



Measurement & Analytics | Measurement made easy

CoriolisMaster

Measurement made easy

Accurate flow measurement  
of liquids and gases

Power and productivity  
for a better world™



# CoriolisMaster

## Measurement made easy

Highest measurement accuracy, easy installation and handling, compact and space-saving design

### CoriolisMaster:

**Easy** to measure mass and volume flow, density, temperature and concentration with only one meter

**Easy** installation due to space saving design

**Easy** to reduce lifetime costs: minimum pressure loss, no moving parts, maintenance free design

**Easy** to reduce maintenance due to self draining design: no fluid residues remain in the meter

**Easy** to integrate and operate: modular transmitter approach with up to five simultaneous outputs, ABB common user interface and sensor and application memory

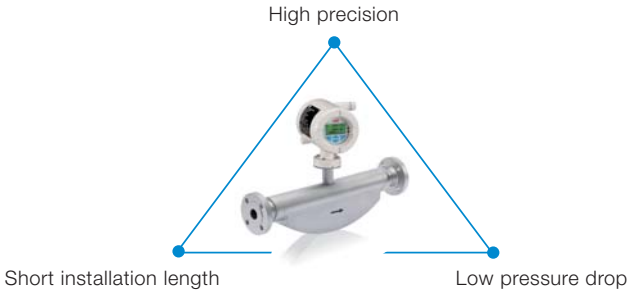
FCB450 integral



# CoriolisMaster

## The sensors

The CoriolisMaster sensors are designed to be the perfect balance of performance, compact size and small pressure drop.



### **FCBxxx compact general purpose meter**

One of the most cost saving meters on the market today – save on installation, pump power and spares costs with this class-leading coriolis mass flowmeter.

### **FCHxxx compact meter for hygienic purposes**

All the outstanding benefits of the FCB300xxx series are available as a hygienic version with EHEDG certification.

### **MS2 – low flow meters**

Low flow rates up to 500 bar (7250 psi) process pressure and very compact design.

FCB400



FCH400



MS2



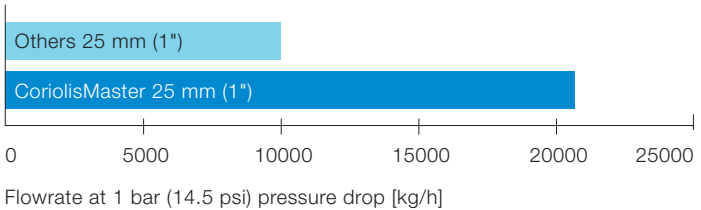
# CoriolisMaster

## Top performance

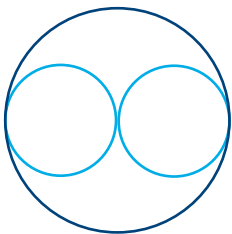
The design of CoriolisMaster offers unmatched measuring accuracy for liquids and gases.

The excellent zero stability enables measuring spans of 100:1 or larger. The high measuring accuracy of 0.1% is available over a wide measuring range.

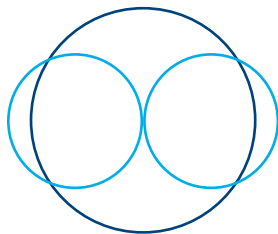
The enhanced sensor design performance can be tailored to your needs as different models with different accuracy levels are available. Installation length and handling are identical for all models. The large tube diameter minimizes pressure losses to virtually zero – allowing for up to 50% pressure loss savings compared to other commercially available products.



Others



Low pressure drop: CoriolisMaster  
FCBxxx and FCHxxx series



# CoriolisMaster

## Measurement made easy

The CoriolisMaster is designed to provide easy handling and low maintenance.

### Sensor and application memory

The unique sensor and application memory concept stores all relevant meter and application data, calibration factors, user settings and totalizers undetachably with the sensor. Any possible change in electronics can be done at a minimum of effort. ABB has taken this idea one step further and also stores all relevant firmware of a remote transmitter solution with the sensor, making sure that only type approved firmware is used.

### Maintenance free design

As CoriolisMaster has no moving parts inside the fluid, it is virtually maintenance free.

### Self draining meter design

The meter design allows for self draining installations preventing any media or solid residues in the meter tubes. It is the better alternative to many other meter solutions.

### Compact meter design

Its small length and height as well as its light weight makes the meter easy to install and easy to handle. Especially with larger meter sizes, installation time can be reduced significantly.

### CoriolisMaster in the oil and gas industry



# CoriolisMaster

## The transmitters

CoriolisMaster comes with a variety of transmitter series that are tailored for specific applications.

### **FCx100 – system integration transmitter**

The FCx100 transmitter is specifically designed to make system integration as easy as possible. It provides a high speed Modbus RS485 output and additional two digital outputs (pulse, frequency or logic output). This enables the meter to be fully integrated while providing very fast 10 kHz frequency outputs for fast filling applications, meter proving and custody transfer applications.

### **FCx300 and ME2 – general remote and integral transmitter**

The classic FCx300 transmitter series provides a display, various analog and digital outputs and HART communication.

**FCx100 – Integral design  
for easy system integration**



**FCx300 and ME2 – Remote  
or integral mount design**



# CoriolisMaster

## The transmitters

### The high performance CoriolisMaster transmitter with modular concept

#### **FCx400 – high performance Coriolis transmitter**

This transmitter series provides up to five independent I/Os. Its modular approach with "plug in" cards provides maximum flexibility. Its sensor and application memory concept enables easy maintenance and utmost data security. Its all digital platform allows for easy remote installations with industry standard cables.

#### **Special application software**

The integrated DensiMass software enables CoriolisMaster to perform direct concentration measurement, or Brix and Net-oil (water-cut) computation. It also provides temperature-standardized density, volume and concentration calculation based on large data matrices stored in the meter. Due to the modular design, this feature can be activated even in the field after installation. The FillMass software provides "stand alone" filling capability, allowing CoriolisMaster to control the filling valve directly.

#### **FCx400 – Integral and remote transmitter**



# CoriolisMaster VeriMass – onboard verification

The unique VeriMass feature allows for monitoring the health status of the meter and verification of its performance.

Extensive diagnostics according to NAMUR standard NE107 is available as a basic feature. VeriMass offers much more. The built-in erosion monitor creates an application finger print of the meter in the specific application and compares the meter function continuously with this finger print without the need of any further interaction with the meter. As this feature focuses on erosion and coating of the meter, long term trends are identified.

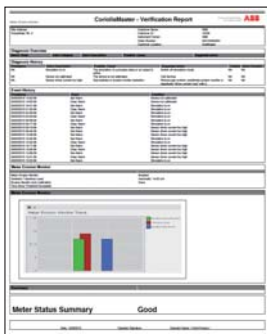
The health status of the meter as well as the erosion monitor status can be combined in a verification report print out, documenting required meter checks.

## Diagnosis and VeriMass verification report

Simulation Mode

Diagnosis Monitoring

- ABB FCx1xx / FCx4xx HART CoriolisMaster : OK
  - Sensor
  - Electronics
  - Configuration
  - Operating Condition



Diagnosis Monitoring

- ABB FCx1xx / FCx4xx HART CoriolisMaster : Failure
  - Sensor
    - Sensor temperature out max range
      - Possible Cause: Medium / ambient temperature too high.
      - Suggested action: Check Conditions
    - Sensor amplitude out of range.
      - Possible Cause: Bubbles in pipe. Defective HW.
      - Suggested action: Call Service.
  - Electronics
    - Sensor temperature measure error
      - Possible Cause: Defective Pt1000. Wrong connection.
      - Suggested action: Check connection
  - Configuration
  - Operating Condition



# CoriolisMaster

## The Portfolio at a glance

### CoriolisMaster sensors\*

FCBxxx



FCHxxx Hygienic



### CoriolisMaster transmitters

FCx100 – Modbus and pulse transmitter series



FCx300 – Universal transmitter series



FCx400 – New transmitter series



### FCM2000 sensors\*

MS2



### FCM2000 transmitters

ME2



\*Only available with transmitters

# CoriolisMaster

## Simply fits your purpose

### The most important data at a glance

Nominal sizes	
1.5 mm (1/16") (MS2)	0...65 kg/h (2.388 lb/min)
3 mm (1/8") (MS2)	0...250 kg/h (9.186 lb/min)
6 mm (1/4") (MS2)	0...1,000 kg/h (36.744 lb/min)
DN15 (1/2") (FCBxxx)	0...8,000 kg/h (293.950 lb/min)
DN25 (1") (FCBxxx/FCHxxx)	0...35,000 kg/h (1,286.029 lb/min)
DN50 (2") (FCBxxx/FCHxxx)	0...90,000 kg/h (3,306.934 lb/min)
DN80 (3") (FCBxxx/FCHxxx)	0...250,000 kg/h (9,185.928 lb/min)
DN100 (4") (FCBxxx)	0...520,000 kg/h (19,106.729 lb/min)
DN150 (6") (FCBxxx)	0...860,000 kg/h (31,599.591 lb/min)
Wetted materials	1.4404/1.4435 (316L) or Hasteloy C




CoriolisMaster FCXx30	CoriolisMaster FCXx50
Accuracy for liquids	
Mass: 0.4 % o.r. / 0.25 % o.r.	Mass: 0.15 % / 0.1 % o.r.
Volume: 0.4 % o.r. / 0.25 % o.r.	Volume: 0.15 % o.r.
Density: 10 g/l	Density: 2 g/l or 1 g/l
Accuracy for gases	
Mass: 1 % o.r.	Mass: 0.5 % o.r.
Measuring medium temperatures	
-50...160 °C (-58...320 °F)	-50...205 °C (-58...400 °F)*

### Approvals

Hazardous areas	IECEX, ATEX, cFMus, NEPSI and many more, details on <a href="http://www.abb.com/flow">www.abb.com/flow</a>
Marine approvals	DNV (see <a href="http://www.abb.com/flow">www.abb.com/flow</a> for approved models)
Custody transfer	In compliance with API Chapter 5.6 and AGA11 MID / OIML pending, many local approvals
Hygienic approvals	EHEDG, FDA material compliant
Mechanical safety	PED and NACE

\*FCB300: 200 °C (392 °F)



	FCx100 series	FCx300 series	FCx400 series
			
Display	no	yes	yes
Outputs	Modbus 2 digital out (pulse, frequency contact out)	2 current outputs 1 pulse 1 contact out/in HART	up to 5 modular I/O Freely selectable and adjustable* HART
Through the glass operation	no	no	yes
SensorMemory concept	yes	yes	yes
Undetachable sensor and application memory	yes	no	yes
Tambient	-40...55 °C (-40...131 °F)	-40...60 °C (-40...140 °F)	-40...70 °C (-40...158 °F)
MID / OIML approval	pending	no	pending
SIL2	no	no	yes
Power supply	11...30 VDC	24 AC/DC 110/230 VAC	11...30 VDC 110/230 VAC
Max. power consumption	5 W (usual: 2...3 W)	25 W (usual: 6...9 W)	20 W (usual 4...5 W)
DensiMass concentration	yes (FCx150 version)	yes (FCx350 version)	yes (FCx450 version)
FillMass Batch software	yes (FCx150 version)	no	yes (FCx450 version)
VeriMass verification	yes	no	yes

\*For details please refer to data sheet

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### **Note:**

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