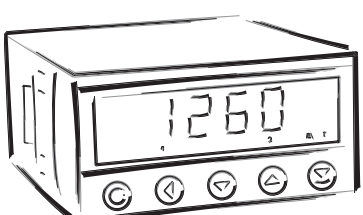
GUARANTEE
5
YEARS

# 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 standards:
EN 55 022, class B
EN 61000-4-2, -4, -5, -6, -8, -9, -10, -11

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

## CONNECTION

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

CE

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PAP

## 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

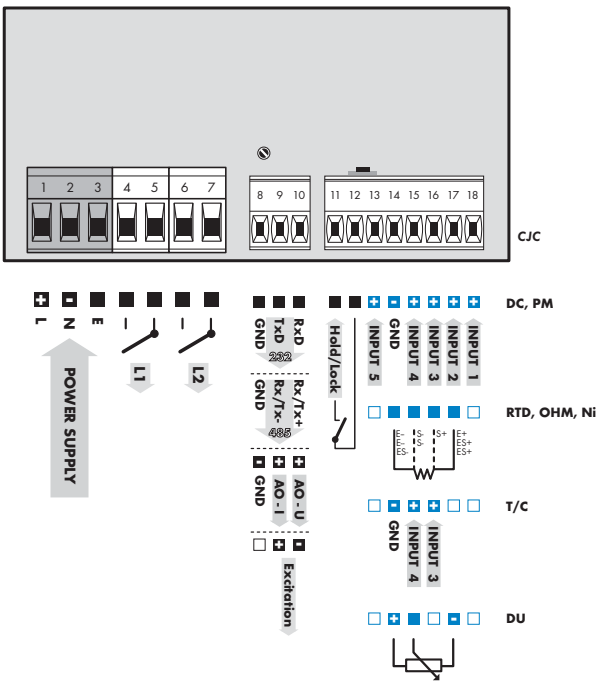
| Type | Input 1 | Input 2 | Input 3 | Input 4 | Input 5 |
|---|---|---|---|---|---|
| DC | 0...1 000 mV | | 0...60 mV | 0...20 mV | |
| PM | 0...5/10 V | | | 0...2 V | 0/4...20 mA |
| OHM | 0...300 Ω • 0...1,5 kΩ • 0...3 kΩ • 0...30 kΩ | | | | |
| RTD-Pt | Pt 100 • Pt 500 • Pt 1 000 | | | | |
| RTD-Cu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

### OM 352DC

| Type | Input 1 | Input 2 | Input 3 | Input 4 | Input 5 |
|---|---|---|---|---|---|
| DC | 0...100/200 V | 0...20/40 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.*

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).

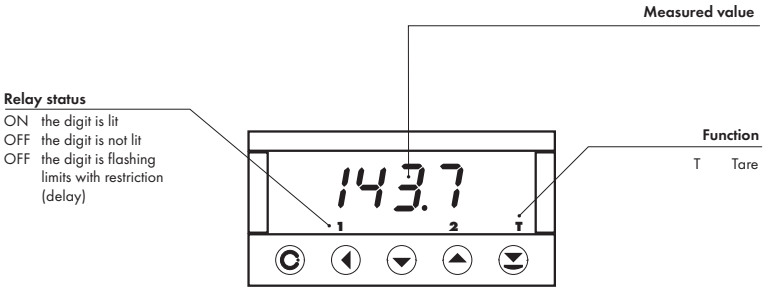
Complete instrument operation and setting may be performed via OM Link communication interface, which is a standard equipment of all instruments.

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).

# 4 INSTRUMENT SETTING

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.




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

### THE MINUS SIGN

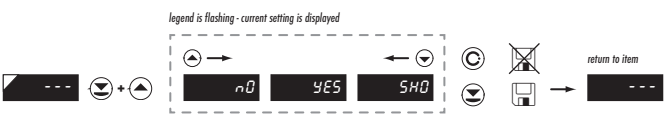
Setting the minus sign is performed by the key ▼ on higher decade. When editing the item substraction must be made from the current number (e.g..: 013 > ▼ , on class 100 > -87)

## 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)<br>resistance measured (RTD)<br>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<br>- 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


| | |
|---|---|
| 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"

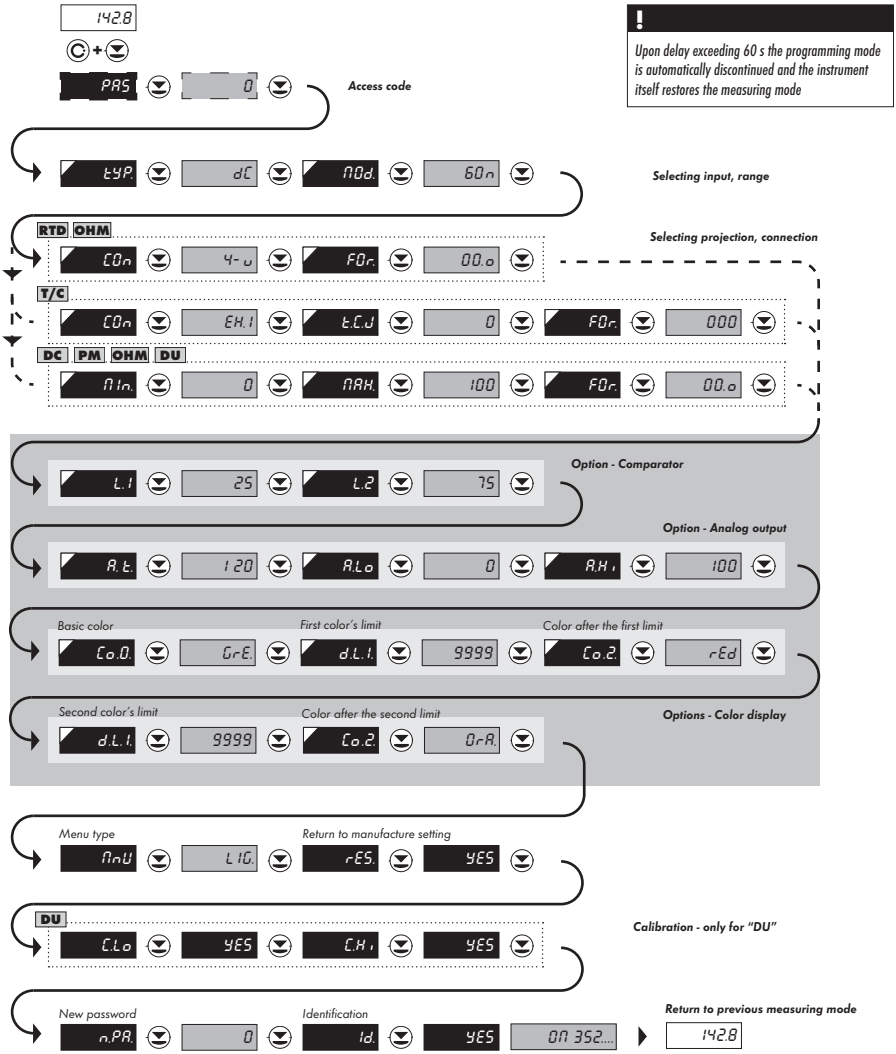
**LIGHT** **Simple programming menu**

- 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 |

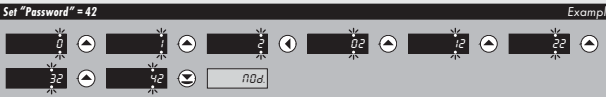

142.8
C + ▼
PAS
0
Access code
!
Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode
tyP.
dC
rOd.
60n
Selecting input, range
RTD OHM
COn
4-u
FOr.
00.0
Selecting projection, connection
T/C
COn
EH.1
t.C.J
0
FOr.
000
DC PM OHM DU
rIn.
0
rAH.
100
FOr.
00.0
Option - Comparator
L.1
25
L.2
75
Option - Analog output
A.t.
120
A.Lo
0
A.H.
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
rnU
L1G.
rES.
YES
DU
Calibration - only for "DU"
C.Lo
YES
C.H.
YES
New password
Identification
Return to previous measuring mode
n.PA.
0
Id.
YES
ON 352....
142.8


**PAS.** **Access into instrument menu**

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

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

*Set "Password" = 42* *Example*



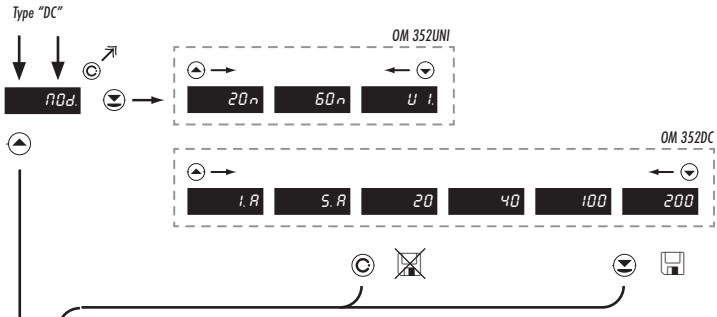


**typ.** **Selection of the type of instrument**

- 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*

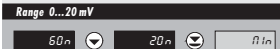



**nOd.** **Selection of the instrument measuring range**

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

| MOD. | Menu | Measuring ranges |
|---|---|---|
| | 20m | 0...20 mV |
| | 60m | 0...60 mV |
| | U 1. | 0...1 000 mV |
| | 1. A | 0...1 A |
| | 5. A | 0...5 A |
| | 20 | 0...20 V |
| | 40 | 0...40 V |
| | 100 | 0...100 V |
| | 200 | 0...200 V |

***Range 0...20 mV*** *Example*



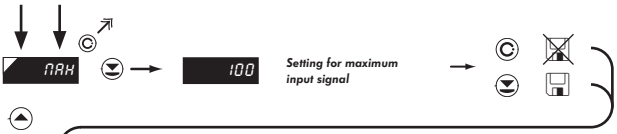


**nIn** **Setting display projection for minimum value of input signal**

- 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 mV > MIN = 0*** *Example*




**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 20 mV > MAX = 1500* *Example*



**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*


**subsequent item on the menu depends on instrument equipment*

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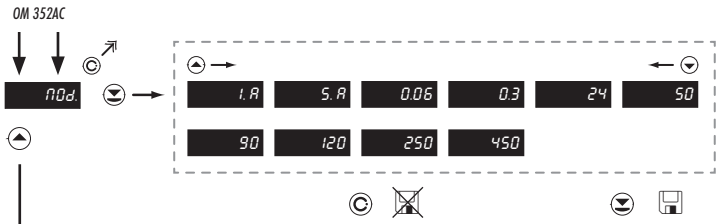
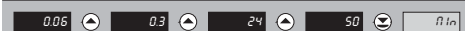



**nOd.** **Selection of the instrument measuring range**

DEF = 60 mV

| MOD - OM 352AC | Menu | Measuring ranges |
|---|---|---|
| | 1. A | 0...1 A |
| | 5. A | 0...5 A |
| | 0.06 | 0...60 mV |
| | 0.3 | 0...300 mV |
| | 24 | 0...24 V |
| | 50 | 0...50 V |
| | 90 | 0...90 V |
| | 120 | 0...120 V |
| | 250 | 0...250 V |
| | 450 | 0...450 V |

***Range 0...50 V*** *Example*



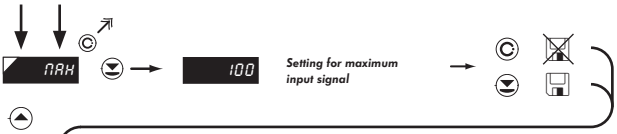


**nIn** **Setting display projection for minimum value of input signal**

- 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*




**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 5 A > Max = 350* — *Example*



**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*


**subsequent item on the menu depends on instrument equipment*

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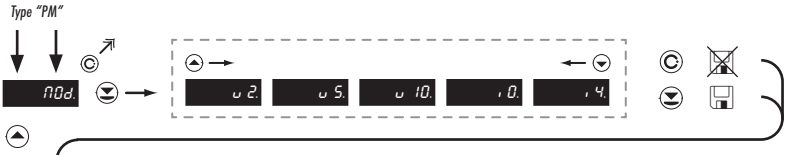
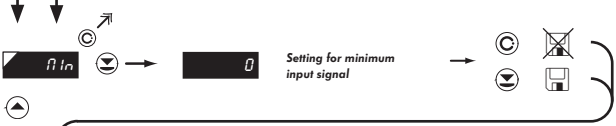



**MOd.** **Selection of the instrument measuring range**

DEF = I 4

| MOD. | 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 |

***Range 4...20 mA*** *Example*

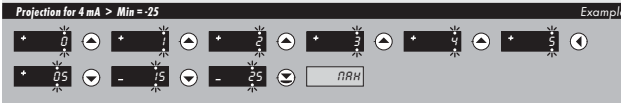



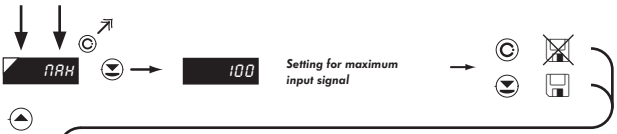

**Min** **Setting display projection for minimum value of input signal**

- 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*






**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 20 mA > Max = 250* *Example*



**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*


**subsequent item on the menu depends on instrument equipment*

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*Type "OHM"*

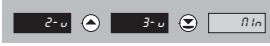

**CON** **Selection of the type of sensor connection**

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

DEF = 2-wire

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

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





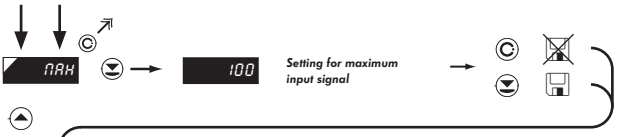
***Setting for minimum input signal***

**MIN** **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*




**nAX 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*



**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*


**subsequent item on the menu depends on instrument equipment*


### nOd. Selection of instrument measuring range

- setting the input range depends on ordered measuring range

DEF = E. 1

| | Menu | Measuring range | Pt |
|---|---|---|---|
| A | E0.1 | Pt 100 (3 850 ppm/°C) | |
| | U0.1 | Pt 100 (3 920 ppm/°C) | |
| | R.05 | Pt 50 (3 910 ppm/°C) | |
| | R0.1 | Pt 100 (3 910 ppm/°C) | |
| B | E0.5 | Pt 500 (3 850 ppm/°C) | |
| C | E1.0 | Pt 1000 (3 850 ppm/°C) | |

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

***Type of sensor Pt 100 > E0.1*** *Example*



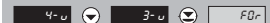
### COn Selection of the type of sensor connection

- 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*




**FOr** **Setting projection of the decimal point**

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

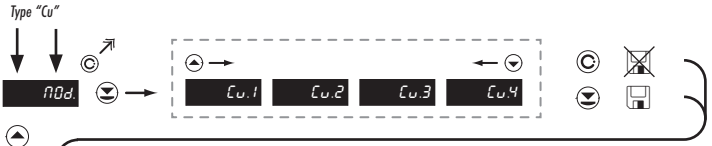
**000.** > for range -50°...400°C
**00.0** > for range -50,0°...199,9°C

DEF = 00.0

***Projection of DP on display > 000*** *Example*


**subsequent item on the menu depends on instrument equipment*

34



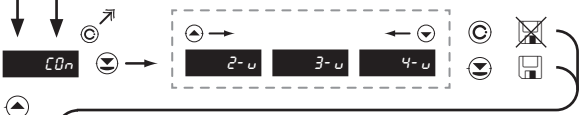

**MOd.** **Selection of instrument measuring range**

- setting the input range depends on ordered measuring range

DEF = Cu.2

| MOD. | 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*


**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

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

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


### FOr Setting projection of the decimal point

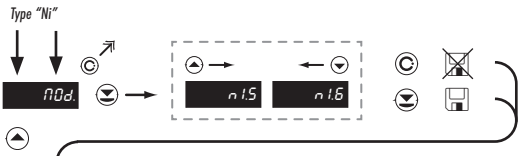
- positioning of the DP is set here in the measuring mode

DEF = 00.0

*Projection of DP on display > 000* — Example


*subsequent item on the menu depends on instrument equipment

34




### n0d. Selection of instrument measuring range

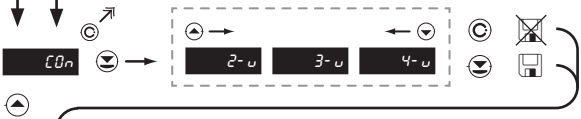
- setting the input range depends on ordered measuring range

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*

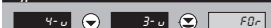

### C0n Selection of the type of sensor connection

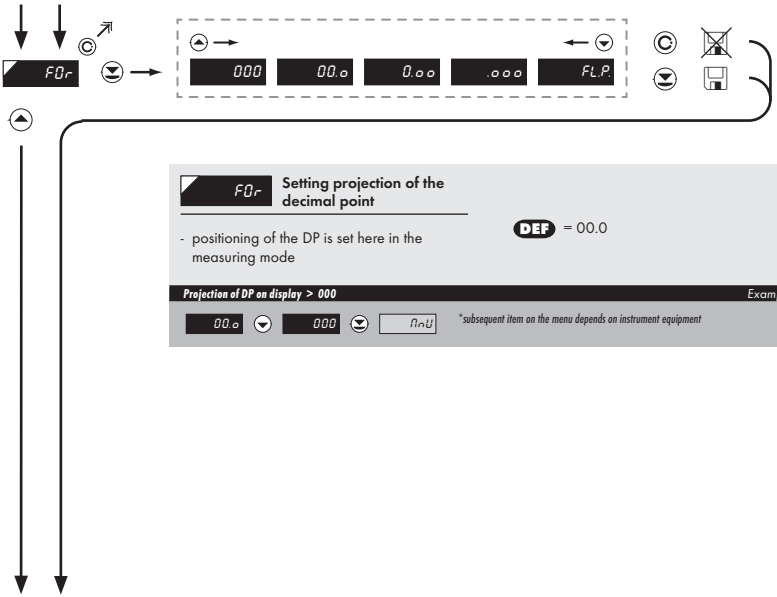
- in 2- or 3- wire connection it is necessary to link the unconnected inputs (see Chapter Connection)

DEF = 4-wire

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

***Type of connection - 3 wire > C0n = 3-u*** *Example*






34

### FOr Setting projection of the decimal point

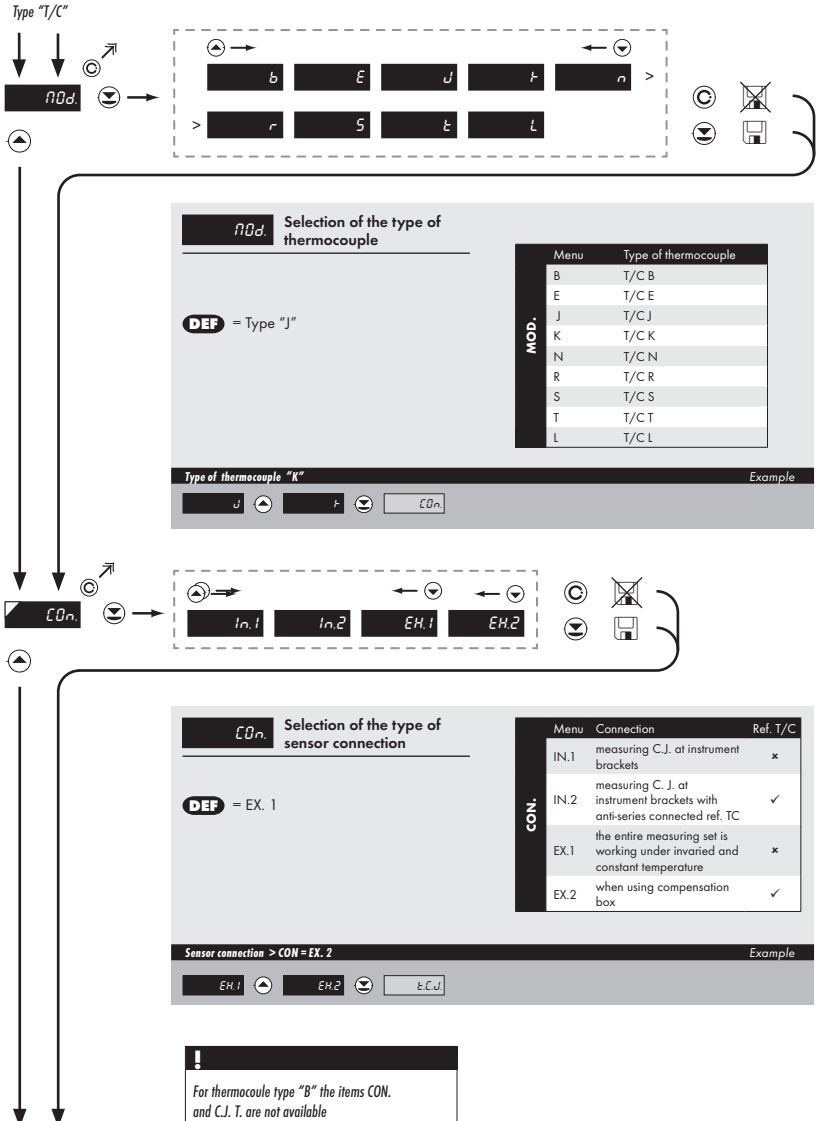
- positioning of the DP is set here in the measuring mode

DEF = 00.0

**Projection of DP on display > 000** *Example*

00.0 000 nnU

**subsequent item on the menu depends on instrument equipment*




**nOd.** **Selection of the type of thermocouple**

DEF = Type "J"

| MOD. | 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 |

***Type of thermocouple "K"*** *Example*

J → K → COn.

**COn.** **Selection of the type of sensor connection**

DEF = EX. 1

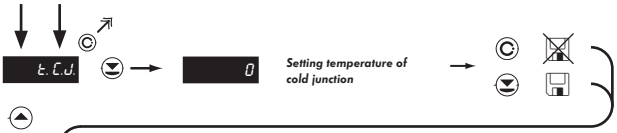
| CON. | Menu | Connection | Ref. T/C |
|---|---|---|---|
| | IN.1 | measuring C.J. at instrument brackets | × |
| | IN.2 | measuring C. J. at instrument brackets with anti-series connected ref. TC | ✓ |
| | EX.1 | the entire measuring set is working under invaried and constant temperature | × |
| |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

***Sensor connection > CON = EX. 2*** *Example*

EH.1 → EH.2 → t.C.J

**!**

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




**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*



**FOr** **Setting projection of the decimal point**

DEF = 000

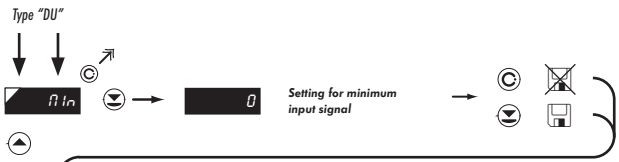
- positioning of the DP is set here in the measuring mode

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


**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*

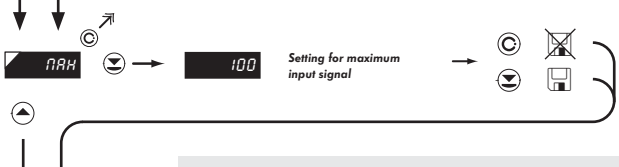



**Min Setting display projection for minimum value of input signal**

- 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*

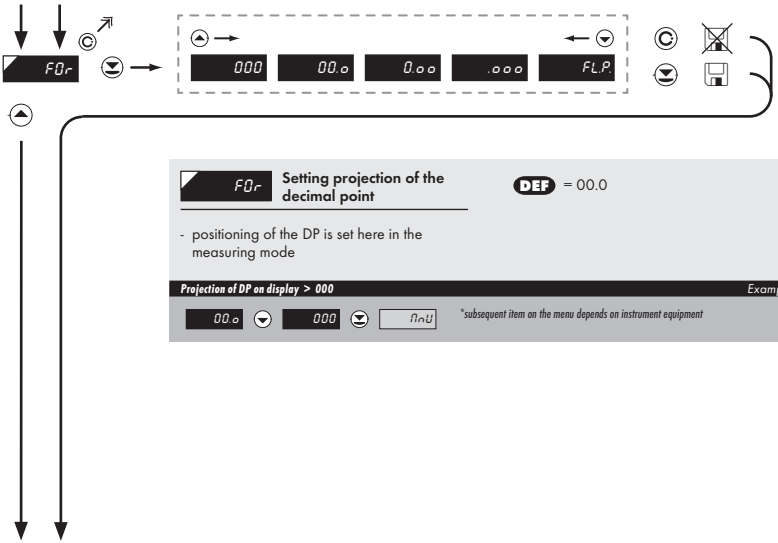




**MAX Setting display projection for maximum value of input signal**

- 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 end > MAX = 50** *Example*




### FOr Setting projection of the decimal point

DEF = 00.0

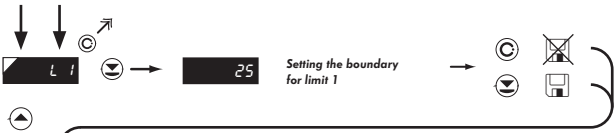
- positioning of the DP is set here in the measuring mode

**Projection of DP on display > 000** *Example*




**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***

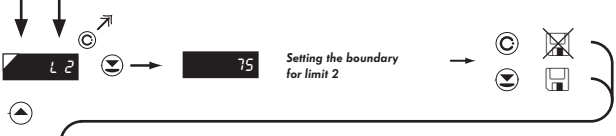



**L 1** **Setting the boundary for limit 1**

- 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*


**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

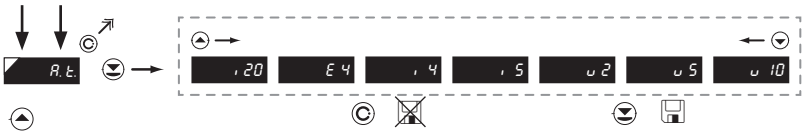
DEF = 75

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


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

**!**

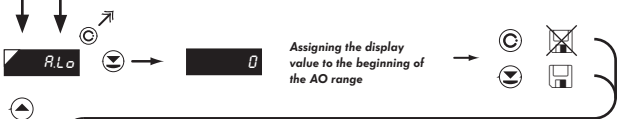
*Items for "Limits" and "Analog output" are accessible only if the instrument contains them.*




**A.t.** **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 | |

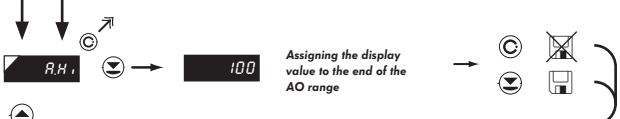
*Type of analog output - 0...10 V > A. t. = U 10* *Example*


**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

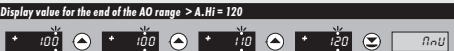
*Display value for the beginning of the AO range > A.Lo = 0* *Example*


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

- range of the setting is ±1999

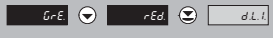
*Display value for the end of the AO range > A.Hi = 120* *Example*




**Co.0.** **Selection of display color > basic setting**

DEF = green

*Selection of display color - basic > red* *Example*





*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*

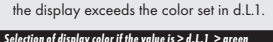


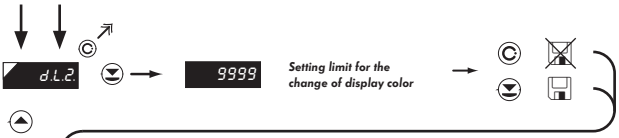
**Co.1.** **Selection of display color > after exceeding d.L. 1.**

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*



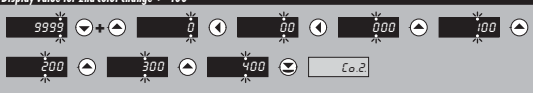



**d.L.2.** Setting second value for the change of display color

DEF = 9999

- range of the setting -999...9999

*Display value for 2nd color change > 400* *Example*



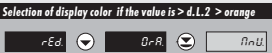


**Co.2.** **Selection of display color > after exceeding d.L. 2.**

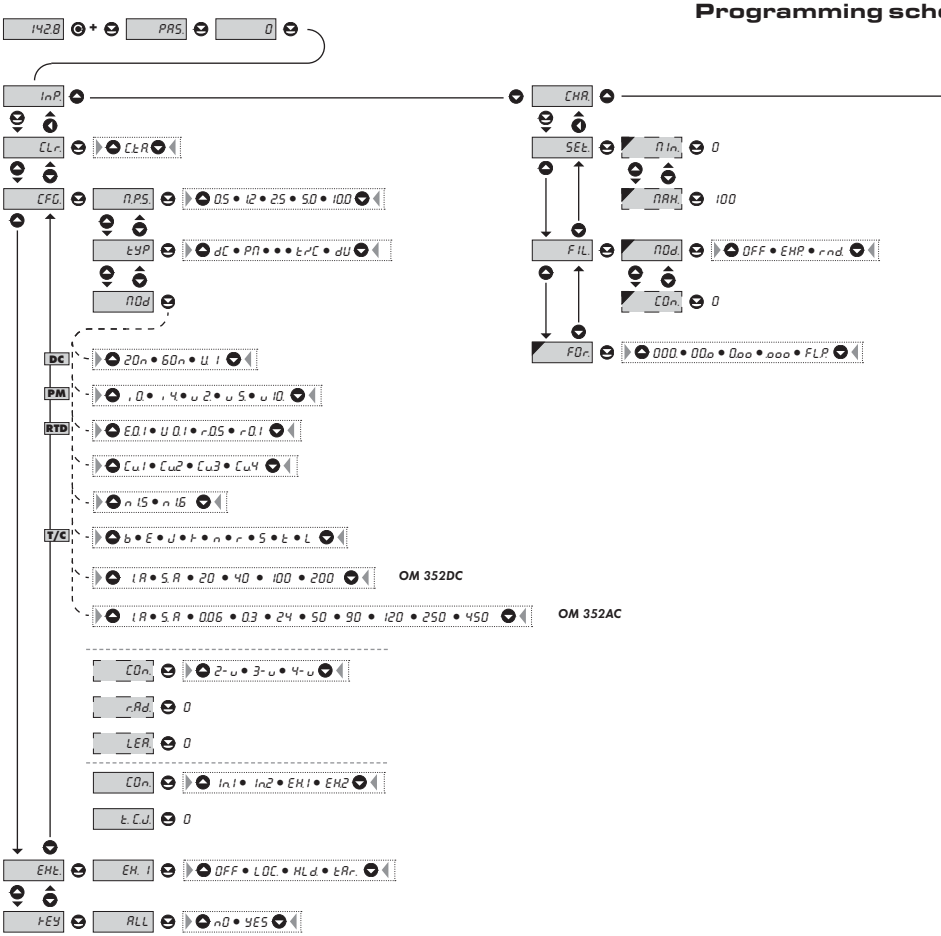
DEF = red

- 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.

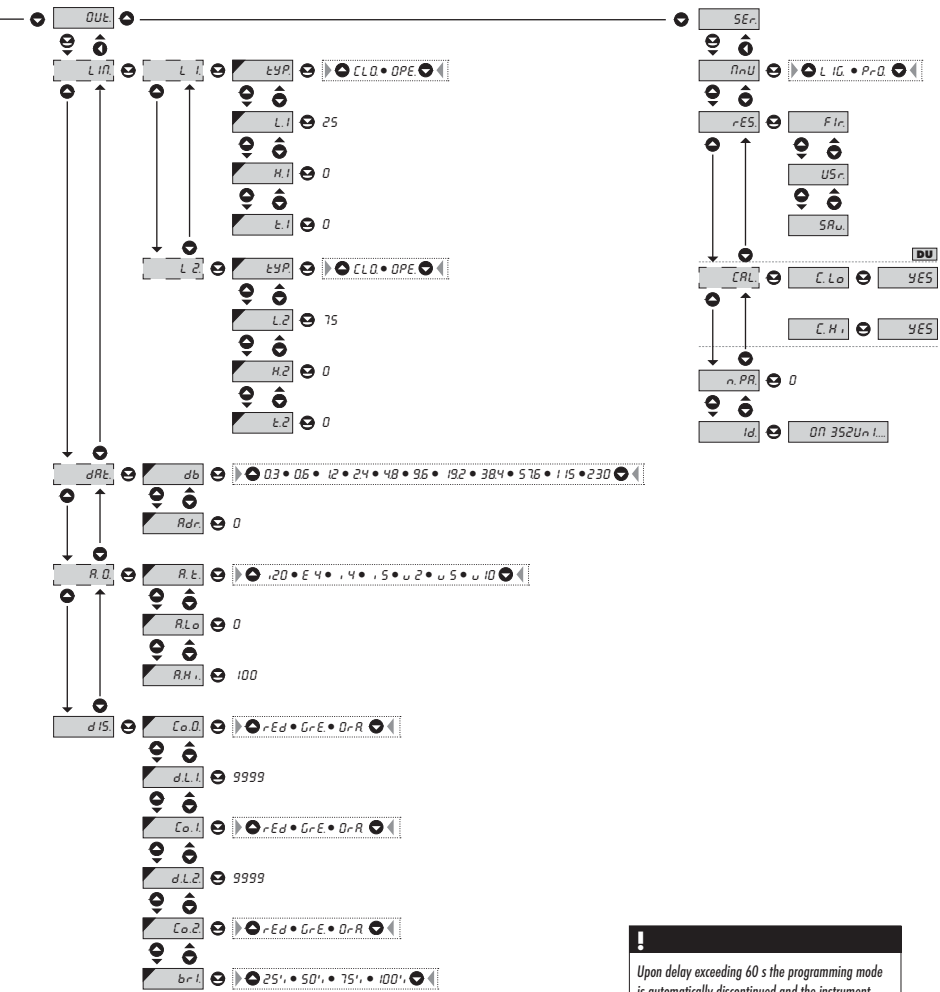
*Selection of display color if the value is > d.L.2 > orange* *Example*



## Programming sch

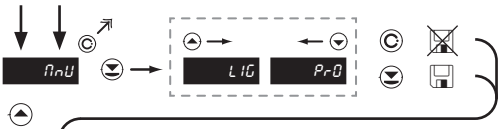


## eme PROFI MENU




**!**

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



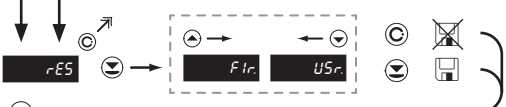

**MnU** **Setting the menu type LIGHT/PROFI**

**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*

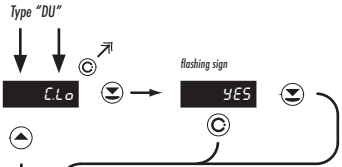




**rES** **Restoration of the instrument manufacture setting**

- in the event of error setting the manufacture setting may be restored
- restoration is performed for the currently selected type of the instrument input (select "FIR")
- provided you stored your user setting in the "PROFI" menu, it may also be restored (select "USR")
- loading manufacture calibration and primary setting of items on the menu (DEF)

***Restoration of manufacture setting > FIR.*** *Example*


** following item depends on the instrument type, for "DU" > "C.Lo"*



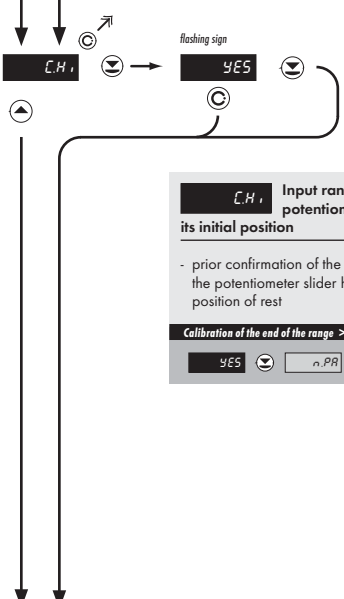

**C.Lo** **Input range calibration - potentiometer slider is in its initial position**

*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.H1




**C.H1** **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


### 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*



### 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


*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

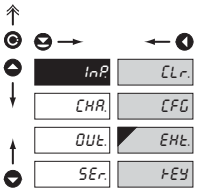
C + ▼

- 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)

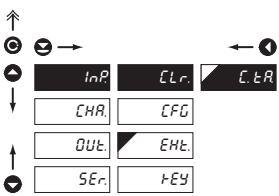
## 6.1 Setting "PROFI" - INPUT




The basic instrument parameters are set in this menu

- 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



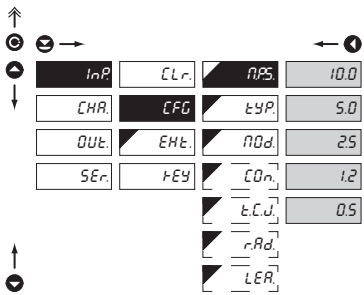

C.tA. **Tare reseting**

**!**

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

## 6.1.2 Setting the input parameters

### 6.1.2a Selection of measuring rate

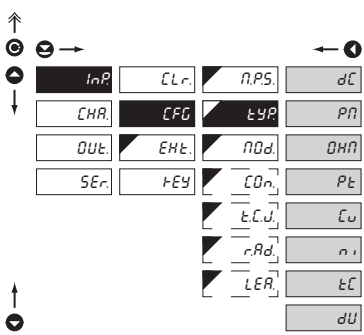



**n.P.S. Selection of measuring rate**

| | |
|---|---|
| 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 |

** not for type OM 352AC*

### 6.1.2b Selection of „instrument" type

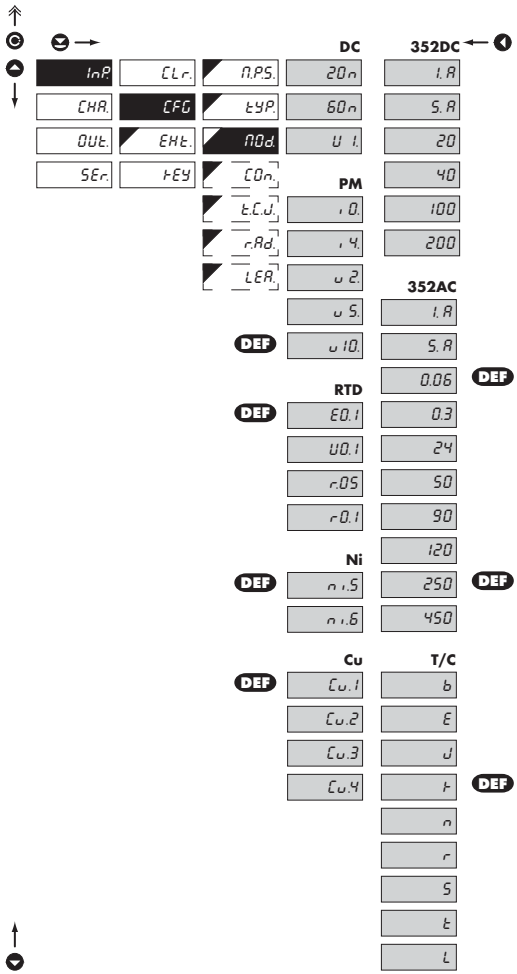



**tYP. Selection of "instrument" type**

- 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 |
| n i | Thermometer for Ni |
| tC | Thermometer for thermocouples |
| dU | Display for linear potentiometers |

## 6.1.2c Selection of measuring range




### n0d. Selection of instrument measuring range

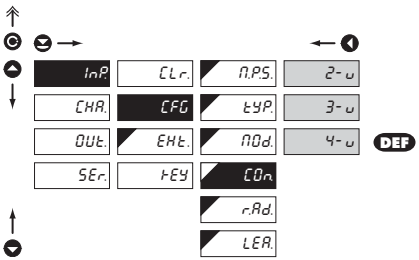
- setting the input range depends on the measured range ordered

| | 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 | E0.1 | Pt 100 (3 850 ppm/°C) | |
| | U0.1 | Pt 100 (3 920 ppm/°C) | |
| | R.05 | Pt 50 (3 910 ppm/°C) | |
| | R0.1 | Pt 100 (3 910 ppm/°C) | |
| B | E0.5 | Pt 500 (3 850 ppm/°C) | |
| C | E1.0 | 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



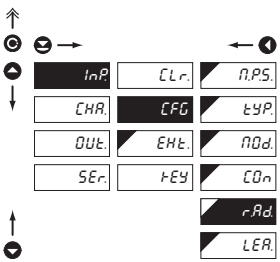

**COn** **Selection of type of sensor connection**

- 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

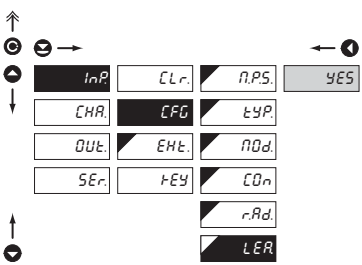



**r.Rd.** **Offset of the beginning of the measuring range**

- 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

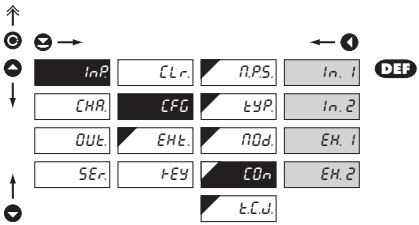



**LEA.** **Compensation of 2-wire conduct**

- 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




**CJn** **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

**!**

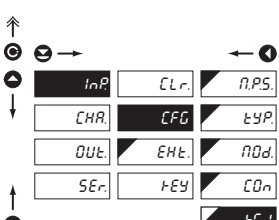
*For thermocoule type "B" the items CON. and C.J. T. are not available*

**!**

*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



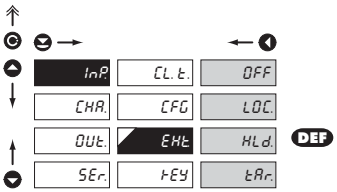

**t.C.J.** **Setting temperature of cold junction**

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

**!**

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

## 6.1.3 External input function selection



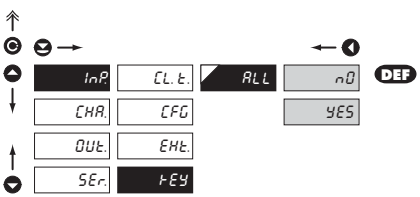

**EHt. External input function selection**

- 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




**FEY Assigning further functions to instrument keys**

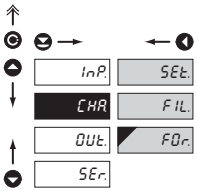
- ALL — Setting all keys

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

- 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

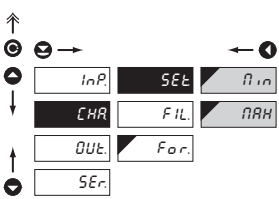
SEt. Setting display projection

FIL. Setting the digital filters

FOr. Setting the decimal point

### 6.2.1 Projection on the display

DC AC PM DU OHM

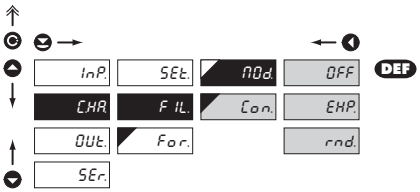



**SEt. Setting display projection**

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

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




**nOd. Setting the digital filters**

- 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

**EXP.** Selection of exponential filter

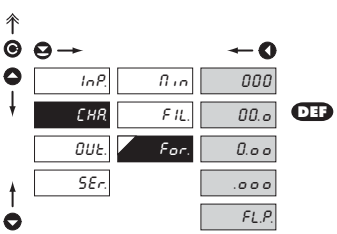
- the value is calculated from a number of measurements selected in „CON"
- range 2...100

**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.

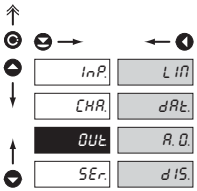
**00.0** Setting the DP - XXX.x

**0.00** Setting the DP - XX.xx

**.000** 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

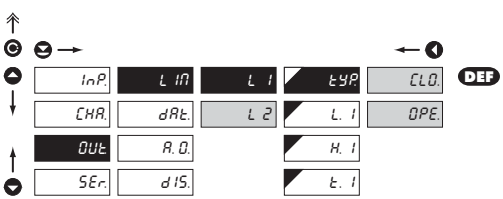
- LIN — Setting the type and the switching of limits
- dAt — Setting the type and the parameters ot data output
- A.O. — Setting the type and parameters of analog output
- dIS. — Setting the display brightness

**!**

*Analog and data outputs may not be fitted simultaneously*

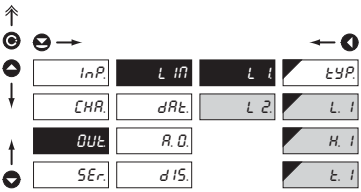
### 6.3.1 Setting the limits

#### 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




**!**

*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. 1** Setting hysteresis

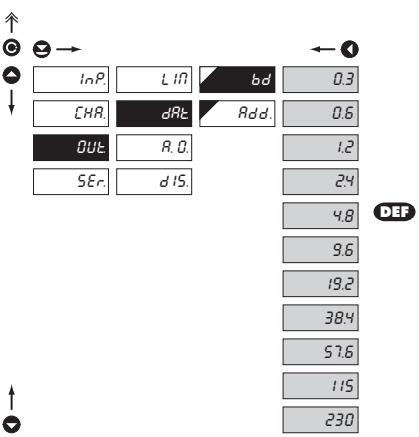
- within the full display range (±1999)
- DEF = 0

**t. 1** Setting the offset of the relay switch-on

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

## 6.3.2 Setting the data output

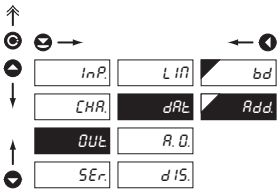
### 6.3.2a Data output - Rate




**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

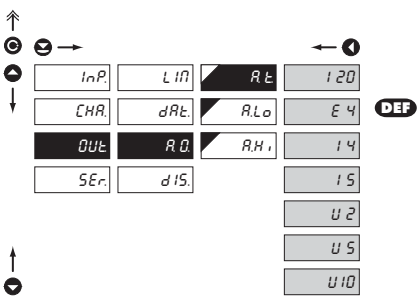



**Add.** **Setting the instrument address**

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

## 6.3.3 Setting the analog output

### 6.3.3a Analog output - Type

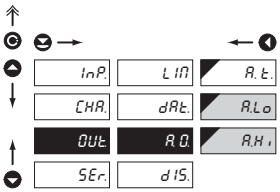



DEF

**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




**A.0. Setting the analog output range**

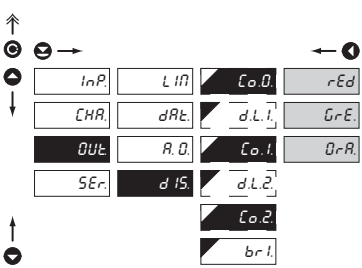
- analog output is isolated and its value corresponds with the displayed data. It is fully programmable, i.e. it allows to assign the AO limit points to any two arbitrary points of the entire measuring range

**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.H1** 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."

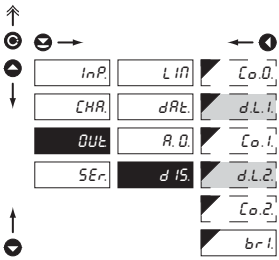
**rEd** Red color

**GrE.** Green color

**OrA.** Orange color

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

### 6.3.4b Selection of change of display color

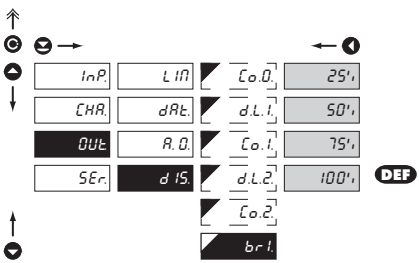



**d.L.- Selection of change of display color**

- 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 %

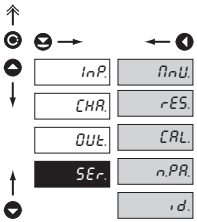
25' Display brightness - 25 %

50' Display brightness - 50 %

75' Display brightness - 75 %

100' Display brightness - 100 %

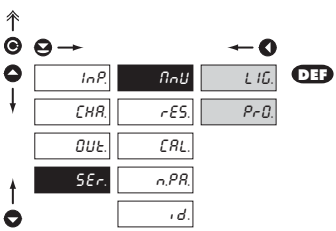
## 6.4 Setting "PROFI" - SERVICE




The instrument's service functions are set in this menu

- 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
- id. — Instrument identification

### 6.4.1 Selection of the type of programming menu




**AnU. Selection of menu type LiGHT/PROFI**

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

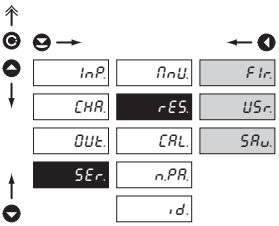
LIG. Active LIGHT menu

- 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




**rSE. Restoration of manufacture setting**

- in the event of error setting or calibration, manufacture setting may be restored.

**FIr.** Restoration of instrument manufacture setting

- generating the manufacture setting for currently selected type of instrument (items marked DEF)

**USr.** Restoration of instrument user setting

- generating the instrument user setting, i.e. setting stored under SER./RES./SAV.

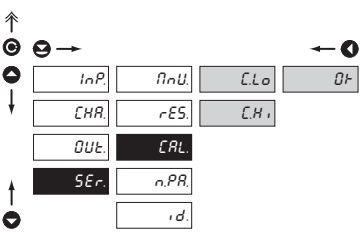
**SAv.** Save instrument user setting

- storing the user setting allows the operator to restore it in future if needed

**!**

*After restoration the instrument switches off for couple seconds*

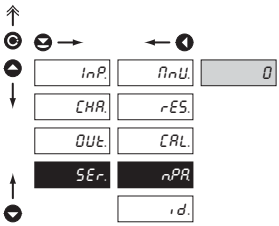
## 6.4.3 Calibration of the input range DU




**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""

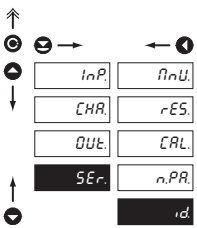
## 6.4.4 Setting new access password




**n.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 
- 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


item will not be displayed in USER menu

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

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


*Example:*

Into USER menu were selected these items

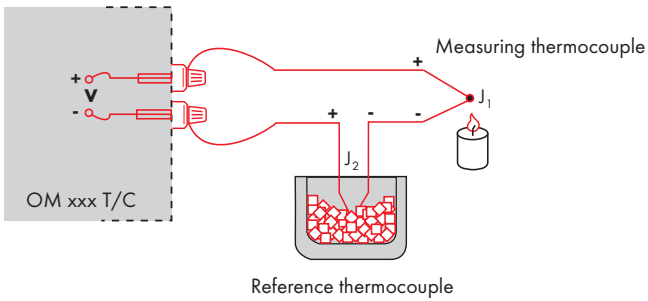
(keys + ) > C. TA., *LIM 1*, *LIM 2* for which we have preset this sequence (keys + ):

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.TA . > LIM 1

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




**WITH REFERENCE THERMOCOUPLE**

- a reference thermocouple may be located in the same place as the measuring instrument or in place with stable temperature/compensation box
- when measuring with reference thermocouple set CJC in the instrument menu to In.2 or EH.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 EH.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 EH.1
- when measuring temperature without reference thermocouple the error in the measured data may be even 10 °C (applies for setting CJC to EH.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 corfirmation (Instrument) - OK | ! | A | A | <CR> | | | | | | | |
| Command corfirmation (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 limit1 | # | 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 corfirmation (ok) |
| ? | 63 | $3F_H$ | Negative command corfirmation (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. Hw | 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 > 100/500/1 000 Ohm, with 3 850 ppm/°C<br>US > 100 Ohm, with 3 920 ppm/°C<br>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 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<br>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.: | 50 ppm/°C | |
| Accuracy: | ±0,2% of the range + 1 digit** | |
| | ±0,3 % of the range + 1 digit | ***T/C, AC*** |
| | ±0,6 % of the range + 1 digit | ***T/C - B*** |
| 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<br>Hold - stop measuring (upon contact)<br>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<br>7 bit + even parity + 1 stop bit (Messbus) |
| Rate: | 300...230 400 Baud<br>9 600...12 MBaud (PROFIBUS) |
| 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: | 50 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<br>- 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, 13,5 VA, isolated,<br>- fuse inside (T 4000 mA)<br>80...250 V AC/DC, 13,5 VA, isolated<br>- fuse inside (T 630 mA) |

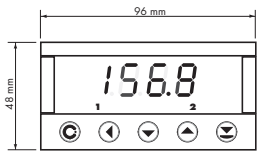
### MECHANIC PROPERTIES

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

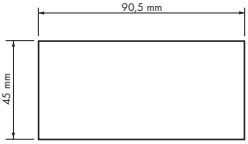
### OPERATING CONDITIONS

| | |
|---|---|
| Connection: | connector terminal board,<br>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 |
| Dielectric strength: | 4 kVAC after 1 min between supply and input<br>4 kVAC after 1 min between supply and data/analog output<br>4 kVAC after 1 min between supply and relay output<br>2,5 kVAC after 1 min between supply and data/analog output |
| Insulation resistance: | for pollution degree II, measurement category III<br>Instrument power supply > 670 V (PI), 300 V (DI)<br>Input/output > 300 V (PI), 150 (DI) |
| EMC: | EN 61326-1 |

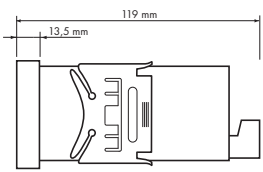
**Front view**




**Panel cut**



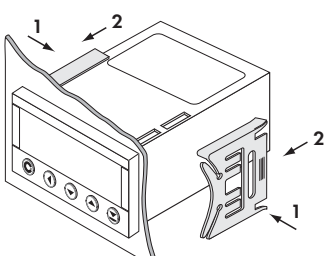

**Side view**

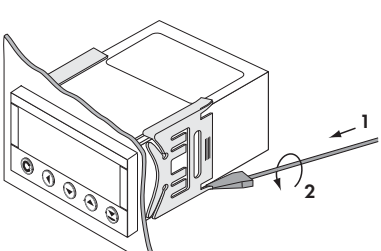



Panel thickness: 0,5...20 mm

**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 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

## YEARS

# 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 explicit 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 types referred-to hereunder, which are being brought out to the market, with technical documentation and requirements of the appurtenant Czech statutory orders.

**Product:** 3 ½ digit programmable panel instrument

**Type:** **OM 352**

**Version:** DC, AC, UNI

It has been designed and manufactured in line with requirements of:
Statutory order no. 17/2003 Coll., on low-voltage electrical equipment (directive no. 73/23/EHS)
Statutory order no. 18/2003 Coll., on electromagnetic compatibility (directive no. 89/336/EHS)

The product qualities are in conformity with harmonized standard:

| | | |
|---|---|---|
| El. safety: | EN 61010-1 | |
| EMC: | EN 50131-1, chapter 14 and chapter 15 | |
| | EN 50130-4, chapter 7 | |
| | EN 50130-4, chapter 8 | EN 61000-4-11, ed. 2 |
| | EN 50130-4, chapter 9 | EN 61000-4-2 |
| | EN 50130-4, chapter 10 | EN 61000-4-3, ed. 2 |
| | EN 50130-4, chapter 11 | EN 61000-4-6 |
| | EN 50130-4, chapter 12 | EN 61000-4-4, ed. 2 |
| | EN 50130-4, chapter 13 | EN 61000-4-5 |
| | EN 61000-4-8 | |
| | EN 61000-4-9 | |
| | EN 61000-6-1 | |
| | EN 61000-6-2 | |
| | EN 55022, chapter 5 and chapter 6 | |

The product is furnished with CE label issued in 2007.

As documentation serve the protocoles of authorized and accredited organizations:
MO ČR, Agency for development of informatics, testing lab no.1558, accredited ČIA, in compliance with EN ISO/EIC 17025

Place and date of issue: Prague, 15. Januar 2007

Miroslav Hackl v.r.
Company representative

*Assessment of conformity pursuant to §22 of Act no. 22/1997 Coll. and changes as amended by Act no.71/2000 Coll. and 205/2002 Coll*