KROHNE

measure the facts

IFC 050

Signal Converter for Electromagnetic Flowmeters

- Signal converter for diverse applications
- Multiple outputs
  - RS485 Modbus
  - Active pulse output to electro-mechanical counter
- Best in class measurement accuracy
- Indication of conductivity
- Blind version available optionally

HART® FIELD COMMUNICATIONS PROTOCOL

Product features

The IFC 050 signal converter is designed to measure the flow velocity, conductivity, volume and mass flow of electrically conductive liquid media.

Significant features of the signal converter

- An active pulse output for simple systems, like driving an electro-mechanical counter.
- RS485 Modbus communication with data processing system, SCADA etc.
- Extra insulation for the electronics and housing for high performance in areas with extreme humidity and chances of flooding.

(Signal converter with display)

(Signal converter without display)

1. Large graphic display with 4 magnetic keys for operating the signal converter when the housing is closed
2. 4 push buttons to operate the signal converter when the housing is open
3. Supply voltage: 100...230 VAC and 24 VDC

Highlights

- Available outputs : current (including HART®),active pulse/frequency, status and modbus
- Intuitive operation with touch buttons
- Excellent price/performance ratio
- Modern robust housing design
- All versions with and without display are available
- Simple installation and start-up
- Bright graphic display
- Certified tests for humidity and vibration

Applications and industries

- Process industries
- Steel plants
- Water and wastewater
- Water treatment and distribution network
- Agriculture, irrigation, water abstraction
- Heating, ventilation and air-conditioning (HVAC)
- Machinery
- Power plants

Signal converter / Flow sensor combinations

Flow sensor	Signal converter	
	Compact (10°) version	Remote version
Optiflux 1000	Optiflux 1050C	Optiflux 1050W
Optiflux 2000	Optiflux 2050C	Optiflux 2050W
Optiflux 4000	Optiflux 4050C	Optiflux 4050W
Waterflux 3000	Waterflux 3050C	Waterflux 3050W
Ecomag	Ecomag 050C	Ecomag + IFC 050W
Aquamag	Aquamag 050C	Aquamag + IFC 050W
IFS 4000	IFM 4050C	IFS 4000 + IFC 050W
Aquaflux	Aquaflux 050C	Aquaflux + IFC 050W

Measuring principle – Faraday's law

An electrically conductive fluid flows inside an electrically insulated pipe through a magnetic field. This magnetic field is generated by a current, flowing through a pair of field coils. Inside the fluid, a voltage U is generated:

U = V * K* B * D

Where

V = Mean flow velocity

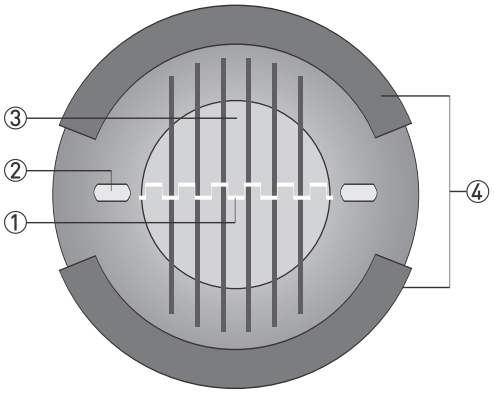
K = Meter constant / correction factor for geometry

B = Magnetic field strength

D = Inner diameter of flowmeter

The signal voltage **U** is picked up by electrodes and is directly proportional to the mean flow velocity V and thus the flow rate **Q**. The generated signal voltage is very low.

Signal converter is used to amplify this signal voltage, filter it (separate from noise) and convert it into signals for totalising, recording and output processing.



1. Voltage (induced voltage is directly proportional to flow velocity)
2. Electrodes
3. Magnetic field
4. Field coils

Technical data

Measuring system

Measuring principle	Faraday's law of electromagnetic induction
Application range	Continuous measurement of instantaneous and totalized flow, velocity, mass flow (at constant density), conductivity and coil temperature

Design

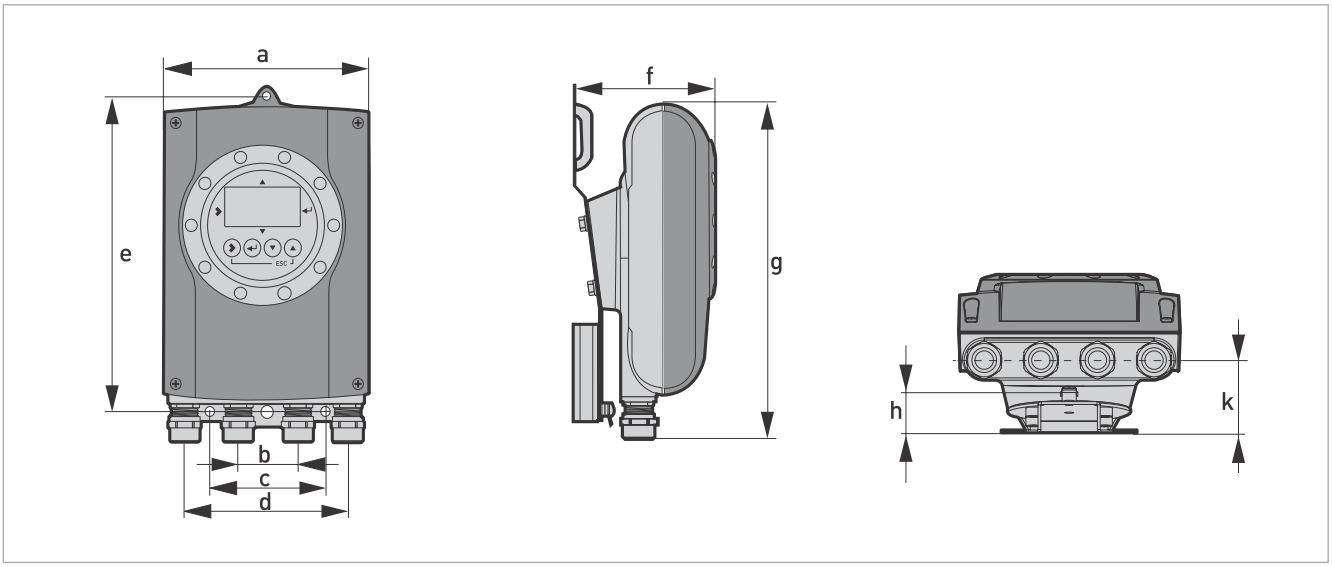
Measuring sensor	
Optiflux 1000	DN 25 ... DN 150 / 1" ... 6"
Optiflux 2000	DN 25 ... DN 1200 / 1" ... 48"
Optiflux 4000	DN 10 ... DN 1200 / 3/8" ... 48"
Waterflux 3000	DN 25 ... DN 600 / 1" ... 24"
Ecomag	DN 25 ... DN 150 / 1" ... 6"
Aquamag	DN 50 ... DN 150 / 2" ... 6"
IFS 4000	DN 10 ... DN 1200 / 3/8" ... 48"
Aquaflux	DN 50 ... DN 1200 / 3/8" ... 48"
Signal converter	
Compact version (C)	IFC 050C
Remote version (W)	IFC 050W
Version	Standard: Non-Ex
Options	
Outputs	4 ... 20mA, HART, pulse (active), frequency, status output and / or limit switch
Counter	2 internal counters with 10 counter places (e.g. for counting volume and / or mass units)
Verification	Integrated verification, diagnostic function: measuring device, empty pipe detection, stabilisation
Optional output	
Relay (under preparation)	1no
	Rating: 230VAC, 5A / 24VDC, 5A
Communication interface	Modbus RS485
Display and User interface	
Graphic display	Backlit white LC display, Size: 128 x 64 pixels corresponding to 59 x 31mm
Units	Metric, British and US units selectable as required from lists for volume / mass flow and counting, flow velocity, electrical conductivity, temperature
Programming	4 push buttons for operating the signal converter when housing is open.
	4 magnetic keys for operating the signal converter when housing is closed.
Remote programming	PACTware® (incl. Device Type Manager (DTM)) HART® through Hand Held Communicator
Measuring Accuracy	
Measuring error	±0.5% of the measured value Higher accuracy on request
Repeatability	±0.1%
Calibration media	Water

Operating conditions	
Temperature	
Process temperature	Refer to technical data for the measuring sensor.
Ambient temperature	-40...+65°C / -40...+149°F
Storage temperature	-40...+70°C / -40...+158°F
Chemical properties	
Electrical conductivity	³ 5 µS/cm
Solid content (volume)	£ 10% by volume
Gas content (volume)	£ 3% by volume
Materials	
Signal converter housing	Die-cast aluminum with polyester topcoat
Electrical connection	
Power supply	Universal power supply 100...230 VAC (-15% / +10%), 50/60 Hz
	24 VDC (-30% / +30%)
Power consumption	AC: 15 VA
	DC: 5.6 W
Cable length	Maximum 600 m / 1950 ft
Cable entry	Standard: M20 x 1.5 (8...12 mm)
	Option: ½" NPT, PF ½
Error Identification	Without HART®: 20 ... 22mA With HART®: 3 ... 22mA
Outputs	
General	All outputs are electrically isolated from each other and from all other circuits.
Current output	Active / passive 0 / 4.... 20mA, HART HART version: V5 Multi-drop mode: Yes, current output: 4mA
Low flow cut-off	
Function	Switching point and hysteresis separately adjustable for each output, counter and the display
Switching point	Set in increments of 0.1%
	0...20% (current output, frequency output) or 0...±9.999 m/s (pulse output)
Hysteresis	Set in increments of 0.1%
	0...5% (current output, frequency output) or 0...5 m/s (pulse output)
Time Constant	Time constant corresponds to the elapsed time until 67% of the end value has reached according to a step function.
Settings	Set in increments of 0.1
	0...100 s
Status output / limit switch	
Function and settings	Adjustable as automatic measuring range conversion, display of flow direction, counter overflow, error, switching point, or empty pipe detection
	Valve control with activated dosing function
	Status and/or control: ON or OFF
Passive	Independent of connection polarity
	Uext £ 32 VDC, I £ 100 mA

Modbus	
Description	Modbus RTU, Master / Slave, RS485
Address range	1... 247
Broadcast	Supported with function code 16
Supported Baudrate	1200, 2400, 3600, 4800, 9600, 19200, 38400, 57600, 115200 Baud
Approvals and Certifications	
Protection category to IEC 529 /EN 60529	IP 66 / 67 (eq. to NEMA 4X/6)
CE	The device fulfils the statutory requirements of the EC directives.
Shock and vibration resistance	IEC 680068-2-3; EN 60068-2-6 and EN60068-2-27; IEC 61298-3

Dimensions and weights

Wall mounted version



Dimensions and weights in mm and kg

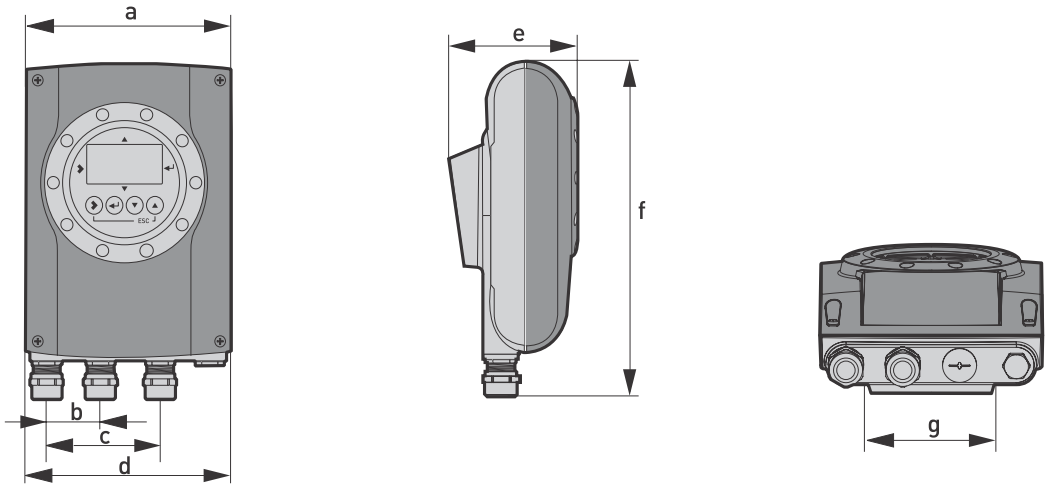
	Dimensions (mm)									Weight (kg)
	a	b	c	d	e	f	g	h	k	
Version with & without display	157	40	80	120	248	111.7	260	28.4	51.3	1.9

Dimensions and weights in inch and lb

	Dimensions (mm)									Weight (kg)
	a	b	c	d	e	f	g	h	k	
Version with & without display	6.18	1.57	3.15	4.72	9.76	4.39	10.24	1.12	2.02	4.2

Dimensions and weights

Compact version



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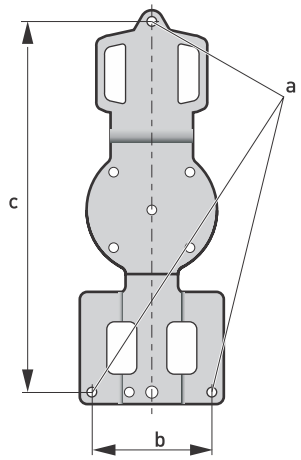
Mounting plate, wall version



Dimensions in mm and inch

	(mm)	(inch)
a	ø6.5	ø0.26
b	80	3.15
c	248	9.76

Note: The subject flow meters cannot be used as a weight or measures under the Legal Metrology Act. Specifications subject to changes without prior notice DOC#FMKRH/0917/2310/V3.R1

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