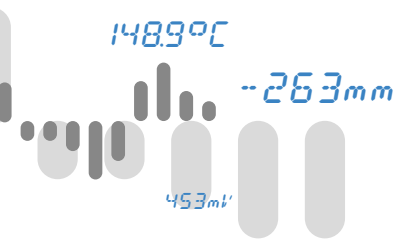
# USER MANUAL
NÁVOD K OBSLUZE




# OM 621BCD

**6 DIGIT PROGRAMMABLE**

BCD MONITOR
ACTIVE TRANSFORMER TAPPING LEADS

**DIGITAL PANEL METERS**
PANELOVÉ MĚŘÍCÍ PŘÍSTROJE

**BARGRAPHS**
SLOUPCOVÉ ZOBRAZOVAČE

**LARGE DISPLAYS**
VELKOPLOŠNÉ DISPLEJE

**TRANSMITTERS TO DIN RAIL**
PŘEVODNÍKY NA LIŠTU

**PAPERLESS RECORDERS**
BEZPAPÍROVÉ ZAPISOVAČE

**PLC**

WARRANTY 5 YEARS

orbit merret

**SAFETY INSTRUCTIONS**

Please read carefully the enclosed safety instructions and observe them!

Installation, all operational interventions, maintenance and service must be performed by a qualified personnel and in accordance with the attached information and safety regulations. The manufacturer is not liable for damage caused by improper installation, configuration, maintenance, and service.

The recorder must be installed according to the respective application. Incorrect installation can cause a malfunction, which can result in damage or accident.

The recorder uses dangerous voltages that can cause a fatal accident. Before you start solving problems (e.g. in case of failure or disassembly), the device must be disconnected from the power supply. For safety information the EN 61 010-1 + A2 standard must be observed.

When removing or inserting a card, observe the safety instructions and follow the recommended procedure. During any intervention the recorder must be disconnected from the power supply.

Do not attempt to repair or modify the device. A defective recorder must be sent for repair to the manufacturer.

These devices should be safeguarded by isolated or common fuses (breakers)!

The recorder is not designed for installation in potentially explosive surroundings (Ex). Use it only outside potentially explosive surroundings

**TECHNICAL DATA**

Measuring instruments of the OM 621 series conform to the European regulation 2014/30/EU and 2014/35/EU

The instruments are up to the following European standards:

EN 61010-1 Electrical safety

EN 61326-1 Electronic measuring, control and laboratory devices – Requirements for EMC “Industrial use”

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

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

Tel: +420 - 281 040 200
Fax: +420 - 281 040 299
e-mail: orbit@merret.eu
www.orbit.merret.eu

# 2. INSTRUMENT DESCRIPTION

## 2.1 DESCRIPTION

Model OM 621BCD is a 6-digit panel monitor of serial or parallel BCD/BIN signal and  montor of active transformer tapping leads, allowing for projection of transitional status and servomotor running.
The instrument is based on a single-chip microprocessor, which guarantees accuracy, stability and easy control.

**PROGRAMMABLE PROJECTION**

| | |
|---|---|
| Setting: | in „CM“ you can set the type of BCD input or montor of active transformer tapping leads |
| Projection: | -9999...9999 |

### Control

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

| | |
|---|---|
| **Configuration menu** | (hereinafter referred to as „CM“) is protected by an optional numeric code and containis  complete instrument setting |
| **User menu** | may contain arbitrary programming setting defined in CM with another selective restriction change |

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

### Extension

**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 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 measured data for further projection or directly into the control systems. We offer isolated RS232 and RS485 with the ASCII protocol or MessBus.

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


1489°C
-263mm

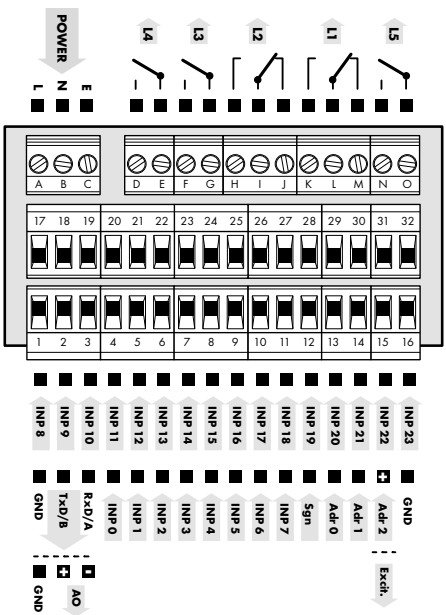
# 3. INSTRUMENT CONECTION

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.




*Grounding on terminal „E" must be connected at all times*

*Relay parameters specified in the technical data apply for resistance load. Upon connection of the induction load we recommend to fit the leads to relay 1 A with a fuse for maximum load protection.*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-263mm
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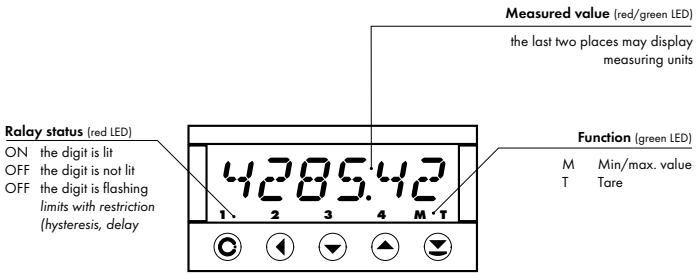
# 4. INSTRUMENT SETTING

The instrument is set and controlled by 5 control keys located on the front panel. By means of these control keys it is possible to browse through the operting program, to select and set the required values.




**CONFIGURATION MODE**

- designated for professional service and maintenance
- complete instrument setting
- access is password protected as
- authorization for "User mode"

**USER MODE**

- designated for instrument service
- may contain setting the limits, analog and data output and brightness, with restriction per the setting in "Configuration mode"

Symbols used in the instructions

DEF Indication of manufacture pre-setting

**CONTROL KEYS FUNCTIONS**

| MENU | ENTER | LEFT | DOWN | UP |
|---|---|---|---|---|
| **Measuring mode** | | | | |
| menu access | optional function | optional function | optional function | optional function |
| **Moving around in the menu** | | | | |
| exit the menu without saving | move to next level | back to previous level | | move to next item |
| **Setting/selecting - items** | | | | |
| cancel setting without saving | confirm selected item | | move down | move up |
| **Setting - numbers** | | | | |
| cancel setting without saving | cancel selected number | move to higher decade | change of current figure - down - | change of current figure - up - |

## Setting the decimal point and the minus sign

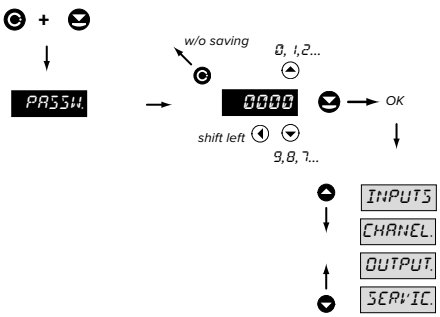
### DECIMAL POINT

Its selection is performed for each quantity independently in the „Channels“ menu. Upon modification of the number to be adjusted transition behind the highest decade is performed by the control key ◀ , when the decimal point starts flashing. Positioning is performed by ▲.

### MINUS SIGN

Its selection is performed independently for every item. The sign is set on the highest decade by the control key ▲ and it is placed between the digits „9“ and „0“. Confirmation is made by pressing ▼.

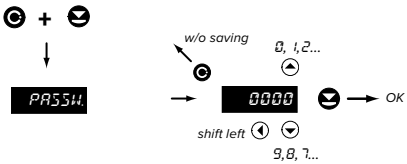
## Access into the configuration mode




*The code is always preset from manufacture to 0000. In case of loss of access password it is possible to use universal access code "8177"*

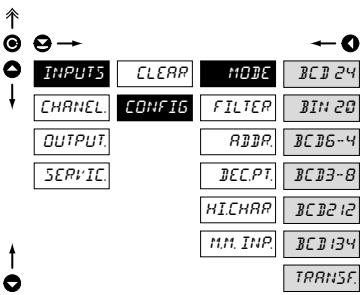
## 4.1 GUIDE THROUGH MINIMUM INSTRUMENT SETTING

### ❶ Access into the „Configuration menu“




| | |
|---|---|
| PASSW. | **Entering the introductory access password** |
| 0000 | Standard manufacture setting of the access password |

### ❷ Setting display projection




| | |
|---|---|
| MODE | **Setting the input parameters** |
| BCD 24 | Parallel BCD - 24 bit |
| BIN 20 | Binar - 20 bit |
| BCD6-4 | Serial BCD - 4 data/6 Strobe |
| BCD3-8 | Serial BCD - 8 data/3 Strobe |
| BCD2 12 | Serial BCD - 13 data/2 Strobe |
| BCD134 | Serial BCD - 4 data/1 Strobe/ 3 segments |
| TRANSF. | Transformer tapping leads |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-263mm
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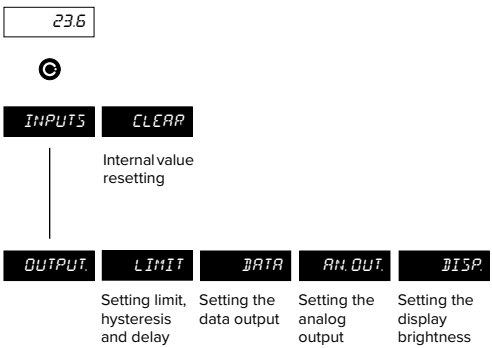
## 4.2 USER MENU

- designed for instrument service
- may contain setting limits, analog/data output and brightness with restriction as per the setting in „Configuration mode“

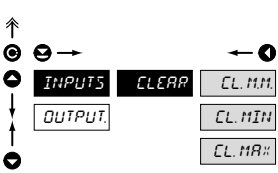



*INPUTS*
Setting the instrument input

*OUTPUT.*
Setting the instrument outputs

*Projection of items and their accessibility depends on the setting in „Configuration menu“, items „RIGHTS“*

## 4.2.1 USER MENU - INTERNAL VALUES RESETTING

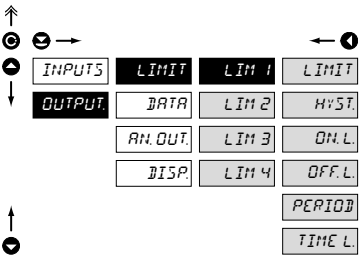



**CLEAR** Instrument internal values resetting

| | |
|---|---|
| CL.M.M. | Resetting the minimum and maximum values, measurements |
| CL.MIN | Resetting the minimum values measurements |
| CL.MAX | Resetting the maximum values measurements |

*Adjustable authorization of access into items see page 33*

## 4.2.2 LIMITS - ENTERING THE VALUES




*Adjustable authorization of access into items, see page 34*

**LIM -** **Entering the limit values for status evaluations**

**LIMIT** Setting the limit for relay switch-on

- *in full range of the display*

**HYST** Setting hysteresis only in (+) values

- *in full range of the display*

**ON.L** Setting the beginning of the range of the limit switch-on

- *in full range of the display*

**OFF.L** Setting the end of the range of the limit switch-on

- *in full range of the display*

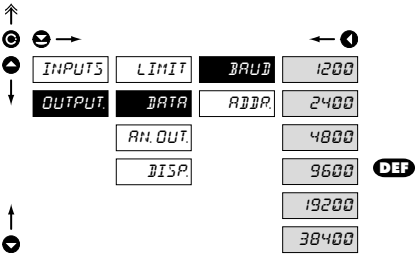
**PERIOD** Setting the period of the limit switch-on

- *in full range of the display*

**TIME.L** Setting the offset of the limit switch-on

- *in range 0...99,9 s*

## 4.2.3 DATA OUTPUT - SETTING THE RATE




*Adjustable authorization of access into items, see page 34*

**BAUD** **Setting the data output rate (baud)**

**1200** Rate - 1 200 Baud

**2400** Rate - 2 400 Baud

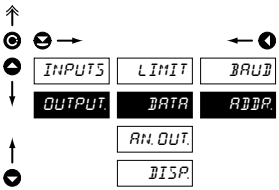
**4800** Rate - 4 800 Baud

**9600** Rate - 9 600 Baud

**19200** Rate - 19 200 Baud

**38400** Rate - 38 400 Baud

### 4.2.3.1 DATA OUTPUT - SETTING THE INSTRUMENT ADDRESS

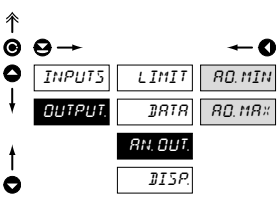



**ADDR** Setting the instrument address

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

*Adjustable authorization of access into items, see page 34*

### 4.2.4 ANALOG OUTPUT - SETTING THE RANGE




*Adjustable authorization of access into items, see page 34*

**AN. OUT** Setting the analog output range

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

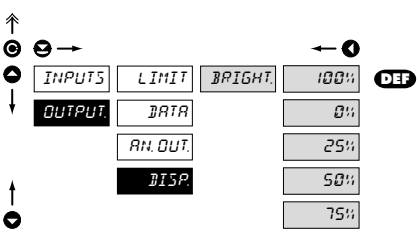
**AO. MIN** Assigining the displayed value to the beginning of the AO range

- *range of the setting is ±50 000*

**AO. MAX** Assigining the displayed value to the end of the AO range

- *range of the setting is ±50 000*

### 4.2.5 SETTING THE DISPLAY BRIGHTNESS




*Adjustable authorization of access into items, see page 35*

**BRIGHT** Setting the display brightness

**100%** Brightness 100 %

**0%** Brightness 0 %, display switched-off

- *display switches off after approximately 10 s and it switches on after pressing any key*

**25%** Brightness 25 %

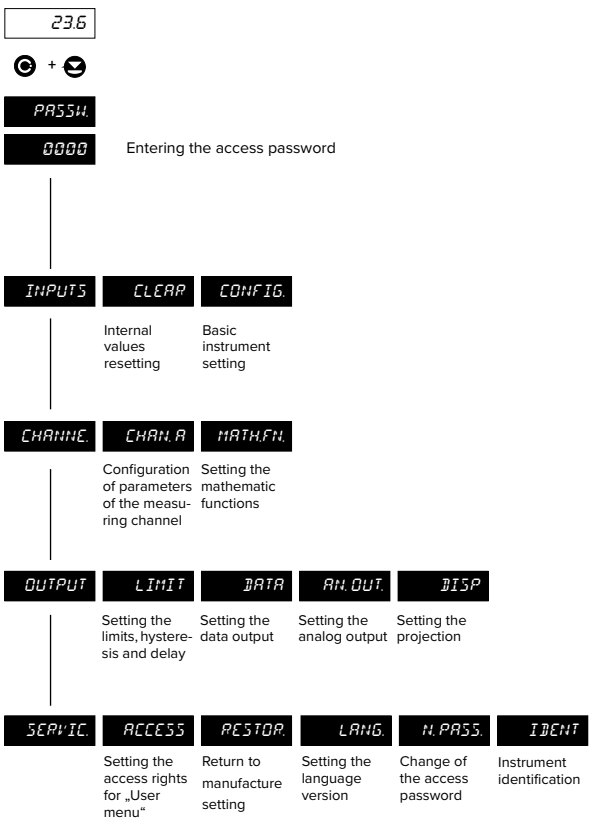
**50%** Brightness 50 %

**75%** Brightness 75 %

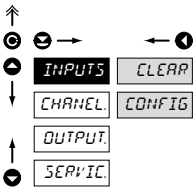
## 4.3 CONFIGURATION MENU

- complete instrument setting
- access is protected by password or a shorting link on the input connector
- authorization for "User mode"

! *Upon delay longer than 15 s the programming mode is automatically discon-tinued and the instrument itself switches back to the measuring mode*



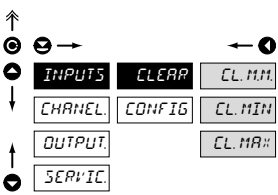
### 4.3.1 CONFIGURATION MODE - INPUTS




The basic instrument parameters are adjusted in this menu

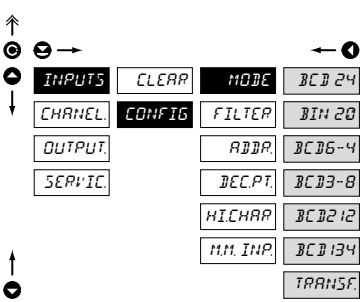
| | |
|---|---|
| CLEAR | Resetting the internal values of the instrument |
| CONFIG | Basic instrument setting |

### 4.3.1.1 INTERNAL VALUES RESETTING




| | |
|---|---|
| CL.M.M. | Resetting the min and max value of the measurement |
| CL.MIN | Resetting the minimal value of the measurement |
| CL.MAX | Resetting the maximal value of the measurement |

### 4.3.1.2.1 SETTING THE MEASURING MODE




| | |
|---|---|
| **MODE** | **Setting the input parameters** |
| BCD 24 | Parallel BCD - 24 bit |
| BIN 20 | Binar - 20 bit |
| BCD6-4 | Serial BCD - 4 data/6 Strobe |
| BCD3-8 | Serial BCD - 8 data/3 Strobe |
| BCD212 | Serial BCD - 13 data/2 Strobe |
| BCD134 | Serial BCD - 4 data/1 Strobe/ 3 segments |
| TRANSF. | Transformer tapping leads |

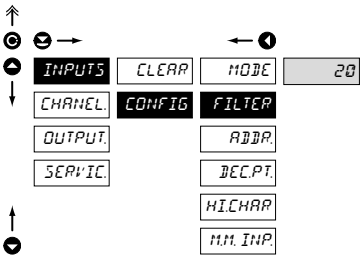
| Input | BCD 24 | BIN 20 | BCD6-4 | BCD3-8 | BCD212 | BCD134 | TRANSF.RM. |
|---|---|---|---|---|---|---|---|
| Inp0 | A0 | 000001 | A | A0 | A0 | A | Tap 1 |
| Inp1 | B0 | 000002 | B | B0 | B0 | B | Tap 2 |
| Inp2 | C0 | 000004 | C | C0 | C0 | C | Tap 3 |
| Inp3 | D0 | 000008 | D | D0 | D0 | D | Tap 4 |
| Inp4 | A1 | 000016 | x | A1 | A1 | Segment 0 | Tap 5 |
| Inp5 | B1 | 000032 | x | B1 | B1 | Segment 1 | Tap 6 |
| Inp6 | C1 | 000064 | x | C1 | C1 | Segment 2 | Tap 7 |
| Inp7 | D1 | 000128 | x | D1 | D1 | Strobe | Tap 8 |
| Inp8 | A2 | 000256 | x | x | A2 | x | Tap 9 |
| Inp9 | B2 | 000512 | x | x | B2 | x | Tap 10 |
| Inp10 | C2 | 001024 | x | x | C2 | x | Tap 11 |
| Inp11 | D2 | 002048 | x | x | D2 | x | Tap 12 |
| Inp12 | A3 | 004096 | x | x | x | x | Tap 13 |
| Inp13 | B3 | 008192 | x | x | x | x | Tap 14 |
| Inp14 | C3 | 016384 | x | x | x | x | Tap 15 |
| Inp15 | D3 | 032768 | x | x | x | x | Tap 16 |
| Inp16 | A4 | 065536 | Strobe 0 | Strobe 01 | Strobe 012 | x | Tap 17 |
| Inp17 | B4 | 131072 | Strobe 1 | Strobe 23 | Strobe 345 | x | Tap 18 |
| Inp18 | C4 | 262144 | Strobe 2 | Strobe 45 | x | x | Tap 19 |
| Inp19 | D4 | 524288 | Strobe 3 | x | x | x | Tap 20 |
| Inp20 | A5 | E.Over. | Strobe 4 | x | x | x | Tap 21 |
| Inp21 | B5 | E.Over. | Strobe 5 | x | x | x | Tap 22 |
| Inp22 | C5 | E.Over. | x | x | x | x | Tap 23 |
| Inp23 | D5 | E.Over. | x | x | x | x | Tap 24 |
| Sgn | minus | minus | minus | minus | minus | minus | servo |
| Adr0 | yes | yes | yes | yes | yes | yes | no |
| Adr1 | yes | yes | yes | yes | yes | yes | no |
| Adr2 | yes | yes | yes | yes | yes | yes | no |

**Differences in projection when in mode „TRANSFORMER“**

- if tap 20 or higher is switched in BCD mode, all relays become energised
- if no input is switched on, the display shows “ ---- “
- when 1 input is switched on, the display shows „88“. Number „88“ represents the number of the tap
- when 2 inputs are switched on, the display shows “ [88] “. Number 88 represents the number of the tap, that has been switched on*
- when 3 or more inputs are switched on, the display shows “ XXXX “
- when Sgn is on, the display shows “-ZZZZ-”. ZZZZ represents what was on the display

! *When device is fitted with sensor excitation, input Adr 2 is not available*

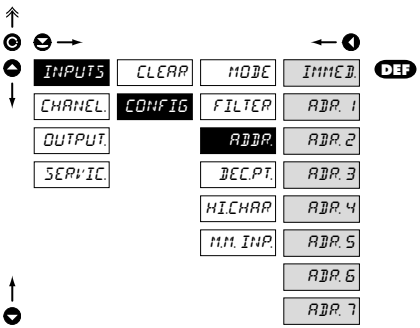
### 4.3.1.2.2 SETTING THE INPUT FILTER




**FILTER** **Setting the range or type of measurement**

- *setting range: 0...9999*
- *numeric value of the filter represents the duration of time (in ms) of a pulse that is to be recognised as valid by the system*

### 4.3.1.2.3 SETTING OF DEVICE ADDRESS




**ADDR.** **Setting the indtrument address**

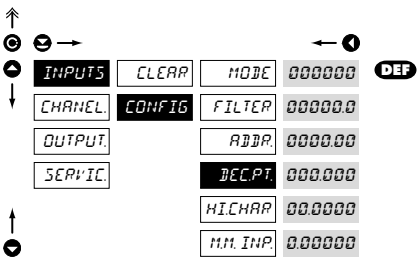
**IMMED.** Input data are displayed regardless of address

**ADR. 1** Address 1

- *setting range: Adr. 1...7*

! *When setting the excitation, the range is limited to Adr 1...3*

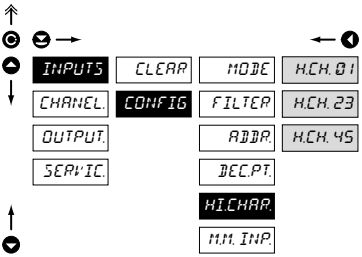
### 4.3.1.2.4 SETTING THE DECIMAL POINT




**FORMAT** **Setting the decimal point**

- *the instrument allows for classic projection of a number with placement of the decimal point (000000/00000,0/0000,00/000,000/0000,00/00000,0)*

### 4.3.1.2.5 SETTING OF UPPER BCD SYMBOLS




**HI.CHAR.** **Setting of display projection when input BCD combination is greater than 9**

**H.CH. 01** Symbols for input codes $1010_b$ and $1011_b$

- *def. value „AB“*

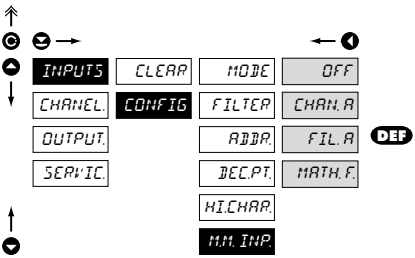
**H.CH. 23** Symbols for input codes $1100_b$ and $1101_b$

- *def. value „CD“*

**H.CH. 45** Symbols for input codes $1110_b$ and $1111_b$

- *def. value „EF“*

### 4.3.1.2.6 SETTING OF MIN/MAX VALUE EVALUATION




**M.M. INP.** **Setting of input „value“ for evaluation of Min/Max value**

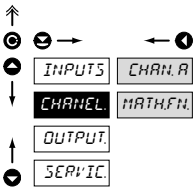
**OFF** Min/Max value is inactive vypnutá

**CHAN.A** From the value of Channel A

**FIL.A** From the filtered values of Channel A

**MAT.F** From the Mathematic functions

### 4.3.2 CONFIGURATION MODE - CHANNELS



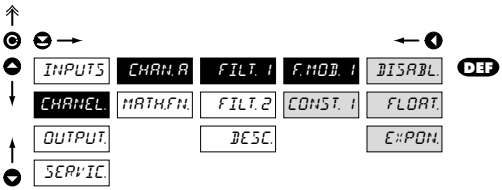

The basic parameters of the instrument input values are adjusted in this menu

`CHAN.A` Setting the parameters and the range of the measuring channel A

`MAT.FCE` Setting the instrument mathematic functions

! *Menu items "Channels" cannot be accessed when in mode "TRANSFORMER"*

### 4.3.2.1.1 SETTING THE MEASURING „CHANNEL A" - FILTERS




`F.MOD. 1` **Setting the digital filters 1**

`CONST. 1` Setting the Filtration constants

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

`DISABL.` Filters are off

`FLOAT.` Selection of floating filter

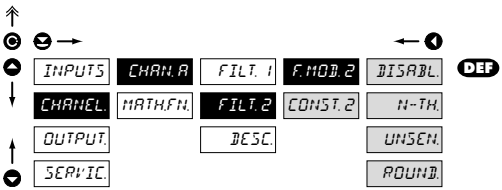
- *floating arithmetic average from given number („CONSt. 1") of measured data and updates with each measured value (range 2...30)*

`EXPON` Selection of the exponential filter

- *calculation is from a selected number of measurements (range 2...100)*

! *Unavailable for mode **TRANSFORMER***

### 4.3.2.1.2 SETTING THE MEASURING „CHANNEL A" - FILTERS




`F.MOD.2` **Setting the digital filters 2**

`CONST. 1` Setting the Filtration constants

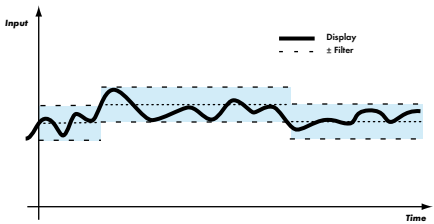
- *this menu is displayed always after selection of a particular type of filter*

`DISABL.` Filters are off

`N-TH` Selection of the n-th value

- *this filter allows to drop n-1 values and for further processing use every n-th measured value (range 2...100 measurements)*

! *Unavailable for mode **TRANSFORMER***



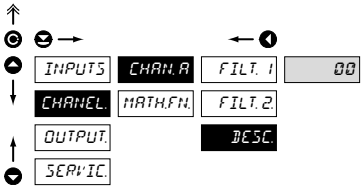

UNSEN. Selection of the band of insensitiveness

- *this filter enables to stabilize the resulting value. The measurement result is understood as the previous value, provided the measured value is not higher than the previous + P or smaller than previous - P. The value „±P" indicates the band of insensitiveness in which the measured value may change without affecting the result - the change of the displayed data (range 0,00001...100 000)*

ROUND. Measured value round-off

- *it is set by arbitrary number, which determines the step of projection (e.g., 2.5 - 0, 2.5, 5, 7.5, etc.)*

## 4.3.2.1.3 SETTING THE MEASURING UNITS DESCRIPTION



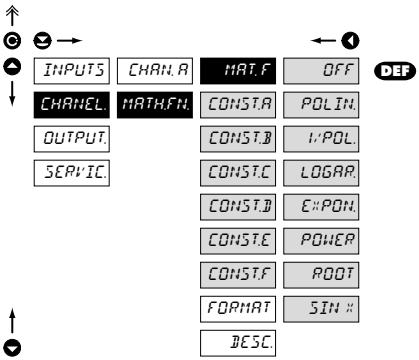

DESC. Setting projection of the measuring units on the display for Channel A

- *the instrument allows to add two description symbols to classical numeric formats (at the expense of number of displayed positions). Setting is performed with the aid of shifted ASCII code. Upon the setting the first two positions show the given symbols and the last two the code of the relevant symbol from 0 to 95.*

  *Description is cancelled by entering 00*

! *Unavailable for mode **TRANSFORMER***

### 4.3.2.6 MATHEMATIC FUNCTIONS




**MAT.F** Selection of mathematic functions

**CONST.--** Setting the constants for calculation of mat.functinos

- *thismenu is displayed always after selection of particular mathematic function with the option of entering constants A, B, C, D, E and F*

**OFF** Mathematic functions are off

**POLIN.** Polynome

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

**1/POL** 1/x

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

**LOGAR.** Logarithm

$$A \quad \ln \frac{Bx \quad C}{Dx \quad E} \quad F$$

**EXPON.** Exponential

$$A \quad e^{\frac{Bx \quad C}{Dx \quad E}} \quad F$$

**POWER** Power

$$A \quad Bx \quad C^{\,Dx \quad E} \quad F$$

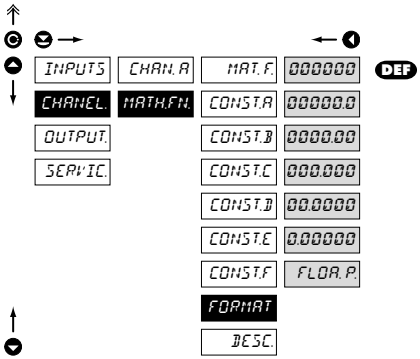
**ROOT** Root

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

**SIN x** Sin x

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

### 4.3.2.6.1 SETTING THE DECIMAL POINT

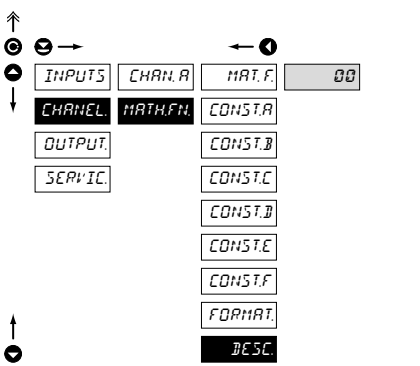



**FORMAT** **Setting the decimal point**

- *the instrument allows for classic projection of a number with placement of the decimal point (0000/000,0/00,00/0,000) and projection with floating point, allowing to display the number in its most precise form „FLOA. P.“*

! *Unavailable for mode **TRANSFORMER***

### 4.3.2.6.2 MATHEMATIC FUNCTIONS - DESCRIPTION ON THE DISPLAY

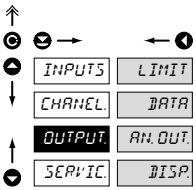



**DESC.** **Setting the measuring units on the display upon projection of the mathematic functions**

- *in this menu we set individual projection of the symbol of mathematic function which is independent of the projection of the measured quantity description and it is displayed only with the given function*

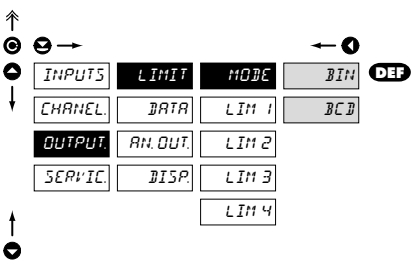
! *Unavailable for mode **TRANSFORMER***

### 4.3.3 CONFIGURATION MODE - OUTPUT




| | |
|---|---|
| LIMIT | Setting the function and type of the limits switch-on |
| DATA | Setting the data output type and parameters |
| AN. OUT. | Setting the analog output type and parameters |
| DISP. | Setting the permanent and temporary display projection and assignment of further projection of internal data to arbitrary instrument control keys |

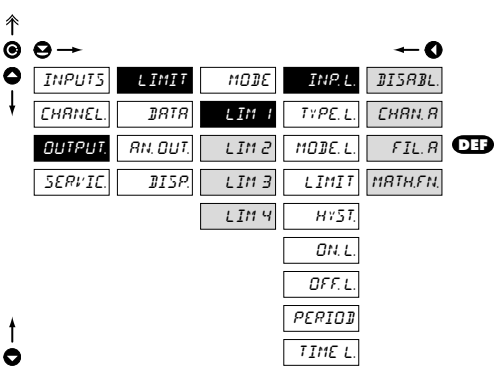
### 4.3.3.1.1 LIMITS - MODE SETTING




| | |
|---|---|
| MODE | **Relay switching mode for detection of active tap** |
| BIN | BIN 10 = 01010 |
| BCD | BCD 10 = 10000 |

! *Only for mode **TRANSFORMER***

### 4.3.3.1.2 LIMITS - SETTING THE DATA FOR EVALUATION

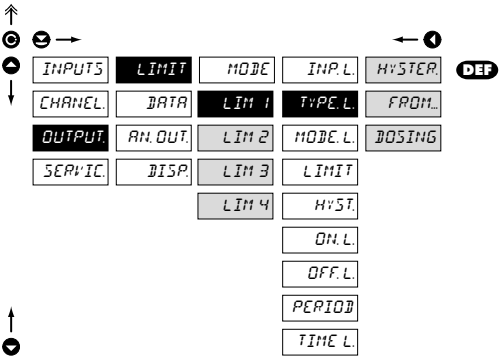



| | |
|---|---|
| INP. L | **Setting the input „quantity“ for limits evaluation** |
| DISABL. | The limit will not be evaluated |
| CHAN. A | The limit will be evaluated from the output of „Channel A“ |
| FIL. A | The limit will be evaluated from the output of „Channel A“ after modification by digital filters |
| MATH.FN. | The limit will be evaluated from the mathematic functions output |

*Setting is identical for LIM 1, LIM 2, LIM 3 and LIM 4*

! *Unavailable for mode **TRANSFORMER***

## 4.3.3.1.3 LIMITS - SETTING THE TYPE OF LIMITS




*Setting is identical for LIM 1, LIM 2, LIM 3 and LIM 4*

***DOSING** regime may be set only for LIM 1*

*The menu is dynamic, i.e. the items are displayed in dependance on the set type of limits.*

*HYSTER. ⇨ LIMIT + HYST. + TIME. L*
*FROM... ⇨ ON. L + OFF. L*
*DOSING ⇨ PER. L + TIME. L*

**TYPE. L** — **Setting the type of limits**

**HYSTER.** — **A limit has a boundary, hysteresis and delay**

- *for this regime the „LIMIT" parameters are set, at which the limit shall react and is adjustable within full range of the display, „HYST.." is an auxiliary parameter preventing oscillation at unsteady value, it is adjustable only in plus values. The limit parameter is „TIME L." determining the offset of the relay switch-on from the time of exceeding the set limit in range 0,0... 99,9 s*

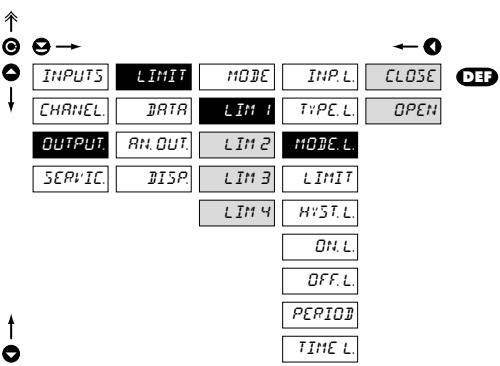
**FROM...** — **Limit is in the regime switch-on „from - to"**

- *for this regime the parameters „ON. L.." and „OFF L" are entered between which the limit is to switch-on, they are adjustable within the full display range*

**DOSING** — **Dose limit (Periodic)**

- *in this regime we set two parameters „PERIOD" in full range, determining at which value the relay shall switch on and by how much higher shall be the next value. Second parameter is „TIME L." in range 0,0... 99,9 s determining the time for which the relay shall be switched on. Upon resetting the counter to zero the value is set, at which the relay shall switch on to value „PERIOD"*

## 4.3.3.1.4 LIMITY - SETTING THE RELAY MODE



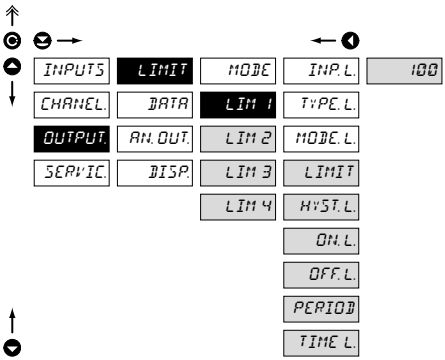

**MODE. L** — **Setting the switching mode of the relay**

**CLOSE** — **Relay switches on when the condition is met**

**OPEN** — **Relay switches off when the condition is met**

*Setting is identical for LIM 1, LIM 2, LIM 3 and LIM 4*

## 4.3.3.1.5 LIMITY - SETTING THE BOUNDARIES




**LIM -** **Setting the values for limits evaluation**

**LIMIT** Setting the boundary for relay switch-on

- *in full range of the display*

**HYST.** Setting hysteresis only in (+) values

- *within 1/10 of the display range*

**ON.L** Setting the beginning of the range of the limit switch-on

- *in full range of the display*

**OFF.L** Setting the end of the range of the limit switch-on

- *in full range of the display*

**PERIOD** Setting the period of the limit switch-on

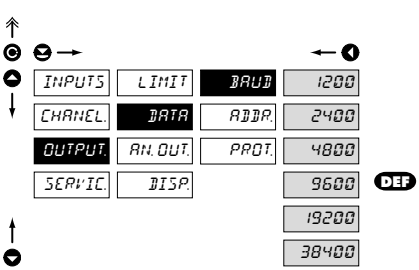
- *in full range of the display*

**TIME.L** Setting the offset of the imit switch-on

- *in range 0...99,9 s*

! ***PERIOD** setting may be set only for LIM 1*

## 4.3.3.2.1 DATA OUTPUT - SETTING THE TRANSMISSION RATE




**BAUD** **Setting the transmission rate (baud)**

**1200** Rate - 1 200 Baud

**2400** Rate - 2 400 Baud

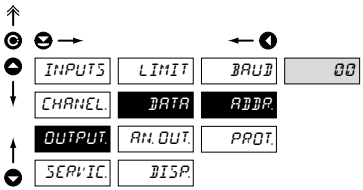
**4800** Rate - 4 800 Baud

**9600** Rate - 9 600 Baud

**19200** Rate - 19 200 Baud

**38400** Rate - 38 400 Baud

### 4.3.3.2.2 DATA OUTPUT - SETTING THE INSTRUMENT ADDRESS




**ADDR.** **Setting the instrument address**

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

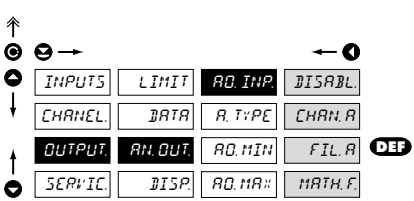
### 4.3.3.2.3 DATA OUTPUT - SETTING THE DATA PROTOCOL


**PROT.** **Setting the type of the data protocol**

**ASCII** ASCII protocol

**PROT.** DIN MessBus protocol

### 4.3.3.3.1 ANALOG OUTPUT - SETTING THE DATA FOR EVALUATION




**AO. INP.** **Setting the input „quantity“ for evaluation of analog output**

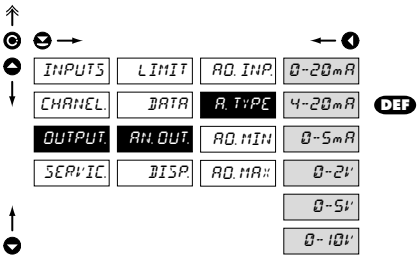
**DISABL.** AO nebude vyhodnocována

**CHAN. A** AO will be evaluated from output of „Channel A“

**FILT. I** AO will be evaluated from FILTER. value of „Channel A“

**MATH. F.** AO will be evaluated from the math.functions output

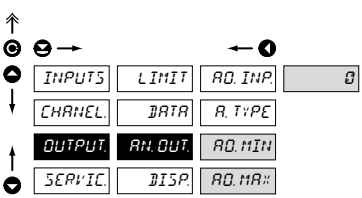
### 4.3.3.3.2 ANALOG OUTPUT - SETTING THE TYPE




**A. TYPE** Setting the type of analog output

| | |
|---|---|
| 0-20 mA | Type - 0...20 mA |
| 4-20 mA | Type - 4...20 mA |
| 0-5 mA | Type - 0...5 mA |
| 0-2 V | Type - 0...2 V |
| 0-5 V | Type - 0...5 V |
| 0-10 V | Type - 0...10 V |

### 4.3.3.3.3 ANALOG OUTPUT - SETTING THE RANGE




**AN. OUT.** Setting the range of the analog output

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

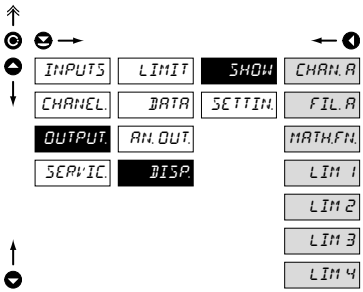
**AO. MIN** Assigning the displayed value to the beginning of the AO range

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

**AO. MAX** Assigning the displayed value to the end of the AO range

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

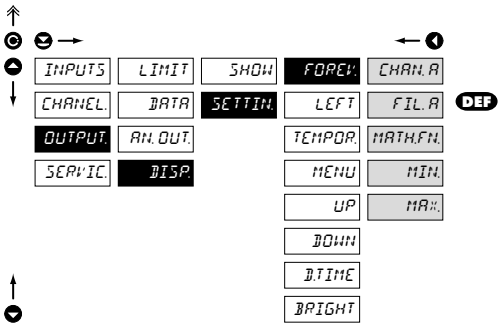
### 4.3.3.4 DISPLAY PROJECTION




**SHOW** In this menu item the following data may be displayed

- **CHAN.A** Value of „Channel A“
- **FIL.A** Value of „Channel A“ after Filtration
- **MATH.FN.** Value of the „Mathematic function“
- **LIM 1** Value of „Limit 1“
- **LIM 2** Value of „Limit 2“
- **LIM 3** Value of „Limit 3“
- **LIM 4** Value of „Limit 4“

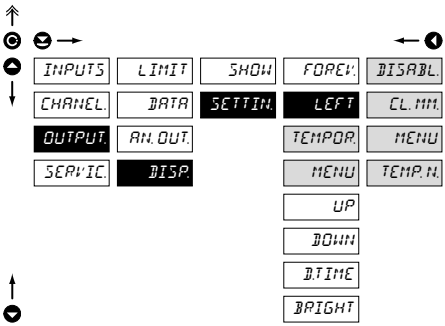
### 4.3.3.4.1 DISPLAY PROJECTION - PERMANENT




**FOREV.** Selection of values for permanent projection on the instrument display

- **CHAN.A** Value of „Channel A“
- **FILT.I** Value of „Channel A“ after Filtration
- **MATH.FN.** Value of the „Mathematic function“
- **MIN** Value of the „Minimum measuring value“
- **MAX** Value of the „Maximum measuring value“

## 4.3.3.4.2 DISPLAY PROJECTION - AFTER PRESSING „LEFT“



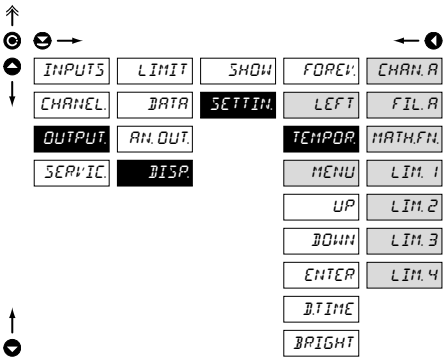

**LEFT** **Assigning function to the control key „LEFT“**

| | |
|---|---|
| DISABL. | The control key has no function |
| CL.MM. | Resetting the min/max. value |
| MENU | Direct access to selected menu item |

*- see setting „MENU“*

| | |
|---|---|
| TEMP.N. | Projection of temporary value |

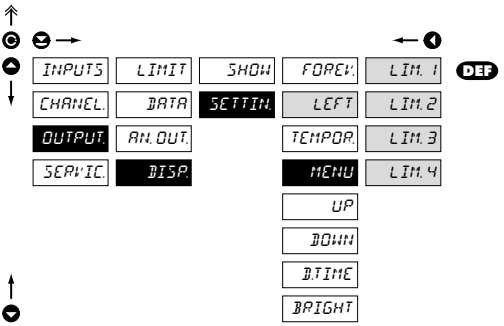
*- after pressing the selected value will be displayed with flashing DP for approx. 2 s*




**TEMPOR.** **After selection of item „TEMP. N.“ from menu „LEFT“ the following options are available**

*- in this menu we may select value for temporary display projection (after pressing ◀), which will be projected for approx 2s with flashing DP*

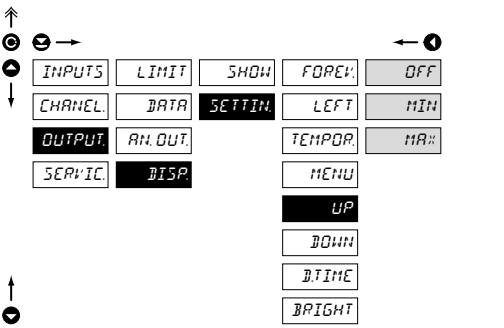
| | |
|---|---|
| CHAN.A | Value of „Channel A“ |
| FIL.A | Value of „Channel A“ after Filtration |
| MATH.FN. | Value of the „Mathematic function“ |
| LIM 1 | Value of „Limit 1“ |
| LIM 2 | Value of „Limit 2“ |
| LIM 3 | Value of „Limit 3“ |
| LIM 4 | Value of „Limit 4“ |




**MENU** **After selecting „MENU“ item from the menu „LEFT“ these options are available**

| | |
|---|---|
| LIM. 1 | Direct access into menu „Limit 1“ |
| LIM. 2 | „Direct access into menu „Limit 2“ |
| LIM. 3 | „Direct access into menu „Limit 3“ |
| LIM. 4 | „Direct access into menu „Limit 4“ |

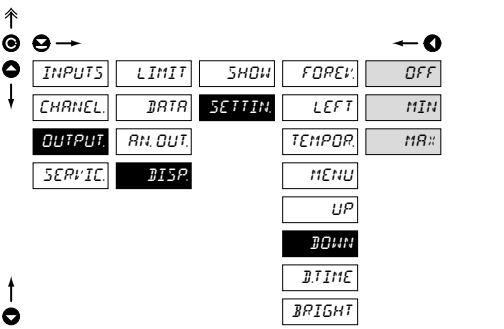
## 4.3.3.4.3 DISPLAY PROJECTION - AFTER PRESSING „UP“




**UP** **Assigning function to the control key „UP“**

| | |
|---|---|
| OFF | The control key has no function |
| MIN | Value of the „Minimum measuring value“ |
| MAX | Value of the „Maximum measuring value“ |

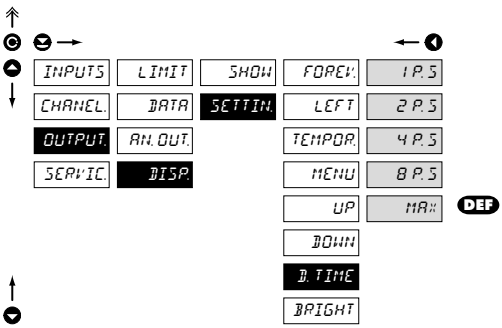
## 4.3.3.4.4 DISPLAY PROJECTION - AFTER PRESSING „DOWN“




**DOWN** **Assigning function to the control key „DOWN“**

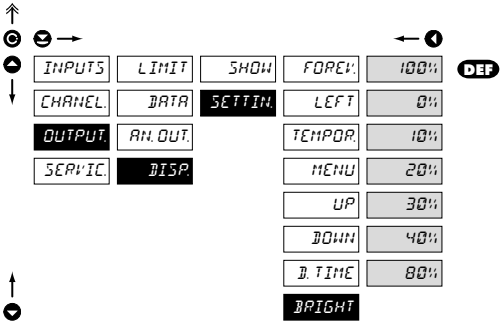
| | |
|---|---|
| OFF | The control key has no function |
| MIN | Value of the „Minimum measuring value“ |
| MAX | Value of the „Maximum measuring value“ value“ |

### 4.3.3.4.5 DISPLAY REFRESH FREQUENCY




| | |
|---|---|
| D. TIME | **Display refresh frequency** |
| 1 P. S | Refresh 1 times per second |
| 2 P. S | Refresh 2 times per second |
| 4 P. S | Refresh 4 times per second |
| 8 P. S | Refresh 8 times per second |
| MAX | Maximum refresh speed, approx. 20 times per second |

### 4.3.3.4.6 DISPLAY PROJECTION - BRIGHTNESS

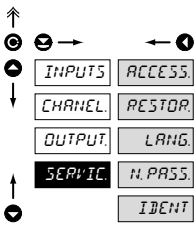



| | |
|---|---|
| BRIGHT | **Setting the display brightness** |
| 100% | Brightness 100 % |
| 0% | Brightness 0 %, display is off |

*- the display switches off after approx. 10 s and it lights up after pressing any key*

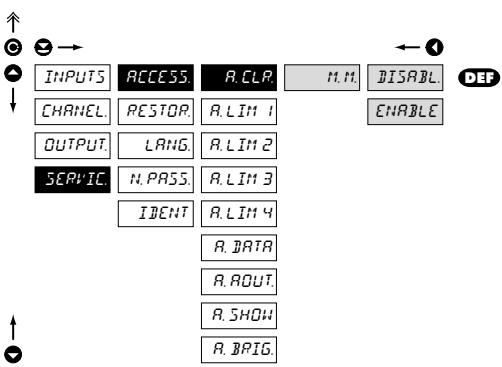
| | |
|---|---|
| 10% | Brightness 10 % |
| 20% | Brightness 20 % |
| 30% | Brightness 30 % |
| 40% | Brightness 40 % |
| 80% | Brightness 80 % |

### 4.3.4 CALIBRATION MODE - SERVICE




| | |
|---|---|
| ACCESS. | Setting the access rights for „User mode“ |
| RESTOR. | Restoration of the manufacture calibration or setting |
| LANG. | Setting the language version |
| N. PASS. | Change of the access password |
| IDENT | Instrument identification |

### 4.3.4.1.1 SETTING THE ACCESS RIGHTS FOR „USER MODE“ - RESETTING TO ZERO

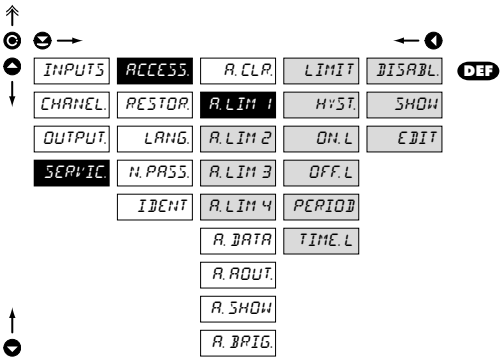



| | |
|---|---|
| A. CLR. | **Authorization for the instrument internal values resetting** |
| M. M. | Authorization for item „CL. M.M.“, permitted resetting of the Min/ max. value |

**The following parameters may be selected in all items**

| | |
|---|---|
| DISABL. | The item is not displayed in „UM“ |
| ENABLE | The item has full access in „UM“ |

### 4.3.4.1.2 SETTING THE ACCESS RIGHTS FOR „USER MODE“ - LIMITS




**A.LIM -** **Setting the access rights into Limits in „UM“**

**LIMIT** Authorization for item „LIMIT“, setting the boundary

**HYST.** Authorization for item „HYST.“, setting hysteresis

**ON.L** Authorization for item „ON. L.“, setting the beginning of the switch-on (from-to)

**OFF.L** Authorization for item „OFF. L.“, setting the end of the switch-on (from-to)

**PERIOD** Authorization for item „PERIOD.“, setting the end of the switch-on (Dosing)

**TIME.L** Authorization for item „TIME L.“, setting the offset of the switch-on

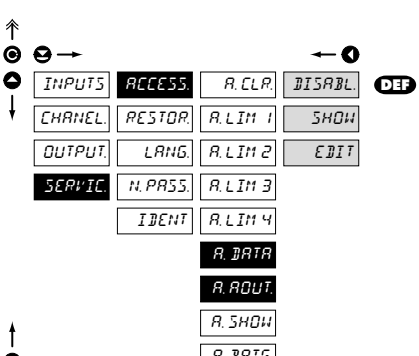
**The following parameters may be selected in all items**

**DISABL.** The item is not displayed in „UM“

**SHOW** The item is displayed in „UM“ but cannot be changed

**EDIT** The item has full access in „UM“, including editing

### 4.3.4.1.3 SETTING THE ACCESS RIGHTS FOR „USER MODE“ - OUTPUTS




**A.DATA** **Authorization for item „DATA“, setting the data output**

**A.AOUT.** **Authorization for item „AN. OUT.“, setting the analog output**

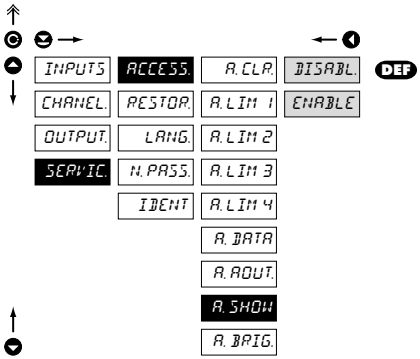
**The following parameters may be selected in all items**

**DISABL.** The item is not displayed in „UM“

**SHOW** The item is displayed in „UM“ but cannot be changed

**EDIT** The item has full access in „UM“, including editing

### 4.3.4.1.4 SETTING THE ACCESS RIGHTS FOR „USER MODE“ - PROJECTION




**A.SHOW** **Authorization for temporary projection of internal values „SHOW“ from menu „OUTPUT. - DISP“**

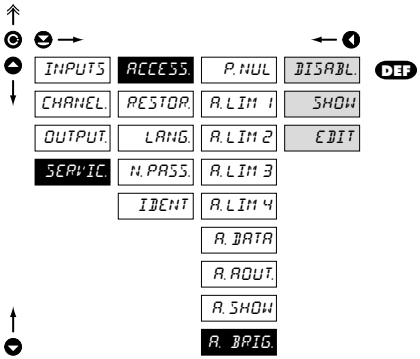
- *it sets authorization for temporary projection of the instrument internal values*

**The following parameters may be selected in this item**

**DISABL.** The item is not displayed in „UM“

**ENABLE** The item has full access in „UM“

### 4.3.4.1.5 SETTING THE ACCESS RIGHTS FOR „USER MODE“ - BRIGHTNESS




**A.BRIG.** **Authorization for item „BRIGHT“, setting the display brightness**

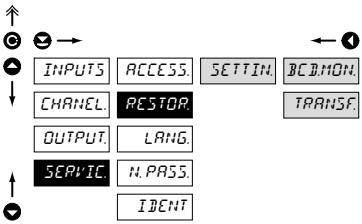
**The following parameters may be selected in this item**

**DISABL.** The item is not displayed in „UM“

**SHOW** The item is displayed in „UM“ but cannot be changed

**EDIT** The item has full access in „UM“, including editing

### 4.3.4.2 RESTORATION OF MANUFACTURE CALIBRATION/SETTING



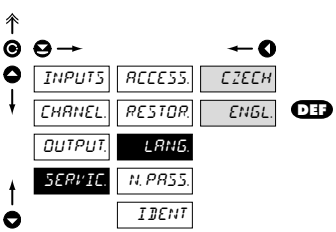

**RESTOR.** **Restoration of manufacture instrument setting**

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

**BCD.MON.** Pre-setting of values for BCD monitor

**TRANSF.** Pre-setting of values for transformer tap monitor

### 4.3.4.3 LANGUAGE VERSION FOR THE INSTRUMENT MENU

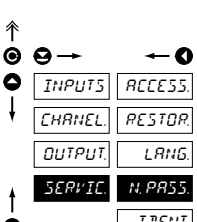



**LANG.** **Setting the language version of the instrument menu**

**CZECH** The instrument menu is in Czech

**ENGL.** The instrument menu is in in English

### 4.3.4.4 SETTING NEW ACCESS PASSWORD

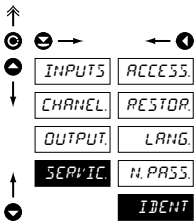



**N.PASS.** **Setting new access password for the „Configuration menu“**

- *this option allows to change the numeric code which blocks the access into the instrument „Configuration mode“. Range of the numeric code is 0...9999*

*The code is always preset from manufacture to 0000. In case of loss of access password it is possible to use universal access code "8177".*

### 4.3.4.5 INSTRUMENT IDENTIFICATION




**IDENT** **Projection of the instrument version**

- *the display shows the type identification of the instrument with the number of revision*
- *instrument name - input - program version - date SW (MM/DD/YY), e.g.: OM621BCD > 041-16 > 170603*

# 5. DATA PROTOCOL

The instruments communicate via serial line RS232 or RS485. For communication they use either ASCII protocol and communication is running in the following format:

ASCII: 8 bit, no parity, one stop bit

Both the transmission rate and the address are adjustable in the instrument menu.
Manufacture setting always presets the ASCII protocol, rate of 9600 Baud, address 00.

**COMMANDS FOR INSTRUMENT OPERATION**

The commands are described in the description which can be found at **www.orbit.merret.cz/rs**.
The command consists of a couple number-letter, where the letter size is of importance.

| Symbol | Meaning | Symbol | Meaning |
|---|---|---|---|
| ⇉ | Send unit value | C | Complete number |
| ⇇ | Set unit value | V | Selection = complete number |
| ■ | Perform relevant action | D | Decimal number |
| | | T | Text - printable ASCII characters |
| | | H | Intel HEX format |

| Legend | | | | |
|---|---|---|---|---|
| # | | 35 | $23_H$ | Beginning of the command |
| A | A | 0...31 | | Two signs of the inst. address (sent in ASCII - decades and units, ex."01") |
| <CR> | | 13 | $0D_H$ | Carriage return |
| <SP> | | 32 | $20_H$ | Space |
| N | P | | | Number and command - command code |
| D | | | | Data - usually signs "0"..."9","-","." ; (D) - dp. and (-) may prolong data |
| R | | $30_H$...$3F_H$ | | Relay status; zero bit corresponds with 1st relay, 1st bit with 2nd relay, etc. |
| ! | | 33 | $21_H$ | Positive command confirmation (ok) |
| ? | | 63 | $3F_H$ | Negative command confirmation (bad) |
| > | | 62 | $3E_H$ | Beginning of the transmitted data |


1489°C
-263mm
453mi

# 6. ERROR STATEMENTS

| ERROR | REASON | ELIMINATION |
|---|---|---|
| E.Unde. | range underflow (A/D transducer) | change the input signal value or change display projection |
| E.Over. | range overflow (A/D transducer) | change the input signal value or change display projection |
| EADC | A/D transmission error | upon repeated error statement send the instrument for repair |
| E.DatAE | distrupted data integrity in EEPROM, error upon data storage | upon repeated error statement send the instrument for repair |
| E.SHOW | projection error, setting the DP and description at the same time | change of setting |
| E.MEM. | EEPROM memory error | „Def“ values will be used in emergency, needs to be sent for repair |
| E.LoPWR | value cannot be measured (only for Power factor) | input signal control (input brackets have zero value of voltage/current) |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# 7. TABLE OF SYMBOLS

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 | { | \| | } | ~ | |


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# 8. TECHNICAL DATA

**INPUT**

*BCD monitor*

| | | |
|---|---|---|
| Range: | 5...24 VDC | |
| | 10...60 VDC | |
| Type: | serial BCD | 4 data + 6 strobe |
| | | 8 data + 3 strobe |
| | | 12 data + 2 strobe |
| | | 4 data + 3 pozice + 1 strobe |
| | parallel BIN/BCD | 20 data/24 data |
| Addressing: | up to 8 monitors | |

*BCD - transformer tapping leads monitor*

| | |
|---|---|
| Range: | 5...24 VDC |
| | 10..60 VDC |
| | 90...130 VDC |
| | 190...250 VDC |
| Tap. leads number: | 24 + 1 signaling (on request 27) |
| Input resistance: | 5,5 kOhm/V |
| Output: | relay BIN/BCD |
| | 5 relays *(250 VAC/50 VDC, 3 A) |
| | Mode: BIN 10 = 01010 / BCD 10 = 10000 |

**PROJECTION**

| | |
|---|---|
| Display: | 999999, intensive red or green 14-segment LED, digit height 14 mm |
| Decimal point: | adjustable - in Configuration mode |
| Brightness: | adjustable - in programming mode |

**INSTRUMENT ACCURACY**

| | |
|---|---|
| Temp.coefficient: | 60 ppm/°C |
| Accuracy: | ±0,2 % of range |
| Overload capacity: | 10x (t < 100 ms), 2x (long-term) |
| Digital filter | exponential, N-th value, radius of insensitiveness, round-off |
| Functions: | Blocking the access into „CM“ |
| | Min/max. value resetting |
| | Projection of measured units |
| Math. functions: | see documentation |
| Watch-dog: | reset after 1,2 s |
| Calibration: | at 25°C and 40 % r.h. |

**COMPARATOR**

| | |
|---|---|
| Type: | digital, adjustable in the menu |
| Limits: | -99999...999999 |
| Hysteresis: | 0...99999 |
| Delay: | 0...99,9 s |
| Reaction: | < 30 ms |
| Outputs: | 1... 2x relays Form C and 1...2x relays Form A *(230 VAC/30 VDC, 3 A) |
| Relay: | 1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300 |

**DATA OUTPUTS**

| | |
|---|---|
| Data format: | 7 bit + event parity + 1 stop bit (DIN MESSBUS) |
| | 8 bit + no parity + 1 stop bit (ASCII) |
| Rate: | 1200...38 400 Baud |
| RS 232: | isolated |
| RS 485: | isolated, addressing (max. 31 instruments) |

**ANALOG OUTPUTS**

| | |
|---|---|
| Type: | isolated, programmable with resolution of max. 10 000 points, analog output corresponds with the displayed data, type and range are adjustable |
| Non-linearity: | 0,2 % of range |
| TC: | 100 ppm/°C |
| Rate: | response to change of vlaue < 100 ms |
| Voltage: | 0...2 V/5 V/10 V |
| Current: | 0...5/20 mA/4...20 mA |
| | (compensation up to 600 Ohm) |

**POWER SUPPLY**

| | |
|---|---|
| Options: | 9...50 V AC/DC, ±10 %, PF ≥ 0,4, |
| | $I_{STP}$ < 40 A/1 ms, isolated |
| | 80...250 V AC/DC, ±10 %, PF ≥ 0,4, |
| | $I_{STP}$ < 40 A/1 ms, isolated |

Power supply is protected by a fuse inside the instrument.

**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 |

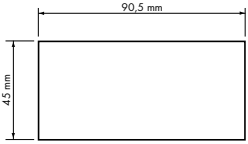
**OPERATING CONDITIONS**

| | |
|---|---|
| Connection: | connector terminal board, conductor cross-section < 2,5 mm$^2$ |
| Stabilization 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 cat.: | EN 61010-1, A2; for pollution degree II |
| | III. - instrument power supply (300 V) |
| | II. - input, output, excitation (300 V) |
| EMC: | EN 61326-1 |

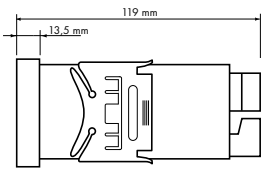
** the values apply for resistance load*

**Front view**


**Panel cut**



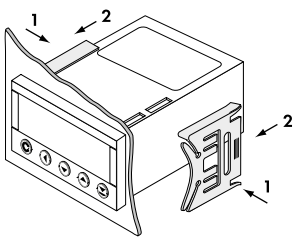

**Side view**

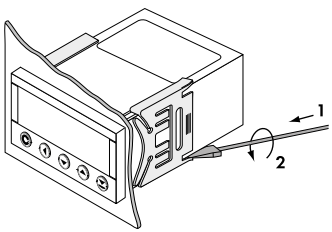



Panel thickness: 0,5...20 mm

**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 scre-driver under the traveller wing
2. turn the screw-driver and remove the traveller
3. take the instrument out of the panel

# 10. CERTIFICATE OF GUARANTEE

| | |
|---|---|
| Product | OM 621BCD |
| 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

# ES 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 sole 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. The object of the declaration is in conformity with the relevant Union harmonisation Legislation.

**Product:** Programmable panel instrument

**Type** **OM 621**

**Version:** UQC, BCD

**Thas been designed and manufactured in line with requirements of:**

Low-voltage electrical equipment (directive no. 2014/35/EU)
Electromagnetic compatibility (directive no. 2014/30/EU)

**The product qualities are in conformity with harmonized standard:**

El. safety: EN 61010-1
EMC: EN 61326-1
Electronic measuring, control and laboratory devices – Requirements for EMC "Industrial use"
EN 50131-1, chap. 14 and chap. 15, EN 61000-4-2, EN 61000-4-3, ed. 2, EN 61000-4-4, EN 61000-4-5,, EN 61000-4-6 EN 61000-4-8, EN 61000-4-11, EN 61000-4-111, EN 61000-3-2, EN 55022, chap. 5 and chap. 6

The product is furnished with CE label issued in 2002

**As documentation serve the protocoles of authorized and accredited organizations:**

EMC VTÚE Praha, laborator No. 1158, protocol No.: 186-28/2002 of 24/10/2002
VTÚE Praha, laborator No. 1158, protocol No.: 186-37/2002 of 24/10/2002
VTÚPV Vyškov, laborator No. 1103, protocol No.: 730-483/2002 of 15/10/2002
VTÚPV Vyškov, laborator No. 1103, protocol No.: 730-480/2002 of 15/10/2002

Place and date of issue: Prague, 1 April 2016

Miroslav Hackl
Company representative

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

tel.: +420 281 040 200
fax.: +420 281 040 299
e-mail: orbit@merret.eu

www.orbit.merret.eu

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