



Vibro-Meter

OPERATING INSTRUCTIONS
Vibration Monitor
VMS 830



19" card



Aluminum housing



Sheet steel housing with LCD display

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1. General

The VIBRATION MONITOR VMS 830 is used for the absolute vibration measurement and monitoring of machines and industrial plants.

The universal electronic structure allows the use of different Sensors.

- ❖ Vibration velocity Sensor type CV 2...
(Output signal mV/mm/s)
- ❖ Piezoelectric CA ... or MTN ... Sensor with charge output
(Output signal in pC/g)
- ❖ Piezoelectric CE ... sensor for constant current supply
(Output signal in mV/g)
- ❖ Piezoelectric CE ... Sensor with following galvanic separator stage
GSI 130 / GSI 124 or GSI 127 (Output signal in μ A/g)
- ❖ Piezoelectric CE ... sensor with following galvanic separator stage GSI 122 /
GSI 124 or GSI 127 for measurements in explosive zone 1
(CE Sensor and galvanic separator stage GSI 122 / GSI 124 or GSI 127 with ATEX
certificate)

Is there a long distance (> 10 m) between Sensor and VIBRATION MONITOR VMS 830, we recommend the use of the Vibration velocity sensor type CV 2... or at cable length up to 1000 m type CE .. + GSI

By this configuration the distance is nearly without influence because of the current modulating routing. Potential differences between Sensor location and electronics are avoided by the galvanic separator stage GSI.

The VIBRATION MONITOR VMS 830 is used with an operating voltage of 115/230V 50/60 Hz. A version with +24V_{DC} or +48V_{DC} can be delivered optionally.

The VIBRATION MONITOR VMS 830 without display is placed in an aluminum housing of protection class IP 65 and the VIBRATION MONITOR VMS 830 with LCD-Display is placed in a sheet steel housing of protection class IP 66 .

A Europe card version for inserting in a 19" module rack is also available.

2. Function

2.1 Input amplifiers

For the different types of sensors an adaption of the input signal and sensor feeding happens in different factory settings.

2.2 Filters

The output signal of the input amplifying stage is led through a band pass consisting of a high and low pass filter.

The standard filters are designed for an operating range of 10 – 1000 Hz according to DIN ISO 10816 or ISO 2373.

For special application the high pass filter can be bridge, so that measurements from 3 Hz are possible.

The low pass filter can be changed to 100 Hz, if necessary. Special filter settings are also possible by factory settings.

2.3 OK – system sensor circuit monitoring

The sensor circuit is monitored by the OK system. A failure, e.g. by a cable break activates monitoring function. The OK relay reacts and the green LED switches off.

For sensors with charging signals pC/g is this function is not available.

2.4 Amplifier and integrator

The vibration velocity or displacement can be selected via DIP switch S2.

2.5 Limit values

Two independently adjustable limit value detectors with time delay allow an alarm and a danger via correspondingly assigned relays. The function Normally De Energized (NDE) and Normally Energized (NE), as well as latched or unlatched can be selected via DIP Switch.

The yellow LED (Alarm) and the red LED (Danger) show the status of the relays.

The time delay of the limit values is selected via DIP switch in 1, 3, 5 or 10 seconds.

The setting of the switch threshold happens via potentiometer P1 for alarm and P2 for danger. Dependent on the version a potentiometer with scale or 10 step trimmer is available. For checking the settings there are the measuring points MP1 and MP2, from 1 to 10 V depending to 10 to 100%.

2.6 Output signals

For further processing analog signals 0...+10V or 0/+4...+20 mA are available. Whether a voltage or current signal is available, is set at the factory and documented in the test report. The zero point of the current range can be changed from 0 mA to 4 mA by the DIP-Switch S1.

If required, the zero point of the analog signal can be adjusted with the trimmer P3.

2.7 Resetting the limit values

At the operation type "latched" the limit values have to be reset manually via voltage impulse +15...30V. The external connection happens via terminal 18 or (6a).

In the 19" version is a reset button mounted in the front panel.

3. Technical data

Power supply:	115/230 V _{AC} (-10/+15 %) 50/60 Hz approx. 7 VA +18...36 V _{DC} or +36...60 V _{DC} optional approx. 10 W
Sensors:	CV... Vibration velocity sensor [mV/mm/s] CE... Sensor with constant current feeding [mV/g] CA... Sensor with charging output [pC/g] CE... Sensor with current modulating output [μA/g]
Amplifier:	AC voltage amplifier
RAW Signal:	3 Hz ... 5 kHz / 3 dB, R _{Load} > 20 kΩ
Frequency range:	High pass filter HP: 3 Hz or 10 Hz Low pass filter LP: 100 Hz or 1,000 Hz Filter (Butterworth 2 Pol; 40 dB / Decade)
Measured units:	selectable via DIP switch v => Vibration velocity mm/s eff s => Vibration displacement μmp
Measuring range:	selectable via DIP switch Vibration velocity 10, 20, 50 mm/s eff or or Vibration displacement 100, 200, 500 μmp
DC output :	0 ... +10 V, R _{Load} > 10 kΩ or 0/4...+20 mA, R _{Load} < 500 Ω
Power supply for external devices:	+ 24 V _{DC} Tolerance ± 1 % ; max.125 mA ; Noise level max.50 mV _{pp}
Limit value switch:	2 switches independently adjustable 10 - 100 % of measurement range (1 V to 10 V _{DC}) with potentiometers P 1 and P 2
Time delay:	selectable via DIP-Switch in 1, 3, 5 or 10 seconds
Relay load:	max. switching voltage: 220V DC or 250V AC max. switching current: 2 A max. switching capacity: 60 W, 125 VA

Aluminum housing version

Temperature ranges :	-20 ... +70 °C operation -30 ... +80 °C storage
Humidity:	max. 95.%, not condensing
Housing :	Pressure cast Aluminum, material GD AL Si 12
Size:	120 x 220 x 91 mm (H x W x D)
Colour:	RAL 7001 (grey)
Protection class:	IP65
Connection :	Screwed cable gland 3 pieces M16x1.5 polyamide
Weight :	approx. 2.00 kg

19" version

Temperature ranges:	0...+50°C operation -20...+80°C storage
Size:	Euro board
Dimensions:	Size 160 x 100mm
Width:	8 TE (40mm) front plate
Height:	3 HE
Connection:	Blade contact connector 32 pole DIN 41612 type D
Weight:	approx. 0.45 kg

Sheet steel housing version

Temperature ranges:	0 ... +50° C operation 0 ... +50° C storage
Humidity:	max. 95% non-condensing
Housing:	steel housing, powder-coated
Size:	150 x 300 x 128 mm (W x H x L)
Colour:	RAL 7035
Protection class:	IP 66
Material strength:	housing 1.25 mm; door 1.25 mm
Version:	housing including hinged door, lock including double-bit
Connection:	3 Screwed cable gland M16 x 1.5 polyamide
Weight:	approx. 3.5kg

4. Assembly

Aluminum and sheet steel housing version

The Aluminum houses has to be fixed with 4 screws M5 and the sheet steel housing with 4 screws M8. The place of assembly must not be subjected to vibration ≥ 0.5 g peak in the range of 10 to 55 Hz. If the place of assembly is in free air or dusty or moist environment, this is to be considered at the cable gland and the closing of the cover.

19" version

It must be ensured, that the 19" board is bolted with its front panel in the 19" rack firmly. The place of assembly must not be subjected to vibration ≥ 0.5 g peak in the range of 10 to 55 Hz. Moisture and dirt are to avoid at all costs.

5. Commissioning**5.1 Connecting the operating voltage $115V_{AC}$, $230V_{AC}$ or $+24V_{DC}$, $+48V_{DC}$** ***Attention!***

It must be ensured that only the voltage is applied to the VMS 830, which is documented on the label!

Operating voltage $115 V_{AC}$ and $230 V_{AC}$

The line voltage 115 or 230 V 50/60 Hz is applied to terminal 1(32c) and 2(30c). The protective conductor (earth - PE) must be connected to terminal 3(28c) and for security additionally connected to the metal housing. The factory setting is 0V GND terminal 3 (28c) on the jumper B3 of the PCB connected, if necessary, this bridge can be opened.

Terminal 1 (32c):	PS	(L)
Terminal 2 (30c):	PS	(N)
Terminal 3 (28c):	Earth	(PE)

Operating voltage $24 V_{DC}$ and $48 V_{DC}$

The correct polarity by the $+24 V_{DC}$ or $+48 V_{DC}$ versions is to ensure! If the polarity is not correct the device is internally protected.

To improve shielding, the protective conductor (Earth - PE) to terminal 3 (28c) and also connected to the metal housing. The factory setting is 0V GND terminal 3 (28c) on the jumper B3 of the PCB connected, if necessary, this bridge can be opened.

Terminal 1 (32c):	PS	(+)
Terminal 2 (30c):	PS	(-)
Terminal 3 (28c):	Earth	(PE)

5.2 Connecting the sensor**5.2.1 CV ... sensor with signal (mV/mm/s)**

Terminal 16 (10a)	(+) Signal
Terminal 17 (8a)	(-) Signal
Terminal 19 (4a)	(0V) Shield

5.2.2 CE ... sensor for constant current supply (mV/g)

Terminal 16 (10a)	(+) Signal 0.5 to 4mA constant current
Terminal 17 (8a)	(-) Signal
Terminal 19 (4a)	(0V) Shield

5.2.3 CE ... sensor with current output (µA/g) with galv. separator stage GSI.. (mV/g)

Terminal 16 (10a)	(+) Signal mV/g
Terminal 17 (8a)	0V
Terminal 20 (2a)	+24V _{DC} Feeding GSI...

5.2.4 CA ... Sensor with charging output (pC/g)

Terminal 16 (10a)	(+) Signal
Terminal 17 (8a)	0V Shield
Terminal 19 (4a)	(-) Signal

Warning!

Be sure that the shielding of the measurement cable happens exactly according to the installation diagram. The cable shield of the measurement cable is to be put only one-sided. Non-observance can lead to electric shocks (unstable display) and failures of the measurement signal. The cable from the sensor head to VMS 830 is to be fixed, cable oscillations can lead to failures.

The place where the sensor is mounted has to be earthed!

5.3 Setting the limit values

	Measuring point	Potentiometer	Time delay 1, 3, 5, 10s
Relay K1 Alarm	MP1	P1 Alarm	DIP-Switch S3
Relay K2 Danger	MP2	P2 Danger	DIP-Switch S5

Example:

Limit Relay K1 at 60 %:

Potentiometer P1 Alarm at measurement point MP 1 to 6V_{DC}. (100% = 10V_{DC})

6. Factory settings of the DIP-Switches

		On	Off
S1 – 1*	High pass 10 Hz	X	
S1 – 2*	4.. 20 mA	X	
S1 – 3	0.. 20 mA		X
S1 – 4	not in use		X
S1 – 5	not in use		X
S1 – 6	0.. 10 mm/s eff		X
S1 – 7*	0.. 20 mm/s eff	X	
S1 – 8	0.. 50 mm/s eff		X
S2 – 1	not in use		X
S2 – 2	not in use		X
S2 – 3	0..100 µmp		X
S2 – 4	0..200 µmp		X
S2 – 5	0..500 µmp		X
S2 – 6	Vibration displacement (µmp)		X
S2 – 7*	Vibration velocity (mm/s)	X	
S2 – 8	Linearization 1 ... 1000 Hz (only for CV 211)		X
Limit 1	60% = 6VDC*		
S3 – 1	1 seconds		X
S3 – 2	3 seconds		X
S3 – 3*	5 seconds	X	
S3 – 4	10 seconds		X
S4 – 1	latched		X
S4 – 2*	unlatched	X	
S4 – 3*	Normally energized (NE) (fail safe)	X	
S4 – 4	Normally deenergized (NDE)		X

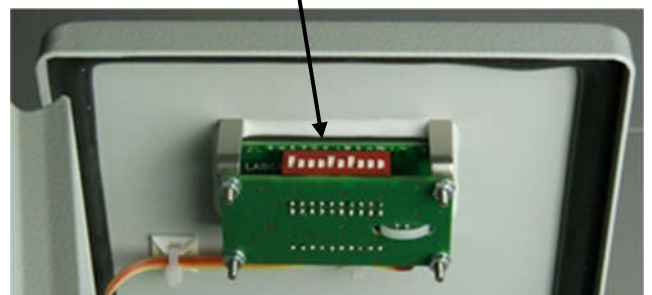
		On	Off
Limit 2	80% = 8VDC*		
S5 – 1	1 seconds		X
S5 – 2	3 seconds		X
S5 – 3*	5 seconds	X	
S5 – 4	10 seconds		X
S6 – 1	latched		X
S6 – 2*	unlatched	X	
S6 – 3*	Normally Energized (NE) (fail safe)	X	
S6 – 4	Normally De-energized (NDE)		X
Low pass Filter	100 Hz		
Low pass Filter*	1000 Hz	X	
Power Supply	+18...36 V _{DC}		
Power Supply	115 V _{AC}		
Power Supply	230 V _{AC}		

LCD Display

In the factory setting the display corresponds to the chosen measuring range. If the measuring range changes you have to adjust the display by using the DIP switch.

Measurement range	Display	DIP-Switch					
		1	2	3	4	5	6
10 mm/s	10,0	ON	OFF	OFF	ON	OFF	OFF
20 mm/s	20,0	OFF	ON	OFF	ON	OFF	OFF
50 mm/s	50,0	OFF	OFF	ON	ON	OFF	OFF
100 µm p	100	ON	OFF	OFF	OFF	OFF	OFF
200 µm p	200	OFF	ON	OFF	OFF	OFF	OFF
500 µm p	500	OFF	OFF	ON	OFF	OFF	OFF

DIP switch at the LCD display



The backlight is switched off in the factory setting.

Backlight	DIP-Switch
Switched on	ON
Switched off	OFF

DIP switches 8, 9 und 10 are not in use.

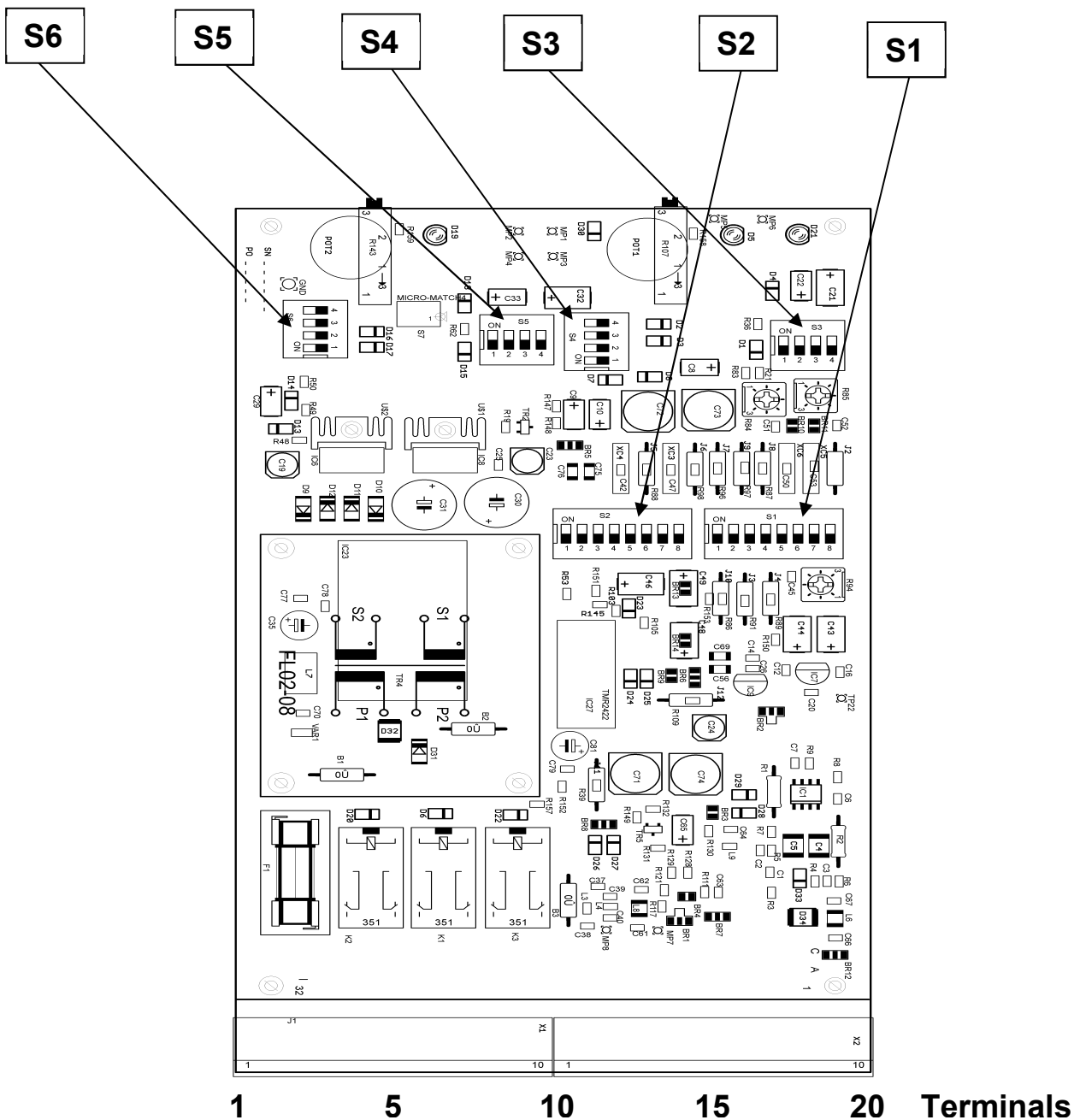
Warning!

Always select S1 – 1 or S2 – 8
High pass filter 10 Hz or linearization 1... 1000 Hz (only CV 211)

Always select S2 – 6 + S1 – 8 or S2 – 7
Vibration displacement or vibration velocity

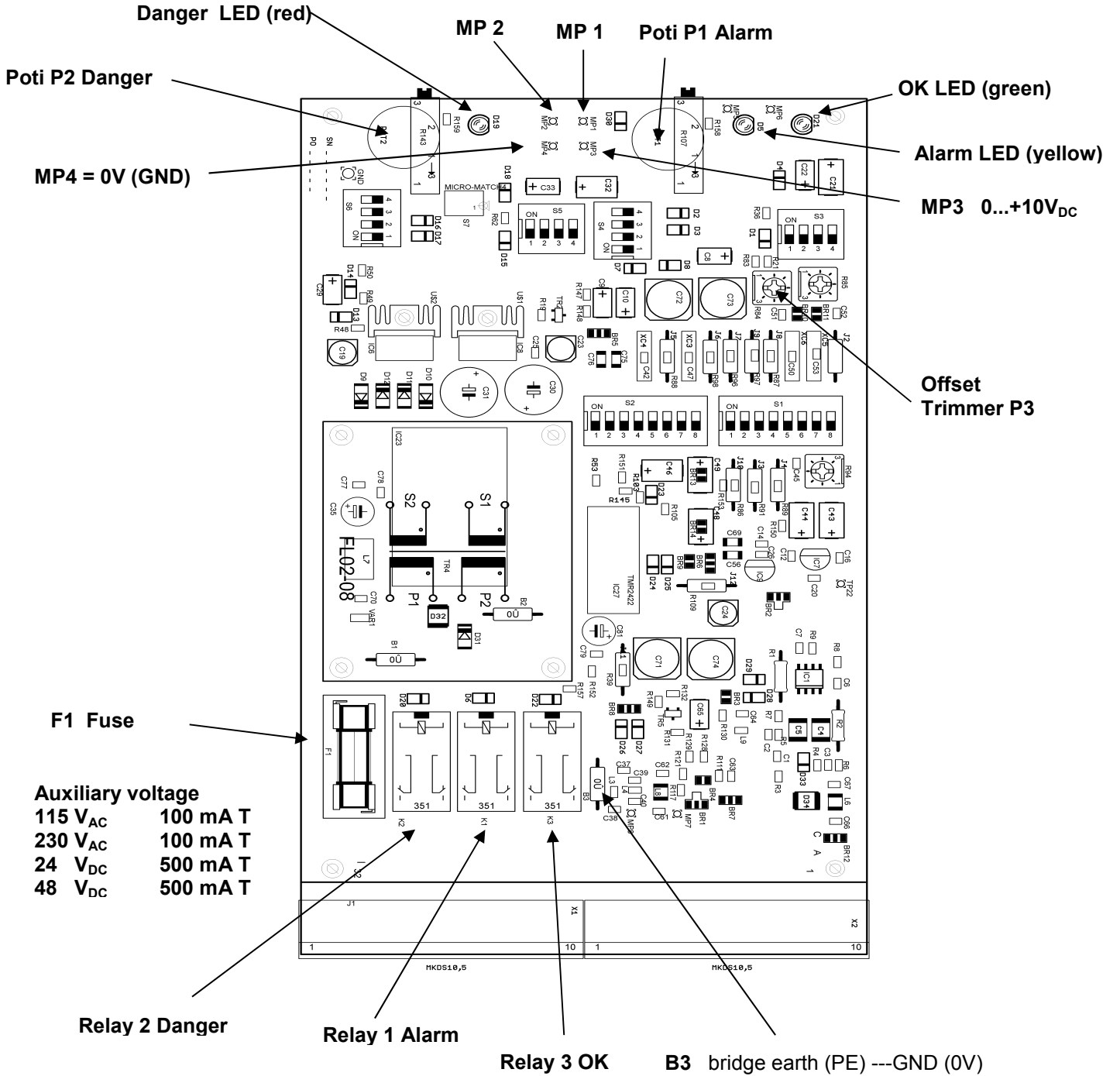
* = standard factory setting

7. Position plan DIP-Switches



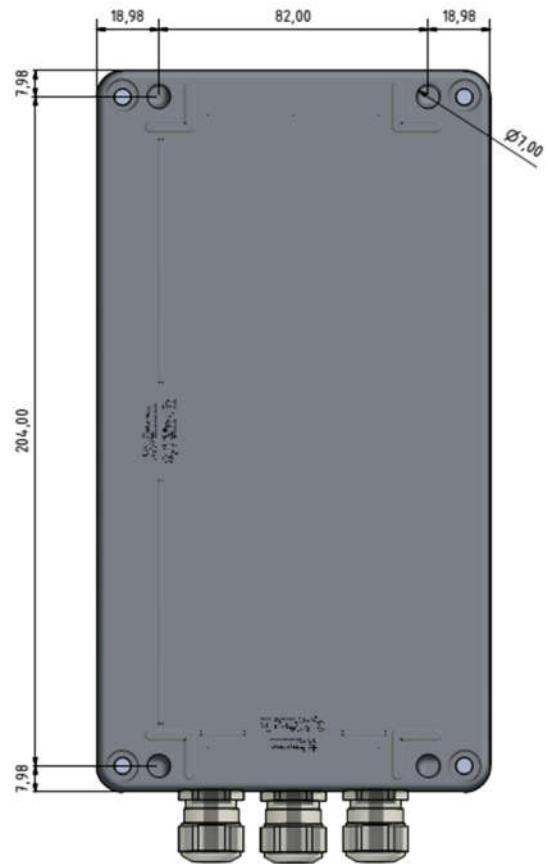
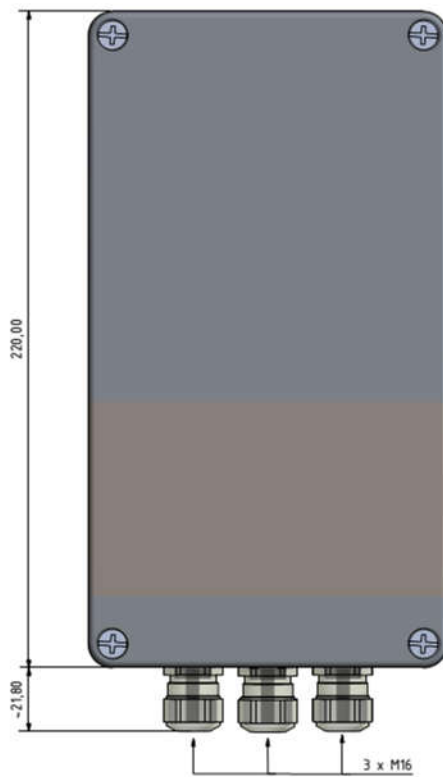
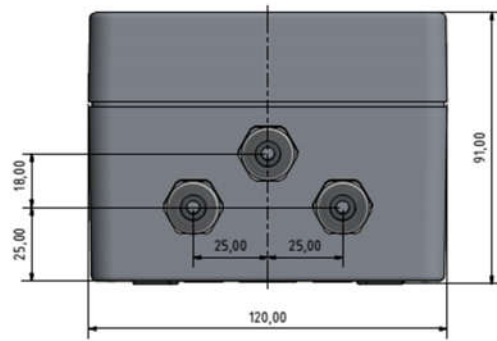
8. Position plan

MP1 and MP2 adjustable from 1 to 10 V_{DC}

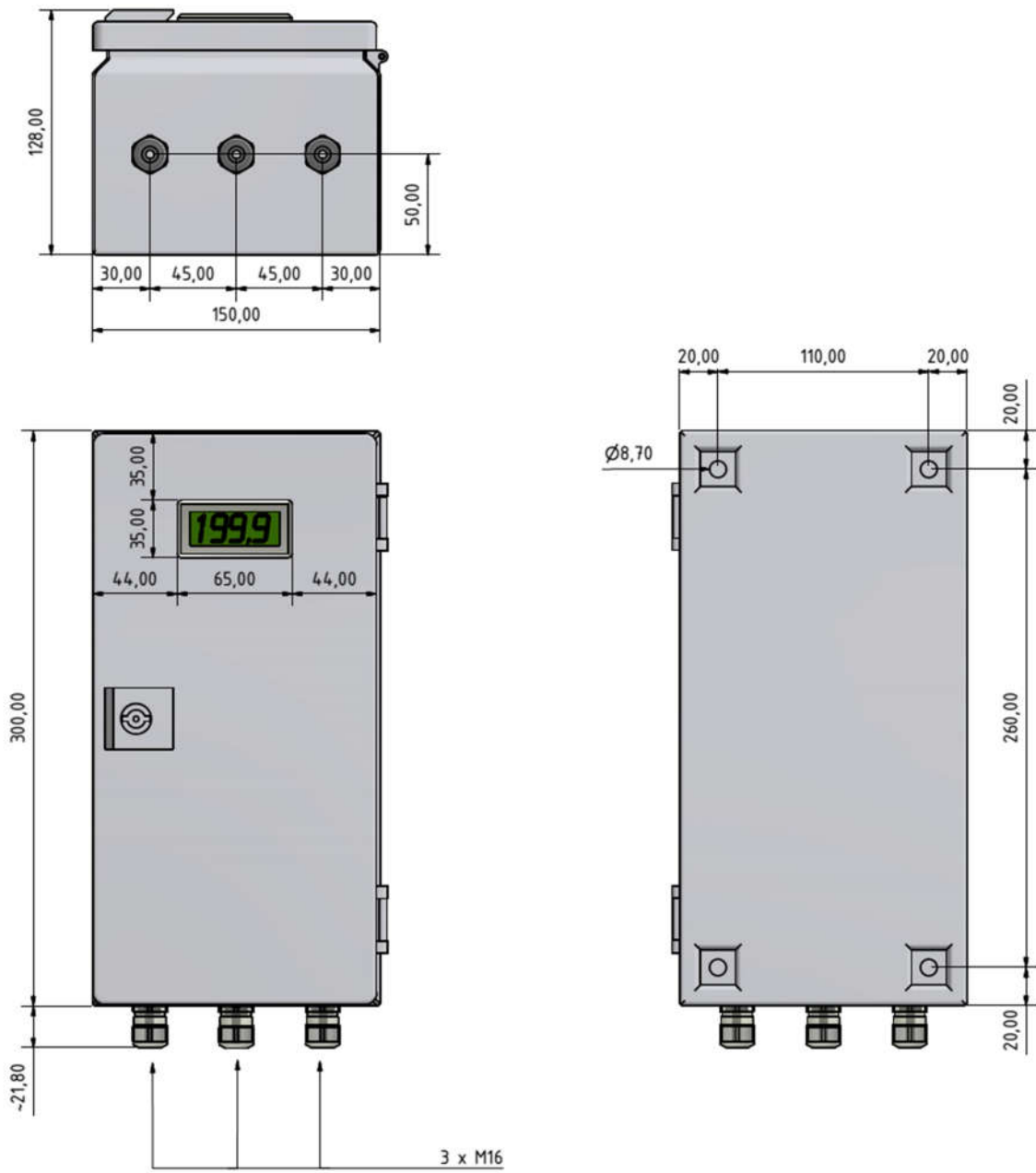


9. Drawings

Aluminum housing



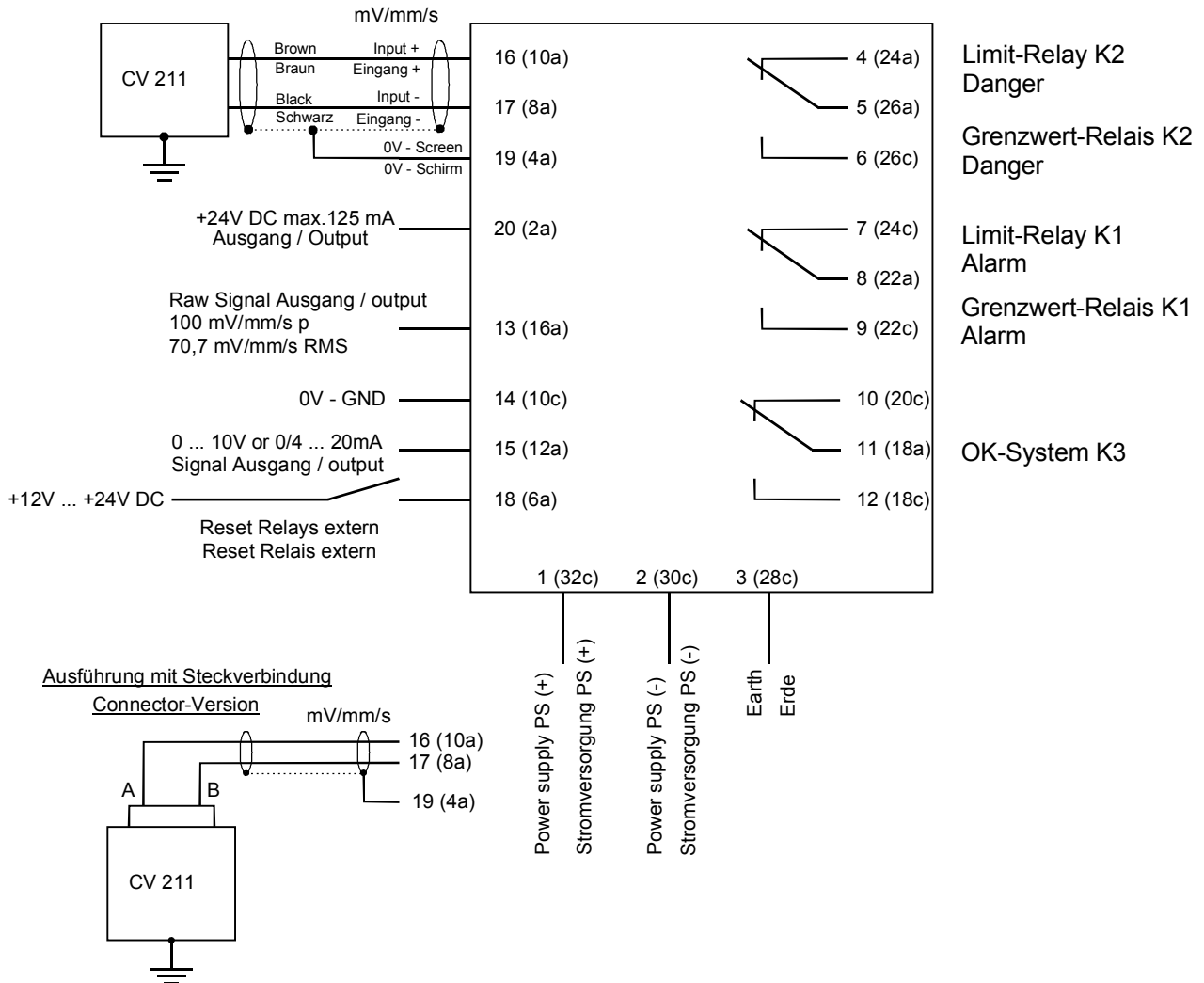
Sheet steel housing with LCD-Display



10. Connection diagram VMS 830 – CV 211

Achtung: Der Sensor muss mit Erde verbunden werden!

Please note: The sensor must be grounded!

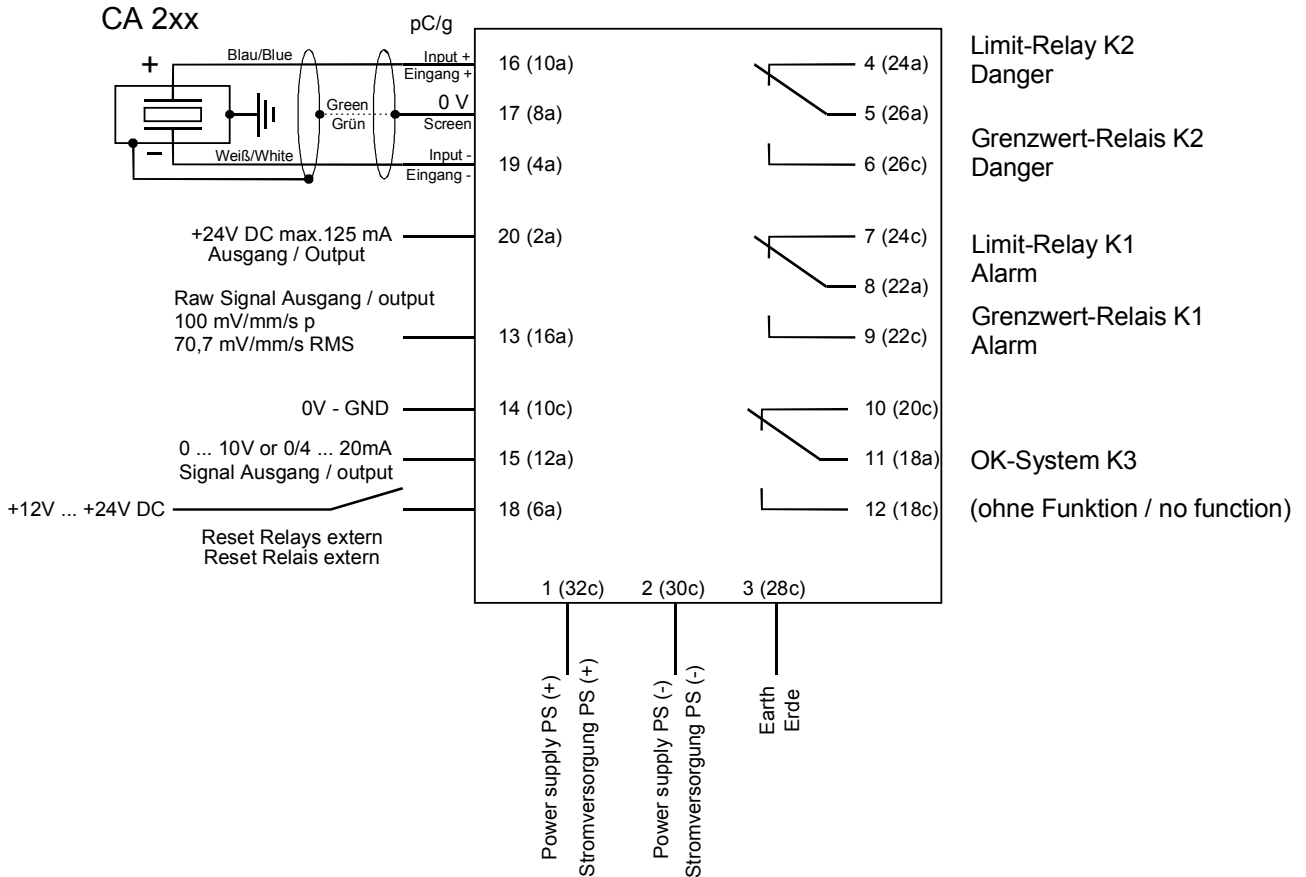


Note: Terminals name in parentheses are valid by 19 " version

example: (32c)

11. Connection diagram VMS 830 – CA 2xx

Achtung: Der Sensor muss mit Erde verbunden werden!
Please note: The sensor must be grounded!

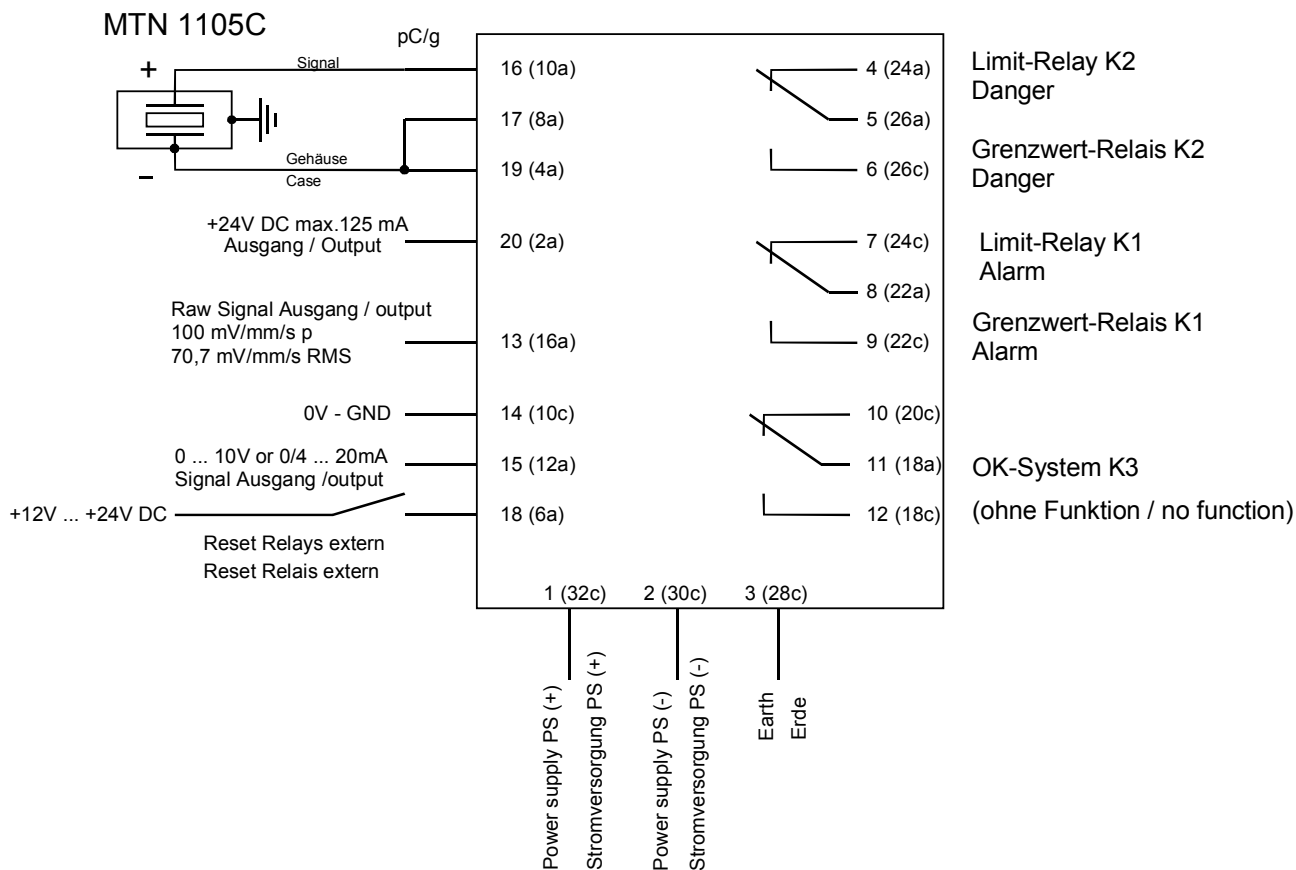


Note: Terminals name in parentheses are valid by 19 " version

example: (32c)

12. Connection diagram VMS 830 – MTN 1105 C

Achtung: Der Sensor muss mit Erde verbunden werden!
Please note: The sensor must be grounded!

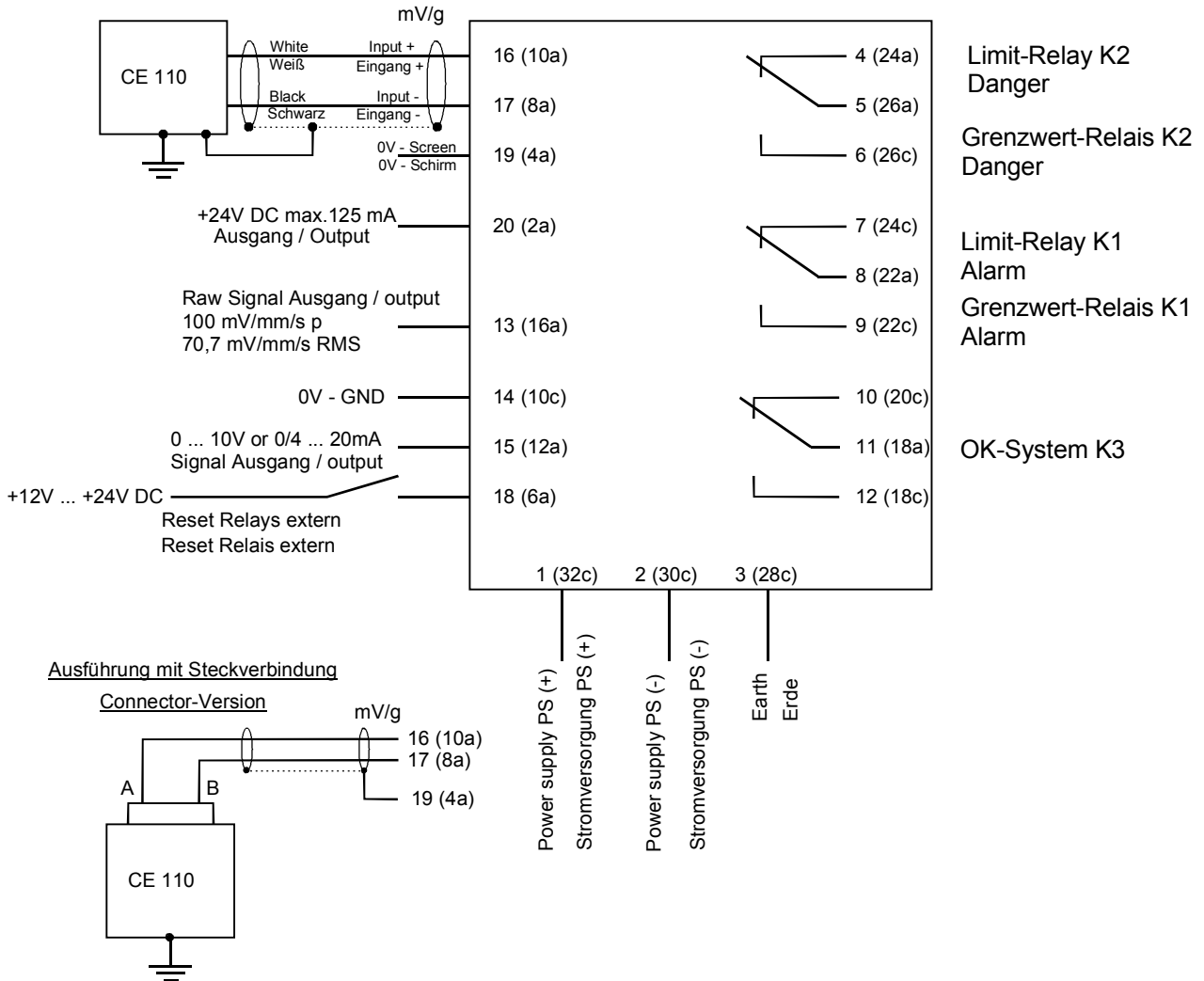


Note: Terminal name in parentheses are valid by 19" version

example: (32c)

13. Connection diagram VMS 830 – CE 1xx

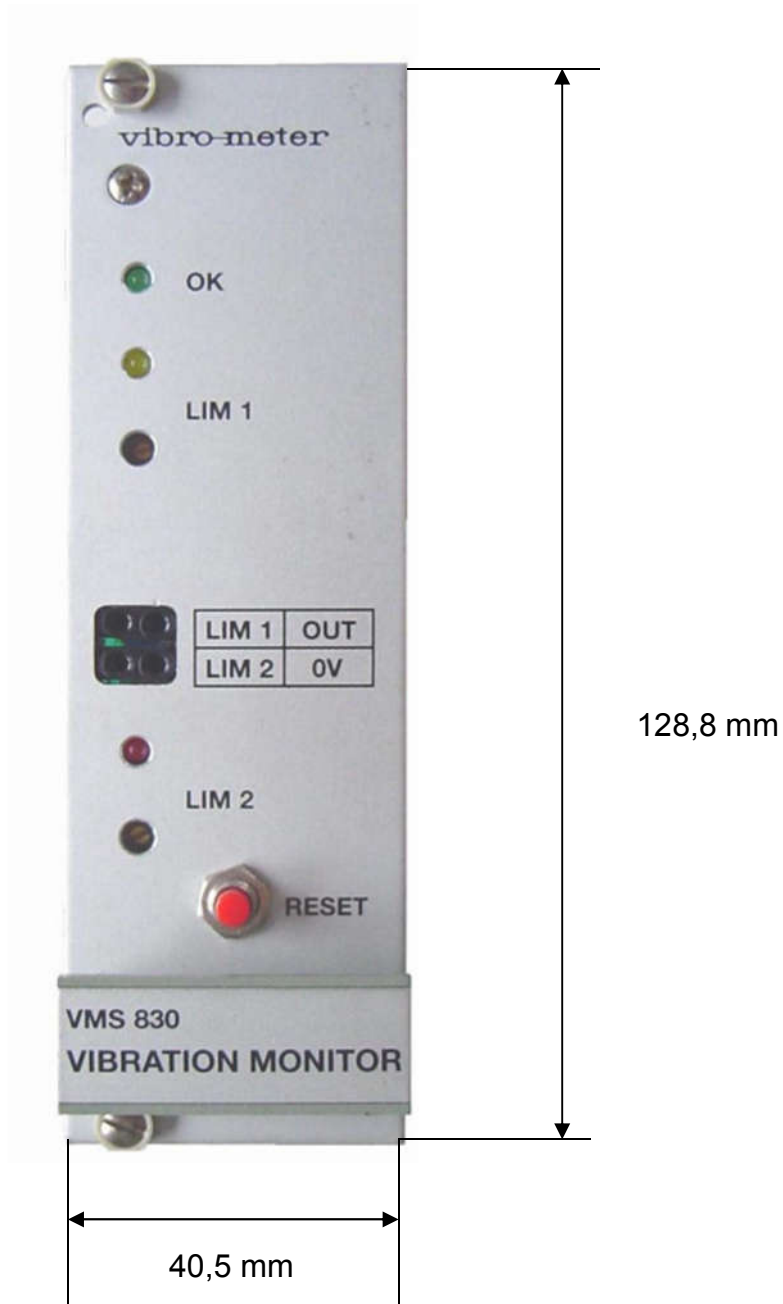
Achtung: Der Sensor muss mit Erde verbunden werden!
Please note: The sensor must be grounded!



Note: Terminals name in parentheses are valid by 19 " version

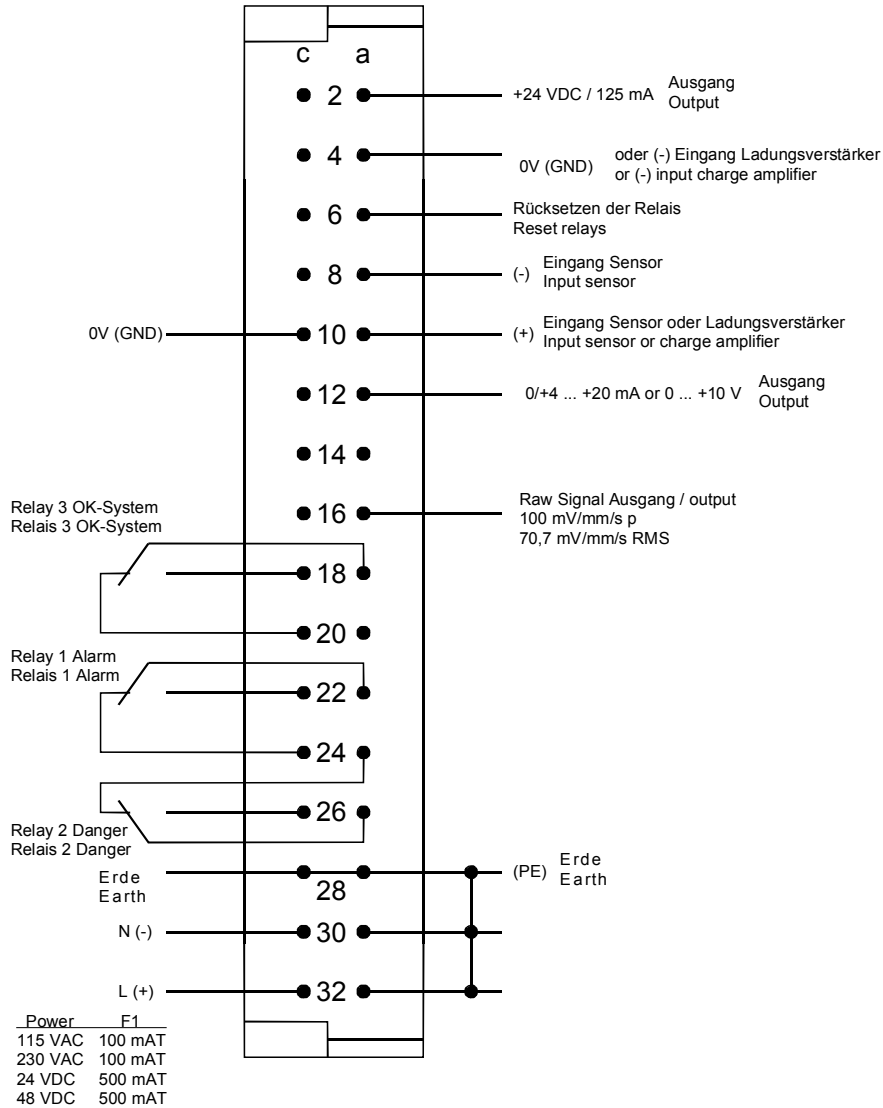
example: (32c)

14. Version 19" Version

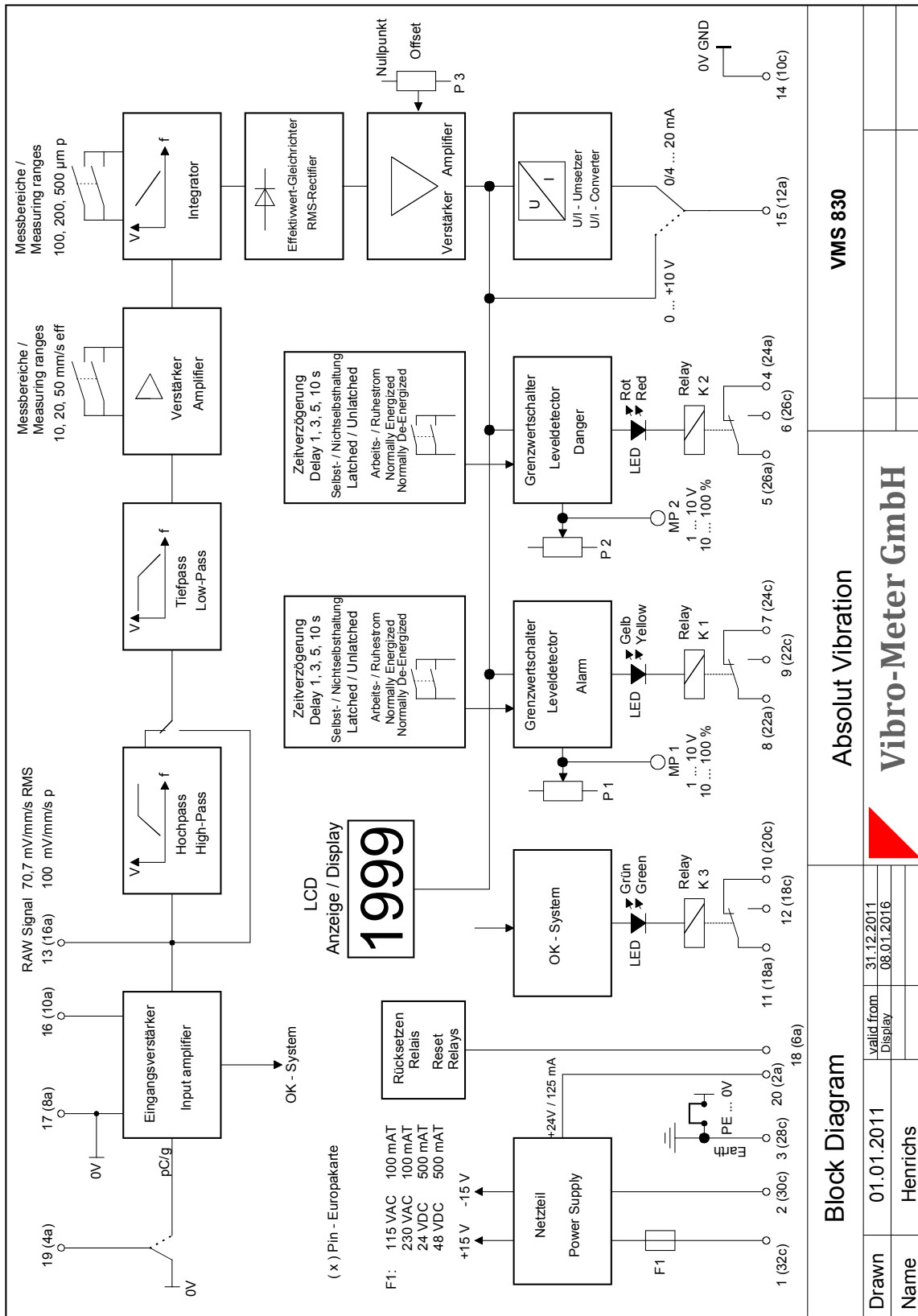


15. Connection diagram 32 – blade-contact connector

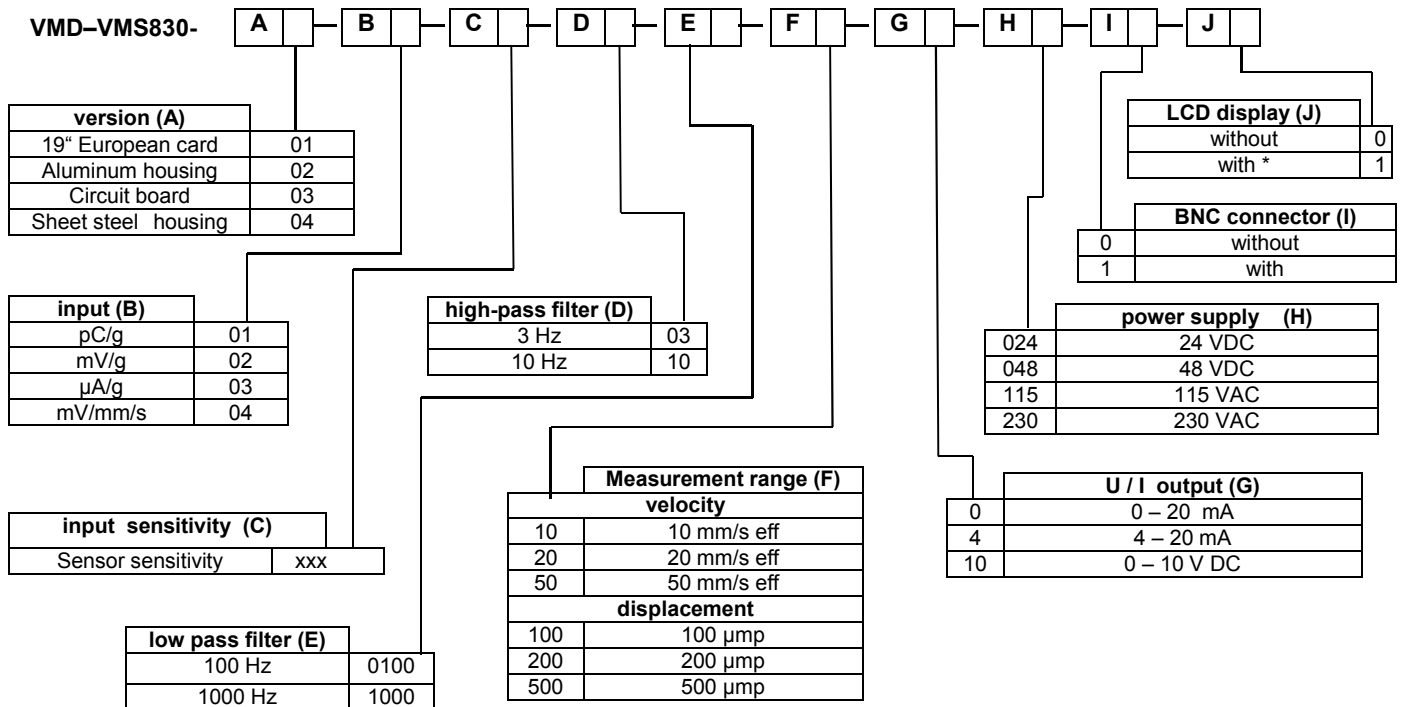
Anschlussplan 32-polige Steckerleiste
Wiring 32-pin connector



16. Block diagram



17. Ordering code



* LCD-display only available in combination with sheet steel housing

Example:

VMD-VMS830-A04-B01-C100-D10-E1000-F20-G4-H230-I0-J1

Version (A04):	Sheet steel housing
Input (B02):	mV/g
Input sensitivity (C100):	100
HP – high-pass filter (D10):	10 Hz
TP – low pass filter (E1000):	1000 Hz
Measuring range (F20):	20 mm/s eff
Current output (G4):	4 – 20 mA
Power supply (H230):	230 V AC
BNC connector (I0):	none
LCD display (J1):	With LCD display

Subject to change without notice.

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