OM 402UNI

4 DIGIT PROGRAMMABLE
UNIVERSAL INSTRUMENT

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

SAFETY INSTRUCTIONS

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

TECHNICAL DATA

Measuring instruments of the OM 402 series conform to the European regulation 89/336/EWG.

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

Seismic capacity:
IEC 980: 1993, čl. 6

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

CONNECTION

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

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2 | INSTRUMENT DESCRIPTION

2.1 Description

The OM 402 model series are 4 digit panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price. Two models are available: UNI and PWR.

Type OM 402UNI is a multifunction instrument with the option of configuration for 8 various input options, easily configurable in the instrument menu. By further options of input modules it is feasible to measure larger ranges of DC voltage and current or increase the number of inputs up to 4 (applies for PM).

The instrument is based on an 8-bit microcontroller with a multichannel 24-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

The OM 402 is a multifunction instrument available in following types and ranges

type UNI
DC: 0...60/150/300/1200 mV
PM: 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/±40 V
OHM: 0...100 Ω/0...1 kΩ/0...10 kΩ/0...100 kΩ
RTD-Pt: Pt 50/100/Pt 500/Pt 1 000
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 UNI, option A
DC: 0...1 A/0...5 A/120 V/±250 V/±500 V

type UNI, option B (expansion by 3 more inputs)
PM: **3x** 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/±40 V

PROGRAMMABLE PROJECTION

Selection: of type of input and measuring range
Measuring range: adjustable as fixed or with automatic change
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...850,0
Projection: -9999...9999 (-99999...999999)

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)

LINEARIZATION

Linearization:*   by linear interpolation in 50 points (solely via OM Link)

DIGITAL FILTERS

Floating average: from 2...30 measurements
Exponen.average: from 2...100 measurements
Rounding: setting the projection step for display

MATHEMATIC FUCTIONS

Min/max. value: registration of min./max. value reached during measurement
Tare: designed to reset display upon non-zero input signal
Peak value: the display shows only max. or min. value
Mat. operations: polynome, 1/x, logarithm, exponential, power, root, sin x

only for types DC, PM, DU

EXTERNAL CONTROL

Lock:	control keys blocking
Hold:	display/instrument blocking
Tare:	tare activation/resetting tare to zero
Resetting MM:	resetting min/max value
Memory:	data storage into instrument memory

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 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).

OMLINK 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).

The program OM LINK in „Basic" version will enable you to connect one instrument with the option of visualization and archiving in PC. The OM Link „Standard" version has no limitation of the number of instruments connected.

2.3 Options

Excitation is suitable for supplying power to sensors and transmitters. It has a galvanic separation.

Comparators are assigned to monitor one, two, three or four limit values with relay output. The user may select limits regime: LIMIT/DOSING/FROM-TO. The limits have adjustable hysteresis within the full range of the display as well as selectable delay of the switch-on in the range of 0...99,9 s. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

Data outputs are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII or DIN MessBus protocol.

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

Measured data record is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed by Real Time with data storage in a selected time segment and cycle. Up to 250 000 values may be stored in the instrument memory. Data transmis sion into PC via serial interface RS232/485 and OM Link.

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

Type	Input I	Input U
DC		0...60/150/300/1 200 mV
PM	0...5/20 mA/4...20 mA	±2/±5/±10/±40 V
OHM	0...0,1/1/10/100 kΩ/Autorange	
RTD-Pt	Pt 100/Pt 500/ Pt 1 000	
RTD-Cu	Cu 50/100	
RTD-Ni	Ni 1 000/10 000	
T/C	J/K/T/E/B/S/R/N/L	
DU	Linear potentiometer (min. 500 Ω)	

OPTION "A"

Type	Input I	Input U
DC	±0,1 A/±0,25 A/±0,5 A to GND (C) ±2 A/±5 A to GND (B)	±100 V/±250 V/±500 V to GND (C)

OPTION "B"

Type	Input 2, 3, 4/I	Input 2, 3, 4/U
PM	0...5/20 mA/4...20 mA	±2/±5/±10/±40 V

C3 E3 C4 E4

Open collectors

SSR

L3 L4

Relays

RxD/L+
TxD/L-
GND

GND
AO-I
AO-U

8 9 10 11 12 13

1 2 3 4 5 6 7

14 15 16 17 18 19 20 21 22 23

A B C D E

> **!**
> Excitation has the minus pole common with the input - the bracket no. 20 - GND and you may set its value by trimmer above the bracket no. 17

Option A

⊞ **INPUT - U**

☐

⊟ **GND - U/I0,5**

⊟ **GND - I5**

⊞ **INPUT - I**

CJC

POWER SUPPLY

L N E I I

L1 L2

DC, PM

EXT.3 EXT.2 EXT.1 Excitation GND INPUT - I INPUT - U

E1 C1 E2 C2

Open collectors

RTD, OHM, Ni

IE+ IS+ IS-
IE+ IS+ ES-
ES+   ES-

T/C

DU

⚠ **Maximum of 250 mA may be connected to "INPUT - I" (bracket no. 21) , i.e. 10-times range overload.**
Mind the correct connection/mistaking of current - voltage input.
Destruction of measuring resistance in current input (15R) may occur.

Setting | PROFI

profi

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

Setting | LIGHT

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

profi   light

user

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

4.1 Setting

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

LIGHT   **Simple programming menu**
            - contains solely items necessary for instrument setting and is protected by optional number code

PROFI   **Complete programming menu**
            - contains complete instrument menu and is protected by optional number code

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            - 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).

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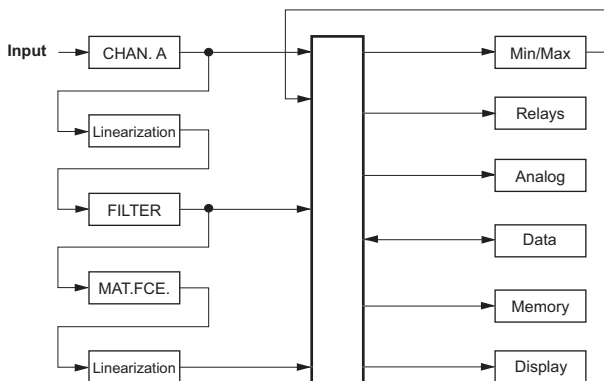
Setting and controlling the instrument is performed by means of 5 control keys located on the front panel. With the aid of these keys it is possble to browse through the operation menu and to select and set required values.

Indication of measured input (green LED)

imput number
(only for option "A")

Measured value (red/green LED)

the last two places may display
measuring units

Ralay status (red LED)

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

Function (green LED)

M   Min/max. value
T   Tare
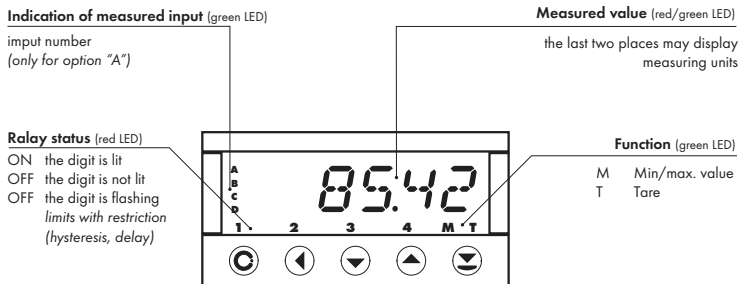
Symbols used in the instructions

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)
MIN	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)

Control keys functions

Key	Measurement	Menu	Setting numbers/selection
C	access into USER menu	exit menu	quit editing
◀	programmable key function	back to previous level	move to higher decade
▼	programmable key function	move to previous item	move down
▲	programmable key function	move to next item	move up
✉	programmable key function	confirm selection	confirm setting/selection
▲ + ▼			numeric value is set to zero
C + ✉	access into LIGHT/PROFI menu		
C + ▼	direct access into PROFI menu		
✉ + ▲		configuration of an item for "USER" menu	
✉ + ▼		determine the sequence of items in "USER - LIGHT" 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

NO   item will not be displayed in USER menu

YES   item will be displayed in USER menu with the option of setting

SHOW   item will be solely displayed in USER menu

Access password

`142.8` `C`+`⌄` `PASSW.` `⌄` `0` `⌄`

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

Type of instruments   Measuring range

`TYPE` `⌄` `PM` `MODE` `⌄` `4-20mA` `⌄`

Selecting projection and connection

RTD **OHM**
`CONNEC.` `⌄` `2-WIRE` `⌄` `FORM.A` `⌄` `00000.o` `⌄`

T/C
`CONNEC.` `⌄` `EXT. ITC` `C.J.TEM.` `⌄` `23` `⌄` `FORM.A` `⌄` `00000.o` `⌄`

DC **PM** **OHM** **DU**
`MIN A` `⌄` `0` `⌄` `MAX A` `⌄` `100` `⌄` `FORM.A` `⌄` `0000.oo` `⌄`

`LIM.L.1` `20` `⌄` `LIM.L.2` `40` `⌄` `LIM.L.3` `60` `⌄` `LIM.L.4` `80` `⌄`

Option - comparator

`TYP.A.O.` `⌄` `I 20` `⌄` `MIN A.O.` `⌄` `0` `⌄` `MAX A.O.` `⌄` `100` `⌄`

Option - Analog output

Menu type   Return to manufacture calibration   Return to manufacture setting

`MENU` `⌄` `LIGHT` `⌄` `RE.CAL.` `⌄` `YES` `⌄` `RE.SET.` `⌄` `TYPE` `⌄`

DU
`C.MIN` `⌄` `YES` `⌄` `C.MAX` `⌄` `YES` `⌄`

Calibration - only for "DU"

Typ Menu

Language selection   New password

`LANG.` `⌄` `ENGL.` `⌄` `PAS.LI.` `⌄` `0` `⌄`

Identification   Type of instruments   SW: version   Input

`IDENT.` `⌄` `YES` `⌄` `OM 402UNI` `⌄` `66-001` `PM` `▶` `142.8`   **Return to measuring mode**

```
142.8
```

C ⌄

`PRSSW.` ⌄ → `0` Entering access password for access into the menu → ⌄

`PRSSW.` **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*

`0` ⌃ `1` ⌃ `2` ◁ `02` ⌃ `12` ⌃ `22` ⌃

`32` ⌃ `42` ⌄ `T:PE`

C ↗

`T:PE` ⌄ → `DC` `PM` `OHM` `RTD-Pt` `RTD-Ni` `TC`

⌃ → `DU` `RTD-Cu` ← ⌄

C ✕

⌄ 💾

`T:PE` **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
	DC	DC voltmeter
	PM	Process monitor
	OHM	Ohmmeter
TYPE	RTD-Pt	Thermometer for sensors Pt
	RTD-Ni	Thermometer for sensors Ni
	TC	Thermometer for thermocouples
	DU	Display for lin. potentiometer
	RTD-Cu	Thermometer for sensors Cu

Type "PM"   *Example*

`DC` ⌃ `PM` ⌄ `MODE`

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

light

Type "DC"

MODE

60 mV   150 mV   300 mV   1200mV   DC
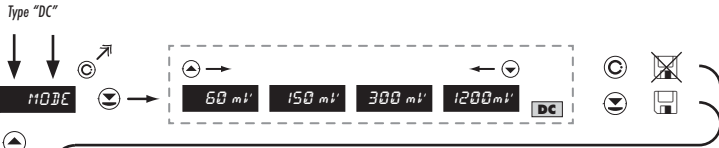
MODE Selection of the instrument measuring range

DEF = 60 mV

DEF = 500 V*

* only for option "A"

	Menu	Measuring range
MODE	60 mV	±60 mV
	150 mV	±150 mV
	300 mV	±300 mV
	1200mV	±1,2 V
MODE - A	100 V	±100 V
	250 V	±250 V
	500 V	±500 V
	0.10 A	±0,1 A
	0.25 A	±0,25 A
	0.50 A	±0,5 A
	1.00 A	±1 A
	5.00 A	±5 A

Range ±150 mV   **Example**

60 mV   150 mV   MIN A

MIN A   →   0   *Setting for minimum input signal*

MIN A Setting display projection for minimum value of **input signal**

- range of the setting is -99999...999999

- 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 A = 0   **Example**

0   MAX A

MAX A → 100 Setting for maximum input signal

MAX A Setting display projection for maximum value of input signal
- range of the setting is -99999...999999
- position of the DP does not affect display projection
- the DP is automatically shifted after the value is confirmed

DEF = 100

Projection for 150 mV > MAX A = 3500   Example

100 100 100 200 300 400
500 0500 1500 2500 3500 FORM.A

FORM.A

000000 00000.o 0000.oo 000.ooo 00.oooo 0.ooooo FLOA.P.
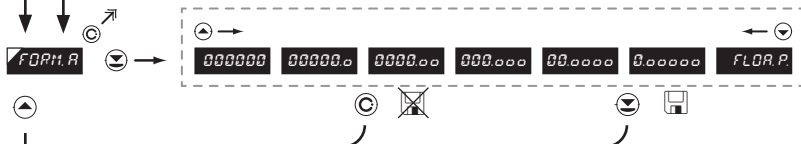
FORM.A Setting projection of the decimal point
- positioning of the DP is set here in the measuring mode

DEF = 0000.oo

Projection of DP on display > 00000.o   Example

0000.oo 00000.o MENU *subsequent item on the menu depends on instrument equipment

32

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

Type "PM"

MODE — Selection of the instrument measuring range

DEF = 4 - 20 mA

	Menu	Range
MODE	0-5mA	0...5 mA
	0-20mA	0...20 mA
	4-20mA	4...20 mA
	0-2 V	±2 V
	0-5 V	±5 V
	0-10 V	±10 V
	0-40 V	±40 V
	Er.4-20	4...20 mA, with error statement of „underfl ow" upon signal smaller than 3,36 mA

Range 0...20 mA   *Example*

MIN A — Setting for minimum input signal

MIN A — Setting display projection for minimum value of input signal

- range of the setting is -99999...999999

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

DEF = 0

Projection for 0 mA > MIN A = -25   *Example*

`MAX A` → `100` Setting for maximum input signal

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

- range of the setting is -99999...999999

- 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 A = 2500   Example

`100` `100` `100` `200` `300` `400`
`500` `0500` `1500` `2500` `FORM.A`

`FORM.A`

`000000` `00000.o` `0000.oo` `000.ooo` `00.oooo` `0.ooooo` `FLOA.P.`

`FORM.A` **Setting projection of the decimal point**

DEF = 0000.oo

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

Projection of DP on display > 00000.o   Example

`0000.oo` `00000.o` `MENU`   * subsequent item on the menu depends on instrument equipment

📖 **32**

light

OHM OHM OHM OHM OHM OHM OHM OHM OHM

Type "OHM"

MODE → 100 R   1 k   10 k   100 K   AUTO   **OHM**

MODE   Selection of instrument measuring range

DEF = 100 Ω

MODE	Menu	Measuring range
	100 R	0...100 Ω
	1 k	0...1 kΩ
	10 k	0...10 kΩ
	100 k	0...100 kΩ
	AUTO	Autorange

Range 0...10 kΩ   *Example*

100 R → 1 k → 10 k → CONECT.

CONECT. → 2-WIRE   3-WIRE   4-WIRE

CONECT.   Selection of the type of sensor connection

DEF = 2- WIRE

CONECT.	Menu	Connection
	2-WIRE	2-wire
	3-WIRE	3-wire
	4-WIRE	4-wire

Type of connection - 3 wire > CONECT. = 3-WIRE   *Example*

2-WIRE → 3-WIRH → MIN A

MIN A → 0   *Setting for minimum input signal*

MIN A   Setting display projection for minimum value of input signal

- range of the setting is -99999...999999

- 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 A = 0   *Example*

0 → MA⌐ A

MAX A Setting for maximum input signal

MAX A Setting display projection for maximum value of input signal

- range of the setting is -99999...999999

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

DEF = 100

Projection for 10 kOhm > MAX A = 10000   Example

100 100 100 000 0000 00000

10000 FORM.A

FORM.A

000000 00000.0 0000.00 000.000 00.0000 0.00000 FLOA.P.

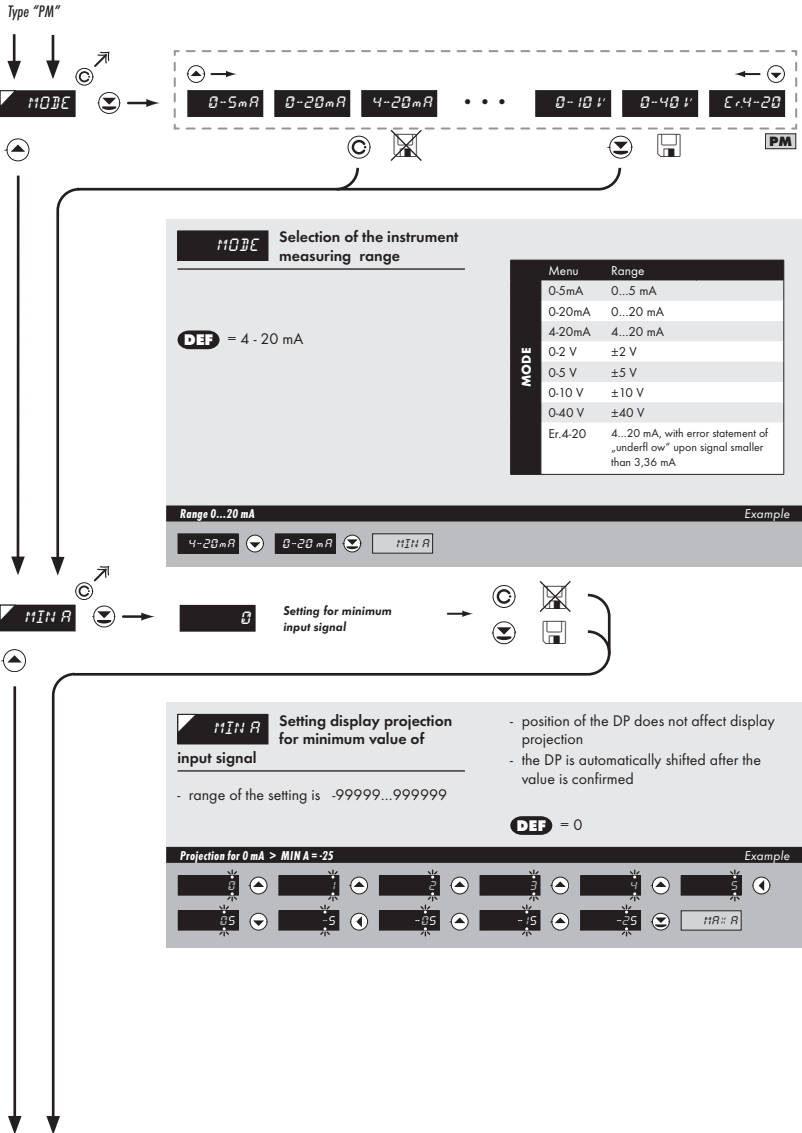**FORM.A** Setting projection of the decimal point   **DEF** = 0000.oo

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

Projection of DP on display > 00000.o   Example

0000.oo 00000.o MENU   * subsequent item on the menu depends on instrument equipment

📖 **32**

light

Type "RTD-Pt"

MODE → EU-100 EU-500 EU-1k0 US-100 US-100 US-100 **RTD**

MODE Selection of instrument measuring range

DEF = Pt 100

Menu	Measuring range
EU-100	Pt 100 (3 850 ppm/°C)
EU-500	Pt 500 (3 850 ppm/°C)
EU-1k0	Pt 1000 (3 850 ppm/°C)
US-100	Pt 100 (3 920 ppm/°C)
RU-50	Pt 50 (3 910 ppm/°C)
RU-100	Pt 100 (3 910 ppm/°C)

Range - Pt 1 000 > MODE = EU-1k0   Example

EU-100 ▲ EU-500 ▲ EU-1k0 ▼ CONECT.

CONECT. → 2-WIRE 3-WIRE 4-WIRE

CONECT. Selection of the type of sensor connection

DEF = 2- WIRE

Menu	Connectiion
2-WIRE	2-wire
3-WIRE	3-wire
4-WIRE	4-wire

Type of connection - 3 wire > CONNEC = 3-WIRE   Example

2-WIRE ▲ 3-WIRE ▼ FORM.A

RTD - Pt   RTD - Pt   RTD - Pt   RTD - Pt   RTD - Pt   RTD - Pt   RTD - Pt

| FORM.A | Setting projection of the decimal point | DEF = 00000.o |

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

Projection of DP on display > 000000   *Example*

  * subsequent item on the menu depends on instrument equipment

📖 32

light

Type "RTD-Ni"

MODE

| 5.0-1k | 6.2-1k | 5.0-10k | 6.2-10k |

RTD

MODE Selection of instrument measuring range

DEF = Ni 1 000 - 5 000 ppm/°C

	Menu	Measuring range
MODE	5.0-1k	Ni 1 000 (5 000 ppm/°C)
	6.2-1k	Ni 1 000 (6 180 ppm/°C)
	5.0-10k	Ni 10 000 (5 000 ppm/°C)
	6.2-10k	Ni 10 000 (6 180 ppm/°C)

Range - Ni 10 000, 5 000 ppm > MODE = 5.0-10k *Example*

5.0-1k → 6.2-1k → 5.0-10k → CONECT.

CONECT.

| 2-WIRE | 3-WIRE | 4-WIRE |

CONECT. Selection of the type of sensor connection

DEF = 2- WIRE

	Menu	Connection
CONECT.	2-WIRE	2-wire
	3-WIRE	3-wire
	4-WIRE	4-wire

Type of connection - 3 wire > CONNEC = 3-WIRE *Example*

2-WIRE → 3-WIRE → FORM.A

FORM. A Setting projection of the decimal point   **DEF** = 00000.o

- positioning of the DP is set here in the measuring mode
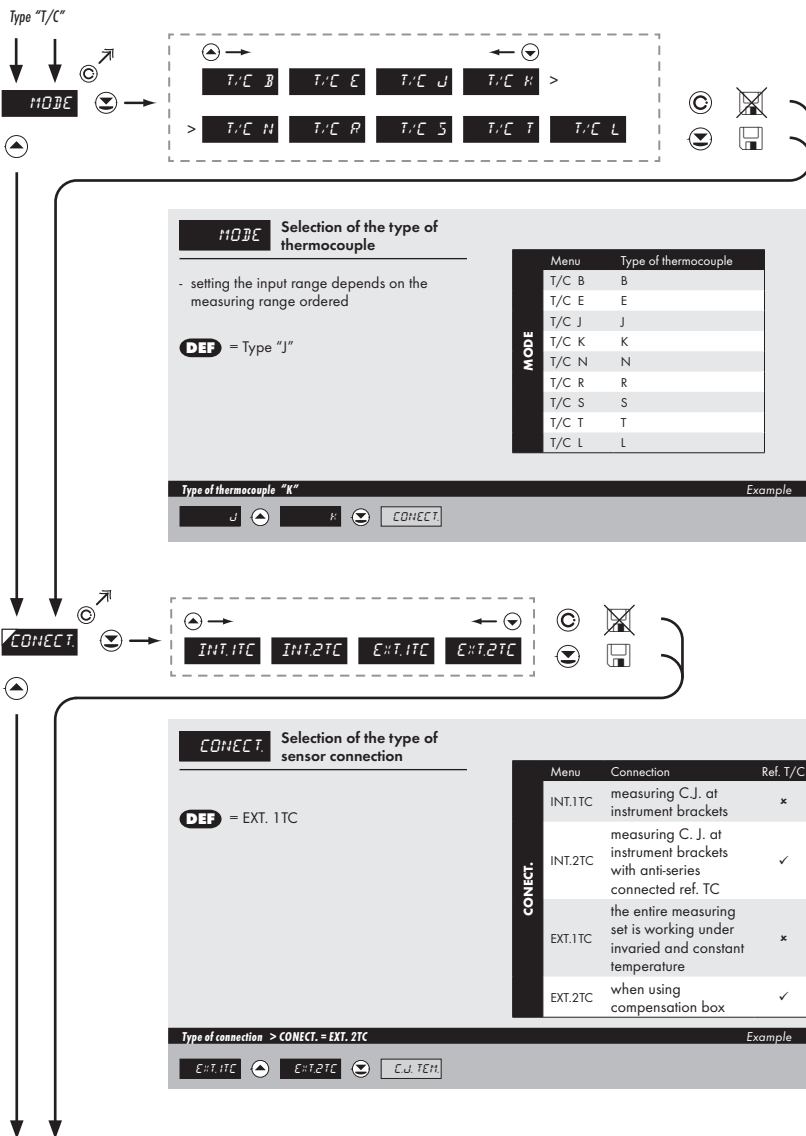
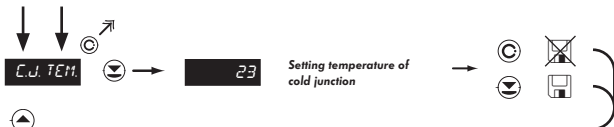*Projection of DP on display > 000000*   *Example*

subsequent item on the menu depends on instrument equipment

📖 **32**

RTD-Ni RTD-Ni RTD-Ni RTD-Ni RTD-Ni RTD-Ni RTD-Ni RTD-Ni RTD-Ni

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

Type "T/C"

MODE → T/C B T/C E T/C J T/C K >

> T/C N T/C R T/C S T/C T T/C L

MODE Selection of the type of thermocouple

- setting the input range depends on the measuring range ordered

DEF = Type "J"

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

MODE

Type of thermocouple "K" *Example*

J ▲ K ▼ CONECT.

CONECT. → INT.1TC INT.2TC EXT.1TC EXT.2TC

CONECT. Selection of the type of sensor connection

DEF = EXT. 1TC

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

Type of connection > CONECT. = EXT. 2TC *Example*

EXT.1TC ▲ EXT.2TC ▼ C.J. TEM.

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

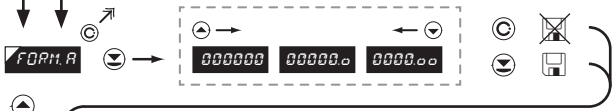`C.J. TEM.`   →   `23`   Setting temperature of cold junction   →

C.J. TEM.   **Setting temperature of cold junction**   **DEF** = 23

- range 0...99°C with compensation box

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

`23` `24` `25` `25` `35` → `FORM.A`

`FORM.A`   →   `000000` `00000.o` `0000.oo`

FORM.A   **Setting projection of the decimal point**   **DEF** = 00000.o

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

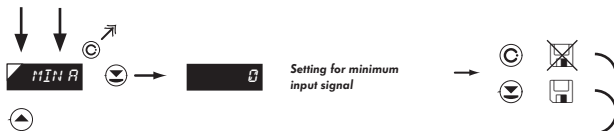**Projection of DP on display > 000000**   *Example*

`00000.o` → `000000` → `MENU`   * subsequent item on the menu depends on instrument equipment

> **!**
> For thermocoule type "B" the items CONECT. and C.J. TEM. are not available

> **!**
> Method and procedure of setting the cold junctions is described in separate chapter on page 78

📖 **32**

Type "DU"

`MIN A` → `0` **Setting for minimum input signal**

`MIN A` **Setting display projection for minimum value of input signal**
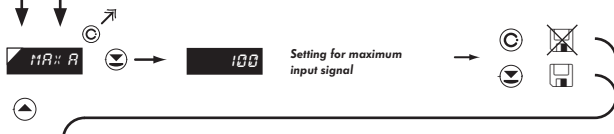
- range of the setting is -99999...999999

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

DEF = 0

Projection for the beginning > MIN A = 0   *Example*

`0` `MAX A`

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

`MAX A` **Setting display projection for maximum value of input signal**
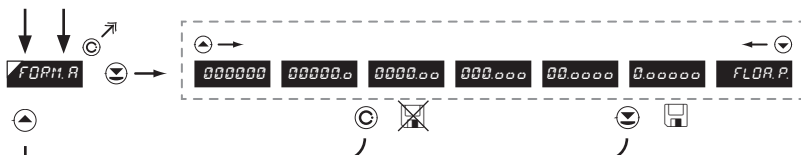
- range of the setting is -99999...999999

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

DEF = 100

Projection for the end > MAX A = 5000   *Example*

`100` `100` `100` `000` `0000` `1000`

`2000` `3000` `4000` `5000` `FORM.A`

FORM. A Setting projection of the decimal point **DEF** = 0000.oo

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

Projection of DP on display > 0000.oo *Example*

0000.oo ⊙ MENU * subsequent item on the menu depends on instrument equipment

📖 **32** *Calibration of the beginning and the end of range of linear potentiometer is on page 37*

light

Type "RTD-Cu"

`MODE` → `428-50` `428-0.1` `426-50` `426-0.1` **RTD**

`MODE` **Selection of instrument measuring range**

DEF = Cu 50/4 280 ppm

	Menu	Measuring range
MODE	5.0-1k	Ni 1 000 (5 000 ppm/°C)
	6.2-1k	Ni 1 000 (6 180 ppm/°C)
	5.0-10k	Ni 10 000 (5 000 ppm/°C)
	6.2-10k	Ni 10 000 (6 180 ppm/°C)

Range - Cu-50/4 260 ppm > MODE = 426-50   *Example*

`428-50` ▲ `428-0.1` ▲ `426-50` ▼ `CONECT.`

`CONECT.` → `2-WIRE` `3-WIRE` `4-WIRE`

`CONECT.` **Selection of the type of sensor connection**

DEF = 2- WIRE

	Menu	Connectiion
CONECT.	2-WIRE	2-wire
	3-WIRE	3-wire
	4-WIRE	4-wire

Type of connection - 3 wire > CONNEC = 3-WIRE   *Example*

`2-WIRE` ▲ `3-WIRE` ▼ `FORM.A`
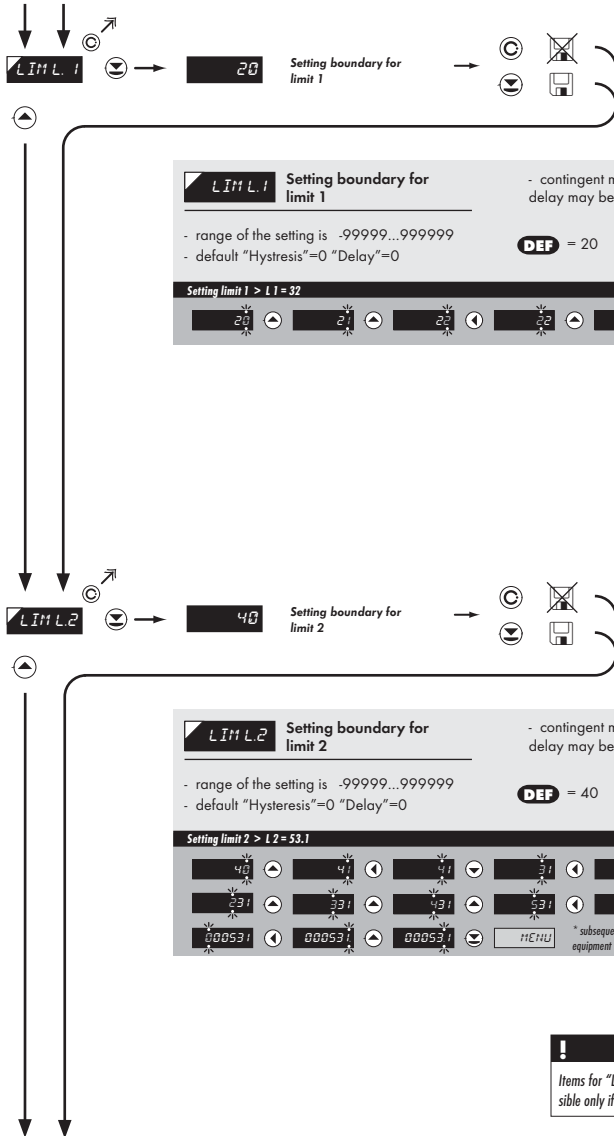
RTD-Cu RTD-Cu RTD-Cu RTD-Cu RTD-Cu RTD-Cu RTD-Cu RTD-Cu

FORM.A Setting projection of the decimal point

DEF = 00000.o

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

Projection of DP on display > 000000   Example

* subsequent item on the menu depends on instrument equipment

📖 32

light

Displayed only with options > **Comparators**

LIM L. 1 → 20   Setting boundary for limit 1

LIM L.1 **Setting boundary for limit 1**

- range of the setting is -99999...999999
- default "Hystresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 20

Setting limit 1 > L 1 = 32   Example

20 21 22 22 32   MENU

LIM L.2 → 40   Setting boundary for limit 2

LIM L.2 **Setting boundary for limit 2**

- range of the setting is -99999...999999
- default "Hysteresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 40

Setting limit 2 > L 2 = 53.1   Example

40 41 41 31 031 131
231 331 431 531 0531 00531
000531 000531 000531   MENU

* subsequent item on the menu depends on instrument equipment

---

!

Items for "Limits" and "Analog output" are accessible only if incorporated in the instrument.

`LIM L.3`   →   `60`   Setting boundary for limit 3

Setting boundary for limit 3

- range of the setting is   -99999...999999
- default "Hysteresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 60

Setting limit 3 > L 3 = 85   Example

`60` `61` `62` `63` `64` `65`
`65` `75` `85`   `MENU`   * subsequent item on the menu depends on instrument equipment

`LIM L.4`   →   `80`   Setting boundary for limit 4

Setting boundary for limit 4

- range of the setting is   -99999...999999
- default "Hysteresis"=0 "Delay"=0

- contingent modification of hysteresis or delay may be performed in "PROFI" menu

DEF = 80

Setting limit 4 > L 4 = 103   Example

`80` `81` `82` `83` `83` `93`
`03` `003` `103`   `MENU`   * subsequent item on the menu depends on instrument equipment

Displayed only with options > **Comparators**

Displayed only with options ∨ **Analog output**

TYP. A.O. Setting the type of analog output

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

DEF = 4...20 mA

Type of analog output - 0...10 V > TYP. A.O. = 0-10 V   *Example*

MIN A.O. Assigning the display value to the beginning of the AO range   **DEF** = 0

- range of the setting is -99999...999999

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

!

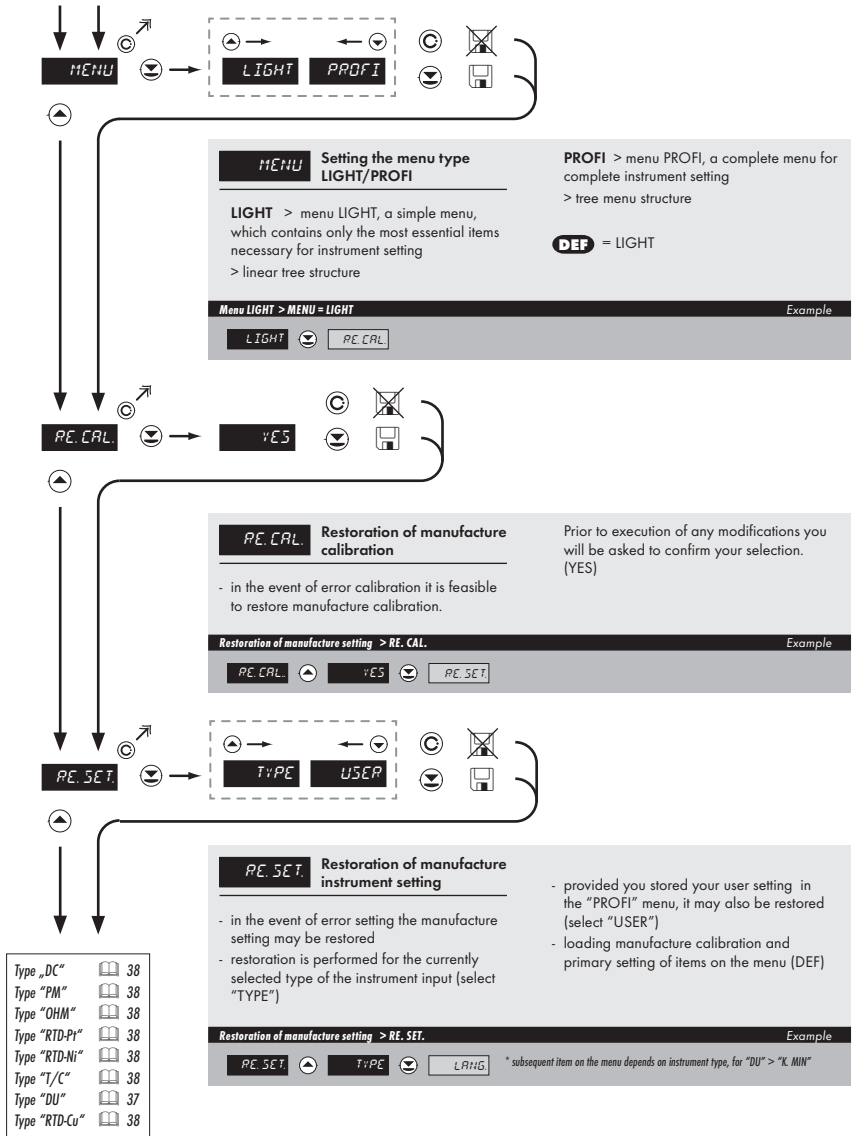*Items for "Limits" and "Analog output" are accessible only if incorporated in the instrument.*

MAX A.O.

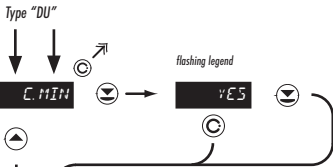*Assigning the display value to the end of the AO range*
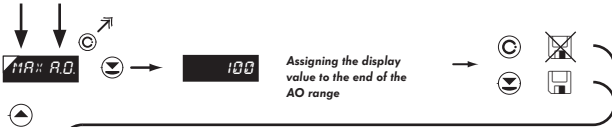
MAX A.O.   **Assigning the display value to the end of the AO range**

DEF = 100

- range of the setting is -99999...999999

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

Displayed only with options > **Analog output**

MENU → LIGHT PROFI

MENU — Setting the menu type LIGHT/PROFI

LIGHT > menu LIGHT, a simple menu, which contains only the most essential items necessary for instrument setting
> linear tree structure

PROFI > menu PROFI, a complete menu for complete instrument setting
> tree menu structure

DEF = LIGHT

Menu LIGHT > MENU = LIGHT — *Example*

LIGHT → RE. CAL.

RE. CAL. → YES

RE. CAL. — Restoration of manufacture calibration

- in the event of error calibration it is feasible to restore manufacture calibration.

Prior to execution of any modifications you will be asked to confirm your selection. (YES)

Restoration of manufacture setting > RE. CAL. — *Example*

RE. CAL. → YES → RE. SET.

RE. SET. → TYPE USER

RE. SET. — Restoration of manufacture instrument 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 "TYPE")

- provided you stored your user setting in the "PROFI" menu, it may also be restored (select "USER")
- loading manufacture calibration and primary setting of items on the menu (DEF)

Type „DC" 📖 38
Type "PM" 📖 38
Type "OHM" 📖 38
Type "RTD-Pt" 📖 38
Type "RTD-Ni" 📖 38
Type "T/C" 📖 38
Type "DU" 📖 37
Type "RTD-Cu" 📖 38

Restoration of manufacture setting > RE. SET. — *Example*

RE. SET. → TYPE → LANG * subsequent item on the menu depends on instrument type, for "DU" > "K. MIN"

light

SETTING 5

Type "DU"

flashing legend

C.MIN **Calibration of input range - the potentiometer traveller in initial position**   *Only for type "DU"*
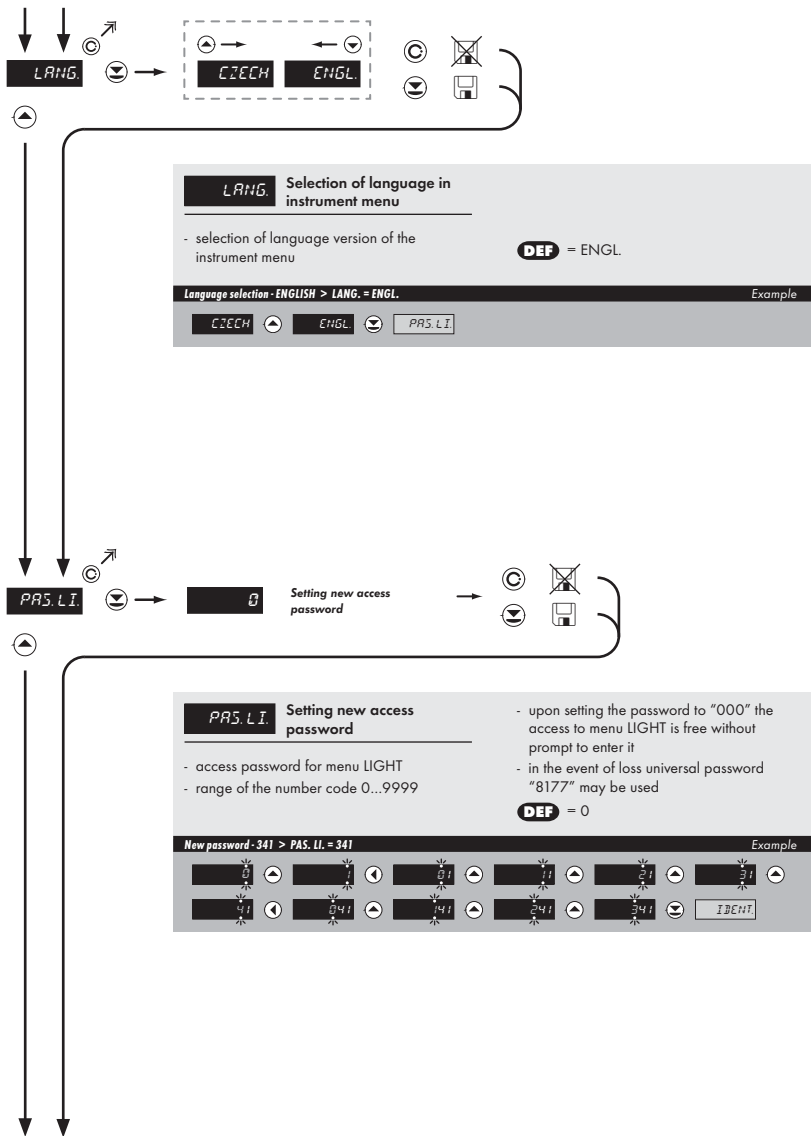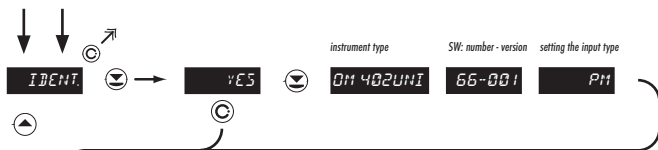
- prior confirming the flashing "YES" sign the potentiometer traveller has to be in given idle position

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

flashing legend
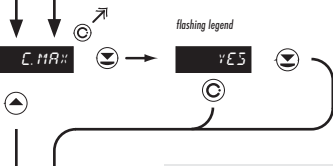
C.MAX **Calibration of input range - the potentiometer traveller in end position**   *Only for type "DU"*

- prior confirming the flashing "YES" sign the potentiometer traveller has to be in given idle position

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

INSTRUCTIONS FOR USE **OM 402UNI** | **37**

LANG.

Selection of language in instrument menu

- selection of language version of the instrument menu

DEF = ENGL.

Language selection - ENGLISH > LANG. = ENGL.   *Example*

CZECH → ENGL. → PAS.LI.

PAS.LI.

0   **Setting new access password**

Setting new access password

- access password for menu LIGHT
- range of the number code 0...9999

- upon setting the password to "000" the access to menu LIGHT is free without prompt to enter it
- in the event of loss universal password "8177" may be used

DEF = 0

New password - 341 > PAS. LI. = 341   *Example*

0 → 1 → 01 → 11 → 21 → 31 → 41 → 041 → 141 → 241 → 341 → IDENT.

	instrument type	SW: number - version	setting the input type
`IDENT.` → `YES`	`OM 402UNI`	`66-001`	`PM`

`142.8` **Return to measuring mode**

`IDENT.` **Instrument SW version**

- the display shows the type of instrument indication, SW number, SW version and current input setting (Mode)

- if SW version contains a letter in first position, then it is a customer SW
- after the identification is completed the menu is automatically exited and the instrument restores the 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

○ + ▼
- access to **PROFI** menu
- authorization for access to **PROFI** menu does not depend on setting under item SERVIC. > MENU
- password protected access (unless set as follows under the item SERVIC. > N. PASS. > PROFI =0)

○ + ☻
- access to menu selected under item SERVIC. > MENU > **LIGHT/PROFI**
- password protected access (unless set as follows under the item SERVIC. > N. PASS. > LIGHT =0)
- for access to **LIGHT** menu passwords for **LIGHT** and **PROFI** menu may be used

6.1   Setting "PROFI" - INPUT
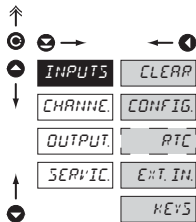
The primary instrument parameters are set in this menu

CLEAR	Resetting internal values
CONFIG.	Selection of measuring range and parameters
RTC	Setting date and time for option with RTC
EXT. IN.	Setting external inputs functions
KEYS	Assigning further functions to keys on the instrument

6.1.1   Resetting internal values
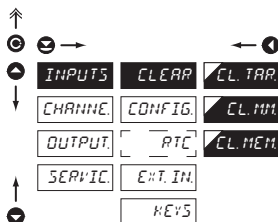
CLEAR	**Resetting internal values**

CL. TAR.	Tare resetting
CL. M.M.	Resetting min/max value

- resetting memory for the storage of minimum and maximum value achieved during measurement

CL. MEM.	Resetting the instrument memory

- resetting memory with data measured in the "FAST" or "RTC" modes
- not in standard equipment

6.1.2a Selection of measuring rate

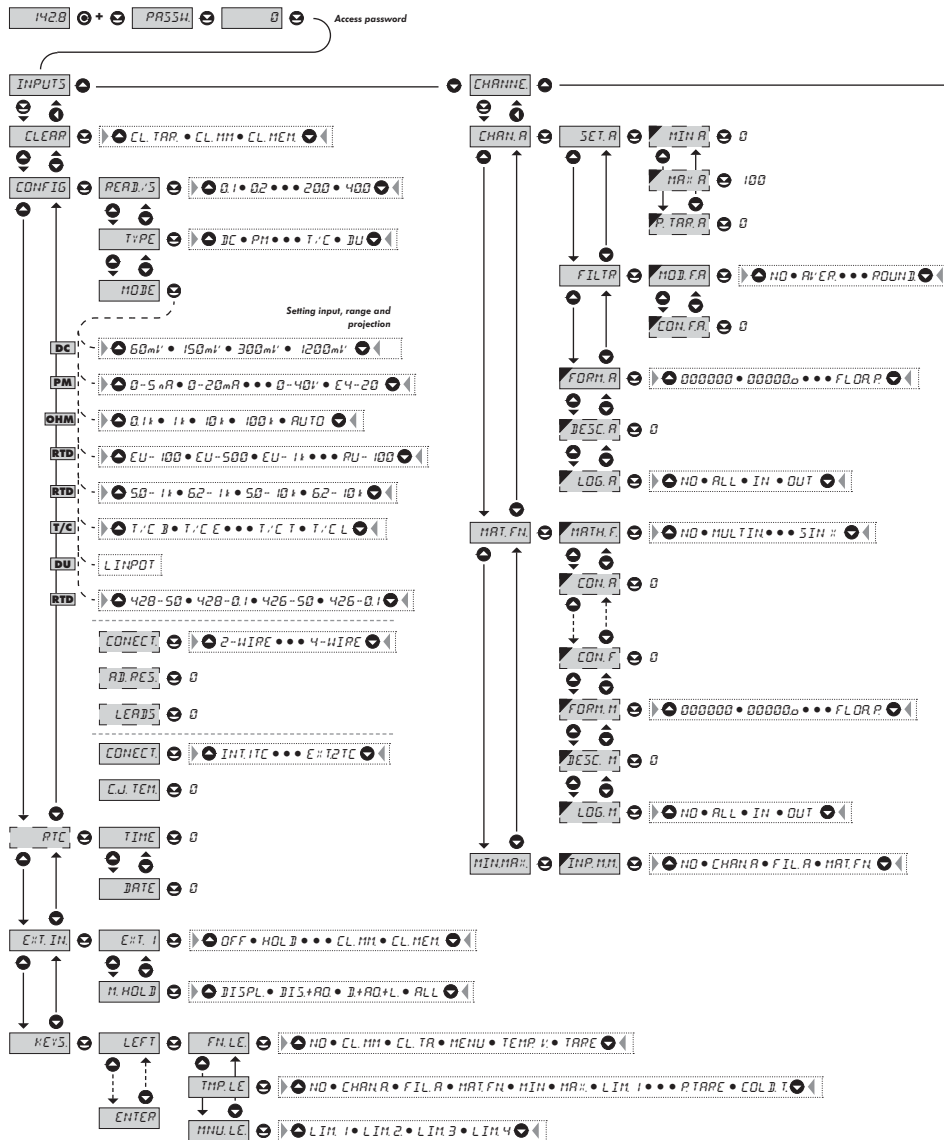| READ./S	Selection of measuring rate
40.0	40,0 measurements/s
20.0	20,0 measurements/s
10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.0	2,0 measurements/s
1.0	1,0 measurement/s
0.5	0,5 measurements/s
0.2	0,2 measurements/s
0.1	0,1 measurements/s

6.1.2b Selection of „instrument" type

TYPE Selection of „instrument" type

- selection of particular type of "instrument" is bound to relevant dynamic items

DC	DC voltmeter
PM	Process monitor
OHM	Ohmmeter
RTD-Pt	Thermometer for Pt xxx
RTD-N₁	Thermometer for Ni xxxx
TC	Thermometer pro thermocouples
DU	Display for linear potentiometers
RTD-Cu	Thermometer for Cu xxx

profi

`142.8` ⊖ + ⊖ `PA55W.` ⊖ `0` ⊖ Access password

`INPUTS` ⊙
`CLEAR` ⊖ ◈ `CL. TAR. • CL. MM • CL. MEM.` ◈
`CONFIG` ⊖ `READ.'5` ⊖ ◈ `01 • 02 • • • 200 • 400` ◈
`TYPE` ⊖ ◈ `DC • PM • • • T/C • DU` ◈
`MODE` ⊖

Setting input, range and projection

`DC` — ◈ `60mV • 150mV • 300mV • 1200mV` ◈
`PM` — ◈ `0-5 mA • 0-20mA • • • 0-40V • E4-20` ◈
`OHM` — ◈ `0.1 • 1 • 10 • 100 • AUTO` ◈
`RTD` — ◈ `EU-100 • EU-500 • EU-1 • • • PU-100` ◈
`RTD` — ◈ `50-1 • 62-1 • 50-10 • 62-10` ◈
`T/C` — ◈ `T/C B • T/C E • • • T/C T • T/C L` ◈
`DU` — `LINPOT`
`RTD` — ◈ `428-50 • 428-0.1 • 426-50 • 426-0.1` ◈

`CONECT.` ⊖ ◈ `2-WIRE • • • 4-WIRE` ◈
`AD.RE5` ⊖ `0`
`LEADS` ⊖ `0`
`CONECT.` ⊖ ◈ `INT.TC • • • EXT2TC` ◈
`C.J. TEM.` ⊖ `0`

`RTC` `TIME` ⊖ `0`
`DATE` ⊖ `0`

`EXT. IN` `EXT. 1` ◈ `OFF • HOLD • • • CL.MM • CL.MEM.` ◈
`M.HOLD` ◈ `DISPL. • DIS+RO • D+RO+L. • ALL` ◈

`KEYS` `LEFT` `FN.LE.` ⊖ ◈ `NO • CL.MM • CL.TR • MENU • TEMP.V • TARE` ◈
`TMP.LE.` ⊖ ◈ `NO • CHAN.R • FIL.A • MAT.FN • MIN • MAX • LIM.1 • • • P.TARE • COLD.T.` ◈
`ENTER` `MNU.LE.` ⊖ ◈ `LIM.1 • LIM.2 • LIM.3 • LIM.4` ◈

`CHANNE.` ⊙
`CHAN.A` `SET.A` ⊖ `MIN.A` ⊖ `0`
`MAX.A` ⊖ `100`
`P.TAR.A` ⊖ `0`
`FILTR.` ⊖ `MOD.FA` ◈ `NO • AVER. • • • ROUND` ◈
`CON.FA` `0`
`FORM.A` ◈ `000000 • 00000o • • • FLOR.P` ◈
`DESC. A` ⊖ `0`
`LOG.A` ◈ `NO • ALL • IN • OUT` ◈

`MAT.FN.` `MATH.F.` ◈ `NO • MULTIN • • • SIN X` ◈
`CON.A` ⊖ `0`
`CON.F.` ⊖ `0`
`FORM.M` ◈ `000000 • 00000o • • • FLOR.P` ◈
`DESC. M` ⊖ `0`
`LOG.M` ◈ `NO • ALL • IN • OUT` ◈

`MIN.MAX.` ⊖ `INP.MM.` ◈ `NO • CHAN.A • FIL.A • MAT.FN` ◈

profi

OUTPUT

MEMORY — REWRIT. — NO • YES
START — 00.00.00
STOP — 00.00.00
PERIOD — 00.00.00
TRIGER — 3%

LIMITS — LIM 1 — INP.L.1 — NO • CHAN.A • FIL.A • • • MAX
MOD.L.1 — HYSTER • FROM • DOSING
TYPE L.1 — CLOSE • OPEN
LIM.L.1 — 20
HYS.L.1 — 0
ON.L.1 — 0
OFF.L.1 — 0
PER.L.1 — 0
TIM.L.1 — 0
LIM 4

DATA — BAUD — 600 • 1200 • 2400 • • • 115200 • 230400
ADDR. — 0
PROT. — ASCII • MODBUS • M.BUS

ANALOG — INP.AO. — NO • CHAN.A • FIL.A • MAT.FN • MIN • MAX
TYP AO. — 0-20mA • E 4-20 • 4-20mA • 0-5mA • 0-2V • 0-5V • 0-10V
MIN A.O. — 0
MAX A.O. — 100

DISP. — PERM. — CHAN.A • FIL.A • MAT.FN • MIN • MAX
BRIGHT. — 0% • 25% • 50% • 75% • 100%

SERVIC

MENU — LIGHT • PROFI
RESTOR. — RE.CAL. — YES
RE.SET. — TYPE
USER
SAVE

CALIB. — C.MIN — YES
C.MAX — YES

MENU — CZECH • ENGL.
N.PASS. — PAS.LI — 0
PAS.PR.
IDENT. — OM402UNI...

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

6.1.2c   **Selection of measuring range**

Menu flowchart:

			DC	OHM
INPUTS	CLEAR	READ/S	60mV	100 R — DEF
CHANNE.	CONFIG.	TYPE	150mV	1 k
OUTPUT.	PTC	MODE	300mV	10 k
SERVIC.	EXT.IN.	CONECT.	1200mV	100 k
	KEYS	C.J.TEM.		AUTO
		AD.RES.		
		LEADS	DC - A	PM

DC - A:
100 V
250 V
500 V (DEF)
0.10 A
0.25 A
0.50 A
1.00 A
5.00 A

PM:
0-5mA
0-20mA
4-20mA (DEF)
0-2 V
0-5 V
0-10 V
0-40 V
Er.4-20

RTD-Pt (DEF): EU-100, EU-500, EU-1k0, US-100, RU-50, RU-100

RTD-Cu (DEF): 428-50, 428-0.1, 426-50, 426-0.1

RTD-Ni (DEF): 5.0-1k, 6.2-1k, 5.0-10k, 6.2-10k

T/C: T/C B, T/C E, T/C J, T/C K (DEF), T/C N, T/C R, T/C S, T/C T, T/C L

DU (DEF): LIN.POT.

!

Switching in the mode AUTO - "OHM"

0.1 > 1 k	0.101 k
1 k > 10 k	1.010 k
10 k > 100 k	10.10 k
100 > 10 k	9.900 k
10 k > 1 k	0.990 k
1 k > 0.1 k	0.099 k

When selecting the "AUTO" range, the items "MIN", "MAX", "P. TAR. A" will not be displayed in the "CHAN. A" setting

---

MODE   Selection of instrument measuring range

	Menu	Measuring range
DC	60 mV	±60 mV
	150 mV	±150 mV
	300 mV	±300 mV
	1200mV	±1,2 V
DC - A	100 V	±100 V
	250 V	±250 V
	500 V	±500 V
	0.10 A	±0,1 A
	0.25 A	±0,25 A
	0.50 A	±0,5 A
	1.00 A	±1 A
	5.00 A	±5 A
PM	Menu	Measuring range
	0-5mA	0...5 mA
	0-20mA	0...20 mA
	4-20mA	4...20 mA
	0-2 V	±2 V
	0-5 V	±5 V
	0-10 V	±10 V
	0-40 V	±40 V
	Er.4-20	4...20 mA, with error statement of „underfl ow" upon signal smaller than 3,36 mA
OHM	Menu	Measuring range
	100 R	0...100 Ω
	1 k	0...1 kΩ
	10 k	0...10 kΩ
	100 k	0...100 kΩ
	AUTO	Autorange
RTD-Pt	Menu	Measuring range
	EU-100	Pt 100 (3 850 ppm/°C)
	EU-500	Pt 500 (3 850 ppm/°C)
	EU-1k0	Pt 1000 (3 850 ppm/°C)
	US-100	Pt 100 (3 920 ppm/°C)
	RU-50	Pt 50 (3 910 ppm/°C)
	RU-100	Pt 100 (3 910 ppm/°C)
RTD-Ni	Menu	Measuring range
	5.0-1k	Ni 1 000 (5 000 ppm/°C)
	6.2-1k	Ni 1 000 (6 180 ppm/°C)
	5.0-10k	Ni 10 000 (5 000 ppm/°C)
	6.2-10k	Ni 10 000 (6 180 ppm/°C)
RTD-Cu	Menu	Measuring range
	428-50	Cu 50 (4 280 ppm/°C)
	428-0.1	Cu 1 00 (4 280 ppm/°C)
	426-50	Cu 50 (4 260 ppm/°C)
	426-0.1	Cu 100 (4 260 ppm/°C)
T/C	Menu	Type of thermocouple
	T/C B	B
	T/C E	E
	T/C J	J
	T/C K	K
	T/C N	N
	T/C R	R
	T/C S	S
	T/C T	T
	T/C L	L

6.1.2d Selection of type of sensor connection RTD OHM T/C

INPUTS	CLEAR	READ.VS	2-WIRE	DEF
CHANNE.	CONFIG.	TYPE	3-WIRE	
OUTPUT.	RTC	MODE	4-WIRE	
SERVIC.	EXT. IN.	CONECT.		
	KEYS	AD.RES.		
		LEADS		

INPUTS	CLEAR	READ.VS	INT.1TC	
CHANNE.	CONFIG.	TYPE	INT.2TC	
OUTPUT.	RTC	MODE	EXT.1TC	DEF
SERVIC.	EXT. IN.	CONECT.	EXT.2TC	
	KEYS	C.J. TEM.		

CONECT. Selection of type of sensor connection

RTD OHM

2-WIRE 2-wire connection

3-WIRE 3-wire connection

4-WIRE 4-wire connection

T/C

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

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

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

EXT.2TC Measurement with reference thermocouple
- when using compensation box

!

Method and procedure of setting the cold junctions is described in separate chapter on page 78

!

For thermocoule type "B" the items CONECT. and C.J. TEM. are not available

6 | SETTING

profi

6.1.2e **Setting temperature of cold junction**   `T/C`

```
⇑
◉  ⊖ →              ← ◀
▲  INPUT5   CLEAR   REAB.V5
↓  CHANNE.  CONFIG. TYPE
   OUTPUT.  [ RTC ] MODE
   SERVIC.  EXT.IN. CONECT.
            KEY5    C.J.TEM.
⇕
▼
```
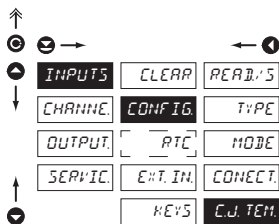
`C.J.TEM.` **Setting temperature of cold junction**

- range 0...99°C with compensation box
- **DEF** = 23°C

6.1.2f **Compensation of 2-wire conduct**   `RTD` `OHM`

```
⇑
◉  ⊖ →              ← ◀
▲  INPUT5   CLEAR   REAB.V5
↓  CHANNE.  CONFIG. TYPE
   OUTPUT.  [ RTC ] MODE
   SERVIC.  EXT.IN. CONECT.
            KEY5    AB.RE5.
⇕                   LEAB5
▼
```
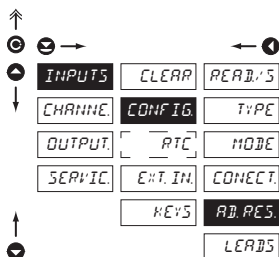
`AB.RE5.` **Offset of the beginning of the measuring range**

- 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...9999)
- **DEF** = 0

6.1.2g **Compensation of 2-wire conduct**   `RTD` `OHM`

```
⇑
◉  ⊖ →              ← ◀
▲  INPUT5   CLEAR   REAB.V5   YE5
↓  CHANNE.  CONFIG. TYPE
   OUTPUT.  [ RTC ] MODE
   SERVIC.  EXT.IN. CONECT.
            KEY5    AB.RE5.
⇕                   LEAB5
▼
```
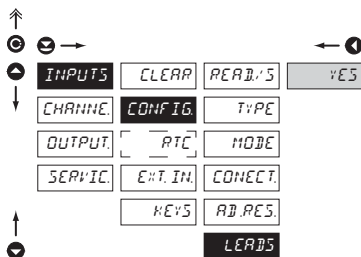
`LEAB5` **Compensation of 2-wire conduct**

- 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

---

48 | INSTRUCTIONS FOR USE **OM 402UNI**

6.1.3   Setting the real time clock

RTC	**Setting the real time clock (RTC)**

TIME	Time setting

- format 23.59.59

DATE	Date setting

- format DD.MM.YY

6.1.4a   External input function selection

Ext.In.	**External input function selection**

OFF	Input is off

HOLD	Activation of HOLD

LOCK K.	Locking keys on the instrument

B.PASS.	Activation of locking access into programming

menu LIGHT/PROFI

TARE	Tare activation

CL.TAR.	Tare resetting

CL.MM	Resetting min/max value

SAVE	Activation of measured data record in

instrument memory (not in standard equipment)

CL.MEM.	Clearing memory

- clearing memory with data measured in modes "FAST" or "RTC"

- **DEF** EXT. 1 > HOLD
- **DEF** EXT. 2 > LOCK K.
- **DEF** EXT. 3 > TARE

*

Setting procedure is identical for EXT. 2 and EXT. 3

6.1.4b   Selection of function "HOLD"

INPUTS	CLEAR	ExT. 1	DISPL.
CHANNE.	CONFIG.	ExT. 2	DIS.+AO.
OUTPUT.	RTC	ExT. 3	D.+AO.+L.
SERVIC.	ExT. IN.	M.HOLD	ALL
	KEYS		

M.HOLD   Selection of function "HOLD"

DISPL.   "HOLD" locks only the value displayed

DIS.+AO.   "HOLD" locks the value displayed and on AO

D.+AO.+L.   "HOLD" locks the value displayed, on AO and limit evaluation

ALL   "HOLD" locks the entire instrument

6.1.5a   Optional accessory functions of the keys

INPUTS	CLEAR	LEFT	FN. LE.	NO
CHANNE.	CONFIG.	DOWN	TMP. LE.	CL.M.M.
OUTPUT.	RTC	UP	MNU.LE.	CL. TAR.
SERVIC.	ExT. IN.	ENTER		MENU
	KEYS			TEMP. V.
				TARE
				CL.MEM.
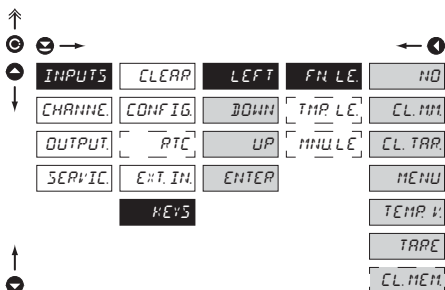
FN. LE.   Assigning further functions to instrument keys

- „FN. LE." > executive functions
- „TMP. LE." > temporary projection of selected values
- „MNU. LE." > direct access into menu on selected item

NO   Key has no further function

CL.M.M.   Resetting min/max value

CL. TAR.   Tare resetting

MENU   Direct access into menu on selected item

- after confirmation of this selection the "MNU. LE." item is displayed on superior menu level, where required selection is performed

TEMP. V.   Temporary projection of selected values

- after confirmation of this selection the item "TMP. LE." is displayed on superior menu level, whererequired selection is performed

TARE   Tare function activation

CL.MEM.   Clearing memory

- clearing memory with data measured in modes "FAST" or "RTC"

!

Preset values of the control keys **DEF** :
LEFT	Show Tare
UP	Show Max. value
DOWN	Show Min. value
ENTER	w/o functione

!

Setting is identical for LEFT, DOWN, UP and ENTER

6.1.5b Optional accessory functions of the keys - Temporary projection

`INPUTS`	`CLEAR`	`LEFT`	`FN LE.`	`NO`
`CHANNE.`	`CONFIG.`	`DOWN`	`TMP. LE.`	`CHAN.A`
`OUTPUT.`	`RTC`	`UP`		`FIL.A`
`SERVIC.`	`EXT.IN.`	`ENTER`		`MAT.FN.`
	`KEYS`			`MIN`
				`MAX`
				`LIM 1`
				`LIM 2`
				`LIM 3`
				`LIM 4`
				`TIME`
				`DATE`
				`TARE`
				`P.TARE`
				`COL.D.J.`
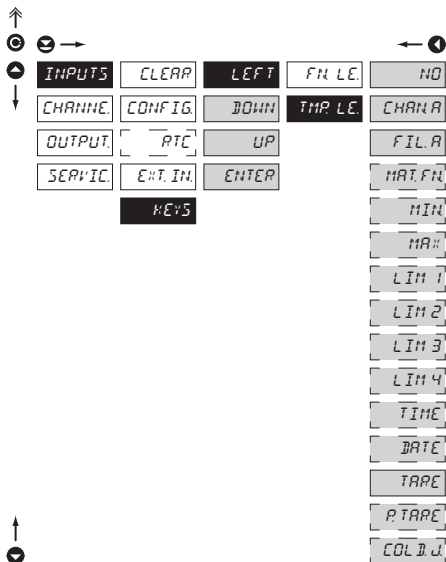
`TMP. LE.` **Temporary projection of selected item**

- "Temporary" projection of selected value is displayed for the time of keystroke
- "Temporary" projection may be switched to permanent by pressing + "Selected key", this holds until the stroke of any key

`NO` Temporary projection is off

`CHAN.A` Temporary projection of "Channel A" value

`FIL.A` Temporary projection of "Channel A" value after processing digital filters

`MAT.FN.` Temporary projection of "Mathematic functions" value

`MIN` Temporary projection of "Min. value"

`MAX` Temporary projection of "Max. value"

`LIM 1` Temporary projection of "Limit 1" value

`LIM 2` Temporary projection of "Limit 2" value

`LIM 3` Temporary projection of "Limit 3" value

`LIM 4` Temporary projection of "Limit 4" value

`TIME` Temporary projection of "TIME" value

`DATE` Temporary projection of "DATE" value

`TARE` Temporary projection of "TARE" value

`P. TARE` Temporary projection of "P. TARE" value

`COL.D.J.` Temporary projection of "CJC" value

!
Setting is identical for LEFT, DOWN, UP and ENTER

6.1.5c   **Optional accessory functions of the keys - Direct access to item**

INPUTS	CLEAR	LEFT	FN. LE.	LIM 1
CHANNE.	CONFIG.	DOWN	MNU.LE.	LIM 2
OUTPUT.	PTC	UP		LIM 3
SERVIC.	EXT. IN.	ENTER		LIM 4
	KEYS			
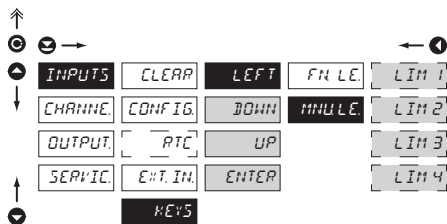
MNU.LE.	**Assigning access to selected menu item**
LIM 1	Direct access to item "LIM 1"
LIM 2	Direct access to item "LIM 2"
LIM 3	Direct access to item "LIM 3"
LIM 4	Direct access to item "LIM 4"

!

Setting is identical for LEFT, DOWN, UP and ENTER

6.2 Setting "PROFI" - CHANNELS

INPUTS CHAN.A
CHANNE. MAT.FN
OUTPUT. MIN.MA×
SERVIC.
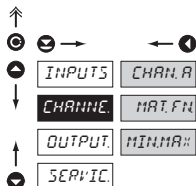
The primary instrument parameters are set in this menu

CHAN.A — Setting parameters of measuring "Channel"

MAT.FN. — Setting parameters of mathematic functions

MIN.MA× — Selection of access and evaluation of Min/max value

---

6.2.1a Display projection   `DC` `PM` `DU` `OHM`

INPUTS CHAN.A SET.A MIN A
CHANNE. MAT.FN FILTER MA× A
OUTPUT. MIN.MA× FORM.A P.TAR.A
SERVIC. DESC.A
        LOG.A
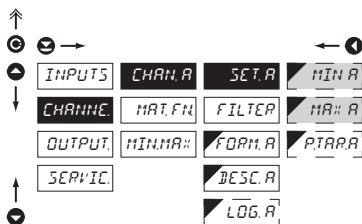
SET.A — Setting display projection

MIN A — Setting display projection for minimum value of input signal
- range of the setting is -99999...999999
- **DEF** = 0

MA× A — Setting display projection for maximum value of input signal
- range of the setting is -99999...999999
- **DEF** = 100

6.2.1b Setting fixed tare   `DC` `PM` `DU` `OHM`

INPUTS CHAN.A SET.A MIN A
CHANNE. MAT.FN FILTER MA× A
OUTPUT. MIN.MA× FORM.A P.TAR.A
SERVIC. DESC.A
        LOG.A
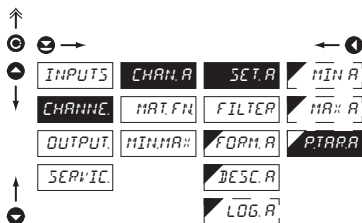
P. TAR. A — Setting "Fixed tare" value

- setting is designed for the event when it is necessary to firmly shift the beginning of the range by known size
- when setting (*P. TAR. A* > 0) display shows "T" symbol
- range of the setting is 0...999999
- **DEF** = 0

6.2.1c Digital filters
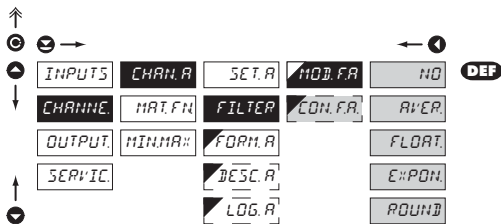
MOD.F.A **Selection of digital filters**

- at times it is useful for better user projection of data on display to modify it mathematically and properly , wherefore the following filters may be used:

NO Filters are off

AVER. Measured data average
- arithmetic average from given number ("CON.F. A.") of measured values
- range 2...100

FLOAT. Selection of floating filter
- floating arithmetic average from given number ("CON.F. A.") of measured data and updates with each measured value
- range 2...30

EXPON. Selection of exponential filter
- integration filter of first prvního grade with time constant ("CON.F. A.") measurement
- range 2...100

ROUND Measured value rounding
- is entered by any number, which determines the projection step (e.g: "CON.F. A."=2,5 > display 0, 2.5, 5,...)

CON.F.A. Setting constants
- this menu item is always displayed after selection of particular type of filter
- **DEF** = 2

profi

6.2.1d Projection format - positioning of decimal point

INPUTS	CHAN.A	SET.A	000000
CHANNE.	MAT.FN	FILTER	00000.o
OUTPUT.	MIN.MA×	FORM.A	0000.oo
SERVIC.		DESC.A	000.ooo
		LOG.A	00.oooo
			0.ooooo
			FLOA.P.
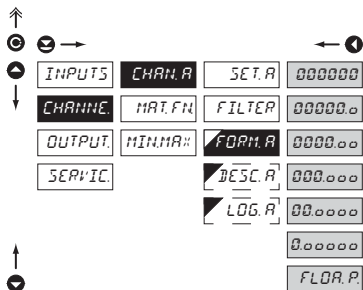
FORM.A — Selection of decimal point

- the instrument allows for classic projection of a number with positioning of the DP as well as projection with floating DP, allowing to display a number in its most exact form „FLOAT.P."

`000000.` Setting DP - XXXXXX.

`00000.o` Setting DP - XXXXX.x

- **DEF** > **RTD** **T/C**

`0000.oo` Setting DP - XXXX.xx

- **DEF** > **DC** **PM** **DU** **OHM**

`000.ooo` Setting DP - XXX.xxx

`00.oooo` Setting DP - XX.xxxx

`0.ooooo` Setting DP - X.xxxxx

`FLOA.P.` Floating DP

6.2.1e Projection of description - the measuring units

INPUTS	CHAN.A	SET.A
CHANNE.	MAT.FN	FILTER
OUTPUT.	MIN.MA×	FORM.A
SERVIC.		LOG.A
		SAVE A
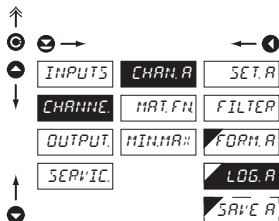
DESC.A — Setting projection of descript. for "Channel A"

- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by code 00
- **RTD** **T/C** **DEF** = °C
- **DC** **PM** **DU** **OHM** **DEF** =none

!

Table of signs on page 83

6.2.1f   Selection of storing data into instrument memory
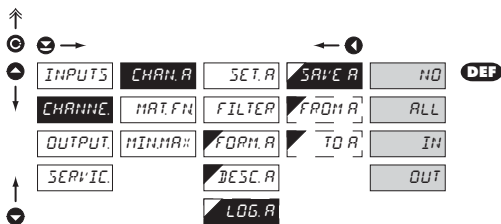
`SAVE.A` Selection of storing data into instrument memory

- by selection in this item you allow to register values into instrument memory
- another setting in item "OUTPUT. > MEMORY" (not in standard experiment)

`NO` Measured data is not stored

`ALL` Measured data is stored in memory

`IN` Only data measured within the set interval is stored in memory

`OUT` Only data measured outside the set interval is stored in memory

`FROM A` Setting the initial interval value
- setting range: -99999...999999

`TO A` Setting the final interval value
- setting range: -99999...999999

6.2.2a Mathematic functions

INPUTS CHAN.A MATH.F. OFF DEF
CHANNE. MAT.FN CON.A MULTIN.
OUTPUT. MIN.MAX CON.B 1/MUL.
SERVIC. CON.C LOGAR.
CON.D EXPON.
CON.E POWER
CON.F ROOT
FORM.M SIN X
DESC.M
LOG M
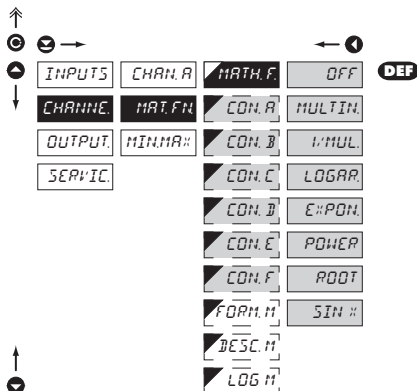
MATH.F. — Selection of mathematic functions

OFF — Mathematic functions are off

MULTIN. — Multinominal

$$Ax^5 + Bx^4 + Cx^3 + Dx^2 + Ex + F$$

1/MUL. — 1/x

$$\frac{A}{x^5} + \frac{B}{x^4} + \frac{C}{x^3} + \frac{D}{x^2} + \frac{E}{x} + F$$

LOGAR. — Logarithm

$$A \times \ln\left(\frac{Bx + C}{Dx + E}\right) + F$$

EXPON. — Exponential

$$A \times e^{\left(\frac{Bx+C}{Dx+E}\right)} + F$$

POWER — Power

$$A \times \left(Bx + C\right)^{(Dx+E)} + F$$

ROOT — Root

$$A \times \sqrt{\frac{Bx + C}{Dx + E}} + F$$

SIN X — Sin x

$$A\sin^5 x + B\sin^4 x + C\sin^3 x + D\sin^2 x + E\sin x + F$$

CON. - — Setting constants for calculation of mat. functions
- this menu is displayed only after selection of given mathematic function

6.2.2b | **Mathematic functions - decimal point**

```
INPUTS    CHAN.A   MATH.F.   000000
CHANNE.   MAT.FN   CON.A     00000.o
OUTPUT.   MIN.MAX  CON.B     0000.oo
SERVIC.            CON.C     000.ooo
                   CON.D     00.oooo
                   CON.E     0.ooooo
                   CON.F     FLOA.P.  DEF
                   FORM.M
                   DESC.M
                   LOG.M
```
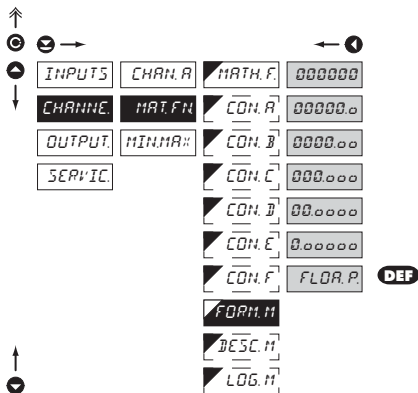
FORM.M.   Selection of decimal point

- the instrument allows for classic projection of a number with positioning of the DP as well as projection with floating DP, allowing to display a number in its most exact form „FLOA.P."

000000.	Setting DP - XXXXXX.
00000.o	Setting DP - XXXXX.x
0000.oo	Setting DP - XXXX.xx
000.ooo	Setting DP - XXX.xxx
00.oooo	Setting DP - XX.xxxx
0.ooooo	Setting DP - X.xxxxx
FLOA.P.	Floating DP

- **DEF**

6.2.2c | **Mathematic functions - measuring units**

```
INPUTS    CHAN.A   MATH.F.
CHANNE.   MAT.FN   CON.A
OUTPUT.   MIN.MAX  CON.B
SERVIC.            CON.C
                   CON.D
                   CON.E
                   CON.F
                   FORM.M
                   DESC.M
                   LOG.M
```
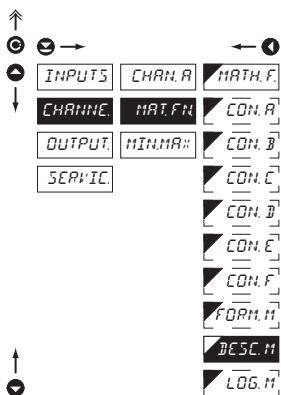
DESC.M.   Setting projection of description for "MAT.FN"

- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by code 00

- **DEF** = no description

!

Table of signs on page 83

6.2.2d Mathematic functions - selection of storing data into instrument memory

INPUTS	CHAN. A	MATH. F.	SAVE M	NO	DEF
CHANNE.	MAT. FN	CON. A	FROM M	ALL	
OUTPUT.	MIN.MAX	CON. B	TO M	IN	
SERVIC.		CON. C		OUT	
		CON. D			
		CON. E			
		CON. F			
		FORM.M			
		DESC. M			
		SAVE M			
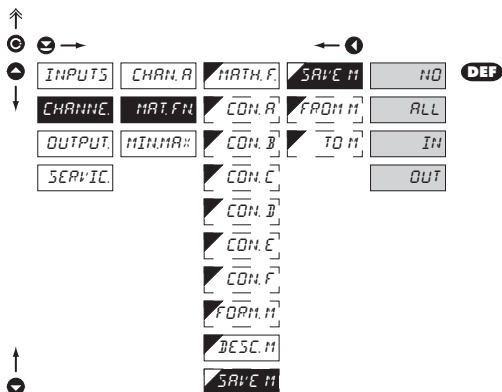
SAVE.M — **Selection of storing data into instrument memory**

- by selection in this item you allow to register values into instrument memory
- another setting in item "OUTPUT. > MEMORY" (not in standard experiment)

NO — Measured data is not stored

ALL — Measured data is stored in memory

IN — Only data measured within the set interval is stored in memory

OUT — Only data measured outside the set interval is stored in memory

FROM M — Setting the initial interval value
- setting range: -99999...999999

TO M — Setting the final interval value
- setting range: -99999...999999

6.2.3 Selection of evaluation of min/max value

INPUTS	CHAN. A	INPUTS	NO	DEF
CHANNE.	MAT. FN		CHAN. A	
OUTPUT.	MIN.MAX		FIL. A	
SERVIC.			MAT. FN.	
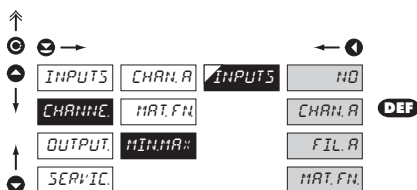
INPUTS — **Selection of evaluation of min/max value**

- selection of value from which the min/max value will be calculated

NO — Evaluation of min/max value is off

CHAN. A — From "Channel A"

FIL. A — From "Channel A" after digital filters processing

MAT. FN. — From "Mathematic functions"

6.3 Setting „PROFI" - OUTPUTS

INPUTS | MEMORY
CHANNE. | LIMITS
OUTPUT. | DATA
SERVIC. | AN.OUT.
| DISP.
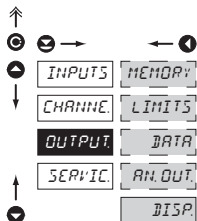
In this menu it is possible to set parameters of the instrument output signals

MEMORY — Setting data logging into memory

LIMITS — Setting type and parameters of limits

DATA — Setting type and parameters of data output

AN.OUT. — Setting type and parameters of analog output

DISP. — Setting display projection and brightness

6.3.1a Selection of mode of data logging into instrument memory

INPUTS | MEMORY | REWRIT. | YES
CHANNE. | LIMITS | START | NO **DEF**
OUTPUT. | DATA | STOP
SERVIC. | AN.OUT. | PERIOD.
| DISP. | TRIGER
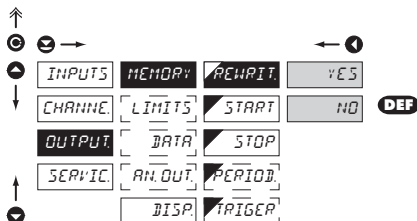
REWRIT. **Selection of the mode of data logging**

- selection of the mode in the event of full instrument memory

NO — Rewriting values prohibited

YES — Rewriting values permitted, the oldest get rewritten by the latest

6.3.1b   Setting data logging into instrument memory - RTC

INPUTS	MEMORY	REWRIT.
CHANNE.	LIMITS	START
OUTPUT.	DATA	STOP
SERVIC.	AN.OUT.	PERIOD.
		DISP.
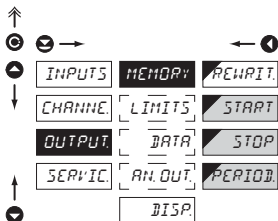
START — Start of data logging into instrument memory
- time format HH.MM.SS

STOP — Stop data logging into instrument memory
- time format HH.MM.SS

PERIOD. — Period of data logging into instrument memory
- determines the period in which values will be logged in an interval delimited by the time set under items *START* and *STOP*
- time format HH.MM.SS
- records are made on a daily basis in selected interval and period
- item not displayed if "SAVE" is selected in menu *(INPUT > EXT. IN.)*

6.3.1c   Setting data logging into instrument memory - FAST

INPUTS	MEMORY	REWRIT.	3%	DEF
CHANNE.	LIMITS	TRIGER		
OUTPUT.	DATA			
SERVIC.	AN.OUT.			
	DISP.			
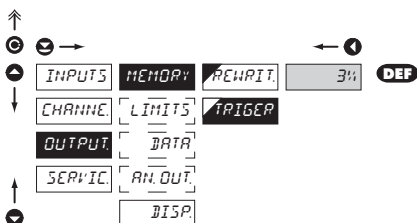
TRIGER — Setting logging data into inst. memory
- logging data into inst. memory is governed by the folowing selection, which determines how many percent of the memory is reserved for data logging prior to initiation of trigger imputse
- initialization is on ext. input or button
- setting in range 1...100 %
- when setting 100 %, datalogging works in the mode ROLL > data keep getting rewritten in cycles

1. Memory initialization
- clear memory (ext.input, button)
- LED "M" flashes, after reading TRIGGER (%) memory is permanently shining. In ROLL flashes constantly.

2. Triggering
- external input, button
- after the memory LED is full "M" turns off
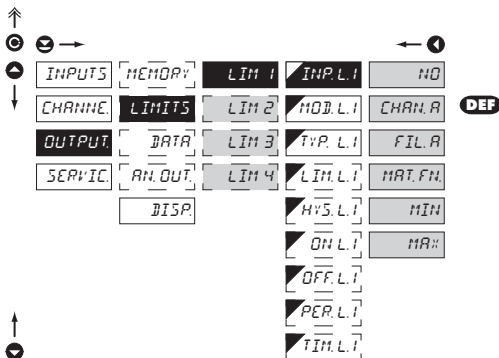- in the ROLL mode the trigger ends datalogging and LED turns off

3 . Termination
- ext. input, button or reading data via RS

Description of relay function > HYSTER • FROM-TO • DOSING

OFF • +H/2 • 3 P

LIM • 2,5 P

ON • -H/2 • 2 P

1,5 P

1 P

0,5 P

z - delay "TIM. L."

Dose limit: MODE L. > "DOSE"

axis x > "P" Period

Switch-on relay
TYPE > SWITCH-ON
LED signalization

Switch-off relay
TYPE > SWITCH-OFF
LED signalization

Window limit: MODE L. > "FROM . ."

axis x > "ON L." switch on, "OFF L." switch off

Switch-on relay
TYPE > SWITCH-ON
LED signalization

Switch-off relay
TYPE > SWITCH-OFF
LED signalization

Limit - Limit/hysteresis/delay: MODE L. > "HYSTER"

axis x > "LIM. L." limit, "H/2" hysteresis

Z > 0 - Switch-on relay
TYPE > SWITCH-ON
LED signalization

Z < 0 - Switch-on relay
TYPE > SWITCH-OFF
LED signalization

Z > 0 - Switch-off relay
TYPE > SWITCH-ON
LED signalization

Z < 0 - Switch-off relay
TYPE > SWITCH-OFF
LED signalization

6.3.2a Selection of input for limits evaluation

```
INPUTS  MEMORY   LIM 1   INP.L.1    NO
CHANNE  LIMITS   LIM 2   MOD.L.1  CHAN.A  DEF
OUTPUT   DATA    LIM 3   TYP.L.1   FIL.A
SERVIC  AN.OUT.  LIM 4   LIM.L.1  MAT.FN.
          DISP.          HYS.L.1    MIN
                         ON.L.1     MAX
                         OFF.L.1
                         PER.L.1
                         TIM.L.1
```

! Setting is identical for LIM 2, LIM 3 and LIM 4

INP.L.1 — **Selection evaluation of limits**

- selection of value from which the limit will be evaluated

NO — Limit evaluation is off

CHAN.A — Limit evaluation from "Channel A"

FIL.A — Limit evaluation from "Channel A" after digital filters processing

MAT.FN. — Limit evaluation from "Mathematic functions"

MIN — Limit evaluation from "Min.value"

MAX — Limit evaluation from "Max.value"

6.3.2b Selection of type of limit

```
INPUTS  MEMORY   LIM 1   INP.L.1  HYSTER  DEF
CHANNE  LIMITS   LIM 2   MOD.L.1  FROM.
OUTPUT   DATA    LIM 3   TYP.L.1  DOSING
SERVIC  AN.OUT.  LIM 4   LIM.L.1
          DISP.          HYS.L.1
                         ON.L.1
                         OFF.L.1
                         PER.L.1
                         TIM.L.1
```
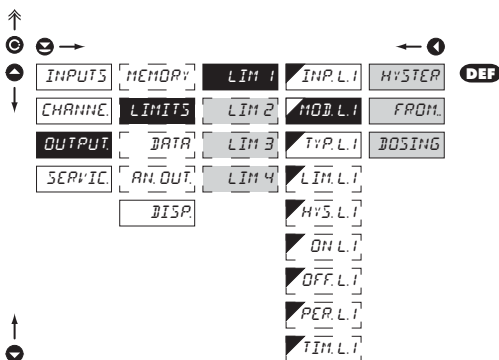
! Setting is identical for LIM 2, LIM 3 and LIM 4

MOD.L.1 — **Selection the type of limit**

HYSTER — Limit is in mode "Limit, hysteresis, delay"
- for this mode the parameters of "LIM. L." are set, at which the limit will shall react, "HYS. L." the hysteresis range around the limit (LIM ±1/2 HYS) and time "TIM. L." determining the delay of relay switch-on

FROM. — Frame limit
- for this mode the parameters are set for interval "ON. L." the relay switch-on and "OFF. L." the relay switch-off

DOSING — Dose limit (periodic)
- for this mode the parameters are set for "PER. L." determining the limit value as well as its multiples at which the output is active and "TIM. L." indicating the time during which is the output active

profi

6.3.2c Selection of type of output
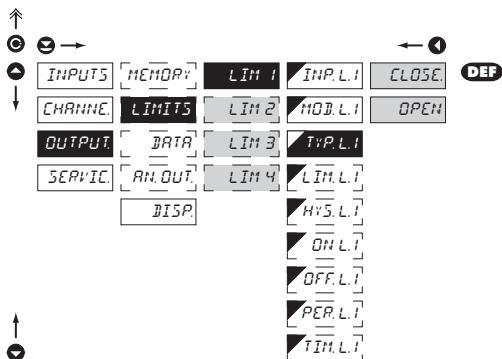
`TYP.L.1`	Selection of type of output
`CLOSE.`	Output switches on when condition is met
`OPEN`	Output switches off when condition is met

!
Setting is identical for LIM 2, LIM 3 and LIM 4

6.3.2d Setting values for limits evaluation
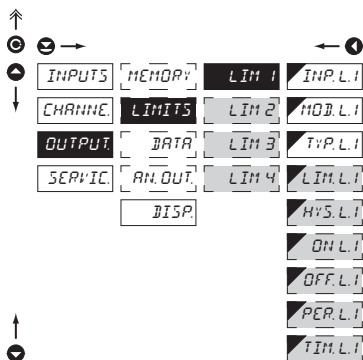
`LIM.L.1`	Setting limit for switch-on

- for type "HYSTER"

`HYS.L.1`	Setting hysteresis

- for type "HYSTER"
- indicates the range around the limit (in both directions, LIM. ±1/2 HYS.)

`ON.L.1`	Setting the outset of the interval of limit switch-on

- for type "FROM"

`OFF.L.1`	Setting the end of the interval of limit switch-on

- for type "FROM"

`PER.L.1`	Setting the period of limit switch-on

- for type "DOSE"

`TIM.L.1`	Setting the time switch-on of the limit

- for type "HYSTER" and "DOSE"
- setting within the range: ±0...99,9 s
- positive time > relay switches on after crossing the limit (LIM. L1) and the set time (TIM. L1)
- negative time > relay switches off after crossing the limit (LIM. L1) and the set negative time (TIM. L1)

!
Setting is identical for LIM 2, LIM 3 and LIM 4

6.3.3a Selection of data output baud rate

INPUTS	MEMORY	BAUD	600
CHANNE.	LIMITS	ADDR.	1200
OUTPUT.	DATA	AD.-MOD.	2400
SERVIC.	AN.OUT.	ADR.P.B.	4800
	DISP.	PROT.	9600 **DEF**
			19200
			38400
			57600
			115200
			230400

BAUD	Selection of data output baud rate
600	Rate - 600 Baud
1200	Rate - 1 200 Baud
2400	Rate - 2 400 Baud
4800	Rate - 4 800 Baud
9600	Rate - 9 600 Baud
19200	Rate - 19 200 Baud
38400	Rate - 38 400 Baud
57600	Rate - 57 600 Baud
115200	Rate - 115 200 Baud
230400	Rate - 230 400 Baud

6.3.3b Setting instrument address

INPUTS	MEMORY	BAUD	0
CHANNE.	LIMITS	ADDR.	
OUTPUT.	DATA	AD.-MOD.	
SERVIC.	AN.OUT.	ADR.P.B.	
	DISP.	PROT.	

ADDR.	Setting instrument address

- setting in range 0...31
- **DEF** = 00

ADDR.	Setting instrument address - MODBUS

- setting in range 1...247
- **DEF** = 1

ADR.P.B.	Setting instrument address - PROFIBUS

- setting in range 1...127
- **DEF** = 1

6.3.3c	Selection of data output protocol

INPUTS	MEMORY	BAUD	ASCII	DEF
CHANNE.	LIMITS	ADDR.	M.BUS	
OUTPUT.	DATA	AD.-MOD.	MODBUS	
SERVIC.	AN.OUT.	ADR.P.B.		
	DISP.	PROT.		
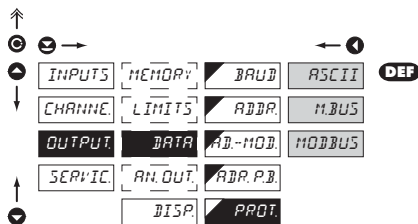
PROT.	Selection of the type of analog output
ASCII	Data protocol ASCII
M. BUS	Data protocol DIN MessBus
MODBUS	Data protocol MODBUS-RTU

- option is available only for RS 485

6.3.4a	Selection of input for analog output

INPUTS	MEMORY	INP.A.O.	NO	
CHANNE.	LIMITS	TYP.A.O.	CHAN.A	DEF
OUTPUT.	DATA	MIN A.O.	FIL.A	
SERVIC.	AN.OUT.	MAX A.O.	MAT.FN.	
	DISP.		MIN	
			MAX	
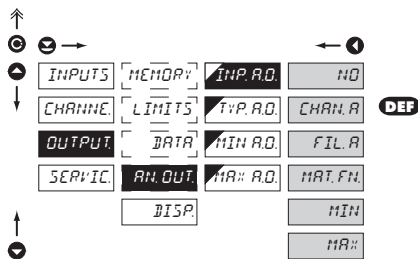
INP.AO.	Selection evaluation analog output

- selection of value from which the analog output will be evaluated

NO	AO evaluation is off
CHAN.A	AO evaluation from "Channel A"
FIL.A	AO evaluation from "Channel A" after

digital filters processing

MAT.FN.	AO evaluation from "Math.functions"
MIN	AO evaluation from "Min.value"
MAX	AO evaluation from "Max.value"

6.3.4b Selection of the type of analog output

```
        ↑
  ◉  ☺  →                    ← ◀
  ▲   [INPUTS] [MEMORY] [INP. AO.] [0-20mA]
  ↓   [CHANNE.] [LIMITS] [TYP. AO.] [E 4-20]
      [OUTPUT]  [DATA]  [MIN AO.] [4-20mA] (DEF)
      [SERVIC.] [AN.OUT.] [MAX AO.] [0-5mA]
                [DISP.]            [0-2V]
        ↑                          [0-5V]
        ▼                          [0-10V]
```
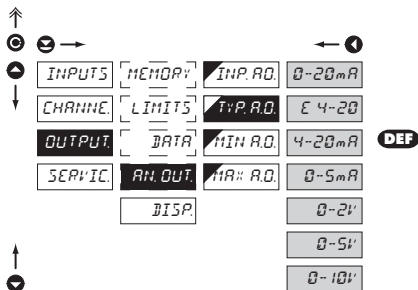
[TYP. AO.]	Selection of the type of analog output
[0-20mA]	Type - 0...20 mA
[E 4-20]	Type - 4...20 mA
	- with indication of error statement (< 3,0 mA)
[4-20mA]	Type - 4...20 mA
[0-5mA]	Type - 0...5 mA
[0-2V]	Type - 0...2 V
[0-5V]	Type - 0...5 V
[0-10V]	Type - 0...10 V

6.3.4c Setting the analog output range

```
        ↑
  ◉  ☺  →                    ← ◀
  ▲   [INPUTS] [MEMORY] [INP. AO.] [0.0]
  ↓   [CHANNE.] [LIMITS] [TYP. AO.]
      [OUTPUT]  [DATA]  [MIN AO.]
      [SERVIC.] [AN.OUT.] [MAX AO.]
        ↑       [DISP.]
        ▼
```
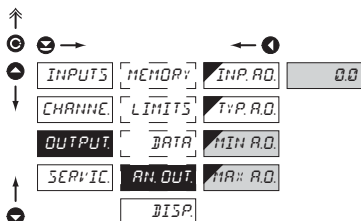
[AN. OUT.]	Setting the analog output range

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

[MIN AO.]	Assigning the display value to the beginning of

the AO range
- range of the setting is -99999...999999
- (DEF) = 0

[MAX AO.]	Assigning the display value to the end of the

AO range
- range of the setting is -99999...999999
- (DEF) = 100

6.3.5a | **Selection of input for display projection**

```
INPUTS   MEMORY   �crossPERM.   CHAN.A   DEF
CHANNE.  LIMITS   BRIGHT       FIL.A
OUTPUT.  DATA                  MAT.FN.
SERVIC.  AN.OUT.               MIN.
         DISP.                 MAX
```
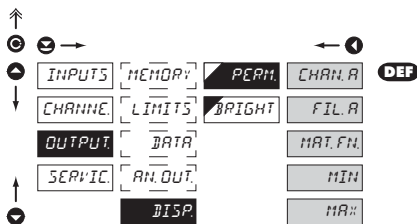
PERM.	**Selection display projection**

- selection of value which will be shown on the instrument display

CHAN.A	Projection of values from "Channel A"
FIL.A	Projection of values from "Channel A" after digital filters processing
MAT.FN.	Projection of values from "Math.functions"
MIN.	Projection of values from "Min.value"
MAX	Projection of values from "Max.value"

6.3.5b | **Selection of display brightness**

```
INPUTS   MEMORY   PERM.    100%   DEF
CHANNE.  LIMITS   BRIGHT.  75%
OUTPUT.  DATA              50%
SERVIC.  AN.OUT.           25%
         DISP.             0%
```
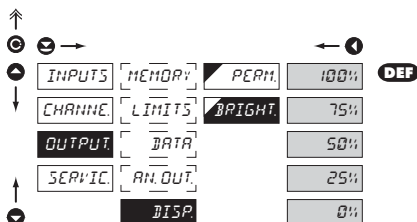
BRIGHT	**Selection of display brightness**

- by selecting display brightness we may appropriately react to light conditions in place of instrument location

0%	Display is off

- after keystroke display turns on for 10 s

25%	Display brightness - 25 %
50%	Display brightness - 50 %
75%	Display brightness - 75 %
100%	Display brightness - 100 %

profi

6.4 Setting "PROFI" - SERVIS

INPUTS	MENU
CHANNE.	RESTOR.
OUTPUT.	CALIB.
SERVIC.	LANG.
	N.PASS.
	IDENT.
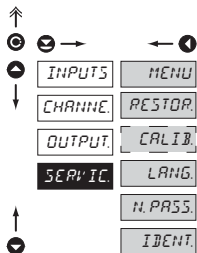
The instrument service functions are set in this menu

MENU	Selection of menu type LIGHT/PROFI
RESTOR.	Restore instrument manufacture setting and calibration
CALIB	Input range calibration for „DU" version
LANG.	Language version of instrument menu
N.PASS.	Setting new access password
IDENT.	Instrument identification

6.4.1 Selection of type of programming menu

INPUTS	MENU	LIGHT	DEF
CHANNE.	RESTOR.	PROFI	
OUTPUT.	CALIB.		
SERVIC.	LANG.		
	N.PASS.		
	IDENT.		
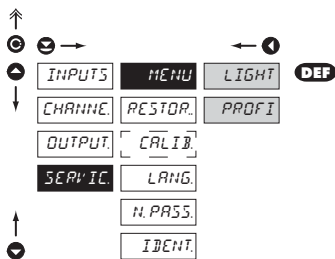
MENU — **Selection of menu type - LIGHT/PROFI**

- enables setting the menu complexity according to user needs and skills

LIGHT — Active LIGHT menu

- simple programming menu, contains only items necessary for configuration and instrument setting
- linear menu > items one after another

PROFI — Active PROFI menu

- complete programming menu for expert users
- tree menu

!

Change of setting is valid upon next access into menu

6.4.3 Calibration - Input range [DU]

```
  ↑
  ⊝  ⊕ →                    ← ◁
  ▲    INPUTS    MENU     C.MIN      YES
  ↓    CHANNE.   RESTOR.  C.MAX
       OUTPUT.   CALIB.
       SERVIC.   LANG.
                 N.PASS.
  ↑              IDENT.
  ⊝
```
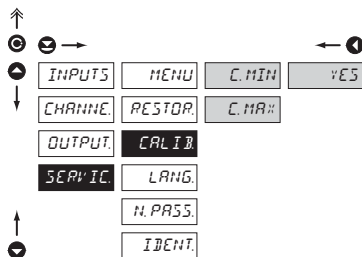
CALIB. Input range calibration

- when "C. MIN" is displayed, move the potentiometer traveller to the required minimum position and confirm by „Enter", calibration is confirmed by "YES"

- when "C. MAX" is displayed, move the potentiometer traveller to required maximum position and confirm by „Enter", calibration is confirmed by „YES"

6.4.4 Selection of instrument menu language version

```
  ↑
  ⊝  ⊕ →                    ← ◁
  ▲    INPUTS    MENU     CZECH
  ↓    CHANNE.   RESTOR.  ENGL.   DEF
       OUTPUT.   CALIB.
       SERVIC.   LANG.
                 N.PASS.
  ↑              IDENT.
  ⊝
```
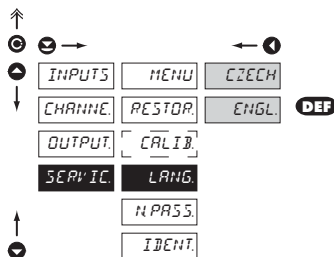
LANG. Selection of instrument menu language version

CZECH Instrument menu is in Czech

ENGL. Instrument menu is in English

6.4.5 Setting new access password

```
  ↑
  ⊝  ⊕ →                    ← ◁
  ▲    INPUTS    MENU     PAS.LI      0
  ↓    CHANNE.   RESTOR.  PAS.PR.
       OUTPUT.   CALIB.
       SERVIC.   LANG.
                 N.PASS.
  ↑              IDENT.
  ⊝
```
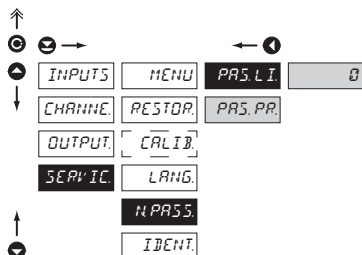
N.PASS. Setting new password for access to LIGHT and PROFI menu

- this option allows to change the numeric code, which blocks the access into LIGHT and PROFI Menu.

- numerci code range: 0...9999

- universal passwords in the event of loss:
  LIGHT Menu > „8177"
  PROFI Menu > „7915"

6.4.6 Instrument identification

INPUTS MENU   OM 402UNI 66-001   PM
CHANNE. RESTOR.
OUTPUT. CALIB.
SERVIC. LANG.
        N.PASS.
        IDENT.
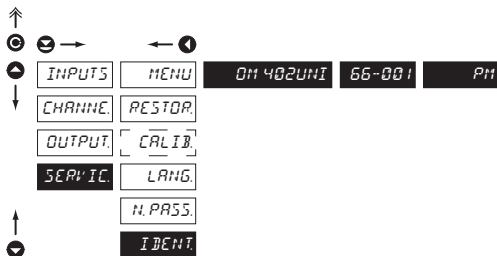
IDENT. Projection of instrument SW version

- display shows type identification of the instrument, SW number, SW version and current input setting (Mode)
- if the SW version reads a letter on first position, it is a customer SW

pos	Desctription
1.	type of instrument
2.	SW: number - version
3.	the input type

IDEN.

7.0 **Setting items into "USER" menu**

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

USER

Setting

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

Setting

flashing legend - current setting is displayed

NO   YES   SHOW   return to item

NO	item will not be displayed in USER menu
YES	item will be displayed in USER menu with editing option
SHOW	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 ⊜ + ⊜) > *CL. TAR.*, *LIM 1*, *LIM 2*, *LIM 3*, for which we have preset this sequence (keys ⊜ + ⊜):

CL. TAR.   5
LIM 1   0 (sequence not determined)
LIM 2   2
LIM 3   1

Upon entering USER menu

(key ⊙) items will be projected in the following sequence: LIM 3 > LIM 2 > CL.TAR. > LIM 1

Instrument with input for temperature measurement with thermocouple allows to set two types of measurement of cold junction.
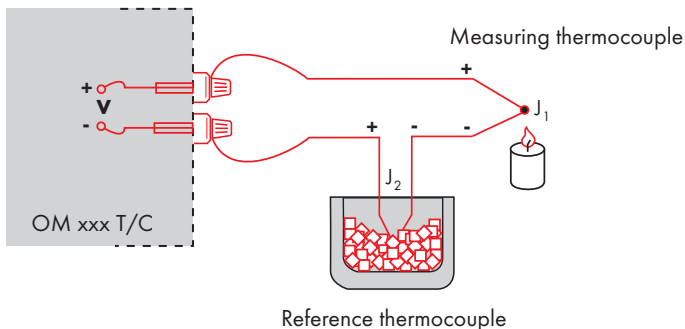
WITH REFERENCE THERMOCOUPLE

– 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 $CONECT.$ in the instrument menu to $INT2TC$ or $EXT2TC$
– when using a thermostat (a compensation box or environment with constant temperature) set in the instrument menu $CJC.TEM.$ its temperature (applies for setting $CONECT.$ to $EXT2TC$)
– if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu $CONECT.$ to $INT2TC.$ Based on this selection the measurement of the ambient temperatureis 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 $CONECT.$ in the instrument menu to $INT.1TC$ or $EXT.1TC$
– when measuring temperature without reference thermocouple the error in measured data may be as much as 10°C (applies for setting $CONECT.$ to $EXT.1TC$)

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
DIN MessBus: 7 bit, even parity, one stop bit

The transfer rate is adjustable in the instrument menu. 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 output board automatically identified by the instrument.

The commands are described in specifications you can find at na www.orbit.merret.cz/rs or in the OM Link program.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Event	Type	Protocol		Transmitted data													
Data solicitation (PC)	232	ASCII		#	A	A	<CR>										
	232	MessBus		No - data is transmitted permanently													
	485	ASCII		#	A	A	<CR>										
	485	MessBus		<SADR>	<ENQ>												
Data transmission (instrument)	232	ASCII		>	D	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<CR>		
	232	MessBus		<SADR>	D	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<ETX>	<BCC>	
	485	ASCII		>	D	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<CR>		
	485	MessBus		<SADR>	D	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<ETX>	<BCC>	
Confirmation of data acceptannce (PC) - OK	485	MessBus		<DLE>	1												
Confirmation of data acceptance (PC) - Bad				<NAK>													
Sending address (PC) prior command				<EADR>	<ENQ>												
Confirmation of address (instrument)				<SADR>	<ENQ>												
Command transmission (PC)	232	ASCII		#	A	A	N	P	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<CR>	
	232	MessBus		<STX>	$	N	P	(D)	(D)	(D)	(D)	(D)	<ETX>	<BCC>			
	485	ASCII		#	A	A	N	P	(D)	(D)	(D)	(D)	(D)	(D)	(D)	<CR>	
	485	MessBus		<SADR>	$	N	P	(D)	(D)	(D)	(D)	(D)	<ETX>	<BCC>			
Command confirmation (instrument)	232	ASCII OK		!	A	A	<CR>										
	232	ASCII Bad		?	A	A	<CR>										
	232	Messbus		No - data is transmitted permanently													
	485	ASCII OK		!	A	A	<CR>										
	485	ASCII Bad		?	A	A	<CR>										
	485	MessBus OK		<DLE>	1												
	485	MessBus Bad		<NAK>													
Command confirmation (inst.) - OK	485	MessBus		!	A	A	<CR>										
Command confirmati (instrument) - Bad				?	A	A	<CR>										
Instrument identification				#	A	A	1Y	<CR>									
HW identification				#	A	A	1Z	<CR>									
One-time transmission				#	A	A	7X	<CR>									
Repeated transmission				#	A	A	8X	<CR>									

LEGEND

#	35	23_H	Command beginning
A A		0...31	Two characters of instrument address (sent in ASCII - tens and units, e.g. "01", "99" universal
<CR>	13	$0D_H$	Carriage return
<SP>	32	20_H	Space
N, P			Number and command - command code
D			Data - usually characters "0"..."9", "-", "."; (D) - dp. and (-) may prolong data
R		$30_H...3F_H$	Relay and tare status
!	33	21_H	Positive confirmation of command (ok)
?	63	$3F_H$	Negative confirmation of command (point)
>	62	$3E_H$	Beginning of transmitted data
<STX>	2	02_H	Beginning of text
<ETX>	3	03_H	End of text
<SADR>	addresa	$+60_H$	Prompt to send from address
<EADR>	addresa	$+40_H$	Prompt to accept command at address
<ENQ>	5	05_H	Terminate address
<DLE>1	16 49	10_H 31_H	Confirm correct statement
<NAK>	21	15_H	Confirm error statement
<BCC>			Check sum -XOR

RELAY, TARE

Sign	Relay 1	Relay 2	Tare	Change relay 3/4
P	0	0	0	0
Q	1	0	0	0
R	0	1	0	0
S	1	1	0	0
T	0	0	1	0
U	1	0	1	0
V	0	1	1	0
W	1	1	1	0
p	0	0	0	1
q	1	0	0	1
r	0	1	0	1
s	1	1	0	1
t	0	0	1	1
u	1	0	1	1
v	0	1	1	1
w	1	1	1	1

Relay status is generated by command #AA6X <CR>.
The instrument immediately returns the value in the format >HH <CR>, where HH is value in HEX format and range $00_H...FF_H$. The lowest bit stands for „Relay 1", the highest for „Relay 8"

ERROR	CAUSE	ELIMINATION
E. B. U n	Number is too small (large negative) to be displayed	change DP setting, channel constant setting
E. B. Ov.	Number is too large to be displayed	change DP setting, channel constant setting
E. T. U n	Number is outside the table range	increase table values, change input setting (channel constant setting)
E. T. Ov.	Number is outside the table range	increase table values, change input setting (channel constant setting)
E. I. U n	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
E. I. Ov.	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. SET	Change of a linked item in the menu, Data in EEPROM outside the range	change of contiguous items, perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. CLR.	Memory was empty (presetting carried out)	upon repeated error statement send instrument for repair, possible failure in calibration

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

Description is cancelled by entering characters with code 00

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

INPUT

range is adjustbale			DC
±60 mV	>100 MOhm		Input U
±150 mV	>100 MOhm		Input U
±300 mV	>100 MOhm		Input U
±1200 mV	>100 MOhm		Input U

range is adjustbale			DC - option "A"
±0,1 A	< 300 mV		Input I
±0,25 A	< 300 mV		Input I
±0,5 A	< 300 mV		Input I
±1 A	< 30 mV		Input I
±5 A	< 150 mV		Input I
±100 V	20 MOhm		Input U
±250 V	20 MOhm		Input U
±500 V	20 MOhm		Input U

range is adjustbale			PM
0/4...20 mA	< 400 mV		Input I
±2 V	1 MOhm		Input U
±5 V	1 MOhm		Input U
±10 V	1 MOhm		Input U
±40 V	1 MOhm		Input U

range is adjustbale		OHM
0...100 Ohm		
0...1 kOhm		
0...10 kOhm		
0...100 kOhm		
Autorange		
Connection:	2, 3 or 4 wire	

Pt xxxx	-200°...850°C	RTD
Pt xxxx/3910 ppm	-200°...1 100°C	
Ni xxxx	-50°..250°C	
Cu/4260 ppm	-50°...200°C	
Cu/4280 ppm	-200°...200°C	
Type Pt:	EU > 100/500/1 000 Ohm, with 3 850 ppm/°C	
	US > 100 Ohm, with 3 920 ppm/°C	
	RU > 50/100 Ohm, with 3 910 ppm/°C	
Type Ni:	Ni 1 000/ Ni 10 000 with 5 000/6 180 ppm/°C	
Type Cu:	Cu 50/Cu 100 with 4 260/4 280 ppm/°C	
Connection:	2, 3 or 4 wire	

range is 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
Voltage of lin. pot.	2,5 VDC/6 mA	
	min. potentiometer resistance is 500 Ohm	

PROJECTION

Display:	999999, intensive red or green
	14-ti segment LED, digit height 14 mm
Projection:	±9999 (-99999...999999)
Decimal point:	adjustable - in menu
Brightness:	adjustbale - in menu

INSTRUMENT ACCURACY

TC:	50 ppm/°C	
Accuracy:	±0,1 % of range + 1 digit	
	±0,15 % of range + 1 digit	RTD, T/C
	Above accuracies apply for projection 9999	
Resolution:	0,01°/0,1°/1°	RTD
Rate:	0,1...40 measurements/s**	
Overload capacity:	10x (t < 100 ms) not for 400 V and 5 A,	
	2x (long-term)	
Linearisation:	by linear interpolation in 50 points	
	- solely via OM Link	
Digital filters:	Averaging, Floating average, Exponential filter, Rounding	
Comp. of conduct:	max. 40 Ohm/100 Ohm	RTD
Comp. of cold junct.:	adjustable	T/C
	0°...99°C or automatic	
Functions:	Tare - display resetting	
	Hold - stop measuring (at contact)	
	Lock - control key locking	
	MM - min/max value	
	Mathematic functions	
OM Link:	company communication interface for setting, operation and update of instrument SW	
Watch-dog:	reset after 400 ms	
Calibration:	at 25°C and 40 % of r.h.	

COMPARATOR

Type:	digital, adjustable in menu
Mode:	Hysteresis, From, Dosing
Limita:	-99999...999999
Hysteresis:	0...999999
Delay:	0...99,9 s
Outputs:	2x relays with switch-on contact (Form A)
	(230 VAC/30 VDC, 3 A)*
	2x relays with switch-off contact (Form C)
	(230 VAC/50 VDC, 3 A)*
	2x SSR (250 VAC/ 1 A)*
	2x/4x open collector (30 VDC/100 mA)
	2x bistabil relays (250 VAC/250 VDC, 3 A/0,3 A)*
Relay:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

* values apply for resistance load

DATA OUTPUTS

Protocols:	ASCII, DIN MessBus, MODBUS, PROBUS
Data format:	8 bit + no parity + 1 stop bit (ASCII)
	7 bit + even parity + 1 stop bit (MessBus)
Rate:	600...230 400 Baud
	9 600 Baud...12 Mbaud (PROFIBUS)
RS 232:	isolated, two-way communication
RS 485:	isolated, two-way communication,
	addressing (max. 31 instruments)
PROFIBUS	Data protocol SIEMENS

ANALOGO OUTPUTS

Type:	isolated, programmable with resolution of max.10 000 points, analog output corresponds with displayed data, type and range are adjustable
Non-linearity:	0,2 % of range
TC:	50 ppm/°C
Rate:	response to change of value < 150 ms
Voltage:	0...2 V/5 V/10 V
Curernt:	0...5/20 mA/4...20 mA
	- compensation of conduct to 500 Ohm/12 V or 1 000 Ohm/24 V

MEASURED DATA RECORD

Type RTC:	time-controlled logging of measured data into instrument memory, allows to log up to 250 000 values
Type FAST:	fast data logging into instrument memory, allows to log up to 8 000 values at a rate of 40 records/s
Transmission:	via data output RS 232/485 or via OM Link

EXCITATION

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

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
Dielectric strength:	4 kVAC after 1 min between supply and input
	4 kVAC after 1 min between supply and data/analog output
	4 kVAC after 1 min between supply and relay output
	2,5 kVAC after 1 min between supply and data/analog output
Overvoltage cat.:	EN 61010-1, A2
Insulation resistance:	for pollution degree II, measurement category III instrum.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
Seismic resistance:	IEC 980: 1993, čl. 6

**Table of rate of measurement in relation to number of inputs

Channels/Rate	40	20	10	5	2	1	0,5	0,2	0,1
No.of channels: 1 (Type: DC, PM, DU)	40,00	20,00	10,00	5,00	2,00	1,00	0,50	0,20	0,10
No.of channels: 2	5,00	2,50	1,25	1,00	0,62	0,38	0,22	0,09	0,05
No.of channels: 3	3,33	1,66	0,83	0,66	0,42	0,26	0,14	0,06	0,03
No.of channels: 4	2,50	1,25	0,62	0,50	0,31	0,19	0,11	0,05	0,02
No.of channels: 1 (Type: OHM, RTD, T/C)	5,00	2,50	1,25	1,00	0,62	0,38	0,22	0,09	0,05
No.of channels: 2	3,33	1,066	0,83	0,66	0,42	0,26	0,14	0,06	0,03
No.of channels: 3	2,50	1,25	0,62	0,50	0,31	0,19	0,11	0,05	0,02
No.of channels: 4	2,00	1,00	0,50	0,40	0,25	0,15	0,08	0,04	0,02

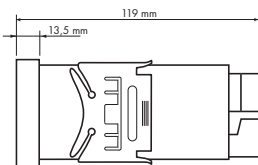*PI - Primary insulation, DI - Double insulation*

Front view
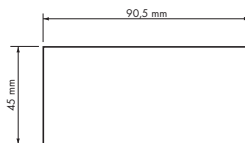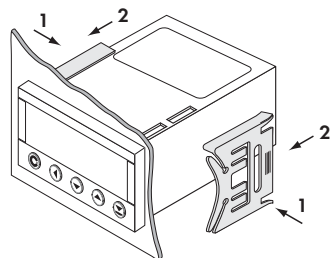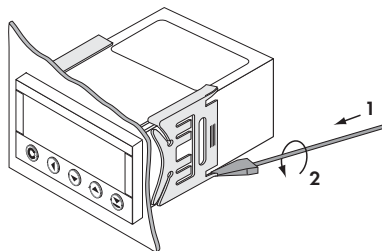

Panel cut

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 402UNI   A**

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 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: 4-digit programmable panel instrument

Type: **OM 402**

Version: UNI, PWR

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 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	

The product is furnished with CE label issued in 2006.

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, 18. March 2006   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