CORIOLIS MASS FLOW METER DN15



- DN15 · 0.15 ... 3 T/H
- MASS, DENSITY AND TEMPERATURE
- ± 0.2 % LIQUID · ± 0.5 % GAS
- PULSE · RS485 MODBUS RTU
- ATEX · IECEX · SIL · IP67

IP67 · Stainless Steel · RS485 · Display

VERSIONS

Feature	Versions
Accuracy class	0.2 (liquid ± 0.2 %, gas ± 0.5 %) · 0.1 · 0.15 · 0.3 · 0.5
Transmitter supply	85 ... 250 V AC, 50/60 Hz · 12 ... 24 V DC (± 5 %)
Outputs	pulse + RS485 Modbus RTU · additionally 4 ... 20 mA or 4 ... 20 mA with HART · second 4 ... 20 mA (instead of RS485)
Medium temperature	–70 ... +160 °C · other ranges between –200 and +200 °C, higher on request
Additional function	concentration measurement (Brix, °INPM, °GL)
Accessories	counter flanges

OVERVIEW

Coriolis mass flow meter DN15 for liquids and gases up to 3 t/h – measures mass, density and temperature directly, with remote transmitter with display.

The medium flows through vibrating tubes of stainless steel 316L; the Coriolis force changes the frequency, phase shift and amplitude of the vibration. From this the transmitter determines mass flow and density, a Pt100 measures the temperature. Density, viscosity, temperature and pressure of the medium do not affect the measurement, and since nothing inside the tube obstructs the flow, short straight pipe runs are sufficient. The remote transmitter in a flameproof housing shows flow, totals, density and temperature and outputs them as pulses and via RS485 Modbus RTU, optionally also as 4 … 20 mA or HART. The meter is ATEX and IECEx certified for zone 1 and suitable for safety functions up to SIL 3 (redundant). Typical uses are oil and gas, chemicals, food and beverage, energy, marine, pulp and paper as well as water and wastewater.

3 t/h	± 0.2 %	± 0.002 g/cm³	IP67
maximum flow	liquid accuracy	density accuracy	protection class

MEASUREMENT
■ mass flow 0.15 … 3 t/h
■ liquid ± 0.2 %, gas ± 0.5 %
■ density ± 0.002 g/cm³
■ medium temperature –70 … +160 °C

TRANSMITTER
■ OLED display, optical keys
■ pulse 0 … 10 kHz
■ RS485 Modbus RTU
■ option 4 … 20 mA / HART

TECHNICAL DATA

MEASUREMENT AND PRECISION

Measuring principle	Coriolis, vibrating tubes
Measured variables	mass flow, density, temperature; volume flow and totals calculated
Flow range	0.15 … 3 t/h
Turndown	1:20 at ± 0.2 %; below the minimum flow the meter keeps measuring with reduced accuracy
Mass flow accuracy	liquid ± 0.2 %, gas ± 0.5 %
Repeatability	0.10 %
Zero stability	0.12 kg/h
Density accuracy	± 0.002 g/cm³
Temperature accuracy	± 1 °C ± 0.5 % of reading

PROCESS

Medium	liquids and gases
Medium temperature	–70 … +160 °C
Nominal pressure	4 MPa (PN40)

SENSOR – MECHANICS

Nominal size	DN15
Process connection	flange DN15 PN40 to DIN 2635, raised face
Flow tubes	stainless steel 316L
Splitter and flanges	stainless steel 304
Housing	stainless steel 304
Junction box	aluminium alloy, intrinsically safe (Ex ib), rotatable up to 180°
Protection class	IP67
Shipping (package, gross)	565 × 355 × 260 mm. 12 kg

TRANSMITTER – ELECTRICAL PROPERTIES

Supply voltage	85 … 250 V AC, 50/60 Hz or 12 … 24 V DC (± 5 %)
Power consumption	≤ 5 W
Power cable	cross-section > 0.8 mm², length ≤ 100 m
Cable to sensor	9-core, shielded; 3 m supplied; lengths up to 150 m permitted

OUTPUTS AND COMMUNICATION

Pulse output	0 … 10 kHz, passive (open collector), max. 50 mA; mass (default) or volume
Interface	RS485 Modbus RTU
Current output (option)	4 … 20 mA, also with HART; flow, density or temperature, range adjustable
Flow direction	forward, reverse, bidirectional or absolute

DISPLAY AND OPERATION

Display	OLED, backlit: flow, totals, density, temperature, alarms
Operation	two optical keys (SET, SELECT) through the glass, two-colour status LED
Configuration	on the device or with PC software via RS485
Diagnostics	self-diagnosis with error codes

TRANSMITTER – ENVIRONMENT AND MOUNTING

Ambient temperature	–30 … +60 °C; in hazardous areas according to temperature class (see table)
Relative humidity	≤ 95 %, non-condensing
Atmospheric pressure	86 … 106 kPa
Storage temperature	–30 … +65 °C
Housing	aluminium alloy, flameproof (Ex db); 138 × 209 × 174 mm (W × H × D, with wall bracket)
Mounting	wall bracket, 4 × Ø 7 mm on 130 × 50 mm
Cable entries	3 × M20 × 1.5; cable Ø 8 … 8.5 mm or 8.5 … 12 mm

TRANSMITTER CONNECTIONS – OUTPUTS AND SUPPLY

Terminal	Assignment
RS485A (+) · RS485B (–)	RS485 Modbus RTU, A (+) and B (–)
FO+ · FO–	pulse output, passive (open collector)
HART+ / mA+ · HART– / mA–	4 … 20 mA / HART (option)
mA+ · mA– (additional board)	second 4 … 20 mA (option, not together with RS485)
AC power module	85 … 250 V AC, fused; ground terminal
DC power module	12 … 24 V DC; ground terminal

CABLE SENSOR – TRANSMITTER (TERMINALS AT THE TRANSMITTER)

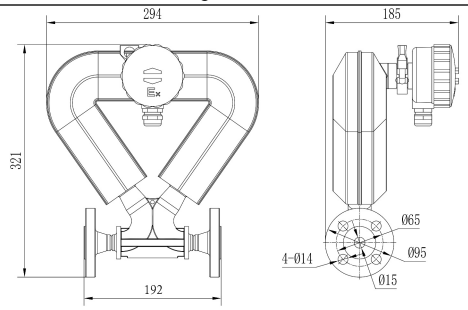
Terminal	Wire	Function
R+ · R– · PE	white · yellow · black (shield)	right pick-off
L+ · L– · TPE	grey · purple · transparent (shield)	left pick-off
S2 · S1 · C1	black · green · orange	temperature measurement (Pt100)
DPE · D+ · D–	black (shield) · blue · red	drive coil

HAZARDOUS AREAS – TEMPERATURE CLASSES

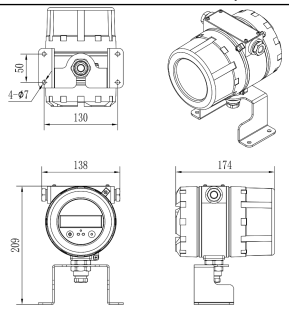
Temperature class	Medium temperature	Transmitter ambient
T6	up to +60 °C	–30 … +45 °C
T5	up to +80 °C	–30 … +45 °C
T4	up to +105 °C	–30 … +45 °C
T3	up to +138 °C	–30 … +45 °C
T2 · T1	up to +160 °C (maximum medium temperature of the sensor)	–30 … +80 °C

DIMENSIONS (mm)

Sensor DN15 with PN40 flanges: front view, side view with flange



Transmitter with display and wall bracket: rear view with hole pattern, oblique view, front and side view



	Flange Ø D / K · holes	Installation length	Shipping weight (gross)
DN15 PN40	95 / 65 · 4 × Ø 14	192	12 kg

Dimensions in mm, tolerance ± 2 mm. Flanges to DIN 2635 PN40. K = pitch circle.

COMPLIANCE AND CERTIFICATION

Protection Rating		IP67
Compliance		ABS Product Design Assessment 25-0390120-PDA for marine and offshore applications (until 09/2030). Hazardous areas: temperature classes see table; cable glands and blanking plugs with their own Ex db IIC certificate, at least IP67, for T2 and T1 cables and glands rated for 100 °C; do not open the transmitter when energized; connect the earth
Calibration		factory calibration with calibration certificate; sensor and transmitter are a matched pair, calibration factor on the sensor nameplate
Certifications		TPS 18 ATEX 04516 001 X: transmitter II 2G Ex db [ib] IIC T6 ... T1 Gb, sensor Ex ib IIC T6 ... T1 Gb (EN 60079-0, -1, -11)
		IECEx TPS 20.0006X: transmitter Ex db [ib] IIC T6 ... T1 Gb, sensor Ex ib IIC T6 ... T1 Gb
		Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU (EN 61010-1, EN 61326-1)
		IEC 61508: SIL 2 at HFT 0, SIL 3 at HFT 1 (redundant), systematic capability SC 3