OMD 201

4/6 DIGIT PROGRAMMABLE
LARGE DISPLAY

DC VOLTMETER/AMMETER
PROCESS MONITOR, OHMMETER
THERMOMETER FOR PT 100/500/1 000
THERMOMETER FOR NI 1 000/2 226/10 000
THERMOMETER FOR THERMOCOUPLES
DISPLAY INSTRUMENT 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

Large displays OMD 201 series conform to European regulation 89/336/EWG and 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

Power supply from the main line has to be isolated from the measuring leads.

CE

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1. CONTENTS

2. INSTRUMENT DESCRIPTION

DESCRIPTION

The OMD 201 model series are 4 and 6 digit large panel displays manufactured in the following alternatives:

OMD 201DC	DC voltmeter/ammeter
OMD 201PWR	*Nets analyser - AC voltmeter/ammeter/wattmeter
OMD 201PM	Process monitor
OMD 201RTD	Thermometer for Pt 100/500/1 000, Ni 1 000/2 226/10 000
OMD 201T/C	Thermometer for thermocouples
OMD 201DU	Display instrument for linear potentiometers
OMD 201OHM	Ohmmeter

The instruments are based on an 8-bit microcontroller with precise 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 type of input
Projection	-999...3999

Digital filters

Radius of insensitiveness adjustable in process units

Mathematic functions

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

External control

Hold	display/instrument blocking
Lock	locking the control keys or the access into Configuration menu

** These instruments have separate instructions for use*

OPERATION

The instrument is set and controlled by for control keys located on the front panel. All programmable settings of the instrument are realised in two adjusting modes:

Configuration menu (hereinafter referred to as „CM") is protected by an optional numeric code and containis complete instrument setting

User menu may contain arbitrary programming setting defined in CM with another selective restriction (see, change)

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

The measured units may be projected on the display.

EXTENSION

Excitation is suitable for feeding of sensors and converters. It has a galvanic isolation with continuously adjustable value in the range of 2...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 measured data for further projection or directly into the control systems. We offer isolated RS232 and RS485 with the DIN-MessBus /ASCII protocols.

Analog outputs will find their place in applications where further evaluating or processing of measured data in external devices is required. We offer universal analog output with the option of selection of the output type - voltage/current. The analog output value corresponds with the displayed data and its type and range are selectable in the programming mode.

3. CONNECTION

The supply lead for feeding the instrument should not be in the proximity of low-potential signals.
Contactors, motors with larger input and other efficient elements should not be in the proximity of the instrument.
The lead into the instrument input (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.

! *Grounding on terminal „E" must be connected at all times*

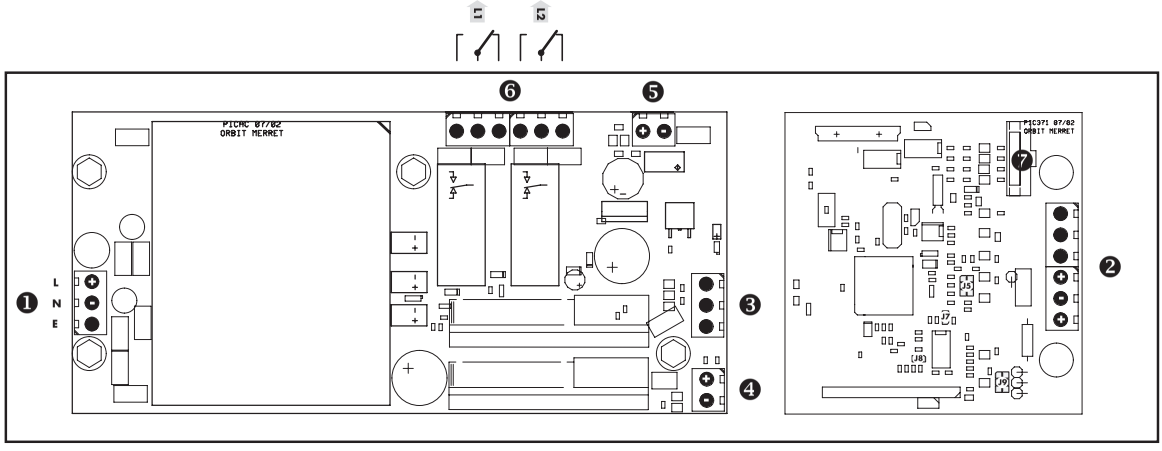
! *In RTD input with 2- or 3- wire connection it is necessary to link the unconnected inputs*

! *Relay parameters specified in the technical data apply for resistance load. Upon connection of the induction load we recommend to fit the leads to relay 1 A with a fuse for maximum load protection.*

! *Construction of the control keyboard does not allow its permanent connection to the instrument*

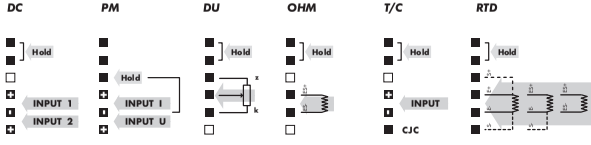
MEASURING RANGES

Type	Input I (1)	Input U (2)
OMD 201 DC - U	0...60/150/300 mV	0...4/40/400 V
OMD 201 DC - I	0...0,4/1/5 A	0...40 mA
OMD 201 PM	0/4...20 mA	0...2/5/10 V
OMD 201 OHM	0...0,4/4/40 kOhm	5...105 Ohm, (upon request 0...100 kOhm)

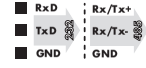


1 **Power supply**

2 **Input**



3 **Data output**



4 **Analog output**

5 **Excitations**

6 **Relays**

7 **Connection of the control keyboard**

4. INSTRUMENT SETTING

The instrument is set and controlled by 4 control keys located on the front panel. By means of these control keys it is possible to browse through the operting program, to select and set the required values.

CONFIGURATION MODE

- designated for professional service and maintenance
- complete instrument setting
- access is password protected
- authorization for "User mode"

USER MODE

- designated for instrument service
- may contain setting the limits, analog and data output and brightness, with restriction as per the setting in "Configuration mode"

SYMBOLS USED IN THE INSTRUCTIONS

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

CONTROL KEYS FUNCTIONS

MENU	ENTER	LEFT	UP
Measuring mode			
menu access	tare	tare projection	
Moving around in the menu			
exit the menu without saving	move to next level	back to previous level	move to enxt item
Setting/selecting - items			
cancel setting without saving	confirm selected item		move up
Setting - numbers			
cancel setting without saving	cancel selected number	move to higher decade	change of current figure - up -

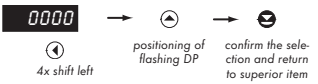
SETTING THE DECIMAL POINT AND THE MINUS SIGN

DECIMAL POINT

Its selection in calibration modes, upon modification of the number to be adjusted is performed by the control key ◀ with transition behind the highest decade, when the decimal point starts flashing. Positioning is performed by ▲. Decimal point is set only in the item „Input - MIN"

MINUS SIGN

It is adjustable upon the shift of the decimal point accross all decades, back to the first one, at which the minus sign will light up. The setting is repeated, i.e. 1x around only positioning of the decimal point and upon next passage accross all decades the minus sign lights up and the decimal point is placed.



Setting

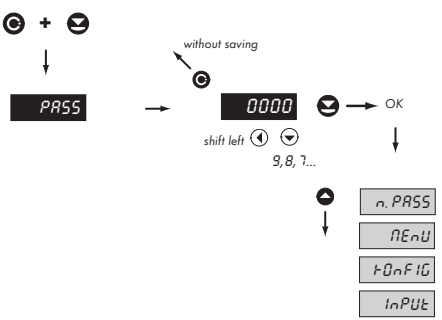
⇨ „Calibration mode" ⇨ Input ⇨ Minimum ⇨ InPUt ⇨ n in

⇨ after transition behind the highest decade ◀ the decimal point starts flashing

⇨ by pressing ▲ or ▼ you will place the decimal point and confirm it by ◆

! *In the MIN item the setting of the decimal point is determining for the entire instrument*

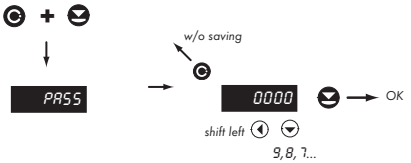
ACCESS INTO THE CONFIGURATION MODE



The code is always preset from manufacture to 0000. In case of loss of access password it is possible to use universal access code "8177"

4.1 GUIDE THROUGH MINIMUM INSTRUMENT SETTING

❶ Access into the „Configuration menu“

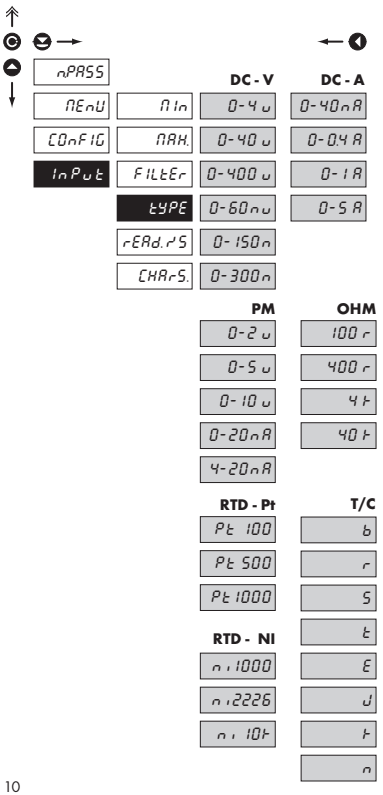


PASS **Entering the introductory access password**

0000 Standard manufacture setting of the access password

❷ Selection of the meas.range/type of input

DC **PM** **OHM** **RTD** **T/C**



tYPE **Setting the instrument measuring range**

DC Input

- *ammeter and voltmeter are two independent instruments*

PM Input

- *setting the measuring range*

RTD Input

- *setting the type of sensor*
- *Pt 3850 ppm/°C EU, standard*
  Pt 3920 ppm/°C US, upon request
  Ni 5000 ppm/°C standard
  Ni 6180 ppm/°C upon request

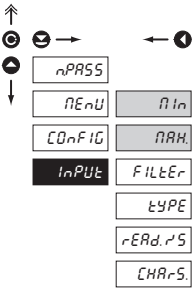
OHM Input

- *setting the measuring range*
- *100 R 5...105 Ohm*
  (100 K 0...100 kOhm), upon request
  400 R 0...400 Ohm
  4 K 0...4 kOhm
  40 K 0...40 kOhm

T/C Input

- *setting the type of thermocouple*
- *B type B*
  R type R
  S type S
  T type T
  E type E
  J type J
  K type K
  N type N

❸ Setting projection on the display



inPUt Setting the input parameters

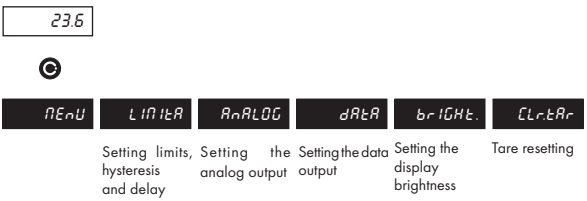
- *items necessary for minimum instrument setting*

Type of input	Displayed items of the menu
DC	MIN, MAX
PM	MIN, MAX
DU	MIN, MAX
OHM	MIN, MAX, LEADS
RTD	*LEADS, CONNEC.
T/C	CJC, COMP.TC

** only for 2-wire*

4.2 USER MENU

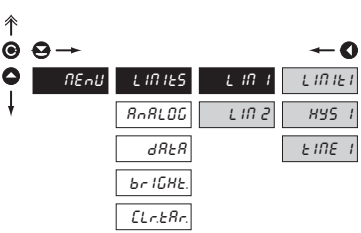
- designated for instrument service
- may contain setting the limits, analog/data output and brightness, with restriction as per the setting in "Configuration mode"



MENU
Instrument setting

! *Projection of items and their accessibility depends on the setting of access rights in the „Configuration menu"*

4.2.1 LIMITS - ENTERING THE VALUES



LIMITS Entering the limit values for status evaluations

LIN 1 Setting for Limit 1

LIN 2 Setting for Limit 2

LIMIT1 Setting the limit for relay switch-on

- *in full range of the display*

HYS 1 Setting hysteresis only in (+) values

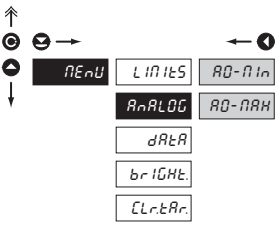
- *in 1/10 of the display range*

TIME 1 Setting the delay of relay activation

- *in the range of 0...99,9 s*

Adjustable authorization of access into items, see page 19

4.2.2 ANALOG OUTPUT



Adjustable authorization of access into items, see page 20

Analog and data outputs may not be fitted simultaneously in this instrument

ANALOG **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*

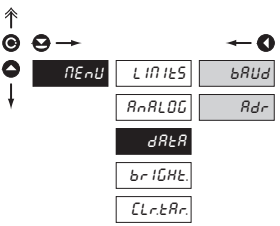
AO-MIN Assigning the displayed value to the beginning of the analog output range

- *range of the setting is -999...3999*

AO-MAX Assigning the displayed value to the end of the analog output range

- *range of the setting is -999...3999*

4.2.3 DATA OUTPUT



Adjustable authorization of access into items, see page 21

DATA **Setting the data output parameters**

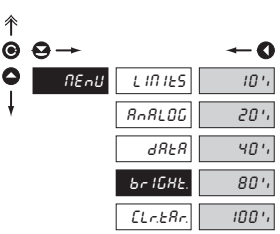
BAUD Setting the transmission rate (baud)

- *setting in the range of 150/300/600/1200/2400/4800/9600/19200/38400/57600/115200 Baud*

ADR Setting the instrument address

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

4.2.4 DISPLAY BRIGHTNESS

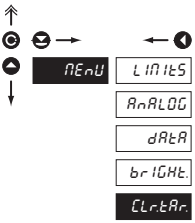


BRIGHT. **Setting the display brightness**

- *by selecting the display brightness we may properly react to light conditions in place of location of the instrument*
- *brightness in the programming menu is always 80%*

Adjustable authorization of access into items, see page 21

4.2.5 TARE RESETTING



Adjustable authorization of access into items, see page 21

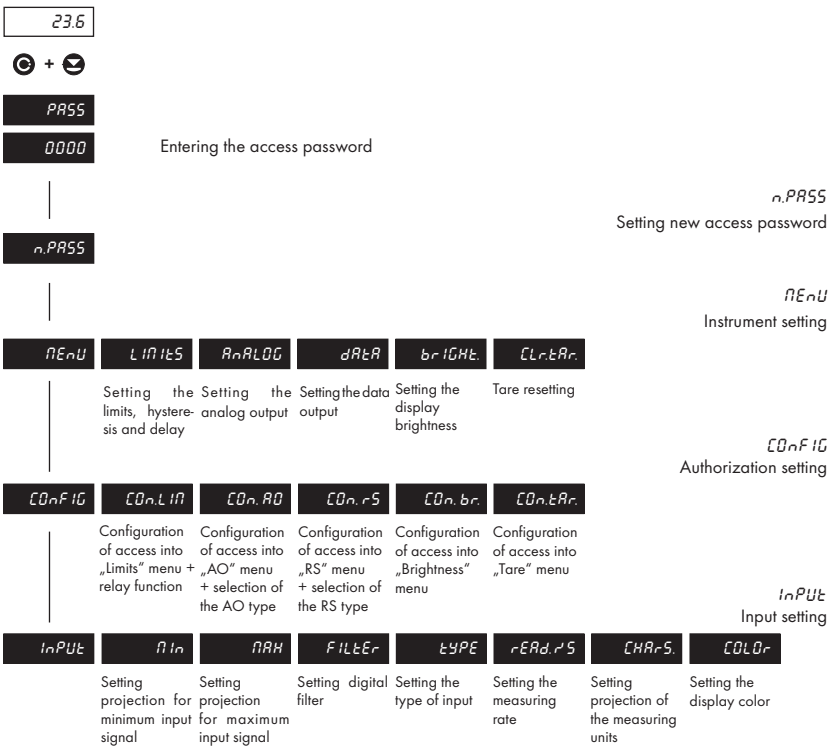
CLrtAr. **Tare resetting**

- after confirmation the tare will be reset to zero and the LED „T" will turn off

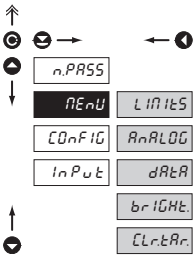
4.3 CONFIGURATION MENU

- designated for professional service and maintenance
- complete instrument setting
- the access is protected by a password or a jumper on the input connector
- authorization for "User mode"

! *Upon delay longer than 15 s the programming mode is automatically discontinued and the instrument itself switches back to the measuring mode*



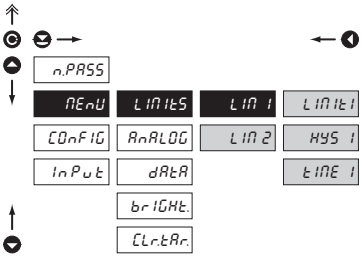
4.3.1 CONFIGURATION MODE - MENU



The basic instrument parameters are adjusted in this menu

LIMITS	Setting the limit values for status evaluation
ANALOG	Setting the analog output range
dATA	Setting the data output parameters
bright.	Setting the display brightness
CLr.tAr.	Tare resetting

4.3.1.1 LIMITS



LIMITS **Entering the limit values for status evaluation**

LIM 1	Setting for Limit 1
LIM 2	Setting for Limit 2
LIMIT1	Setting the limit for relay switch-on

- in full range of the display

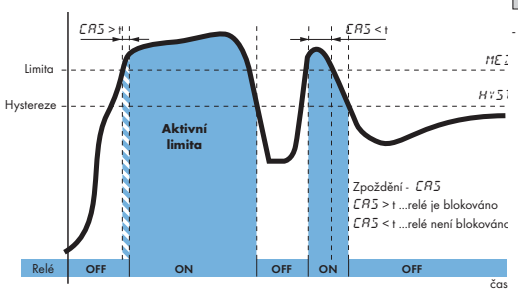
HYS 1	Setting hysteresis only in (+) values

- in 1/10 of the display range

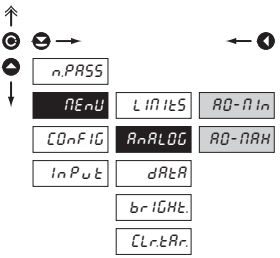
TIME 1	Setting the delay for relay activation

- in the range of 0...99,9 s

The procedure of setting the limit 2 is identical as for limit 1



4.3.1.2 ANALOG OUTPUT



AnALOG **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 toany two arbitrary points of the entire measuring range*

AO-MIn Assigning the displayed value to the beginning of the AO range

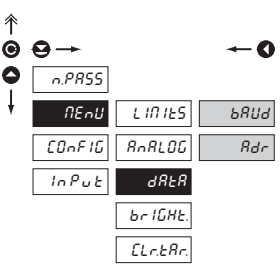
- *range of the setting is -999...3999*

AO-MAX Assigning the displayed value to the end of the AO range

- *range of the setting is -999...3999*

Analog and data outputs may not be fitted simultaneously in this instrument

4.3.1.3 DATA OUTPUT



dAtA **Setting the data output parameters**

bAUd Setting the transmission rate (baud)

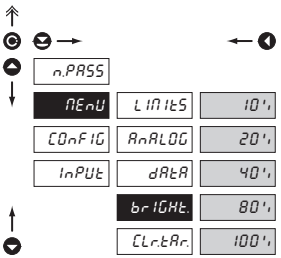
- *setting in the range of 150/300/600/1200/2400/4800/9600/19200/38400/57600/115200 Baud*

Adr Setting the instrument address

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

Analog and data outputs may not be fitted simultaneously in this instrument

4.3.1.4 DISPLAY BRIGHTNESS



bRIGHt. **Setting the display brightness**

- *by selectiung the display brightness we may react properly to light conditions in place of location of the instrument*
- *brightness in the programming menu is always 100%*

10' Display brightness = 10%

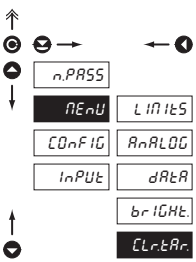
20' Display brightness = 20%

40' Display brightness = 40%

80' Display brightness = 80%

100' Display brightness = 100%

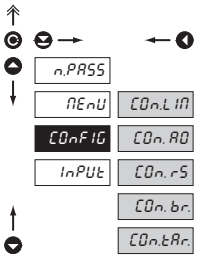
4.3.1.5 TARE RESETTING

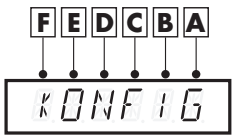


CLr.tAr. **Tare resetting**

- *after confirmation the tare will be reset to zero and the LED „T" will turn off*

4.3.2 CONFIGURATION MODE - CONFIG





The configuration code may consist of up to 6 numbers, which determine the operational setting of the instrument. Individual meaning and setting of the numbers are described in relevant chapters of the configuration mode.

CONFIG Setting the access rights to individual options for „User mode“

- *one of the prime merits of this function is the feasibility to assign authorization for access and modification of parameters in individual steps of the "User mode". This setting will facilitate the instrument service staff easy operation and prevent unauthorized interference into the setting of vital functions.*

CON.LIM Configuration of the access into „Limits“ menu and relay function

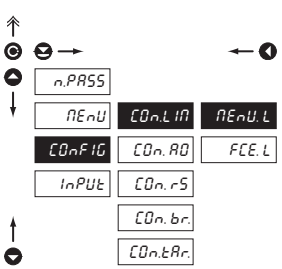
CON.AO Configuration of the access into „AO“ menu and selection of the AO type

CON.rS Configuration ot the access into „RS“ menu

CON.br. Configuration of the access into „Brightness“ menu

CON.TAr. Configuration of the access into „Tare“ menu

4.3.2.1.1 SETTING ACCESS INTO THE LIMITS MENU



CON.LIM Configuration of the access into „Limits“ menu and relay function

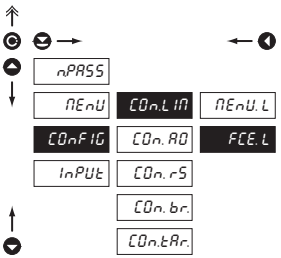
MENU.L Setting the access rights

- *selection of the access rights for „User mode“*

A - Limit 1, B - Limit 2

Rights	Limits	Hyst.	Time	BA
Prohibited	×	×	×	0
Projection	✓	×	×	1
	✓	✓	×	2
	✓	✓	✓	3
Change of setting	✓	×	×	4
	✓	✓	×	5
	✓	✓	✓	6

4.3.2.1.2 SETTING THE RELAY FUNCTION

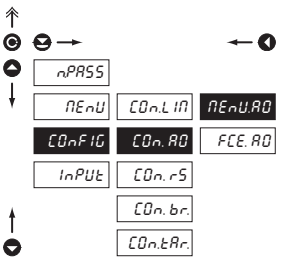


FCE.L Relay configuration

A - Limit 1
B - Limit 2

Relay fuunction		BA
Relay	switch-on	0
	switch-off	1

4.3.2.2.1 SETTING ACCESS INTO THE ANALOG OUTPUT MENU



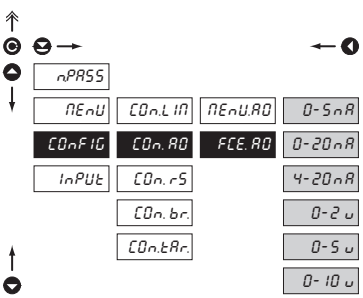
CO.AO **Configuration of the access into „AO" menu and selection of the AO type**

MEnU.AO Setting the access rights

- *selection of the access rights for „User mode"*

Rigts	A
Prohibited	0
Projection	1
Change of setting	2

4.3.2.2.2 SETTING THE TYPE OF THE ANALOG OUTPUT



FCE.AO **Setting the type of the analog output**

0-5 mA Range - 0...5 mA

4-20 mA Range - 0...20 mA

0-20 mA Range - 4...20 mA

0-2 U Range - 0...2 V

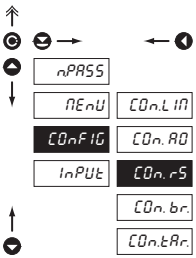
0-5 U Range - 0...5 V

0-10 U Range - 0...10 V

E 4-20mA Range - 4...20 mA with indication „ERROR"

- *upon error statement the value on the output is < 3,6 mA*

4.3.2.3 SETTING ACCESS INTO THE DATA OUTPUT MENU

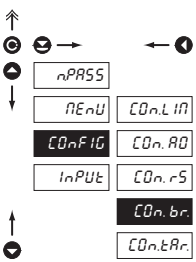


CO.rS Setting the access rights

- *selection of the access rights for the „User mode"*

Rights	A
Prohibited	0
Projection	1
Change of setting	2

4.3.2.4 SETTING ACCESS INTO THE MENU OF BRIGHTNESS SETTING

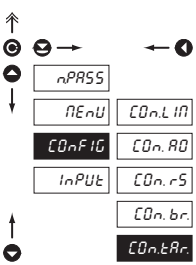


CO.br. Configuration of the access into „Brightness" menu

- *selection of access rights for the „User mode"*

Rights	A
Prohibited	0
Projection	1
Change of setting	2

4.3.2.5 SETTING ACCESS INTO THE MENU OF TARE RESETTING

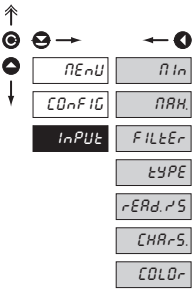


CO.tAr. Configuration of the access into tare resetting

- *selection of access rights for the „User mode"*

Rights	A
Prohibited, the function is off	0
Projection	1
Resetting to zero permitted	2

4.3.3 CONFIGURATION MODE - INPUT



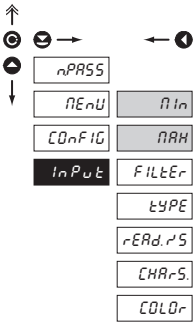
INPUT **Setting the input parameters**

- **MIN** Setting display projection for minimum value of the input signal ❶
- **MAX** Setting display projection for maximum value of the input signal ❷
- **FILTER** Setting the digital filter ❸
- **OFFSET** Shift of the beginning of the measuring range ❹
- **LEADS** Compensation of 2-wire conduct ❺
- **TYPE** Setting the instrument measuring range ❻
- **CONNEC.** Setting the type of input connection ❼
- **READ.RS** Setting the instrument measuring rate ❽
- **CHARS.** Setting the projection of measuring units ❾
- **CJC** Setting the temperature of the cold junction ❿
- **TEMPER** Method of measurement of the cold junction ⓫
- **COLOR** Setting the LED display color ●

Input type	Setting options
DC	① ② ③ ⑥ ⑧ ⑨ ●
PM	① ② ③ ⑥ ⑧ ⑨ ●
DU	① ② ③ ⑧ ⑨ ●
OHM	① ② ③ ⑤ ⑥ ⑧ ⑨ ●
RTD	③ ④ ⑤ ⑦ ⑧ ●
T/C	③ ⑥ ⑧ ⑩ ⊙ ●

4.3.3.1 PROJECTION ON THE DISPLAY

DC PM DU OHM



Min Setting display projection for minimum value of the input signal

- *range of the setting is -999...3999*
- *positioning of the decimal point in this item is determining for the entire instrument*

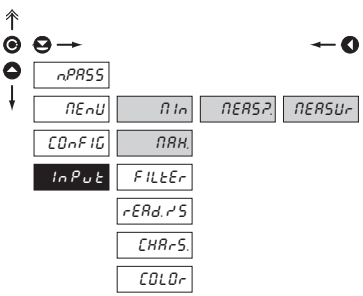
MAX Setting display projection for maximum value of the input signal

- *range of the setting is -999...3999*

! *Setting of the decimal point in the MIN item is determining for the entire instrument*

SETTING FOR LINEAR POTENTIOMETER

DU



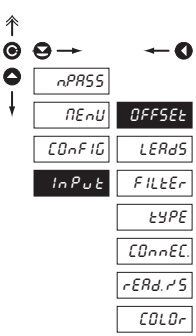
MEAS Call to place the potentiometer traveller into initial position

- *in the MIN and MAX items enter the required projection and confirm by pressing „Enter"*
- *before confirming the sign „MEAS?" by „Enter" the potentiometer traveller has to be positioned and stabilized at the beginning of the measuring range*
- *the „MEASUR" sign indicates automatic calibration of the measuring range, the potentiometer traveller has to be at rest*

! *Calibration for second position is identical with setting of the beginning*

4.3.3.2 SHIFTING THE BEGINNING OF THE RANGE

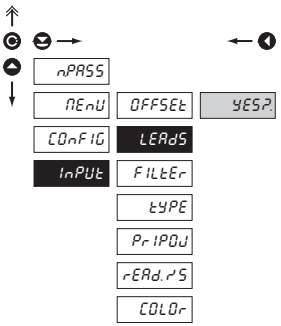
RTD



OFFSEt **Shifting the beginning of the range**

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

4.3.3.3 COMPENSATION OF 2-WIRE CONDUCT



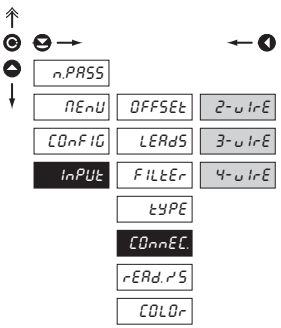
LEAdS **Compensation of 2-wire conduct**

- *for measurement accuracy it is necessary to perform compensation of the conduct always 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"*

! *The items are visible at all times but the active only upon set 2-wire connection*

4.3.3.4 SETTING THE TYPE OF CONNECTION

RTD

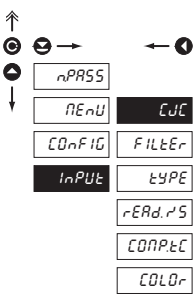


COnnEC. **Setting the type of connection**

2-uIrE	2-wire input connection
3-uIrE	3-wire input connection
4-uIrE	4-wire input connection

4.3.3.5 SETTING THE COLD JUNCTION

T/C

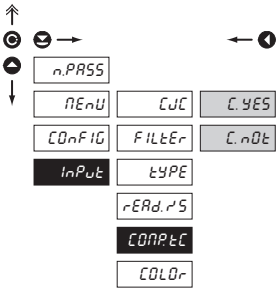


CJC **Setting the temperature of the cold junction**

- *range of 0...98 °C with compensation box*
- *99 °C without compensation box, with/ without reference thermocouple, temperature of the cold junction is measured at the input brackets of the instrument*

Method and procedure of the setting of the cold junctions are described in a separate chapter on page 31

4.3.3.6 SETTING THE METHOD OF MEASUREMENT OF THE COLD JUNCTION T/C



COMP.TC **Setting the method of measurement of the cold junction**

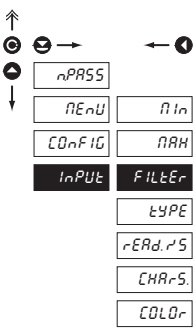
- *measurement with/without reference thermocouple*

C.YES Measurement with reference thermocouple (antiserially)

C.NOt Measurement without reference thermocouple

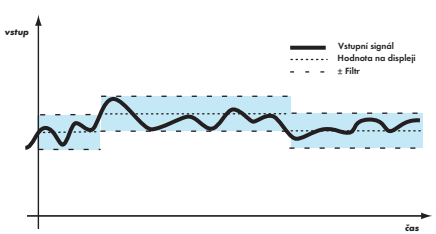
Method and procedure of setting of the cold junctions are described in a separate chapter on page 31

4.3.3.7 DIGITAL FILTER



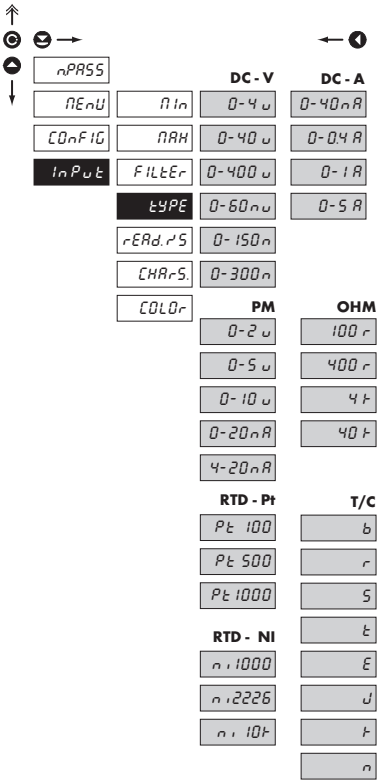
FILTER **Setting the digital filter**

- *use of the digital filter will find its place in applications where the change of projection on the display (by given value) interferes or is not substantial in the measuring regime*
- *it is entered directly in digits and is valid symetrically*



4.3.3.8 SETTING THE MEASURING RANGE

DC PM RTD OHM T/C



! *Upon a change of the range check also the necessary jumper settings (page 28) and connection of given input (page 7)*

TYPE Setting the measuring range of the instrument

DC Input

- *ammeter and voltmeter are two independent instruments*

PM Input

- *setting the measuring range*

RTD Input

- *setting the type of sensor*
- *Pt 3850 ppm/°C EU, standard*
  Pt 3920 ppm/°C US, upon request
  Ni 5000 ppm/°C standard
  Ni 6180 ppm/°C upon request

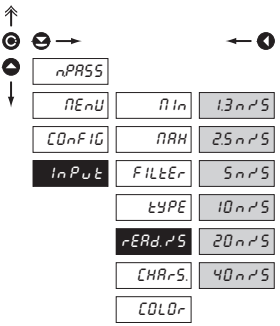
OHM Input

- *setting the measuring range*
- *100 R 5...105 Ohm*
  (100 K 0...100 kOhm), upon request
  400 R 0...400 Ohm
  4 K 0...4 kOhm
  40 K 0...40 kOhm

T/C Input

- *setting the type of thermocouple*
- *B type B*
  R type R
  S type S
  T type T
  E type E
  J type J
  K type K
  N type N

4.3.3.9 SETTING THE MEASURING RATE



READ.PS **Setting the measuring rate**

- *setting the measuring rate is associated with the rate of response to evaluation of the relay status and analog output*

1.3nPS Rate - 1,3 measurements/s

2.5nPS Rate - 2,5 measurements/s

5nPS Rate - 5 measurements/s

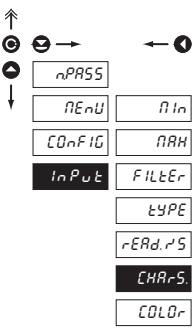
10nPS Rate - 10 measurements/s

20nPS Rate - 20 measurements/s

40nPS Rate - 40 measurements/s

4.3.3.10 SETTING THE DESCRIPTION OF MEASURING UNITS

DC PM DU OHM



CHARS. **Setting projection of measuring units on the display**

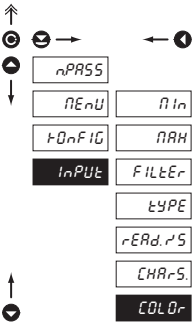
- *the instrument allows to add two descriptive characters to the classic numeric formats (at the expense of the number of displayed places). The setting is performed by means of a shifted ASCII code. Upon setting the first two places display the entered characters and the last two places the code of the relevant symbol from 0 to 95.*

  Description is cancelled by entering characters 00

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

Table of symbols is on page 30

4.3.3.11 SETTING THE DISPLAY COLOR



COLOr Setting the color of the data and description on the display

- *color projection on the display may be set in red/green/orange*
- *this setting is possible only in displays with digit height 57/125 mm*

A - Description, B - Measured data

Display color	BA
red	0
greenn	1
orange	2

5. INPUT CONFIGURATION

Jumpers are accessible after the instrument is opened

INPUT "2" (DC)		60 mV	150 mV	300 mV
J7	*Not*	×	✓	✓
	Yes	✓	×	×
J8	*Not*	×	×	×
	Yes	×	×	×

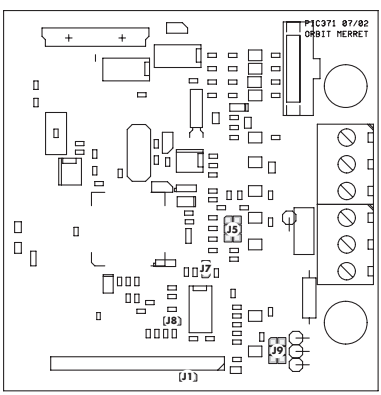
INPUT "1" (DC)		400 mA	1 A	5 A
J7	*Not*	×	✓	✓
	Yes	✓	×	×
J8	*Not*	×	×	✓
	Yes	✓	✓	×

INPUT "2", "U"		DC	PM
J9	*5 - 6*	0...4 V	0...2 V
	3 - 4	0...40 V	0...5 V
	1 - 2	0...400 V	0...10 V

INPUT (T/C)		E, J, K, N	T, R, S	B
J7	*Not*	✓	✓	×
	Yes	×	×	✓
J8	*Not*	✓	×	×
	Yes	×	✓	✓

INPUT		RTD	OHM - Input 1
J5	*5 - 6*	Pt 100/Ni 1 000	0...400 Ohm
	3 - 4	Pt 500/Ni 2 226	0...4 kOhm
	1 - 2	Pt 1 000/Ni 10 000	0...40 kOhm

FUNKTIONS		Hold	Lock
J1	*Not*	✓	×
	Yes	×	✓



! *For every jumper setting disconnect the instrument from the mains*

6. TABLE OF SYMBOLS

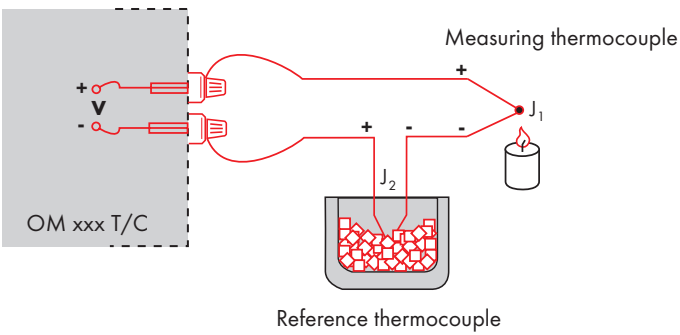
The instrument allows to add two descriptive characters to the classic numeric formats (at the expense of the number of displayed places). The setting is performed by means of a shifted ASCII code. Upon modification the first two places display the entered characters and the last two places the code of the relevant symbol from 0 to 95. Numeric value of given character 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	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	{	|	}	~	

7. METHOD OF MEAS.OF THE COLD JUNCTION

An instrument 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 COMPEC in the instrument menu to C. YES
- when using a thermostat (a compensation box or environment with constant temperature) set CJC in the instrument menu to its temperature
- if the reference thermocouple is located in the same environment as the measuring instrument then set CJC in the instrument menu to number 99. Based on this selection the measurement of the surrounding temperature is performed by a sensor located in the instrument terminal board.

WITHOUT REFERENCE THERMOCOUPLE

- innacuracy 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 COMPEC. in the instrument menu to C. nOE
- when measuring temperature without reference thermocouple the error in measured data maybe even 10°C

8. DATA PROTOCOL

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

ASCII: 8 bit, no parity, one stop bit

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

COMMANDS FOR INSTRUMENT OPERATION

The commands are described in the description which can be found at **www.orbit.merret.cz/rs**.
The command consists of a couple number-letter, where the letter size is of importance.

Symbol	Meaning	Symbol	Meaning
⇉	Send unit value	C	Complete number
⇇	Set unit value	V	Selection = complete number
■	Perform relevant action	D	Decimal number
		T	Text - printable ASCII characters
		H	Intel HEX format

DETAIL 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		>	D	D	D	D	D	D	D	(D)	(D)	(D)	<CR>	
	485	ASCII		>	D	D	D	D	D	D	D	(D)	(D)	(D)	<CR>	
Command transfer (Instrument)	232	ASCII		#	A	A	N	P	D	D	D	D	(D)	(D)	(D)	<CR>
	485	ASCII		#	A	A	N	P	D	D	D	D	(D)	(D)	(D)	<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

9. ERROR STATEMENTS

ERROR	REASON	ELIMINATION
E.Podt	range underflow (A/D converter)	change the input signal value or change display projection
E.PrEt	range overflow (A/D converter)	change the input signal value or change display projection
E.MAt	mathematic error, range of projection is out of display	change the set projection
E.dAtA.E	violation of data integrity in EEPROM, error upon data storage	in case of recurring report send the instrument for repair
E.PAn.	EEPROM error	the „Def" values will be used in emergency, instrument needs to be sent for repair
E.CAL Ib	calibration error, loss of calibration data	instrument needs to be sent for repair

10. TECHNICAL DATA

INPUT

selectable in configurationm menu ***DC***

0...4 V	1 MOhm	Input 2
0...40 V	1 MOhm	Input 2
0...400 V	1 MOhm	Input 2
0...60 mV	1 MOhm	Input 1
0...150 mV	1 MOhm	Input 1
0...300 mV	1 MOhm	Input 1
0...40 mA	< 400 mV	Input 2
0...0,4 A	< 60 mV	Input 1
0...1 A	< 60 mV	Input 1
0...5 A	< 60 mV	Input 1

selectable in configurationm menu ***PM***

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

selectable in configurationm menu ***OHM***

0...400 Ohm		Input 1
0...4 Ohm		Input 1
0...40 kOhm		Input 1
5...105 Ohm		Input 2
0...100,0 kOhm	(upon request)	Input 2

Connection: 2 wire

RTD

Pt xxxx -99,9°...399,9°C
Ni xxxx -30,0°...250,0°C
Type Pt: 100/500/1 000 Ohm, platinum couple
s α=0,003850hm/Ohm/°C
Type Ni: Ni 1 000/2 226/10 000, 5000 ppm/6180 ppm
Connection: 2, 3 or 4 wire

selectable in configurationm menu ***T/C***

Type:	J (Fe-CuNi)	0°...900°C
	K (NiCr-Ni)	0°...1 300°C
	T (Cu-CuNi)	0°...400°C
	E (NiCr-CuNi)	0°...690°C
	B (PtRh30-PtRh6)	300°...1 820°C
	S (PtRh10-Pt)	0°...1 760°C
	R (Pt13Rh-Pt)	0°...1 740°C
	N (Omegalloy)	0°...1 300°C

- The instrument evaluates only temperatures higher than the temperature of the cold junction (CJC)

DU

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

ZOBRAZENÍ

Display: 9999 for 4 digit
999999 for 6 digit
red/green/orange 7-segment LED,
- digit height of 57 or 125 mm
red or green 7-segment LED,
- digit heights| 100 mm
2x red LED - status of limits
2x green LED - tare, mat. functions
Projection: -999...9999 nebo -99999...999999
Decimal point: adjustable - in programming mode
Brightness: adjustable - in programming mode

INSTRUMENT ACCURACY

Temperature coef.: 100 ppm/°C
Accuracy: ±0,15 % of the range ***DC/PM/DU***
±0,5 % of the range ***A C***
±0,2 % of the range ***OHM/RTD/TC***
Resolution: 0,1° ***RTD***
1°C ***T/C***
Rate: 1,3 - 2,5 - 5 - 10 - 20 - 40 measurements/s
Overload capacity: 10x (t < 100 ms), 2x (long-term)
Digital filter adjustable in configuration menu
Comp.of conduct: max. 40 Ohm ***RTD***
Comp. of cold junct.: adjustable ***T/C***
0°...98°Cor automatic (99)
Functions: Tare - display resetting
Hold - stop measuring (upon contact)
Projection of measured units
Watch-dog: reset after 1,2 s
Calibration: at 25°C and 40 % r.h.

COMPARATOR

Type: digital, adjustable in the menu
Limits: -999...3999
Hysteresis: 0...999
Delay: 0...99,9 s
Outputs: 2x relays with switch contact
(230 VAC/50 VDC, 3 A)*
Relay: 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: 150...115 200 Baud
RS 232: isolated, two-way communication
RS 485: isolated, two-way communication,
addressing (max. 31 instruments)

** values apply for resistance load*

ANALOG OUTPUTS

Type:	isolated, programmable with resolution of max. 10 000 points, analog output corresponds with the displayed data, type and range are adjustable
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
Current:	0...5/20 mA/4...20 mA - compensation of conduct up to 600 Ohm

EXCITATION ***PM***

Adjustable:	2...24 VDC/50 mA, isolated

POWER SUPPLY

Options:	24/110/230 VAC, 50/60 Hz, ±10 %, 15 VA 10...30 VDC/max. 2 A, isolated
Protection:	bny a fuse inside the instrument VAC (T 80 mA), VDC (T 4 A)

MECHANIC PROPERTIES

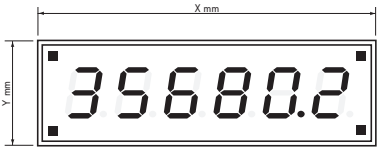
Material:	anodized aluminum, black
Dimensions:	see chapter 11
Panel cut-out:	see chapter 11

OPERATING CONDITIONS

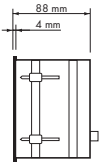
Connection:	through cable bushings to terminal boards inside the instrument, conductore section up to 2,5 mm^2
Stabilization period:	within 15 minutes after switch-on
Wirking temp.:	0°...60°C
Storage temp.:	-10°...85°C
Cover:	IP64
Construction:	safety class I
Overvolatege cat.:	EN 61010-1, A2 III. - instrument power supply (300 V) II. - input, output, excitation (300 V) for pollution degree II
EMC:	EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11; EN 550222, A1, A2

11. INSTRUMENT DIMENSIONS AND INSTAL.

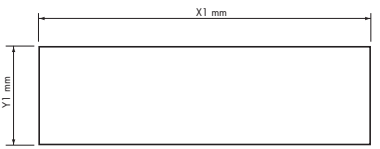
Front view



SIde view



Panel cut-out



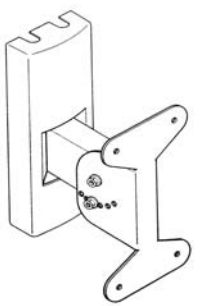
Height	X	Y	X1	Y1
57	372	116	364	108
100-4	465	181	457	173
100-6*	677	181	669	173
100-6	647	181	639	173
125-4	539	237	531	228
125-6	754	237	746	228

Tolerance: ±1 mm

Panel thickness: 0,5 ... 50 mm

Wall mounting

As a standard, large displays are designed for panel installation. Upon request we may also supply a holder for wall mounting, see picture.



12. CERTIFICATE OF GUARANTEE

Product	**OMD 201 DC PM DU RTD T/C OHM**
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 the guarantee and post-guarantee repairs unless provided for otherwise.

Stamp, signature

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