

CMA

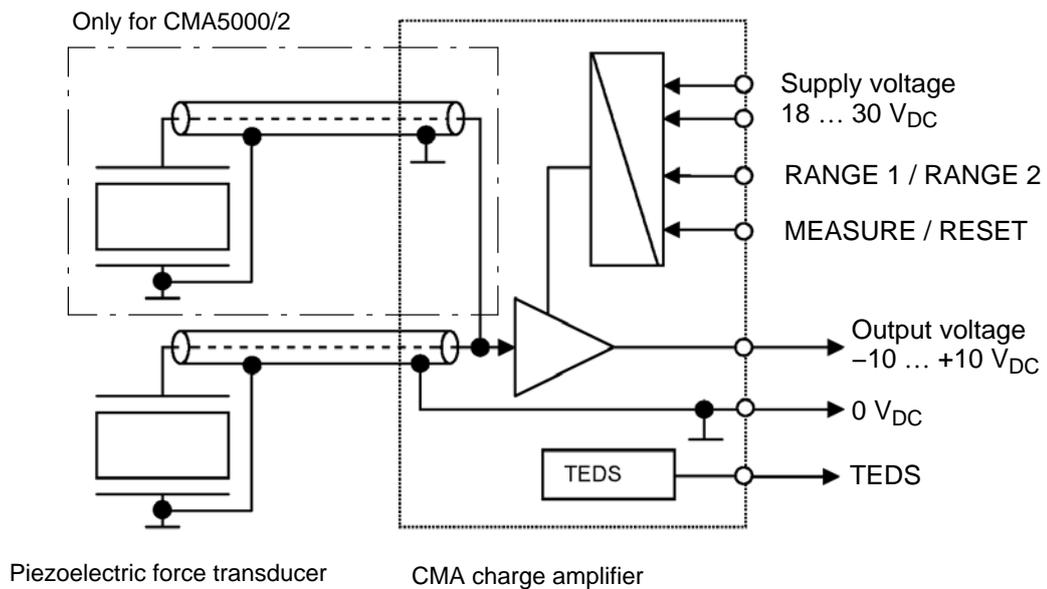
Charge amplifier

Special features

- Compact, robust design
- Two measuring ranges 5:1
- CMA5000/2 with two parallel sensor inputs
- TEDS sensor detection
- Measuring range externally switchable
- Signal output ± 10 V
- All signal inputs/outputs electrically isolated



CMA block diagram



Specifications (data per VDI/VDE/DKD 2638 standards)

Charge amplifier		CMA1 to CMA2000										CMA5000/2
Transducers that can be connected		Piezoelectric sensors (passive)										
Max. charge input	nC	1	2	5	20	39.5	158.3	210.5	287	482	2000	5000
Calibrated measuring ranges 1)	% F _{nom}	100; 20										
Time for measuring range conversion	µs	250										
Output voltage	V	± 10										
On time for secure output signal	ms	4										
Accuracy class (at 25°C)	%	± 0.5										± 1
Hysteresis, 0.5 x F _{nom}	%	< 0.05										
Linearity error	%	< ± 0.05										
Effect of temperature on output span / 10K	%	< 0.5										
Drift, at 20 °C	pC/s	< 0.1								< 1	< 5	
TEDS, as per IEEE1451.4		1-wire										
Measurement frequency range (-3 dB)	kHz	10 (-3 dB) 5 (-1 dB)							7 (-3 dB) 3.5 (-1 dB)		10 (-3 dB) 5 (-1 dB)	
Supply voltage overvoltage and one-way fitting	V	24 (18 ... 30)										
Voltage supply buffer capacitor	µF	22										
Galvanic isolation		Galvanic isolation of signal inputs (charge input) to voltage supply, the CMA housing does not need to be grounded										
Power consumption	W	< 1.2										
Output resistance	Ω	< 10										
Permissible load resistance	kΩ	> 5										
Control inputs												
Reset/Measure step	pC	< ± 2										
Switching time for Reset/Measure	µs	< 100										
Total time for Reset process	ms	75										
Measurement mode												
MEASURE	V	0 ... +5 or open input										
RESET	V	12 ... 30										
Measurement range												
RANGE 1	V	0 ... +5 or open input										
RANGE 2	V	12 ... 30										
Device signals												
Sensor		10–32UNF, Socket; Tightening torque ≤ 1.5 Nm										
Electrical connection		M12 x 1, 8-pin, for signal output, supply, digital input (shielded cable recommended)										
Vibration resistance 20 ... 2000 Hz, duration 16 min, cycle 2 min.	m/s ²	100										
Impact (duration 1 ms)	m/s ²	2000										
Nominal temperature range	°C	0 ... 70										
Dimensions (L x W x H)	mm	57 x 46 x 38										72 x 46 x 39
Weight	g	130										
Housing material		Aluminum										
Degree of protection (with connected cables)		IP65										
EMC conformity as per EN 61326–1:2013, EN 61326–2–3:2016		in an industrial environment										

1) Customized measuring ranges are available on request.

Pin and cable assignment

Supply voltage 0 V (GND)

RANGE 1 / RANGE 2

MEASURE / RESET

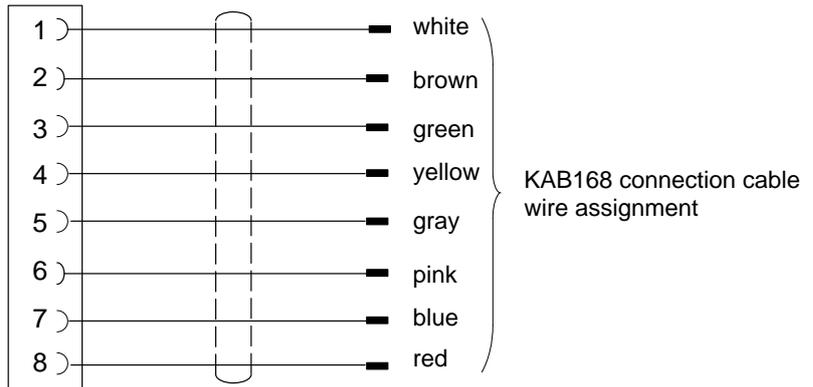
TEDS

Output signal -10 ... +10 V

Signal ground

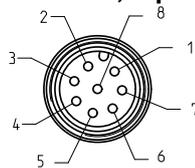
Do not assign!

Supply voltage 18 ... 30 V_{DC}¹⁾

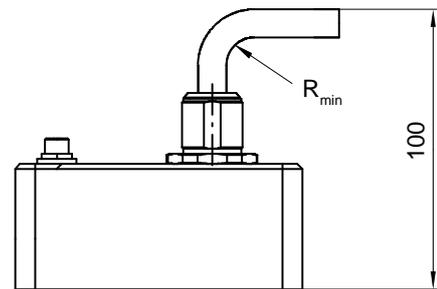
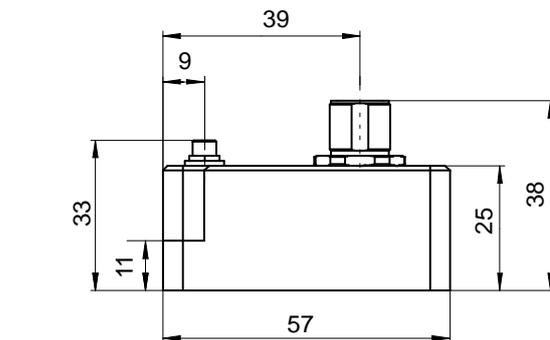


¹⁾ Operating on a SELV circuit (separated extra-low voltage)

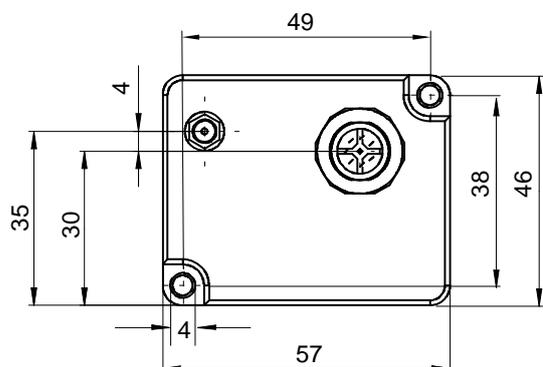
M12 x 1, 8-pin



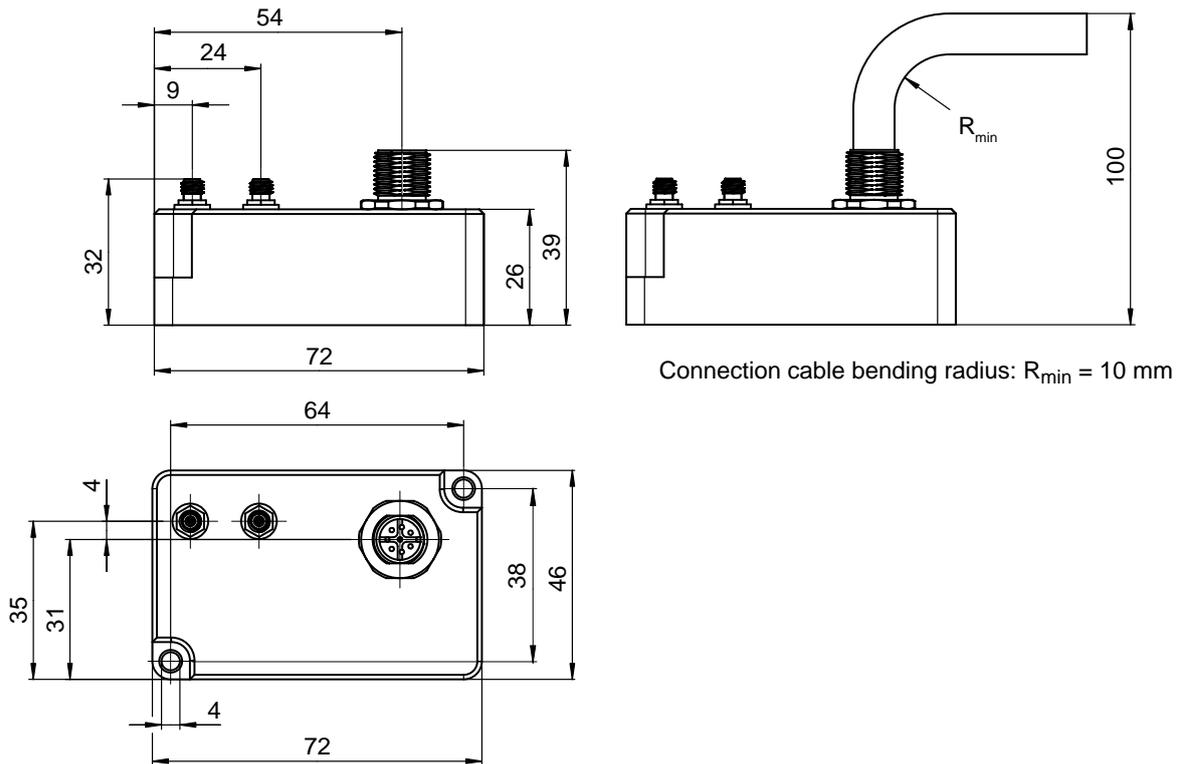
CMA1 to CMA2000, dimensions in mm



Connection cable bending radius: $R_{\min} = 10 \text{ mm}$



CMA5000/2, dimensions in mm



Scope of supply

Order no.	
1-CMA1	Single-channel charge amplifier for piezoelectric sensors, measuring range 1 000 pC
1-CMA2	Single-channel charge amplifier for piezoelectric sensors, measuring range 2 000 pC
1-CMA5	Single-channel charge amplifier for piezoelectric sensors, measuring range 5 000 pC
1-CMA20	Single-channel charge amplifier for piezoelectric sensors, measuring range 20 000 pC
1-CMA39	Single-channel charge amplifier for piezoelectric sensors, measuring range 39 500 pC
1-CMA158	Single-channel charge amplifier for piezoelectric sensors, measuring range 158 000 pC
1-CMA210	Single-channel charge amplifier for piezoelectric sensors, measuring range 210 000 pC
1-CMA287	Single-channel charge amplifier for piezoelectric sensors, measuring range 287 000 pC
1-CMA482	Single-channel charge amplifier for piezoelectric sensors, measuring range 482 000 pC
1-CMA2000	Single-channel charge amplifier for piezoelectric sensors, measuring range 2 000 000 pC
1-CMA5000/2	Single-channel charge amplifier for up to 2 piezoelectric sensors, measuring range 5 000 000 pC

Accessories (not included in the scope of supply)

1-KAB168-5	8-wire cable to the voltage supply and processing electronics, M12 x 1 cable plug, 5 m long, free ends
1-KAB168-20	8-wire cable to the voltage supply and processing electronics, M12 x 1 cable plug, 20 m long, free ends
1-KAB143-3	Sensor connection cable, coaxial, socket 10-32 UNF at both ends, available in 2 m, 3 m and 7 m lengths
1-KAB145-3	Sensor connection cable, coaxial, socket 10-32 UNF at both ends, available in 0.2 m and 3 m lengths, robust design
1-CSB4/1	Summing box CSB4/1 with protective caps

Subject to modifications.
All product descriptions are for general information only. They are not to be understood as a guarantee of quality or durability.

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