

## Description

Digital panel instruments type MD.241 are designed to measure, display, and monitor either pressure (MDR241) or process variables (MDK241) in industrial applications.

The instruments are panel mounted with a front frame dimension of 96 mm x 24 mm and a mounting depth of 89 mm, and are available with 3 1/2 digit 7-segment LED display covering various measuring ranges.

The supply voltage range of DC 12 V...26 V, physically isolated from the measuring circuit, allows a wide spread of applications.

Initial value, full scale range and decimal point may be set by internal jumpers and adjusted by means of the potentiometer accessible from the front.

The pressure measuring instrument MDR241 provides DC 24 V/20 mA to supply a transmitter.



MDK241



MDR241

## Measuring ranges: Process Variables

### DC Current

Measuring input	Input resistance	Overload protection		Pin designation + -
		cont.	max. 3 s	
0...±20 mA	100 Ω	± 50 mA	± 100 mA	1 - 2
4...20 mA	100 Ω	± 50 mA	± 100 mA	1 - 2

### DC Voltage

Measuring input	Input resistance	Overload protection		Pin designation + -
		continuous	_____	
0...±5 V	0,5 MΩ	± 100 V		1 - 2
0...±10 V	1 MΩ	± 100 V		1 - 3

Full scale range: 0...2000 digits  
(optionally indicating either in the positive or negative direction)  
Initial value: -1170...+1170  
User selectable decimal point.  
Please specify physical unit when ordering.

## Measuring Ranges: Pressure

Input	Measuring range	Input resistance	Overload protection		Pin designation + -
			cont.	max. 3 s	
Voltage	0...5 V	0,5 MΩ	± 100 V	-	1 - 2
Voltage	0...10 V	1 MΩ	± 100 V	-	1 - 3
Current	0...20 mA	100 Ω	± 50 mA	± 100 mA	1 - 2
Current	4...20 mA	100 Ω	± 50 mA	± 100 mA	1 - 2

## Technical data

### Display

Red 7-segment LED display, 13 mm high  
3 1/2 digit  
Over-range indication: The last 3 digits will extinguish

### Reading characteristics

Integrating dual-slope  
Count rate: 2.5 readings/s  
Setting time for a 100% reading change: < 2 s

### Accuracy of display (at 23°C)

Versions MDK/MDR: ≤ 0.1% span ±1 digit  
(span = full measuring range)

### Input

MDK/MDR: Physically isolated from mains  
Common mode range:  
input circuit against main circuit: ± 300 V  
common mode rejection: ≥ 80 dB

### Output

Pressure instrument MDR241:  
auxiliary voltage output to supply an electronic transmitter  
Voltage: DC 24 V ± 15%  
Current: 25 mA max.  
Residual ripple: ≤ 0.5%  
Pins: 5 (+) and 6 (-)  
Voltage output physically isolated from measuring input and mains.

### Environmental requirements

Temperature drift: ≤ 0.1 % span/10 K  
Warm-up to full accuracy: ≤ 15 minutes  
Operating temperature range: 0...+50°C  
Storage temperature range: -20...+70°C  
Relative humidity: 0...75 % annual average, 95 % max. (without condensation)

### Voltage supply (voltage rating):

DC 12 V...26 V physically isolated from the measuring input.  
Max. allowed residual ripple 10 %, but not less than the minimum voltage or more than the maximum voltage.

Power consumption:  
MDK ≤ 3 W  
MDR ≤ 4 W

## Ordering information

Type No.	
Physical dimension	
K	Standard signals
Case	
241	96 mm x 24 mm
Inputs	
X	User selectable standard signals (0...20 mA; 4...20 mA; 0.5 V; or 0...10 V)
0	Special measuring range *)
Display	
3	3 1/2 digit
Display range: initial value	
0	-1170...+1170 digits (user selectable)
Full scale range	
X	0...2000 digits (user selectable)
Decimal point	
X	Decimal point (user selectable)
Voltage supply (voltage rating)	
D1	DC 12...26 V
K	factory pre-set marking (unit)
F	OEM branding *)
MD	K 241 - X 3 0 X X D1 ... .. ordering example

\*) Clearly add desired specification.

## Ordering information

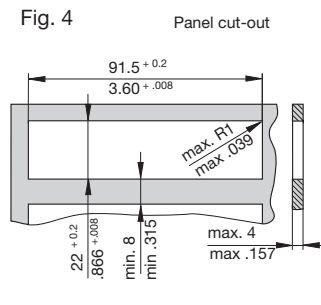
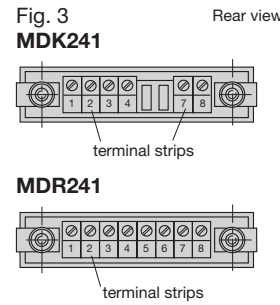
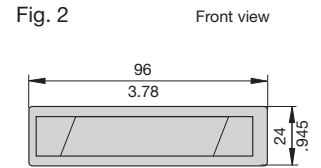
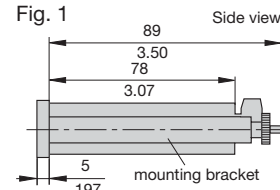
Type No.	
Physical dimension	
R	Pressure
Case	
241	96 mm x 24 mm
Input	
A	Standard signal 0...10 V
B	Standard signal 0...20 mA
C	Standard signal 4...20 mA
E	Standard signal 0...5 V
X	User selectable standard signals 0...20 mA; 4...20 mA; 0.5 V or 0...10 V
Display	
3	3 1/2 digit
Measuring range	
1	0...250
2	0...400
3	0...600
4	0...1000
5	0...1600
6	0...1999
0	Special measuring range *)
X	User selectable: initial value -1170...+1170 digits full scale range 0...2000 digits
Decimal point	
T	1999
H	199.9
Z	19.99
E	1.999
X	Decimal point (user selectable)
Marking (physical unit)	
1	bar
2	mbar
3	kPa
4	psi
5	N/m <sup>2</sup>
6	N/mm <sup>2</sup>
9	blank
0	special marking (see below for standard markings *)
Supply voltage (voltage rating)	
D1	DC 12...26 V with physical isolation
K	special calibration*)
F	OEM branding*)
MD	R 241 - A 3 2 H 4 D1 . F ordering example

\*) Clearly add desired specification.

### Standard markings:

V, mV, kV, MV, A, mA, kA, kW, MW, °C, %, % r.F., ms, Stück, Ohm, pH, µs, l, N, kN, kg, t, lbf, Ncm, Nm, m, cm, mm, km, inch, bar, mbar, Pa, hPa, psi, kg/cm<sup>2</sup>, mmWs, mWs, N/m<sup>2</sup>, N/mm<sup>2</sup>, Hz, kHz, U/min, min<sup>-1</sup>, sec<sup>-1</sup>, rpm, l/h, l/min, kg/h, m<sup>3</sup>/h, m/min, m/sec, t/h

## Case



This is a metric design and millimeter dimensions take precedence ( $\frac{\text{mm}}{\text{inch}}$ )

### Caution:

If several instruments are to be fitted, a minimum of 8 mm (5/16 in) between each cut-out must be provided for correct removal of front glass. (Fig. 4)

Case material:

glass-fibre reinforced black Noryl SE1

Degree of protection:

IP50 (front), IP20 (rear)

Applicable specification:

VDE 0411, part 100

Pollution degree:

3 to IEC 664 and 664 A

Instrument mass:

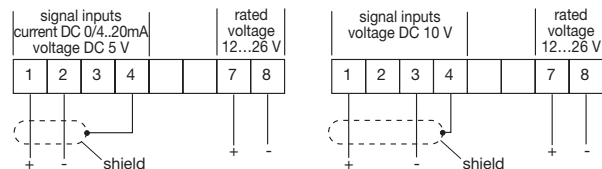
approx. 150 g

## Terminations

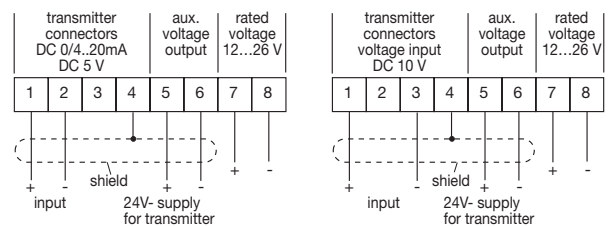
Plug-in screw-terminal strip for max. 1.5 mm<sup>2</sup>/AWG 16 cables.

## Connector pin assignment

### MDK241:



### MDR241:



All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.