OM 352

3 1/2 DIGIT PROGRAMMABLE
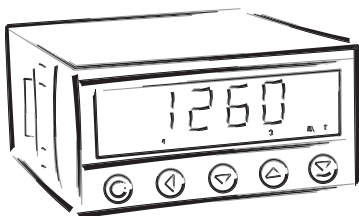## UNIVERSAL INSTRUMENT

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.

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/L
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).

OMLINK   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 visualizatiion 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
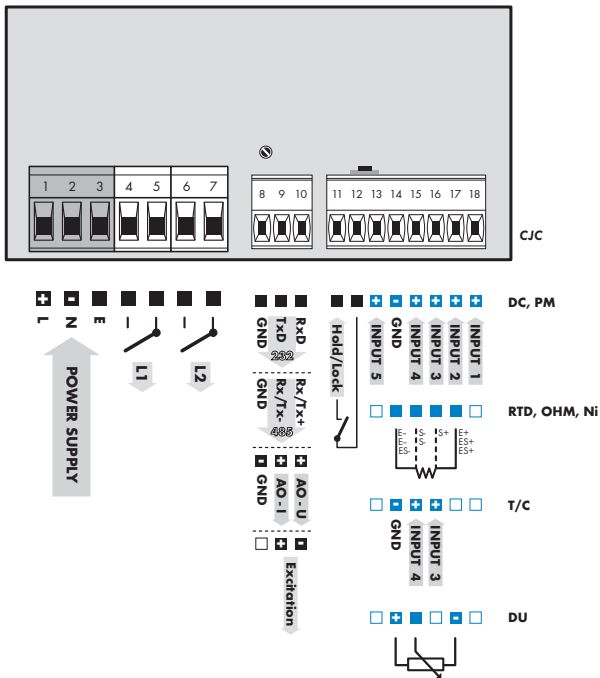
POWER SUPPLY

L N E

L1 L2

RxD / TxD / GND — 232

Rx/Tx+ / Rx/Tx- / GND — 485

AO - U / AO - I / GND

Excitation

Hold/Lock

CJC

DC, PM
INPUT 5 / GND / INPUT 4 / INPUT 3 / INPUT 2 / INPUT 1

RTD, OHM, Ni
E- / E- / ES-   S- / S-   S+   E+ / ES+ / ES+

T/C
GND / INPUT 4 / INPUT 3

DU

8 9 10   11 12 13 14 15 16 17 18

1 2 3   4 5 6 7

Setting PROFI

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

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

Setting 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)
             - acces 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 possble to browse through the operation menu and to select and set required values.

Measured value

Relay status

ON   the digit is lit
OFF   the digit is not lit
OFF   the digit is flashing
       limits with restriction
       (delay)

Function

T   Tare

143.7
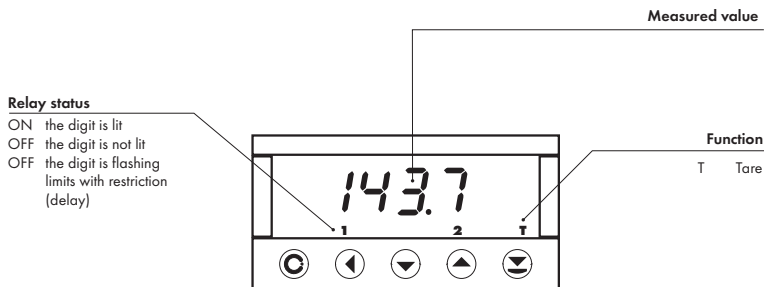
Symbols used in the instructions

AC	DC	PM
DU	OHM	RTD	T/C

     Indicates the setting for given type of instrument

DEF   values preset from manufacture

42   symbol indicates a flashing light (symbol)

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

COnECt   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 ◀ with transition beyond the highest decade, when the decimal point starts flashing . Positioning is performed by ▲/▼.

THE MINUS SIGN

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

Controntrol keys functions

Key	Measurement	Menu	Setting numbers/Selection
(C)	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
(C) + (✉)	access into LIGHT/PROFI menu		
(C) + (▼)	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

legend is flashing - current setting is displayed

(▲) →   ← (▼)   (C)   🚫   *return to item*

☐ --- (✉) + (▲)   nO   YES   SHO   (✉)   💾 →   ---

nO	item will not be displayed in USER menu
YES	item will be displayed in USER menu with the option of setting
SHO	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

• **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

`142.8`

C + ⌄

`PRS` ⌄ `0` ⌄ — *Access code*

`tYP.` ⌄ `dC` ⌄ `ñOd.` ⌄ `60n` ⌄ — *Selecting input, range*

Selecting projection, connection

RTD OHM
`COn` ⌄ `4-ω` ⌄ `FOr.` ⌄ `00.o` ⌄

T/C
`COn` ⌄ `EH.1` ⌄ `t.C.J` ⌄ `0` ⌄ `FOr.` ⌄ `000` ⌄

DC PM OHM DU
`ñin.` ⌄ `0` ⌄ `ñAH.` ⌄ `100` ⌄ `FOr.` ⌄ `00.o` ⌄

Option - Comparator
`L.1` ⌄ `25` ⌄ `L.2` ⌄ `75` ⌄

Option - Analog output
`A.t.` ⌄ `120` ⌄ `A.Lo` ⌄ `0` ⌄ `A.Hi` ⌄ `100` ⌄

Basic color *First color's limit* *Color after the first limit*
`Co.0.` ⌄ `GrE.` ⌄ `d.L.1.` ⌄ `9999` ⌄ `Co.2.` ⌄ `rEd` ⌄

Second color's limit *Color after the second limit* *Options - Color display*
`d.L.1.` ⌄ `9999` ⌄ `Co.2.` ⌄ `OrA.` ⌄

Menu type *Return to manufacture setting*
`ñnU` ⌄ `LIG.` ⌄ `rES.` ⌄ `YES` ⌄

DU
`C.Lo` ⌄ `YES` ⌄ `C.Hi` ⌄ `YES` ⌄ — *Calibration - only for "DU"*

New password *Identification* — **Return to previous measuring mode**
`n.PA.` ⌄ `0` ⌄ `id.` ⌄ `YES` ⌄ `Oñ 352...` ▶ `142.8`

142.8

PAS. → 0 — Entering access password for access into the menu →

PAS. — **Access into instrument menu**

| DC | PM | DU | OHM | RTD | T/C |

PAS = 0
- access into menu is unrestricted, after releasing keys you automatically move to first item of the menu

PAS > 0
- access into menu is protected ny number code

Set "Password" = 42 — Example

0 ▲ 1 ▲ 2 ◀ 02 ▲ 12 ▲ 22 ▲
32 ▲ 42 ◉ nOd.

TYP. →

dC Pn OHN Pt Cu
ni tC dU

TYP. — **Selection of the type of instrument**

- primary selection of the type of instrument
- performs default setting **DEF** of values from manufacture, incl. calibration

	Menu	Type of instrument
TYP.	DC	DC voltmeter
	PM	Process monitor
	OHM	Ohmmeter
	RTD	Thermometer for sensors Pt
	Cu	Thermometer for sensors Cu
	Ni	Thermometer for sensors Ni
	TC	Thermometer for thermocouples
	DU	Display for lin. potentiometer

Type "PM" — Example

dC ▲ Pn ◉ nOd.

Type „DC"	📖 16
Type "352AC"	📖 18
Type "PM"	📖 20
Type "OHM"	📖 22
Type "Pt"	📖 24
Type "Cu"	📖 26
Type "Ni"	📖 28
Type "T/C"	📖 30
Type "DU"	📖 32

light

Type "DC"

OM 352UNI

| 20m | 60m | U 1. |

∏0d.

OM 352DC

| ı0.5 | ı1.0 | ı5.0 | u20 | u40 | 200 |
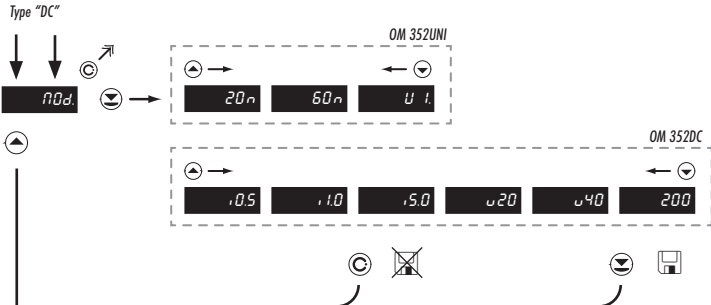
∏0d. Selection of the instrument measuring range

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
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

MOD.

Range 0...20 mV *Example*

| 60m | 20m | ∏ In |

∏ In → 0 *Setting for minimum input signal*

∏ In 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 | ∏RH |

MAX → **100** Setting for maximum input signal

MAX **Setting display projection for maximum 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 = 100

Projection for 20 mV > MAX = 1500   Example

+ **100** ◄ + **100** ◄ + **100** ▲ + **200** ◄ + **300** ▲ + **400** ▲

+ **500** ◄ + **0500** ▲ + **1500** ☽ **FOr.**

FOr. ▲→ **000** **00.o** **0.oo** **.ooo** **FL.P.** ←▼

FOr. **Setting projection of the decimal point** **DEF** = 00.o

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

Projection of DP on display > 000   Example

00.o ▼ **000** ☽ **AnU** *subsequent item on the menu depends on instrument equipment

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AC AC AC AC AC AC AC AC AC AC AC AC AC AC AC AC

OM 352AC

NOd. Selection of the instrument measuring range

DEF = 250 V

	Menu	Measuring ranges
MOD. / OM 352AC	i 1.	0...1 A
	i 5.	0...5 A
	60m	0...60 mV
	u0.3	0...300 mV
	u24	0...24 V
	u50	0...50 V
	u90	0...90 V
	120	0...120 V
	250	0...250 V
	450	0...450 V

Range 0...50 V   Example

250 ⊗ 120 ⊗ u90 ⊗ u50 ⊗ [nIn]

nIn — Setting for minimum input signal

nIn 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 A > MIN = 0   Example

0 ⊗ [nAH]

NAX → 100   *Setting for maximum input signal*

NAX   **Setting display projection for maximum value of input signal**
- range of the setting   ±1999

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

DEF = 100

Projection for 5 A > Max = 350   *Example*

100   100   110   120   130   140
150   150   250   350   FOr

FOr → 000   00.o   0.oo   .ooo   FL.P.

FOr   **Setting projection of the decimal point**   **DEF** = 00.o
- positioning of the DP is set here in the measuring mode

Projection of DP on display > 00.o   *Example*

00.o   nnU   *subsequent item on the menu depends on instrument equipment*

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PM PM PM PM PM PM PM PM PM PM PM PM PM PM PM PM

Type "PM"

nOd.

u 2.   u 5.   u 10.   i 0.   i 4.

nOd.   **Selection of the instrument measuring range**

DEF = I 4

Menu	Measuring ranges
U 2.	0...2 V
U 5.	0...5 V
U 10.	0...10 V
I 0.	0...20 mA
I 4.	4...20 mA

MOD.

Range 4...20 mA   *Example*

i 4.   A In

A In   **Setting for minimum input signal**

0

Setting for minimum input signal

A In   **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 4 mA > Min = -25   *Example*

+ 0   + 1   + 2   + 3   + 4   + 5
+ 05   - 15   - 25   nAx

MAX ↓ → 100 *Setting for maximum input signal*

MAX Setting display projection for maximum 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 = 100

Projection for 20 mA > Max = 250 *Example*

+100 ◀ +100 ▲ +110 ▲ +120 ▲ +130 ▲ +140 ▲
+150 ◀ +150 ▼ +250 ▼ FOr

FOr ↓ → 000 00.o 0.oo .ooo FL.P.

FOr Setting projection of the decimal point

DEF = 00.o

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

Projection of DP on display > 000 *Example*

00.o ▼ 000 ▼ AnU *subsequent item on the menu depends on instrument equipment*

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OHM OHM OHM OHM OHM OHM OHM OHM OHM

Type "OHM"

CON

Menu	Connection
2-υ	2-wire
3-υ	3-wire
4-υ	4-wire

[COn] 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 = 2-wire

Type of connection - 3 wire > COn = 3-υ   *Example*

2-υ → 3-υ → A In

[A In] Setting for minimum input signal

[A In] 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 Ohm > MIN = 0   *Example*

+ 0 → nAx

OHM OHM OHM OHM OHM OHM OHM OHM OHM OHM OHM

NAH → 100   *Setting for maximum input signal*

NAH **Setting display projection for maximum 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 = 100

Projection for 300 Ohm > MAX = 350   *Example*

+100 +100 +110 +120 +130 +140
+150 +150 +250 +350 FOr

FOr → 000 00.o 0.oo .ooo FL.P.

FOr **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.o 000 AnU   *subsequent item on the menu depends on instrument equipment*

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Type "Pt"

```
NOd.
```

```
E. 1    U. 1    r.0.5    r. 1
```

NOd. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = E. 1

	Menu	Measuring range	Pt
A	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)	
B	E. 5	Pt 500 (3 850 ppm/°C)	
C	E.10	Pt 1000 (3 850 ppm/°C)	

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

Type of sensor Pt 100 > E. 1   *Example*

```
E. 1        COn
```

```
COn
```

```
2- u    3- u    4- u
```

COn Selection of the type of sensor connection

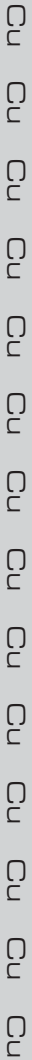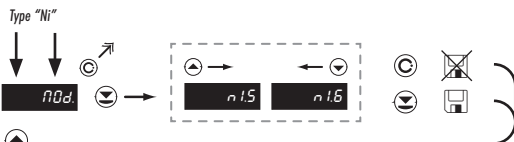- in 2- or 3- wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

DEF = 4-wire

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

Type of connection - 3 wire   > COn = 3-u   *Example*

```
4- u        3- u        FOr
```

FOr	000	00.o	0.oo	.ooo	FL.P.

FOr — Setting projection of the decimal point

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

000. > for range -50°...400°C
00.0 > for range -50,0°...199,9°C

DEF = 00.0

Projection of DP on display > 000   *Example*

| 00.o | 000 | ΠnΠ |

*subsequent item on the menu depends on instrument equipment

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Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt Pt

Type "Cu"

Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu

NOd. → | Cu.1 | Cu.2 | Cu.3 | Cu.4 |
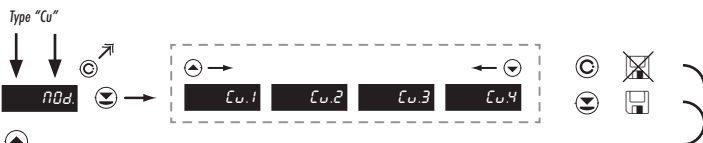
NOd. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = Cu.2

	Menu	Measuring range	Cu
MOD.	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 → COn

COn → | 2-u | 3-u | 4-u |

COn 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
CON.	2-u	2-wire
	3-u	3-wire
	4-u	4-wire

Type of connection - 3 wire > COn = 3-u   *Example*

4-u → 3-u → FOr

FOr

000   00.o   0.oo   .ooo   FL.P.
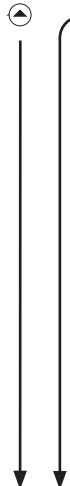
FOr	**Setting projection of the decimal point**

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

DEF = 00.0

Projection of DP on display > 000   *Example*

00.o   000   ∩∩∪

subsequent item on the menu depends on instrument equipment

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Type "Ni"

NOd. 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)
C	Ni.6	Ni 1 000 (6 180 ppm/°C)
D	Ni.5	Ni 10 000 (5 000 ppm/°C)
D	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*

n i5 → COn

COn 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
CON.	2-u	2-wire
CON.	3-u	3-wire
CON.	4-u	4-wire

Type of connection - 3 wire > COn = 3-u   *Example*

4-u → 3-u → FOr

FOr 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

*subsequent item on the menu depends on instrument equipment

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T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C
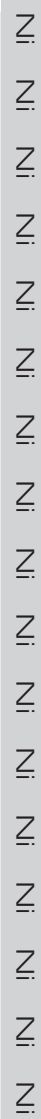
Type "T/C"
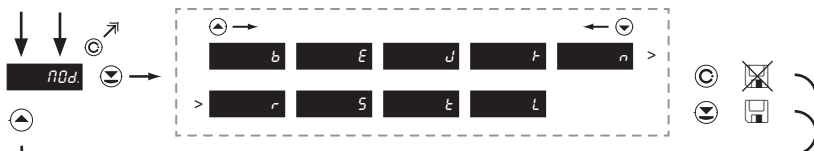
NOd. Selection of the type of thermocouple

DEF = Type "J"

Menu	Type of thermocouple
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

MOD.

Type of thermocouple "K"   *Example*

J ▲ K ▼ CON.

CON. Selection of the type of sensor connection

DEF = EX. 1

	Menu	Connection	Ref. T/C
CON.	IN.1	measuring C.J. at instrument brackets	✗
	IN.2	measuring C. J. at instrument brackets with anti-series connected ref. TC	✓
	EX.1	the entire measuring set is working under invaried and constant temperature	✗
	EX.2	when using compensation box	✓

Sensor connection > CON = EX. 2   *Example*

EX.1 ▲ EX.2 ▼ t.C.J.

!

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

T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C T/C

t.C.J. → 0 Setting temperature of cold junction

| **t.C.J.** Setting temperature of cold junction | **DEF** = 0 |

- range -20...99°C with compensation box

Setting temperature of cold junction > T.C.J. = 35 *Example*

23 → 24 → 25 → 25 → 35 → F0r

F0r → 000 00.o 0.oo .ooo FL.P.

| **F0r** Setting projection of the decimal point | **DEF** = 000 |

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

Projection of DP on display > 00.o *Example*

000 → 00.o → AnU *subsequent item on the menu depends on instrument equipment*

!

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

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Type "DU"

⊓ ⌐⌐⌐⌐⌐⌐	0	Setting for minimum input signal
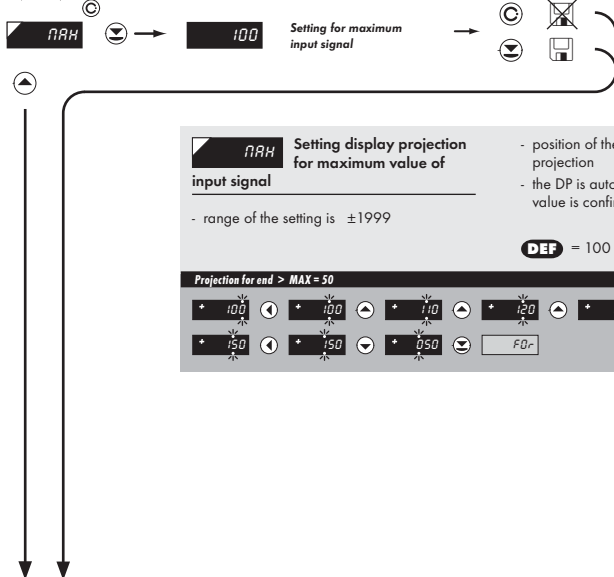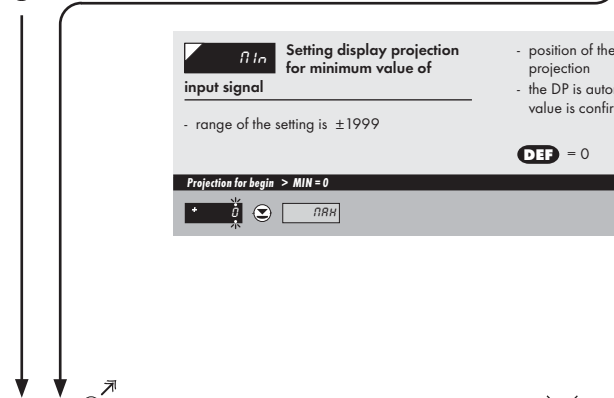
⊓ ⌐⌐⌐⌐⌐⌐   **Setting display projection for minimum value of input signal**

- 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 begin > MIN = 0   *Example*

+ 0	⌐⌐⌐⌐⌐

⌐⌐⌐⌐⌐⌐	100	Setting for maximum input signal

⌐⌐⌐⌐⌐⌐   **Setting display projection for maximum 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 = 100

Projection for end > MAX = 50   *Example*

+ 100	+ 100	+ 110	+ 120	+ 130	+ 140
+ 150	+ 150	+ 050	FOr		

F0r → 000 00.o 0.oo .ooo FL.P.

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.o 000 Ոn∪ *subsequent item on the menu depends on instrument equipment

34 *Calibration of the beginning and the end of range of linear potentiometer is on page 41*

Only with option > **Dual Comparator**

L 1 — 25 — *Setting the boundary for limit 1*

L 1 — Setting the boundary for limit 1

- range of the setting is ±1999
- presetting "Hysteresis"=0 "Delay"=0

- contingent change of hysteresis or offset of the switch-on may be performed in the PROFI menu

DEF = 25

Setting limit 1 > L 1 = 30 — *Example*

25 · 26 · 27 · 28 · 29 · 20 · 20 · 30 · L 2

L 2 — 75 — *Setting the boundary for limit 2*

L 2 — Setting the boundary for limit 2

- range of the setting is ±1999
- presetting "Hysteresis"=0 "Delay"=0

- contingent change of hysteresis or offset of the switch-on may be performed in the PROFI menu

DEF = 75

Setting limit 2 > L 2 = 230 — *Example*

100 · 100 · 110 · 120 · 130 · 130 · 230 · AnU

* following item of the menu depends on instrument equipment, provided it has an analog output the following item is „Type"

!

Items for "Limits" and "Analog output" are accessible only if the instrument contains them.

| A. t. | | i 20 | E 4 | i 4 | i 5 | U 2 | U 5 | U 10 |

A. t.   Setting the type of analog output   **DEF** = E 4

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. t. = U 10   *Example*

| i 4 | i 5 | U 2 | U 5 | U 10 | A.Lo |

A.Lo   0   Assigning the display value to the beginning of the AO range

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

- range of the setting is ±1999

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

| 0 | A.Lo |

A.H i   100   Assigning the display value to the end of the AO range

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

- range of the setting is ±1999

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

| 100 | 100 | 110 | 120 | AnU |

Only with option > **3-color 20 mm display**

Co.0. Selection of display color
> basic setting

DEF = green

Selection of display color - basic > red   Example

GrE. rEd. d.L.1.

9999 *Setting limit for the change of display color*

d.L.1. Setting first value for the change of display color   **DEF** = 9999

- range of the setting -999...9999

Display value for 1st color change > 100   Example

9999 + 0 00 000 100 Co.1.

Co.1. Selection of display color
> after exceeding d.L. 1.   **DEF** = orange

- selection of display color is governed by the
  setting under step d.L.1.
- display color changes when the value on
  the display exceeds the color set in d.L.1.

Selection of display color if the value is > d.L.1 > green   Example

OrA. GrE. d.L.2

Only with option ▷ **3-color 20 mm display**

d.L.2. → 9999 *Setting limit for the change of display color*

d.L.2. Setting second value 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. → rEd. GrE. OrA.

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. ⊖ OrA. ⊖ AnU.

📖 40

profi

OUt.

L In. | L 1. | tYP. | CLO • OPE.
| | L.I | 25
| | H.I | 0
| | C.I | 0

| L 2. | tYP. | CLO • OPE.
| | L.2 | 75
| | H.2 | 0
| | C.2 | 0

dAt. | db | 0.3 • 0.6 • 1.2 • 2.4 • 4.8 • 9.6 • 19.2 • 38.4 • 57.6 • 115 • 230
| Adr. | 0

A. O. | A. t. | i20 • E 4 • , 4 • , 5 • υ 2 • υ 5 • υ 10
| A.Lo | 0
| A.H i. | 100

d IS. | Co.O. | rEd • GrE • OrR
| d.L.I. | 9999
| Co.I. | rEd • GrE • OrR
| d.L.2 | 9999
| Co.2 | rEd • GrE • OrR
| br I. | 25% • 50% • 75% • 100%

SEr.
noU | L IG. • Pr.O.
rES. | YES

DU

CAL. | C. M I. | YES
| C. MR. | YES

n. PA. | 0

Id. | OM 352Un I...
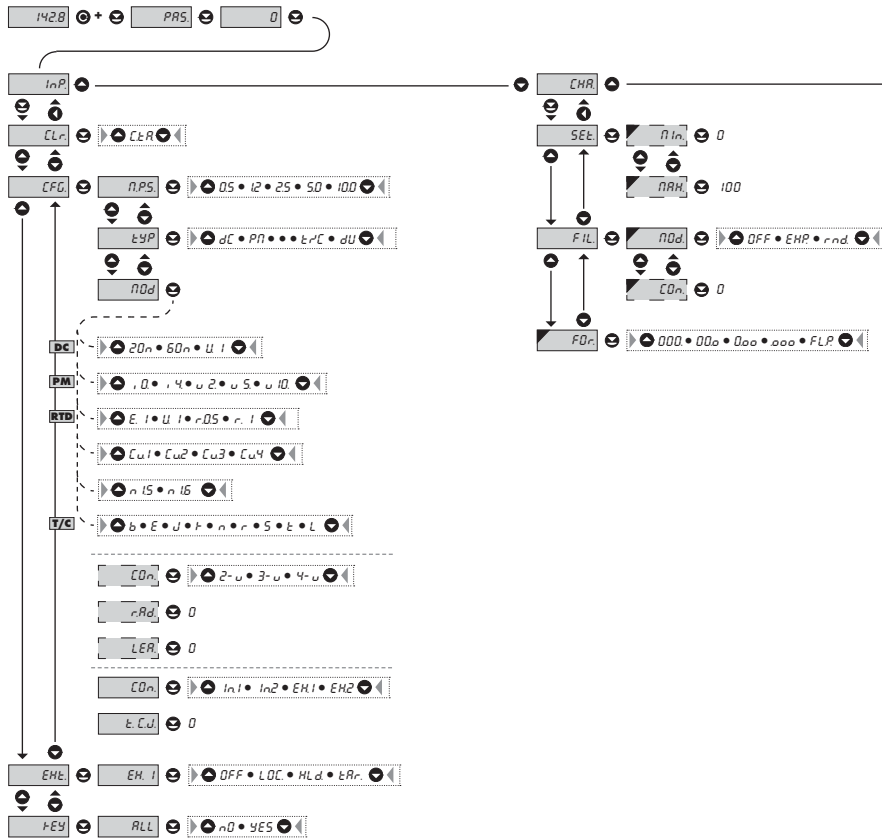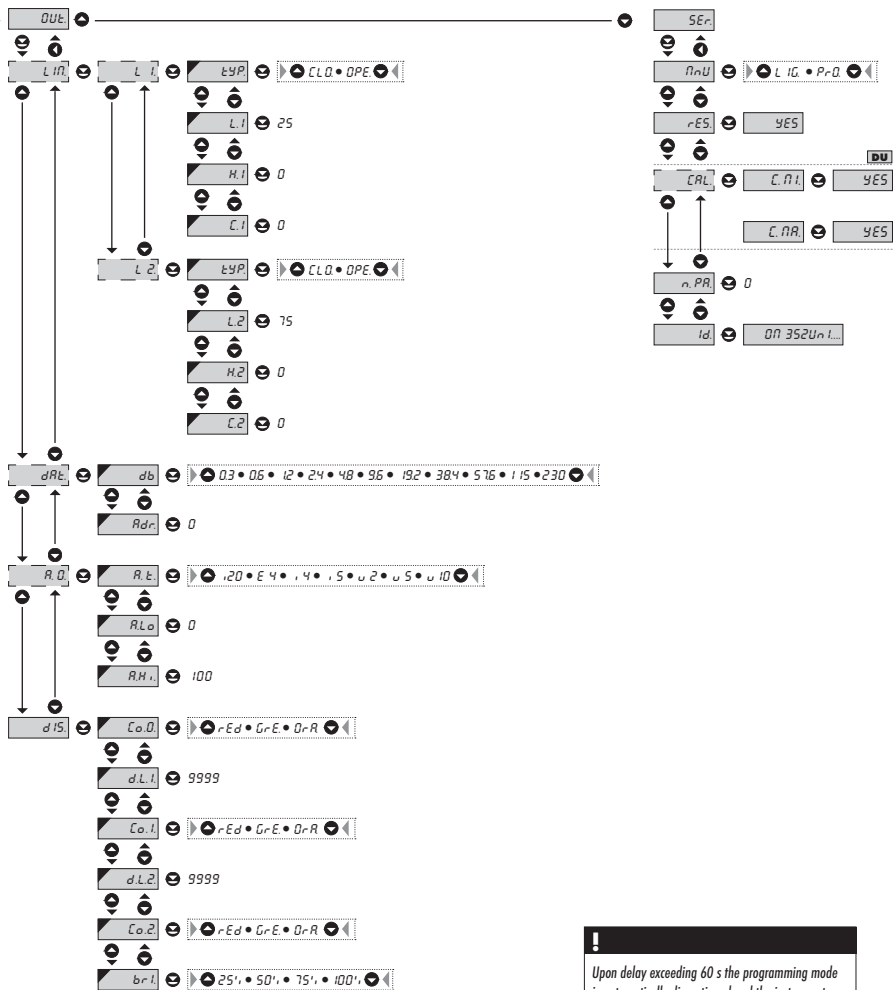
!
Upon delay exceeding 60 s the programming mode
is automatically discontinued and the instrument
itself restores the measuring mode
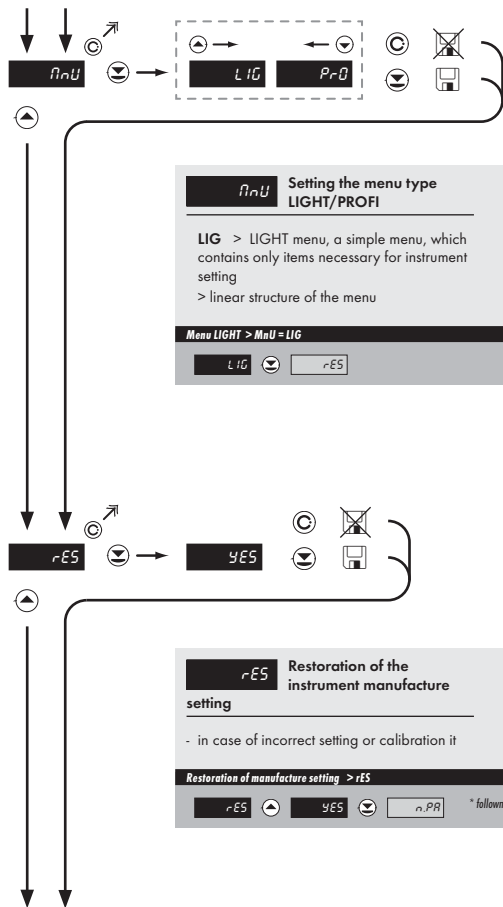
AnU   Setting the menu type
LIGHT/PROFI

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 > MnU = LIG   *Example*

LIG ⊻ rES

rES   Restoration of the instrument manufacture setting

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

Restoration of manufacture setting > rES   *Example*

rES ⌃ YES ⊻ n.PA   * followng item depends on the instrument type, for "DU" > "C.Lo"

Type "DU"

C.Lo → YES
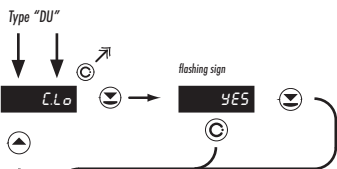
flashing sign

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*
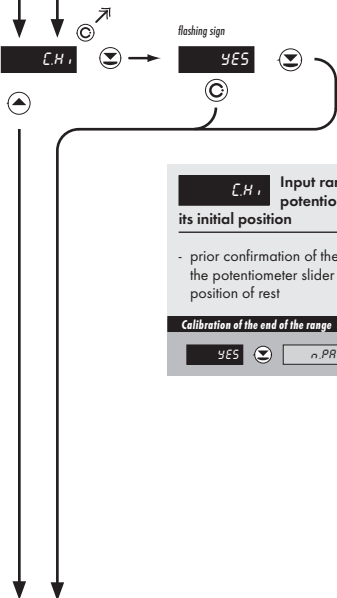
YES   C.H.

C.H. → YES

flashing sign

C.H. **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.PA

n.PA 0 *Setting new access password*

n.PA **Setting new access password**

- access password for LIGHT/PROFI menu
- range of the numeral code 0…1999
- when setting password to "000" the access into LIGHT/PROFI menu is accessible without call for entering it

- in case of loss of password universal password "177" may be used

DEF = 0

New password - 341 > n.PA = 341   Example

0   1   01   11   21   31
41   041   141   241   341   Id

Id YES   *Instrument type* OM 352   *SW number* 61-   *SW version* 139   *setting the input type* 14

Id **SW version of the instrument**

- 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

1428   *Return to measuring mode*

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**

- **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

C + ▼
- 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)

C + ✉
- 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
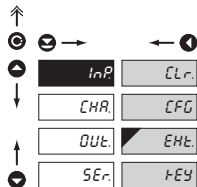
The basic instrument parameters are set in this menu

| | | Tare reseting |
| ClR | Tare resetting |

InP CLr.
CHA. CFG
OUt. EHt.
SEr. rEY

CLr. Tare reseting

CFG Selecting the measuring range and rate

EHt. Setting the external input function

rEY Setting the ENTER key function

6.1.1 Tare reseting

InP CLr. C.tR
CHA. CFG
OUt. EHt.
SEr. rEY
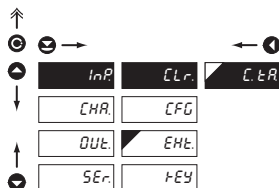
C.tR. Tare reseting

!

Does not apply for version RTD, T/C

6.1.2 Setting the input parameters

6.1.2a Selection of measuring rate
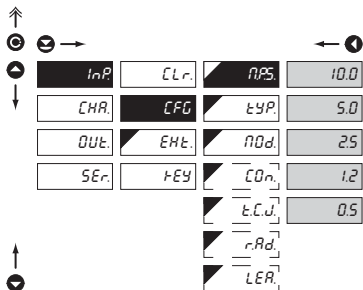
N.PS.	Selection of measuring rate
10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.5	2,5 measurements/s
1.2	1,2 measurements/s
0.5	0,5 measurements/s

6.1.2b Selection of „instrument" type
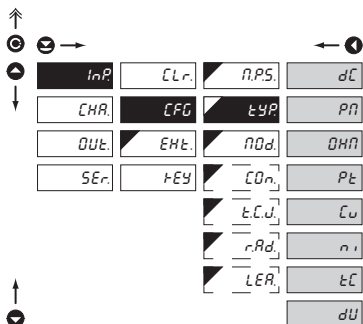
tYP.	Selection of "instrument" type

- 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

Menu navigation (display codes):

InP.	CLr.	n.PS.	20n	**DC**	**352DC** i0.5
CHA.	CFG	tYP.	60n		i1.0
Out.	EHt.	**nOd.**	U 1.		i5.0
SEr.	HEY	COn.	u20		u20
		t.C.J.	u40		u40
		r.Ad.	**PM** 14.		200
		LEA.	U 2.		**352AC** i1.

DC: 20n, 60n, U 1., u20, u40, 200, U 2., U 5., U10. (DEF)

PM: 10., 14., U 2., U 5., U10. (DEF)

RTD (DEF): E. 1, U. 1, r.0.5, r. 1

Ni (DEF): ni.5, ni.6

Cu (DEF): Cu.1, Cu.2, Cu.3, Cu.4

T/C: b, E, J, t (DEF), n, r, S, t, L

352AC: i1., i5., 60n (DEF), u0.3, u24, u50, u90, 120, 250 (DEF), 450

- setting the input range depends on the measured range ordered

	Menu	Measuring range	**DC**
OM 352DC	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**
I 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	**Pt**
A	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)	
B	E. 5	Pt 500 (3 850 ppm/°C)	
C	E.10	Pt 1000 (3 850 ppm/°C)	

	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)	

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

InP.	CLr.	N.PS.	2- u
CHA.	CFG	tYP.	3- u
OUt.	EHt.	NOd.	4- u DEF
SEr.	rEY	COn	
		r.Ad.	
		LEA.	
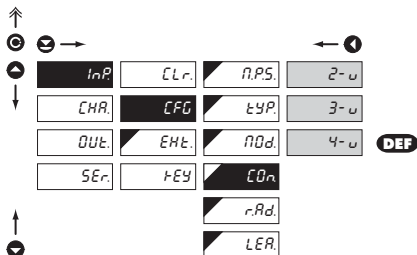
COn   Selection of type of sensor connection

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

   2- u   2-wire connection

   3- u   3-wire connection

   4- u   4-wire connection

6.1.2e Offset of the beginning of the range RTD OHM

InP	CLr.	N.PS.
CHA.	CFG	tYP.
OUt.	EHt.	NOd.
SEr.	rEY	COn
		r.Ad.
		LEA.
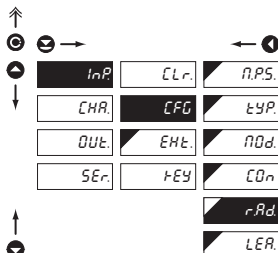
r.Ad.   Offset of the beginning of the measuring range

- 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

InP	CLr.	N.PS.	YES
CHA.	CFG	tYP.	
OUt.	EHt.	NOd.	
SEr.	rEY	COn	
		r.Ad.	
		LEA	
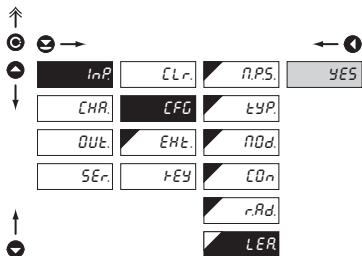
LEA.   Compensation of 2-wire conduct

- 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

InP.	CLr.	n.PS.	In. 1	DEF
CHR.	CFG	tYP.	In. 2	
OUt.	EHt.	nOd.	E. 1	
SEr.	tEY	COn	E. 2	
		t.C.J.		
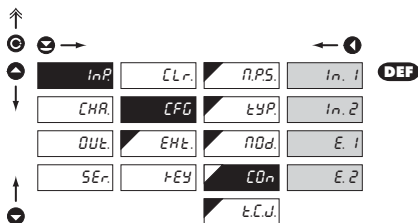
COn — Method of evaluation of the cold junction

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

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

EH.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

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

6.1.2h   Setting temperature of cold junction   T/C

InP.	CLr.	n.PS.
CHR.	CFG	tYP.
OUt.	EHt.	nOd.
SEr.	tEY	COn
		t.C.J.
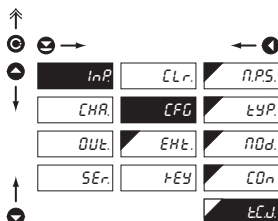
t.C.J. — Setting temperature of cold junction

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

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

6.1.3 External input function selection

InP.	CL. t.	OFF
CHA.	CFG	LOC.
OUt.	EHt	HLd. DEF
SEr.	ʁEY	tAr.
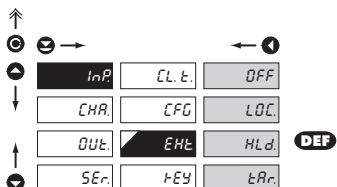
EHt. External input function selection

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

InP.	CL. t.	ALL	nO DEF
CHA.	CFG		YES
OUt.	EHt.		
SEr.	ʁEY		
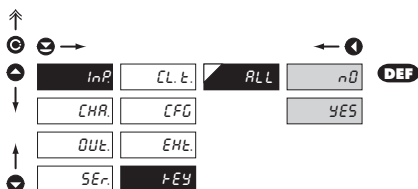
ʁEY Assigning further functions to instrument keys

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

nO 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
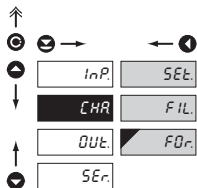
In this menu the instrument input parameters are set

`InP.`	`SEt.`	
`CHA`	`FIL.`	
`OUt.`	`FOr.`	
`SEr.`		

`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
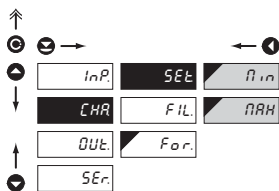
`InP.`	`SEt`	`Min`
`CHA`	`FIL.`	`MAH`
`OUt.`	`For.`	
`SEr.`		

`SEt.` **Setting display projection**

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

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

6.2.2 Setting the digital filters

Setting the digital filters

NOd.

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

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
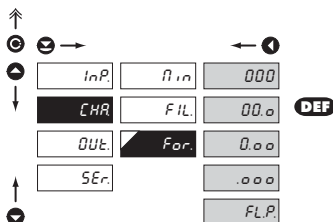
For. **Setting the decimal point**

- 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 "FL.P."

000 Setting the DP - XXXX.

00.o Setting the DP - XXX.x

0.oo Setting the DP - XX.xx

.ooo Setting the DP - X.xxx

FL.P. Floating decimal point

6.3 Setting „PROFI" - OUTPUTS
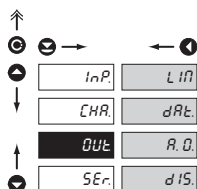
It is possible to set the parameters of the instrument output signals in this menu

`L ın`	Setting the type and the switching of limits
`dAt`	Setting the type and the parameters ot data output
`A. O.`	Setting the type and parameters of analog output
`d ıS.`	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
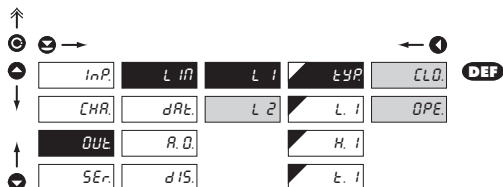
`tYP.`	**Setting the type of relay function**
`CLO.`	Relay switches on when the condition is met
`OPE.`	Relay switches off when the condition is met

6.3.1b Limits - boundaries

InP.	L In	L l	tYP.
CHR.	dAt.	L 2.	L. l
OUt	A. O.		H. l
SEr.	d IS.		t. l

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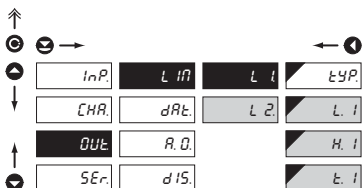
The process of setting the Limit 2 is identical with the setting for Limit 1

L l	**Setting the boundaries**
L. l	Setting the boundary for relay switch-on

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

H. l	Setting hysteresis

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

t. l	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

InP.	L In	bd	0.3
CHR.	dAt	Add.	0.6
OUt	A. O.		1.2
SEr.	d IS.		2.4
			4.8 **DEF**
			9.6
			19.2
			38.4
			57.6
			115
			230
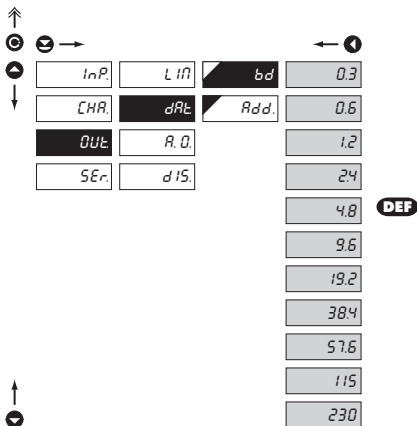
bd	**Setting the data output rate**
0.3	Rate - 300 Baud
0.6	Rate - 600 Baud
1.2	Rate - 1 200 Baud
2.4	Rate - 2 400 Baud
4.8	Rate - 4 800 Baud
9.6	Rate - 9 600 Baud
19.2	Rate - 19 200 Baud
38.4	Rate - 38 400 Baud
57.6	Rate - 57 600 Baud
115	Rate - 115 200 Baud
230	Rate - 230 400 Baud

6.3.2b Data output - Address
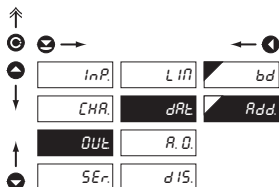
| | | Add. | Setting the instrument address |

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

6.3.3 Setting the analog output

6.3.3a Analog output - Type
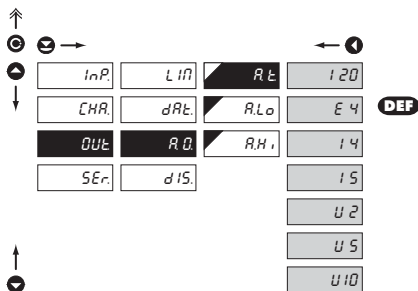
| | A. t. | Setting the type of analog output |

| i 20 | Type - 0...20 mA |

| E 4 | Type - 4...20 mA |

- with indication of error statement (<3,6 mA)

| i 4 | Type - 4...20 mA |

| i 5 | 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

InP.	LIN	A.t.
CHA.	dAt.	A.Lo
OUt	A.O.	A.Hi
SEr.	dIS.	
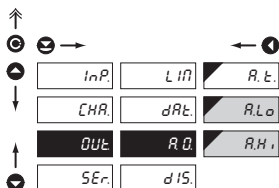
A.O. **Setting the analog output range**

- 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

A.Lo Assigning the displayed value to the beginning of the analog output range
- range of the setting is ±1999
- **DEF** = 0, -40 (RTD, T/C)

A.Hi 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

InP.	LIN	Co.0.	rEd
CHA.	dAt.	d.L.1.	GrE.
OUt	A.O.	Co.1.	OrA.
SEr.	dIS.	d.L.2.	
		Co.2.	
		brI.	
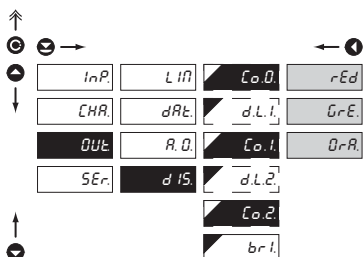
Co.- **Selection of display color**

- 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

OrA. Orange color

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

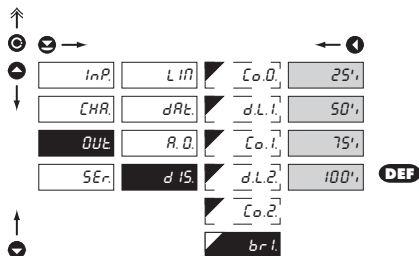### 6.3.4b Selection of change of display color
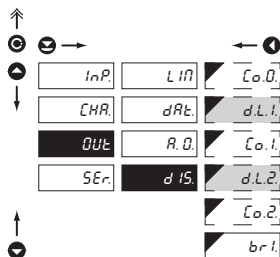
	d.L.-	**Selection of change of display color**

- 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 i.	**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'i	Display brightness - 25 %
50'i	Display brightness - 50 %
75'i	Display brightness - 75 %
100'i	Display brightness - 100 %

6.4 Setting "PROFI" - SERVICE
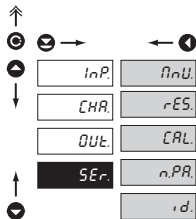
The instrument's service functions are set in this menu

AnU	InP.
rES.	CHA.
CAL.	OUE.
n.PA.	SEr.
Ɪd.	

AnU	Selection of menu type LIGHT/PROFI
rES.	Restoration of the manufacture setting and instrument calibration
CAL.	Calibration of input range for verion „DU"
n.PA.	Setting new access password
Ɪd.	Instrument identification

6.4.1 Selection of the type of programming menu

InP.	AnU	LꞮG. DEF
CHA.	rES.	PrO.
OUE.	CAL.	
SEr.	n.PA.	
	Ɪd.	
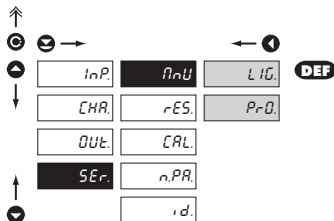
AnU — **Selection of menu type LiGHT/PROFI**

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

LꞮG. — Active LIGHT menu

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

PrO — Active PROFI menu

- complete programming menu for expert users
- tree menu

6.4.2 **Restoration of the manufacture setting**
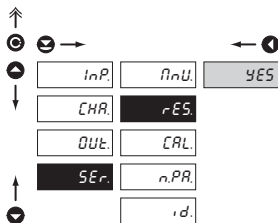
```
 InP.   AnU.   YES
 CHA.   rES.
 OUt.   CAL.
 SEr.   n.PA.
        id.
```

rSE. **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**

```
 InP.   AnU.   C.Lo   Ot
 CHA.   rES.   C.Hi
 OUt.   CAL.
 SEr.   n.PA.
        id.
```
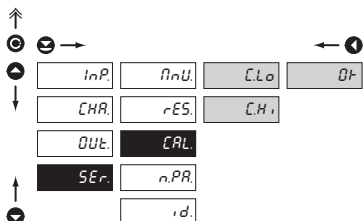
CAL. **Calibration of the input range**

- 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""
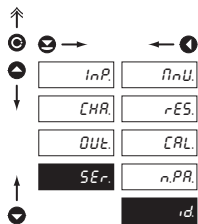
6.4.4 **Setting new access password**

```
 InP.   AnU.
 CHA.   rES.
 OUt.   CAL.
 SEr.   nPA
        id.
```
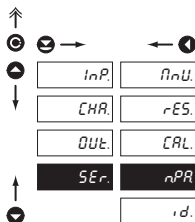
n.PA. **Setting new password for access into the LIGHT and PROFI menu**

- 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 `L 1`
- setting may be performed in **LIGHT** or **PROFI** menu, with the **USER** menu then overtaking the given menu structure

profi light

user

▶
- **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   YES   SHO   Ⓒ   ⊠   return to item
                                                         💾 →   - - -

n0	item will not be displayed in USER menu
YES	item will be displayed in USER menu with the chance of editing
SHO	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

-- -- -- (⊻) + (⊽)   *0*

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.TAč . > LIM 1

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

Measuring thermocouple

Reference thermocouple

OM xxx T/C
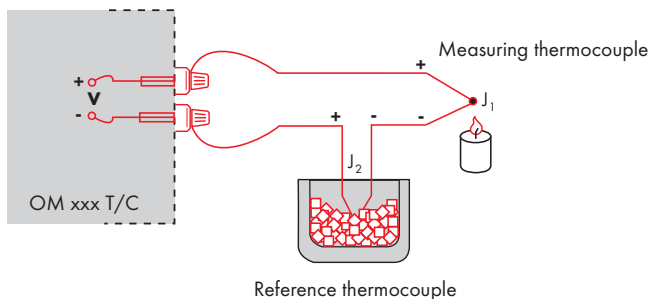
WITH REFERENCE THERMOCOUPLE

- a reference thermocouple may be located in the same place as the measuring instrument or in place with stable temperature/compensation box
- when measuring with reference thermocouple set CJC in the instrument menu to $in.2$ or $E.2$
- when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu tCJ its temperature (applies for setting CJC to $E.2$)
- if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu CJC to $in.2$. Based on this selection the measurement of the surrounding temperature is performed by a sensor located in the instrument terminal board.

WITHOUT REFERENCE THERMOCOUPLE

- inaccuracy originating from the creation of dissimilar thermocouples on the transition point terminal-conductor of the thermocouple is not compensated for in the instrument
- when measuring without reference thermocouple set CJC in the instrument menu to $in.1$ or $E.1$
- when measuring temperature without reference thermocouple the error in the measured data may be even 10°C (applies for setting CJC to $E.1$)

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 corfimation (Instrument) - OK	!	A	A	<CR>							
Command corfimation (Instrument) - Bad	?	A	A	<CR>							
Instrument identification	#	A	A	1Y	<CR>						
HW identification	#	A	A	1Z	<CR>						
One-time mesasurement	#	A	A	7X	<CR>						
Repeated mesasurement	#	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 corfimation (ok)
?	63	3F$_H$	Negative command corfimation (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
E. d. U.	Number is too small (large negative) to be displayed	change DP setting, channel constant
E. d. O.	Number is too large to be displayed	change DP setting, channel constant
E. t U.	Number is outside the table range	increase the table values, change input setting (channel constant)
E. t O.	Number is outside the table range	increase the table values, change input setting (channel constant)
E. I. U.	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
E. I. O.	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
E. Hu	A part of the instrument does not work properly	send the instrument for repair
E. EE	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. dt	Data in EEPROM outside the range	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. CL.	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration

INPUT - OM 352UNI

range is adjustbale in configuration menu		*DC*
0...20 mV	> 10 MOhm	Input 4
0...60 mV	> 10 MOhm	Input 3
0...1000 mV	1,25 MOhm	Input 1

range is adjustbale in configuration menu		*PM*
0/4...20 mA	< 200 mV	Input 5
0...2 V	10 MOhm	Input 4
0...5 V	1,25 MOhm	Input 1
0...10 V	1,25 MOhm	Input 1

range is fixed, as per order	*OHM*
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		*RTD*
EU > Pt xxxx	-50°...450°C	
US > Pt xxx	-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 > Pt 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	
Typee Ni:	Ni 1 000/ Ni 10 000 with 5 000/6 180 ppm/°C	
Typ Cu:	Cu 50/Cu 100 with 4 260/4 280 ppm/°C	
Connection:	2, 3 or 4-wire	

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

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

INPUT - OM 352DC

range is adjustbale in configuration menu		*DC*
0...500 mA	< 6 mV	Input 5
0...1 A	< 12 mV	Input 5
0...5 A	< 60 mV	Input 5
0...20 V	8,66 MOhm	Input 2
0...40 V	8,66 MOhm	Input 2
0...200 V	8,66 MOhm	Input 2

INPUT - OM 352AC

range is adjustbale in configuration menu		*AC*
Range:	0...1 A	< 30 mV	Input 5
	0...5 A	< 150 mV	Input 5
	0...60 mV	1,2 kOhm	Input 4
	0...300 mV	1,2 kOhm	Input 4
	0...24 V	510 kOhm	Input 3
	0...50 V	1 MOhm	Input 2
	0...90 V	1,8 MOhm	Input 1
	0...120 V	510 kOhm	Input 3
	0...250 V	1 MOhm	Input 2
	0...450 V	1,8 MOhm	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, -999...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	*T/C, AC*
Rate:	0,5 - 1,2 - 2,5 - 5 - 10 maeasurements/s	
Overload capacity:	10x (t < 100 ms), 2x (long-term)	
Digital filter	adjustable in configuration menu	
Comp.of conduct:	max. 30 Ohm	*RTD*
Comp.of cold junct.:	adjustable	*T / C*
	-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 operaion, setting and update	
Watch-dog:	reset after 25 ms	
Calibration:	at 25°C and 40 % r.h.	

** 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

Adjustbale:	5...24 VDC/max. 1,2 W, isolated

 - 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)

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 mm² /<2,5 mm²
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

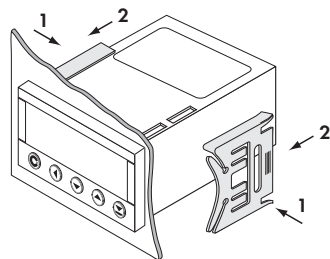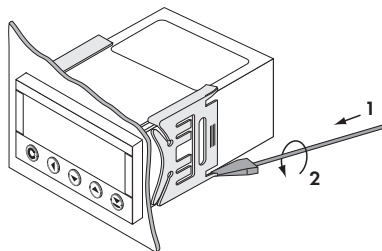**Front view**
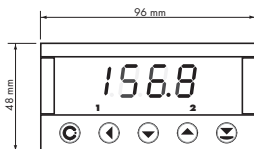
Panel cut
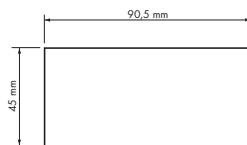
Side view
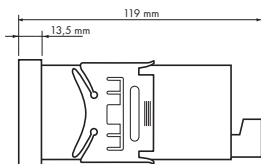
Panel thickness: 0,5...20 mm

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   . . . .

A guarantee period of 60 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 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.

Stamp, signature

DECLARATION OF CONFORMITY

Company:	**ORBIT MERRET, spol. s r.o.**
	Klánova 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 61000-4-11
	EN 50130-4, chapter 8	EN 61000-4-11
	EN 50130-4, chapter 9	EN 61000-4-2
	EN 50130-4, chapter 10	EN 61000-4-3
	EN 50130-4, chapter 11	EN 61000-4-6
	EN 50130-4, chapter 12	EN 61000-4-4
	EN 50130-4, chapter 13	EN 61000-4-5
	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.