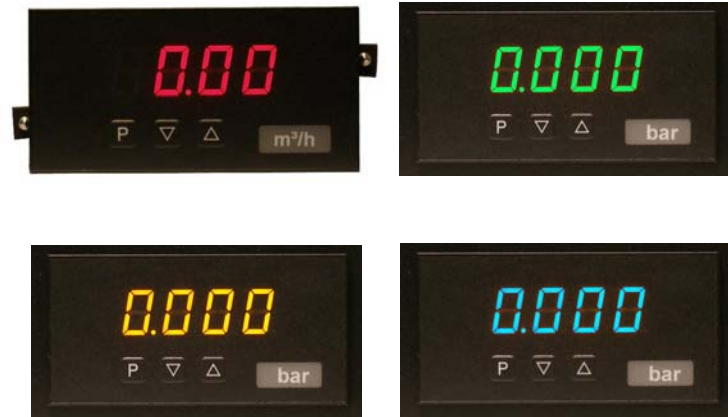


# The new M-Line

## Product type M1

<b>Housing sizes:</b>	96x48x41, 96x24x74 and 48x24x54 mm (WxHxD, incl. plug terminal)
<b>Display</b>	
Segment colour:	Red (optional available in green, yellow, blue)
Display:	4-digit
Display size:	10 mm (48x24), 14 mm (96x48, 96x24)
Display range:	-1999...9999
Protection class	IP65 at the front, IP00 at the rearside
<b>Input types:</b>	
Direct current/voltage:	0...10 VDC / 0/4...20mA
Shunt:	0...60 mV; 0...150 mV
Potentiometer:	>1 k $\Omega$ ...1000 k $\Omega$ / 0...100 %
Resistance:	0-1 k $\Omega$ , 0-10 k $\Omega$ , 0-100 k $\Omega$ or 0-1000 k $\Omega$
PT100 2-/3-wire:	-200 °C... 850 °C / -328...1562°F
Thermocouple:	Type L, J, K, B, S, N, E, T, R switchable via software
Frequency:	in preparation
<b>Power pack</b>	
Supply:	24 VDC +/- 10 %, max. 1 VA 230 VAC +/- 10 %, max. 6 VA
<b>Ambient conditions</b>	
Working temperature:	0... +60 °C
Storing temperature:	-20... +80 °C
Humidity:	0... 85 % rel. humidity (without dew)



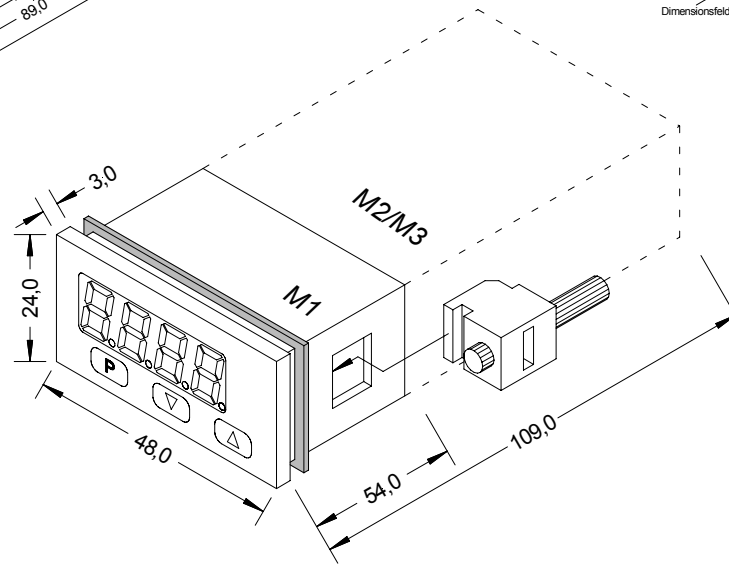
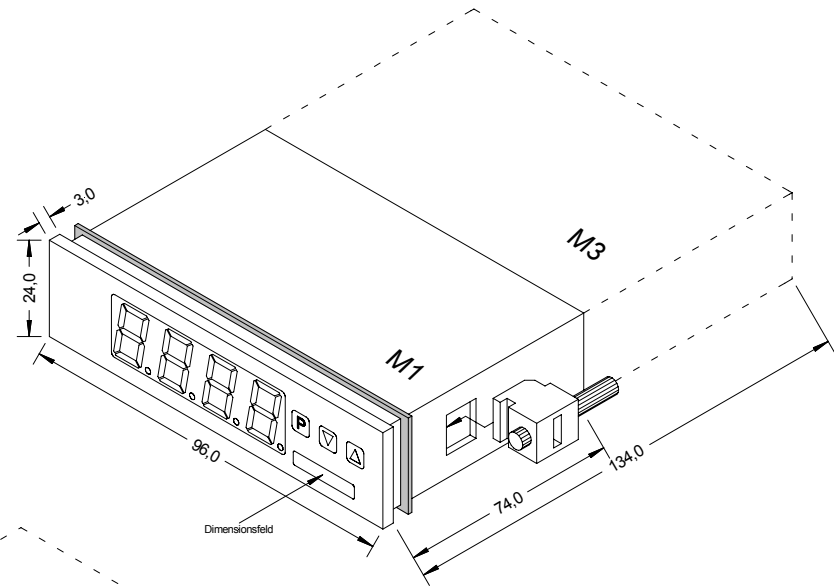
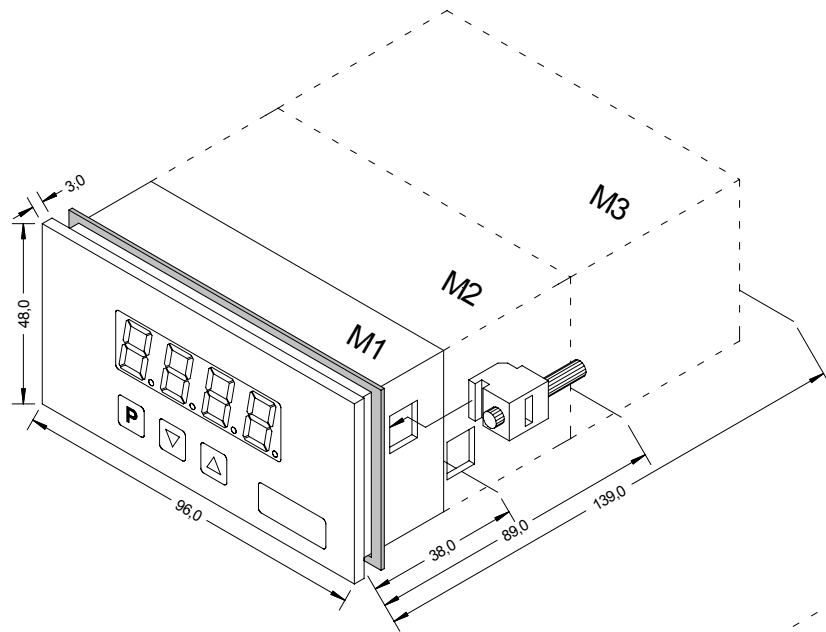
Supply 24 VDC



Supply 230 VAC

# The new M-Line

## Housing sizes and installation depths:



# The new M-Line – Current loop

## Product type M1 – Current loop

### Display

Segment colour: Red  
Display: 4-digit  
Display size: 10 mm (48x24), 14 mm (96x48, 96x24)  
Display range: -1999...9999  
Housing sizes: 96x48x41 mm, 96x24x74 mm, 48x24x54 mm  
(WxHxD, incl. plug terminal)

### Input

Input measuring range: 4...20 mA  
Max. measuring range: 3.5...21 mA  
Fail of voltage: approx. 5.1 V without switching outputs  
approx. 8.0 V with switching outputs  
Measuring fault: 0.3 % of measuring range +/- 1 Digit  
Measuring time: 0.1 ... 10.0 seconds  
Temperature drift: 100 ppm/K  
Resolution: 12 bit (converter);  
14 bit (noiseless by oversampling at 1 s measuring time)  
Measuring principle: successive approximation  
Memory: Flash-memory (independent of supply)

### Switching outputs (2 x Photo-MOS) for 96x48 and 96x24 mm

Max. switching voltage: 30 VDC/AC  
Max. continuous current: 0.4 A  
Puncture resistance AC: 400 V steady; 1800 V for 1min.

### Ambient conditions

Working temperature: 0... +60 °C  
Storing temperature: -20... +80 °C  
Humidity: 0... 85 % rel. humidity (no dew)



# The new M-Line - Tricolour

## Product type M1 – Tricolour

### Display

Segment colour:	Green / Yellow / Red (switchable via threshold value)
Display:	4-digit
Display size:	14 mm (96x48)
Display range:	-1999...9999
Housing size:	96x48 mm
Installation depth:	35 mm with spring power terminal 49 mm with plug terminal

### Input

Measuring range:	0...10 V; 0/4...20 mA
Max. measuring range:	-12...12 V; -22...24 mA
Input resistance:	R <sub>i</sub> at 10 V = ~100 kΩ, 20 mA = ~100 Ω
Measuring fault:	0.1 % of measuring range +/- 1 Digit
Measuring time:	0.1 ... 10.0 seconds
Temperature drift:	100 ppm/K
Resolution:	approx. 18 bit at 1 second measuring time
Measuring principle:	U/F-converter
Memory:	EEPROM

### Switching outputs (2 x Relay change-over contacts)

Max. switching voltage :	250 VAC; 30 VDC
Max. continuous current:	2 A; 2 VDC
Puncture resistance AC:	1800 V for 1 min. for supply

### Power pack

Supply:	24 VDC ± 10%, max. 2 VA
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### Ambient conditions

Working temperature:	0... +60 °C
Storing temperature:	-20... +80 °C
Humidity:	0... 85 % rel. humidity (no dew)



# Coming up – M2 and M3-Line

## Product type M2

### Display

Segment colour: Red (optional green, yellow, blue or green/yellow/red)  
 Display: 5-digit  
 Display range: -19999...99999  
 Housing sizes: 96x48x89, 48x24x109 mm

### Input types:

Standard signal: 0...10 V; 0/4...20 mA  
 Frequency: 0.01 Hz ... 100 kHz  
 Shunt: 0...60 mV; 0...150 mV  
 AC-current: 1 A/AC; 5 A/AC  
 Resistance: 1 k $\Omega$ , 10 k $\Omega$  or 100 k $\Omega$   
 Potentiometer: 1 k $\Omega$  ... 100 k $\Omega$  via centre tap  
 PT-100: -200 °C... 850 °C  
 Thermocouple: Type K, L, B, N, J, L, N, S, E, T, R switchable via software  
 DMS-measuring: 1 mV/V; 2 mV/V; 3,3 mV/V  
 (for 96x48 devices only) 10 V bridge voltage; 350  $\Omega$

Special types: high voltage 300/600 VDC  
 high voltage 300/600 VAC

### Outputs

Analog output current: 0/4...20 mA; galv. insulated  
 Analog output voltage: 0...10 V; galv. insulated  
**or**  
 Sensor supply: 24 VDC; 50 mA

### Switching outputs (2 x Relay change-over contacts)

Max. switching voltage : 250 VAC; 30 VDC  
 Max. continuous current : 2 A; 2 A  
 Puncture resistance AC: 1800 V for 1 min. for supply

## Product type M3

### Based on the technical features of the M2 type:

Housing sizes: 96x48x139mm  
 96x24x134 mm  
 48x24x109 mm

### Switching outputs (2 or 4 Relay change-over contacts)

Max. switching voltage : 250 VAC; 30 VDC  
 Max. continuous current : 2 A; 2 A  
 Puncture resistance AC: 1800 V for 1 min. for supply

### Outputs

Analog output and sensor supply simultaneously.  
 Interface RS232 or RS485.

### General M-Line software functions:

Functions overview	M1	M2	M3
TARA	X	X	X
10-points linearization	X	X	X
Flashing	X	X	X
HOLD		X	X
MIN/MAX permanent		X	X
MIN/MAX-value monitoring	X	X	X
Alarms	2	4	4

## Product overview – M1, M2 and M3 Line

Product line	M1	M2	M3
Housing size	96x48x41, 96x24x74 and 48x24x54 mm	96x48x89, 48x24x109 mm	96x48x139, 96x24x74 and 48x24x109 mm
Display colors	red, green, yellow, blue, tricolour	red, green, yellow, blue,	red, green, yellow, blue,
Display	4 Digits, -1999...9999, 10mm/14mm	5 Digits, -19999...99999, 10/14/20 mm	5 Digits, -19999...99999, 10/14/20 mm
Protection class	IP65 at the front, IP00 at the rearside	IP65 at the front, IP00 at the rearside	IP65 at the front, IP00 at the rearside
<b>Input types</b>			
Direct current/voltage:	0...10 VDC / 0/4...20mA	0...10 VDC / 0/4...20mA	0...10 VDC / 0/4...20mA
Shunt:	0...60 mV; 0...150 mV	0...60 mV; 0...150 mV	0...60 mV; 0...150 mV
Potentiometer:	>1 k $\Omega$ ... 1000 k $\Omega$	>1 k $\Omega$ ... 1000 k $\Omega$	>1 k $\Omega$ ... 1000 k $\Omega$
Resistance:	0-1 k $\Omega$ , 0-10 k $\Omega$ , 0-100 k $\Omega$ , 0-1000 k $\Omega$	0-1 k $\Omega$ , 0-10 k $\Omega$ , 0-100 k $\Omega$	0-1 k $\Omega$ , 0-10 k $\Omega$ , 0-100 k $\Omega$
PT100 2-/3-wire:	-200 °C... 850 °C / -328...1562°F	-200 °C... 850 °C / -328...1562°F	-200 °C... 850 °C / -328...1562°F
Thermocouple:	Type L, J, K, B, S, N, E, T, R	Type L, J, K, B, S, N, E, T, R	Type L, J, K, B, S, N, E, T, R
Frequency:	in preparation	in preparation	in preparation
DMS-measuring	not available	1 mV/V; 2 mV/V; 3,3 mV/V 10 V bridge voltage; 350 $\Omega$	1 mV/V; 2 mV/V; 3,3 mV/V 10 V bridge voltage; 350 $\Omega$
Special types	not available	high voltage 300/600 VDC high voltage 300/600 VAC	high voltage 300/600 VDC high voltage 300/600 VAC
<b>Power supply</b>			
230 V	96x48x41 / 96x24x74 mm	96x48x89 / 48x24x109 mm	96x48x139 / 96x24x74 / 48x24x109 mm
24 V	96x48x41 / 96x24x74 / 48x24x54 mm	96x48x89 / 48x24x109 mm	96x48x139 / 96x24x74 / 48x24x109 mm
<b>Outputs</b>			
Analog output current:	not available	0/4...20 mA; galv. insulated	0/4...20 mA; galv. insulated
Analog output voltage:	not available	0...10 V; galv. insulated	0...10 V; galv. insulated
Sensor supply:	not available	24 VDC; 50 mA	24 VDC; 50 mA
<b>Switching outputs</b>	2 available, only in M1-Tricolor and 2 Photo-MOS-outputs in M1-current loop	2 available in 96x48x89, 48x24x109	4 available in 96x48x139 2 available in 96x24x74 and 48x24x109
<b>Interface</b>	not available	not available	RS232 or 485, Mod-bus
Brightness adjustment	not available	Dimmer	Dimmer