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PROCESS INSTRUMENT INSTRUCTIONS MANUAL

DMP 06

W/OUT RELAY OR WITH 2 RELAYS

NOTICE:

Entering calibrating mode.
1. on the rear side of device is a switch,by switching it to **„CAL“** position, calibrating mode is now active
2. we enter menu using password : **1432**
3. now we can calibrate the device

All addresses in menu are available in **„CAL“** mode.
Only addresses A_00, A_06, A_24 a A_44 to A_53 in menu are available **„MEAS“** mode.

IMPORTANT: The address A_08 is not affected by calibrating device on addresses A_33 and A_34. Address A_08 is independent on address A_33.
We recomend to clear A_08 that represent overall value of OPERATING ZERO ADJUST.

A. BASIC ADDRESSES & SUB-ADDRESSES PREVIEW

address	decription	sub-addreses
A_00	Analogue output and display filter SELECTION **The filtration level is configured on address A_30!!**	0 : w/out filter (basic x > 50Hz filtration)
		1 : moving average
		2 : jitter filter
		3 : old vs. new value filter
	sub-addresses 4 - 13 - **second order polynomial filter** - time in brackets stands for 0% to 100% signal change reaction - **A_30 is not used.**	4 : frequency 0,1Hz (5,8s)
		5 : frequency 0,25Hz (2,8s)
		6 : frequency 0,5Hz (1,5s)
		7 : frequency 0,75Hz (1,1s)
		8 : frequency 1Hz (0,9s)
		9 : frequency 1,5Hz (0,7s)
		10 : frequency 2Hz (0,6s)
		11 : frequency 5Hz (0,44s)
	Accelerated overrun ➔	*12 : frequency 5Hz **(0,33s)*** *13 : frequency 5Hz **(0,2s)***
A_02	Scale beginning adjust	Max. scale range +/- 29 999 digits
A_03	Scale end adjust	
A_04	Display division adjust	decimal point is taken from A_05
A_05	Decimal point adjust	
A_06	Display brightness level	0 : 100%
		1 : 50%
A_07	Display test after power-on	0: inactive
		1: active
A_08	Operating zero adjust – reseting	Reseting to zero
A_09	Operating zero adjust range	0: w/out restriction
		1: upto 20% of scale range
A_10	COMMUNICATION SPEED	0 : 2400 baud
		1 : 4800 baud
		2 : 9600 baud
		3 : 19200 baud
		4 : 38400 baud
		5 : 57600 baud
A_11	OPERATIONAL ZERO in main display	0 : enabled
		1 : disabled
A_12 **NEW HW FILTER**	HARDWARE filter selection	0 : HW fiter OFF
		1 : HW filter ON **(0.9s)**
A_13	UNITS for communication *Units string will be added to measured value and send to RS-232 output*	0 : w/out unit
		1 : mg (miligram)
		2 : g (gram)
		3 : kg (kilogram)
		4 : t (ton)
		5 : q (quintal)

A_24	Analogue output signal selection	0 : 0 – 20 mA DC
		1 : 4 – 20 mA DC
		2 : 0 – 10 V DC
A_30 **NEW**	Analogue output and display filter LEVEL SELECTION	1 – 29 filtration stage is set from lowest (1) to highest (29) *)
A_33	Beginning of input signal calibrating	
A_34	End of input signal calibrating	
A_37	Current analogue output zero point calibrating	
A_38	Current analogue output end point calibrating	
A_39	Voltage analogue output zero point calibrating	
A_40	Voltage analogue output end point calibrating	
A_44	Set limit L3 in main display **)	0 : disabled
		1 : enabled
A_45	Limit L3 numeral setting	in full range of scale
A_46	Limit L3 HYSTERESIS numeral setting	In positive range of scale
A_47	Limit L3 HYSTERESIS timing	from 0 to 299.9 s, step: 0.1 s
A_48	L3 relay output function: direct: relay closes, inverted: relay opens	0 : inverted
		1 : direct
A_49	Set limit L4 in main display **)	0 : disabled
		1 : enabled
A_50	Limit L4 numeral setting	in full range of scale
A_51	Limit L4 HYSTERESIS numeral setting	positive range of scale
A_52	Limit L4 HYSTERESIS timing	from 0 to 299.9 s, step: 0.1 s
A_53	L4 relay output function: direct: relay closes, inverted: relay opens	0 : inverted
		1 : direct

NOTICE:
*) more samples slows the display and analogue output refresh rate
**) enabling this feature provides full access to the value of limits without password protection !

B. DETAILED ADDRESSES & SUB-ADDRESSES DESCRIPTION

address	Detailed desription
A_00 [13]	For selection 1 or 2 the address A_30 sets the filtration level ! For selection 3 the address A_30 sets the percentage of new value that goes into filtration in range 1 – 29 %. For selection 4 to 13 has A_30 no function. **NOTICE:** FILTER IS ALWAYS ACTIVE BOTH FOR DISPLAY AND ANALOGUE OUTPUT.
A_02 [000.00]	**Scale beginning adjust** - the value of scale beginning , that is equal to zero value of analogue input - for ex.: input signal is represented by weight 0 - 3000 kg. We setup the value of scale beginning to 0 kg.
A_03 [200.00]	**Scale end adjust** - the value of scale end , that is equal to max. value of analogue input - for ex.: input signal is represented by weight 0 - 3000 kg. . We setup the value of scale end to 3000 kg.
A_04 [000.00]	**Display division adjust** Display division "**d** " represents the unit step on the display Total quantity of steps "**n**" is designated by formula: n = Max / e , Max = A_03 - A_02 , e = verification division. In this device is e = d . - decimal point is taken from A_05 - example: scale is 0 - 3000 kg, step is 1 kg, we adjust address A_04 to 1, scale will have 3000 divisions
A_05 [xxx . xx]	**Decimal point adjust - DP (changing by button no.2)** - DP position is used for limits too - for ex.: input signal has a scale 0 - 3000 kg -> DP is set to x x x x x **.**
A_06 [0]	**Display brightness level** **-** 0 means 100% BRIGHTNESS and 1 means 50% BRIGHTNESS
A_07 [1]	**Display test after power-on**: - when active (1), display segments,decimal points and LED diodes test will begin after power-on. It takes 3.8 seconds - when inactive (0), no display test on power-on
A_08, A_09 **IMPORTANT**	**Operating zero adjust – reseting** Due to settings on address A_09, operating zero adjust (tare) works in two mode. **sub-address A_09 adjusted to „0“:** Operating zero adjust works in full range of the scale range w/out restriction *if the value of operating zero adjust overruns the input signal size 2.7 mV/V, device stops displaying. It is important that address A_33 and operating zero adjust are in conformity with device input range.* **sub-address A_09 adjusted to „1“:** Operating zero adjust works in range 0-20 % of the full scale range (address A_03) - If the value of operating zero adjust overruns 20%, error message is displayed : „Er NUL“ The address A_08 is not affected by calibrating device on addresses A_33 and A_34. Address A_08 is independent on address A_33. **We recomend to clear A_08 that represent overall value of OPERATING ZERO ADJUST**.
A_10 [2]	**Communication speed selection** Communication is one-way only , DMP06 is continously transmitting measured value at defined speed with or without addtional unit (g,kg,t,q..). **NOTICE**: - Please lower the communication speed, in case of longer communication lines or in rush enviroment with heavy EMC to prevent communication errors. - Device will reset itself , when changing communication speed

A_11 [0]	**OPERATIONAL ZERO in main display** („P. NULA“). This function has no effect to EXTERNAL ZERO function We By setting 0 on address A_11 is operational zero show in main display allowed, otherwise settings 1 will disallow function.
A_12 [0]	**Hardware filter** is preceded to digital (SW) filters and provide additional way of filtration. HW filter is suitable for strong mechanical shocks or vibrations. It is recommended for weighing plasticizers or additives. Using HW filter together with SW filter is possible (Option 12 on address A_00 is recommended).
A_13 [0]	**UNITS for communication** Example : „123.45kg“ -> option 3 (kg) on address A_13
A_24 [2]	**Analogue output signal selection** - selection of input signal: 0-20 mA, 4-20 mA, 0-10 VDC
A_30 [1]	Filtration level selection for both display and analogue output. **NOTICE**: Do not forget to set filter type on address A_00, if A_00 is set to 0, only basic 50Hz filter is active.
A_33	**Beginning of input signal calibrating (TARE)** - provides calibrating beginning of input signal, with no matter of initial sensor load. - device reads input signal and assigns it to address A_02, it is neccesary that input signal equals the value that is stored on address A_02
A_34 [200.00]	**End of input signal calibrating**. - decimal point is taken from A_05 - device reads input signal and assigns it to value entered on address A_34, and use ascending or descending reduction to fit value on address A_03 example: we have only 2000 kg weights balance but the scale is 0 – 3000kg, we enter 2000 on address A_34 and device itself stretch input signal to fit scale 0 - 3000 kg
A_37	**Current analogue output zero point calibrating** - direct DA converter calibrating - we connect digital multimeter to the terminal strips and adjust required value by changing displayed value from range 0 –16383
A_38	**Current analogue output end point calibrating** - direct DA converter calibrating - we connect digital multimeter to the terminal strips and adjust required value by changing displayed value from range 0 – 16383
A_39	**Voltage analogue output zero point calibrating** - direct DA converter calibrating - we connect digital multimeter to the terminal strips and adjust required value by changing displayed value from range 0 – 16383
A_40	**Voltage analogue output end point calibrating** - direct DA converter calibrating - we connect digital multimeter to the terminal strips and adjust required value by changing displayed value from range 0 – 16383
A_44 [0]	**Set limit L3 in main display** 0 - no direct access of L3 in main display , 1 - direct access L3 in main display this selection enables setting of limit L3 in main display, instead of entering menu (by typing password) and accessing the address 45. You can simply list L3 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L3.
A_45 [20.00]	**Limit L3 numeral setting** - when the measured value reach the L3,relay RE3 will open/close(see address 48) - the value of L3 could be set in full range of scale (max. +/- 29 999) - the limit must be setuped according to the decimal point for proper work - for ex.: the scale is 0 - 3000 kg, so the limit L3 can be 500 kg
A_46 [0.01]	**limit L3 HYSTERESIS (dL3) numeral setting**: - this address provides limit L3 HYSTERESIS numeral setting - the value of dL3 could be set in positive range of scale (max. 0 - 29 999) - the limit must be setuped according to the decimal point (see in address 5) - the value of dL3 is symetric in both direction (for ex.: L3=500 ; dL3=10 ; first point of L3 will be 490 and second point will be 510)

A_47 [0.5]	**Limit L3 HYSTERESIS timing: dtL3** - this address provides limit L3 HYSTERESIS timing - the value od dtL3 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L3, relay closes/opens (see address 48) after the time of dtL3 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L3, dtL3 count down is activated. If the input signal falls under the value of L3 during the dtL3 count down is timing, the relay RE3 will not be activated and the dtL3 count down timing is reseted.
A_48 [1]	**Selection of function RE3 when the measured value reach limit L3 :** - direct function: when relay RE3 reach L3 opens /the hook contact of RE3 is activated/ - indirect function : when relay RE3 reach L3 closes /the unhook contact of RE3 is activated/
A_49 [0]	**Set limit L4 in main display** 0 - no direct access of L4 in main display , 1 - direct access L4 in main display this selection enables setting of limit L3 in main display, instead of entering menu (by typing password) and accessing the address 50. You can simply list L4 in main display (by button no. 1) and by pressing enter button you can setup the value of limit L4.
A_50 [40.00]	**Limit L3 numeral setting** - when the measured value reach the L4,relay RE4 will open/close(see address 53) - the value of L3 could be set in full range of scale (max. +/- 29 999) - the limit must be setuped according to the decimal point for proper work - for ex.: the scale is 0 - 3000 kg, so the limit L3 can be 600 kg
A_51 [0.01]	**limit L3 HYSTERESIS (dL3) numeral setting**: - this address provides limit L3 HYSTERESIS numeral setting - the value of dL3 could be set in positive range of scale (max. 0 - 29 999) - the limit must be setuped according to the decimal point (see in address 5) - the value of dL3 is symetric in both direction (for ex.: L3=600 ; dL3=15 ; first point of L3 will be 585 and second point will be 615)
A_52 [0.5]	**Limit L4 HYSTERESIS timing: dtL4** - this address provides limit L4 HYSTERESIS timing - the value od dtL4 could be set from 0 to 299.9 s (step: 0.1 s) - description: if the input signal reach the value of L4, relay closes/opens (see address 53) after the time of dtL4 countdown. (from 0s to 299,9s) - if the input signal overloads the value of L4, dtL4 count down is activated. If the input signal falls under the value of L4 during the dtL4 count down is timing, the relay RE4 will not be activated and the dtL4 count down timing is reseted.
A_53 [1]	**Selection of function RE4 when the measured value reach limit L4 :** - direct function: when relay RE4 reach L4 opens /the hook contact of RE4 is activated/ - indirect function : when relay RE4 reach L4 closes /the unhook contact of RE4 is activated/

Error messages listing:

out r. – scale range overrun, value is greater than A_03 + 9e

Er NUL – operating zero adjust is greater than 20% of scale range

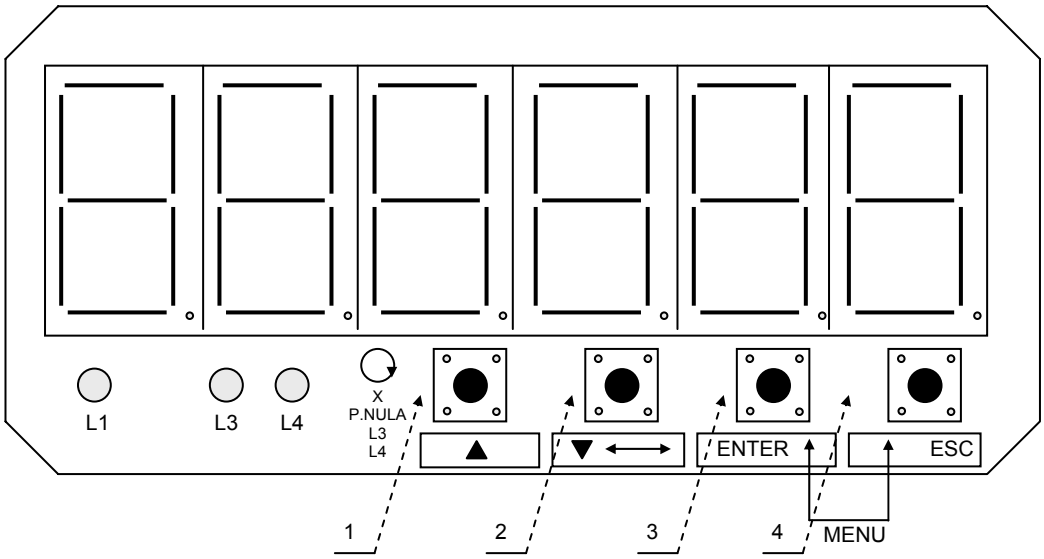
Err.CAL – reversed calibration (readed value A_33 is greater or equal to A_34)

Lo. 300 – very low weight resolution (calibrated range is lower than 300 digits)

Lo.3000 – low weight resolution (calibrated range is lower than 3000 digits)

01___A – Error in interfacing internal IC, please contact manafuctarer

C. BUTTONS USAGE DESCRIPTION



L1 – ZERO indaction (x <= +/- 0.25e)

1	**X P.NULA L3 L4**	**1. function**: in measuring state this button provides cycle showing of L3 and L4 when is button pressed the value on display is shown in this direction: **- measured value** : the device automatically shows measured value on each power on and automatically returns in less than 10 s from P.NULA, L3 or L4 - **operating zero adjust** P. NULA: display shows **„P. NULA“** and by pressing button no. 3 (ENTER) is zero adjust executed, in case that zero adjust is greater than 20% of scale, error message „**Er. NUL“** is displayed and no action is taken - **limit L3**: symbol ' L3 ' is shown for less than 10 s and then if no button pressed returns to the measured value, if enter button is pressed the value of limit will be shown. By pressing enter button again, you will access setting value of limit L3. - **limit L4**: same as limit L3 Then the set of L3 or L4 is standart as a normal access to the L3, L4 from the menu. Anytime you can exit by pressing ESC button without changes. * displayed symbols L3 and L4 dependes on actual configuration of process meter and on settings on address A_44 or A_49
	▲	**2. function**: in programming state this button provides increasing the value on the selected digit of display.(xxx(x)xx highlited 'x' is blinking and button ^ increase value): - to setup numeral data in basic addresses : A_00 - A_53 - to setup the selection in SUB-ADDRESSES - to setup all numeral values (eg. L3, L4 etc...)
2	◄►	**1. function**: in programming state this button provides switching the highlighted (blinking) digit on display (eg. xxx(x)xx, <-> , xxxx(x)x , <-> , xxxxx(x) ,<-> (x)xxxxx) - valid only for setup in addresses where is the numeral value setuped. - not valid for setting SUB-ADDRESSES switches / "program switches" / (for ex.: A_00, A_53)
	▼	**2. function**: in menu this button provides decreasing numeral value of address A_00 - A_53 . (for ex. A_15 button pressed A_14 , Butt Pressed , A_13) notice: if you press the button and the numeral value of adress is 1 (A_00) the next value will be 53 (A_53) -> cycle
3+4	ENTER + ESC	pressing together button "ENTER" and "ESC" provides entering to the password protected menu. - by pressing ENTER+ESC together, on display apears " 0 0 0 0 " and device is waiting for the password. (if no button pressed in 5 second the device returns back) - user password : provides access to the address A_00 - A_53 ('user setup area') - with buttons n.1 and n.2 write the password and then confirm by pressing ENTER button. notice: the password cannot be change so be careful and hide the password from any unauthorized person
3	ENTER	ENTER provides confirm and saving values - by confirm (pressing ENTER butt) address (eg. A_10) you enter the programming state - now you can set the value or exit by pressing ESC button. - by next pressing ENTER the setuped value is saved into EEPROM memory and on display appears message 'hotouo' - Confirm this message by pressing ESC button
4	ESC	ESC provides escaping the programing state , menu , etc...
LED diode L1		- zero indication - LED diode L1 lights in range of input signal : **X <= + / - 0.25 e**

D. DEVICE SET-UP INSTRUCTIONS

First device setup	
1	Switch the switch located on the rear side of indicator to **CAL** position
2	Press ENTER and ESC together to access menu and enter password **1432**
3	address **A_00** –> **0** (no samples for averaging)
4	address **A_02** –> the **scale beginnig** (+ / - 29 999)
5	address **A_03** –> the **scale end** (+ / - 29 999)
6	address **A_04** –> **Display division adjust „d“**
7	address **A_05** –> **Decimal point DP** (DP is taken back to address **A_03 a A_04**)
8	address **A_06** –> **Display brightness level** (**„0“** – 100% , **„1“** – 50%)
9	address **A_07** –> **1** (power-on display segmets test)
10	address **A_08** –> choose „**ANO“** to reset operating zero adjust value (**„A_08“** → *Enter* → **„------„** → *Enter* → **„ANO“** → *Enter* → **„hotouo"**)
11	address **A_09** –> **0**
12	address **A_12 -> 0**
13	address **A_24** –> **2** – analogue output **0 – 10 VDC**
14	Address **A_30 → 1** – lowest filtration stage
15	address **A_33** –> **TARE :** with no load on the weight (empty and clean weight) **„A_33“** → *Enter* → **„hotouo“**)
16	address **A_34** –> **end of range (zesílení)** example: on 2500kgs weight we use e.g. 600kgs weights balance and enter 600 on display (in format according to DP position – 600.00 , 600.0 , 600)
17	address **A_37** –> **current analogue output adjust - begin**
18	address **A_38** –> **current analogue output adjust – end**
19	address **A_39** –> **voltage analogue output adjust - begin**
20	address **A_40** –> **voltage analogue output adjust - end**
21	Exit the menu with button **ESC**. On display is shown blinking symbol **„C“**, notifying us that the device is still in callibration mode and callibration addresses are available in menu. By switching the switch to „**MEAS“** position, device returns back to measure mode and symbol **„C“** disappear.
Setup is done.	

Device setup in periodical weight calibration	
1	Switch the switch located on the rear side of indicator to **CAL** position
2	Press ENTER and ESC together to access menu and enter password **1432**
3	address **A_08** –> choose „**ANO“** to reset operating zero adjust value (**„A_08“** → *Enter* → **„------„** → *Enter* → **„ANO“** → *Enter* → **„hotouo"**)
13	address **A_33** –> **TARE :** with no load on the weight (empty and clean weight) **„A_33“** → *Enter* → **„hotouo“**)
14	address **A_34** –> **end of range (zesílení)** example: on 2500kgs weight we use e.g. 600kgs weights balance and enter 600 on display (in format according to DP position – 600.00 , 600.0 , 600)
15	Exit the menu with button **ESC**. On display is shown blinking symbol **„C“**, notifying us that the device is still in callibration mode and callibration addresses are available in menu. By switching the switch to „**MEAS“** position, device returns back to measure mode and symbol **„C“** disappear.
Setup is done.	

E. SAFETY OPERATIONS

1. SETTING IN OPERATION

Device doesn't require any before running procedures and is ready to use after unpacking. Make sure that proper supply voltage is set and all input and outputs are connected correctly before connection to supply system.

Device is factory pre-seted, if no other specifications were received: *)

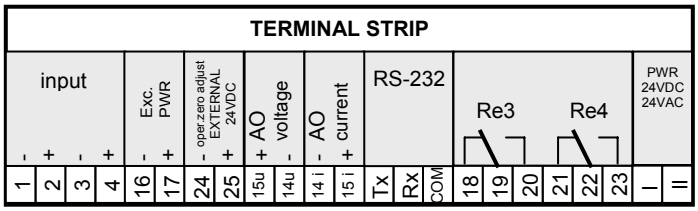
DP: 00.000 Scale: 0.00-200.00 limits: L3 = 20.00, L4 = 40.00

AO: 0-10V DC excitation supply: 10V DC, max. 200mA

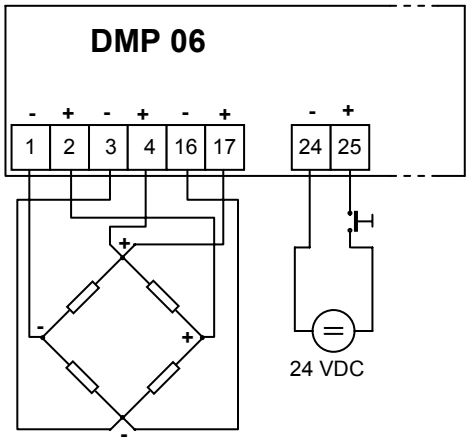
*) available functions may vary due to device configuration

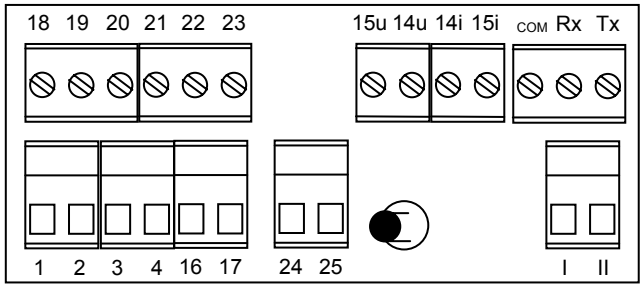
Electrical wiring has to be done by skilled person, device setup can be done by instructed person.

2. TERMINAL STRIP



3. INPUT SIGNAL AND OPERATING ZERO ADJUST WIRING





4. INSTALLATION AND MAINTAINANCE INSTRUCTIONS

Instrument is continuos run device 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 element.

DMP06 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.

5. 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, was made pre-set parametres check. 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.

6. WARRANTY

Manafacturer quarantees 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.

F. ANALOGUE OUTPUT RESPONSE TIME ON 0% TO 100% SIGNAL CHANGE

Filter type	A_30 : filtration stage selection							
	1	**5**	**9**	**15**	**20**	**25**	**29**	
A_00: **1**	0,25	0,74	1,16	1,86	2,56	3,16	3,6	sec
A_00: **2**	0,2	0,66	1,08	1,78	2,32	3,08	3,48	sec

Filter type (A_00)	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Frequency (Hz)	0,1Hz	0,25 Hz	0,5 Hz	0,75 Hz	1,0 Hz	1,5 Hz	2,0 Hz	5,0 Hz	5,0 Hz	5,0 Hz
Response time (sec)	5,8 s	2,8 s	1,5 s	1,1 s	0,9 s	0,7 s	0,6 s	0,4 s	0,3 s	0,2 s