E	**XK**	**7**	**Lower mapping**	Unlimited	Unlimited	**var.**	Unit see XK 2
E	**XK**	**8**	**Upper mapping**	Unlimited	Unlimited	**var.**	Unit see XK 2
B	**XK**	**9**	**Averaging factor**	0	0.99999	**none**	
E	**XK**	**10**	**Operating mode**	Menu		**none**	off; 0-1000Hz; 0-2000Hz; 0-2500Hz; Default; Test frequency;
B	**XK**	**13**	**Default frequency**	0.000 Hz	2500.000 Hz	**Hz**	
B	**XK**	**14**	**Test frequency**	0.000 Hz	2500.000 Hz	**Hz**	
G	**XK**	**18**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
I	XK	19	Act. Frequency			Hz	
D	XK	20	Abs. error			Hz	

A.180 Formula evaluation

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	XL	1	Value 1			none	
D	XL	2	Value 2			none	
D	XL	3	Value 3			none	
D	XL	4	Value 4			none	
D	XL	5	Value 5			none	
D	XL	6	Value 6			none	
D	XL	7	Value 7			none	
D	XL	8	Value 8			none	

B	**XL**	**9**	**Expression 1**	Unlimited	Unlimited	**none**	
B	**XL**	**10**	**Expression 2**	Unlimited	Unlimited	**none**	
B	**XL**	**11**	**Expression 3**	Unlimited	Unlimited	**none**	
B	**XL**	**12**	**Expression 4**	Unlimited	Unlimited	**none**	
B	**XL**	**13**	**Expression 5**	Unlimited	Unlimited	**none**	
B	**XL**	**14**	**Expression 6**	Unlimited	Unlimited	**none**	
B	**XL**	**15**	**Expression 7**	Unlimited	Unlimited	**none**	
B	**XL**	**16**	**Expression 8**	Unlimited	Unlimited	**none**	

A.181 Current input channel 1 terminal X5-1, X5-2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YA	1	Current 1			mA	
I	YA	2	HART meas.value			none	
D	YA	3	Uncal. current			mA	
D	YA	4	Uncal. average			mA	
I	YA	5	Converter value			hex	
D	YA	6	Timeout current			s	
S	**YA**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YA**	**10**	**Lower calib.val.**	-5.000 mA	25.000 mA	**mA**	
S	**YA**	**11**	**Upper calib.val.**	-5.000 mA	25.000 mA	**mA**	
S	**YA**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YA**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YA	15	Beneficiary			none	
S	**YA**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YA	17	HART unit code			none	
J	YA	18	HART manufacturer			none	
J	YA	19	HART device type			none	
J	YA	20	HART identification			none	
D	YA	21	HART timeout			s	
D	YA	22	HART status			none	

A.182 Current input channel 2 terminal X5-3, X5-4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YB	1	Current 2			mA	
I	YB	2	HART meas.value			none	
D	YB	3	Uncal. current			mA	
D	YB	4	Uncal. average			mA	
I	YB	5	Converter value			hex	

D	YB	6	Timeout current			s	
S	**YB**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YB**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YB**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YB**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YB**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YB	15	Beneficiary			none	
S	**YB**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YB	17	HART unit code			none	
J	YB	18	HART manufacturer			none	
J	YB	19	HART device type			none	
J	YB	20	HART identification			none	
D	YB	21	HART timeout			s	
D	YB	22	HART status			none	

A.183 Current input channel 3 terminal X5-5, X5-6

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YC	1	Current 3			mA	
I	YC	2	HART meas.value			none	
D	YC	3	Uncal. current			mA	
D	YC	4	Uncal. average			mA	
I	YC	5	Converter value			hex	
D	YC	6	Timeout current			s	
S	**YC**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YC**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YC**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YC**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YC**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YC	15	Beneficiary			none	
S	**YC**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YC	17	HART unit code			none	
J	YC	18	HART manufacturer			none	
J	YC	19	HART device type			none	
J	YC	20	HART identification			none	
D	YC	21	HART timeout			s	
D	YC	22	HART status			none	

A.184 Current input channel 4 terminal X6-1, X6-2

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YD	1	Current 4			mA	
I	YD	2	HART meas.value			none	
D	YD	3	Uncal. current			mA	
D	YD	4	Uncal. average			mA	
I	YD	5	Converter value			hex	
D	YD	6	Timeout current			s	
S	**YD**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YD**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YD**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YD**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YD**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YD	15	Beneficiary			none	
S	**YD**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YD	17	HART unit code			none	
J	YD	18	HART manufacturer			none	
J	YD	19	HART device type			none	
J	YD	20	HART identification			none	
D	YD	21	HART timeout			s	
D	YD	22	HART status			none	

A.185 Current input channel 5 terminal X6-3, X6-4

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YE	1	Current 5			mA	
I	YE	2	HART meas.value			none	
D	YE	3	Uncal. current			mA	
D	YE	4	Uncal. average			mA	
I	YE	5	Converter value			hex	
D	YE	6	Timeout current			s	
S	**YE**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YE**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YE**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YE**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YE**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YE	15	Beneficiary			none	
S	**YE**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;

J	YE	17	HART unit code			none	
J	YE	18	HART manufacturer			none	
J	YE	19	HART device type			none	
J	YE	20	HART identification			none	
D	YE	21	HART timeout			s	
D	YE	22	HART status			none	

A.186 Current input channel 6 terminal X6-5, X6-6

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YF	1	Current 6			mA	
I	YF	2	HART meas.value			none	
D	YF	3	Uncal. current			mA	
D	YF	4	Uncal. average			mA	
I	YF	5	Converter value			hex	
D	YF	6	Timeout current			s	
S	**YF**	**9**	**Meas strategy**	Menu		**none**	Standard; Diff. pressure;
S	**YF**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YF**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YF**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YF**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YF	15	Beneficiary			none	
S	**YF**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YF	17	HART unit code			none	
J	YF	18	HART manufacturer			none	
J	YF	19	HART device type			none	
J	YF	20	HART identification			none	
D	YF	21	HART timeout			s	
D	YF	22	HART status			none	

A.187 Current input channel 7 special interface

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YG	1	Current 7			mA	
D	YG	3	Uncal. current			mA	
D	YG	4	Uncal. average			mA	
I	YG	5	Converter value			hex	
D	YG	6	Timeout current			s	
S	**YG**	**9**	**Meas strategy**	Menu		**none**	Standard;

S	**YG**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YG**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YG**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YG**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YG	15	Beneficiary			none	

A.188 Current input channel 8 special interface

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YH	1	Current 8			mA	
D	YH	3	Uncal. current			mA	
D	YH	4	Uncal. average			mA	
I	YH	5	Converter value			hex	
D	YH	6	Timeout current			s	
S	**YH**	**9**	**Meas strategy**	Menu		**none**	Standard;
S	**YH**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YH**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YH**	**13**	**Transd. supply**	Menu		**none**	off; on;
G	**YH**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YH	15	Beneficiary			none	

A.189 Current input channel 9 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YI	1	Current 9			mA	
I	YI	2	HART meas.value			none	
I	YI	3	Uncal. current			mA	
D	YI	4	Uncal. average			mA	
D	YI	6	Timeout current			s	
S	**YI**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YI**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
G	**YI**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YI	15	Beneficiary			none	
S	**YI**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YI	17	HART unit code			none	

J	YI	18	HART manufacturer			none	
J	YI	19	HART device type			none	
J	YI	20	HART identification			none	
D	YI	21	HART timeout			s	
D	YI	22	HART status			none	

A.190 Current input channel 10 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YJ	1	Current 10			mA	
I	YJ	2	HART meas.value			none	
I	YJ	3	Uncal. current			mA	
D	YJ	4	Uncal. average			mA	
D	YJ	6	Timeout current			s	
S	**YJ**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YJ**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
G	**YJ**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YJ	15	Beneficiary			none	
S	**YJ**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YJ	17	HART unit code			none	
J	YJ	18	HART manufacturer			none	
J	YJ	19	HART device type			none	
J	YJ	20	HART identification			none	
D	YJ	21	HART timeout			s	
D	YJ	22	HART status			none	

A.191 Current input channel 11 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YK	1	Current 11			mA	
I	YK	2	HART meas.value			none	
I	YK	3	Uncal. current			mA	
D	YK	4	Uncal. average			mA	
D	YK	6	Timeout current			s	
S	**YK**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YK**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
G	**YK**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YK	15	Beneficiary			none	

S	**YK**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YK	17	HART unit code			none	
J	YK	18	HART manufacturer			none	
J	YK	19	HART device type			none	
J	YK	20	HART identification			none	
D	YK	21	HART timeout			s	
D	YK	22	HART status			none	

A.192 Current input channel 12 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YL	1	Current 12			mA	
I	YL	2	HART meas.value			none	
I	YL	3	Uncal. current			mA	
D	YL	4	Uncal. average			mA	
D	YL	6	Timeout current			s	
S	**YL**	**10**	**Lower calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
S	**YL**	**11**	**Upper calib.val.**	-5.0000 mA	25.0000 mA	**mA**	
G	**YL**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YL	15	Beneficiary			none	
S	**YL**	**16**	**HART operat.mode**	Menu		**none**	off; HART; HART burst;
J	YL	17	HART unit code			none	
J	YL	18	HART manufacturer			none	
J	YL	19	HART device type			none	
J	YL	20	HART identification			none	
D	YL	21	HART timeout			s	
D	YL	22	HART status			none	

A.193 Resistance measurement 1 terminal X5-7, X5-8, X5-9, X5-10

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YM	1	Resistance 1			Ω	
D	YM	2	Temperature calib.			°C	
D	YM	3	Temperature uncal.			°C	
D	YM	4	T-average uncal.			°C	
I	YM	5	Converter value			hex	

D	YM	6	Running timeout			s	
S	**YM**	**10**	**Lower calib.value**	-100.0000 °C	100.0000 °C	**°C**	
S	**YM**	**11**	**Upper calib.value**	-100.0000 °C	100.0000 °C	**°C**	
B	**YM**	**12**	**open circ. control**	Menu		**none**	no; yes;
E	**YM**	**13**	**Range**	Menu		**none**	PT100; PT500; PT1000;
G	**YM**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YM	15	Beneficiary			none	
D	YM	16	Dev. setval. AD0			%	
D	YM	17	Dev. setval. AD1			%	
D	YM	18	Dev. setval. AD2			%	
D	YM	19	Open circuit			none	
D	YM	20	Special dev. AD0			%	
D	YM	23	Uncal. resistance			Ω	
D	YM	24	Uncal. average			Ω	
D	YM	26	Open circuit AD0			none	
D	YM	27	Open circuit AD1			none	
D	YM	28	Open circuit AD2			none	
D	YM	29	Open circ. ready			none	

A.194 Resistance measurement 2 terminal X6-7, X6-8, X6-9, X6-10

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YN	1	Resistance 2			Ω	
D	YN	2	Temperature calib.			°C	
D	YN	3	Temperature uncal.			°C	
D	YN	4	T-average uncal.			°C	
I	YN	5	Converter value			hex	
D	YN	6	Running timeout			s	
S	**YN**	**10**	**Lower calib.value**	-100.0000 °C	100.0000 °C	**°C**	
S	**YN**	**11**	**Upper calib.value**	-100.0000 °C	100.0000 °C	**°C**	
B	**YN**	**12**	**open circ. control**	Menu		**none**	no; yes;
E	**YN**	**13**	**Range**	Menu		**none**	PT100;
G	**YN**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;

D	YN	15	Beneficiary			none	
D	YN	16	Dev. setval. AD0			%	
D	YN	17	Dev. setval. AD1			%	
D	YN	18	Dev. setval. AD2			%	
D	YN	19	Open circuit			none	
D	YN	20	Special dev. AD0			%	
D	YN	23	Uncal. resistance			Ω	
D	YN	24	Uncal. average			Ω	
D	YN	26	Open circuit AD0			none	
D	YN	27	Open circuit AD1			none	
D	YN	28	Open circuit AD2			none	
D	YN	29	Open circ. ready			none	

A.195 Resistance measurement 3 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YO	1	Resistance 3			Ω	
D	YO	2	Temperature calib.			°C	
D	YO	3	Temperature uncal.			°C	
D	YO	4	T-average uncal.			°C	
D	YO	6	Running timeout			s	
S	**YO**	**10**	**Lower calib.value**	-100.0000 °C	100.0000 °C	**°C**	
S	**YO**	**11**	**Upper calib.value**	-100.0000 °C	100.0000 °C	**°C**	
B	**YO**	**12**	**open circ. control**	Menu		**none**	no; yes;
G	**YO**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YO	15	Beneficiary			none	
I	YO	23	Uncal. resistance			Ω	
D	YO	24	Uncal. average			Ω	

A.196 Resistance measurement 4 Exi

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
A	YP	1	Resistance 4			Ω	
D	YP	2	Temperature calib.			°C	
D	YP	3	Temperature uncal.			°C	

D	YP	4	T-average uncal.			°C	
D	YP	6	Running timeout			s	
S	**YP**	**10**	**Lower calib.value**	-100.0000 °C	100.0000 °C	**°C**	
S	**YP**	**11**	**Upper calib.value**	-100.0000 °C	100.0000 °C	**°C**	
B	**YP**	**12**	**open circ. control**	Menu		**none**	no; yes;
G	**YP**	**14**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
D	YP	15	Beneficiary			none	
I	YP	23	Uncal. resistance			Ω	
D	YP	24	Uncal. average			Ω	

A.197 Frequency input channel 1 X8 or X9

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YQ	1	Frequency 1			Hz	
D	YQ	2	Smoothed			Hz	
I	YQ	3	Input pulses 1			Pulse	
D	YQ	4	Run. timeout			s	
G	**YQ**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YQ	7	Assignment	Discrete texts		none	Term. X8-7,X8-8; Term. X9-3,X9-4;
D	YQ	15	Beneficiary			none	

A.198 Frequency input channel 2 X8 or X9

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YR	1	Frequency 2			Hz	
D	YR	2	Smoothed			Hz	
I	YR	3	Input pulses 2			Pulse	
D	YR	4	Run. timeout			s	
G	**YR**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YR	7	Assignment	Discrete texts		none	Term. X8-9,X8-10; Term. X9-5,X9-6;
D	YR	15	Beneficiary			none	

A.199 Frequency input channel 3 X8 or X10

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YS	1	Frequency 3			Hz	
D	YS	2	Smoothed			Hz	
I	YS	3	Input pulses 3			Pulse	
D	YS	4	Run. timeout			s	
G	**YS**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YS	7	Assignment	Discrete texts		none	Term. X8-3,X8-4; Term. X10-3,X10-4;
D	YS	15	Beneficiary			none	

A.200 Frequency input channel 4 X8 or X10

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YT	1	Frequency 4			Hz	
D	YT	2	Smoothed			Hz	
I	YT	3	Input pulses 4			Pulse	
D	YT	4	Run. timeout			s	
G	**YT**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YT	7	Assignment	Discrete texts		none	Term. X8-5,X8-6; Term. X10-5,X10-6;
D	YT	15	Beneficiary			none	

A.201 Frequency input channel 5 X9 or X8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YU	1	Frequency 5			Hz	
D	YU	2	Smoothed			Hz	
D	YU	4	Run. timeout			s	
G	**YU**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YU	7	Assignment	Discrete texts		none	Term. X9-1,X9-2; Term. X8-3,X8-4;
D	YU	15	Beneficiary			none	

A.202 Frequency input channel 6 X9 or X8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YV	1	Frequency 6			Hz	
D	YV	2	Smoothed			Hz	
D	YV	4	Run. timeout			s	
G	**YV**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YV	7	Assignment	Discrete texts		none	Term. X9-3,X9-4; Term. X8-5,X8-6;
D	YV	15	Beneficiary			none	

A.203 Frequency input channel 7 X9 or X8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YW	1	Frequency 7			Hz	
D	YW	2	Smoothed			Hz	
D	YW	4	Run. timeout			s	
G	**YW**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YW	7	Assignment	Discrete texts		none	Term. X9-5,X9-6; Term. X8-7,X8-8;
D	YW	15	Beneficiary			none	

A.204 Frequency input channel 8 X9 or X8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YX	1	Frequency 8			Hz	
D	YX	2	Smoothed			Hz	
D	YX	4	Run. timeout			s	
G	**YX**	**6**	**Format**	Menu		**none**	%.0f; %.1f; %.2f; %.3f; %.4f; %.5f; %.6f; %g; %e; %f;
A	YX	7	Assignment	Discrete texts		none	Term. X9-7,X9-8; Term. X8-9,X8-10;
D	YX	15	Beneficiary			none	

A.205 Contact inputs terminal X7,X8

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
I	YY	2	Input pattern			none	
T	**YY**	**4**	**Invert mask**	0	255	**none**	
D	YY	14	Running timeout			s	
D	YY	15	Contact 1			none	
D	YY	16	Contact 2			none	
D	YY	17	Contact 3			none	
D	YY	18	Contact 4			none	
D	YY	19	Contact 5			none	
D	YY	20	Contact 6			none	
D	YY	21	Contact 7			none	
D	YY	22	Contact 8			none	

A.206 Quantity of cycle

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZA	1	Vm cycl.quant.			var.	Unit see AE 31
D	ZA	2	DVm cycl.quant.			var.	Unit see AE 31
D	ZA	3	Vmc cycl.quant.			var.	Unit see AE 31
D	ZA	4	DVmc cycl.quant.			var.	Unit see AE 31
D	ZA	5	Vb cycl.quant.			var.	Unit see AE 30

D	ZA	6	DVb cycl.quant.			var.	Unit see AE 30
D	ZA	7	E cycl.quant.			var.	Unit see AE 32
D	ZA	8	DE cycl.quant.			var.	Unit see AE 32
D	ZA	9	Vm cycl.quant.			var.	Unit see BE 31
D	ZA	10	DVm cycl.quant.			var.	Unit see BE 31
D	ZA	11	Vmc cycl.quant.			var.	Unit see BE 31
D	ZA	12	DVmc cycl.quant.			var.	Unit see BE 31
D	ZA	13	Vb cycl.quant.			var.	Unit see BE 30
D	ZA	14	DVb cycl.quant.			var.	Unit see BE 30
D	ZA	15	E cycl.quant.			var.	Unit see BE 32
D	ZA	16	DE cycl.quant.			var.	Unit see BE 32
D	ZA	17	Vm cycl.quant.			var.	Unit see CE 31
D	ZA	18	DVm cycl.quant.			var.	Unit see CE 31
D	ZA	19	Vmc cycl.quant.			var.	Unit see CE 31
D	ZA	20	DVmc cycl.quant.			var.	Unit see CE 31
D	ZA	21	Vb cycl.quant.			var.	Unit see CE 30
D	ZA	22	DVb cycl.quant.			var.	Unit see CE 30
D	ZA	23	E cycl.quant.			var.	Unit see CE 32
D	ZA	24	DE cycl.quant.			var.	Unit see CE 32
D	ZA	25	Vm cycl.quant.			var.	Unit see DE 31
D	ZA	26	DVm cycl.quant.			var.	Unit see DE 31
D	ZA	27	Vmc cycl.quant.			var.	Unit see DE 31
D	ZA	28	DVmc cycl.quant.			var.	Unit see DE 31
D	ZA	29	Vb cycl.quant.			var.	Unit see DE 30
D	ZA	30	DVb cycl.quant.			var.	Unit see DE 30
D	ZA	31	E cycl.quant.			var.	Unit see DE 32
D	ZA	32	DE cycl.quant.			var.	Unit see DE 32
D	ZA	33	Vm cycl.quant.			var.	Unit see EE 31
D	ZA	34	DVm cycl.quant.			var.	Unit see EE 31
D	ZA	35	Vmc cycl.quant.			var.	Unit see EE 31
D	ZA	36	DVmc cycl.quant.			var.	Unit see EE 31
D	ZA	37	Vb cycl.quant.			var.	Unit see EE 30
D	ZA	38	DVb cycl.quant.			var.	Unit see EE 30
D	ZA	39	E cycl.quant.			var.	Unit see EE 32
D	ZA	40	DE cycl.quant.			var.	Unit see EE 32
D	ZA	41	Vm cycl.quant.			var.	Unit see FE 31
D	ZA	42	DVm cycl.quant.			var.	Unit see FE 31
D	ZA	43	Vmc cycl.quant.			var.	Unit see FE 31
D	ZA	44	DVmc cycl.quant.			var.	Unit see FE 31
D	ZA	45	Vb cycl.quant.			var.	Unit see FE 30
D	ZA	46	DVb cycl.quant.			var.	Unit see FE 30

D	ZA	47	E cycl.quant.			var.	Unit see FE 32
D	ZA	48	DE cycl.quant.			var.	Unit see FE 32
D	ZA	49	Vm cycl.quant.			var.	Unit see GE 31
D	ZA	50	DVm cycl.quant.			var.	Unit see GE 31
D	ZA	51	Vmc cycl.quant.			var.	Unit see GE 31
D	ZA	52	DVmc cycl.quant.			var.	Unit see GE 31
D	ZA	53	Vb cycl.quant.			var.	Unit see GE 30
D	ZA	54	DVb cycl.quant.			var.	Unit see GE 30
D	ZA	55	E cycl.quant.			var.	Unit see GE 32
D	ZA	56	DE cycl.quant.			var.	Unit see GE 32
D	ZA	57	Vm cycl.quant.			var.	Unit see HE 31
D	ZA	58	DVm cycl.quant.			var.	Unit see HE 31
D	ZA	59	Vmc cycl.quant.			var.	Unit see HE 31
D	ZA	60	DVmc cycl.quant.			var.	Unit see HE 31
D	ZA	61	Vb cycl.quant.			var.	Unit see HE 30
D	ZA	62	DVb cycl.quant.			var.	Unit see HE 30
D	ZA	63	E cycl.quant.			var.	Unit see HE 32
D	ZA	64	DE cycl.quant.			var.	Unit see HE 32
D	ZA	65	M cycl.quant.			var.	Unit see AE 33
D	ZA	66	DM cycl.quant.			var.	Unit see AE 33
D	ZA	67	M cycl.quant.			var.	Unit see BE 33
D	ZA	68	DM cycl.quant.			var.	Unit see BE 33
D	ZA	69	M cycl.quant.			var.	Unit see CE 33
D	ZA	70	DM cycl.quant.			var.	Unit see CE 33
D	ZA	71	M cycl.quant.			var.	Unit see DE 33
D	ZA	72	DM cycl.quant.			var.	Unit see DE 33
D	ZA	73	M cycl.quant.			var.	Unit see EE 33
D	ZA	74	DM cycl.quant.			var.	Unit see EE 33
D	ZA	75	M cycl.quant.			var.	Unit see FE 33
D	ZA	76	DM cycl.quant.			var.	Unit see FE 33
D	ZA	77	M cycl.quant.			var.	Unit see GE 33
D	ZA	78	DM cycl.quant.			var.	Unit see GE 33
D	ZA	79	M cycl.quant.			var.	Unit see HE 33
D	ZA	80	DM cycl.quant.			var.	Unit see HE 33

A.207 Sums of cycle

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZB	1	Vb cycl.quant.			var.	Unit see LA 35
D	ZB	2	DVb cycl.quant.			var.	Unit see LA 35
D	ZB	3	Vm cycl.quant.			var.	Unit see LA 36

D	ZB	4	DVm cycl.quant.			var.	Unit see LA 36
D	ZB	5	Vmc cycl.quant.			var.	Unit see LA 36
D	ZB	6	DVmc cycl.quant.			var.	Unit see LA 36
D	ZB	7	E cycl.quant.			var.	Unit see LA 37
D	ZB	8	DE cycl.quant.			var.	Unit see LA 37
D	ZB	9	Vb cycl.quant.			var.	Unit see LB 35
D	ZB	10	DVb cycl.quant.			var.	Unit see LB 35
D	ZB	11	Vm cycl.quant.			var.	Unit see LB 36
D	ZB	12	DVm cycl.quant.			var.	Unit see LB 36
D	ZB	13	Vmc cycl.quant.			var.	Unit see LB 36
D	ZB	14	DVmc cycl.quant.			var.	Unit see LB 36
D	ZB	15	E cycl.quant.			var.	Unit see LB 37
D	ZB	16	DE cycl.quant.			var.	Unit see LB 37
D	ZB	17	Vb cycl.quant.			var.	Unit see LC 35
D	ZB	18	DVb cycl.quant.			var.	Unit see LC 35
D	ZB	19	Vm cycl.quant.			var.	Unit see LC 36
D	ZB	20	DVm cycl.quant.			var.	Unit see LC 36
D	ZB	21	Vmc cycl.quant.			var.	Unit see LC 36
D	ZB	22	DVmc cycl.quant.			var.	Unit see LC 36
D	ZB	23	E cycl.quant.			var.	Unit see LC 37
D	ZB	24	DE cycl.quant.			var.	Unit see LC 37
D	ZB	25	Vb cycl.quant.			var.	Unit see LD 35
D	ZB	26	DVb cycl.quant.			var.	Unit see LD 35
D	ZB	27	Vm cycl.quant.			var.	Unit see LD 36
D	ZB	28	DVm cycl.quant.			var.	Unit see LD 36
D	ZB	29	Vmc cycl.quant.			var.	Unit see LD 36
D	ZB	30	DVmc cycl.quant.			var.	Unit see LD 36
D	ZB	31	E cycl.quant.			var.	Unit see LD 37
D	ZB	32	DE cycl.quant.			var.	Unit see LD 37
D	ZB	33	M cycl.quant.			var.	Unit see LA 38
D	ZB	34	DM cycl.quant.			var.	Unit see LA 38
D	ZB	35	M cycl.quant.			var.	Unit see LB 38
D	ZB	36	DM cycl.quant.			var.	Unit see LB 38
D	ZB	37	M cycl.quant.			var.	Unit see LC 38
D	ZB	38	DM cycl.quant.			var.	Unit see LC 38
D	ZB	39	M cycl.quant.			var.	Unit see LD 38
D	ZB	40	DM cycl.quant.			var.	Unit see LD 38

A.208 Differences of cycle

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZC	1	Vb cycl.quant.			var.	Unit see MA 31
D	ZC	2	E cycl.quant.			var.	Unit see MA 34
D	ZC	3	Vb cycl.quant.			var.	Unit see MB 31
D	ZC	4	E cycl.quant.			var.	Unit see MB 34
D	ZC	5	Vb cycl.quant.			var.	Unit see MC 31
D	ZC	6	E cycl.quant.			var.	Unit see MC 34
D	ZC	7	Vb cycl.quant.			var.	Unit see MD 31
D	ZC	8	E cycl.quant.			var.	Unit see MD 34

A.209 Counter Reset

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZD	1	Symbol			none	
D	ZD	2	Current value			var.	
Y	**ZD**	**3**	**Set value**	Unlimited	Unlimited	**var.**	Unit see ZD 2

A.210 Function

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZX	1	Not available	Discrete texts		none	;

A.211 Input values

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZY	1	Debug value 4			hex	
I	ZY	4	FCBios-cycles			Hz	
I	ZY	13	Puls comp. run 1			none	
I	ZY	14	Puls comp. run 2			none	
I	ZY	15	Startup meter run 1	Discrete texts		none	no; yes;
I	ZY	16	Startup meter run 2	Discrete texts		none	no; yes;
I	ZY	18	Base time-second			none	
I	ZY	19	Base cycle second			s	
I	ZY	24	Loss of synchron.			none	
I	ZY	25	Base cycle HF1/2			s	
I	ZY	26	Base cycle HF3/4			s	
I	ZY	27	Base time-HF1/2			none	
I	ZY	28	Base time-HF3/4			none	
I	ZY	29	FPGA check			none	
D	ZY	32	Test cycle			s	

A.212 Miscellaneous

Access	Column	Line	Designation	Minimum	Maximum	Unit	Remark(s)
D	ZZ	1	Placeholder empty			none	
D	ZZ	7	diverse 13	Discrete texts		none	region; ALSKOPIE; NONIERM; path; ERMITAM; Freeze at once; Füllstand BIS; Füllstand VON; Kennung; phys. Einheit; Servicerequest; Terminal; running No.; Warning; Contents of;
D	ZZ	9	User access			none	
D	ZZ	10	diverse 1	Discrete texts		none	Name; Access; A; B; C; D; E; F; I; K; P; Q; S; T; Z; Unknown; Column; Line; Value; Unit; Variable; X; M; backwards;
D	ZZ	11	diverse 2	Discrete texts		none	Data type; txt[2]; txt[20]; Fault display; float; Menu; int; Menu; long; Menu; Pointer; Fraction; short; Standard query; ulong; UTC time; ushort; Y; Multi-use; Counter+fraction; Symbol; Modbus buffer;
D	ZZ	12	diverse 3	Discrete texts		none	Parameterization; Fault display; Enter; Cancel; Panel; List of parameters; Menu; Totalizer; IP4 address; txt[80]; Local time; G; Contact; Q=0 fault; txid; Expression; Quantity type;
D	ZZ	13	diverse 4	Discrete texts		none	Load defaults; active; Short text; Long text; Acknowledge faults; Old value; Specified value; New value; Result; Continue; of object; As; Access denied; W; J; set;
D	ZZ	14	diverse 5	Discrete texts		none	settable under; Variable; none; IAUSWAHL; KAUSWAHL; Edit; Link on; Format; Discrete texts; Range; Visible; Eintrag;
D	ZZ	15	diverse 6	Discrete texts		none	Modbus; Take PC time; Acknowledge; Max; Min; Selection; DSfG-Tabelle; Matrix; Modbus registers; SAVLOD; Group; Unknown; Input enabled; planning; EADR Quelle;
D	ZZ	16	diverse 7	Discrete texts		none	Designation; Value (display); Value (DSfG); Value (Modbus); DSfG-Name; Register; Bytes; Refresh; Fault documentation; Fault number; Fault category; Valence; Remark(s); Jump target; DEL-Adr. Quelle;
D	ZZ	17	diverse 8	Discrete texts		none	Overview; Test; Overview; Outputs; Inputs; double; Maximum load; ID display; Maximum load; Print; Number; LED; Communication; Calculated values; Registration; Archives; Identification; Subst. Ultrason.; Daten;
D	ZZ	18	diverse 9	Discrete texts		none	Pictures; Picture 1; Picture 2; Picture 3; Unit see; Unlimited; Numerical types; Logical types; without parameters; Visible types; Editor; wrote; VIEWBPP; CRC12;

A	ZZ	19	Counter test 1			none	
A	ZZ	20	Counter test 2			none	
D	ZZ	21	Receive MOD520			none	
D	ZZ	22	Send M32 okay			none	
D	ZZ	23	Send M32 err			none	
D	ZZ	24	Receive difference			none	
D	ZZ	25	Bursttelegrams			none	
Q	**ZZ**	**26**	**CAN burst**	0	300	**none**	
A	ZZ	27	Qm freq. main			Hz	
A	ZZ	28	Qm freq. ref.			Hz	
D	ZZ	29	roughness			none	
D	ZZ	30	Current coordinate			none	
D	ZZ	31	Current key			none	
D	ZZ	42	State	Discrete texts		none	At rest; starts; Running; Ready;
D	ZZ	43	Group names A-M	Discrete texts		none	Flow Computer 1; Flow Computer 2; Flow Computer 3; Flow Computer 4; Flow Computer 5; Flow Computer 6; Flow Computer 7; Flow Computer 8; Archives; Unknown; Unknown; Summation; Subtraction;
D	ZZ	44	Group names N-Z	Discrete texts		none	Function Keys; Pressure Sensor; Temperature Sensor; Gas Quality; Volume Sensor; Modes; Test; Communication; Error messages; Times; Outputs; Inputs; Miscellaneous;
D	ZZ	45	diverse 10	Discrete texts		none	Components; Log; Changes; Proving certificate; Documentation; Go to top; Go to end; Entry; Empty; DSfG Umwerter; DSfG Registrierung; DSfG DFUE; DSfG Events; Generation of Docu; DSfG-Tabelle; Archivtyp;
D	ZZ	51	Last event			none	
D	ZZ	52	Time of last event			none	
D	ZZ	56	diverse 11	Discrete texts		none	Frozen values; View log; New entry; No editor; No entry; Entry too long; Partial CRC; Total checksum; Archive group; Table of faults; MODBUS-Table; Help with Parm.; Log entry; self-interest;
D	ZZ	57	diverse 12	Discrete texts		none	Parameter check; Parameter check col.; Documentation column; LOGERG; EICHSEXP; Mail address; Phone; Missing remarks; Publishing details; Ordinal No.; Time stamp; Channel status; Date; Time; TSV file; Anzahl Kanäle;

K	ZZ	62	Magic number			none	
Q	**ZZ**	**63**	**Save Netconfig.**	0	1	**none**	
D	ZZ	67	Timestmp power fail			none	
D	ZZ	68	Duration power fail			s	
X	**ZZ**	**72**	**Default reset**	Menu		**none**	no; yes;
M	ZZ	73	Modbus release			none	
D	ZZ	74	Helpvalue 2	Discrete texts		none	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8;
D	ZZ	75	Helpvalue 1	Discrete texts		none	Flow computer 1; Flow computer 2; Flow computer 3; Flow computer 4; Flow computer 5; Flow computer 6; Flow computer 7; Flow computer 8; Sum 1; Sum 2; Sum 3; Sum 4;
Z	ZZ	76	Helpvalue 3			none	
D	ZZ	77	Petronas file			none	