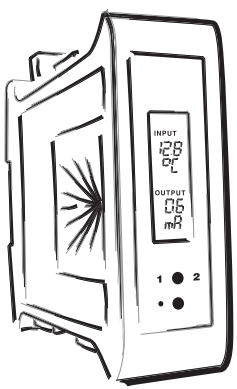
GUARANTEE 2 YEARS

OMLINK

OMX 100

PROGRAMMABLE TRANSMITTER

DC VOLTMETER/AMMETER
AC VOLTMETER/AMMETER
PROCESS MONITOR
OHMMETER
THERMOMETER FOR PT 100/500/1 000
THERMOMETER FOR NI 1 000
THERMOMETER FOR THERMOCOUPLES
DISPLAY INSTR.FOR LIN.POTENTIOMETERS



SAFETY INSTRUCTIONS

Please, read the enclosed safety instructions carefully and observe them!
These instruments should be safeguarded by isolated or common fuses (breakers)!
For safety information the EN 61 010-1 + A2 standard must be observed.
This instrument is not explosion-safe!

TECHNICAL DATA

Transmitters of the OMX 100 series conform to European regulation 89/336/EWG and the Ordinance 168/1997 Coll.

They are up to the following European standards:
EN 55 022, class B
EN 61000-4-2, -4, -5, -6, -8, -9, -10, -11

The instruments are applicable for unlimited use in agricultural and industrial areas.

CONNECTION

Supply of energy from the main line has to be isolated from the measuring leads.

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1. CONTENTS

2. INSTRUMENT DESCRIPTION

DESCRIPTION

The OMX 100 model series are programmable transmitters to DIN rail manufactured in the following types:

OMX 100DC	DC voltmeter/ammeter
OMX 100PWR	AC voltmeter/ammeter, wattmetr
OMX 100PM	Process monitor
OMX 100RTD	Thermometer for Pt 100/500/1 000, Ni 1 000
OMX 100T/C	Thermometer for thermocouples
OMX 100DU	Display instrument for linear potentiometers
OMX 100OHM	Ohmmeter
OMX 100F	Frequency meter

The instruments are based on an 8-bit microcontroller with A/D converter, that secures high accuracy, stability and easy operation of the instrument.

Programmable projection of the display

Calibration	projection for the beginning and the end of the input range
	setting the input type
Projection	-99...999

Digital filters

Radius of insensitiveness	adjustable in process units
Exponen. average	from 2...100 measurements
Rounding	setting the projection step for display

Mathematic functions

Tare*	assigned to reset display in case of non-zero input signal

External control

Hold	display/instrument blocking
Lock	locking the control keys of access into Configuration menu
Tare	tare activation
Resetting	counter resetting/preset

Output

Analog	programmable
	0...5 mA, 0...20 mA, 4...20 mA (with error statement evaluation 3 mA)
	0...2/5/10 V
	0,2...2 200 Hz

** only for type DC, PM, DU*

OPERATION

The transmitter is set by two control keys on the front panel or via data line RS 232/485.

A standard equipment is the OM Link interface, through which it is possible to modify and store all settings. The OM Link program is freely procurable, to be downloaded from the web site. For the connection an OM Link cable is necessary.

All programmable parameters are stored in the EEPROM memory (they hold even after the instrument is switched off).

EXTENSION

Excitation is suitable for feeding sensors and converters. It has a galvanic isolation of 12...24 VDC.

Comparators are assigned to control two limit values with relay output. The limits have adjustbale hysteresis as well as selectable delay of the switch-on. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

Data outputs are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS 232 and RS 485 with the ASCII protocol.

Real time is an internal time control of data collection. It is suitable everywhere where it is neccessary to register measured values in a given time segment. Up to 65 000 values may be stored in the instrument's memory. Data transmission into PC via serial interface RS232/485

FIRMWARE *www.orbit.merret.cz/update*

With respect to the continuous development and innovation of our products it is now possible to download the most recent program version for every instrument directly from the web pages.

After connecting the instrument to PC and running the program the upgrade is performed automatically .

For firmware upgrade the communication module FlashNec is required.

Number of the current program version in your instrument can be found „Configuration menu - service - identification"

3. CONNECTION

The lead for feeding the instrument should not be in the proximity of the incoming low-potential signals.

Contactors, motors with larger input power and other efficient elements should not be in the proximity of the instrument.

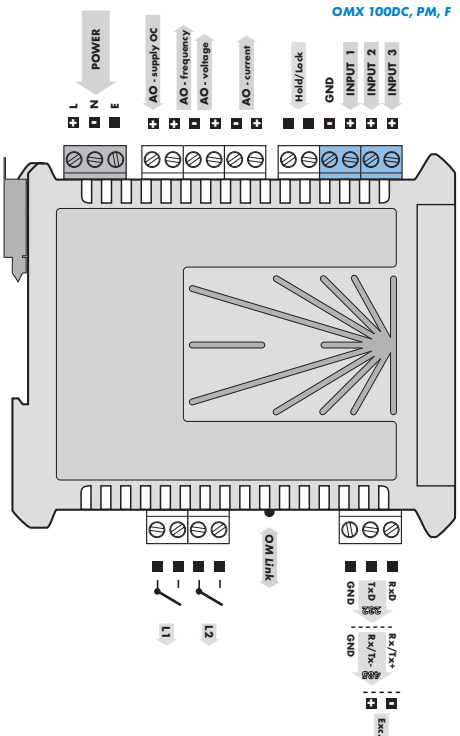
The lead into the input of the instrument (the measured quantity) should be in sufficient distance from all power leads and appliances. Provided this cannot be secured it is necessary to use shielded leads with connection to ground.

The instruments are tested in compliance with standards for use in industrial area, yet we recommend to abide by the above mentioned principles.

MEASURING RANGES

Type	Input 1	Input 2	Input 3
OMX 100 PWR	Input 1 > 0...60 mV * 0...150 mV * 0...300 mV * 0...1 A * 0...5 A		
OMX 100 PWR	Input 2 > 0...10 V * 0...100 V * 0...150 V * 0...250 V * 0...450 V		
OMX 100 DC	±4/±40 mA	±0,4/±4 V	±40/±400 V
OMX 100 DC	0...1/5 A	0...60/150 mV	
OMX 100 PM	0/4...20 mA	0...2 V	0...5/10 V
OMX 100 OHM	0...999 Ohm * 0...9,99 kOhm * 0...99,9 kOhm * 5...105 Ohm		
OMX 100 F	< 30 V	< 150 V	< 300 V

! *Grounding on terminal „E" has to be connected at all times.*



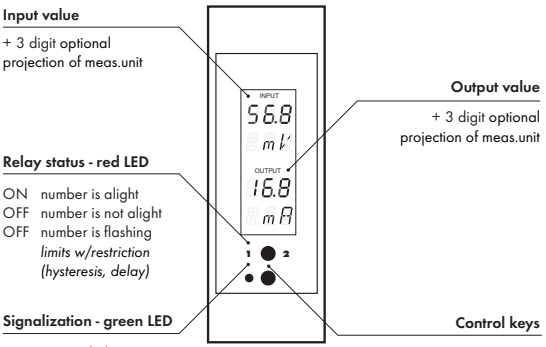
Feeding of an open collector (OC) for frequency output max. 40 V, (internal resistance 5k6)

Relay parameters listed in Technical data apply for resistance load. Upon connection of induction load we recommend fitting the leads to relay 1 A with a fuse for protection of maximum load.

In RTD and OHM it is necessary

4. INSTRUMENT SETTING

The instrument is set and controlled by 5 control keys located on the front panel. By means of these controls it is possible to browse through the operating program and to select and set the required values.



SYMBOLS USED IN THE INSTRUCTIONS

DC **AC** **PM** **DU** **OHM** **RTD** **T/C** Indicates the setting for given type of instrument

CONTROL KEYS FUNCTIONS

▼	▲	▼ + ▲
DOWN*	UP*	DOWN + UP
Measuring mode		
tare/resetting	restored data on display	input do menu
Moving around in the menu		
move to next item	return to previous level	confirm selected item
Setting/selection - items		
move down	move up	confirm selected item
Setting - numbers		
change of current figure - up -	move to higher decade	confirm selected number

** control keys react after being released*

SETTING THE DECIMAL POINT AND THE (-) SIGN

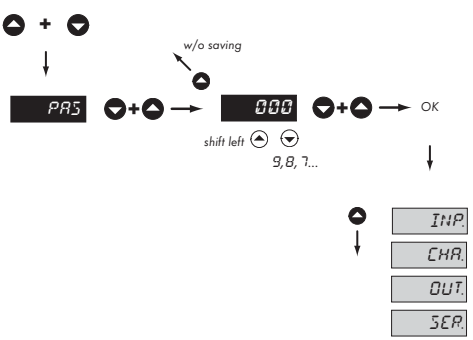
DECIMAL POINT

Its selection in the setting mode is performed by control key ▲ with transition behind the highest decade, when the data starts flashing. Positioning is performed by ▼.
For projection of value exceeding 999 the „k" suffix may be set up (display value is multiplied by 1000, only for frequency output).

MINUS SIGN

Setting the minus sign is performed by control key ▼ on the highest decade. When editing the item, figures change in numeric row 0,1...9,-,0,1

ACCESS INTO THE CONFIGURATION MODE

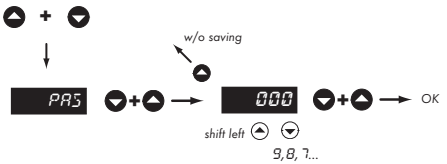


The code from manufacture is always preset to 000. In case of loss of access password it is possible to use the universal access code "177"

If the code is preset to 000 than the access into the menu is free, i.e. without call for its setting

4.1 GUIDE THROUGH MINIMUM INSTRUMENT SETTING

❶ Access into the „Configuration menu““

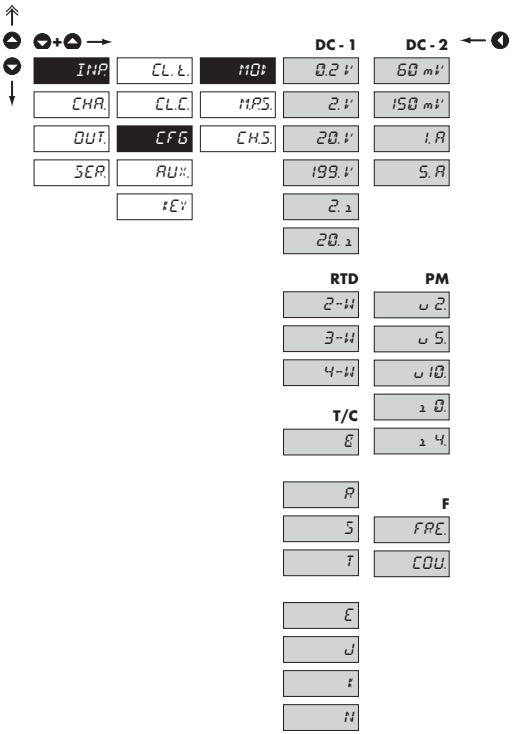


PAS **Entering the introductory access password**

000 Standard manufacture setting of the access password

If the code is preset to 000 than the access into „CM" is free, i.e. without call for its setting

❷ Selection of the measuring range/input type



MOd **Setting the instrument measuring range**

DC Input

- *setting the input range is dependant on the ordered measuring range*

PM Input

- *setting the input range*

RTD Input

- *setting the type of connection*
- *in 2 or 3-wire connection it is necessary to link the unconnected inputs (see the connection)*

T/C Input

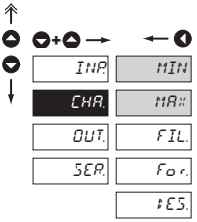
- *setting the type of thermocouple is dependant on the ordered measuring range*

- *B*	*type B*	*Range 1*
R	*type R*	*Range 2*
S	*type S*	
T	*type T*	
E	*type E*	*Range 3*
J	*type J*	
K	*type K*	
N	*type N*	

Input F

- *setting the measuring mode*
- *FRE.* *Frequency measurement*
  COU. *Impulse counter*

❸ Setting the display projection



`MIN.` Setting the display projection for minimum value of the input signal

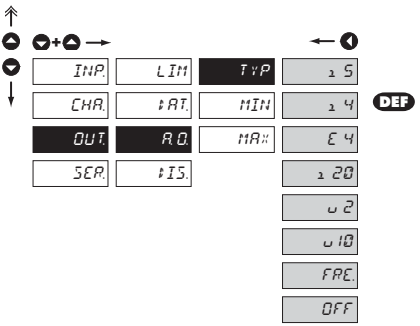
- *range of the setting is* -99...999

`MAX` Setting the display projection for maximum value of the input signal

- *range of the setting is* -99...999

For type „F" the items „SCA" and „OFF" will be displayed

❹ Setting the analog output type



`0 5` Type - 0...5 mA

`4 20` Type - 4...20 mA

`E 4` Type - 4...20 mA with error statement (3,0 mA)

`0 20` Type - 0...20 mA

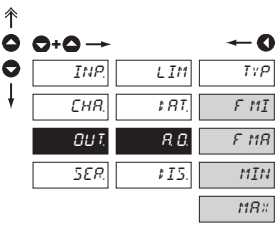
`0 2` Type - 0...2 V

`0 10` Type - 0...10 V

`FRE.` Type - 0,2...2 200 Hz

`OFF` The output is off

❺ Setting the analog output range



`F MI` Setting the beginning of the frequency range for item „MIN"

- *range of the setting is* 0,2...2 200 Hz

`F MA` Setting the end of the frequency range for item „MAX"

- *range of the setting is* 0,2...2 200 Hz

`MIN` Assigning the display value to the beginning of the AO rangevýstupu

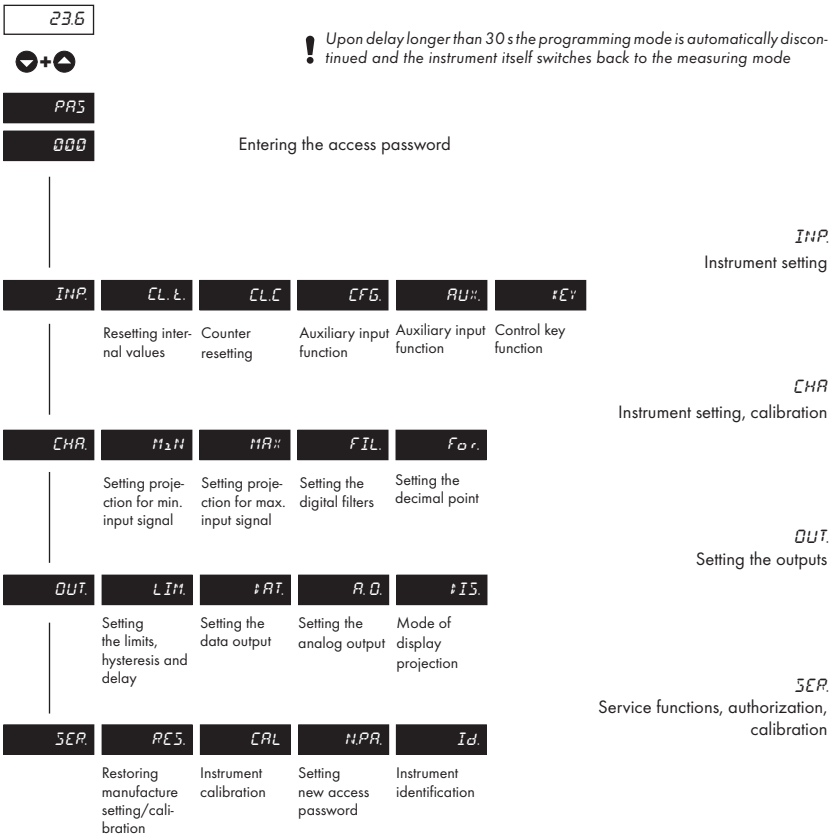
- *range of the setting is* -99...999

`MAX` Assigning the display value to the end of the AO range

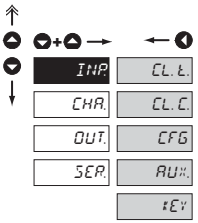
- *range of the setting is* -99...999

4.2 CONFIGURATION MENU

- designated for professional service and maintenance
- complete instrument setting
- access is protected by password or a shorting link on the input connector



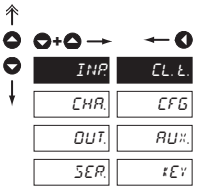
4.2.1 CONFIGURATION MODE - INPUT



The basic instrument functions are set in this menu

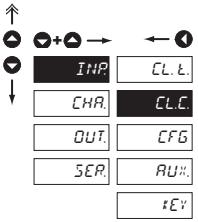
CL.t.	Internal values resetting
CL.C.	Counter resetting Type „F"
CFG	Selecting the measuring range and measuring rate
AUX.	Setting the external control input function
tEY	Setting the control-key function

4.2.1.1 INTERNAL VALUES RESETTING



CL.t. **Tare resetting**

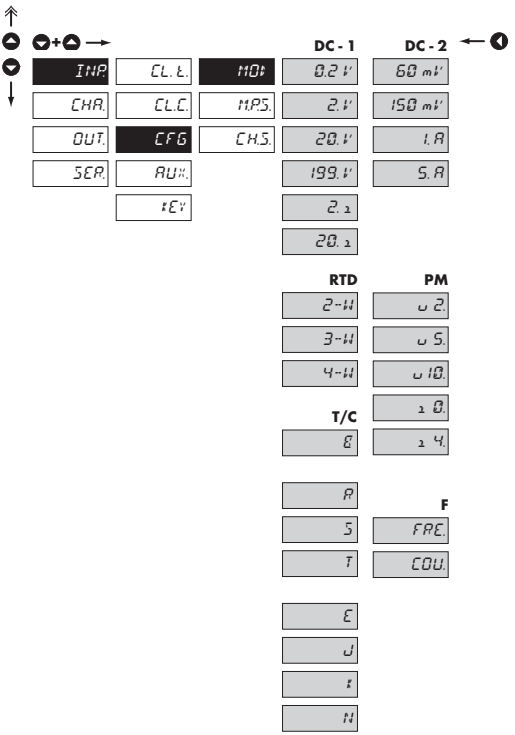
4.2.1.2 COUNTER RESETTING F



CL.C. **Counter resetting**

Holds valid for mode „Counter"

4.2.1.3.1 SETTING THE MEASURING RANGE



MOD Setting the instrument measuring range

DC Input

- *setting the input range is dependant on the ordered measuring range-* *0.2 u*

±0,2 V	*Range 1*	
2. u	*±2 V*	
20. u	*±20 V*	
199. u	*±200 V*	
60. mV	*±60 mV*	*Range 2*
150. mV	*±150 mV*	
1. A	*±1 A*	
5. A	*±5 A*	

PM Input

- *setting the input range*

RTD Input

- *setting the type of connection*
- *in 2 or 3-wire connection it is necessary to link the unconnected inputs (see connection)*

T/C Input

- *setting the type of thermocouple is dependant on the ordered measuring range*

- *B*	*type B*	*Range 1*
R	*type R*	*Range 2*
S	*type S*	
T	*type T*	
E	*type E*	*Range 3*
J	*type J*	
K	*type K*	
N	*type N*	

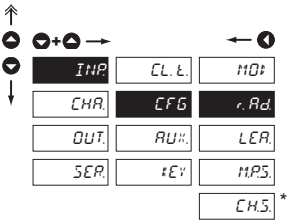
Input F

- *setting the measuring mode*

- *FRE.*	*Frequency measurement*
COU.	*Impulse counter*

4.2.1.3.2 SHIFTING THE BEGINNING OF THE RANGE

RTD OHM

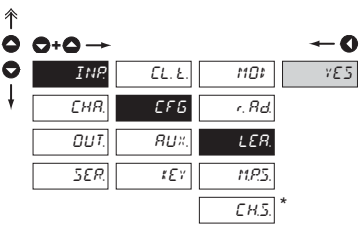


r. Ad. Shifting the beginnnig of the measuring range

- *in cases when it is necessary to shift the beginning of the range by a given value, e.g. when using sensor in measuring head*
- *entered directly in Ohm*

4.2.1.3.3 COMPENSATION OF 2-WIRE CONDUCT

RTD OHM

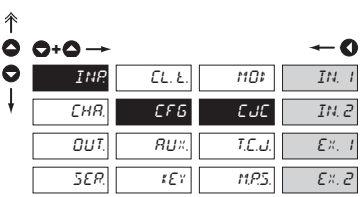


LER. Compensation of 2-wire conduct

- *for measurement accuracy it is always necessary to perform compensation of the conduct in case of 2-wire connection*
- *entered directly in Ohm*
- *prior to confirmation of the displayed challenge „YES" it is necessary to substitute the sensor at the end of the conduct by a short circuit*
- *preset from manufacture to „0"*

4.2.1.3.4 SETTING THE MODE OF ASSESSMENT OF CJC

T/C



C.J.C. Mode of assessment of cold junction

- *description of the mode of assessment of cold junction is in chapter 5, page 30*

IN. 1 Measurement without reference thermocouple

- *CJC measurement on the instrument brackets*

IN.2 Measurement with reference thermocouple

- *cold junction measurement on the instrument brackets with anti-series connection of ref. thermocouple*

EX. 1 Measurement without reference thermocouple

- *whole measuring system operates under identical and constant temperature*

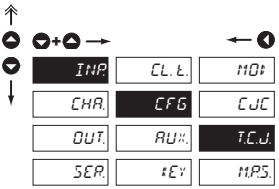
EX.2 Measurement with reference thermocouple

- *when using compensation box*

** valid only for OMX 100OHM*

4.2.1.3.5 SETTING THE TEMPERATURE OF CJC

T/C



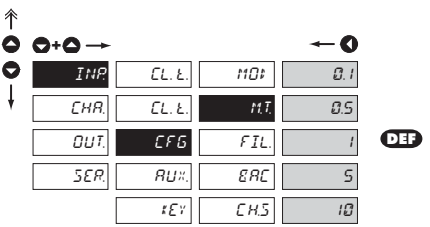
T.C.J. Setting the temperature of CJC

- *range 0...60 °C with compensation box*

Method and process of the setting of CJC is described in separate chapter on page 30

4.2.1.3.6 SETTING THE TIME BASE

F

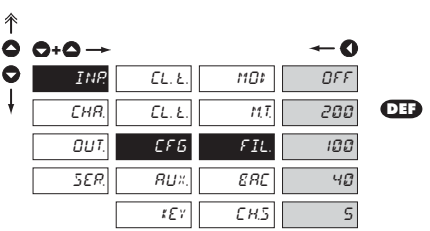


M.T. Setting the measuring time - time base

- *if you set the time of measurement e.g to 1s, the measuring time is approximately from 1s to 2s (1 s + maximum one period of measured signal). If no impulse comes within 2 s , it is understood that the signal has zero frequency*
- *range of the setting of the time base is 0,5 s to 10 s*
- *in the „RTC" regime with projection of date the set time determines the period of switching between time/date, min. is 5 s, the date is displayed for approximately 2,5*

4.2.1.3.7 SETTING THE INPUT FILTER PARAMETERS

F



FIL. Setting the digital input filter

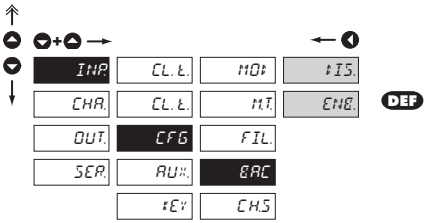
- *through digital filter we may suppress undesirable interfering impulses (e.g. relay back-swings) on the input signal. The set parameter indicates maximum possible instrument frequency (Hz), which the instrument may process without restriction*

Valid for the „Counter" mode

When entering the contact and if we known the maximum input frequency we recommend using the filter

4.2.1.3.8 SETTING THE DISPLAY STATUS BACKUP

F



BAC. Setting the display status backup

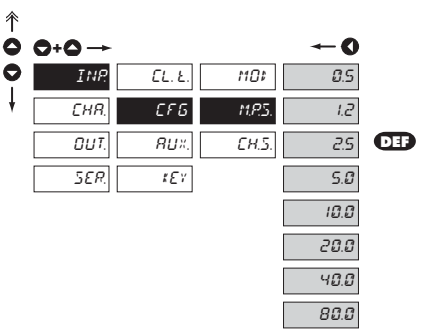
- *setting the restoration of display value after power outage or instrument switchoff*

RIS. After switch-on instrument resets itself to zero

ENB. After switch-on instrument reads the display status from its memory

Valid for the „Counter" mode

4.2.1.3.9 SETTING THE INSTRUMENT MEASURING RATE



M.R.S. Setting the measuring rate

0.5 Rate - 0,5 measurements/s

1.2 Rate - 1,2 measurements/s

2.5 Rate - 2,5 measurements/s

5.0 Rate - 5 measurements/s

10.0 Rate - 10 measurements/s

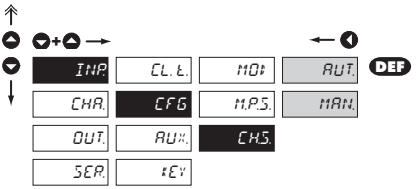
20.0 Rate - 20 measurements/s

40.0 Rate - 40 measurements/s

80.0 Rate - 80 measurements/s

4.2.1.3.10 SELECTION OF MENU PRESETTING

DC PM OHM F



When selecting „AUT." in type „F" the decimal point and description are preset in the range of 0,01 Hz...50,0 kHz. Limits and AO are set in kHz!

CHS. Menu presetting

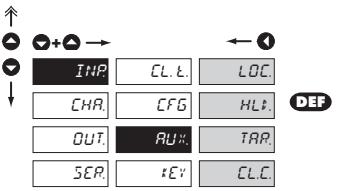
AUT. Automatic

- *depending on the set input the following items will be preset automatically:*
  - *CHANNELS: MIN/MAX, FOR, DES*
  - *OUT: A.O. > MIN/MAX*
- *aut. ppreset items will disappear from the menu and reappear again after setting „MAN"*
- *example for input 4-20mA (PM): MIN/MAX > 4-20; FOR > 00.0; DES > mA; A.O. MIN/MAX > 4-20*

MAN. Manual

- *as a standard, according to individual items on the menu*

4.2.1.6 SELECTION OF EXTERNAL INPUT FUNCTION



AUX. Selection of external input function

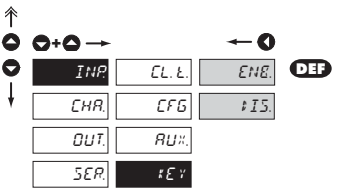
LOC. LOCK, locking the control keys on the instrument

HLD. HOLD, stop measuring of the entire instrument

TAR. TARE - Tare* activation

CL.C. Counter resetting only for type „F", mode „COU"

4.2.1.7 SETTING ANOTHER FUNCTION OF THE CONTROL KEY „ENTER"



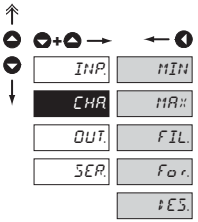
KEY Setting another function of the control key ▼

DIS. Without function

ENT. Activation of keys for Tare* projection, in type „F" in mode „COU" > resetting to zero

** only for type DC, PM, DU, F*

4.2.2 CONFIGURATION MODE - CHANNELS



In this menu instrument parameters are set

MIN Setting the display projection for minimum value of the input signal ❶

MAX Setting display projection for maximum value of the input signal ❷

FIL. Setting the digital filters ❸

For. Setting the decimal point ❹

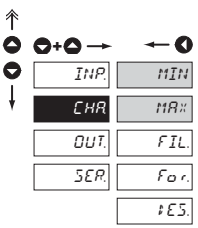
UES. Setting the measuring units ❺

Input type	Setting options
DC	① ② ③ ④ ⑤
AC	① ② ③ ④ ⑤
PM	① ② ③ ④ ⑤
DU	① ② ③ ④ ⑤
OHM	① ② ③ ④ ⑤
RTD	③ ④
T/C	③
F	① ② ③ ④ ⑤

! *Items „MIN" and „MAX" resp. „SCA" and „OFF" are displayed only when the menu is set to „Manual"*
INP > CFG > CH.S > MAN

4.2.2.1 DISPLAY PROJECTION

DC PM DU OHM F



MIN. Setting the display projection for minimum value of the input signal

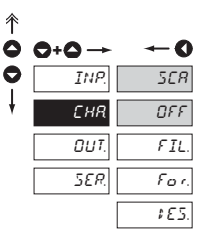
- *range of the setting is* -99...999

MAX Setting display projection for maximum value of the input signal

- *range of the setting is* -99...999

SCA Setting the calibration constant

- *calibration constant is for the conversion of input value to required display value*
- *by setting the minus value the direction of counting changes, i.e. we count down*
- *range: -0,00001...999999,* DEF = 1

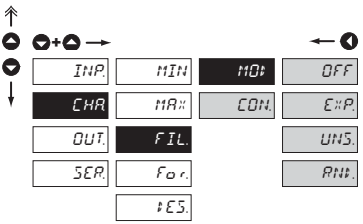


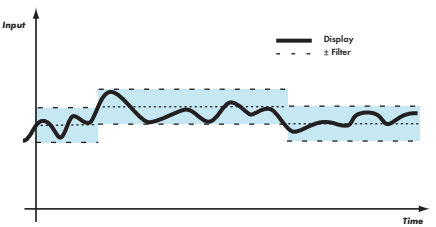
Only for type „F"

OFF Setting the additive constant „PRESET"

- *shifting the beginning of measurement by a set value which will always be read upon resetting the instrument to zero*
- *range: -99999...999999,* DEF = 0

4.2.2.2 SETTING THE DIGITAL FILTERS





FIL. Setting the digital filters

CON. Setting the filtration constant

- *this menu is always displayed after selection of a particular type of filter*

OFF Filters are off

EXP Selection of exponential filter

- the value is calculated from a number of measurements selected in „CON"

- range 2...100

UNS. Selection of the band of insensitiveness

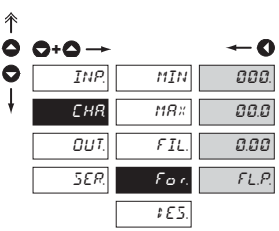
- *this filter enables to stabilize the resulting value. A measuring result is understood as the previous value, provided the measured value is not higher than the previous + P or smaller than the previous - P. Value „±P" indicates the band of insensitiveness in which the measured value may change without affecting the result - change of the data on display*
- *range ±1999*

RND. Rounding the measured value

- *it is set by an optional number which determines the projection step (e.g. step 2,5 - 0, 2.5, 5, 7.5, etc.)*

4.2.2.3 SETTING THE DECIMAL POINT

DC **PM** **DU** **OHM** **F**



For. Setting the decimal point

- *the instrument allows classic projection of a number with placement of the decimal point as well as projection with floating point, allowing to display the number in its most precise form „FLP."*

000. Setting the DP

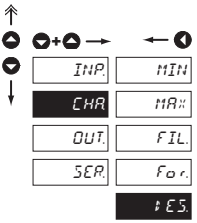
000.0 Setting the DP

0.000 Setting the DP

FLP. Setting the DP

4.2.2.4 SETTING THE DECIMAL POINT

DC PM DU OHM F



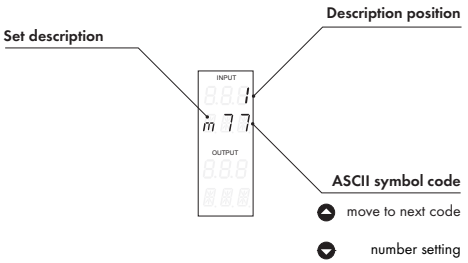


Table of symbols is on page 28

YES Setting the projection of measuring units on the display

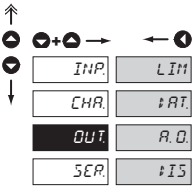
- *the instrument allows to add three symbols to classic numeric formats. The setting is performed by means of shifted ASCII code. Upon the setting the upper number indicates the symbol position, the lower line displays entered symbol on the first position and on the last two positions the code of the relevant symbol from 0 to 95.*

  Description is cancelled by entering symbols 00

- *instruments with input for temperature measurement display °C as a standard*

In „COU" mode in type „F" the projection in format 000000 is divided in two parts, first line (upper) thousands and next line units to hundreds

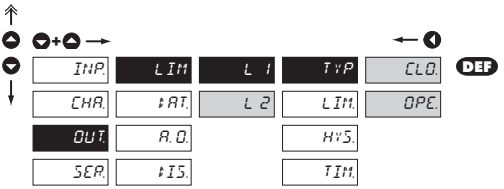
4.2.3 CONFIGURATION MODE - OUTPUTS



In this menu it is possible to set parameters of the instrument output signals

- LIM — Setting the type and the switching of limits
- dAT. — Setting the type and the parameters of data output
- A.O. — Setting the type and the parameters of analog output
- dIS. — Display projection mode

4.2.3.1.1 LIMITS - TYPE OF RELAY SWITCHING

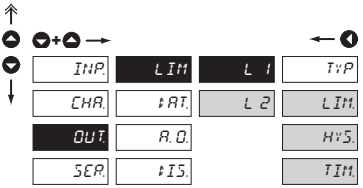


TYP — Setting the type of relay evaluation

- CLO. — Relay switches on when condition is met
- OPE. — Rely switches off when condition is met

The process of setting the limit 2 is identical with the setting for Limit 1

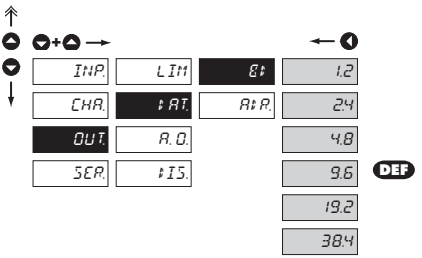
4.2.3.1.2 LIMITS - SETTING THE BOUNDS



- LIM. — Setting the bounds for relay switch-on
  - *within full display rangee*
- HYS. — Setting hysteresis only in (+) values
  - *within full display rangee*
- TIM. — Setting the offset of the limit switch-on
  - *in range 0...99,9 s*

The process of setting the limit 2 is identical with the setting for Limit 1

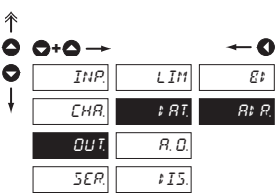
4.2.3.2.1 DATA OUTPUT - RATE



bd **Setting the data output rate**

- 1.2 — Rate - 1 200 Baud
- 2.4 — Rate - 2 400 Baud
- 4.8 — Rate - 4 800 Baud
- 9.6 — Rate - 9 600 Baud
- 19.2 — Rate - 19 200 Baud
- 38.4 — Rate - 38 400 Baud

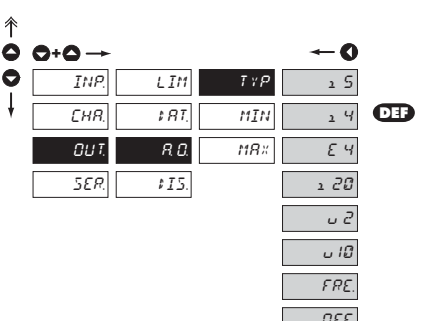
4.2.3.2.2 DATA OUTPUT - ADDRESS



ADR. **Setting the instrument address**

- *setting within the range of 0...31*
- *manufacture setting 00* DEF

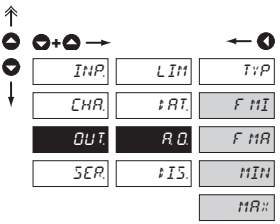
4.2.3.3.1 ANALOG OUTPUT - TYPE



TYP **Setting the analog output type**

- 0...5 — Type - 0...5 mA
- 4...20 — Type - 4...20 mA
- E 4 — Type - 4...20 mA with error statement (3,0 mA)
- 0...20 — Type - 0...20 mA
- 0...2 — Type - 0...2 V
- 0...10 — Type - 0...10 V
- FRE. — Type - 0,2...2 200 Hz
- OFF — The output is off

4.2.3.3.2 ANALOG OUTPUT - RANGE



A0. **Setting the analog output range**

- *analog output is isolated and its value corresponds with the displayed data. It is fully programmable, i.e. it allows to assign the AO limit points to any two arbitrary points of the entire measuring range*

F MI Setting the beginning of the frequency range for item „MIN"

- *range of the setting is 0,2...2 200 Hz*

F MA Setting the end of the frequency range for item „MAX"

- *range of the setting is 0,2...2 200 Hz*

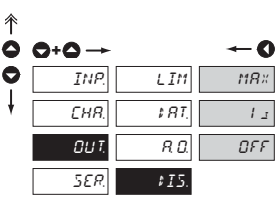
MIN Assigning the display value to the beginning of the AO range

- *range of the setting is -99...999*

MAX Assigning the display value to the end of the AO range

- *range of the setting is -99...999*

4.2.3.4 DISPLAY PROJECTION



BUS. **Display projection mode**

MAX Display value is changing at maximum rate

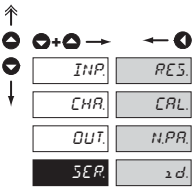
- *it burdens the processor performance, i.e. in fully equipped transmitter the arithmetic operation may be slowed down*

1 s Display value is being restored 1x per second

OFF Display is off

- *after pressing the control key the display is active after 60 s at max. projection rate*

4.2.4 CONFIGURATION MODE - SERVICE



The instrument's service functions are set in this menu

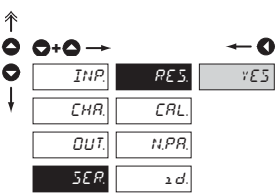
RES. Restoration of the manufacture setting and instrument calibration

CAL. Input range calibration for „DU" version

N.PR. Setting new access password

id. Instrument identification

4.2.4.1 RESTORATION OF MANUFACTURE SETTING

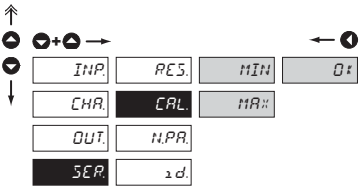


RES. Restoration of the instrument manufacture setting

- *in case of incorrect setting or calibration it is possible to return to manufacture setting. Prior execution of the changes you will be asked to confirm your selection „YES"*
- *reading the manufacture calibration and original setting of items in the menu (DEF)*

4.2.4.2 INPUT RANGE CALIBRATION

DU

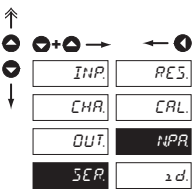


CAL. Input range calibration

- *when MIN is displayed move the potentiometer runner into required minimum position and confirm by „Enter", calibration is confirmed by the „OK" notice*
- *when MAX is displayed move the potentiometer runner into required maximum position and confirm by „Enter", calibration is confirmed by the „OK" notice*

! *Before pressing „ENTER" the potentiometer runner has to be at rest*

4.2.4.3 SETTING NEW ACCESS PASSWORD

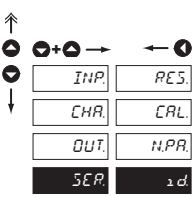


N.PA. Setting new access password for „Configuration menu"

- *this option allows to change the numeric code which blocks the access into the instrument „Configuration mode". The range of the numeric code is 0...999*

If the code is preset to 000 than the access into the menu is free, i.e. without call for its setting

4.2.4.4 INSTRUMENT IDENTIFICATION



id. Projection of the instrument version

- *the display shows the type identification of the instrument with the number of revision*
- *instrument name - program version - SW date e.g.: OMX, 100, PM2, 003, 000,*

5. TABLE OF SYMBOLS

The instrument allows to add two descriptive symbols to classic numeric formats (at the expense of the number of displayed places). The setting is performed by means of shifted ASCII code. Upon modification the first two places display the entered symbols and the last two places the code of the relevant symbol from 0 to 95. Numeric value of given symbol equals the sum of the numbers on both axes of the table.

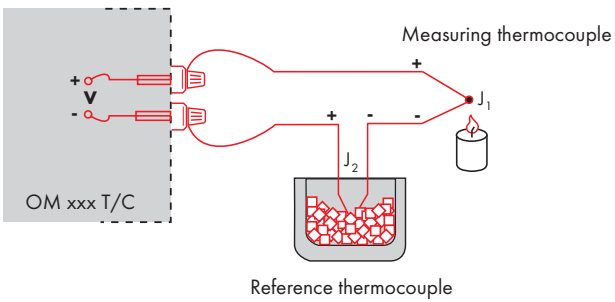
Description is cancelled by entering characters with code 00

	0	1	2	3	4	5	6	7
0								
8								
16								
24								
32								
40								
48								
56								
64								
72								
80								
88								

	0	1	2	3	4	5	6	7
0		!	"	#	$	%	&	'
8	(	)	*	+	,	-	.	/
16	0	1	2	3	4	5	6	7
24	8	9	:	;	<	=	>	?
32	@	A	B	C	D	E	F	G
40	H	I	J	K	L	M	N	O
48	P	Q	R	S	T	U	V	W
56	X	Y	Z	[	\	]	^	_
64	`	a	b	c	d	e	f	g
72	h	i	j	k	l	m	n	o
80	p	q	r	s	t	u	v	w
88	x	y	z	{	|	}	~	

6. METHOD OF MEASURING OF CJC

Istrument with input for temperature measurement with thermocouple allows for setting of two types of measurement of the cold junction.



WITH REFERENCE THERMOCOUPLE

■ a reference thermocouple may be located in the same place as the measuring instrument or in place with stable temperature/compensation box

■ when measuring with reference thermocouple set CJC in the instrument menu to IN.2 or E.2

■■ when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu TCJ. its temperature (applies for setting CJC to E.2)

■ if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu CJC to I n 2. Based on this selection the measurement of the surrounding temperature is performed by a sensor located in the instrument terminal board.

WITHOUT REFERENCE THERMOCOUPLE

■ inaccuracy originating from the creation of dissimilar thermocouples on the transition point terminal-conductor of the thermocouple is not compensated for in the instrument

■ when measuring without reference thermocouple set CJC in the instrument menu to IN 1 or E.1

■ when measuring temperature without reference thermocouple the error in the measured data may be even 10°C (applies for setting CJC to E.1)

7. DATA PROTOCOL

The instruments communicate via serial line RS232 or RS485. For communication they use the ASCII protocol. Communication runs in the following format:

ASCII: 8 bit, no parity, one stop bit

The transfer rate is adjustable in the instrument menu and depends on the control processor used. The instrument address is set in the instrument menu in the range of 0 ÷ 31. The manufacture setting always presets the ASCII protocol, rate of 9600 Baud, address 00. The type of line used - RS232 / RS485 - is determined by an exchangeable card automatically identified by the instrument.

COMMANDS FOR INSTRUMENT OPERATION

The commands are described in specification you can find at **www.orbit.merret.cz/rs**.
A command consists of a number and a letter, where the letter size is of significance.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Activity	Type	Protocol		Data transferred										
Data solicitation (PC)	232	ASCII		#	A	A	<CR>							
	485	ASCII		#	A	A	<CR>							
Data transfer (Instrument)	232	ASCII		>	R	SP	D	D	D	D	D	(D)	(D)	<CR>
	485	ASCII		>	R	SP	D	D	D	D	D	(D)	(D)	<CR>
Command tranfer (Instrument) - identification	232	ASCII		#	A	A	1	Y	<CR>					
	485	ASCII		#	A	A	1	Y	<CR>					
Command confirmation (Instrument)	232	ASCII	ok	!	A	A	<CR>							
			bad	?	A	A	<CR>							
	485	ASCII	ok	!	A	A	<CR>							
			bad	?	A	A	<CR>							

Legend			
#	35	23_H	Beginning of the command
A A	0...31		Two signs of the inst. address (sent in ASCII - decades and units, ex."01")
<CR>	13	$0D_H$	Carriage return
<SP>	32	20_H	Space
N P			Number and command - command code
D			Data - usually signs "0"..."9","-","." ; (D) - dp. and (-) may prolong data
R	30_H...$3F_H$		Relay status; zero bit corresponds with 1st relay, 1st bit with 2nd relay, etc.
!	33	21_H	Positive command confirmation (ok)
?	63	$3F_H$	Negative command confirmation (bad)
>	62	$3E_H$	Beginning of the transmitted data

8. ERROR STATEMENTS

ERROR	CAUSE	ELIMINATION
E.UN.	range underflow (A/D converter)	change the value of input signal or change display projection
E.OV.	range overflow (A/D converter)	change the value of input signal or change display projection
E. M.	infringement of data integrity in EEPROM, error in data storage, EEPROM error	when reported repeatedly send the instru- ment for repair
E.E.E.	EEPROM error	„Def" values will be used in emergency but calibration data will be impaired > send for repair

9. TECHNICAL DATA

INPUT

selectable in configuration menu — ***DC***

DC 1	±4 mA	< 200 mV	Input 1
	±40 mA	< 200 mV	Input 1
	±400 mV	100 kOhm	Input 2
	±4 V	100 kOhm	Input 2
	±40 V	10 MOhm	Input 3
	±400 V	10 MOhm	Input 3
DC 2	±1 A	< 150 mV	Input 1
	±5 A	< 150 mV	Input 1
	±60 mV	100 kOhm	Input 2
	±150 mV	100 kOhm	Input 2

range is fixed, as per order — ***PWR***

Range U:	0...10 V	100 kOhm	Input 2
	0...100 V	10 MOhm	Input 2
	0...150 V	10 MOhm	Input 2
	0...250 V	10 MOhm	Input 2
	0...450 V	10 MOhm	Input 2
Range I:	0...60 mV	100 kOhm	Input 1
	0...150 mV	100 kOhm	Input 1
	0...300 mV	100 kOhm	Input 1
	0...1 A	< 150 mV	Input 1
	0...5 A	< 150 mV	Input 1

selectable in configuration menu — ***PM***

	0/4...20 mA	< 400 mV	Input 1
	0...2 V	1 MOhm	Input 2
	0...5 V	1 MOhm	Input 3
	0...10 V	1 MOhm	Input 3

range is fixed, as per order — ***OHM***

0...999 Ohm
0...9,99 kOhm
0...99,9 kOhm
5...105 Ohm

Connection: 2, 3 or 4 wire

RTD

Pt xxxx -50,0°...199,9°C/-50°...400°C
Ni xxxx -30,0°...199,9°C
Type Pt: 100/500/1 000 Ohm, platinum couple
s α=0,003850hm/Ohm/°C
Type Ni: Ni 1 000, 5000 ppm/6180 ppm
Connection: 2, 3 or 4 wire

selectable in configuration menu — ***T/C***

Type:	J (Fe-CuNi)	-200°...900°C
	K (NiCr-Ni)	-200°...1 300°C
	T (Cu-CuNi)	-200°...400°C
	E (NiCr-CuNi)	-200°...690°C
	B (PtRh30-PtRh6)	300°...1 820°C
	S (PtRh10-Pt)	-50°...1 760°C
	R (Pt13Rh-Pt)	-50°...1 740°C
	N (Omegalloy)	-200°...1 300°C

DU

Lin.pot.supply. 2,5 VDC/6 mA
min. potentiometer resistance is 500 Ohm

PROJECTION

Display: LCD with illumination, 2x 3 symbols + 2x description (3 symbols)
Projection: -99...999
DP: adjustable - in programming mode

INSTRUMENT ACURACY

TC: 100 ppm/°C
Accuracy: ±0,2 % of range + 1 digit
±0,3 % of range + 1 digit — ***T/C, PWR***
±0,05 % of range + 1 digit — ***F***
Resolution: 0,1°/1°C — ***RTD***
1°C — ***T/C***
Rate: 0,5 - 1,2 - 2,5 - 5 - 10 - 20 - 40 - 80 measurements/s
Overload capacity: 10x (t < 100 ms), 2x (long-term)
Digital filter adjustable in configuration menu
Compensation of conduct: max. 40 Ohm — ***RTD***
Comp.of CJC: adjustable — ***T/C***
0°...98°C or automatic (99)
Functions: Tare - display resetting
Hold - stop measuring (upon contact)
Lock - control keys locking
Watch-dog: reset after 25 ms
Calibration: at 25°C and 40 % r.h.

OUTPUTS

Analog: isolated,
programmable w/ resolution of max. 12 bit
Non-linearity: 0,2 % of the range
TC: 100 ppm/°C
Rate: response to change of value< 100 ms
Voltage: 0...2 V/5 V/10 V, na přání ±5 V/±10 V
Current: 0...5/20 mA/4...20 mA, on request ±20 mA
- compensation of conduct up to 600 Ohm
Corrugation: 5 mV of residual corrugation at output voltage 10 V
Frequency: isolated, programmable, open collector with the

** values apply for resistance load*

option of external supply (max. 40 V) přes vnitřní resistance (5k6), 0,2...2 200 Hz

COMPARATOR

Type:	digital, adjustbale in menu
Limits:	-99...999
Hysteresis:	0...999
Delay:	0...99,9 s
Outputs:	2x relays with switch-on contact (230 VAC/30 VDC, 3 A)*
Relays:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

Protocols:	ASCII
Data format:	8 bit + no parity + 1 stop bit (ASCII)
Rate:	1 200...38 400 Baud
RS 232:	isolated, two-way communication
RS 485:	isolated, two-way communication, addressing (max. 31 instrument)

EXCITATION

Adjustable:	12...24 VDC/20 mA, isolated

- cannot be combined with data output

POWER SUPPLY

Options:	24/110/230 VAC, 50/60 Hz, ±10 %, 3 VA 10...30 VDC/max. 250 mA, isolated
Protection:	melting fuse inside the instrument VAC (T 80 mA), VDC (T 630 mA)

MECHANIC PROPERTIES

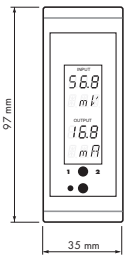
Material:	PP 06 (UL 94 -V0), bloue
Dimensions:	113 x 97 x 35 mm
Installation:	to DIN rail, width 35 mm

OPERATING CONDITIONS

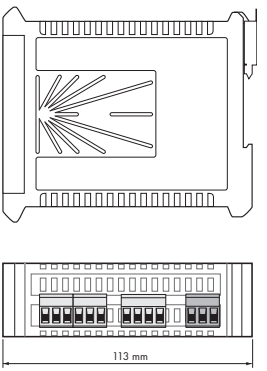
Connection:	connector terminal board, conductor cross section up to 2,5 mm^2
Stabilisation period:	within 15 minutes after switch-on
Working temp.:	0°...60°C
Storage temp.:	-10°...85°C
Protection:	IP20
Construction:	safety class I
Overvoltage categ.:	EN 61010-1, A2 III. - instrument power supply (300 V) II. - input, output, excitation (500 V) for pollution degree II
EMC:	EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11; EN 550222, A1, A2

10. INST.DIMENSIONS AND INSTALLATION

Front view



Side view



Installation to DIN rail of 35 mm width

11. CERTIFICATE OF GUARANTEE

Product	**OMX 100 DC PWR PM DU RTD T/C OHM F**
Type	. . . . .
Manufacturing No	. . . . .
Date of sale	. . . . .

A guarantee period of 24 months from the date of sale to the user applies to this instrument.
Defects occuring during this period due to manufacture error or due to material faults shall be eliminated free of charge.

For instrument quality, function and construction the guarantee shall apply provided that the instrument was connected and used in compliance with the instruction for use.

The guarantee shall not apply for defects caused by:

- mechanic damage
- in transport
- intervention of unqualified person incl. the user
- unavoidable event
- other unprofessional interventions

The manufacturer performs guarantee and post-guarantee repairs unless provided for otherwise.

Stamp, signature

DECLARATION OF CONFORMITY

Assessment of conformity pursuant to Section 12, par. 4 b, d of Act No. 22/1997 Coll.

Company: **ORBIT MERRET, spol. s r.o.**
Klánova 81/141, 142 00 Prague 4, Czech Republic, IČO: 00551309

Manufacturer: **ORBIT MERRET, spol. s r.o.**
Vodňanská 675/30, 198 00 Prague 9, Czech Republic

The manufacturer declares at its full responsibility that the product presented hereunder meets all technical requirements, is safe for use when used under the terms and conditions determined by Orbit Merret, spol.s r.o., and that our company has taken all steps to ensure conformity of all products of the type referred to below, which are being brought out to the market, with technical documentation and requirements of the appurtenant Ordinance.

Product: Digital transmitter to DIN rail

Type: **OMX 100**

Version: DC, PM, PWR, RTD, T/C, DU, OHM, F

Conformity is assessed pursuant to the following standards:

Electr. safety: EN 61010-1

EMC:
EN 50131-1, chapt. 14 and chapt. 15
EN 50130-4, chapt. 7 EN 61000-4-11
EN 50130-4, chapt. 8 EN 61000-4-11
EN 50130-4, chapt. 9 EN 61000-4-2
EN 50130-4, chapt. 10 EN 61000-4-3
EN 50130-4, chapt. 11 EN 61000-4-6
EN 50130-4, chapt. 12 EN 61000-4-4
EN 50130-4, chapt. 13 EN 61000-4-5
EN 50130-5, chapt. 20
prEN 50131-2-1, article 9.3.1
EN 61000-4-8
EN 61000-4-9
EN 61000-3-2 ed. 2:2001
EN 61000-3-3: 1997, Cor. 1:1998, Z1:2002
EN 55022, chapt. 5 and chapt. 6.

As evidence serve the protocols of authorised and accredited organisations:
VTÚE Praha, examination laboratory No. 1158, accredited by ČIA
VTÚPV Vyškov, examination laboratory No. 1103, accredited by ČIA

Prague, 18. 12. 2003

Miroslav Hackl v.r.
General manager