DIGITAL PROCESS METER DMP 11

with accessories for analogue signals measuring

- **230 VAC or 24 V AC/DC power supply**

- **6 digits LED 14,2mm display**

- **Scale -/+ 60 000**

- **Isolated analogue output (active and passive)**

- **Excitation power supply upto 21,6V @ 130mA**

- **2 or 4 relays output**

- **Optional CERTIFIED IP 65 enclosure**

DMP 11

⚠️	This device is designed for connection to hazardous electric voltages. Ignoring this warning can result is severe personal injury or mechanical damage. To avoid the risk of electric shock and fire, the safety instructions of this manual must be obeserved and the guidelines followed. If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired. This device should be installed and adjusted by qualified electrical maintenance personnel familiar with the connection and operation of the device and the hazards involved. Failure to observe this precaution could result in injury.
⚡	Until the device is fixed, do not connect hazardous voltages to the device - there is a risk of electric shock.
📖	Before putting the device into operation, this manual must be read carefully and familiarize yourself with the features of the device and electrical wirrings. **The device is intended exclusively for industrial or professional use.**
🗑️	This device is subject to separate collection, do not dispose of it with municipal waste. Jaroslav Rzepka MERCOS company is involved in the **collective system ASEKOL a.s.** (according to the Waste Act). Company registration number at the Ministry of Environment is: **00726105-ECZ**. Jaroslav Rzepka MERCOS company is involved in the **associated performance EKO-KOM** under client number: **EK-FO6050094**.
CE	The CE mark proves the compliance of the device with the essential requirements of the directives.

1. RECEIPT AND UNPACKING

Before putting the device into operation, please read this manual first and familiarize yourself with the features of the device and wirrings. The device does not require any intervention and is capable of operation after unpacking. If the device has been stored at too low or too high temperatures, it is necessary to let it acclimate for several minutes after unpacking.

2. MOUNTING, ELECTRICAL WIRRINGS AND OPERATION

This device should be installed and adjusted by qualified electrical maintenance personnel familiar with the connection and operation of the device, device setup can be done by instructed person.
In case of any doubts, do not hesitate to contact us at : 604 334 327 , mercos@mercos.cz
Make sure that proper power supply voltage is set and all input and outputs are connected correctly before connection to power supply system – electrical wirrings diagrams are at the end of this manual.

This device is designed for is continuos run and doesn't have own power-off switch. Installation must contains some power-off switch or building distribution circuit-breaker (e.g. power-off switch in switchboard or main distribution circuit-breaker). It has to be easy accessible by operating staff and has to be marked as cutting-off switch.

3. MAINTANANCE

DMP 11 is constructed to require minimal maintainance. Front panel with foil keypad isn't resistant to organic solvents (e.g. toluene, acetone etc...). **Use only suitable non-agresive cleaners for cleaning front panel (e.g. industrial alcohol).**
To prevent long-term failure-free operation, is recommned to use device in specified temperature range, not expose to extreme climatic condition, which have effect to longtime lifecycle of electronic components.

4. REPAIR INSTRUCTIONS

Each device was subjected to components quality check control, pre-setting circuits and 24 hours burn-in on power supply. After 24 hours burn-in, pre-set parametres check was made. If device failure occurs (e.g. by overvoltage, mechanical damage, device malfunction ...), that impact its own functionality, it is necessary to contact manufacturer, which will provide appropriate repair.

5. WARRANTY

Manafacturer guarantees in accordance with §429 Commercial code (Czech Republic) for technical and operating characteristics , specified in accompanying technical documentation. Device has 36 months warranty and after warranty service is provided. This warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication; (b) to unauthorized repair or modification or (c) if serial number has been removed or defaced.

How to control DMP 11

After power-on device shows measured value and device entered <u>main display mode</u>. In main display mode we could switch between several values by pressing ⟳ key (see the following table). Number of available items in <u>main display mode</u> vary due to settings and configuration of device.

Measured value	L1 limit	L2 limit	L3 limit	L4 limit	offset	Tara / hold
- 2500	L 1	L2	L3	L4	OFFSEt	tArA hoLd

By pressing ↵ key device shows value of selected item or executes its function (Tara/hold). By pressing ↵ key again device enters in <u>numeric input mode</u> . By pressing ᴱˢᶜ key, we can go back one step at a time without making any changes. If we press ↵ key, device stores edited value into EEPROM and shows message hotovo.

◫ glowing segment ; ◻ flashing segment

L 1   2000   002000   hotovo
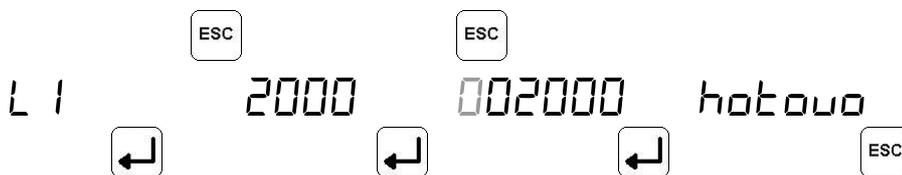
Entering address menu

To access the address menu, press the keys ↵ and ᴱˢᶜ together. The device now requires a password.

A message E PASS is displayed if the password is incorrectly entered and in the device memory the number of invalid attempts to enter the menu is increased by 1. The password is set to 1432 from the manufacturer. The user can change this password.

0000   1000   1000   1 100   A_00

Numeric input mode

When entering a numeric value, the first digit from the left will flash, by pressing ⟳ key we will move one by one digit to the right. To change the value of the current digit (flashing), press the ⟳ key and cycle through the value with each press one up (0 .. 1 .. 2 to 9 .. 0 .. 1 etc). In the first position on the left, only 0 or a minus sign is valid. Press the ᴱˢᶜ key to stop editing the numeric value at any time.

002000   002000   0 12000   022000   hotovo

Numeric option mode

When entering a numeric option, the last digit will flash and help text will appear from the left. To change the numeric option, press the ⟳ key and cycle through the selection with each press one up (0 .. 1 .. 2 .. 3 to 9 .. 0 .. 1 etc.).

0-20c0   4-20c 1   0- 10c2   Pot c3   hotovo
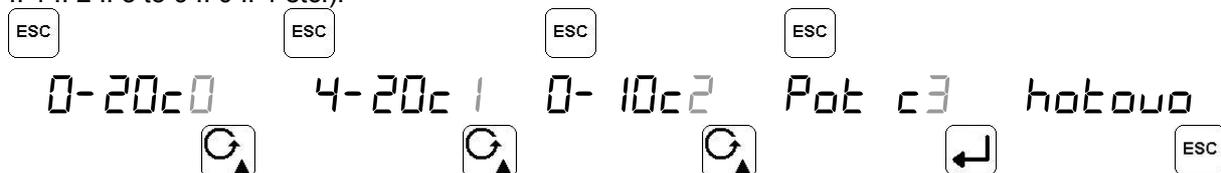
Decimal point mode

The numeral flashes together with the decimal point. To change the position of the decimal point, press the ⬚ button and change it one position to the right with each press.

ESC	ESC	ESC	ESC	
000000.	000.000	0000.00	00000.0	hotovo
Ⓐ	Ⓐ	Ⓐ	↵	ESC

Address menu of DMP 11

The individual functions and settings of the device are accessible at so-called addresses for simplicity. After entering the correct password, we enter the address menu, each address has its own number and is displayed in the format A_00 , A_01 , A_02 etc. To move up in address menu, press the Ⓐ key and to move down the ⬚ key. To enter the selected address, press the ↵ key. To exit the address and return to the address menu without changing the data, press the ᴱˢᶜ key.

If we change the numeric value or option at the given address, we are informed about the successful writing to the EEPROM by a message hotovo. We confirm this message with the ᴱˢᶜ key and the device returns to the address menu to the given address. To exit the address menu and return to the main view, press the ᴱˢᶜ key.

ⓘ *After entering the menu, the device continues to measure at 4 measurements / sec. The device returns to the main display for longer periods of inactivity. When you exit the menu, the device remembers the password* **for 1 minute,** *so you do not need to enter it when you re-enter menu. You delete the password immediately from the temporary memory of the device by* ᴱˢᶜ *key. When entering the menu again, the last selected address is displayed.*

ⓘ *The number of available addresses in the address menu depends on the device configuration and its equipment.*

⚠ *If the password is forgotten, the password can be temporarily reset to factory's default. Turn off the device and turn on the device again with the keys* ↵ *and* ᴱˢᶜ *pressed. The password is now set to 1432 for 10 minutes and the original password can be viewed in the menu or a new password can be set.*

Warning messages

E Aduc	Device malfunction, contact manufacturer	E -I nP	Input signal is lower than 3,8 mA
E PASS	Invalid password was entered	E I nP	Input signal is higher than 20,5 mA
hotovo	Data were stored into EEPROM	Out-rA	Displayed value is lower than -65535
E L in	L1 value out of preseted range	Out rA	Displayed value is higher than +65536
E dAtA	EEPROM data integrity error, contact the manufacturer for further instructions			

Device keys description

key	Main display mode function	Address menu function	Function in address
Ⓐ	Switching displayed items	Move up in addresses	Numeric input change or numeral digit on position change
▼◄►		Move down in addresses	A selected digit shift to the right
↵	Enter selected item	Enter in to selected address	Confirmation and saving into EEPROM
ESC	Return to measured value display	Return to main display mode	Escaping withou **saving** !

List of addresses and description

Address* [factory preset]	description	options
A_00 [0]	Input signal **filtering settings** ****	**0** – without filtration
		1 – 1,5 sec filter
		2 – 2 sec filter
		3 – 2,5 sec filter
		4 – 4,5 sec filter
		5 – 7 sec filter
		6 – 10,5 sec filter
		7 – 20 sec filter
A_01 [1]	**Input signal** selection	**0** – 0 to 20 mA
		1 – 4 to 20 mA
		2 – 0 to 10 V
		3 – potenciometer 0 to 100%
		4 – user def. current input I
		5 – user def. voltage input U
		6 – low voltage +/- 585 mV
		7 – user def. potenciometer
A_02 [0.00]	**Starting point** of the scale	**+/- 60000 digits**
A_03 [200.00]	**End point** of the scale	**+/- 60000 digits**
A_05 [XXXX. XX]	**Decimal point** ⓘ allowed positions are indicated, last position = dec. point off	$00.0.0.0.0.$
A_06 [2]	Display **brightness** ⓘ display brightnes is changed immidiatelly, setting is saved after the ⏎ key is pressed.	**0** – 25% brightness
		1 – 50% brightness
		2 – 75% brightness
		3 – 100% brightness
A_08 [0.00]	**User input scale start point** ⓘ It is necessary to have a signal source representing the start point connected to the input during settings	**+/- 60000 digits**
A_09 [20.00]	**User input scale end point** ⓘ It is necessary to have a signal source representing the end point connected to the input during settings	**+/- 60000 digits**

A_14 [0]	**L1 limit display** in main display mode ⓘ *With options 1 and 2, settings the L1 limit value is not password-protected, option 2 allows you to change the L1 limit within preseted range (at A_60 and A_61)*	**0** – disabled (pass protected)	
		1 – enabled (no pass protect.)	
		2 – enabled within preseted range (A_60 & A_61)	
A_15 [20.00]	Limit L1 **value**	**+/- 60000 digits**	
A_16 [0.01]	Limit L1 **numeral hysteresis** value	**0 to 30000 digits**	
A_17 [0,5]	Limit L1 **time hysteresis** value	**0 to 299,9 seconds**	
A_18 [0]	Limit L1 **control settings**	**0** – level mode inverse	
		1 – level mode direct	
		2 – window mode inverse	
		3 – window mode direct	
A_19 [0]	**L2 limit display** in main display mode ⓘ *With options 1 settings the L1 limit value is not pass-protected*	**0** – disabled (pass protected)	
		1 – enabled (no pass protect.)	
A_20 [40.00]	Limit L2 **value**	**+/- 60000 digits**	
A_21 [0.01]	Limit L2 **numeral hysteresis** value	**0 to 30000 digits**	
A_22 [0.5]	Limit L2 **time hysteresis** value	**0 to 299,9 seconds**	
A_23	Limit L2 **control settings**	**0** – level mode inverse	
		1 – level mode direct	
		2 – window mode inverse	
		3 – window mode direct	
A_24 [1]	**Output signal** type setting ⓘ *Option 3, 4 and 5 allows you to assign a user-defined scale range (A_25 and A_26) to the selected analog output type*	**0** – 0 to 20 mA	
		1 – 4 to 20 mA	
		2 – 0 to 10 V	
		3 – user output 0 to 20 mA	
		4 – user output 4 to 20 mA	
		5 – user output 0 to 10 V	
A_25 [0.00]	**User output signal scale start point**	**+/- 60000 digits**	
A_26 [200.00]	**User output scale signal end point**	**+/- 60000 digits**	
A_44 [0]	**L3 limit display** in main display mode ⓘ *With options 1 settings the L1 limit value is not pass-protected*	**0** – disabled (pass protected)	
		1 – enabled (no pass protect.)	
A_45 [60.00]	Limit L1 **value**	**+/- 60000 digits**	

A_46 [0.01]	Limit L3 **numeral hysteresis** value	0 to 30000 digits
A_47 [0.5]	Limit L3 **time hysteresis** value	0 to 299,9 seconds
A_48 [0]	Limit L3 **control settings**	**0** – level mode inverse
		1 – level mode direct
		2 – window mode inverse
		3 – window mode direct
A_49 [0]	**L4 limit display** in main display mode ⓘ *With options 1 settings the L1 limit value is not pass-protected*	**0** – disabled (pass protected)
		1 – enabled (no pass protect.)
A_50 [80.00]	Limit L4 **value**	+/- 60000 digits
A_51 [0.01]	Limit L4 **numeral hysteresis** value	0 to 30000 digits
A_52 [0.5]	Limit L4 **time hysteresis** value	0 to 299,9 seconds
A_53 [0]	Limit L4 **control settings**	**0** – level mode inverse
		1 – level mode direct
		2 – window mode inverse
		3 – window mode direct
A_60 [0.00]	**Preseted range** for L1 limit – **lower range**	+/- 60000 digits
A_61 [10.00]	**Preseted range** for L1 limit – **upper range**	+/- 60000 digits
A_62 [0]	**Relays response** to 4-20 mA current loop fault **	**0** – no reaction (undefined)
		1 – relay closes
		2 – relay opens (normally open)
A_63 [0]	**Output signal response** to 4-20 mA current loop fault ⓘ *The output signal must be set to 4-20 mA*	**0** – no reaction (undefined))
		1 – drop to 3.5 mA
		2 – rising to 21.5 mA
A_64 [0]	**Scale offset display** in main display mode	**0** – disabled (pass protected)
		1 – enabled (no pass protect.)
A_65 [0.00]	**Scale offset settings** ⓘ *The offset value is added to the measured value - the displayed data may be distorted!*	+/- 60000 digits
A_66 [0]	Function of **main display FNC and external input** ***	**0** – function disabled
		1 – TARA function
		2 – HOLD function

A_67	**Minimal measured value** display ⓘ *in csae of power-loss the value is lost. Value is cleared by pressing ⏎ button*	**+/- 60000 digits**
A_68	**Maximal measured value** display ⓘ *in csae of power-loss the value is lost. Value is cleared by pressing ⏎ button*	**+/- 60000 digits**
A_69	**TARA** value display/reset ⓘ *Tara value is displayed first, by pressing ⏎ button we clear tara value*	
A_70	**Input signal measuring** – service mode	
A_78	Number of **unsuccessful attemps** to enter device menu ⓘ *Max number of attemps is 255, by pressing ⏎ button we clear the value*	**0 to 255**
A_79 [1432]	**Password changing**	**0000 to 9999**
Notice: *) *number of available menu addresses dependes on device configuration and accessories* **) *Input current loop malfunction detection due to NAMUR NE43* ***) *External input is optional accessory, please check your device if it is available (see device label)* ****) *Filtration is not active for potenciometers (selection 3 and 7 on A_01)*		

Detail description of each address function

address	description
A_00	By settings higher time value filters could reach a stable measured value even in an enviroment with higher EMC levels. ⓘ *The higher time value flter is set, the lower input signal response we get*
A_01	Device works in two basic ways with input signal. First one uses factory calibration to measure input signals - options **0**, **1**, **2**, **3** and **5**. Second one let the user execute his own calibration to measure non-standart signal ranges – option **4** and **6**. ⓘ *When option 4 or 6 is selected, input signal calibration has to be done on adresses A_08 and A_09.*
A_02	Starting point of the scale assigned to the begining of input signal. *Example: Measuring water level in a tank (input signal is 4-20mA , water level range is 0,500 to 4,000m).* *We set Starting point of the scale to value 000.500 and device assigns it to the input signal of 4 mA.*
A_03	End point of the scale assigned to the end of input signal. *Example: Measuring water level in a tank (input signal is 4-20mA , water level range is 0,500 to 4,000m).* *We set End point of the scale to value 004.000 and device assigns it to the input signal of 20 mA.*
A_05	Decimal point settings is global for all of these adresses – A_02, A_03, A_08, A_09, A_15, A_16, A_20, A_21, A_25, A_26, A_45, A_46, A_50, A_51, A_60, A_61 and A_65. *Example: Measuring water level in a tank (input signal is 4-20mA , water level range is 0,500 to 4,000m).* *We set decimal point to 000.000*
A_06	Display brightness could be set in four levels. In low light enviroments is dimmed display more suitable.
A_08	User input scale start point requires connected input signal that corresponds to begining of user input signal range. *Example: Distance measuring application (input signal is 3,5 mA to 15,4mA , distance 0,200 to 11,000m)* *1. We set user input scale start point to 000.200 and confirm it by pressing ↵ key.* *2. Then connect corresponding input signal 3,5 mA to analogue input terminals, device shows last measured data from A/D from previous calibration in 1.3.2.7.6.8. format.* *3. In case we want to change scale value only and use previous calibration we press ᴱˢᶜ key and finish user input scale start point settings.* *4. If we want to make new calibration of input signal we repeatly press 🔍 key, with each press we get new measurement – so we could check input signal stability. Whenwe are satisfied with measured A/D data we press ↵ key and finish user input scale start point calibration and settings.*
A_09	User input scale point requires connected input signal that corresponds to end of user input signal range. *Example: Distance measuring application (input signal is 3,5 mA to 15,4mA , distance 0,200 to 11,000m)* *1. We set user input scale end point to 011.000 and confirm it by ↵ key*

	2. Then connect corresponding input signal 15,4 mA to analogue input terminals and follows instructions on A_08.
A_14	**L1 limit display in main display mode** offers direct access to L1 limit value settings. It has three modes: - option 0 : no direct access , L1 limit value is password protected - option 1 : full access in main display mode to L1 limit value - option 2 : limited access in main display mode to L1 limit value – the range is limited by values set on addresses A_60 a A_61. ⓘ *When option 2 is selected and user sets L1 limit value out of preseted range (A_60, A_61) warning message* E L ın *is displayed and value is corrected within preseted range and it is not **saved**.*
A_15	**L1 limit value** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. *Example: Water level measuring (Scale 0,200 to 11,000m, L1 limit setpoint is 5.500m)* *We set L1 limit value to* ⎕⎕5.5⎕⎕ *and confirm by* ⏎ *key.*
A_16	**Limit L1 numeral hysteresis value (dL1)** can be set within range 0 to 30000 digits, with respecting decimal point settings. Due to Limit L1 control settings (A_18) acts relay in these scenarios: - **Level mode** (pict. 1) – **direct/inverse** function (A_18,A_23,A_48,A_53) - Relay **closes/opens** when measured signal rise over L1 + dL1 . - Relay **opens/closes** when measured signal drops bellow L1 – dL1 . - **Windows mode** (pict. 2) – **direct/inverse** function (A_18,A_23,A_48,A_53) - Relay **closes/opens** when measured signals is within range defined by : (L1 – dL1) < **X** < (L1 + dL1) - Relay **opens/closes** when measured signal is out of range defined by : (L1 – dL1) < **X** < (L1 + dL1) *Example: Water level measuring (Scale 0,200 to 11,000m, L1 limit setpoint is 5.500m)* *We set L1 limit numeral hysteresis (dL1) to* ⎕⎕⎕.⎕⏀ *and confirm by* ⏎ *key.* ⓘ *When selection 2 or 3 option (window function– addresses A_14,23,48 and 53)it is recommneded to set time hysteresis dtLx to 0,5 seconds or more – to prevent fast relays closings/opens.*
A_17	**Limit L1 time hysteresis (dtL1)** can be set in range 0.0 to 299.9 seconds. When input signal rise over L1 + dL1 value or drop bellow L1 – dL1, device starts to count down time hysteresis (dtL1) and then is relay opens/closes. ⓘ *When input signal rise over L1 + dL1, dtL1 time hysteresis count down starts.If the input signal drops bellow L1 + dL1 during count down, relay will not opens/closes and dtL1 time hystresis count down timer is reseted* ⓘ *When input signal drops bellow L1 – dL1, dtL1 time hystresis count down starts. If input signals rise over L1 – dL1 during count down, relay will not opens/closes and dtL1 time hysteresis count down timer is reseted.*
A_18	**Limit L1 control settings** defines relay behavior when limit L1 is reached We can choose : direct/inverse level mode ∣ direct / inverse window mode ⓘ *see more at A_16 description*
A_19	**L2 limit display in main display mode** offers direct access to L2 limit value settings.

A_20	**L2 limit value** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. *Example: Water level measuring (Scale 0,200 to 11,000m, L2 limit setpoint is 6.500m)* *We set L2 limit value to* 006.500 *and confirm by* ⏎ *key.*
A_21	**Limit L2 numeral hysteresis value (dL2)** can be set within range 0 to 30000 digits, with respecting decimal point settings. Due to Limit L2 control settings (A_23) relay acts as described on address A_16.
A_22	**Limit L2 time hysteresis (dtL2)** can be set in range 0.0 to 299.9 seconds. When input signal rise over L2 + dL2 value or drop bellow L2 – dL2, device starts to count down time hysteresis (dtL2) and then is relay opens/closes. ⓘ *see more at address A_17*
A_23	**Limit L2 control settings** defines relay behavior when limit L2 is reached We can choose : direct/inverse level mode | direct / inverse window mode ⓘ *see more at A_16 description*
A_24	**Output signal type settings** has two modes. **First mode** (options 0,1 and 2) uses factory calibration where scale begin (A_02) is assigned to begin of analog output signal and scale end (A_03) is assigned to end of analog output signal **Second mode** (options 3,4 and 5) offers possibility to assign user-defined scale to analogue output signal (A_25 and a_26). Begin of analog output signal is assigned to A_25 value and end of analogue output signal is assigned to A_26.
A_25	**User output signal scale start point** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. This value represents begining of analogue output signal. *Example: Water level measuring (Scale 0,200 to 11,000m,output signal 4-20mA is assigned for range 5.000 to 10.500m)* *We set user output signal scale start point value to* 005.000 *and confirm it by* ⏎ *key. Analogue output signal will be 4mA when measured value will be 5.000.* ⓘ *All settings on this address are valid only for options 3,4 a 5 set on address A_24.*
A_26	**User output signal scale start point** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. This value represents begining of analogue output signal. *Example: Water level measuring (Scale 0,200 to 11,000m,output signal 4-20mA is assigned for range 5.000 to 10.500m)* *We set user output signal scale start point value to* 0 10.500 *and confirm it by* ⏎ *key. Analogue output signal will be 20mA when measured value will be 10.500.* ⓘ *All settings on this address are valid only for options 3,4 a 5 set on address A_24.*
A_44	**L3 limit display in main display mode** offers direct access to L3 limit value settings.
A_45	**L3 limit value** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. *Example: Water level measuring (Scale 0,200 to 11,000m, L3 limit setpoint is 7.500m)* *We set L3 limit value to* 007.500 *and confirm by* ⏎ *key.*
A_46	**Limit L3 numeral hysteresis value (dL3)** can be set within range 0 to 30000 digits, with respecting decimal point settings. Due to Limit L3 control settings (A_48) relay acts as described on address A_16.

A_47	**Limit L3 time hysteresis (dtL3)** can be set in range 0.0 to 299.9 seconds. When ipnut signal rise over L3 + dL3 value or drop bellow L3 – dL3, device starts to count down time hysteresis (dtL3) and then is relay opens/closes. ⓘ *see more at address A_17*
A_48	**Limit L3 control settings** defines relay behavior when limit L3 is reached We can choose : direct/inverse level mode | direct / inverse window mode ⓘ *see more at A_16 description*
A_49	**L4 limit display in main display mode** offers direct access to L4 limit value settings.
A_50	**L4 limit value** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. *Example: Water level measuring (Scale 0,200 to 11,000m, L4 limit setpoint is 8.500m)* *We set L4 limit value to* 008.500 *and confirm by* ↵ *key.*
A_51	**Limit L4 numeral hysteresis value (dL4)** can be set within range 0 to 30000 digits, with respecting decimal point settings. Due to Limit L4 control settings (A_53) relay acts as described on address A_16.
A_52	**Limit L4 time hysteresis (dtL4)** can be set in range 0.0 to 299.9 seconds. When ipnut signal rise over L4 + dL4 value or drop bellow L4 – dL4, device starts to count down time hysteresis (dtL4) and then is relay opens/closes. ⓘ *see more at address A_17*
A_53	**Limit L4 control settings** defines relay behavior when limit L4 is reached We can choose : direct/inverse level mode | direct / inverse window mode ⓘ *see more at A_16 description*
A_60	**Preseted range** for L1 limit – **lower range** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. When entering to the settings of limit L1 value from main display mode with option 2 set on A_14 is the value of L1 limited within preseted range (A_60, A_61). This feature is useful to preset safe range when operating personnel needs to change limit L1 value.
A_61	**Preseted range** for L1 limit – **upper range** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. When entering to the settings of limit L1 value from main display mode with option 2 set on A_14 is the value of L1 limited within preseted range (A_60, A_61). This feature is useful to preset safe range when operating personnel needs to change limit L1 value. ⓘ*When user set value out of preseted range, warning message* E L in *is displayed and the value is changed according preseted,* ***but it is not saved***.
A_62	**Relays response** to 4-20 mA current loop fault provides user option to set defined reaction of device relays when current loop fails. ⓘ *Input signal type has to be set to 4-20 mA(A_01, option 1*
A_63	**Output signal response** to 4-20 mA current loop fault provides user option to set defined reaction of device AO when current loop fails. ⓘ *Input signal type has to be set to 4-20 mA(A_01, option 1)) and output signal type to 4-20mA (A_24, option 1)*
A_64	**Scale offset display** in main display mode provides user option to direct access of offset value settings from main display mode
A_65	**Scale offset settings** can be set withing range of -60000 to +60000 digits, with respecting decimal point settings. Offset value is added to measured value, so the displayed value is corrected. To switch off offset function, set zero value on this address. ⓘ *The offset value is added to the measured value - the displayed data may be distorted!*

A_66	Function of **main display FNC and external input** **TARA** – by executing tara function is measured value zeroed **HOLD** – device will hold displayed value for 20 seconds, measuring is not affected External input is optional accessory and settings works for both. Active HOLD function is symbolized by blinking 1st left decimal point $0.08.500$
A_67	**Minimal measured value** display stores lowest measured value from last power on, to reset value press ↵ key and select Ano. ⓘ *Value is reseted with powerloss*
A_68	**Maximal measured value** display stores highest measured value from last power on, to reset value press ↵ key and select Ano. ⓘ *Value is reseted with powerloss*
A_69	**TARA value display/reset** offers user both preview of actuall tara value and tara value reset option. To reset tara value press ↵ key and select Ano. ⓘ *Value is **saved** if powerloss occured*
A_70	**Input signal measuring** – service mode Value on this address shows actual input signal measured physical value due to options on the adress A_01 in respective physical units (mA, V, mV). ⓘ *Device is in special measuring mode here and stops converting signal, control relays, AO and etc.*
A_78	Number of **unsuccessful attemps** to enter device menu is increased by 1 with each wrong password. This address offers preview of total attemps and reset option. To reset numbers of attemps press ↵ key and select Ano. ⓘ *Max number of attemps is 255*
A_79	**Password changing** address offers user to set his own password. Factory set password provides basic level of security. Password can be set in range 0000 to 9999 . ⓘ *In case of password lost, follow instructions at section „address menu of DMP11"*

DIGITAL PROCESS METER DMP 11

❏ 230 V or 24 V power supply
❏ for current and voltage signals

INPUT SIGNALS

Preset		
CURRENT	0 – 20 mA DC	
	4 – 20 mA DC	
VOLTAGE	0 – 10 V DC	
POTENCIOMETER	0 – 100 %	
Adjustable by user		
CURRENT	- 4 – 21 mA DC	
VOLTAGE	+/- 0 – 10,5 V DC	
	+/- 0 – 295 mV DC	
POTENCIOMETER	100 Ω – 2.0 kΩ	

OPTIONAL ACCESSORIES

2 or 4 releays outputs		
relay output L1, L2, L3 a L4	230 VAC @ 5A	
	Independent. set	
Isolated analogue output		
CURRENT	0 – 20 mA DC	
	4 – 20 mA DC	
due wirrings	active / passive	
VOLTAGE	0 – 10 V DC	
Excitation power supply		
upto 21,6 VDC @ 130mA +/- 10%		

INTRODUCTION

Digital process meter DMP 11 provides physical value measuring with displaying it within -60000 to +60000 digits range. Internal analogue sigma-delta converter offers resolution of one digit even in full scale range. Device provides adjustable input signal scale, output signal scale, decimal point and etc. to fit any kind of application. User can even set his own calibration for current, voltage (low, high) and potencimeters signals. Potencimeter measuring is based on the ratio measurement, slow changes in total potentiometer resistance do not affect measurement accuracy. Device has implemented NAMUR NE43 input current loop 4-20mA checking, with defined behaviour in case of current loop error.

FUNCTIONS

- ❏ **DISPLAYS** measured physical value
- ❏ **INPUT SIGNAL SELECTION** by user
- ❏ **SCALE RANGE** upto -60000 to +60000 digits
- ❏ **EXCITATION POWER SUPPLY** included
- ❏ **4 RELAYS FUNCTION**
  - ▪ direct / inverse level mode – relays closes / opens when limit is reached
  - ▪ direct window mode – relays closes in range defned by numeral hysteresis and limit value
  - ▪ inverse window mode – relays closes when signal is out of range defined by numeral hysteresis and limit value
- ❏ **NUMERAL HYSTERESIS** for each limit
- ❏ **TIME HYSTERESIS** for each limit
- ❏ **ANALOGUE OUTPUT** fully adjustable by user
  - ▪ 0 / 4 – 20 mA DC, 0 – 10 V DC
  - ▪ inverse AO : 20 – 4 / 0 mA , 10 – 0 V DC
  - ▪ fully adjustable eg. 12-18 mA , 1,6 – 8,3 V
- ❏ **TARA and HOLD FUNCTION** as standart equipment
- ❏ **DIGITAL INPUT** for TARA and HOLD function (optional acc.)
- ❏ **INPUT 4-20 mA CURRENT LOOP CHECK**
  - ▪ comply to NAMUR NE43 *
  - ▪ defined relays and analogue output behavior
- ❏ **DISPLAY BRIGHTNESS** in 4 levels
- ❏ **LIMIT L1 VALUE RANGE RESTRICTION** for operating personnel
- ❏ **DIGITAL FILTERS** for measured signal
- ❏ **GALVANIC INSULATION**
  - ▪ <u>Power supply from</u>: input, output, excitation power supply & relays
  - ▪ input signal from output signal
  - ▪ relays output betweeneach other

*) valid signal is within range 3,8 mA to 20,5 mA
**) 130mA excitation power supply is an optional accessory
***) DMP11-10010 version only
****) DMP11-22121 version has max. operating temp 45°C

TECHNICAL DATA

DISPLAY	-60 000 to +60 000 – red LED 14,2 mm
PWR.SUPPLY 230V	230 VAC (-20% / +15%)
POWER SUPPLY 24V	24 VAC or 24 VDC (-15% / +20%)
	21,6 to 52,8 VDC – **with all accessories**
	10,6 VDC to 52,8 VDC – **without accessories *****
CONSUPTION *Device has <u>T500mA</u> fuse*	2,5 W – without accessories
	+ 0,7 W – 2 relays
	+ 1,4 W – 4 relays
	+ 0,7 W – isolated analogue output
	+ 1,0 W / 3.0 W – excitation power supply
Exc. power supply	21,6V @ 30mA or 21,6V @ 130mA **
INPUT RESITANCE	current input – 50Ω + 13 Ω PTC
	voltage input 10 V – 370kΩ
	voltage input 295 mV – greater than 10 MΩ
POTENCIOMETER	3-wires connection (input resistance greater than 1MΩ)
SAMPLES	16,7 meas/sec (internal) ; 4 samples/sec – (display)
DIG.RESOLUTION	analogue input – 20 bits / analogue output – 14 bits
RESPONSE TIME	10% to 90% – input / output : **180 ms** (w/out filters)
ACCURACY	+/- 0,1 % from full range +/- 2digits
TEMP.COEFFIC.	0,005 % from full range / °C @ T_{ref} = 23°C
ISOLATION STRENGTH - **230 V**	**3 kV** *power supply vs.input/output/relay* **1 kV** *input vs.output. vs. digital input*
ISOLATION STRENGTH - **24 V**	**1,5 kV** *power supply vs.input/output/relay* **1 kV** *input vs.output. vs. digital input*
ANALOG.OUTPUT	max. 21,5 mA or max. 10,5 V DC
OUTPUT IMPEDANCE	**current** : max. 600 Ω | **voltage** : min. 5 kΩ
MAX. OUTPUT OVERLOAD	current: unlimited (*short-circuit resistant*) voltage : unlimited (*short-circuit resistant*)
RELAYS OUPTUT	2 or 4 switching contacts 230 VAC @ 5A
LIMITS L1 – L4	adjustable in full range of scale (+/- 60 000)
LIMITS L1 – L4 HYSTERESIS	value –adjustable in range 0 to 30 000
	timing – adjustable in range 0,0 to 299,9 sec
LIMITS L1 – L4 LOGIC FUNCTION	level mode – direct / inverse
	window mode – direct / inverse
DIMENSIONS	96 x 48 x 85 mm (w x h x d) – **cutout 91 x 44 mm** (w x h)
ENCLOSURE	IP40
WIRRING CONNECTION	terminal strip *max. conductor cross-section is 2,5mm*
WEIGHT	270 g – **with all accessories**
STABILISATION	5 minutes
OPERATING TEMP.	-25 °C to +50 °C *****
STORAGE TEMP.	-40 °C to +85 °C
HUMIDITY	20% < rH < 80% (without consdesation)
OPERATION	continous
SITE ALTITUDE	max. 2000 above sea level
APPLICATION	**intended solely for industrial or professional use**
EMC compatibility	ČSN EN 61326-1 ed.2 : 2013
EMC radiation	ČSN EN 55011 ed.3 : 2010 + A1:2011,class.B grp.1
ELECTRICAL SAFETY	ČSN EN 61010-1 ed. 2 : 2011,ČSN EN 61010-2-030:2011
EMC immunity influence	max. +/- 0,1% from full signal with unshielded wires

ORDER CODE

DMP 11 - . . . . .

A B C D E

A	**Power supply**	1 – 24 VAC / VDC , -15 to +20 %
		2 – 230 VAC , -20 to +15%
B	**Relay output**	0 – w/out relays output
		1 – 2 relays output
		2 – 4 relays output
C	**Analogue output**	0 – w/out analogue output
		1 – with analogue output
D	**Excitation power supply**	1 – exc.power supply 21,6 VDC @ **30 mA**
		2 – exc.power supply 21,6 VDC @ **130 mA**
E	**Digital input**	0 – w/out digital input
		1 – with digital output

ORDER EXAMPLE

DMP 11 – 21110
- power supply 230 VAC
- 2 relays output
- with analogue output
- excitation power supply 30mA
- w/out digital input

DIGITAL INPUT

ISOLATION DIAGRAM - 230 V

OUTPUT SIGNALS WIRRINGS for DMP 11

CURRENT OUTPUT

current active
- 0/4 – 20 mA
DMP 11 generates current

current passive
- 4 – 20 mA
DMP 11 is current hole

VOLTAGE OUTPUT

voltage actives
- 0 – 10 V DC
DMP 11 generates voltage

TERMINAL STRIP

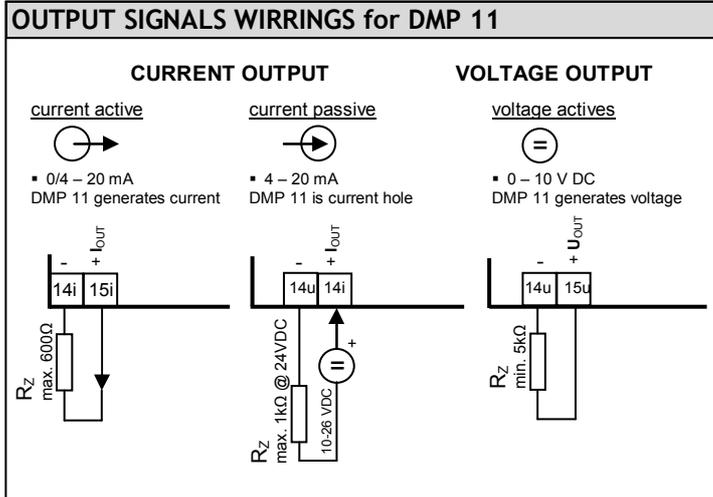Power supply is not universal – please specify power supply in order code
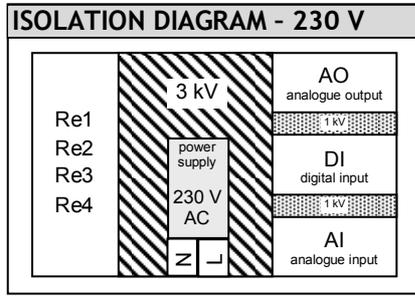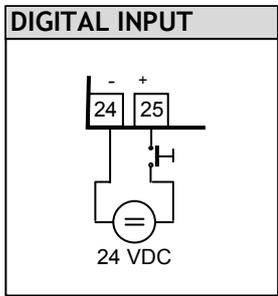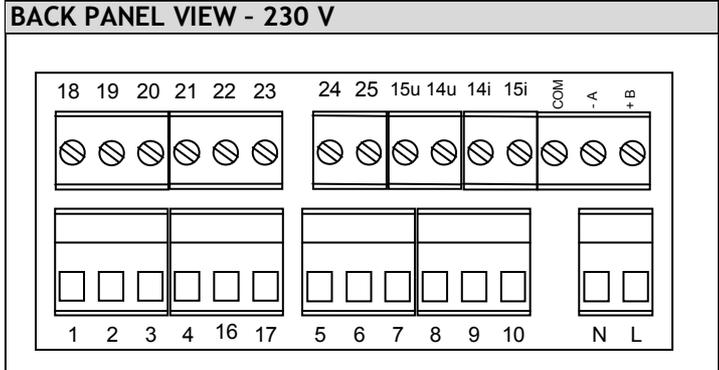
LEGEND:
- □ strips **1, 2, 3, 4, 16 a 17** analogue input & exc.pwr.supply (AI+PN)
- □ strips **5 - 10, 18 – 23** relays output
  - ▪ 5, 6, 7 relay Re1 (limit L1)
  - ▪ 8,9,10 relay Re2 (limit L2)
  - ▪ 18,19,20 relay Re3 (limit L3)
  - ▪ 21,22,23 relay Re4 (limit L4)
- □ strips **14 i , 15 i, 14 u, 15 u** analogue output (AO)
- □ strips **24, 25** digital input (DI)
- □ strips **COM, +A a -B** communication link RS 485
- □ strips **L, N** power supply **230V AC**
- □ strips **I, II** power supply **24V DC / 24V AC**

BACK PANEL VIEW - 230 V

INPUT SIGNALS WIRRINGS for DMP 11

CURRENT INPUT

ACTIVE SENS.

two wires
- 0/4 – 20 mA
- +/- 0 – 20 mA

three wires
0/4 – 20 mA
supply from DMP11

PASSIVE SENS.

two wires
- 4 – 20 mA
supply from DMP11

two wires
- 4 – 20 mA
external supply

VOLTAGE INPUT

two wires
- 0 – 10 VDC
- +/- 0 – 10 VDC

three wires
0 – 10 VDC
supply from DMP11

two wires
- 0 – 295 mVDC
- +/- 295mVDC

POTENCIOMETER

potenciometer(three wires)
- 10 Ω – 500 kΩ
supply from DMP11

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