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Küppers Elektromechanik GmbH

Certified according to DIN EN ISO 9001

Technical Datasheet

C-Flow Coriolis - KCE 8000 Series

Mass Flow Meters

Description

The coriolis mass flow meters measure simultaneously mass flow, volume flow, temperature and density and consequently can replace different measuring instruments.

Due to a construction free of dead spots the meters are well flushable and can be easily sterilized.

The C-flow mass flow meters do not contain any moving parts and consequently are suited for polluted media as well.

According to the requirements the C-flow mass flow meters are available as compact version with on site display and remote version with electronis in a wall mount or panel mount housing.

For the compact version an additional remote display (KRD 8001) is available, designed for cable lengths up to 1 km.

Principle

Two parallel flow tubes inside the KCM flow meter are vibrating at their resonant frequency in opposite direction. Any mass flow passing through the tubes will delay the vibration at the incoming side and accelerate the vibration at the outgoing side. This causes a small time delay between both ends of the tube. This time delay is measured and used to calculate the mass flow through the tubes.

By measuring the resonant frequency of the tubes the mass of the medium and - given a constant volume inside the tubes - the specific gravity of the medium can be calculated.

As both effects are temperature dependent, the temperature is measured via a precise sensor for correcting the temperature effects of flow and density measurement.

As a consequence a coriolis mass flow meter directly measures mass flow, density and temperature of the medium. Knowing the mass flow and the specific cravity, also the volume flow can be calculated.

Application

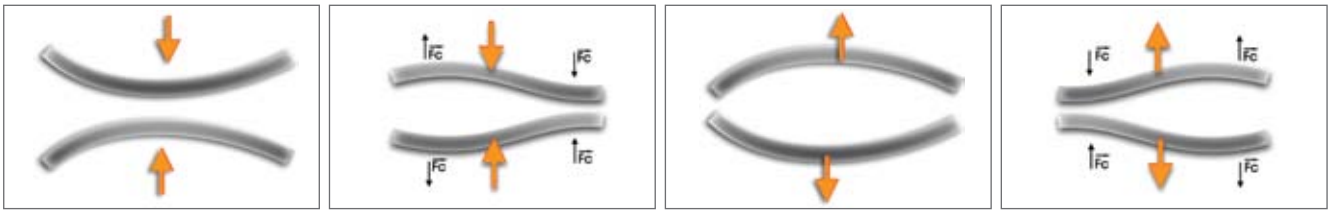
- Flow measurement of PU components and paints
- Flow measurement of aggressive and contaminated media
- Measurement of mass flow, density, temperature and volume flow

Besonderheiten

- Pmax. 350 bar
- Short response time
- DKD calibration
- Excellent puring and sterilization qualities due to a construction free of dead spots
- Up to +125°C medium temperature
- Individual 8-point-calibration including report
- Ex protected as per ATEX and EMC tested

Cycle of excursion (simplified)

Rotation and deformation of two parallel looped pipes by the coriolis force Fc.



Movement to the inside no flow | Movement to the inside with flow | Movement to the ouside no flow | Movement to the outside with flow

The C-Flow

The C-Flow Coriolis Mass Meters consist of two components:

KCE Transmitter

KCM Transducer

Technical Data - KCM Transducer with KCE 8000 Electronic

	KCM0300	KCM0600	KCM1500	KCM3000	KCM6000	KCM60k
Max. flow (kg/h)	300	600	1500	3000	6000	60 000
Min. flow (kg/h)	3	6	15	30	60	600
Max. flow (lb/min)	11.0	22.1	55.2	110	221	2206
Min. flow (lb/min)	0.11	0.22	0.55	1.10	2.21	22.06
Basic Accuracy (% of flow reading)	0.5	0.5	0.2	0.2	0.2	0.5
Zero Stability (% of full scale)	0.02	0.02	0.01	0.01	0.01	0.02
Zero Drift (% f.s. per °C)	0.002	0.002	0.001	0.001	0.001	0.002
Repeatability (% of flow)	0.2	0.2	0.1	0.1	0.1	0.2
Density measuring range	0 - 4500 kg/m³					
Density accuracy	± 0.002 kg/ltr					
Temperature accuracy	±1°C ±0.5% of reading					
Process and Ambient						
Process connections	female thread 1/2" adaptors for flanges, diary and tri-clamp				flanges EN1092, ANSI B16.5, DIN2512	
Max. pressure	200 bar				100 bar	100 bar
Max. pressure (Option)	350 bar					
Pressure Drop at max. flow H_20	see diagramm					
Operating Density range	100 - 2500 kg/m³ (lower densities on request)					
Process temperature	-40 ... +125°C				-40 ... +100°C	
Ambient temperture	-20 ... +70°C				-20 ... +60°C	
Storage temperature	-40 ... +80°C					
Electr. connections remote	screw type terminals					
Electr. connections compact.	none (internally connected to the electronics)					
Ingress Protection	IP67				IP65	
General						
Tube arrangement	2 serial	2 parallel	2 serial	2 parallel	2 parallel	2 parallel
tube inner diameter	4mm	4mm	8mm	8mm	12mm	34mm
tube material	stainless steel DIN 1.4571				ss 1.4404 / 1.4571	
housing material	stainless steel DIN 1.4571				cast iron	
Dimensions	see drawings					

Technical Data - KCE 8000 Transmitter

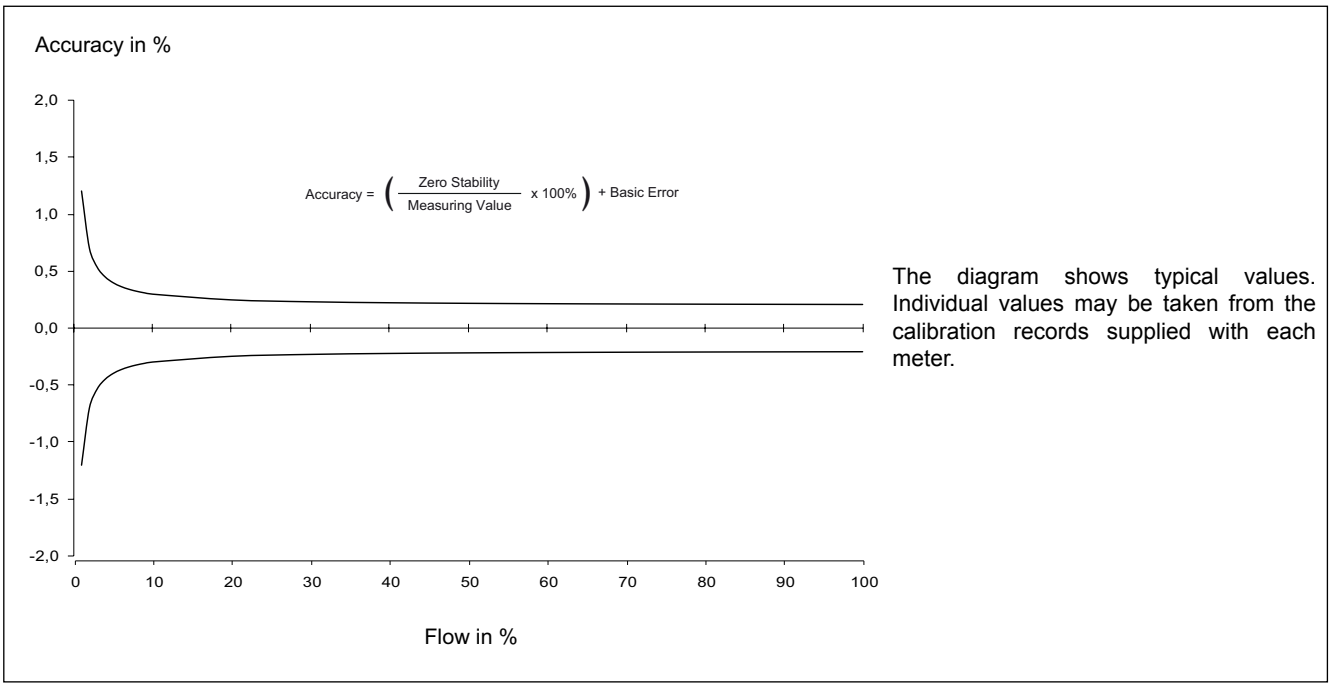
General	
Display:	Graphic, 132 x 32 dot
Supply votage:	24 VDC, ±20%
Programming:	via front keyboard
Interface:	RS 485, Option HART®, option Foundation Fieldbus
EMC:	according to EN 50 081-2 and EN 50 082-2
Power consumption:	max. 4 W
Exd housing:	
Dimensions:	see drawing
Connections:	internal clamp terminals cable gland for 7 - 13 mm cables
Material:	aluminium diecast
Protection class	IP 67
Weight:	approx. 2 kg
Temperature:	operating:- 20 up to 70°C storage and transport: -40 up to 80°C
Panel-mounted housing:	
Dimensions:	96 x 96 x 83mm (h x w x d)
Connections:	rear clamp terminals
Material:	Noryl
Protection class:	front: IP 40, rear: IP 30
Weight:	approx. 500g
Temperature:	operation: 0 to 50°C storage and transport: -20 up to 70°C
Analog Outputs	
Two current outputs:	4-20 mA passive, two-wire, isolated
Resolution:	14 bit
Linearity:	± 0.05% of full scale
Temperature drift:	0.05% per 10K
Load:	< 800 Ω
Output value:	programmable: flow, total, density, temperature
Pulse Output	
Frequency range:	0.5-10,000 Hz
Output signal:	active push pull output for flow rate
Status In-and Output	
Status output	push pull programmable
Control input	programmable

Technical Data - KRD 8001 Remote Display

Display	Graphic, 132 x 32 dot
Supply voltage:	via interface
Programming:	via front keyboard
Interface to KCM:	RS 485
EMC:	according to EN 50 081-2 and EN 50 082-2
Dimensions:	90 x 120 x 50 mm3 (h x w x d)
Connections:	connector M12, B coded
Material:	ABS-FR
Protection class:	IP 64
Weight:	approx. 500g
Temperature:	operation: 0 to 50°C storage and transport: -20 up to 70°C
Wall mount	hidden screws

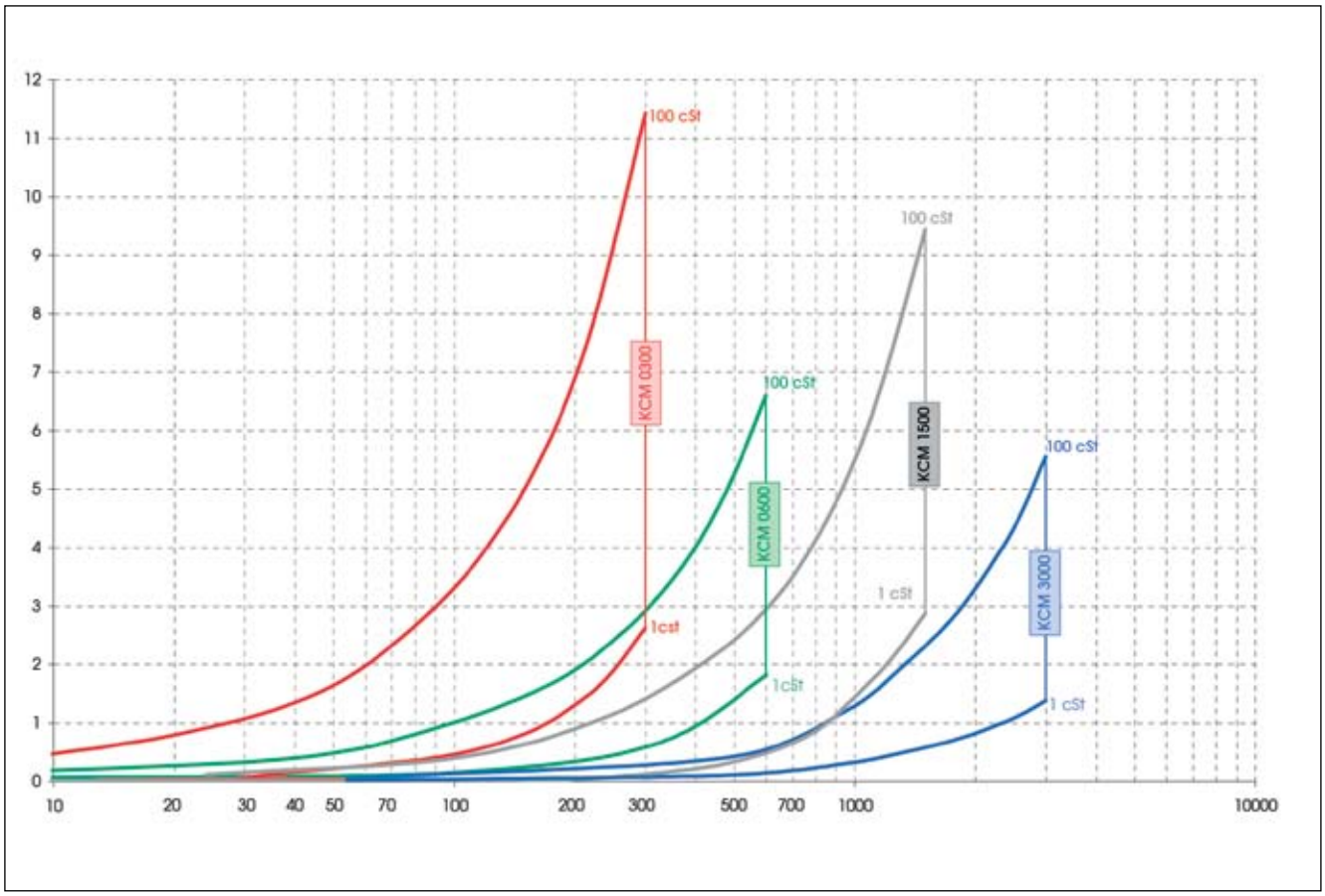
EX-Protection

EX-Approval Ex II 2G Ex Exd (ib) IIC T2-T4 in preparation.

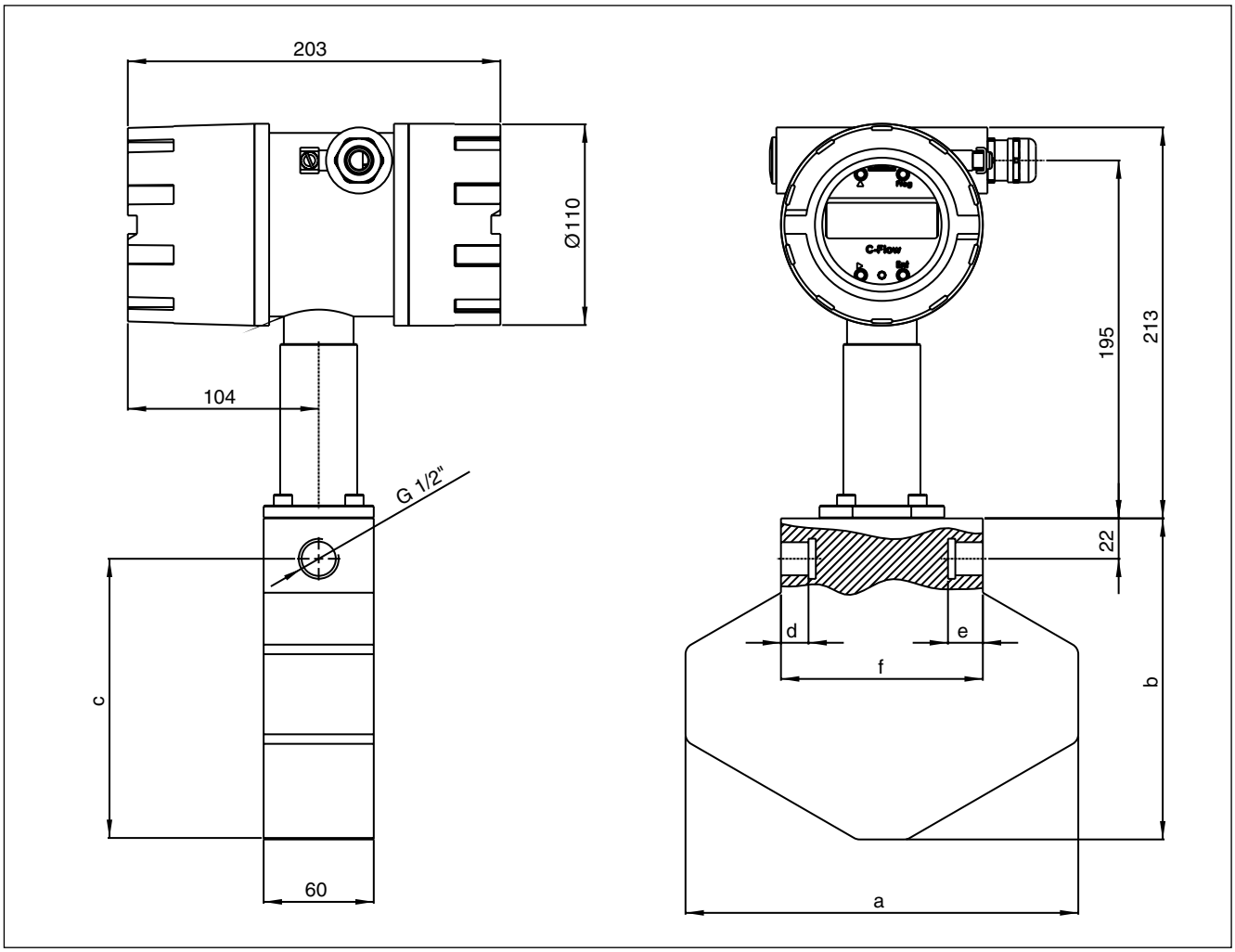


The diagram shows typical values. Individual values may be taken from the calibration records supplied with each meter.

Pressure drop in bar

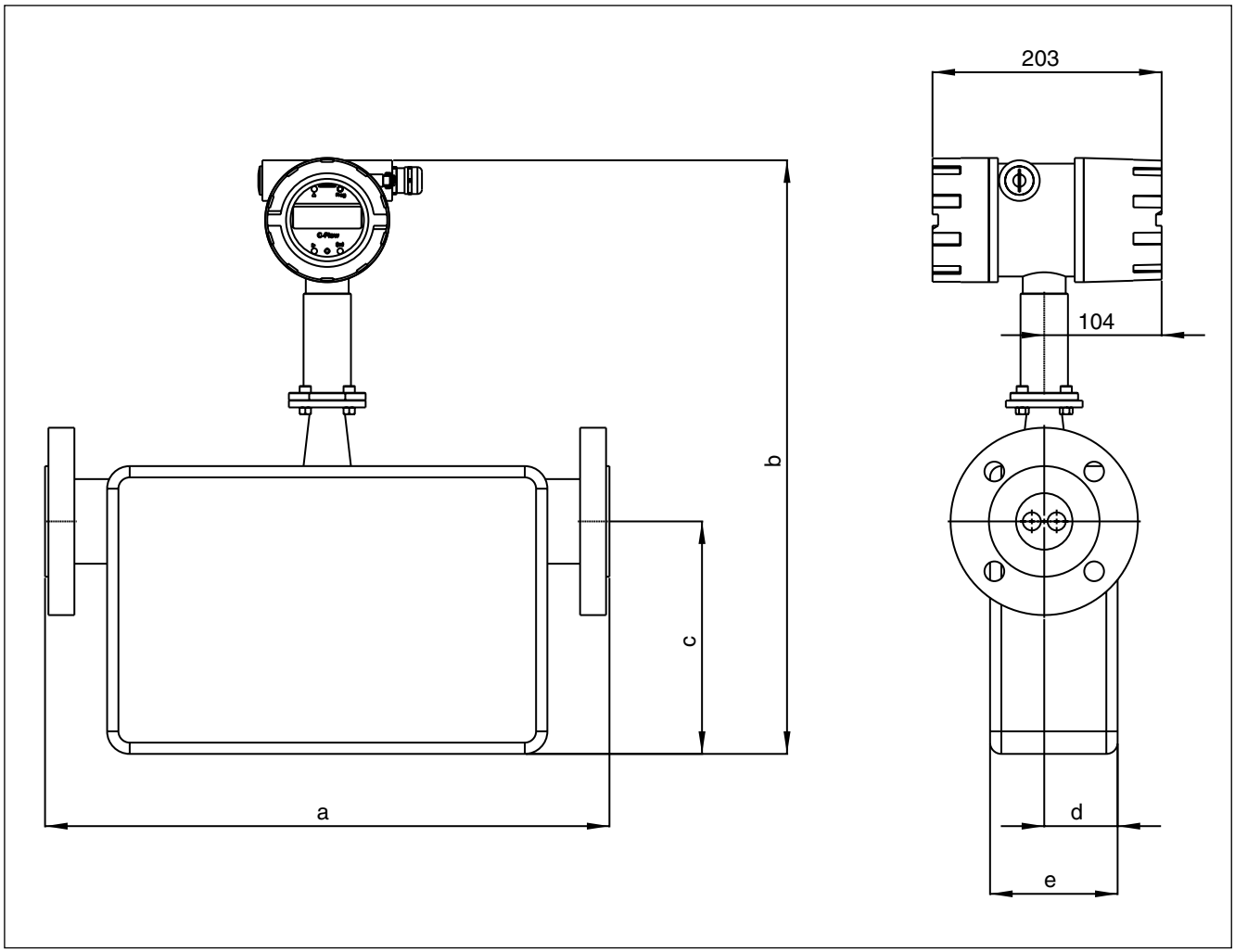


Dimensional drawing (mm) KCM 0300 to KCM 3000



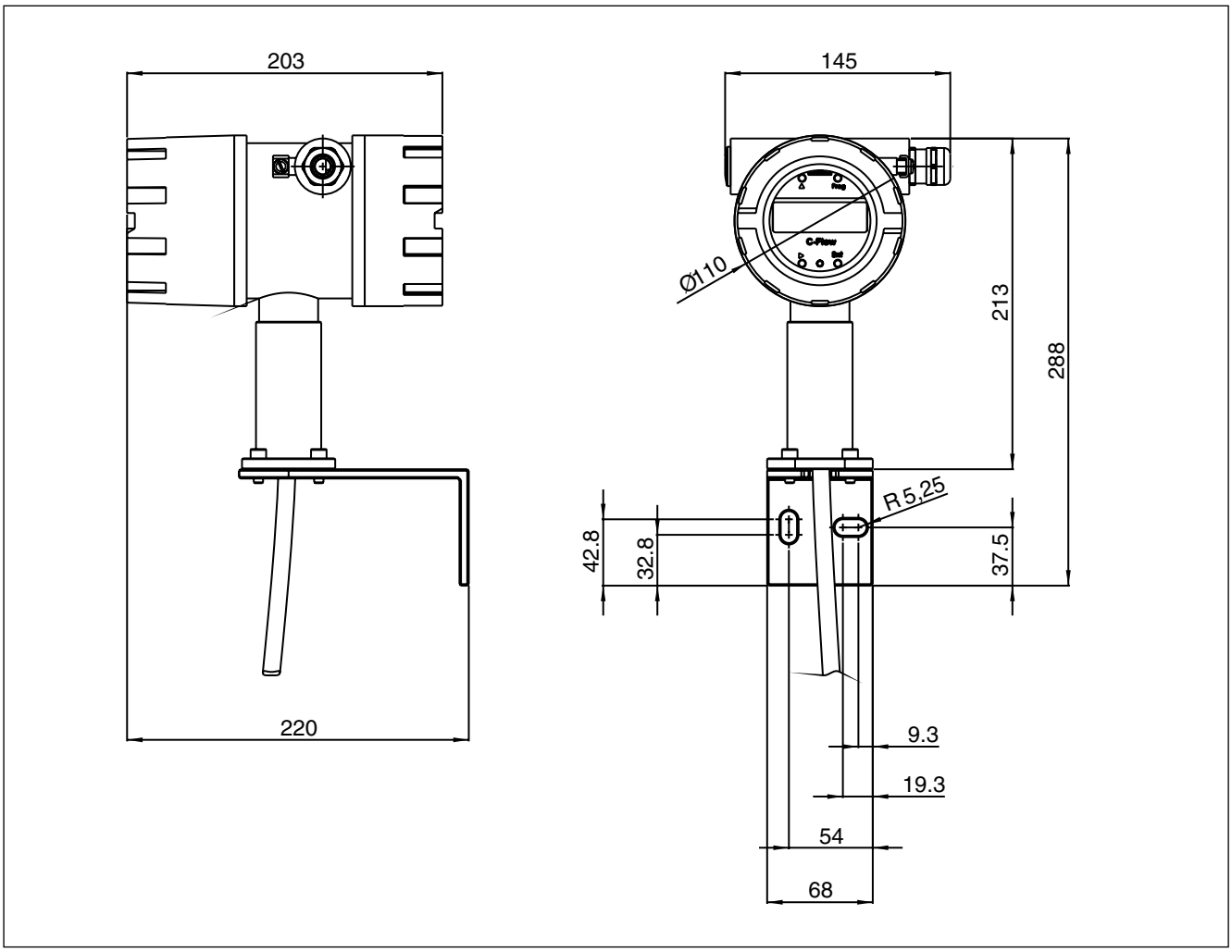
Type	a	b	c	d	e	f
KCM 0300	214	182	160	15	19	110
KCM 0600	214	182	160	15	19	110
KCM 1500	350	280	258	18	21	140
KCM 3000	350	280	258	18	21	140

Dimensional drawing (mm) KCM 6000 to KCM 60K

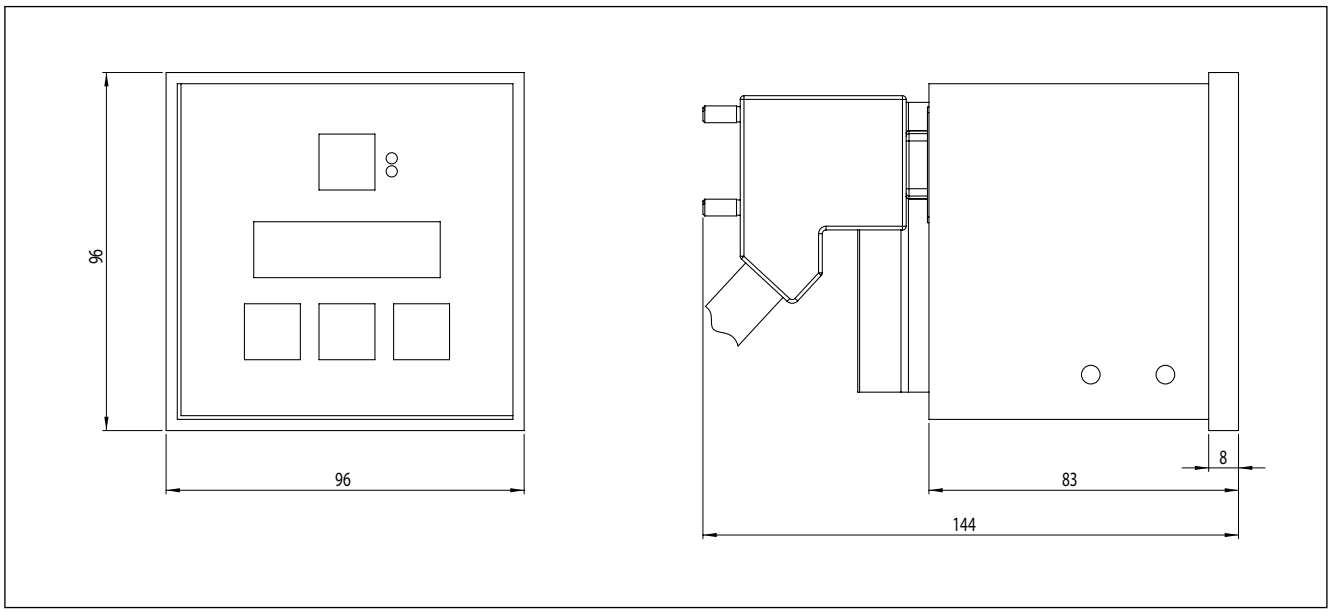


Typ	a	b	c	d	e	Flansche
KCM 6000	400	450	173	65	113	DN 25 PN 40, ANSI 1“ 300 1b
KCM 60K	600	577	290	77	137	DN 80 PN 40, ANSI 3“ 300 1b

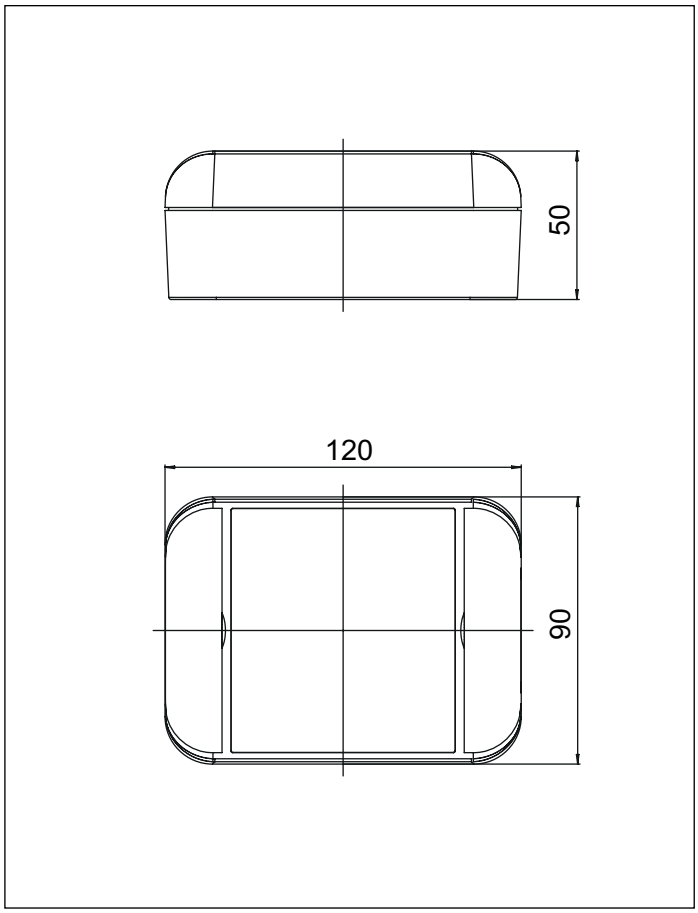
Dimensional drawing (mm) KCE 80xx - WG



Dimensional drawing (mm) Panel-Mounted Housing



Dimensional drawing (mm) Remote Display KRD 8001



Overview

Compact version with female threads and Exd housing

Remote Display KRD 8001

Exd housing for wall-mounting
(separated version, also with flange ends)

Remote panel-mounted housing
(separated version, also with flange ends)

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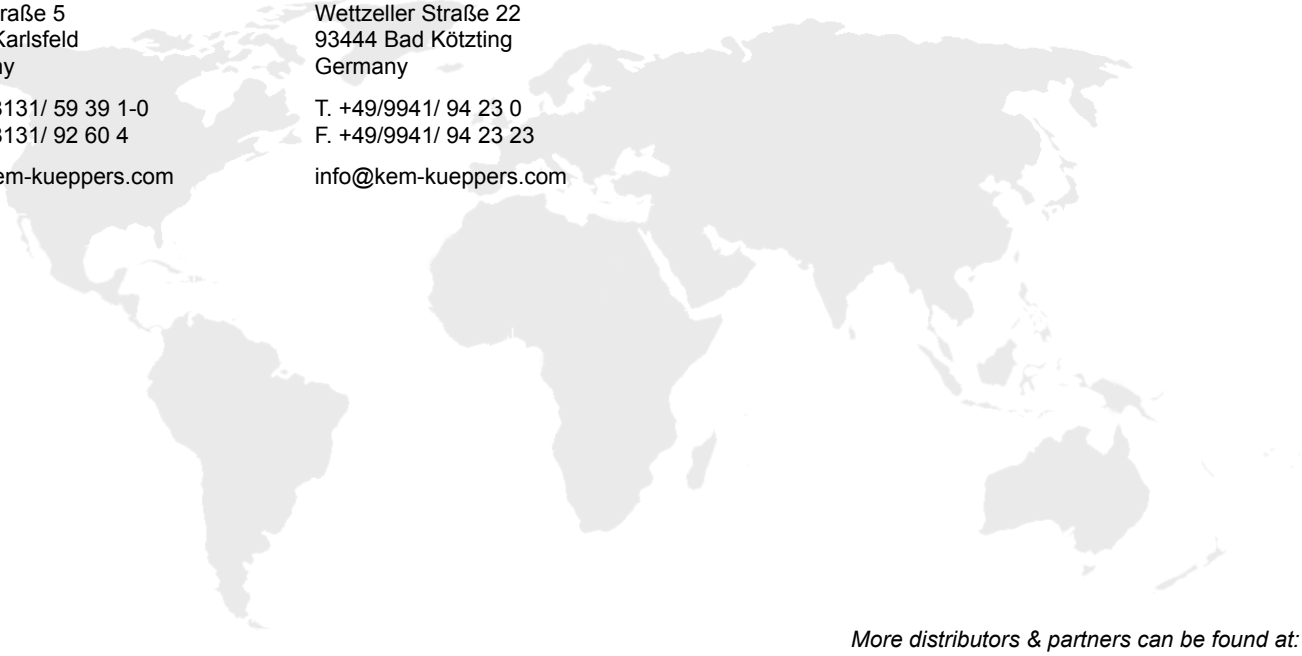

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