



OM 352

3 1/2 DIGIT PROGRAMMABLE UNIVERSAL INSTRUMENT

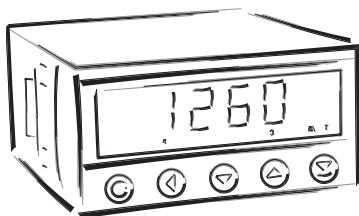
AC/DC VOLTMETER/AMMETER
PROCESS MONITOR
OHMMETER

THERMOMETER FOR PT 100/500/1 000

THERMOMETER FOR NI 1 000

THERMOMETER FOR THERMOCOUPLES

DISPLAY INST. FOR LINEAR 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

Measuring instruments of the OM 352 series conform to the European regulation 89/336/EWG and the Ordinance 168/1997 Coll.

They are up to the following European and Czech standards:

CNS EN 55 022, class B

CNS 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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2.1 Description

The OM 352 model series are 3 1/2 digit lowcost panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price. Three models are available: UNI, DC and PWR.

Type OM 352UNI is a multifunction instrument with the option of configuration for 7 various input options, easily configurable in the instrument menu.

The instrument is based on an 8-bit microcontroller with a multichannel 10-bit sigma-delta converter, which secures good accuracy, stability and easy operation of the instrument.

The OM 352 is a multifunction instrument available in following types and ranges

type UNI

DC:	0...20/60/1000 mV
PM:	0...20 mA/4...20 mA/0...2 V/0...5 V/0...10 V
OHM:	0...300 Ω; 0...1500 Ω; 0...3 kΩ; 0...30 kΩ
RTD-Pt:	Pt 50; Pt 100; Pt 500; Pt 1000
RTD-Cu:	Cu 50; Cu 100
RTD-Ni:	Ni 1 000; Ni 10 000
T/C:	J/K/T/E/B/S/R/N
DU:	Linear potentiometer (min. 500 Ω)

type DC

DC:	0...500 mA/0...1 A/0...5 A/ 0...20 V/0...40 V/0...200 V
------------	---

type AC

AC:	0...1 A/0...5 A/0...60 mV/0...300 mV/0...24 V/0...50 V/0...90 V/0...120 V/0...250 V/0...450 V
------------	---

PROGRAMMABLE PROJECTION

Selection:	of type of input and measuring range
Measuring range:	adjustable or fixed
Setting:	manual, optional projection on the display may be set in the menu for both limit values of the input signal, e.g. input 0...20 mA > 0...150,0
Projection:	±1999, (for 20 mm display -999...9999)

LINEARIZATION

Linearization:*	by linear interpolation in 25 points (solely via OM Link)
-----------------	---

COMPENSATION

of conduct:	in the menu it is possible to perform compensation for 2-wire connection
of conduct in probe:	internal connection (conduct resistance in measuring head)
of CJC (T/C):	manual or automatic, in the menu it is possible to perform selection of the type of thermocouple and compensation of cold junctions, which is adjustable or automatic (temperature at the brackets)

DIGITAL FILTERS

Exponen.average:	from 2...100 measurements
Rounding:	setting the projection step for display

MATHEMATIC FUCTIONS

Tare*:	designed to reset display upon non-zero input signal
--------	--

EXTERNAL CONTROL

Hold	display/instrument blocking
Lock	locking the control keys for access into Configuration menu
Tára*	tare activation

* Does not apply for version RTD, T/C

2.2 Operation

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

- LIGHT** **Simple programming menu**
- contains only items necessary for instrument setting and is protected by an optional numeral code
- PROFI** **Complete programming menu**
- contains complete instrument menu and is protected by an optional numeral code
- USER** **User programmable menu**
- may contain arbitrary items selected from programmable menu (LIGHT/PROFI), which determines the authorization (see or change)
- access is without password

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



Complete operation and setting of the instrument may be performed via communication interface OM Link, which is a standard equipment of every instrument.

The operation program is freely available (www.orbit.merret.cz) and the only requirement is the purchase of OML cable for connecting the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.

Another option for connection is with the aid of data output RS 232 or RS 485 (without the need for OML cable).

The OM LINK program version „Standard“ allows you to connect an unlimited number of instruments with the option of visualization and storage in PC.

2.3 Extension

Excitation is suitable for feeding sensors and converters. It has a galvanic isolation.

Comparators are assigned to control two limit values with relay output. The limits have adjustable 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 an isolated RS232 and RS485 with the ASCII protocol.

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

The instrument supply leads should not be in proximity of the incoming low-potential signals.

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

The leads into the instrument input (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 (bracket E).

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

OM 352UNI

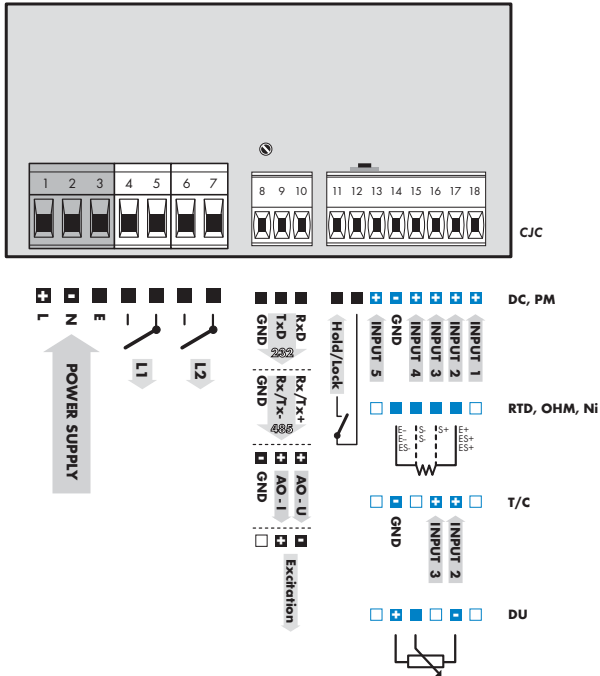
Type	Input 1	Input 2	Input 3	Input 4	Input 5
DC	0...1 000 mV		0...60 mV	0...20 mV	
PM	0...5/10 V			0...2 V	0/4...20 mA
OHM	0...300 Ω • 0...1,5 kΩ • 0...3 kΩ • 0...30 kΩ				
RTD-Pt	Pt 100 • Pt 500 • Pt 1 000				
RTD-Cu	Cu 50 • Cu 100				
RTD-Ni	Ni 1 000 • Ni 10 000				
T/C			B/R/S/ T	E/J/K/N/L	
DU	Linear potentiometer (min. 500 Ω)				

OM 352DC

Type	Input 1	Input 2	Input 3	Input 4	Input 5
DC		0...20/40/200 V			0...0,5/1/5 A

OM 352AC

Type	Input 1	Input 2	Input 3	Input 4	Input 5
DC	0...90/450 V	0...50/250 V	0...24/120 V	0...60/300 mV	0...1/5 A



⚠

Grounding on terminal „E“ has to be connected at all times. In case of RTD and OHM inputs with 2- or 3-wire connection it is necessary to link the unconnected inputs on the terminal board (14+15/16+17 or 16+17).

⚠

The OM Link connector has galvanic interconnection with bracket 14.

PROFI

Setting

profi

- For expert users
- Complete instrument menu
- Access is password protected
- Possibility to arrange items of the „User“ menu
- Tree menu structure

LIGHT

Setting

light

- For trained users
- Only items necessary for instrument setting
- Access is password protected
- Possibility to arrange items of the „User“ menu
- Linear menu structure

USER

Setting

*profi light**user*

- For user operation
- Menu items are set by the user (Profi/Light) as per request
- Access is not password protected
- Optional menu structure either tree (PROFI) or linear (LIGHT)

4.1 Setting

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

- LIGHT** **Simple programming menu**
- contains solely items necessary for instrument setting and is protected by optional number code
- PROFI** **Complete programming menu**
- contains complete instrument menu and is protected by optional number code
- USER** **User programming menu**
- may contain arbitrary items selected from the programming menu (LIGHT/PROFI), which determine the right (see or change)
- access without password

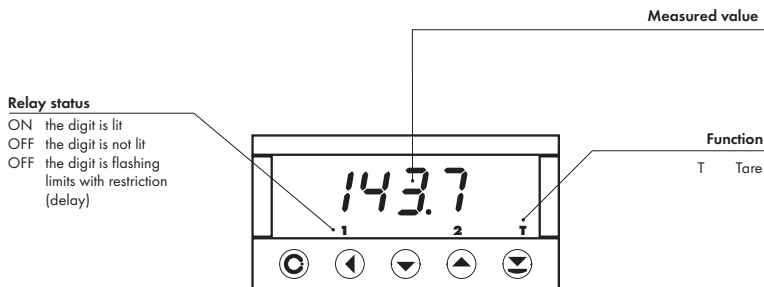
All programmable parameters are stored in the EEPROM memory (they hold even after the instrument is switched off).

Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.

The operation program is freely accessible (www.orbit.merret.cz) and the only requirement is the purchase of OML cable to connect the instrument to PC. It is manufactured in version RS 232 and USB and is compatible with all ORBIT MERRET instruments.

Another option for connection is with the aid of data output RS 232 or RS 485 (without the need of the OML cable).

Setting and controlling the instrument is performed by means of 5 control keys located on the front panel. With the aid of these keys it is possible to browse through the operation menu and to select and set required values.



Symbols used in the instructions

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

DEF values preset from manufacture

symbol indicates a flashing light (symbol)

inverted triangle indicates the item that can be placed in USER menu

broken line indicates a dynamic item, i.e. it is displayed only in particular selection/version

after pressing the key the set value will not be stored

after pressing the key the set value will be stored

30 continues on page 30

Setting the decimal point and the minus sign

DECIMAL POINT

Its selection in the menu, upon modification of the number to be adjusted it is performed by the control key **1** with transition beyond the highest decade, when the decimal point starts flashing . Positioning is performed by **2**/**3**.

THE MINUS SIGN

Setting the minus sign is performed by the key **4** on higher decade. When editing the item subtraction must be made from the current number (e.g.: 013 > **4**, on class 100 > -87)

Control keys functions

Key	Measurement	Menu	Setting numbers/Selection
	access into USER menu	exit menu w/o saving	transition to next item w/o saving
	tare value (DC, PM) resistance measured (RTD) cold junctions temperature (T/C)	back to previous level	move to higher decade
	cancel Tare	move to previous item	move down
	cancel Tare	move to next item	move up
	Tare	confirm selection	setting/selection confirmation
+	access into LIGHT/PROFI menu		
+	direct access into PROFi menu - temporary (remains LIGHT)		
+	configuration of an item for USER menu		

Setting items into „USER“ menu

- in LIGHT or PROFi menu
- no items permitted in USER menu from manufacture
- on items marked by inverted triangle

user

Legend is flashing - current setting is displayed



- n0** item will not be displayed in USER menu
- YES** item will be displayed in USER menu with the option of setting
- SH0** item will be solely displayed in USER menu

5.0

Setting "Light"

LIGHT

Simple programming menu

- contains only items necessary for instrument setting and is protected by optional numeral code

SETTING

LIGHT

light

- For capable users
- Only items necessary for instrument setting
- Password protected access
- Possibility to arrange items of the „User“ menu
- Linear menu structure

Preset from manufacture

Password	"0"
Menu	LIGHT
USR menu	off
Setting the items	DEF

1428



PAS

0

Access code



Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode

typ

dC

NOd

60n

Selecting input, range

RTD OHM

CO_n

4-u

FOR

00.0

Selecting projection, connection

T/C

CO_n

EM1

ELV

0

FOR

000

DC PM OHM DU

Pin

0

NAH

100

FOR

00.0

L1

25

L2

75

Option - Comparator

RL

120

RL0

0

RL1

100

Option - Analog output

Basic color

CO₀

GrE

First color's limit

d.L.1

9999

Color after the first limit

CO₂

rEd

Second color's limit

d.L.1

9999

Color after the second limit

CO₂

OrR

Options - Color display

Menu type

nub

LiG

Return to manufacture setting

rES

YES

DU

CL0

YES

CL1

YES

Calibration - only for "DU"

New password

n.PP

0

Identification

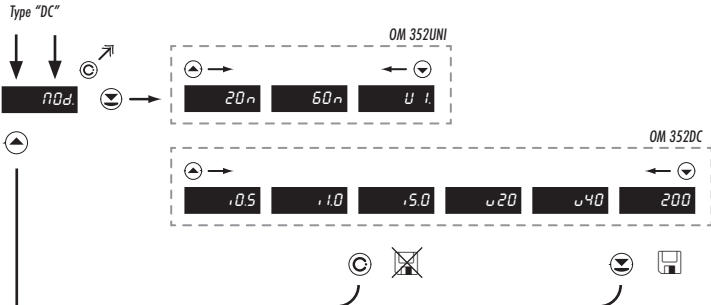
Id

YES

Return to previous measuring mode

0n 352...

1428



n0d. Selection of the instrument measuring range

DEF = 60 mV (OM 352UNI)
DEF = 200 V (OM 352DC)

Menu	Measuring ranges
20m	0...20 mV
60m	0...60 mV
U 1.	0...1 000 mV
.05	0...500 mA
i1.0	0...1 A
i5.0	0...5 A
u20	0...20 V
u40	0...40 V
200	0...200 V

Range 0...20 mV Example

60n 20n n1n



n1n Setting display projection for minimum value of input signal

- range of the setting is ± 1999

- position of the DP does not affect display projection
 - the DP is automatically shifted after the value is confirmed

DEF = 0

Projection for 0 mV > MIN = 0 Example

+ 0 NAN



MAX Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 100

Projection for 20 mV > MAX = 1500 Example

+ 100	+ 100	+ 100	+ 200	+ 300	+ 400
+ 500	+ 0500	+ 1500	F0r		



F0r Setting projection of the decimal point

DEF = 00.0

- positioning of the DP is set here in the measuring mode

Projection of DP on display > 000 Example

00.0	000	n-n
------	-----	-----

*subsequent item on the menu depends on instrument equipment



100 Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for 20 mA > Max = 250 Example

+ 10.0	+ 100	+ 1.0	+ 1.0	+ 1.0	+ 1.0
+ 1.0	+ 1.0	+ 1.0	+ 1.0	+ 1.0	+ 1.0

F0r



F0r Setting projection of the decimal point

- positioning of the DP is set here in the measuring mode

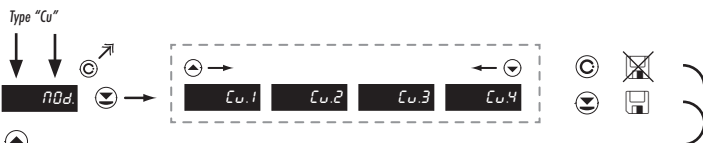
DEF = 00.0

Projection of DP on display > 000 Example

00.0	000	0.00	.000	FLP
------	-----	------	------	-----

F0r

*subsequent item on the menu depends on instrument equipment



nDd. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = Cu.2

Menu	Measuring range	Cu
Cu.1	Cu 50 [4 280 ppm/°C]	
Cu.2	Cu 100 [4 280 ppm/°C]	
Cu.3	Cu 50 [4 260 ppm/°C]	
Cu.4	Cu 100 [4 260 ppm/°C]	

Type of sensor Cu 100/4 280 ppm > Cu.2

Example

Cu.2

CO_n Selection of the type of sensor connection

- in 2- or 3- wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

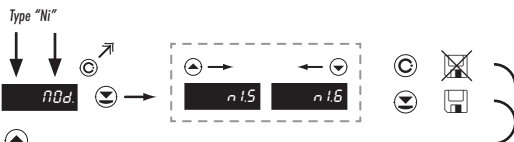
DEF = 4-wire

Menu	Connection
2-u	2-wire
3-u	3-wire
4-u	4-wire

Type of connection - 3 wire > CO_n = 3-u

Example

4-u



n0d. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = Ni.5

Menu	Measuring range	Ni
C	Ni.5	Ni 1 000 (5 000 ppm/°C)
	Ni.6	Ni 1 000 (6 180 ppm/°C)
D	Ni.5	Ni 10 000 (5 000 ppm/°C)
	Ni.6	Ni 10 000 (6 180 ppm/°C)

* letter in the first column marks the measuring range as per the order

Type of sensor Ni 1 000/5 000 ppm > Ni.5

Example

n1.5 C0n



C0n Selection of the type of sensor connection

- in 2- or 3- wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

DEF = 4-wire

CON.	Menu	Connection
CON.	2-w	2-wire
	3-w	3-wire
	4-w	4-wire

Type of connection - 3 wire > C0n = 3-w

Example

4-w 3-w F0r



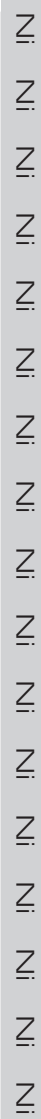
F0r Setting projection of the decimal point

- positioning of the DP is set here in the measuring mode

DEF = 00.0

Projection of DP on display > 000 Example

00.0 000 0.00 *subsequent item on the menu depends on instrument equipment



Type "DU"



MIN Setting display projection for minimum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

- range of the setting is ± 1999

DEF = 0

Projection for begin > MIN = 0 Example

+ 0 [DP] -



MAX Setting display projection for maximum value of input signal

- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

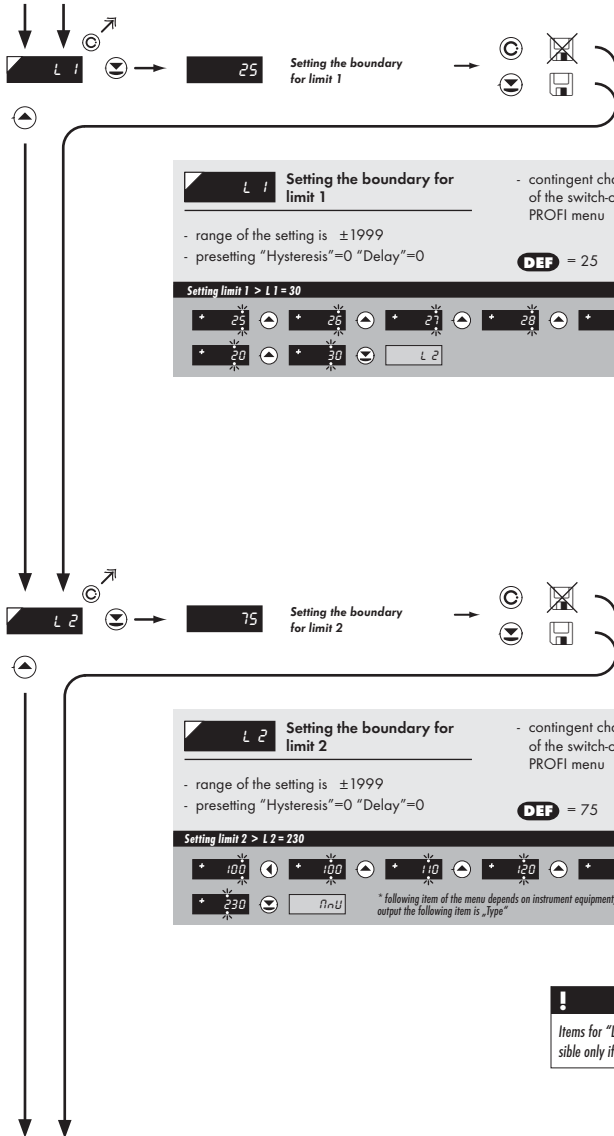
- range of the setting is ± 1999

DEF = 100

Projection for end > MAX = 50 Example

+ 100 [DP] - + 100 [DP] + 110 [DP] + 120 [DP] + 130 [DP] + 140 [DP]

+ 150 [DP] + 150 [DP] + 050 [DP] [DP]





R.L. Setting the type of analog output **DEF** = E 4

Menu Range Description

Menu	Range	Description
i20	0...20 mA	
E 4	4...20 mA	with indication of error statement (<3,6 mA)
i 4	4...20 mA	
I 5	0...5 mA	
U 2	0...2 V	
U 5	0...5 V	
U10	0...10 V	

Type of analog output - 0...10 V > A. I. = U 10 Example

.4 .5 U 2 U 5 U 10 RLo

R.Lo Assigning the display value to the beginning of the AO range

0

Assigning the display value to the beginning of the AO range

R.Lo Assigning the display value to the beginning of the AO range **DEF** = 0; (40 > RTD, T/C)

Assigning the display value to the beginning of the AO range

- range of the setting is ±1999

Display value for the beginning of the AO range > A.Lo = 0 Example

+ 0 RLo

R.H.I Assigning the display value to the end of the AO range

100

Assigning the display value to the end of the AO range

R.H.I Assigning the display value to the end of the AO range **DEF** = 100; (199.9 > RTD, T/C)

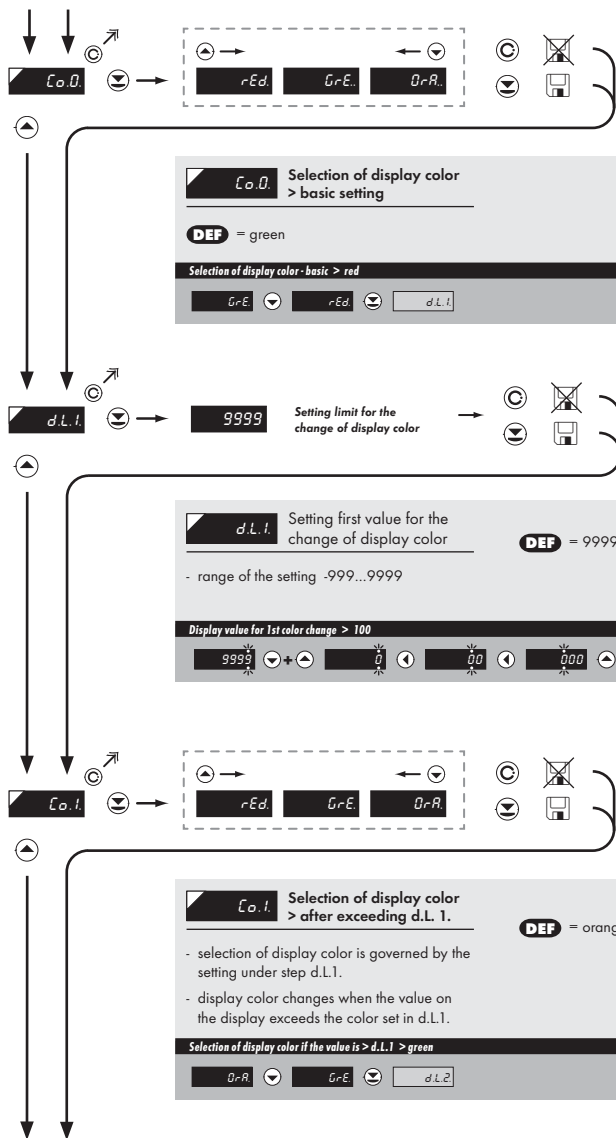
Assigning the display value to the end of the AO range

- range of the setting is ±1999

Display value for the end of the AO range > A.HI = 120 Example

+ 100 + 100 + 110 + 120 nU

Only with option > Analog output





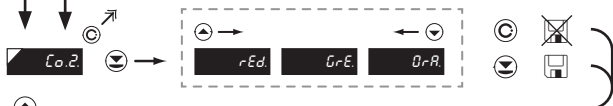
d.L.2. Setting limit for the change of display color

DEF = 9999

- range of the setting -999...9999

Display value for 2nd color change > 400 Example

9999	+	0	00	000	100
200	300	400	Co.2		



Co.2. Selection of display color > after exceeding d.L. 2.

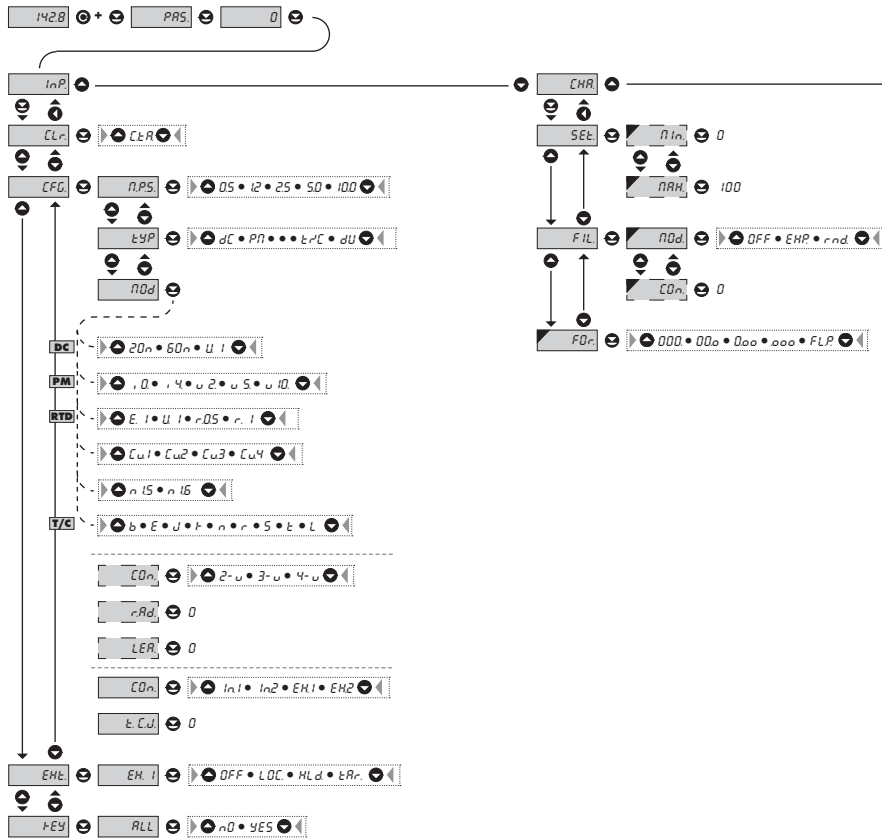
DEF = red

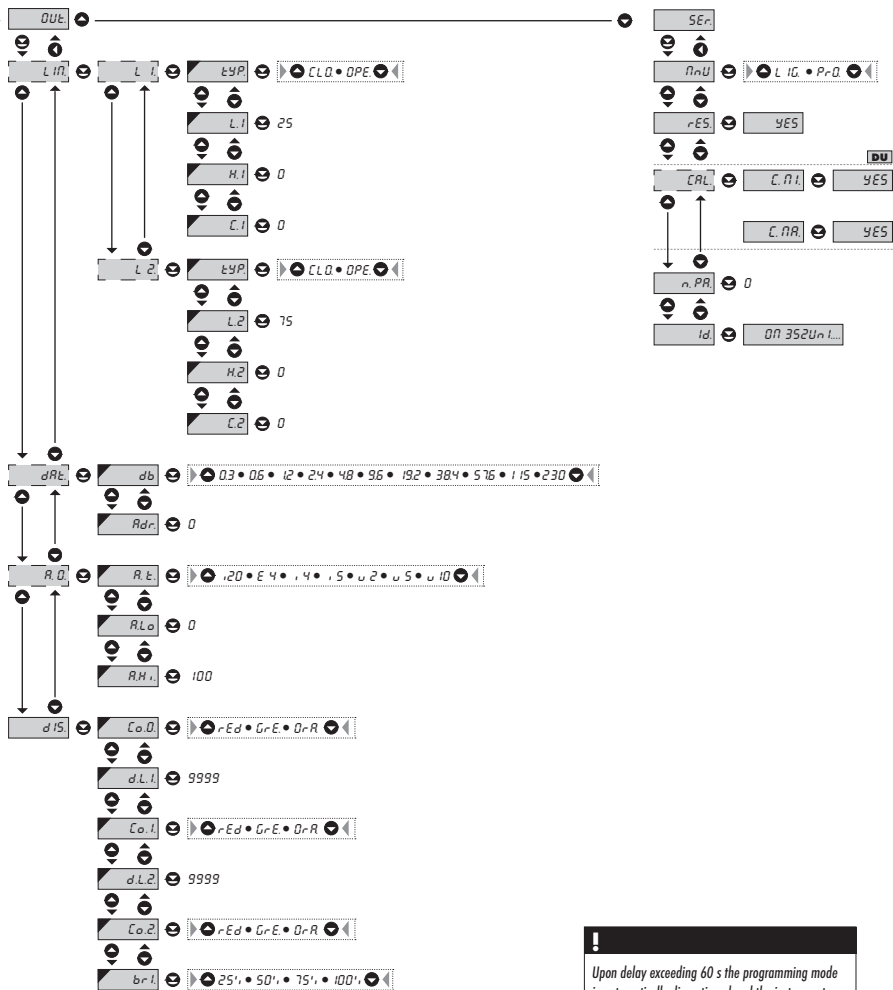
- selection of display color is governed by the setting under step d.L.2.
- display color changes when the value on the display exceeds the color set in d.L.2.

Selection of display color if the value is > d.L.2 > orange Example

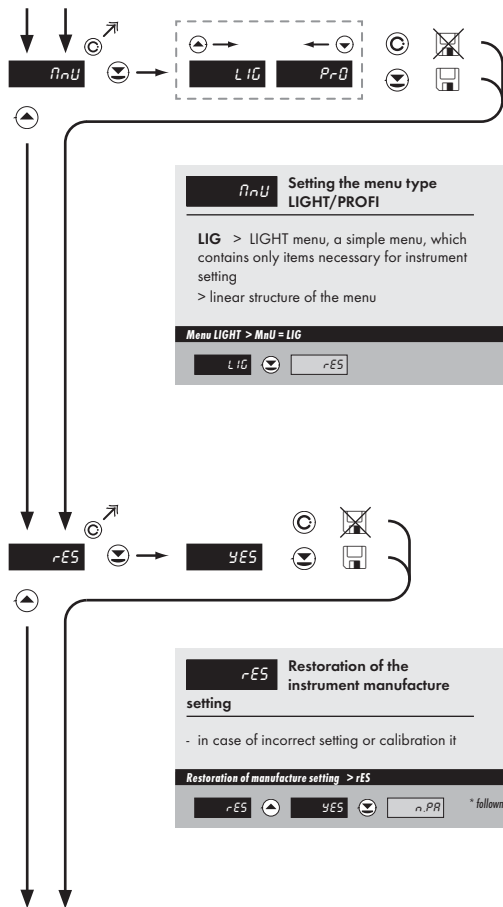
red	OrR	BlU
-----	-----	-----

Only with option > 3-color 20 mm display





!
 Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode



MaU **Setting the menu type**
LIGHT/PROFI

LIG > LIGHT menu, a simple menu, which contains only items necessary for instrument setting
> linear structure of the menu

PRO > PROFi menu, a complete menu for entire instrument setting
> tree structure of the menu

DEF = LIG

Menu LIGHT > MaU = LIG Example

LIG

rES **Restoration of the instrument manufacture setting**

is possible to return to manufacture setting. Prior execution of the changes you will be asked to confirm your selection (YES)

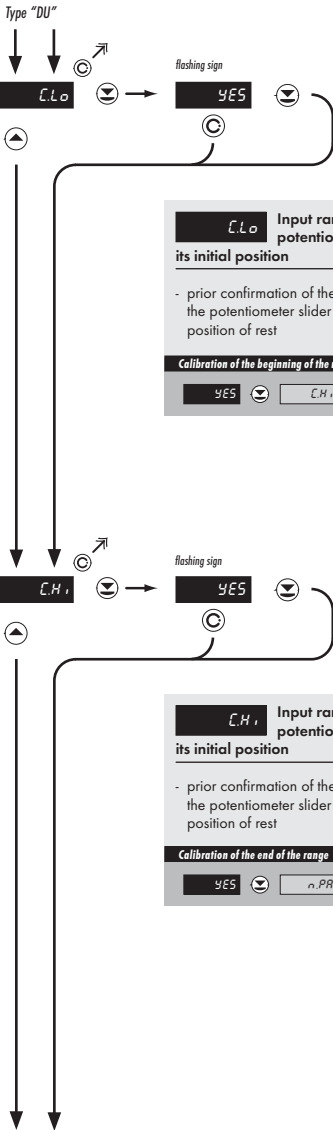
- reading the manufacture calibration and original setting of items in the menu

Restoration of manufacture setting > rES Example

rES

* following item depends on the instrument type, for "DU" > "CLa"

Type „DC“		42
Type „352AC“		42
Type „PM“		42
Type „OHM“		42
Type „Pr“		42
Type „Cu“		42
Type „Ni“		42
Type „T/C“		42
Type „DU“		41



C.Lo Input range calibration - potentiometer slider is in its initial position Only for type "DU"

- prior confirmation of the flashing sign "Yes" the potentiometer slider has to be in given position of rest

Calibration of the beginning of the range > C.Lo Example

YES C.Hi

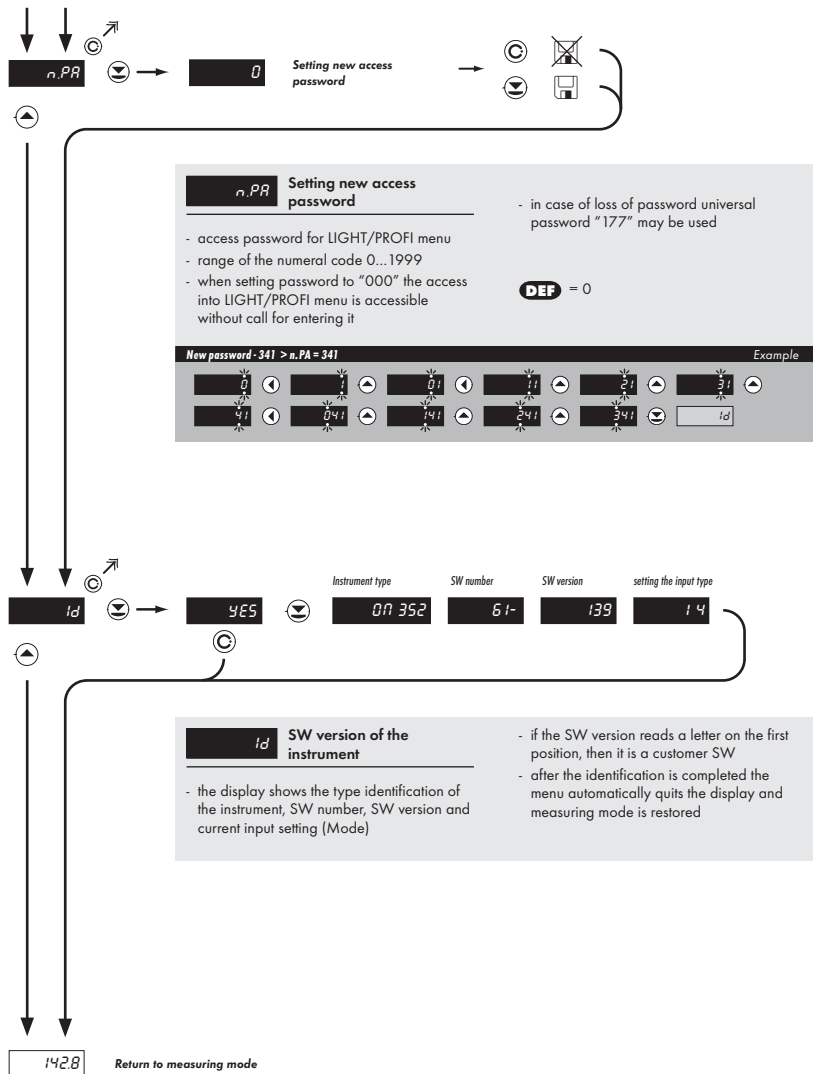
C.Hi Input range calibration - potentiometer slider is in its initial position Only for type "DU"

- prior confirmation of the flashing sign "Yes" the potentiometer slider has to be in given position of rest

Calibration of the end of the range > C.Hi Example

YES n.PR





6.0

Setting "PROFI"

PROFI

Complete programming menu

- contains complete instrument menu and is protected by optional number code
- designed for expert users
- preset from manufacture is menu **LIGHT**

 SETTING
 PROFIL
 ▼
 ▼
 ▼
 ▼
 ▼
 ▼
 ▼
 ▼


- For expert users
- Complete instrument menu
- Access is password protected
- Possibility to arrange items of the „User“ menu
- Tree menu structure

Switching over to "PROFI" menu

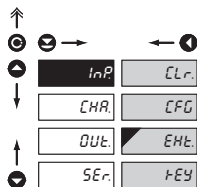


- temporary switch-over to **PROFI** menu, which is suitable to edit a few items
- after quitting **PROFI** menu the instrument automatically switches to **LIGHT** menu
- access is password protected (if it was not set under item N. PA. =0)







- access into **LIGHT** menu and transition to item „MNU“ with subsequent selection of „PRO“ and confirmation
- after re-entering the menu the **PROFI** type is active
- access is password protected (if it was not set under item N. PA. =0)

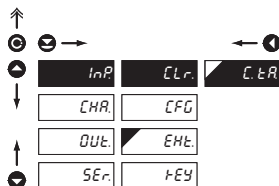
6.1 Setting "PROFI" - INPUT




The basic instrument parameters are set in this menu

-  Tare resetting
-  Selecting the measuring range and rate
-  Setting the external input function
-  Setting the ENTER key function

6.1.1 Tare resetting

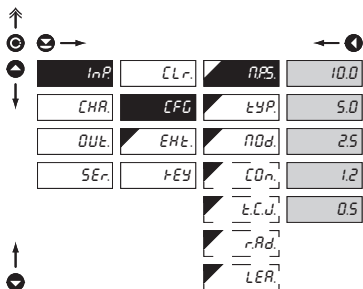


 Tare resetting

 *Does not apply for version RTD, T/C*

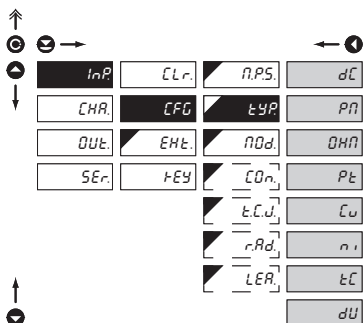
6.1.2 Setting the input parameters

6.1.2a Selection of measuring rate



nPS	Selection of measuring rate
10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.5	2,5 measurements/s
1.2	1,2 measurements/s
0.5	0,5 measurements/s

6.1.2b Selection of „instrument“ type



LYP	Selection of "instrument" type
- selection of particular type of "instrument" is bound to relevant dynamic items	
dC	DC voltmeter
Pn	Process monitor
OHn	Ohmmeter
Pt	Thermometer for Pt
Cu	Thermometer for Cu
Ni	Thermometer for Ni
tC	Thermometer for thermocouples
dU	Display for linear potentiometers

6.1.2c Selection of measuring range

↑
 Ⓞ →
 ▲
 ↓

inP	CLr	N.P.S.	20n	352DC	0.5
CHR	CFG	LYP	60n		1.0
OUT	EMt	NOd	U 1		1.50
SER	FXY	EOm			0.20
		t.C.J.	1.0		0.40
		rAd	1.4		2.00
		LEr	U 2		
				352AC	
			U 5		1
DEF			U 10		5
		RTD	60n	DEF	
DEF		E. 1	0.3		
		U. 1	0.24		
		r. 0.5	0.50		
		r. 1	0.90		
		Ni	120		
DEF		n. 5	250	DEF	
		n. 6	450		
		Cu		T/C	
DEF		CU. 1	b		
		CU. 2	E		
		CU. 3	J		
		CU. 4	F	DEF	
			n		
			r		
			S		
			t		
			L		


NOd Selection of instrument measuring range

- setting the input range depends on the measured range ordered

Menu	Measuring range	DC
20m	0...20 mV	
60m	0...60 mV	
U 1.	0...1 000 mV	
i0.5	0...500 mA	
i1.0	0...1 A	
i5.0	0...5 A	
u20	0...20 V	
u40	0...40 V	
200	0...200 V	

Menu	Measuring range	PM
1.0.	0...20 mA	
i.4.	4...20 mA	
U 2.	0...2 V	
U 5.	0...5 V	
U 10.	0...10 V	

Menu	Measuring range	OHM
A	0...300 Ohm	
B	0...1 500 Ohm	
C	0...3 000 Ohm	
D	0...30 000 Ohm	

Menu	Measuring range	PI
E. 1	Pt 100 [3 850 ppm/°C]	
U. 1	Pt 100 [3 920 ppm/°C]	
R.0.5	Pt 50 [3 910 ppm/°C]	
R. 1	Pt 100 [3 910 ppm/°C]	
E. 5	Pt 500 [3 850 ppm/°C]	
E.10	Pt 1000 [3 850 ppm/°C]	

Menu	Measuring range	Ni
Ni.5	Ni 1 000 [5 000 ppm/°C]	
Ni.6	Ni 1 000 [6 180 ppm/°C]	
Ni.5	Ni 10 000 [5 000 ppm/°C]	
Ni.6	Ni 10 000 [6 180 ppm/°C]	

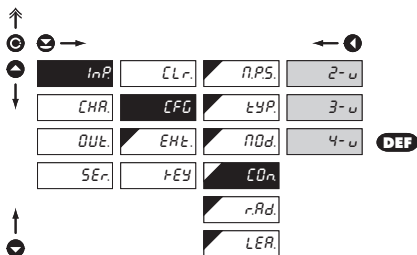
Menu	Measuring range	Cu
Cu.1	Cu 50 [4 280 ppm/°C]	
Cu.2	Cu 100 [4 280 ppm/°C]	
Cu.3	Cu 50 [4 260 ppm/°C]	
Cu.4	Cu 100 [4 260 ppm/°C]	

Menu	Type of thermocouple	T/C
B	T/C „B“	
E	T/C „E“	
J	T/C „J“	
K	T/C „K“	
N	T/C „N“	
R	T/C „R“	
S	T/C „S“	
T	T/C „T“	
L	T/C „L“	

** letter in the first column marks the measuring range as per the order

6.1.2d Selection of type of sensor connection

RTD OHM



CO_n Selection of type of sensor connection

- in 2- or 3-wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

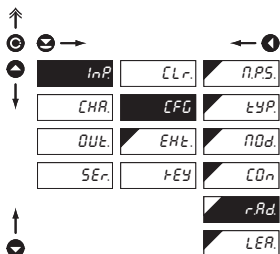
2-w 2-wire connection

3-w 3-wire connection

4-w 4-wire connection

6.1.2e Offset of the beginning of the range

RTD OHM



rAd Offset of the beginning of the measuring range

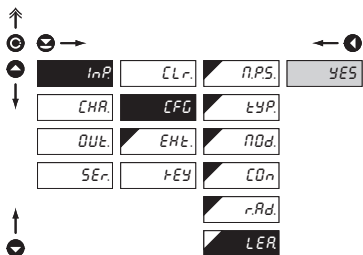
- in cases when it is necessary to offset the beginning of the range by certain value, e.g. while using sensor in measuring head

- entered directly in Ohm (0...19,99)

- **DEF** = 0

6.1.2f Compensation of 2-wire conduct

RTD OHM



LER Compensation of 2-wire conduct

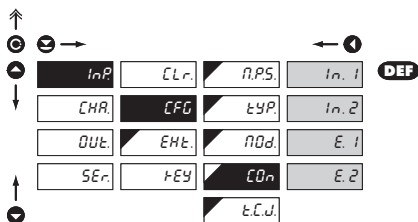
- for measurement accuracy it is necessary to perform compensation of conduct always in case of 2-wire connection

- prior confirmation of the displayed prompt „YES“ it is necessary to substitute the sensor at the end of the conduct by a short-circuit

- **DEF** = 0

6.1.2g Selecting the instrument measuring range

T/C



For thermocouple type "B" the items CON.
and C.J. T. are not available

 CO_n Method of evaluation of the cold junction

In.1 Measurement without reference thermocouple
- measuring cold junction at instrument brackets

In.2 Measurement with reference thermocouple
- measuring cold junction at instrument brackets with anti-series connected reference thermocouple

E.H.1 Measurement without reference thermocouple
- the entire measuring set is working under invaried and constant temperature

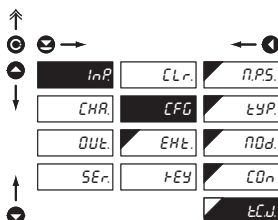
E.H.2 Measurement with reference thermocouple
- when using compensation box



Method and procedure of setting the cold junctions is described in separate chapter on page 66

6.1.2h Setting temperature of cold junction

T/C



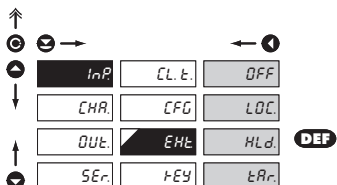
t.C.J. Setting temperature of cold junction

- range -20...99 °C with compensation box
- DEF = 0 °C



For thermocouple type "B" the items CON.
and C.J. T. are not available

6.1.3 External input function selection



EHL. External input function selection

OFF Input is off

LOC. Locking keys on the instrument

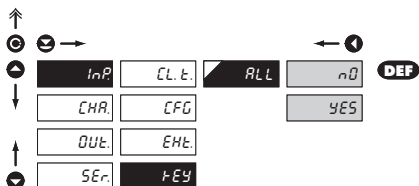
HLD. HOLD, stop measuring of the entire instrument

TAR. TARE - Tare activation*

*

Does not apply for version RTD, T/C

6.1.4 Optional accessory functions of the keys



FEY Assigning further functions to instrument keys

ALL Setting all keys

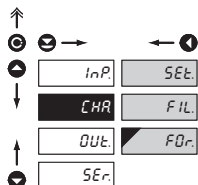
- owing to limited space in the instrument's memory it is not feasible to set the keys' functions one by one

nD Accessory functions are off

YES Accessory functions are on

- ◀ projection of temperature of cold junction (T/C)
- ◀ projection of line resistance (RTD)
- ◀ Tare value displayed (DC, PM, DU)
- ☺ Display taring (DC, PM, DU)
- ▼ Tare reset (DC, PM, DU)

6.2 Setting "PROFI" - CHANNEL



In this menu the instrument input parameters are set

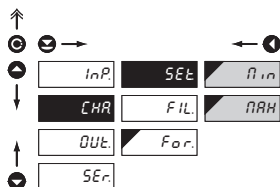
SEt Setting display projection

FiL Setting the digital filters

FOr Setting the decimal point

6.2.1 Projection on the display

DC AC PM DU OHM

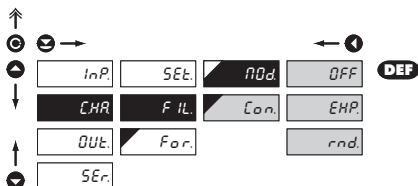


SEt Setting display projection

Min Setting display projection for minimum value of input signal
 - range of the setting is ± 1999
 - **DEF** = 0

Max Setting display projection for maximum value of input signal
 - range of the setting is ± 1999
 - **DEF** = 100

6.2.2 Setting the digital filters



NOd. Setting the digital filters

- the instrument allows for classic projection of a number with decimal point as well as with floating DP, allowing for projection of a number in its most precise form "FLP."

Con. Setting the constant

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

DEF = 2

EHP. Selection of exponential filter

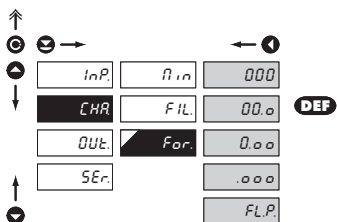
- the value is calculated from a number of measurements selected in „CON“
- range 2...100

rnd. Selection of value round-up

- it is set by ...arbitrary number, which determines the projection step (e.g.: "Con"=2,5 > display 0, 2,5, 5,...)

6.2.3 Setting the decimal point

DC AC PM DU OHM RTD



For. Setting the decimal point

- the instrument allows for classic projection of a number with placement of the decimal point as well as projection with floating point, enabling projection of a number in its most precise form "FLP."

000 Setting the DP - XXXX.

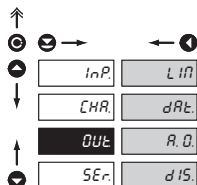
00.0 Setting the DP - XXX.x

0.00 Setting the DP - XX.xx

.000 Setting the DP - X.xxx

FLP. Floating decimal point

6.3 Setting „PROFI“ - OUTPUTS



It is possible to set the parameters of the instrument output signals in this menu

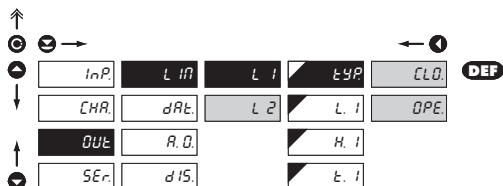
- Setting the type and the switching of limits
- Setting the type and the parameters of data output
- Setting the type and parameters of analog output
- Setting the display brightness



Analog and data outputs may not be fitted simultaneously

6.3.1 Setting the limits

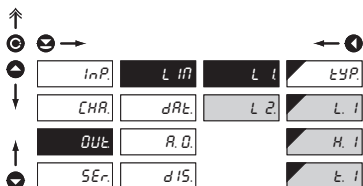
6.3.1a Limits - relay functions



Setting the type of relay function

- Relay switches on when the condition is met
- Relay switches off when the condition is met

6.3.1b Limits - boundaries



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

L 1 Setting the boundaries

L 1 Setting the boundary for relay switch-on

- within the full display range (± 1999)
- **DEF** = 25 (L 1), 75 (L 2)

H. I Setting hysteresis

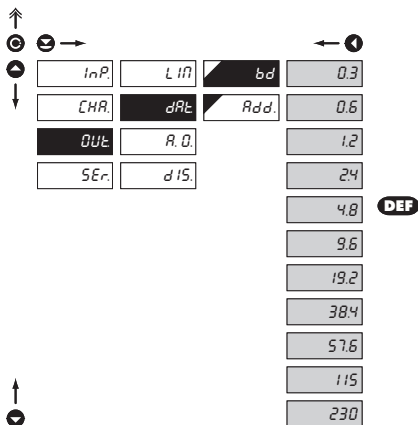
- within the full display range (± 1999)
- **DEF** = 0

t. I Setting the offset of the relay switch-on

- within the range 0...99,9 s
- **DEF** = 0

6.3.2 Setting the data output

6.3.2a Data output - Rate



bd Setting the data output rate

0.3 Rate - 300 Baud

0.6 Rate - 600 Baud

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

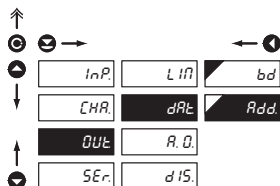
38.4 Rate - 38 400 Baud

57.6 Rate - 57 600 Baud

115 Rate - 115 200 Baud

230 Rate - 230 400 Baud

6.3.2b Data output - Address

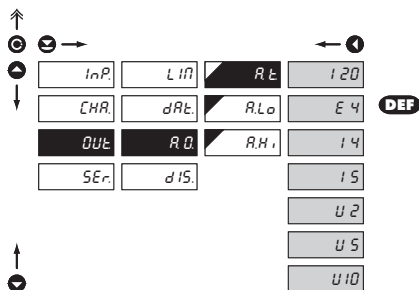


Addr. Setting the instrument address

- setting within the range 0...31
- **DEF** = 00

6.3.3 Setting the analog output

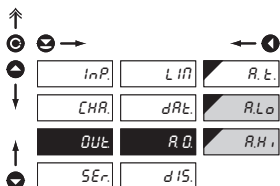
6.3.3a Analog output - Type



RL Setting the type of analog output

- 120* Type - 0...20 mA
- E 4* Type - 4...20 mA
- with indication of error statement (<3,6 mA)
- 14* Type - 4...20 mA
- 15* Type - 0...5 mA
- U 2* Type - 0...2 V
- U 5* Type - 0...5 V
- U 10* Type - 0...10 V

6.3.3b Analog output - Range



R.O. 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

R.L.o Assigning the displayed value to the beginning of the analog output range

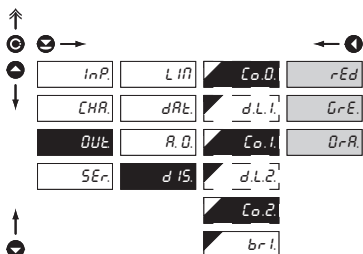
- range of the setting is ± 1999
- **DEF** = 0, -40 (RTD, T/C)

R.H.i Assigning the displayed value to the end of the analog output range

- range of the setting is ± 1999
- **DEF** = 100, 199,9 (RTD, T/C)

6.3.4 Display setting

6.3.4a Selection of display color



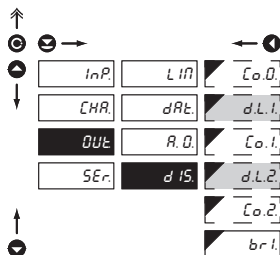
Co. Selection of display color

- selection is available only for version with 3-color 20 mm display
- selection of color is governed by setting under steps "d.L.1." and "d.L.2."

rEd	Red color
GrE	Green color
OrR	Orange color

- "Co.0." **DEF** = Green
- "Co.1." **DEF** = Orange
- "Co.2." **DEF** = Red

6.3.4b Selection of change of display color

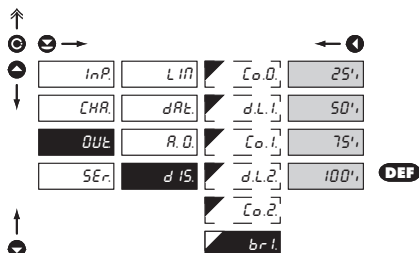


d.L.- Selection of change of display color

- selection is available only for version with 3-color 20 mm display
- in steps "d.L. 1" and "d.L.2" the limit is set when the display color shall change

- "d.L.1." **DEF** = 9999
- "d.L.2." **DEF** = 9999

6.3.4c Display brightness



br t. Setting the display brightness

- by selecting 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 %

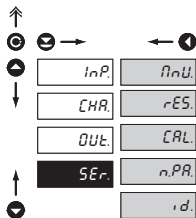
25% Display brightness - 25 %

50% Display brightness - 50 %

75% Display brightness - 75 %

100% Display brightness - 100 %

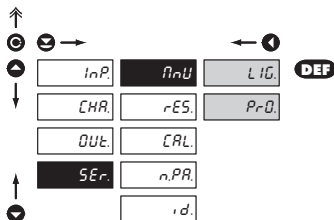
6.4 Setting "PROFI" - SERVICE



The instrument's service functions are set in this menu

n.n.U.	Selection of menu type LIGHT/PROFI
r.ES.	Restoration of the manufacture setting and instrument calibration
CAL	Calibration of input range for version „DU“
n.PR.	Setting new access password
.d.	Instrument identification

6.4.1 Selection of the type of programming menu



n.n.U. Selection of menu type LIGHT/PROFI

- allows to set the menu complexity as per user needs and abilities

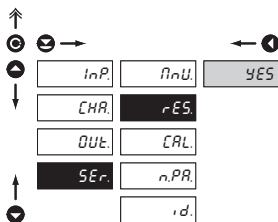
L.LG. Active LIGHT menu

- simple programming menu, contains only items necessary for instrument configuration and setting
 - linear menu structure > items in succession

Pr.D. Active PROFII menu

- complete programming menu for expert users
 - tree menu

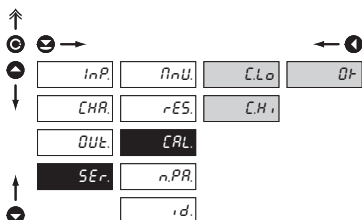
6.4.2 Restoration of the manufacture setting



r.ES. 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), call for confirmation of your selection „Yes“

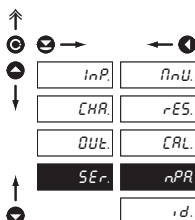
6.4.3 Calibration of the input range

DU


CAL. Calibration of the input range

- when MIN is displayed move the potentiometer slider into required minimum position and confirm by „Enter“, calibration is confirmed by showing sign „OK“
- when MAX is displayed move the potentiometer slider into required maximum position and confirm by „Enter“, calibration is confirmed by showing sign „OK““

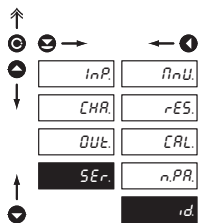
6.4.4 Setting new access password



n.PR. Setting new password for access into the LIGHT and PROFi menu

- this option allows to change the numeral code, which protects the access into the LIGHT and PROFi Menu.
- numeral code range is 0...1999
- universal password in case of loss „177“


6.4.5 Instrument identification



id Projection of instrument SW version

- the display shows the type identification of the instrument, SW number, SW version and current input setting (Mode)
- if the SW version reads a letter on the first position, then it is a customer SW
- after the identification is completed the menu automatically quits the display and measuring mode is restored

7.0 "USER" menu configuration

- **USER** menu is designed for users who need to change only several items of the setting without the option to change the basic instrument setting (e.g. repeated change of limit setting)
- there are no default items from manufacture in **USER** menu
- menu configuration possible on items indicated by inverse triangle  **Li**
- setting may be performed in **LIGHT** or **PROFI** menu, with the **USER** menu then overtaking the given menu structure



- For user operation
- Menu items are set by the user (Profi/Light) as per request
- Access is not password protected

SETTING

flashing sign - current setting is displayed



n0 item will not be displayed in USER menu

YES item will be displayed in USER menu with the chance of editing

SH0 item will be solely displayed in USER menu

Setting sequence of items in "USER" menu

In compiling USER menu from active LIGHT menu the items (max. 10) may be assigned a sequence, in which they will be projected in the menu

setting projection sequence



Example:

Into USER menu were selected these items

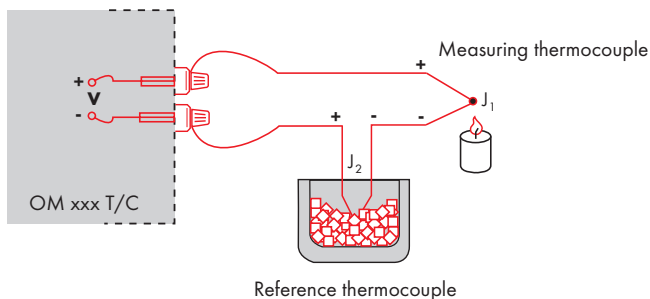
(keys +) > C. TA., LIM 1, LIM 2 for which we have preset this sequence (keys +)

C. TA.	5
LIM 1	0 (sequence not determined)
LIM 2	1

Upon entering USER menu

(key) items will be projected in the following sequence: LIM 2 > C.TAĚ . > LIM 1

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 \mathcal{E}_{J_2} in the instrument menu to 1_{r_2} or E_2
- when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu \mathcal{E}_{J_2} its temperature (applies for setting \mathcal{E}_{J_2} to E_2)
- if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu \mathcal{E}_{J_2} to 1_{r_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 \mathcal{E}_{J_2} in the instrument menu to 1_{r_1} or E_1
- when measuring temperature without reference thermocouple the error in the measured data may be even 10°C (applies for setting \mathcal{E}_{J_2} to E_1)

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. The size of the letters have a significance.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Activity	Data transferred										
Data solicitation (PC)	#	A	A	<CR>							
Data transfer (Instrument)	>	R	<SP>	D	D	D	D	D	(D)	(D)	<CR>
Command confirmation (Instrument) - OK	!	A	A	<CR>							
Command confirmation (Instrument) - Bad	?	A	A	<CR>							
Instrument identification	#	A	A	1Y	<CR>						
HW identification	#	A	A	1Z	<CR>						
One-time measurement	#	A	A	7X	<CR>						
Repeated measurement	#	A	A	8X	<CR>						
Setting to transmit display + relay value	#	A	A	1X	<CR>						
Setting to transmit measured value	#	A	A	1x	<CR>						
Setting limit 1	#	A	A	1L	D	(D)	(D)	(D)	(D)	(D)	<CR>
Setting limit 2	#	A	A	2L	D	(D)	(D)	(D)	(D)	(D)	<CR>

LEGENDA

#	35	23 _H	Beginning of the command
A	A	0...31	Two signs of the inst. address (sending in ASCII - decades and units, ex. "01", "99" universal
<CR>	13	0D _H	Carriage return
<SP>	32	20 _H	Space
D			Data - usually signs "0"... "9", ".", "-", ";", (D) - DP and (-) may prolong data
R	50 _H ...57 _H		Relay and Tare status
!	33	21 _H	Positive command confirmation (ok)
?	63	3F _H	Negative command confirmation (bad)
>	62	3E _H	Beginning of the transmitted data

RELAY, TARE

Signs	Relay 1	Relay 2	Tare
P	0	0	0
Q	1	0	0
R	0	1	0
S	1	1	0
T	0	0	1
U	1	0	1
V	0	1	1
W	1	1	1

ERROR	CAUSE	ELIMINATION
<i>E. d. U</i>	Number is too small (large negative) to be displayed	change DP setting, channel constant
<i>E. d. Q</i>	Number is too large to be displayed	change DP setting, channel constant
<i>E. E. U</i>	Number is outside the table range	increase the table values, change input setting (channel constant)
<i>E. E. Q</i>	Number is outside the table range	increase the table values, change input setting (channel constant)
<i>E. I. U</i>	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
<i>E. I. Q</i>	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
<i>E. H. U</i>	A part of the instrument does not work properly	send the instrument for repair
<i>E. E. E</i>	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
<i>E. d. E</i>	Data in EEPROM outside the range	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
<i>E. C. L.</i>	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration

INPUT - OM 352UNI

range is adjustable in configuration menu

0...20 mV	> 10 MOhm
0...60 mV	> 10 MOhm
0...1000 mV	1,25 MOhm

range is adjustable in configuration menu

0/4...20 mA	< 200 mV
0...2 V	10 MOhm
0...5 V	1,25 MOhm
0...10 V	1,25 MOhm

range is fixed, as per order

0...300 Ohm
0...1,5 kOhm
0...3 kOhm
0...30 kOhm

Connection: 2, 3 or 4-wire

range is fixed, as per order

EU > Pt xxxx	-50°...450°C
US > Pt xxxx	-50°...450°C
RU > Pt 50	-200°...1100°C
RU > Pt 100	-200°...450°C
Cu 100/4280	-200°...200°C
Cu 100/4260	-50°...200°C
Ni xxxx	-50°...250°C
Type Pt:	EU > 100/500/1 000 Ohm, with 3 850 ppm/°C
	US > 100 Ohm, with 3 920 ppm/°C
	RU > 50/100 Ohm with 3 910 ppm/°C
Type Ni:	Ni 1 000/ Ni 10 000 with 5 000/6 180 ppm/°C
Type Cu:	Cu 50/Cu 100 with 4 260/4 280 ppm/°C
Connection:	2, 3 or 4-wire

range is adjustable in configuration menu

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 (Omegaalloy)	-200°...1 300°C
	L (Fe-CuNi)	-200°...900°C

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

DC

Input 4
Input 3
Input 1

PM

Input 5
Input 4
Input 1
Input 1

OHM**RTD****T/C****DU****INPUT - OM 352DC**

range is adjustable in configuration menu

0...500 mA	< 6 mV
0...1 A	< 12 mV
0...5 A	< 60 mV
0...20 V	8,66 MOhm
0...40 V	8,66 MOhm
0...200 V	8,66 MOhm

DC

Input 5
Input 5
Input 5
Input 2
Input 2
Input 2

INPUT - OM 352AC

range is adjustable in configuration menu

Range:	0...1 A	< 30 mV
	0...5 A	< 150 mV
	0...60 mV	1,2 kOhm
	0...300 mV	1,2 kOhm
	0...24 V	510 kOhm
	0...50 V	1 MOhm
	0...90 V	1,8 MOhm
	0...120 V	510 kOhm
	0...250 V	1 MOhm
	0...450 V	1,8 MOhm

AC

Input 5
Input 5
Input 4
Input 4
Input 3
Input 2
Input 1
Input 1
Input 2
Input 2
Input 1

Frequency input: 0...400 Hz

PROJECTION

Display:	1999, intensive red or green 7-segment LED, digit height 14 mm
	9999, intensive 3-color (red/green/orange) 7-segment LED, digit height 20 mm
Projection:	±1999...9999 (for 20 mm display)
Decimal point:	adjustable - in programming mode
Brightness:	adjustable - in programming mode

INSTRUMENT ACCURACY

Temperature coef.:	100 ppm/°C
Accuracy:	±0,2% of the range + 1 digit ±0,3% of the range + 1 digit
Rate:	0,5 - 1,2 - 2,5 - 5 - 10 measurements/s
Overload capacity:	10x (t < 100 ms), 2x (long-term)
Digital filter	adjustable in configuration menu
Comp. of conduct.:	max. 30 Ohm
Comp. of cold junct.:	adjustable -20°...99°C or automatic
Functions:	Tare - display resetting Hold - stop measuring (upon contact) Lock - control keys locking
OM Link:	Company communication interface for instrument operation, setting and update
Watch-dog:	reset after 25 ms
Calibration:	at 25°C and 40% r.h.

T/C, AC**RTD****T/C**

** type "PM" has for range 0...5 V accuracy ±0,4 %

* values apply for resistance load

COMPARATOR

Type:	digital, adjustable in the menu
Limits:	±1999
Hysteresis:	0...999
Delay:	0...99,9 s
Outputs:	2x relays with switch-on contact (Form A) (230 VAC/30 VDC, 3 A)*
Relay:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

Protocols:	ASCII, MESSBUS, MODBUS-RTU, PROFIBUS
Data format:	8 bit + no parity + 1 stop bit 7 bit + even parity + 1 stop bit (Messbus)
Rate:	300...230 400 Baud
RS 232:	isolated, two-way communication
RS 485:	isolated, two-way communication, addressing (max. 31 instruments)
PROFIBUS	Data protocol SIEMENS

- cannot be combined with analog output and excitation

ANALOG OUTPUTS

Type:	isolated, programmable with resolution of max. 4 000 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 < 250 ms
Voltage:	0...2 V/5 V/10 V
Current:	0...5/20 mA/4...20 mA - compensation of conduct up to 450 Ohm

- cannot be combined with data output and excitation

EXCITATION

Adjustable:	5...24 VDC/max. 1,2 W, isolated
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- cannot be combined with data/analog output

POWER SUPPLY

Options:	10...30 V AC/DC, 10 VA, isolated, - fuse inside (T 4000 mA) 80...250 V AC/DC, 10 VA, isolated - fuse inside (T 630 mA)
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MECHANIC PROPERTIES

Material:	Noryl GFN2 SE1, incombustible UL 94 V-I
Dimensions:	96 x 48 x 120 mm
Panel cut-out:	90,5 x 45 mm

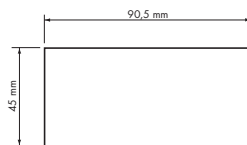
OPERATING CONDITIONS

Connection:	connector terminal board, conductor cross-section <1,5 mm ² / <2,5 mm ²
Stabilisation period:	within 15 minutes after switch-on
Working temp.:	0°...60°C
Storage temp.:	-10°...85°C
Cover:	IP65 (front panel only)
Construction:	safety class I
Overvoltage category:	EN 61010-1, A2
Insulation resistance:	for pollution degree II, measurement category III Instrument power supply > 670 V (PI), 300 V (DI) Input/output > 300 V (PI), 150 (DI)
EMC:	EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11; EN 550222, A1, A2

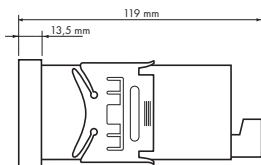
Front view



Panel cut



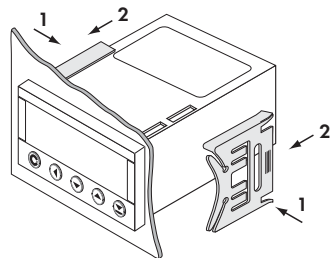
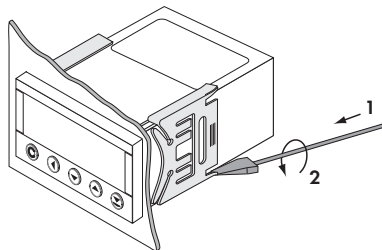
Side view



Panel thickness: 0,5...20 mm

Instrument installation

1. insert the instrument into the panel cut-out
2. fit both travellers on the box
3. press the travellers close to the panel



Instrument disassembly

1. slide a screw driver under the traveller wing
2. turn the screw driver and remove the traveller
3. take the instrument out of the panel

Product **OM 352 UNI DC AC**
 Type
 Manufacturing No.
 Date of sale

GUARANTEE

A guarantee period of 60 months from the date of sale to the user applies to this instrument.
 Defects occurring during this period due to manufacture error or due to material faults shall be eliminated free of charge.

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

The guarantee shall not apply to defects caused by:

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

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

60 YEARS

Stamp, signature

DECLARATION OF CONFORMITY

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

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

declares at its full responsibility that the product presented hereunder meets all technical requirements, is safe for use when utilised under the terms and conditions determined by ORBIT MERRET, spol.s r.o. and that our company has taken all measures to ensure conformity of all products of the type listed hereunder, which are being brought out to the market, with technical documentation and requirements of the appurtenant statutory orders.

Product: 3 ½-digit programmable panel instrument

Type: **OM 352**

Version: UNI, DC, AC

Conformity is assessed pursuant to the following standards:

Electrical safety:	EN 61010-1
EMC:	EN 50131-1, chapter 14 and chapter 15
	EN 50130-4, chapter 7
	EN 50130-4, chapter 8
	EN 50130-4, chapter 9
	EN 50130-4, chapter 10
	EN 50130-4, chapter 11
	EN 50130-4, chapter 12
	EN 50130-4, chapter 13
	EN 50130-5, chapter 20
	prEN 50131-2-1, par. 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, chapter 5 and chapter 6

and government ordinance:

Electrical safety:	No. 168/1997 Sb.
EMC:	No. 169/1997 Sb.

The evidence are the protocols of authorized and accredited organization:

VTÚE Praha, experimental laboratory No. 1158, accredited by ČIA
VTÚPV Vyškov, experimental laboratory No. 1103, accredited by ČIA

Place and date of issue: Prague, 1. September 2006

Miroslav Hackl
Company representative

Mode of asses. of conformity: §12, par. 4 b, d of Act No. 22/1997 Sb.