MODEL AM3030

SINGLE CHANNEL ALARM MONITOR

Installation Manual

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!

CONNECTION

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

CONTENTS 1

2 INSTRUMENT DESCRIPTION

2.1 Description

The AM3030 model series are 30 LED, 3-colour panel programmable horizontal bar graph designed for maximum efficiency and user comfort while maintaining their favorable price.

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

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:	30-segment LED 3-color bar graph + 6-digit display -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)

DIGITAL FILTERS

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

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)
- access without password

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

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 signaled 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.

3 INSTRUMENT CONNECTION

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 abiding by the above mentioned principles.

MEASURING RANGES

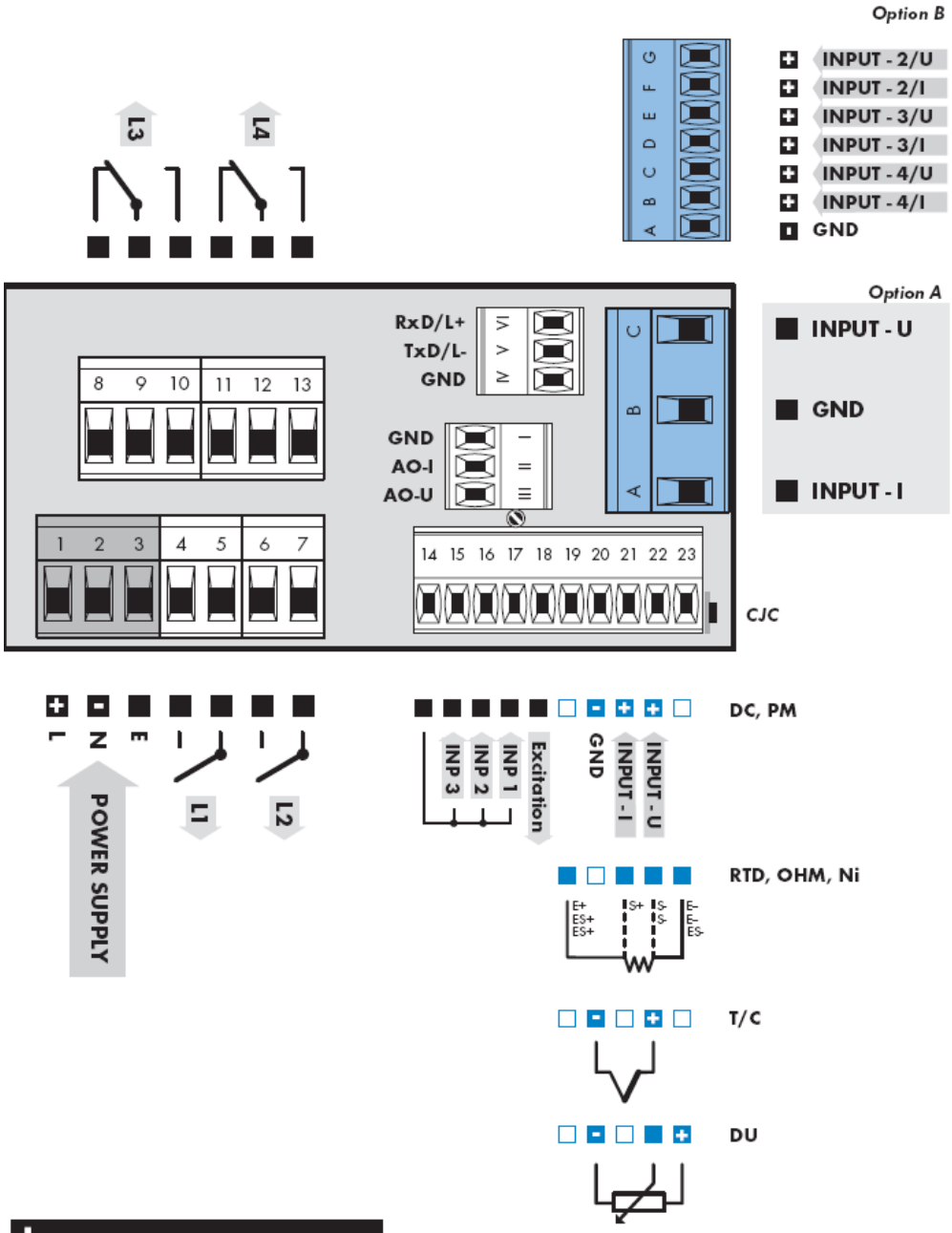
Type	Input I	Input U
DC	0...60/150/300/1 200 mV	
PM	0...5/20 mA/4...20 mA	±2/±5/±10/±40 V
OHM	0...0,1/1/10/100 kΩ	
RTD-Pt	Pt 100/Pt 500/ Pt 1 000	
RTD-Ni	Ni 1 000/10 000	
T/C	J/K/T/E/B/S/R/N	
DU	Linear potentiometer (min. 500 Ω)	

OPTION "A"

Type	Input I	Input U
DC	0...1/5 A	±30/120/500 V

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



!

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

4 INSTRUMENT SETTING

Setting PROFI

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

Setting LIGHT

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

Setting USER

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

4.1 Setting

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

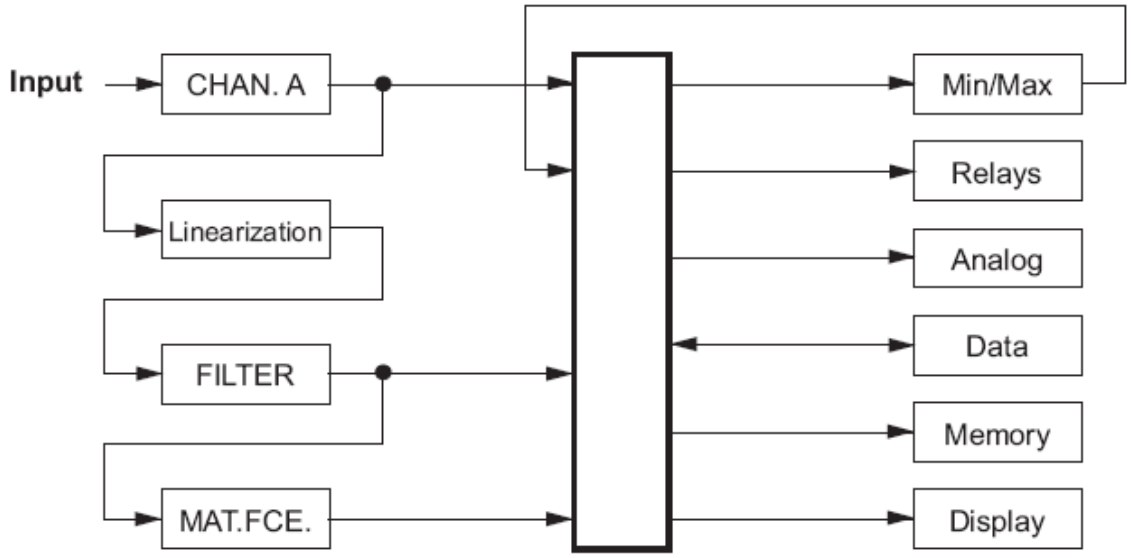
LIGHT Simple programming menu
- contains solely items necessary for instrument setting and is protected by optional number code

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

USER User programming menu
- may contain arbitrary items selected from the programming menu (LIGHT/PROFI), which determine the right (see or change)
- access without password

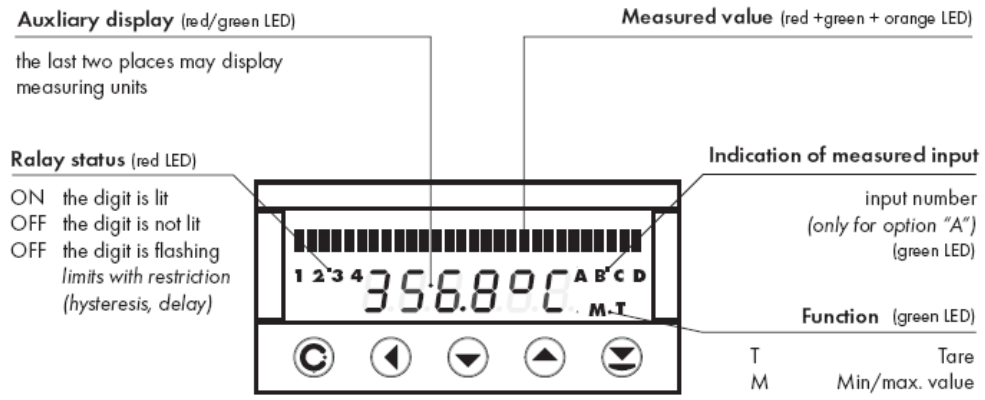
All programmable parameters are stored in the EEPROM memory (they hold even after the instrument is switched off).

Scheme of processing the measured signal



4 INSTRUMENT SETTING

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



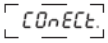
Symbols used in the instructions

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

DEF — values preset from manufacture

symbol indicates a flashing light (symbol)

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



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


after pressing the key the set value will not be stored


after pressing the key the set value will be stored


30 continues on page 30

Setting the decimal point and the minus sign

DECIMAL POINT

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

THE MINUS SIGN

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

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

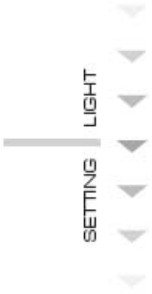
- in **LIGHT** or **PROFI** menu
- no items permitted in **USER** menu from manufacture
- on items marked by inverted triangle

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

5 SETTING light

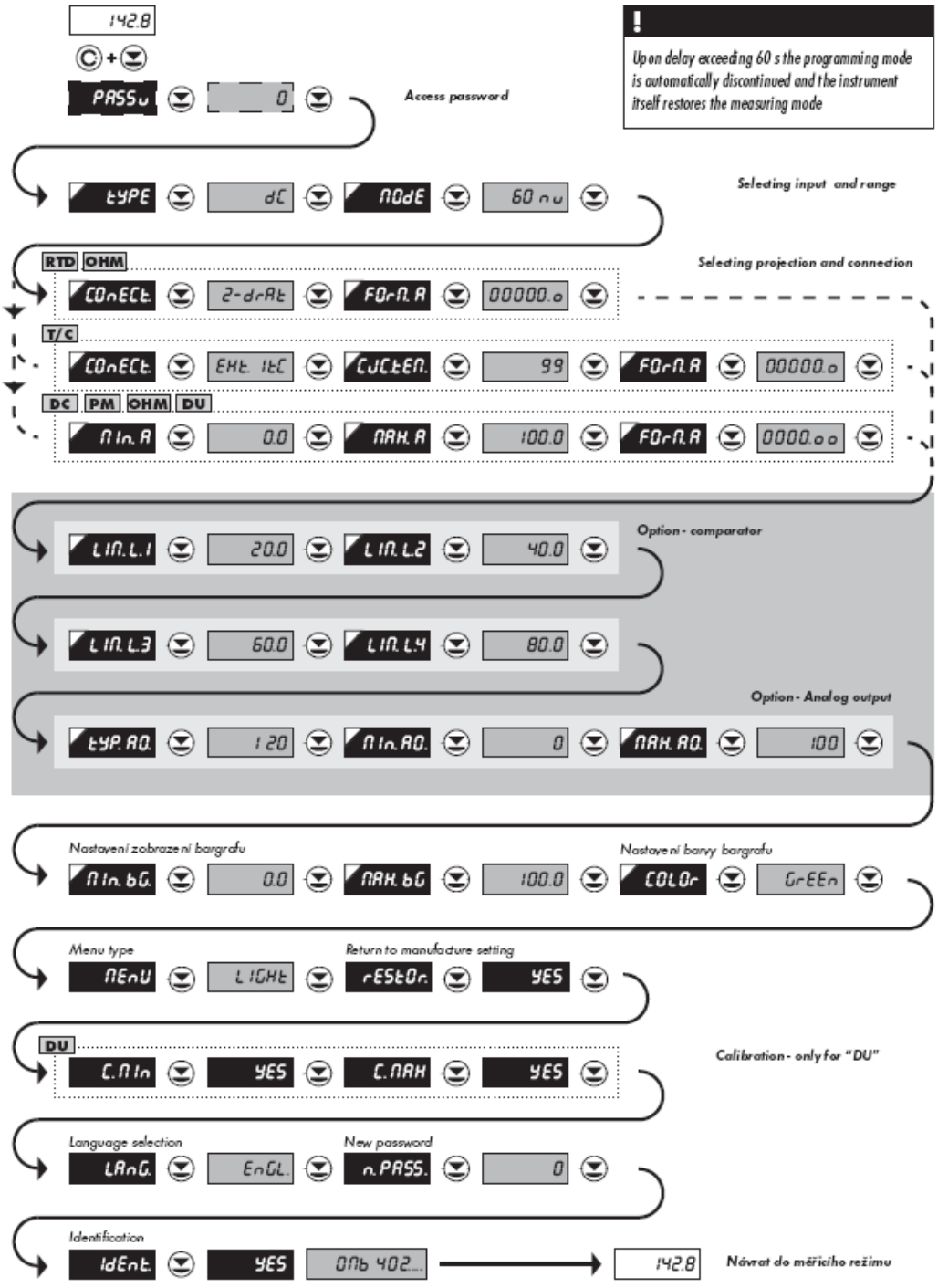
5.0 Setting "LIGHT"

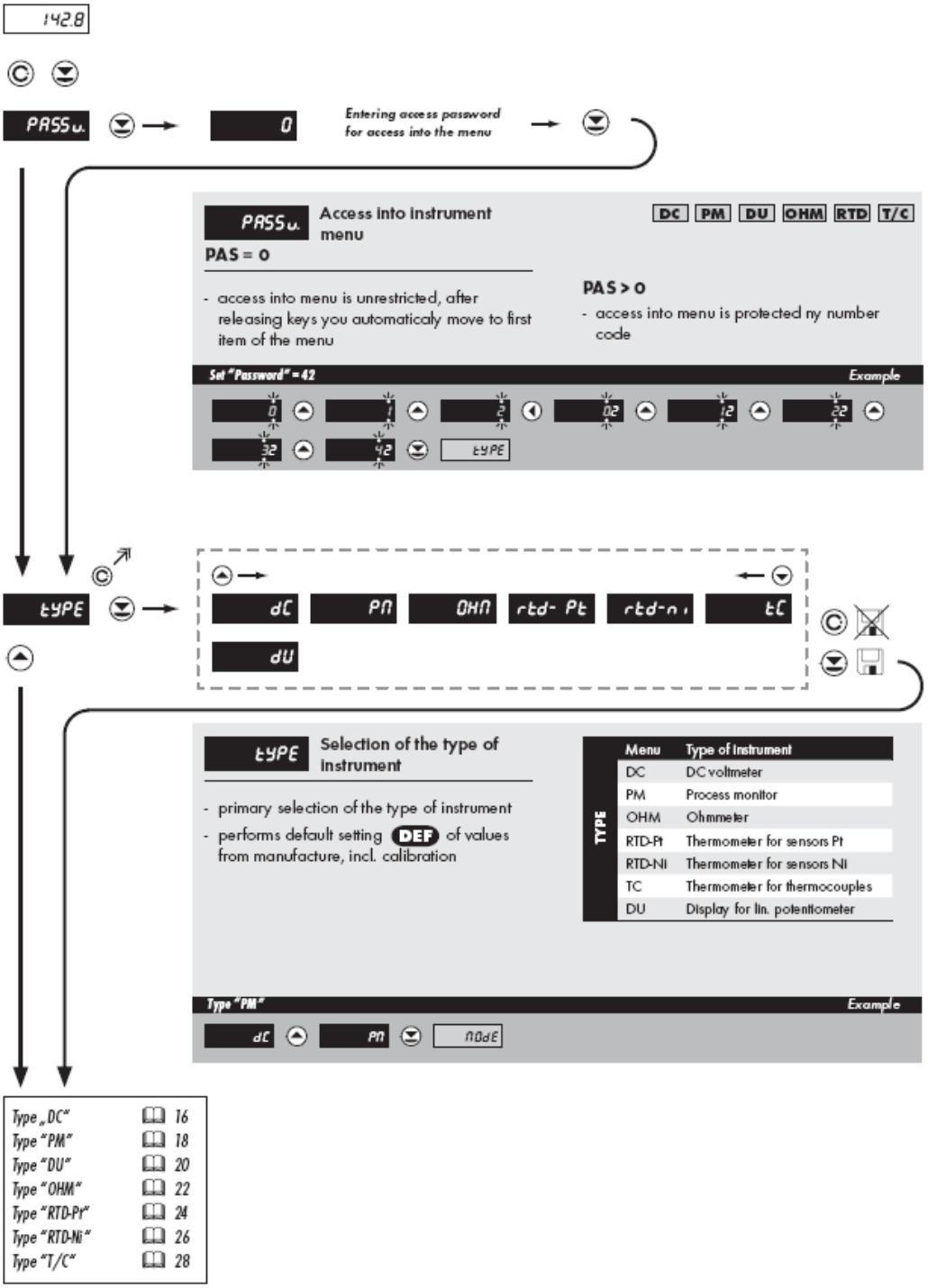
LIGHT Simple programming menu
- contains only items necessary for instrument setting and is protected by optional number code

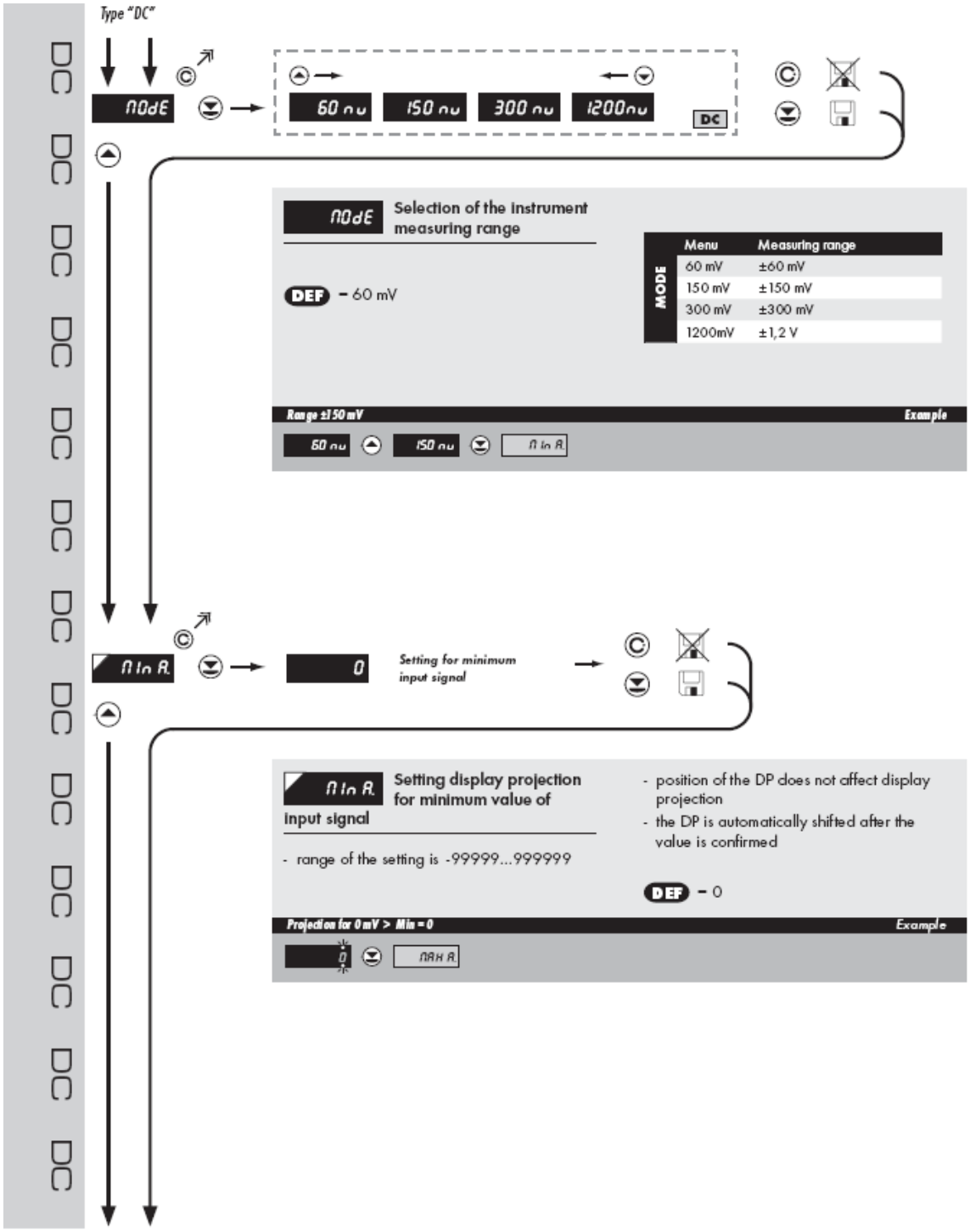


- For capable users
- Only items necessary for instrument setting
- Access is password protected
- Possibility to arrange items of the „User" menu
- Linear menu structure

Preset from manufacture	
Password	*"0"*
Menu	*LIGHT*
USER menu	*off*
Setting the items	DEF


142.8
C + ▼
PASSu
0
Access password
!
Upon delay exceeding 60 s the programming mode is automatically discontinued and the instrument itself restores the measuring mode
tYPE
dC
MOdE
60 nu
Selecting input and range
RTD OHM
COnECt.
2-drAt
FOrM.A
00000.0
Selecting projection and connection
T/C
COnECt.
EHt. ItC
CJCtEn.
99
FOrM.A
00000.0
DC PM OHM DU
MIn.A
0.0
MAX.A
100.0
FOrM.A
0000.00
LIN.L.1
20.0
LIN.L2
40.0
Option - comparator
LIN.L.3
60.0
LIN.L4
80.0
Option - Analog output
tYP.AO.
I 20
MIn.AO.
0
MAX.AO.
100
Nastavení zobrazení bargrafu
MIn.bG.
0.0
MAX.bG
100.0
Nastavení barvy bargrafu
COLOr
GrEEn
Menu type
MEnU
LIGHt
Return to manufacture setting
rESEtOr.
YES
DU
C.MIn
YES
C.MAX
YES
Calibration - only for "DU"
Language selection
LAnG.
EnGL.
New password
n.PASS.
0
Identification
IdEnt.
YES
ONb 402...
142.8
Návrat do měřicího režimu


142.8
PASSu.
0
Entering access password for access into the menu
PASSu. Access into instrument menu
DC PM DU OHM RTD T/C
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 tYPE
tYPE
dC PM OHM rtd- Pt rtd-n i tC dU
tYPE Selection of the type of instrument
- primary selection of the type of instrument
- performs default setting DEF of values from manufacture, incl. calibration
TYPE
Menu | Type of instrument
DC | DC voltmeter
PM | Process monitor
OHM | Ohmmeter
RTD-Pt | Thermometer for sensors Pt
RTD-Ni | Thermometer for sensors Ni
TC | Thermometer for thermocouples
DU | Display for lin. potentiometer
Type "PM"
Example
dC PM nOdE
Type „DC" 16
Type "PM" 18
Type "DU" 20
Type "OHM" 22
Type "RTD-Pt" 24
Type "RTD-Ni" 26
Type "T/C" 28



MODE Selection of the instrument measuring range

DEF – 60 mV

MODE	Menu	Measuring range
	60 mV	±60 mV
	150 mV	±150 mV
	300 mV	±300 mV
	1200mV	±1,2 V

Range ±150 mV — *Example*

60 mV ▲ 150 mV ▼ MIN A.

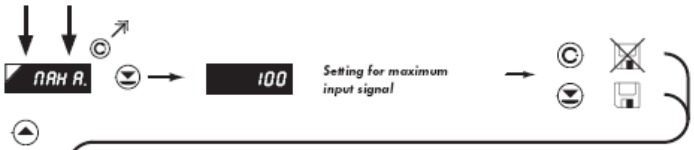
MIN A. Setting display projection for minimum value of input signal

- 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 = 0 — *Example*

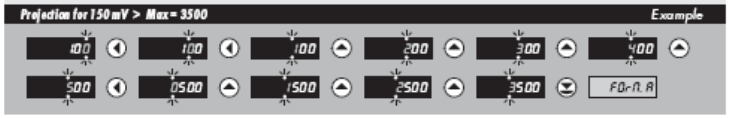
0 ▼ MAX A.



nAH 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



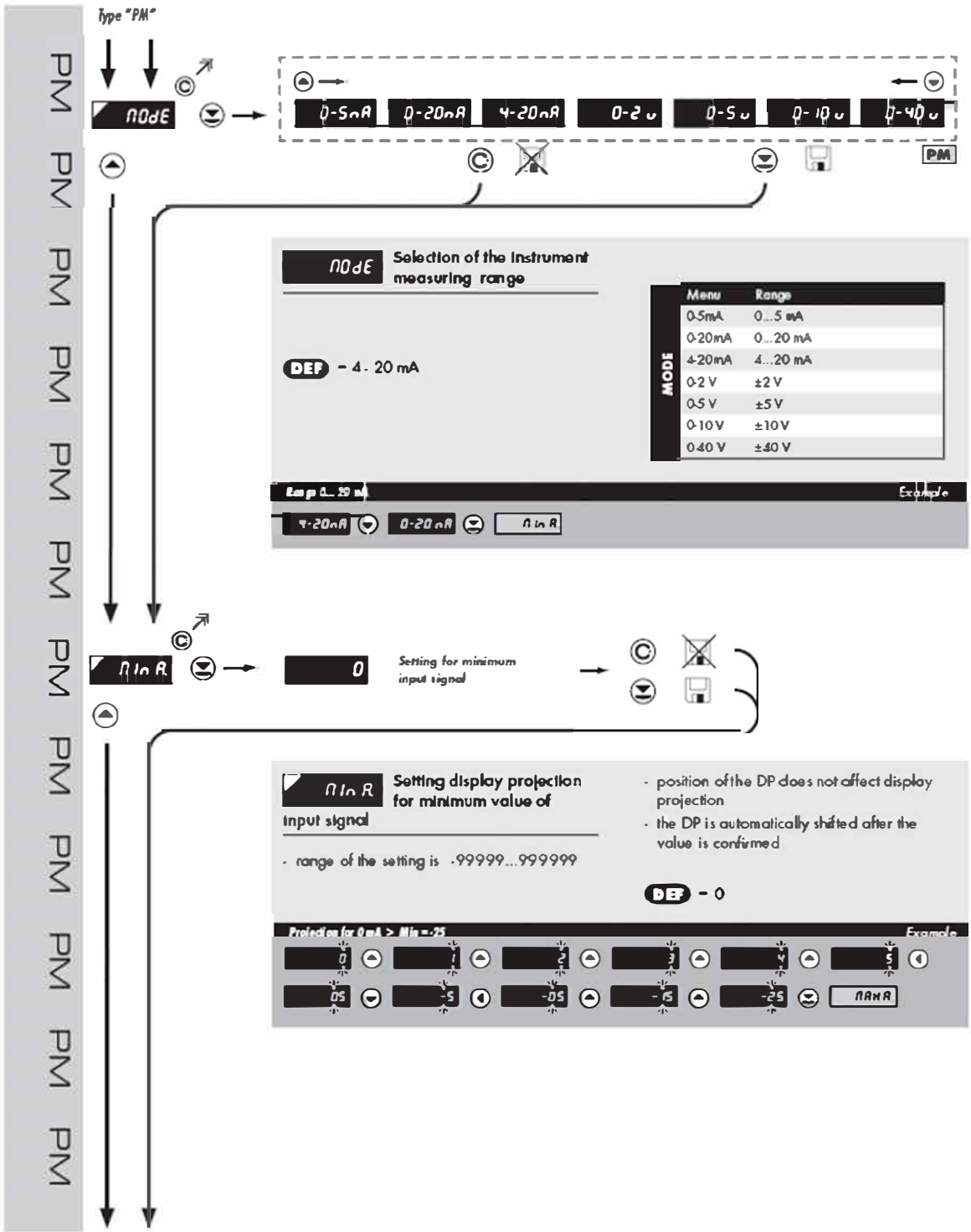
FOrM. A **Setting projection of the decimal point**

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

DEF – 0000.oo

*subsequent item on the menu depends on instrument equipment

30



PM PM PM PM PM PM PM PM PM PM PM

nAH 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 = 2500 *Example*

FOrM. A **Setting projection of the decimal point**

DEF – 0000.00

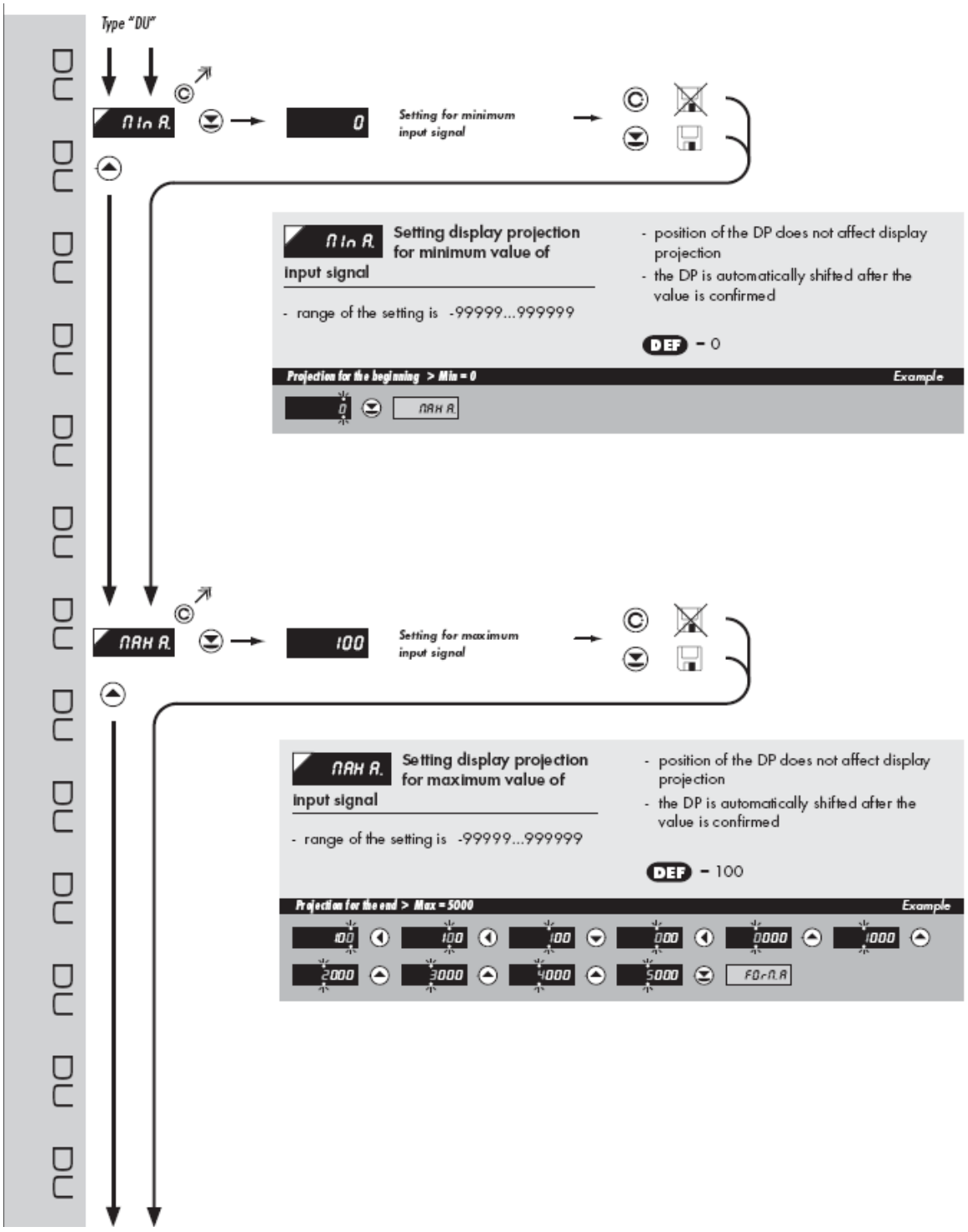
- positioning of the DP is set here in the measuring mode

Projection of DP on display > 00000.0 *Example*

* subsequent item on the menu depends on instrument equipment

30

PM PM PM PM PM PM PM PM PM PM



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 = 0 *Example*

0 MAX A.

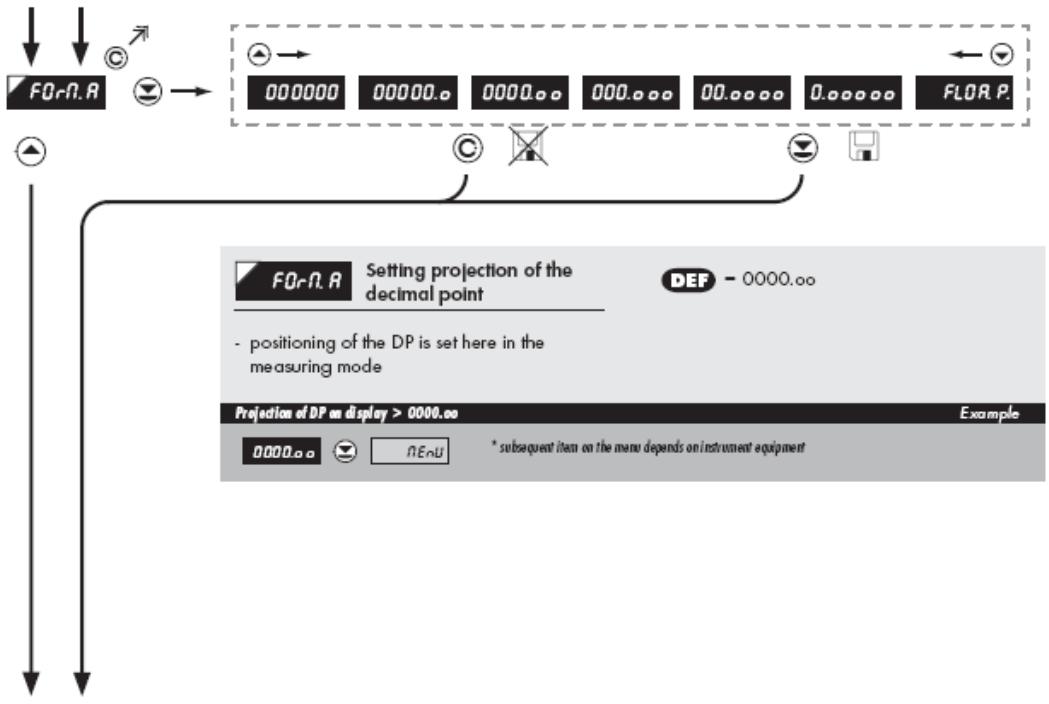
MAX A. **Setting display projection for maximum value of input signal**

- 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 = 5000 *Example*

100 100 100 000 0000 1000 2000 3000 4000 5000 FOrMA



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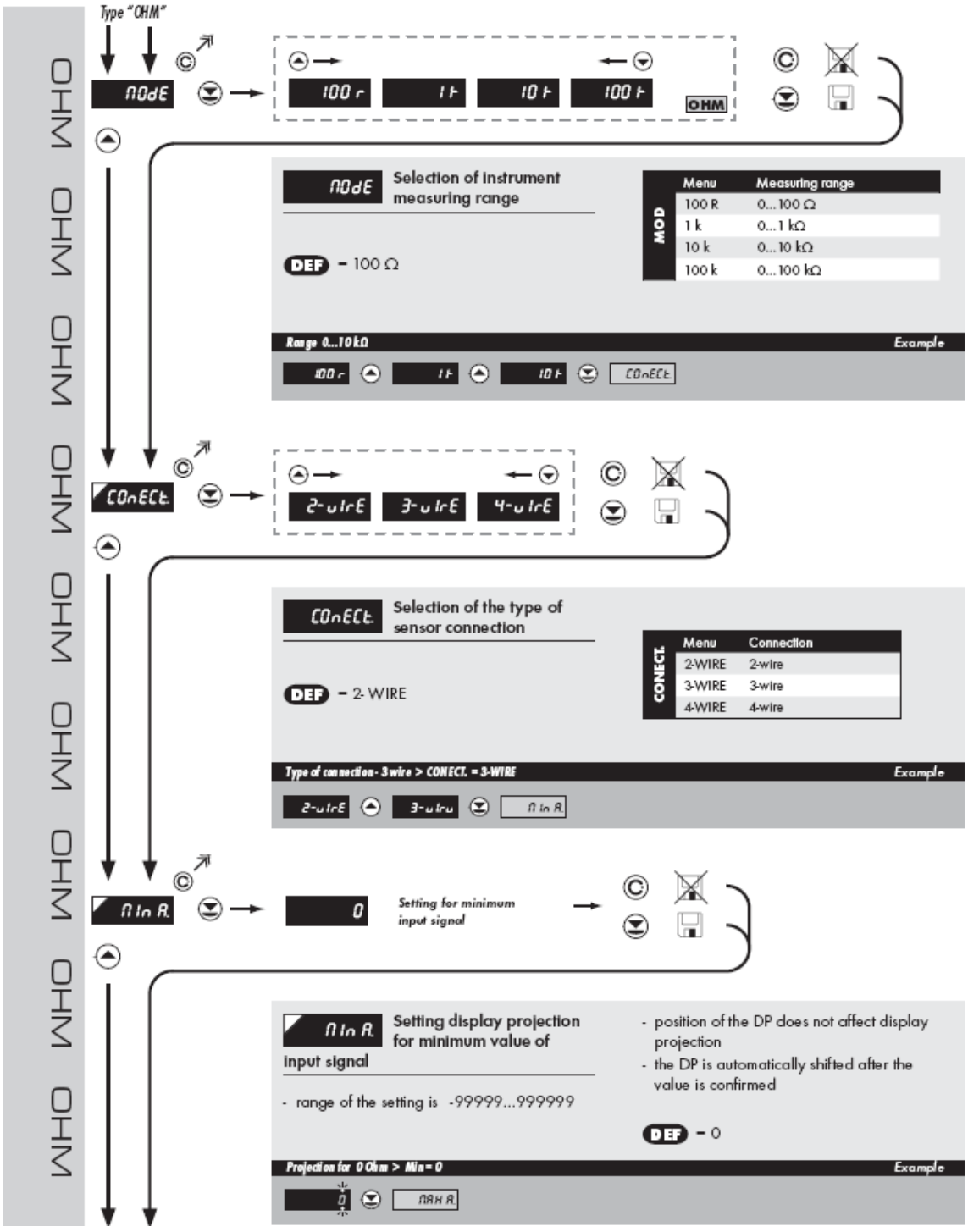
Calibration of the beginning and the end of range of linear potentiometer is on page 35

DC DC DC DC DC DC DC DC DC DC DC DC


OHM WHO OHM WHO OHM WHO OHM WHO OHM
Type "OHM"
nOdE
100 r
1 k
10 k
100 k
OHM
nOdE Selection of instrument measuring range
DEF – 100 Ω
MOD
Menu
Measuring range
100 R
0...100 Ω
1 k
0...1 kΩ
10 k
0...10 kΩ
100 k
0...100 kΩ
Range 0...10kΩ
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- 3wire > CONECT. = 3-WIRE
Example
2-wIrE
3-wIrE
nInA
nInA
0
Setting for minimum input signal
nInA 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 = 0
Example
0
nAxA

nAH 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

FOrM.A **Setting projection of the decimal point**

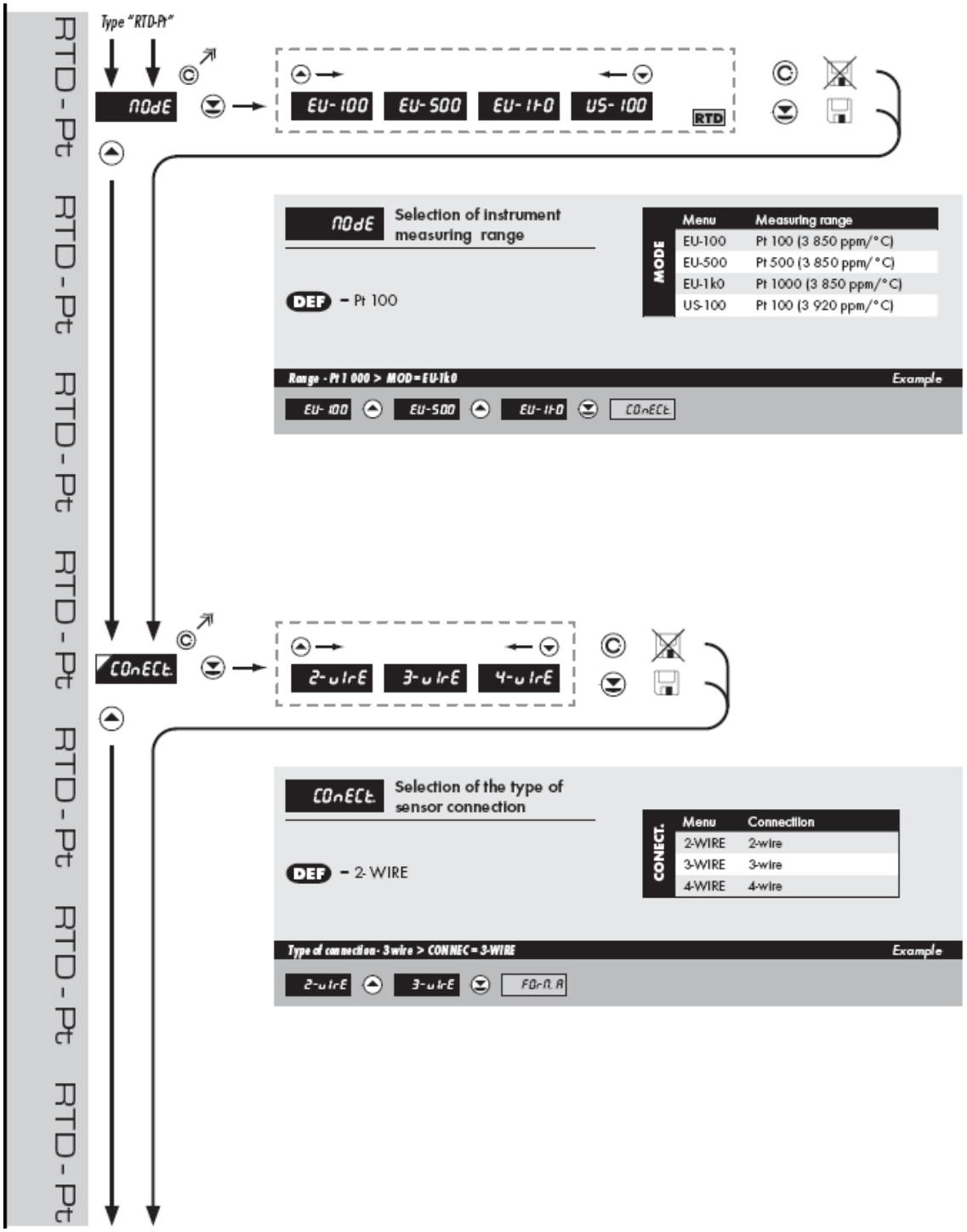
DEF – 0000.oo

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

* subsequent item on the menu depends on instrument equipment

30

OHM OHM OHM OHM OHM OHM OHM OHM



nOdE Selection of instrument measuring range

DEF – Pt 100

MODE	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)

Range - Pt 1 000 > MOD = EU-1k0 — *Example*

EU-100 ▲ EU-500 ▲ EU-1k0 ▼ COnECt

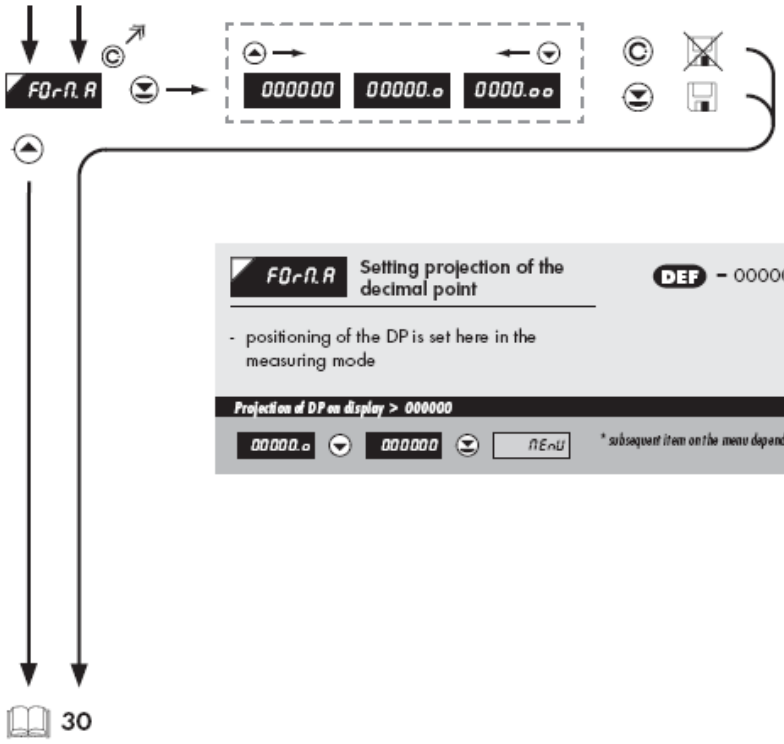
COnECt Selection of the type of sensor connection

DEF – 2-WIRE

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

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

2-uIrE ▲ 3-uIrE ▼ FOrM A



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FOrM.A Setting projection of the decimal point

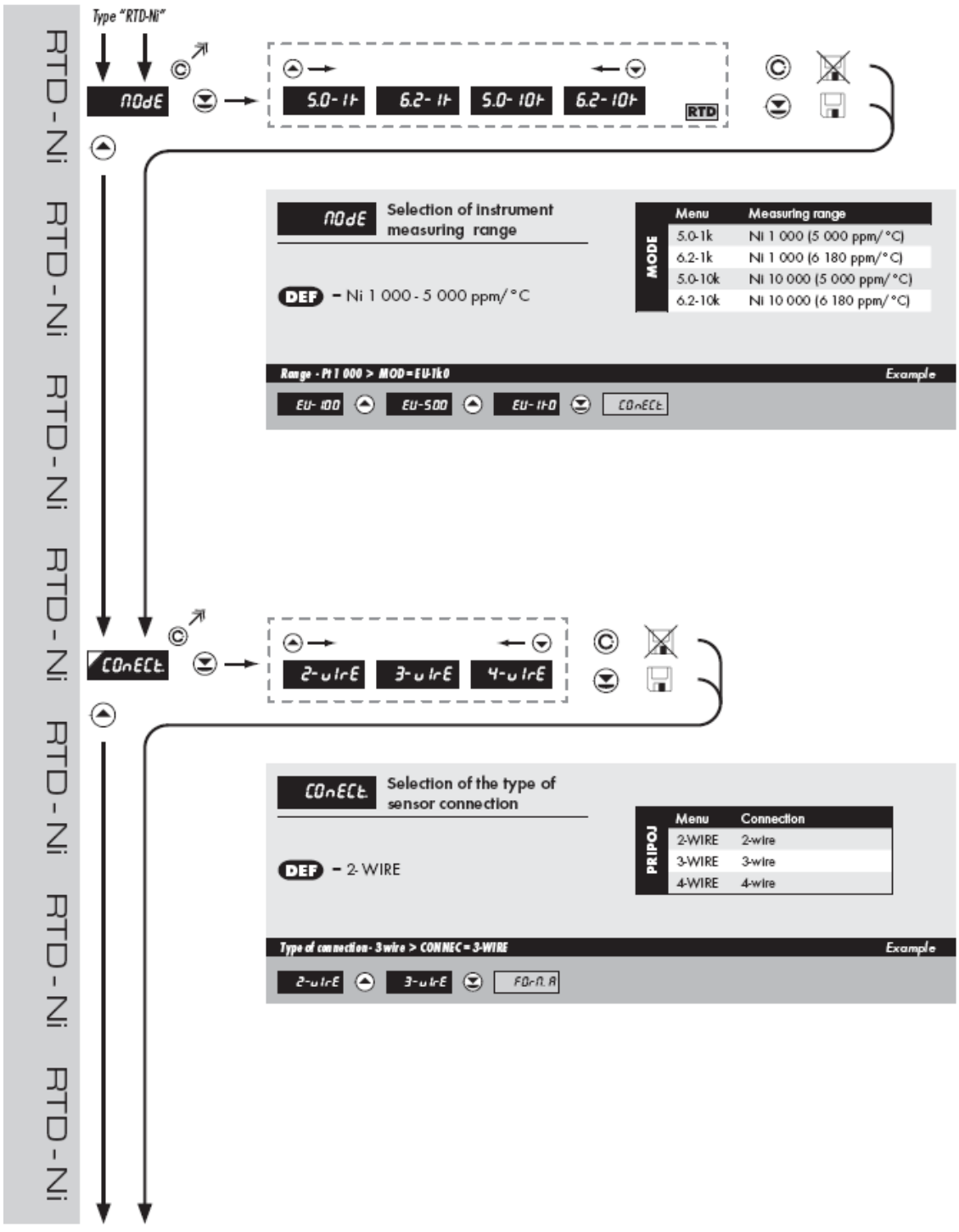
DEF – 00000.o

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

Projection of DP on display > 000000 *Example*

00000.o → 000000 → nEnU

* subsequent item on the menu depends on instrument equipment



nOdE Selection of instrument measuring range

DEF – Ni 1 000 - 5 000 ppm/ °C

MODE	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)

Range - Pt 1 000 > MOD=EU-1k0 — *Example*

EU-100 ▲ EU-500 ▲ EU-1k0 ▼ COnECt

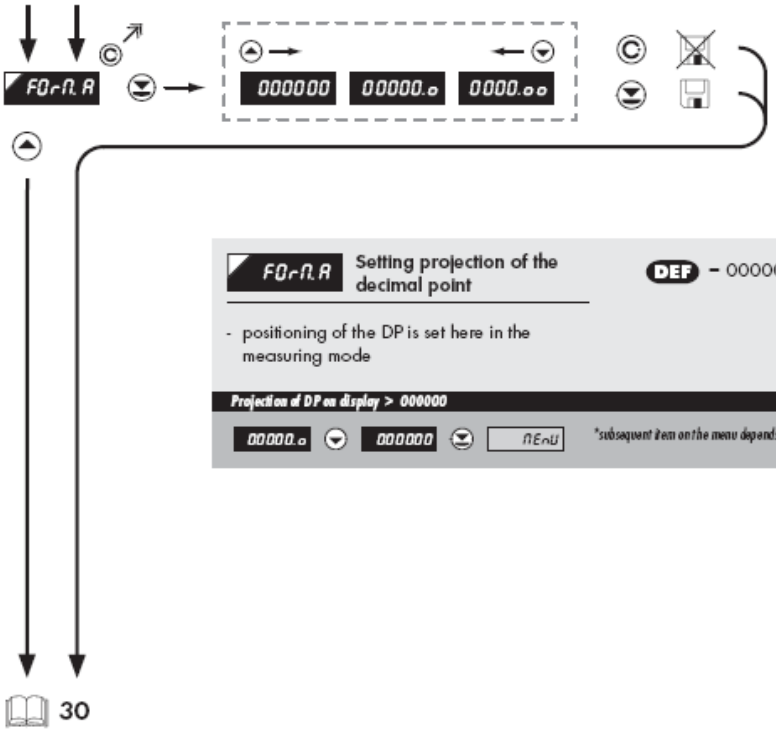
COnECt Selection of the type of sensor connection

DEF – 2-WIRE

PRIPOJ	Menu	Connection
	2-WIRE	2-wire
	3-WIRE	3-wire
	4-WIRE	4-wire

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

2-uirE ▲ 3-uirE ▼ 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*

00000.o → 000000 → MENU

*subsequent item on the menu depends on instrument equipment

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

nOdE Selection of the type of thermocouple

- setting the input range depends on the measuring range ordered

DEF – Type "J"

MODE	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

Type of thermocouple "K" — Example

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

!

Measuring temperature of CJC is on instrument brackets. Method In. 1 (see page 56)

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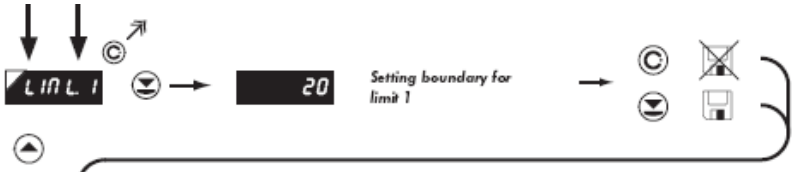


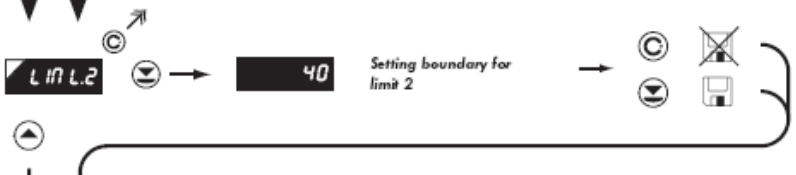
LIN L.1 **Setting boundary for limit 1**

- 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 > L1 = 32 — Example



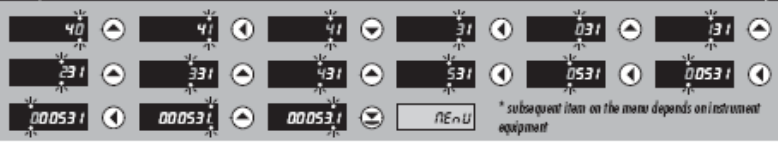
LIN L.2 **Setting boundary for limit 2**

- 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 > L2 = 53.1 — Example



* subsequent item on the menu depends on instrument equipment

!

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

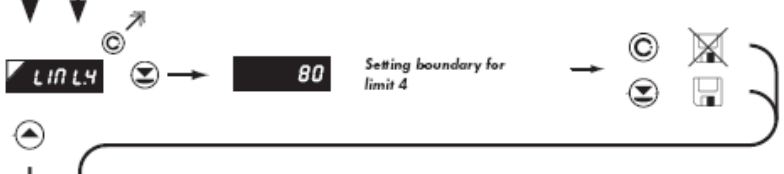
L IN L3 **Setting boundary for limit 3**

- 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 > L3=85 *Example*



L IN L4 **Setting boundary for limit 4**

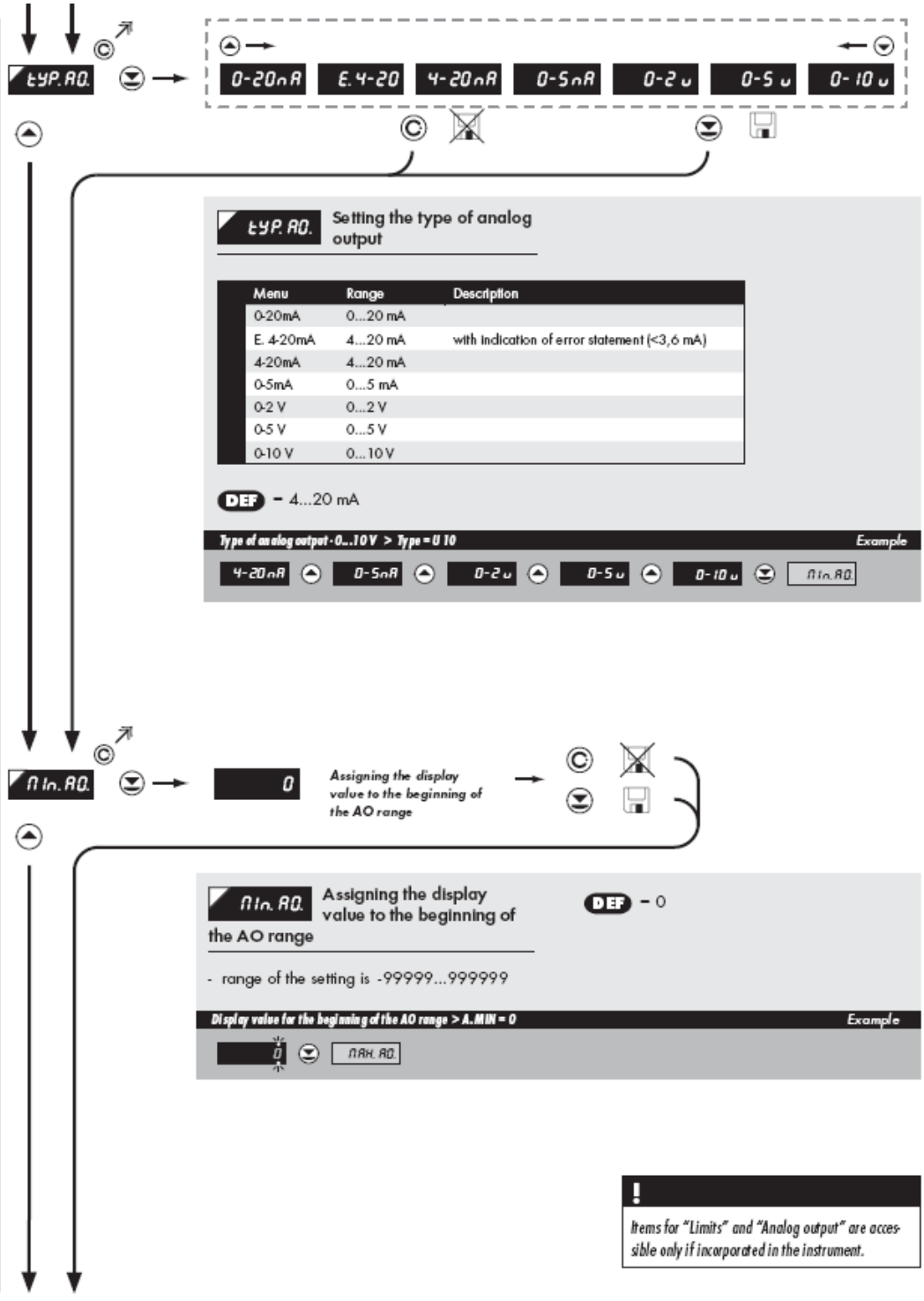
- range of the setting is -99999...999999
- default "Hysteresis"=0 "Delay"=0

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

DEF = 80

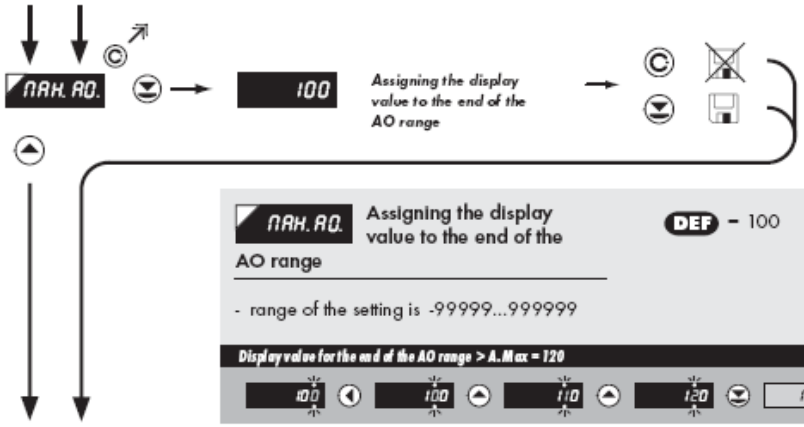
Setting limit 4 > L4=103 *Example*

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



!

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

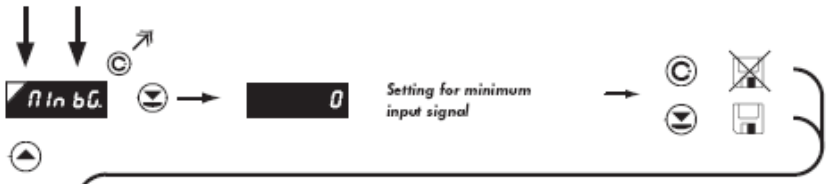


MAX. AO. Assigning the display value to the end of the AO range

DEF – 100

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

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



MIn bG. **Setting bargraph projection for minimum input signal value**

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

DEF – 0

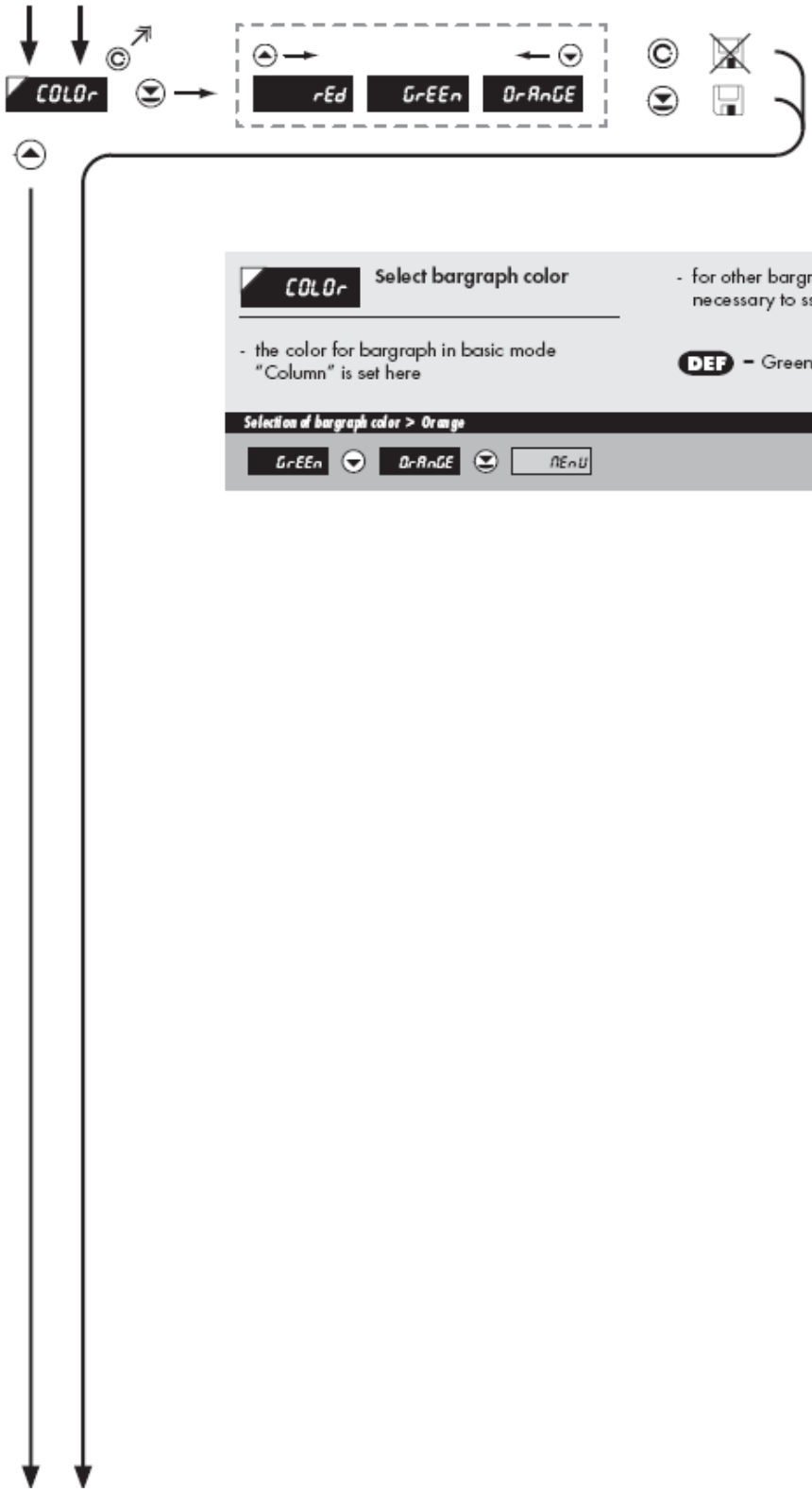
Projection for the beginning > Min = 0 *Example*

MAH bG. **Setting bargraph projection for maximum input signal value**

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

DEF – 100

Projection for the end > Max = 5000 *Example*



COLOr **Select bargraph color**

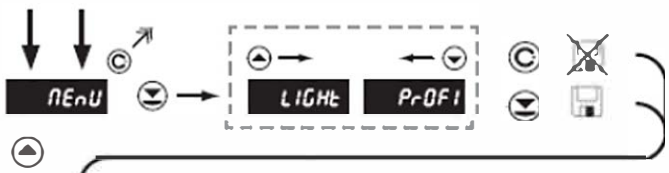
- the color for bargraph in basic mode "Column" is set here

- for other bargraph working modes it is necessary to sswitch to the "PROFI" menu

DEF – Green

Selection of bargraph color > Orange *Example*

GrEEn ▼ OrAnGE ▼ MEnU



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

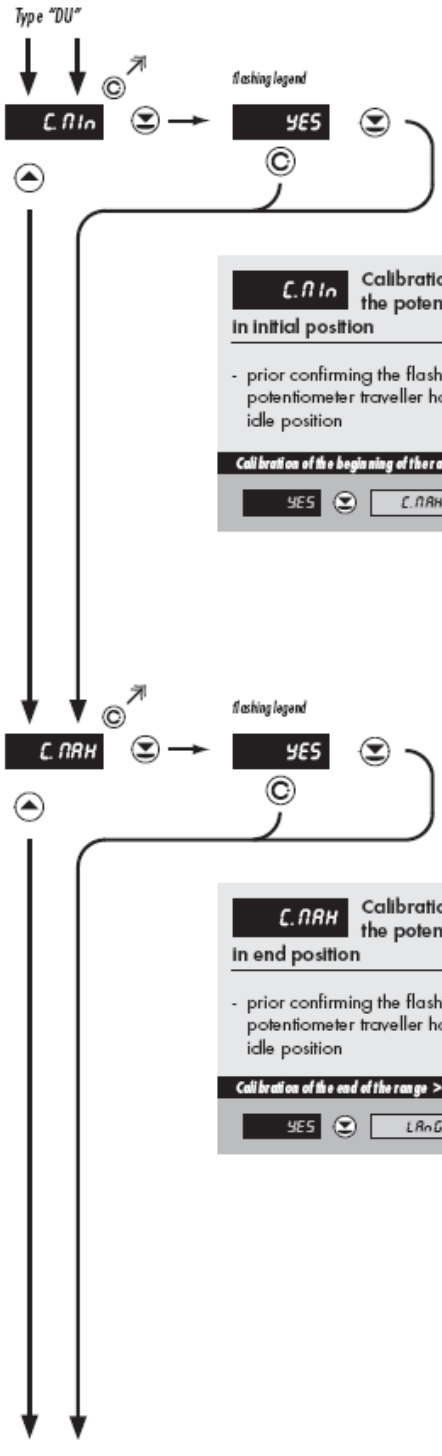
Menu LIGHT >MENU=LIGHT — Example

rESt0r **Restoration of manufacture instrument setting**

- in the event of error setting or calibration it is feasible to restore manufacture setting. Prior to execution of any modifications you will be osked to confirm your selection. (YES)
- loading manufacture calibration and primary setting of items on the menu (DEF)

Restoration of manufacture setting > RESTOR. — Example

* subsequent item on the menu depends on instrument type, for "DU" > "K MIN"



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*

YES → C.MAX

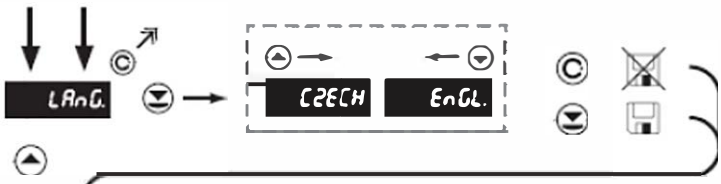
C.MAX **Calibration of input range - the potentiometer traveller in end position**

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*

YES → LAnG.



LAnG. Selection of language in instrument menu

- selection of language version of the instrument menu

DEF – ENGL

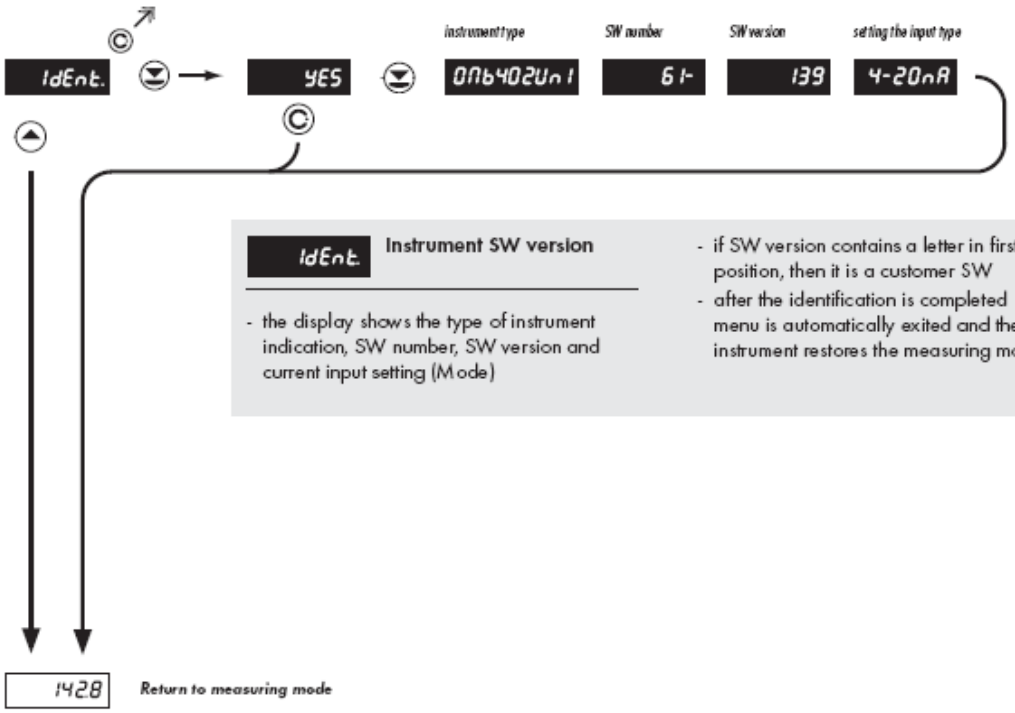
Language selection - ENGLISH > LANG. = ENGL. Example

n. PASS. Setting new access password

- access password for menu LIGHT/PROFI
- range of the number code 0...9999
- upon setting the password to "000" the access to menu LIGHT/PROFI is free without prompt to enter it
- in the event of loss universal password "8177" may be used

DEF – 0

New password - 341 > N.PASSW. = 341 Example



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 SETTING profi

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**

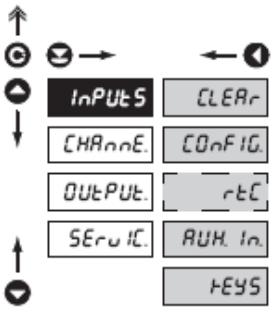
- For expert users
- Complete instrument menu
- Access is password protected
- Possibility to arrange items of the „User" menu
- Tree menu structure

Switching over to "PROFI" menu

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

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

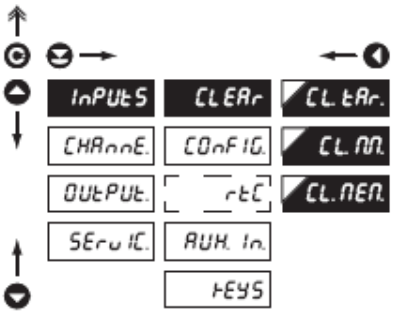
6.1 Setting "PROFI" - INPUT



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
- AUX. In. — Setting external inputs functions
- KEYS — Assigning further functions to keys on the instrument

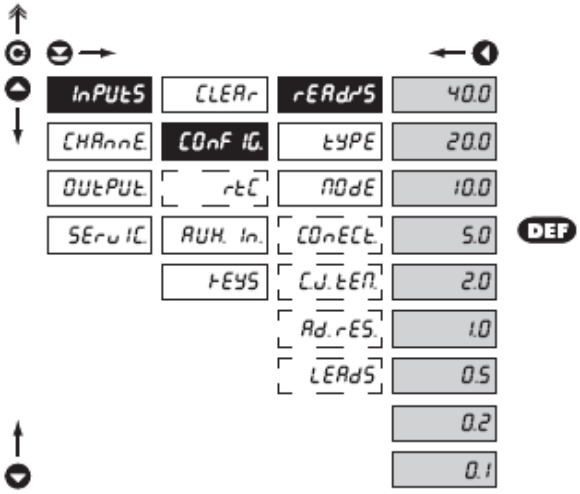
6.1.1 Resetting internal values



CLEAr — **Resetting internal values**

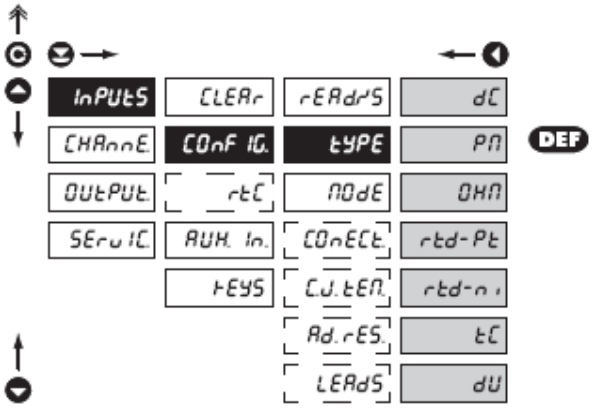
- CL.tAr. — Tare resetting
- CL.M.M. — Resetting min/max value
  - resetting memory for the storage of minimum and maximum value achieved during measurement
- CL.MEM. — Resetting the instrument memory
  - resetting memory with data measured in the "FAST" or "RTC" modes
  - not in standard equipment

6.1.2a Selection of measuring rate

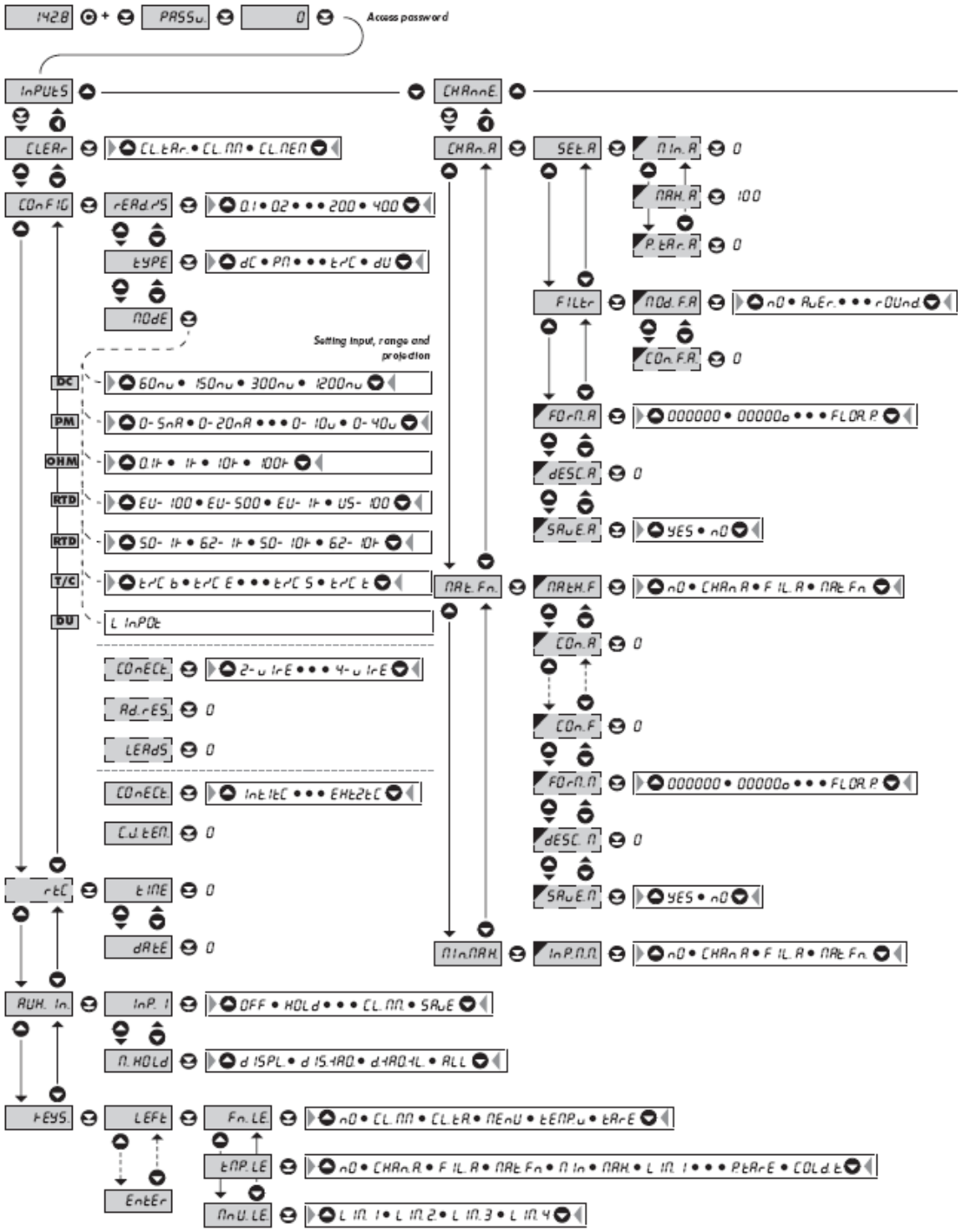


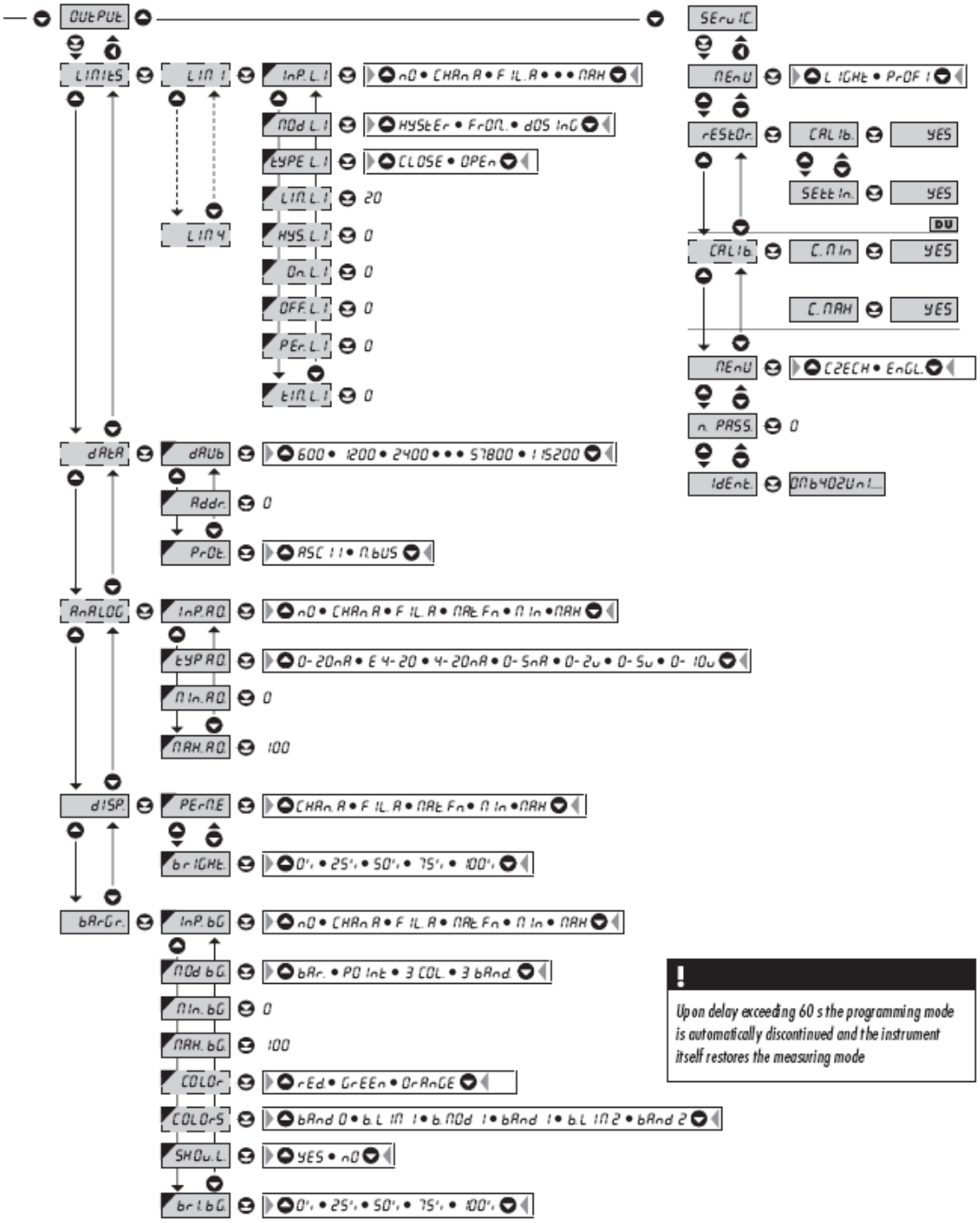
rEAd.rS	Selection of measuring rate
40.0	40,0 measurements/s
20.0	20,0 measurements/s
10.0	10,0 measurements/s
5.0	5,0 measurements/s
2.0	2,0 measurements/s
1.0	1,0 measurement/s
0.5	0,5 measurements/s
0.2	0,2 measurements/s
0.1	0,1 measurements/s

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-ni	Thermometer for Ni xxxx
tC	Thermometer pro thermocouples
dU	Display for linear potentiometers

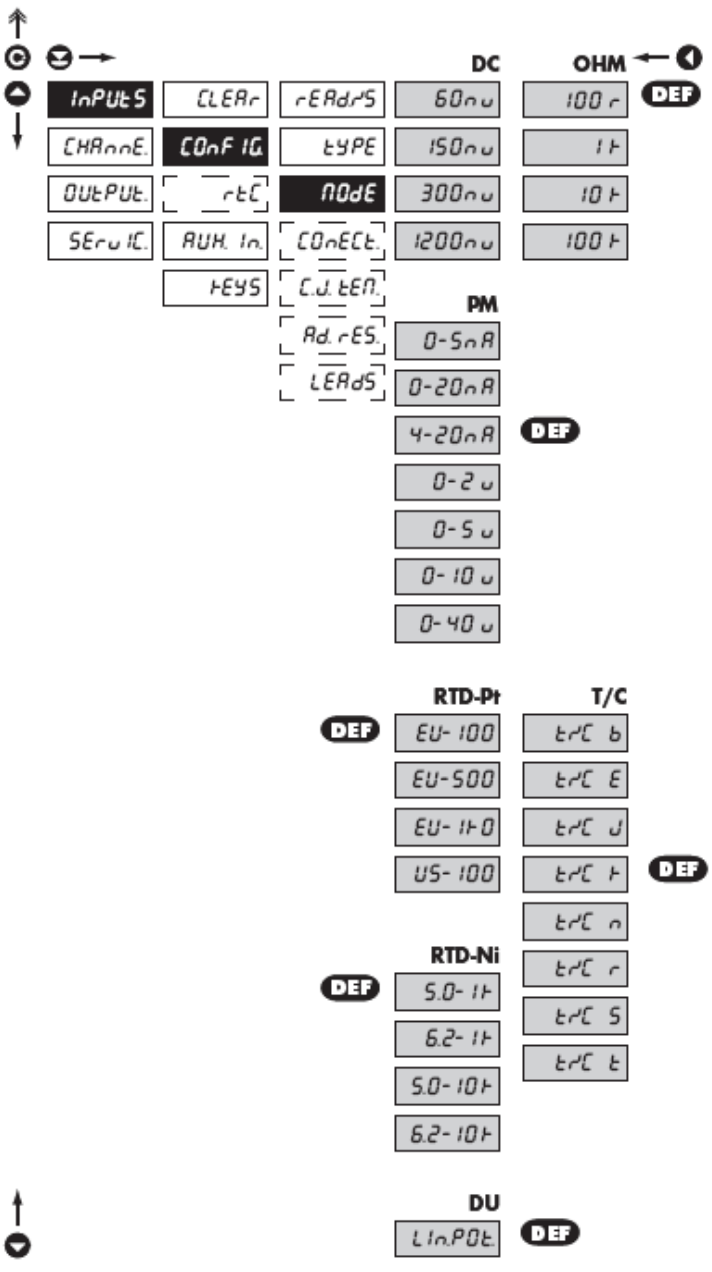

1428 + PASSw 0
Access password
InPUtS
CHAnnE
CLEAr
CLEAr • CL.nn • CL.nEn
CHAn.A
SEt.A
Min.A 0
MAX.A 100
P.tAr.A 0
CONFIG
rEAdrS
0.1 • 02 • • • 200 • 400
tYPE
dC • PM • • • trC • dU
nOdE
Setting input, ranges and projection
DC
60mv • 150mv • 300mv • 1200mv
PM
0-5mA • 0-20mA • • • 0-10v • 0-40v
OHM
0.1k • 1k • 10k • 100k
RTD
Eu-100 • Eu-500 • Eu-1k • US-100
RTD
So-1k • 62-1k • So-10k • 62-10k
T/C
trC b • trC E • • • trC S • trC t
DU
L InPOt
CONnECt
2-w trE • • • 4-w trE
Ad.rES 0
LEAdS 0
CONnECt
Int1tC • • • Ext2tC
CJtEM 0
rtC
tIME 0
dAtE 0
FILtEr
nOd.FA
nO • AvEr. • • • rOUnd
CON.FA 0
FOrM.A
000000 • 00000. • • • FLOA.P
dESC.A 0
SAvE.A
YES • nO
MAt.Fn
MAtH.F
nO • CHAn.A • FIL.A • MAt.Fn
CON.A 0
CON.F 0
FOrM.M
000000 • 00000. • • • FLOA.P
dESC.M 0
SAvE.M
YES • nO
MinMAX
InP.M.M
nO • CHAn.A • FIL.A • MAt.Fn
AUX. In.
InP. 1
OFF • HOLd • • • CL.nn • SAvE
M.HOLd
d ISPL • d IS.AAO • d AAO.AL • ALL
KEYS.
LEFt
Fn.LE
nO • CL.nn • CL.tA • MEnU • tEMPu • tArE
tMP.LE
nO • CHAn.A • FIL.A • MAt.Fn • M.In • MAX • L IN. 1 • • • PtArE • COLd t
EntEr
MnU.LE
L IN. 1 • L IN.2 • L IN.3 • L IN.4



!

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



nOdE Selection of instrument measuring range

DC

Menu	Measuring range
60 mV	±60 mV
150 mV	±150 mV
300 mV	±300 mV
1200mV	±1,2 V

PM

Menu	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

OHM

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

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)

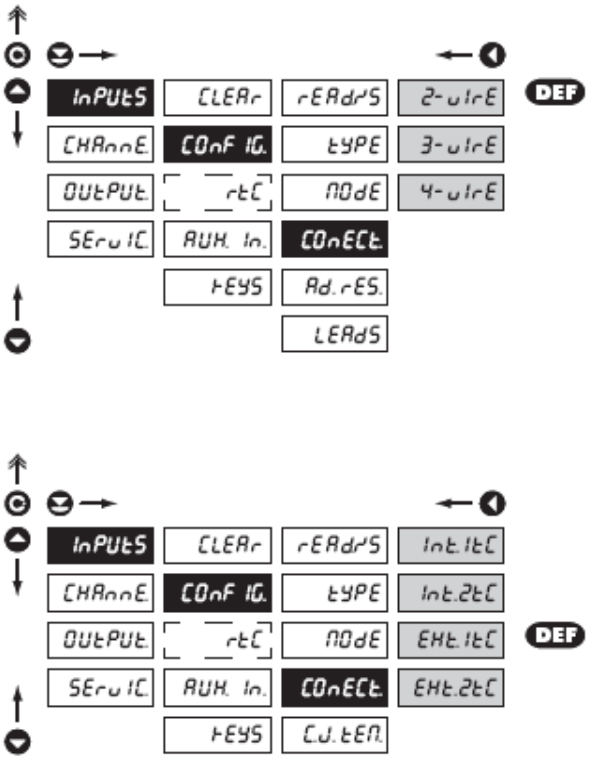
RTD-NI

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)

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

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



CONECt. Selection of type of sensor connection

RTD OHM

- **2-uIrE** 2-wire connection
- **3-uIrE** 3-wire connection
- **4-uIrE** 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
- **EHt.1tC** Measurement without reference thermocouple
  - the entire measuring set is working under invaried and constant temperature
- **EHt.2tC** Measurement with reference thermocouple
  - when using compensation box

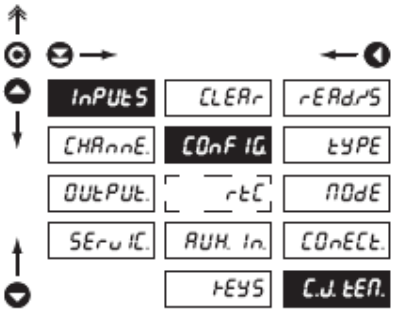
!

Method and procedure of setting the cold junctions is described in separate chapter on page 80

!

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

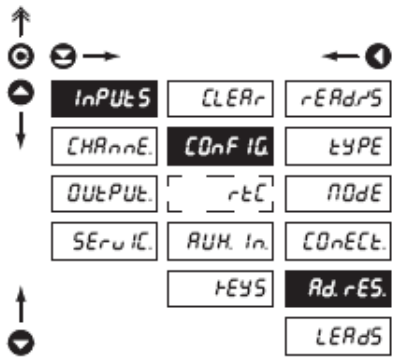
6.1.2e Setting temperature of cold junction T/C



C.J. tEM. Setting temperature of cold junction

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

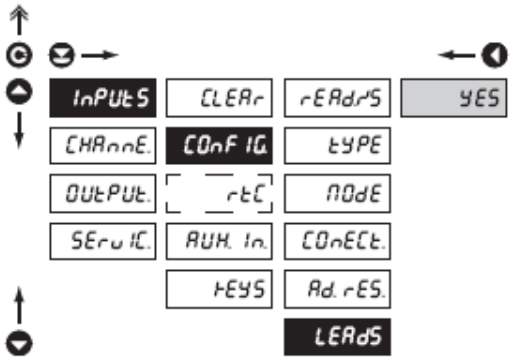
6.1.2f Compensation of 2-wire conduct RTD OHM



Ad. rES. 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

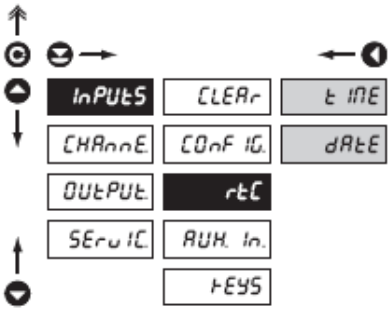
6.1.2g Compensation of 2-wire conduct RTD OHM



LEAdS Compensation of 2-wire conduct

- for measurement accuracy it is necessary to perform compensation of conduct always in case of 2-wire connection
- prior confirmation of the displayed prompt „YES" it is necessary to substitute the sensor at the end of the conduct by a short-circuit
- DEF – 0

6.1.3 Setting the real time clock



rtC Setting the real time clock (RTC)

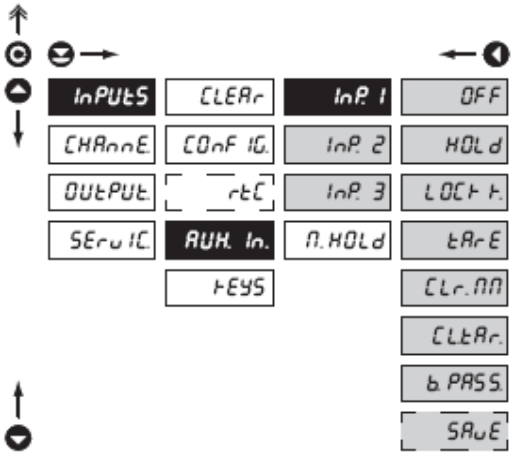
tIME Time setting

- format 23.59.59

dAtE Date setting

- format DD.MM.YY

6.1.4a External input function selection



AUX. In. External input function selection

OFF Input is off

HOLd Activation of HOLD

LOCt t. Locking keys on the instrument

tArE Tare activation

CLr.nn Resetting min/max value

CL.tAr. Tare resetting

b. PASS. Activation of locking access into programming menu LIGHT/PROFI

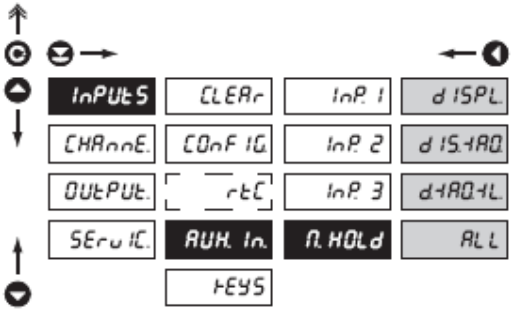
SAvE Activation of measured data record in instrument memory (not in standard equipment)

- DEF INPUT 1 > HOLD
- DEF INPUT 2 > LOCK K.
- DEF INPUT 3 > TARE

*

Setting procedure is identical for Input 2 and Input 3

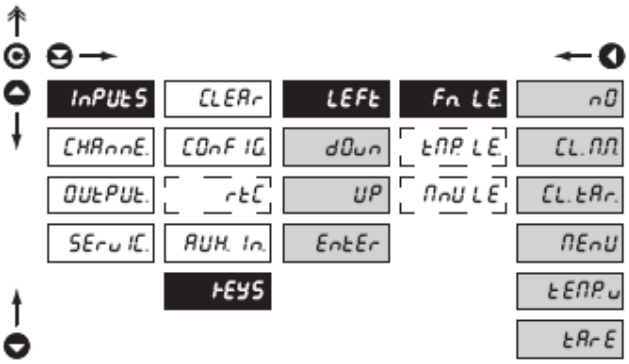
6.1.4b Selection of function "HOLD"



n. HOLd Selection of function "HOLD"

- **d ISPL.** "HOLD" locks only the value displayed
- **d IS.tAO.** "HOLD" locks the value displayed and on AO
- **d.tAO.tL.** "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



Fn. LE. Assigning further functions to instrument keys

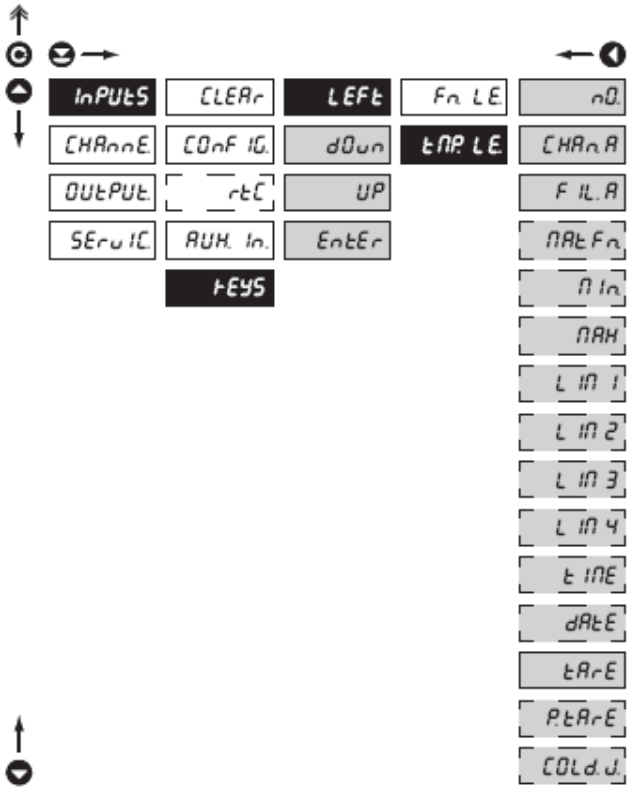
- „FUNC." > executive functions
- „TEMPOR." > temporary projection of selected values
- „MENU" > direct access into menu on selected item

- **nO** Key has no further function
- **CL.MM.** Resetting min/max value
- **CL.tAr.** Tare resetting
- **MEnU** Direct access into menu on selected item
  - after confirmation of this selection the "MENU" item is displayed on superior menu level, where required selection is performed
- **tEMP. u.** Temporary projection of selected values
  - after confirmation of this selection the item "TEMPOR." is displayed on superior menu level, whererequired selection is performed
- **tArE** Tare function activation

!

Setting is identical for LEFT, DOWN, UP and ENTER

6.1.5b Optional accessory functions of the keys - Temporary projection



tMP. LE. **Temporary projection of selected item**

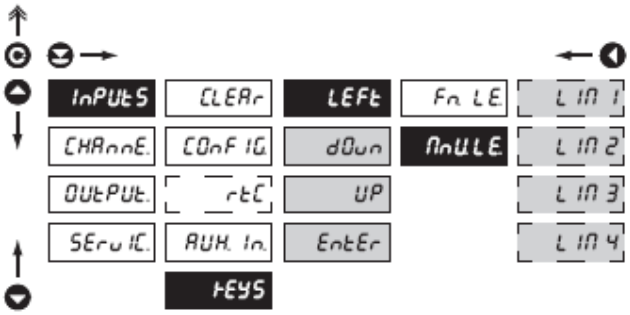
- "Temporary" projection of selected value is displayed for the time of keystroke
- "Temporary" projection may be switched to permanent by pressing ⊙ + "Selected key", this holds until the stroke of any key

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"
LIN 1	Temporary projection of "Limit 1" value
LIN 2	Temporary projection of "Limit 2" value
LIN 3	Temporary projection of "Limit 3" value
LIN 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
COLd.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



AnALE. Assigning access to selected menu item

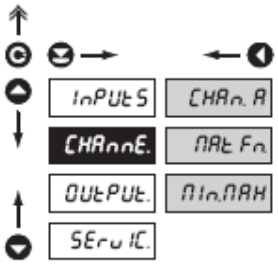
- **LIN 1** Direct access to item "LIM 1"
- **LIN 2** Direct access to item "LIM 2"
- **LIN 3** Direct access to item "LIM 3"
- **LIN 4** Direct access to item "LIM 4"

!

Setting is identical for LEFT, DOWN, UP and ENTER

6 SETTING profi

6.2 Setting "PROFI" - CHANNELS

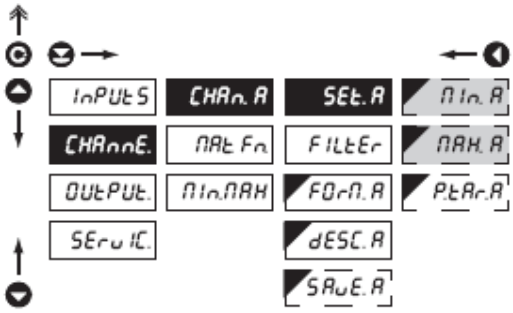


The primary instrument parameters are set in this menu

- CHAn.A — Setting parameters of measuring "Channel"
- MAt.Fn. — Setting parameters of mathematic functions
- MIn.MAH — Selection of access and evaluation of Min/ max value

6.2.1a Display projection

DC PM DU OHM



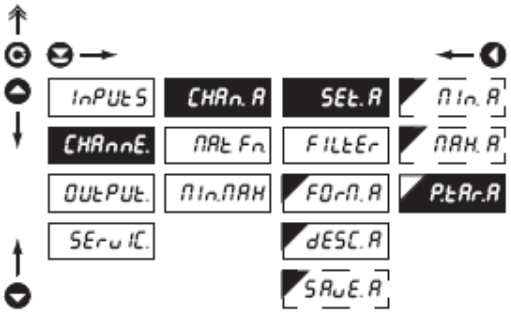
SEt.A Setting display projection

MIn.A. Setting display projection for minimum value of input signal
- range of the setting is -99999...999999
- DEF – 0

MAH.A. Setting display projection for maximum value of input signal
- range of the setting is -99999...999999
- DEF – 100

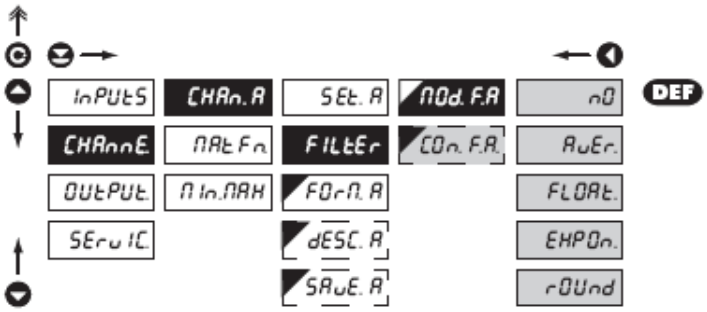
6.2.1b Setting fixed tare

DC PM DU OHM



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



nOd.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

AuEr. 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

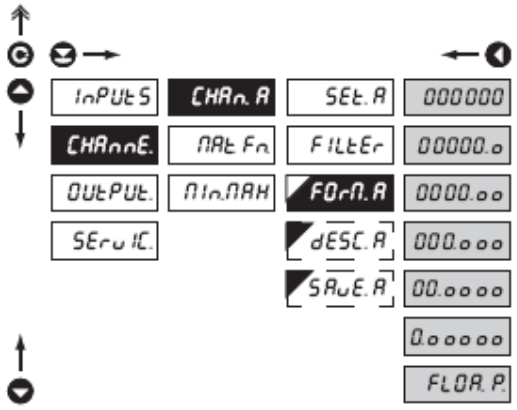
rOUnd Measured value rounding

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

CO n.F.A. Setting constants

- this menu item is always displayed after selection of particular type of filter
- DEF – 2

6.2.1d Projection format - positioning of decimal point



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

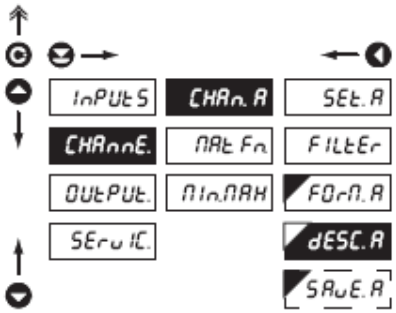
000.ooo Setting DP - XXX.xxx

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



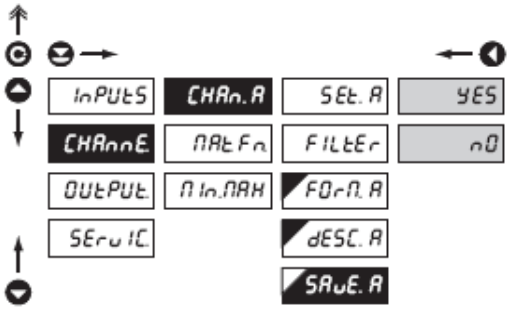
dESC.A Setting projection of descript. for "Channel A"

- 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

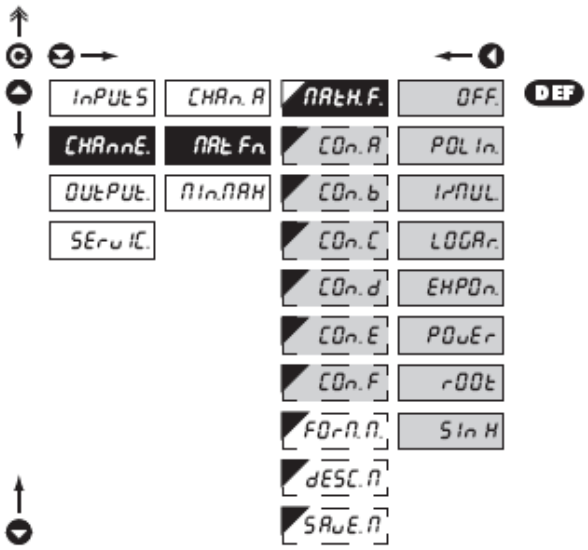


SAvE.A **Selection of storing data into instrument memory**

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

YES	Measured data are stored in the memory
nO	Measured data are not stored

6.2.2a Mathematic functions



nAtH.F. Selection of mathematic functions

OFF. Mathematic functions are off

POL In Polynome

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

InVUL. 1/x

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

LOGAr. Logarithm

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

EHPOn. Exponential

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

POuEr Power

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

rOOt Root

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

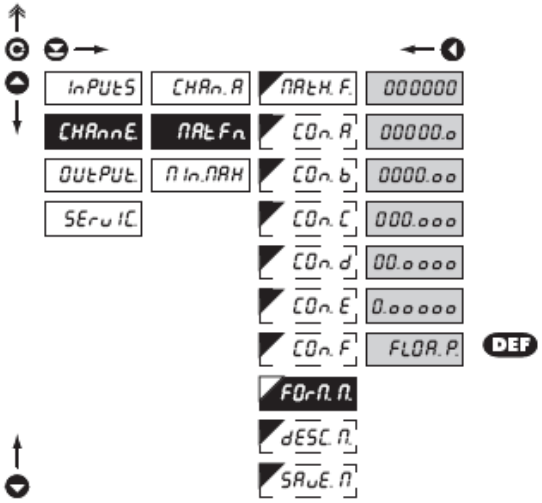
SIn H Sin x

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

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



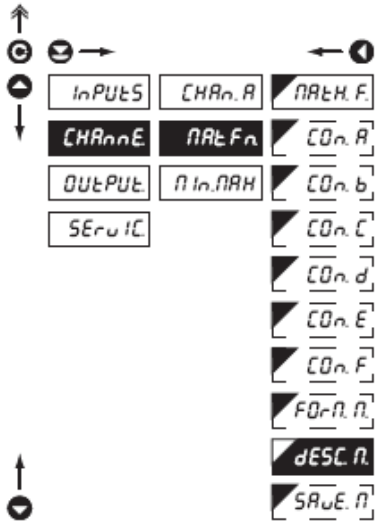
FOrM.N. Selection of decimal point

- 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
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



dESC.N. Setting projection of description for "MAT.FN"

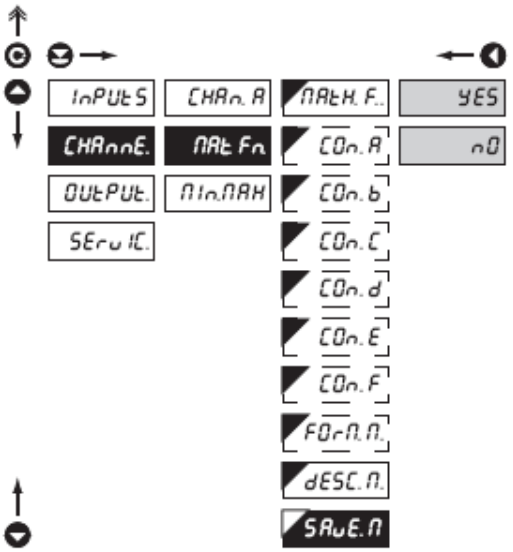
- projection of mesured data may be extended (at the expense of the number of displayed places) by two characters for description
- description is set by shifted ASCII code, when two first places show the set description and two last characters their code in period 0...95
- description is cancelled by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

- DEF – no description

!

Table of signs on page 83

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



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)

YES	Measured data are stored in the memory
nO	Measured data are not stored

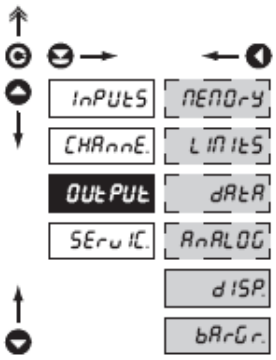
6.2.3 Selection of evaluation of min/max value

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"

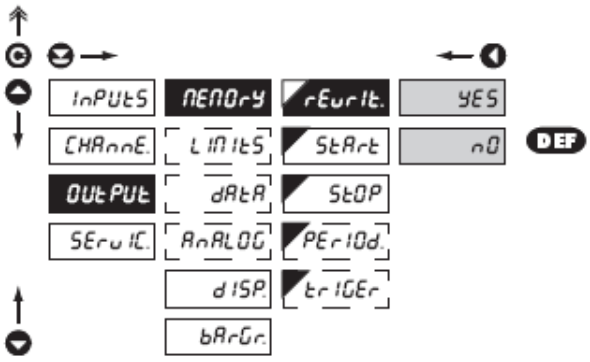
6.3 Setting „PROFI" - OUTPUTS



In this menu it is possible to set parameters of the instrument output signals

- nEMOrY — Setting data logging into memory
- LIMItS — Setting type and parameters of limits
- dAtA — Setting type and parameters of data output
- AnALOG. — Setting type and parameters of analog output
- dISP. — Setting display projection and brightness
- bArGr. — Setting bargraph projection and brightness

6.3.1a Selection of mode of data logging into instrument memory

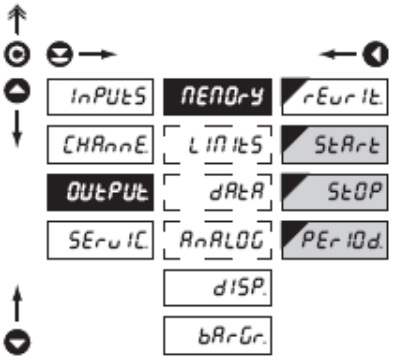


rEvrIt. Selection of the mode of data logging

- 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

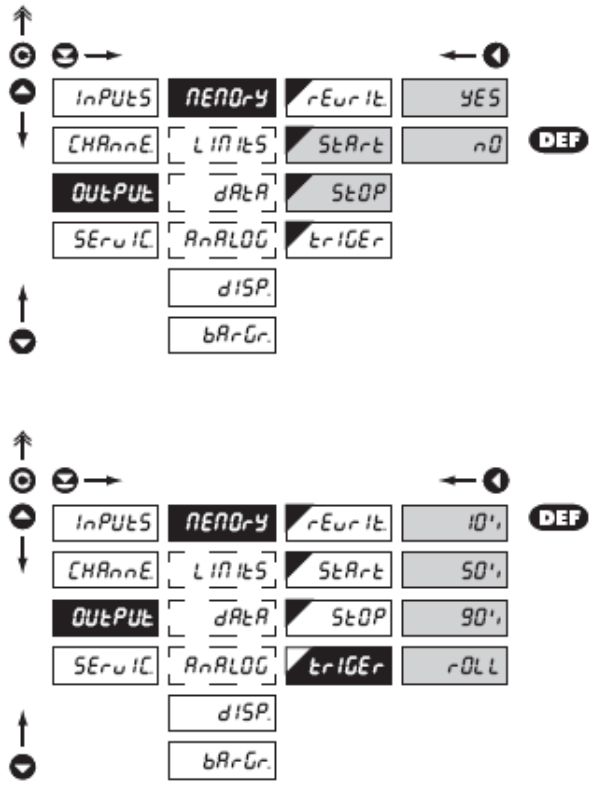


StArt Start of data logging into instrument memory
- time format HH.MM.SS

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

PEr IOd. 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 data hold valid for one day, where the logging is valid for every day without limitation
- time format HH.MM.SS
- item not displayed if "STORE" is selected in menu *(Input > AUX. IN.)*

6.3.1c Setting data logging into instrument memory - FAST



StArt Start of data logging into instrument memory

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

trIGEr **Setting logging data into inst. memory**
- values will be logged in an interval delimited by the time set under items *START* and *STOP*, time data hold valid for one day, where the logging is valid for every day without limitation
- logging data into inst. memory is governed by the following selection, which determines how many percent of the memory is reserved for data logging prior to initiation of trigger imputse
- initiation is on ext. input or control key

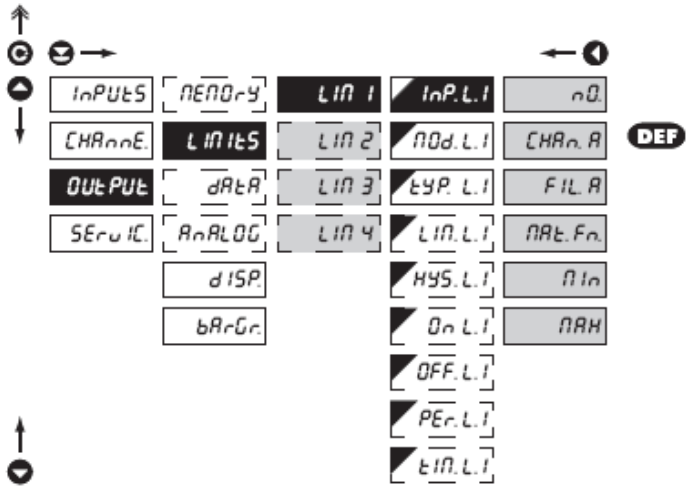
10'. Reser. of 10 % memory prior init. of data logging

50'. Reser. of 50 % memory prior init. of data logging

90'. Reser. of 90 % memory prior init. of data logging

rOLL After initiation of data logging the memory is cyclically transcribed

6.3.2a Selection of input for limits evaluation



InP.L.1 Selection evaluation of limits

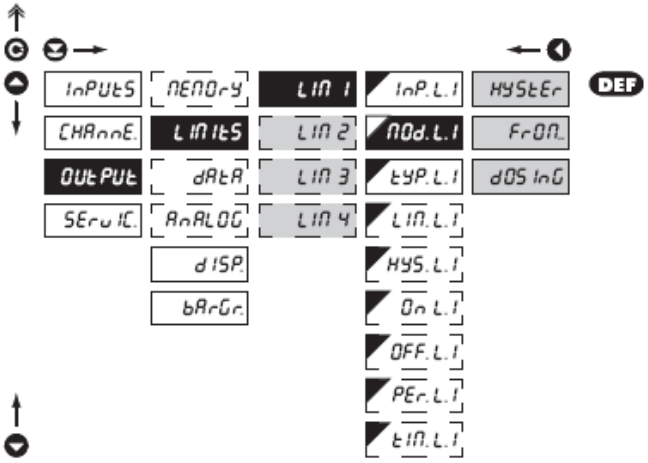
- selection of value from which the limit will be evaluated

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"
MAH	Limit evaluation from "Max.value"

!

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

6.3.2b Selection of type of limit



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

FrON.	Frame limit

- for this mode the parameters are set for interval *"ON. L."* the relay switch-on and *"OFF. L."* the relay switch-off

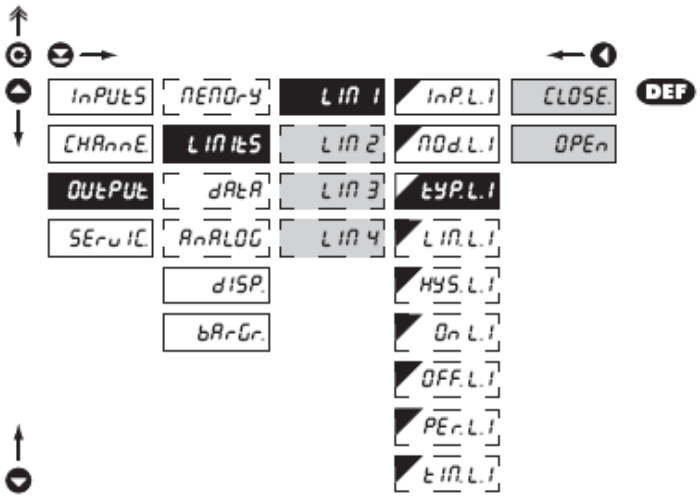
dOSInG	Dose limit (periodic)

- 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

!

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

6.3.2c Selection of type of output

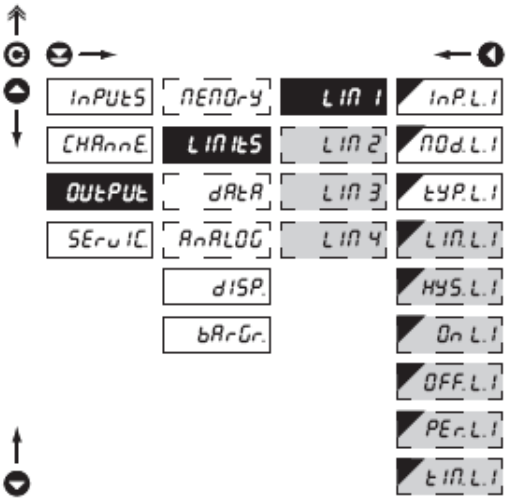


tYP.L.1 Selection of type of output

- **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

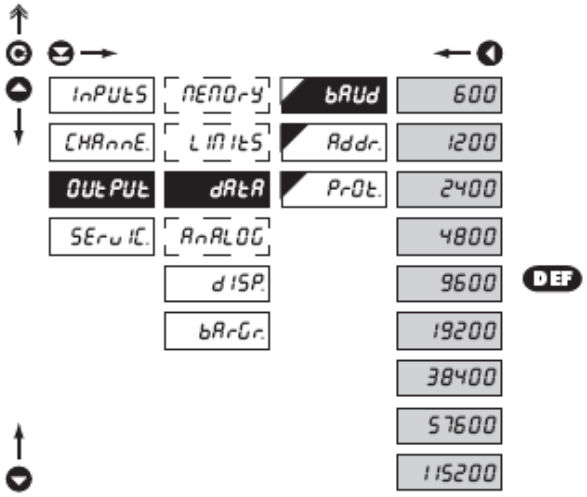
- for type *"DOSE"*

tIM.L.1 Setting the time switch-on of the limit

- for type *"HYSTER"* and *"DOSE"*

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

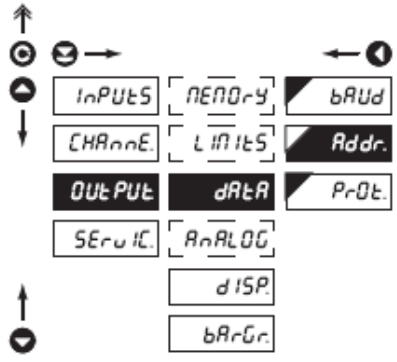
6.3.3a Selection of data output baud rate



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

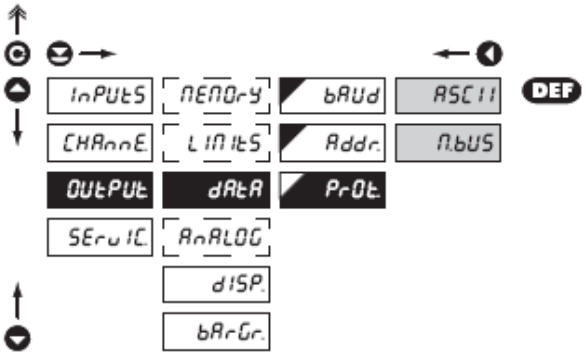
6.3.3b Setting instrument address



Addr. Setting instrument address

- setting in range 0...31
- DEF – 00

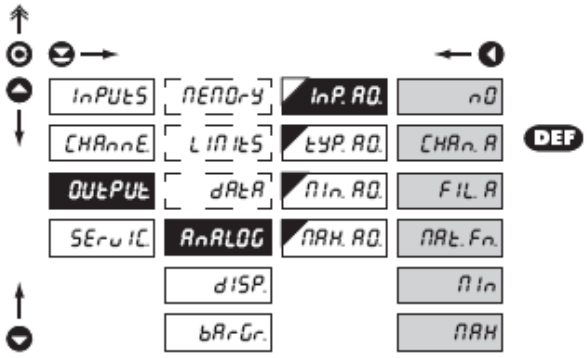
6.3.3c Selection of data output protocol



PrOt. Selection of the type of analog output

ASCII	Data protocol ASCII
n.bUS	Data protocol DIN MessBus

6.3.4a Selection of input for analog output

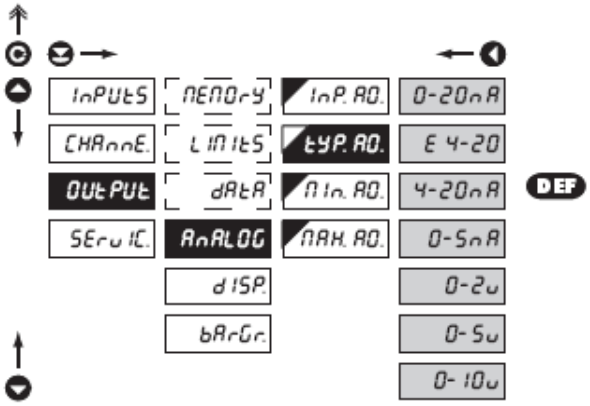


InP.AO. Selection evaluation analog output

- 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"

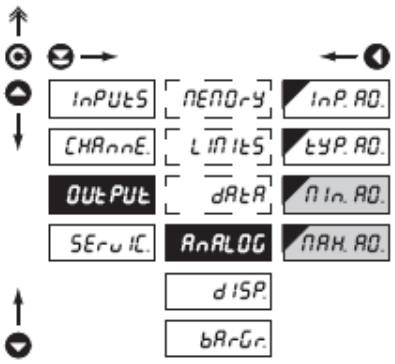
6.3.4b Selection of the type of analog output



tYP. AO. Selection of the type of analog output

- **0-20nA** Type - 0...20 mA
- **E 4-20** Type - 4...20 mA
  - with indication of error statement (< 3,0 mA)
- **4-20nA** Type - 4...20 mA
- **0-5nA** Type - 0...5 mA
- **0-2u** Type - 0...2 V
- **0-5u** Type - 0...5 V
- **0-10u** Type - 0...10 V

6.3.4c Setting the analog output range



AnALOG 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

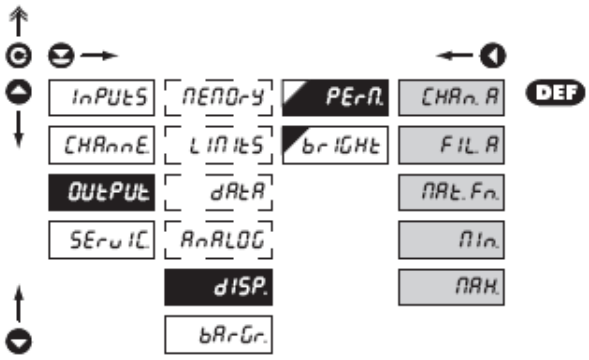
Min. AO. Assigning the display value to the beginning of the AO range

- 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

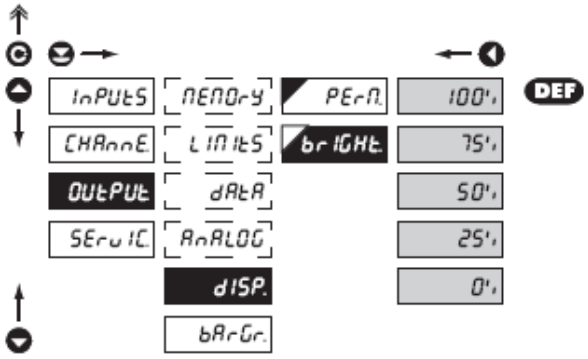


InPUtS Selection display projection

- 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
nAt.Fn.	Projection of values from "Math.functions"
nIn.	Projection of values from "Min.value"
nAH	Projection of values from "Max.value"

6.3.5b Selection of display brightness



brIGHt Selection of display brightness

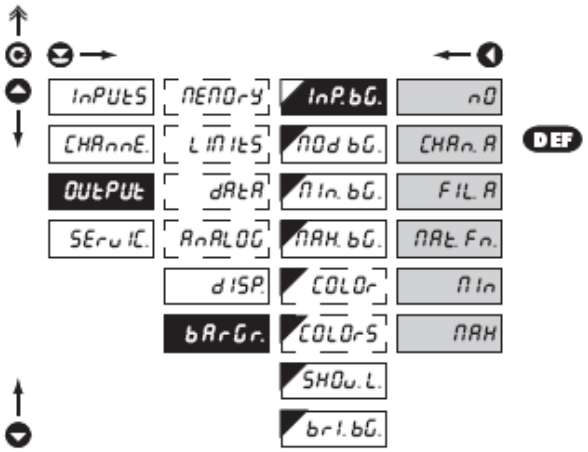
- by selecting display brightness we may appropriately react to light conditions in place of instrument location

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 %

6.3.6a Bargraph - Selection of projection input

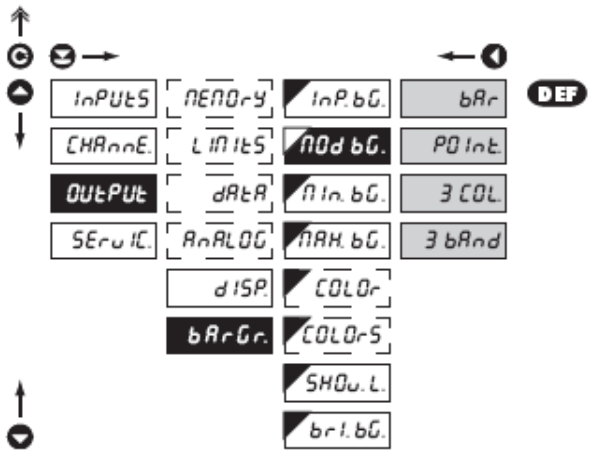


InP.bG. Selection of bargraph evaluation

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

nO	Analog evaluation is off
CHAn.A	From "Channel A"
FIL.A	From "Channel A" after digital filter modification
MAt.Fn.	From "Mathematic function"
Min.	From "Minimum va-lue"
MAX	From "Maximum value"

6.3.6b Bargraph - Selection of projection mode



MOd bG. Selection of bargraph projection mode

bAr	Column projection

- the display shows only a column in one colorě

POInt.	Point projection

- the display shows one point in one color

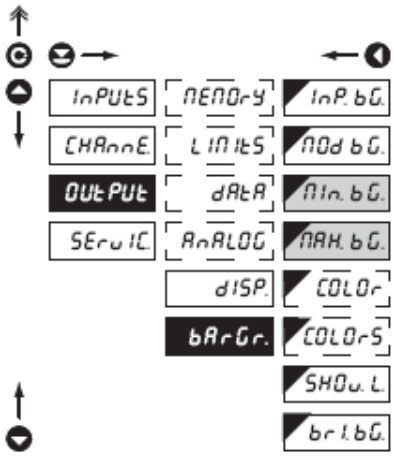
3 COL.	3-colored column projection

- change of color is determined by set limits (COLORS > BAND)
- upon exceeding the limit the color of the entire display, i.e. there is always only one column of one color lit

3 bAnd	3-colored bar projection, cascade

- change of color is determined by the said limits (COLORS > BAND)
- upon exceeding a limit color of the given display section is changing, i.e. the display may shine up to three colors at a time

6.3.6c Bargraph - Setting the projection range



bArGr. Setting the bargraph projection range

- setting is the same as the setting for main display projection

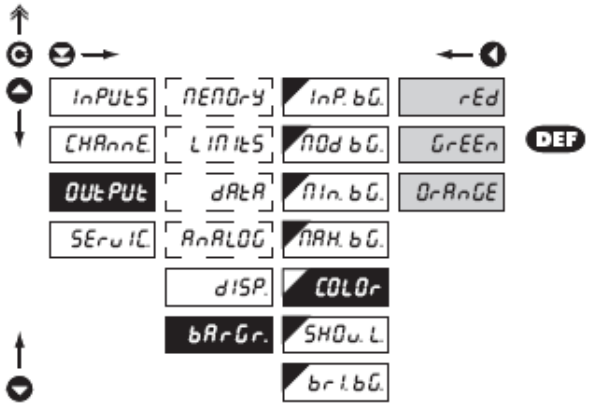
Min. bG. Setting bargraph projection for minimum input signal value

- range of the setting is -99999...999999
- DEF – 0

MAX. bG. Setting bargraph projection for maximum input signal value

- range of the setting is -99999...999999
- DEF – 100

6.3.6d Bargraph - Setting color



COLOr Selection of bargraph color

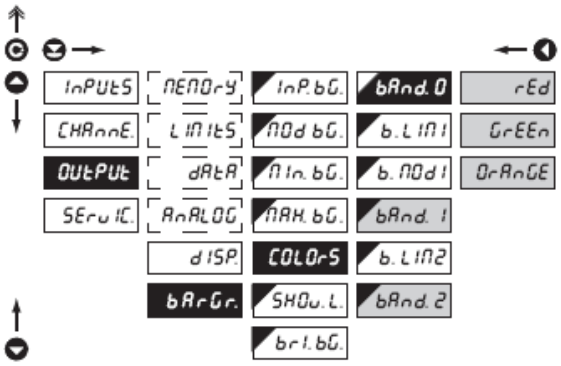
- the item "COLOR" is displayed only with selected mode ("BARGR. > MOD. BG.") "BAR." or "POINT."

rEd Red color

GrEEn Green color

OrAnGE Orange color

6.3.6e Bargraph - Color setting



bAnd.0 Selection of bargraph color

- the item "COLORS" is displayed only with selected mode ("BARGR. > MOD. BG.") "3 COL." or "3 BAND"

rEd Red color

GrEEn Green color

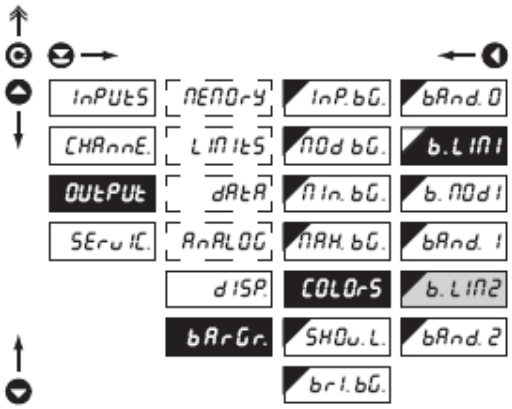
OrAnGE Orange color

- DEF – Green (Band 0)
- DEF – Orange (Band 1)
- DEF – Red (Band 2)

!

Setting is identical for BAND. 1 and BAND. 2

6.3.6f Bargraph - Setting the color changes bands



b.LIM1 Setting color limits for color projection

- the item "COLORS" is displayed only with selected mode ("BARGR. > MOD. BG.") "3 COL." or "3 BAND."
- items „b. LIM 1" and „b. LIM 2" determine the borders of the bargraph color changes

b.LIM 1 Boundary between bands 0 - 1

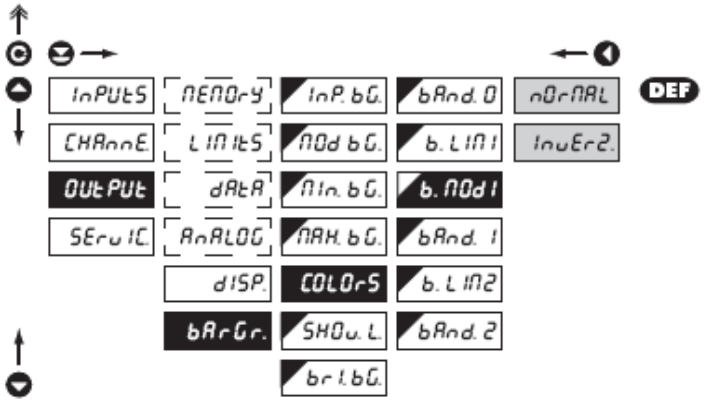
b.LIM 2 Boundary between bands 1 - 2

- DEF – 33 (b. LIM 1))
- DEF – 66 (b. LIM 2)

!

Setting is identical for B. LIM 2

6.3.6g Bargraph - Selection of inverse projection

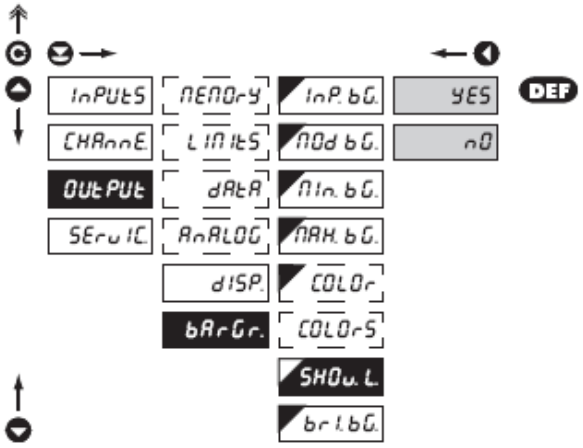


b. MOd 1 Selection of inverse projection of "Band 0"

- the item "COLORS" is displayed only with selected mode ("BARGR. > MOD. BG.") "3 COL.." or "3 BAND."
- setting „b. MOD 1" is designed for projection where indication of zero center is required

nOrMAL	Column in "BAND 0" moves from left to right
InvEr2.	Column in "BAND 0" moves from right to left

6.3.6h Bargraph - Selection of limits projection

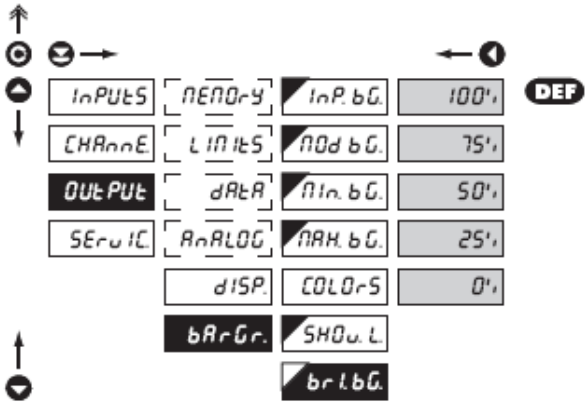


SHOw. L. Selection of limit projection on the bargraph

- limits are always displayed orange, always by one degree lighter or darker

YES	Limits are projected
nO	Limity are not projected

6.3.6i Bargraph - Selection of display brightness



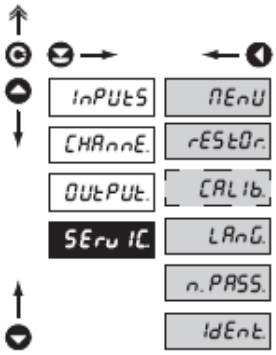
br I. bG. Selection of bargraph brightness

0'	Bargraph is off

- after pres. the key the display lights up for 0 s

25'	Brightness - 25 %
50'	Brightness - 50 %
75'	Brightness - 75 %
100'	Brightness - 100 %

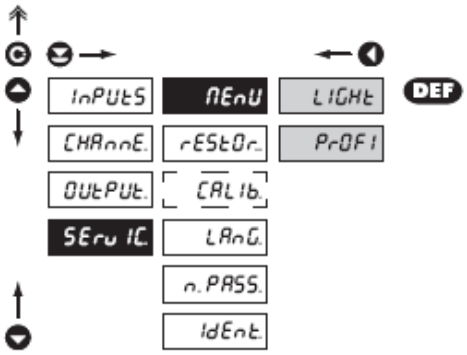
6.4 Setting "PROFI" - SERVIS



The instrument service functions are set in this menu

nEnU	Selection of menu type LIGHT/PROFI
rESEt.	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



nEnU 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

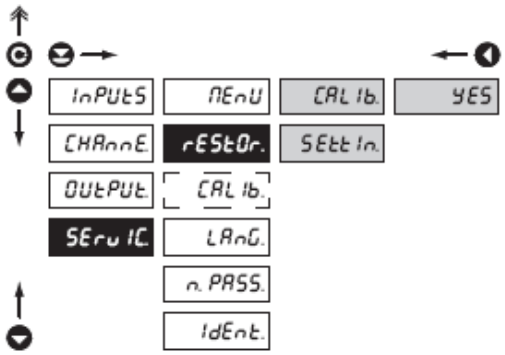
PrOFI Active PROFI menu

- complete programming menu for expert users
- tree menu

!

Change of setting is valid upon next access into menu

6.4.2 Restoration of manufacture setting



rESt0r. Restoring manufacture setting of the instrument

- in the event of erroneous setting or calibration it is feasible to restore manufacture setting. Prior execution of any changes you will be asked to confirm your preference „YES"

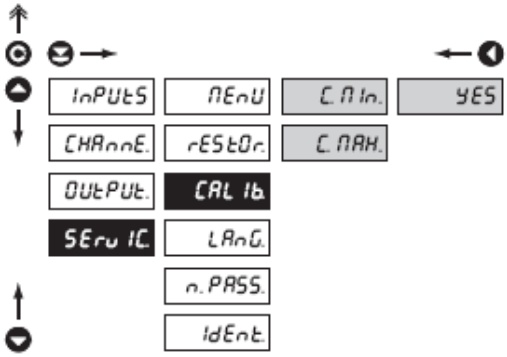
CAL Ib. Restore manufacture instrument calibration

SEtt In. Restore manufacture instrument setting

- loading manufacture setting (items denoted DEF)
- prior execution of changes you will be asked to confirm your preference "YES"

Jobs performed	Restore	
	Calibration	Setting
cancels USER menu rights	✓	✓
deletes table of items order in USER - LIGHT menu	✓	✓
adds items from manufcture to LIGHT menu	✓	✓
deletes data stored in FLASH	✓	✓
cancels or linearization tables	✓	✓
clears tare	✓	✓
clears conduct resistances	✓	✓
restore manufacture calibration	✓	×
restore manufacture setting	×	✓

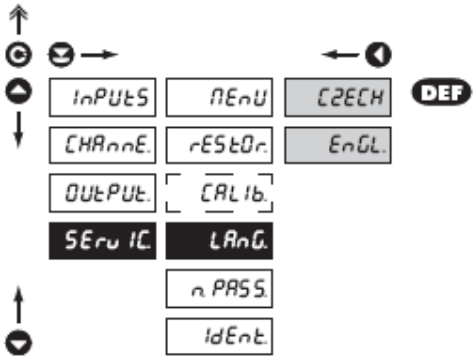
6.4.3 Calibration - Input range DU



CAL Ib. 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"

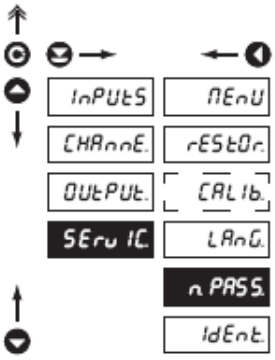
6.4.4 Selection of instrument menu language version



LAnG. Selection of instrument menu language version

C2ECH	Instrument menu is in Czech
EnGL.	Instrument menu is in English

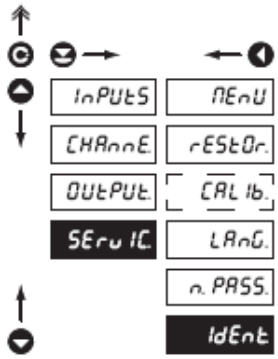
6.4.5 Setting new access password



n. PASS. Setting new password for access to LIGHT and PROFI menu

- this selection enables changing number code that blocks the access into LIGHT and PROFI Menu.
- range of the number code is 0...9999
- universal password in the event of loss is „8177"

6.4.6 Instrument Identification



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

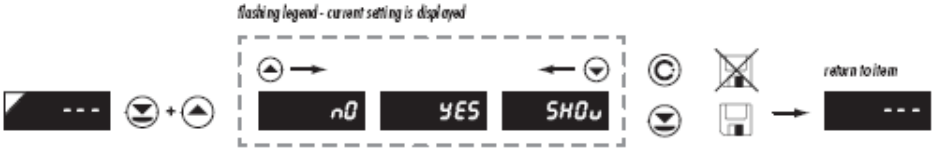
7 SETTING user

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

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

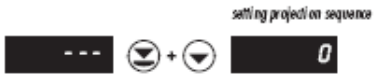
Setting



nO	item will not be displayed in USER menu
YES	item will be displayed in USER menu with editing option
SHOu	item will be solely displayed in USER menu

Setting sequence of items in "USER" menu

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



Example:

Into USER menu were selected these items

(keys +) > *CL. TAR., LIM 1, LIM 2, LIM 3*, for which we have preset this sequence (keys +):

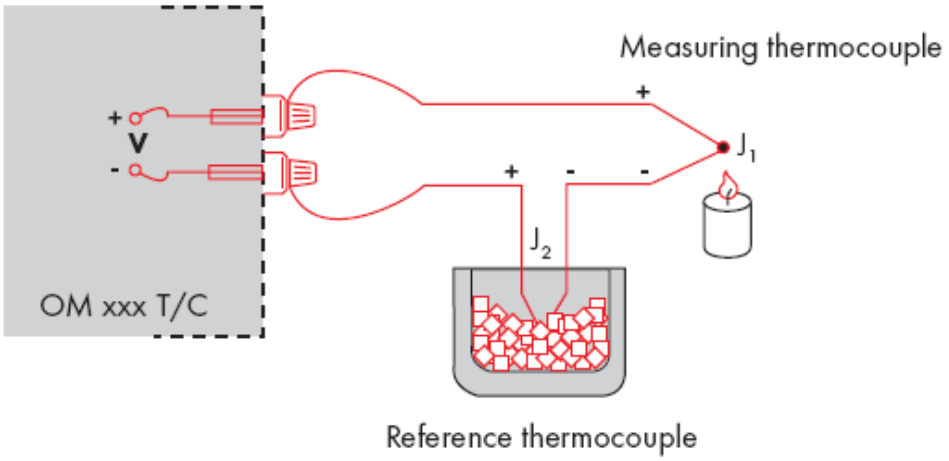
CL. TAR.	5
LIM 1	0 (sequence not determined)
LIM 2	2
LIM 3	1

Upon entering USER menu

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

8 METHOD OF MEASURING THE CJC

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 CONNECT 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 CJCTEM its temperature (applies for setting CONNECT to EXT2TC)
- if the reference thermocouple is located in the same environment as the measuring instrument then set in the instrument menu CONNECT to INT2TC. Based on this selection the measurement of the ambient temperature is performed by a sensor located in the instrument terminal board.

WITHOUT REFERENCE THERMOCOUPLE

- inaccuracy originating from the creation of dissimilar thermocouples on the transition point terminal/conductor of the thermocouple is not compensated for in the instrument
- when measuring without reference thermocouple set CONNECT in the instrument menu to INT.ITC or EXT.ITC
- when measuring temperature without reference thermocouple the error in measured data may be as much as 10°C (applies for setting CONNECT to EXT.ITC)

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 specification you can find at **www.orbit.merret.cz/rs**.

DETAILED DESCRIPTION OF COMMUNICATION VIA SERIAL LINE

Activity	Data transferred										
Data solicitation (PC)	#	A	A	<CR>							
Data transmission (Instrument)	>	R	<SP>	D	D	D	D	D	(D)	(D)	<CR>
Command confirm. (Instr.) - OK	!	A	A	<CR>							
Command confirm. (Instr.) - Bad	?	A	A	<CR>							
Instrument identification	#	A	A	1Y	<CR>						
HW identification	#	A	A	1Z	<CR>						
One-time measurement	#	A	A	7X	<CR>						
Repeated measurement	#	A	A	8X	<CR>						

LEGEND

#	35	23_H	Command beginning
A A	0...31		Two signs of instrument address (sent in ASCII - tens and ones, e.g. "01", "99" universal
<CR>	13	$0D_H$	Carriage return
<SP>	32	20_H	Space
D			Data - usually signs "0"..."9", "-", "."; (D) - DP. and (-) may prolong data
R	50_H...57_H		Relay and Tare status
!	33	21_H	Positive command confirmation (ok)
?	63	$3F_H$	Negative command confirmation (bad)
>	62	$3E_H$	Beginning of the data transmitted

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

10 ERROR STATEMENTS

ERROR	CAUSE	ELIMINATION
E. d. Un.	Number is too small (large negative) to be displayed	change DP setting, channel constant setting
E. d. Ou	Number is too large to be displayed	change DP setting, channel constant setting
E. t. Un.	Number is outside the table range	increase table values, change input setting (channel constant setting)
E. t. Ou	Number is outside the table range	increase table values, change input setting (channel constant setting)
E. I. Un.	Input quantity is smaller than permitted input quantity range	change input signal value or input (range) setting
E. I. Ou	Input quantity is larger than permitted input quantity range	change input signal value or input (range) setting
E. Hu.	A part of the instrument does not work properly	send the instrument for repair
E. EE	Data in EEPROM corrupted	perform restoration of manufacture setting, upon repeated error statement send instrument for repair
E. dAtA	Data in EEPROM outside the range	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	:	;	<	=	>	?
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 — ***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

Connection: 2, 3 or 4 wire

RTD

Pt xxxx	-200°...850°C
Ni xxxx	-30,0°...199,9°C
Type Pt:	100/500/1 000 Ohm, s 3850 ppm/°C 100 Ohm, s 3920 ppm/°C
Type Ni:	Ni 1 000/ Ni 10 000 s 5000/6180 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

DU

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

PROJECTION

Display 1:	30-segment 3-color bargraph
Display2:	auxiliary 6-digit display, intensive red or green, 7-segment LED, letter height 9,1 mm
Projection:	30 LED/-99999...999999
Decimal point:	adjustable - in menu
Brightness:	adjustbale - in menu

INSTRUMENT ACCURACY

TC:	100 ppm/°C	
Accuracy:	±0,1 % of range + 1 digit	
	±0,15 % of range + 1 digit	***RTD, T/C***
	±0,3 % of range + 1 digit	***PWR***
	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 0°...99°C or automatic	***T/C***
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, Dose
Limits:	-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)*
Relay:	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300

DATA OUTPUTS

Protocols:	ASCII, DIN MessBus
Data format:	8 bit + no parity + 1 stop bit (ASCII) 7 bit + even parity + 1 stop bit (MessBus)
Rate:	600...115 200 Baud

** values apply for resistance load*

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:	100 ppm/°C
Rate:	response to change of value < 40 ms
Voltage:	0...2 V/5 V/10 V
Curernt:	0...5/20 mA/4...20 mA - compensation of conduct to 500 Ohm

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

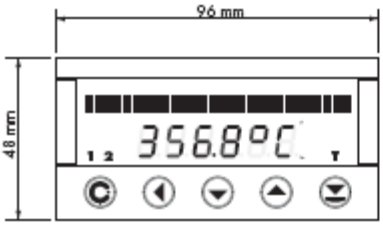
OPERATING CONDITIONS

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
Overvoltage category:	EN 61010-1, A2
Insulation resistance:	for pollution degree II, measurement category III AC instrum.power supply > 670 V (PI), 300 V (DI) DC instrum.power supply > 300 V (PI), 150 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

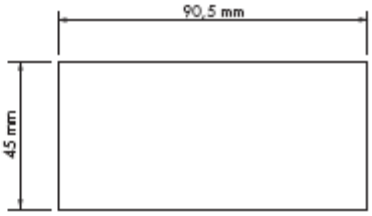
PI - Primary insulation, DI - Double insulation

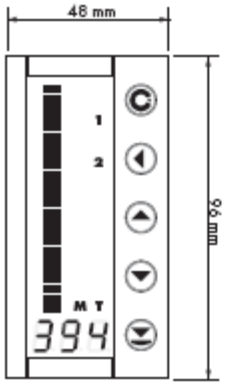
13 INSTR. DIMENSIONS AND INSTALLATION

Front view

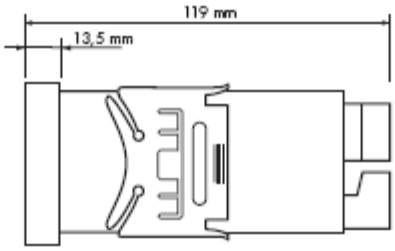


Panel cut





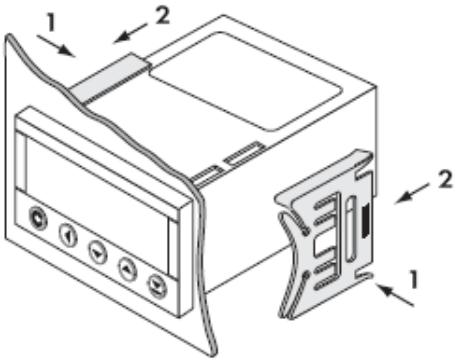
Side view

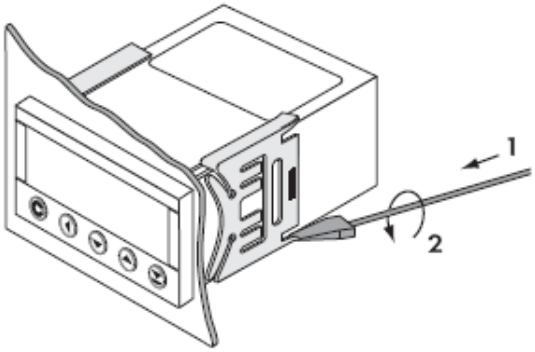


Panel thickness: 0,5...20 mm

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

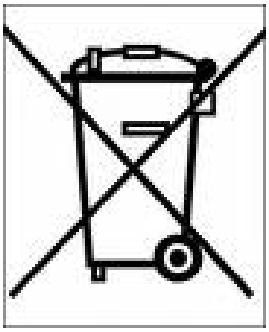




Instrument disassembly

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

ENVIROMENTAL INFORMATION



This electronic equipment was manufactured according to high quality standards to ensure safe and reliable operation when used as intended. Due to its nature, this equipment may contain small quantities of substances known to be hazardous to the environment or to human health if released into the environment. For this reason, Waste Electrical and Electronic Equipment (commonly known as WEEE) should never be disposed of in the public waste stream. The “Crossed-Out Waste Bin” label affixed to this product is a reminder to dispose of this product in accordance with local WEEE regulations. If you have questions about the disposal process, please contact Metrix Customer Services.

Note: Metrix is continuously improving our products. Please refer to our website to download the latest version of this document.

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