KEM-CT

Transmitter for KEM Coriolis sensors for mass flow measurement with fully graphical touch display and versatile interfaces

TECHNICAL ADVANTAGES

- **Touch display** for clear measured-value indication, intuitive operation, and parameterization directly at the device.
- **Configurable I/O modules** for adapting the transmitter to different plant requirements.
- **Remote connection up to 100 m** for flexible installation at accessible operating and reading positions.
- **Galvanic isolation** between supply, signals, and the plant environment.

APPLICATIONS

- Local indication and operation of KEM Coriolis systems using a fully graphical touch display.
- Visualization of measured values, status values, and diagnostic values directly at the measuring point.
- Commissioning, parameterization, and service of KEM Coriolis systems.
- Integration into plant and control systems using application-specific configurable modules.

Key Specifications

Measuring system compatibility	Coriolis sensors KEM-CS and TCM Classic with TCA1000
Supply	24 V DC, ±20 %, galvanically isolated
Display	fully graphical 4.0-inch LCD TFT, 480 x 480 pixels brightness typ. 850 cd/m^2, contrast typ. 800:1
Operating interface	capacitive touch display
Communication	Modbus RTU via RS-485, USB-C
Optional modules	digital I/O (2 outputs, 1 input) analog output 4–20-mA (2 outputs, active/passive) galvanically isolated
Degree of protection	IP66/IP68 with closed housing IP20 with open terminal compartment
Temperature range	normal operation: -30 °C to +60 °C limited display functionality: -40 °C to +60 °C



Features & Performance Characteristics

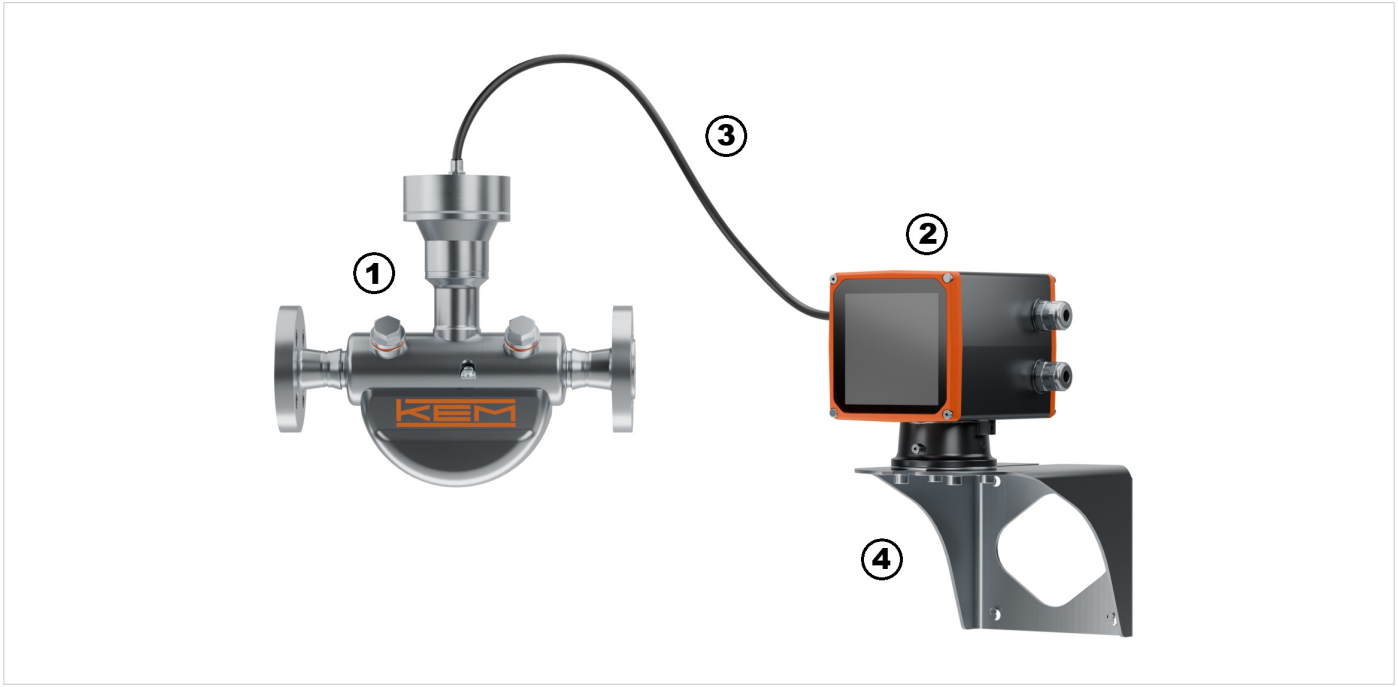
Connection	connection of one Coriolis system with cable length up to 100 m
Display rotation	freely adjustable: 0/90/180/270 degrees
Mounting	universal wall and pipe mounting
Device terminal compartment	four entries, two on the left and two on the right, flexibly usable for M20 x 1.5 cable glands
Interface configuration	Up to 3 flexibly combinable and configurable interface modules for adaptation to plant-specific requirements
Commissioning	simple commissioning using a guided setup assistant

System overview

The KEM-CT (KEM Coriolis Transmitter) extends Coriolis measuring systems with TCA1000 by a remotely mountable indication, operating, and interface unit. Measured-value processing remains in the TCA1000.

The KEM-CT displays measured, status, and diagnostic values directly on site and enables operation and parameterization at an easily accessible position. Via standard and optional interfaces, it connects the measuring system to plant and control systems.

This system architecture clearly separates measured-value processing, local operation, and plant communication, making it suitable for new plants as well as for retrofitting existing TCA-based Coriolis measuring systems.



Component	Description
(1) Coriolis measuring system	Coriolis sensors KEM-CS or TCM Classic with TCA1000
(2) KEM-CT	Coriolis transmitter for indication, parameterization, communication, and I/O connection to further systems
(3) Connecting cable	Connecting cable between the Coriolis measuring system and the KEM-CT
(4) Mounting	Combined wall and pipe bracket

Technical Specifications

General

General technical data for use of the KEM-CT

Product function	Coriolis transmitter for indication, parameterization, communication, and I/O connection to further systems; suitable for non-Ex applications
Measuring system compatibility	Coriolis sensors KEM-CS and TCM Classic with TCA1000
Compliance	CE-compliant according to the applicable EU directives: EMC 2014/30/EU RoHS 2011/65/EU WEEE 2012/19/EU
Material	Housing: coated die-cast aluminum alloy EN AC-43400 housing gasket: CeraPUR® F19-53b wall/pipe bracket and fastening elements: stainless steel, depending on version
Mounting	Remote mounting via wall bracket, combinable with optional pipe bracket
Terminal compartment	Customer-accessible terminal compartment separated from the electronics compartment and secured against tool-free opening
Cable entries	4 entries M20 x 1.5 for cable glands
Coriolis measuring system connection	Connection of the TCA1000 via terminals in the terminal compartment cable length up to 100 m
Process limits	Up to 4 freely configurable process limits (user faults) for mass flow, volume flow, standard volume flow, density, and temperature. Minimum and maximum values can be defined for each process limit. Limit violations can be signaled via output modules or communication.

Ambient conditions

Unless otherwise stated, all values apply to a correctly mounted and sealed device.

Ambient temperature	Normal operation: -30 °C to +60 °C extended operation with limited display functionality: -40 °C to +60 °C
Storage temperature	Normal operation: -40 °C to +80 °C
Humidity	Relative humidity: 5 % to 95 % RH, non-condensing
Degree of protection	Closed housing: IP66 and IP68 (1.5 m water depth, 60 min) open terminal compartment: IP20
Vibration	Endurance sweep, 5 Hz to 2000 Hz, up to 1.0 g according to IEC 60068-2-6

Display and operation

Local display for operation and parameterization directly at the device.

Display	Fully graphical 4.0-inch LCD TFT; 480 x 480 pixels; optically bonded
Brightness and contrast	Brightness: typ. 850 cd/m^2; dimmable and adjustable contrast: typ. 800:1
Operation	Capacitive touch operation through glass cover
Display orientation	0° / 90° / 180° / 270°; via orientation detection or fixed preset
Glass cover	Glass 4.0 mm, scratch resistance 7H, impact resistance IK07
Languages	German, English, French

Electrical supply

For normal operation, supply via the 24 V DC supply input is required. The specified limits for supply voltage and power consumption must be observed.

Supply	24 V DC ±20 %, galvanically isolated
Power consumption	typ. 4 W; max. 8 W peak, depending on module configuration
Grounding	internal and external grounding terminal

Connection terminals

The terminal compartment contains the customer-side terminals and a USB-C service interface.

Supply voltage	Push-in spring terminal 3-pole, conductor cross-section: 0.25 mm^2 ... 2.5 mm^2 / AWG 24 . . . 12 color-coded (blue = 0 V, red = +24 V DC, green-yellow = FE/PE)
Coriolis measuring system	Push-in spring terminal 4-pole, conductor cross-section: 0.25 mm^2 ... 2.5 mm^2 / AWG 24 . . . 12 color-coded according to DIN 47100 (white = +, brown = GND, green = A, yellow = B) Recommended connecting cable: shielded, pair-twisted cable, conductor cross-section $\geq$ 0.5 mm^2, max. cable length 100 m
Modbus RTU	Push-in spring terminal 3-pole, conductor cross-section: 0.25 mm^2 ... 2.5 mm^2 / AWG 24 . . . 12 color-coded according to DIN 47100 (green = A, brown = B, white = GND)
Interfaces	Push-in spring terminal 4-pole each, conductor cross-section: 0.25 mm^2 ... 2.5 mm^2 / AWG 24 . . . 12
USB	USB-C service interface

Communication Modbus RTU

Standard communication is via Modbus RTU RS-485.

Physical connection	RS-485, multidrop capable, switchable 120 Ω terminating resistor [factory setting: disabled]
Device address range	1 [factory setting] to 247
Baud rates	2400 / 4800 / 9600 / 19200 [factory setting] / 38400 / 57600 / 115200 baud
Data format	8 data bits, 1 stop bit, parity None / Even [factory setting] / Odd
Modbus function codes	0x03 Read Holding Registers, 0x10 Write Multiple Registers

Service interface

Service access is provided via USB-C.

Function	USB-C service access for configuration, diagnostics, and firmware update with KEM-PCT (product configuration tool)
Supply	5 V DC via USB-C, for configuration, diagnostics, and firmware update only (not for normal operation)

Digital I/O module (optional)

The optional digital I/O module adds two freely configurable digital outputs and one freely configurable digital input. Parameterization is performed directly via the display or via KEM-PCT.

Function	2 freely configurable digital outputs, each parameterizable as frequency or pulse output 1 freely configurable digital input
Galvanic isolation	Galvanically isolated module with common ground for inputs and outputs

Frequency output

Configurable output variables	Mass flow, volume flow, standard volume flow, density, temperature
Output frequency	max. 10 kHz, freely scalable
Output circuit	Push-pull (PP) / NPN / PNP / NAMUR switching output according to DIN EN 60947-5-6, configurable per output
Damping	0 . . . 10 s, configurable

Pulse output

Configurable output variables	Mass, volume, standard volume
Pulse logic	active high / active low, configurable
Output circuit	Push-pull (PP) / NPN / PNP / NAMUR switching output according to DIN EN 60947-5-6, configurable per output
Pulse width	10 ms . . . 5 s, configurable

Digital input

Actions	Zero adjustment, mass start/stop, mass reset, volume start/stop, volume reset, standard volume start/stop, standard volume reset
Pull-up	integrated 10 kΩ, switchable
Input frequency	max. 1 Hz
Input logic	active high / active low, configurable

For electrical limit values and wiring examples, see operating instructions

4–20-mA analog output module (optional)

The optional analog output module adds two freely configurable, channel-wise galvanically isolated 4–20-mA current outputs per module. Parameterization is performed directly via the display or via KEM-PCT.

Function	2 freely configurable 4–20-mA analog outputs with fault detection; each output parameterizable as active current output (sourcing) or passive current output (sinking)
Galvanic isolation	both analog outputs channel-wise galvanically isolated
Configurable output variables	Mass flow, volume flow, standard volume flow, density, temperature, flow direction, batch status, error, process limits (user faults)
Scaling	Process value and associated output currents freely configurable error current 3.5 mA or 21.5 mA, configurable
Resolution	16 Bit
Accuracy	±0.05 % of measured value
Temperature coefficient	typ. ±10 ppm/K
Damping	0 . . . 10 s, configurable

For electrical limit values and wiring examples, see operating instructions

Dimensions

The following data show the external dimensions of the transmitter and the additional installation and mounting dimensions of the respective mounting type. Binding dimensions are taken from released dimensional drawings and project-specific documents.

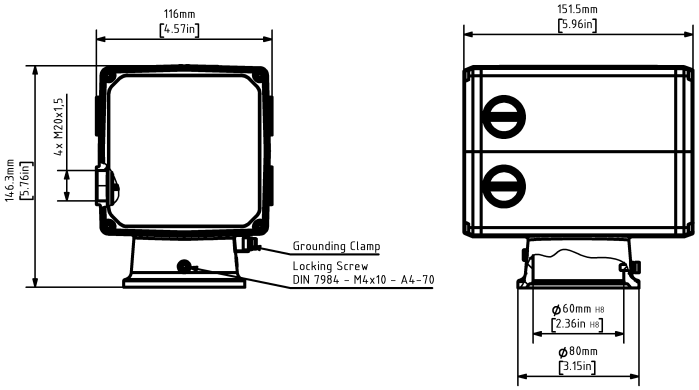
Dimensions and weights

Dimensions without cable glands and connecting cables

Product dimensions	Housing: 151.5 mm x 116 mm x 146.3 mm (L x W x H)
Weight	Product: approx. 1900 g

Dimensional overview





Mounting options

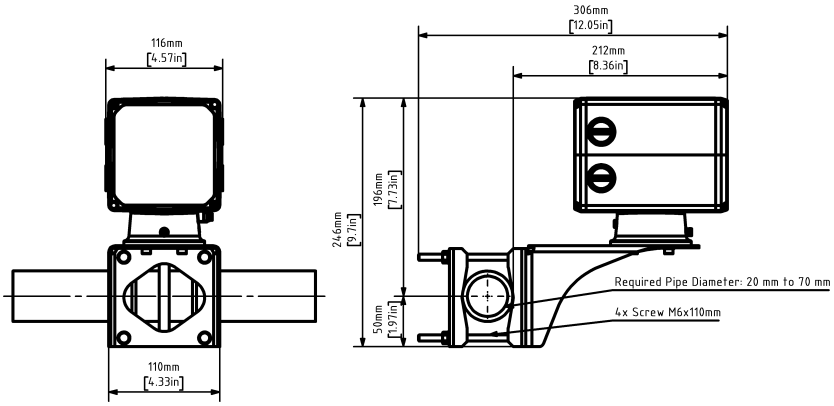
Dimensions and weights

Dimensions without cable glands and connecting cables

Product dimensions (L x W x H)	horizontal pipe mounting: 306 mm x 116 mm x 246 mm vertical pipe mounting: 306 mm x 116 mm x 249 mm wall mounting: 200 mm x 128 mm x 246 mm
Weight	wall mounting total: approx. 2500 g pipe mounting total: approx. 3000 g
Pipe mounting diameter	20 mm to 70 mm
Wall mounting hole pattern	80 mm x 80 mm

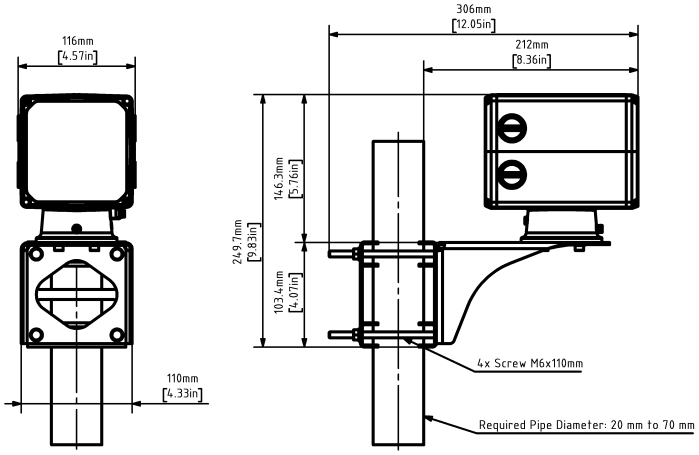
Dimensional overview, horizontal pipe mounting





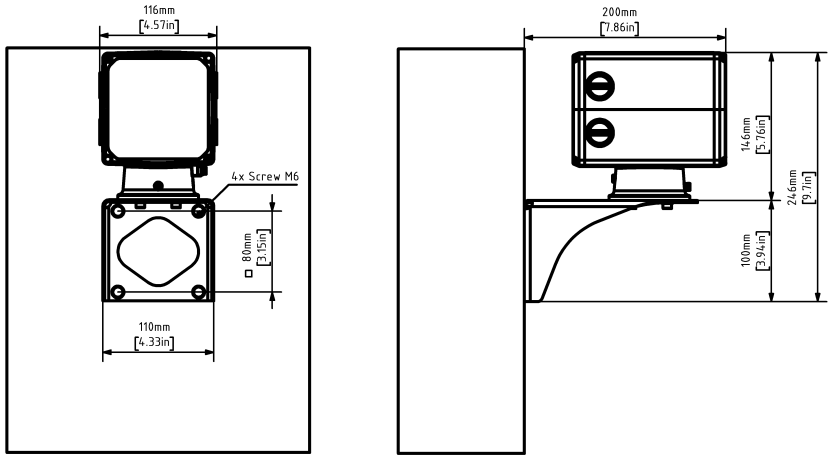
Dimensional overview, vertical pipe mounting





Dimensional overview, wall mounting





Ordering information

The model code describes the orderable configuration of the transmitter.

KEM-CT	A1	AA	A2	A1	AD	FO	AO	ZZ	S1	XX	ZZ
	Version	Thread	Mounting	Supply	Display	Module 1	Module 2	Module 3	Approval	Transmitter option	Factory option

Version

Basic transmitter version.

A1	Standard version, non-Ex

Cable glands

Housing thread and supplied cable glands or adapters. Supplied components are not pre-installed.

AA	M20 x 1.5 housing, without cable glands
AC	M20 x 1.5 housing, 4 x M20 x 1.5 cable glands supplied, non-Ex

Mounting

Mechanical mounting option of the KEM-CT. Bracket sets are supplied as accessories.

A2	Remote version with wall and pipe bracket set
A3	Remote version with wall bracket set

Power supply

Supply of the transmitter.

A1	24 V DC

Display

Local indication and operation at the device.

AD	Fully graphical touch display

Module 1 / Module 2 / Module 3

Slot assignment for optional I/O and communication modules.

ZZ	No module
AO	4–20-mA analog output module with 2x analog output, active/passive
FO	Digital I/O module with 2x frequency output, 0–10 kHz; 1x digital input

Approvals and certificates

Approval and certificate options.

S1	KEM standard, CE

Transmitter option

Physical additional options on the device.

XX	Standard, no additional transmitter options

Factory option

Factory configuration settings and customer-specific presets.

ZZ	Standard, no additional factory options

Further customer-specific versions and configuration options are available on request. Please contact sales.

Accessories

Order code	Article	Description
221276	CON.USB.RS-ISO	Galvanically isolated RS-485-to-USB adapter cable

Subject to technical changes and errors. Only released product data, order documents, and the applicable technical documentation are binding.