OPTIFLUX 4040 C

Technical Datasheet

Electromagnetic Flowmeter

- 2-wire connection without additional cabling
- As dynamic, reliable and accurate as a 4-wire EMF
- Unimpeded pipe cross-section
- No additional pressure loss
- Minimum conductivity 5 µS/cm
- Intrinsically safe connection

KROHNE

2-wire solution

OPTIFLUX 4040 C is an electromagnetic flowmeter in 2-wire technology with the dynamics, reliability and accuracy of a 4-wire EMF. OPTIFLUX 4040 C is suitable for steady or pulsating flows.

1. All Ex approvals
2. Most dimensionally stable PFA liner with stainless steel mesh
3. Housing and flanges also available in stainless steel

Highlights

- 2-wire EMF with 4-wire functionality
- Reliable readings even in case of pulsating or fast changing flows due to rapid signal processing
- Low power consumption and operating costs
- Protection classes "I", "e" or "d" selectable by the user during installation
- The only 2-wire electromagnetic flowmeter suitable for conductivities down to 5 µS/cm

Industries

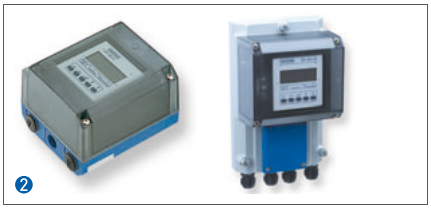
- Chemicals
- Iron, Steel & Metals
- Minerals & Mining
- Pharmaceuticals
- Power Plants
- Pulp & Paper
- Water
- Wastewater

Aplications

- Pulsating flows
- For aggressive chemicals
- For products with high solid contens
- Suitable for control loop applications

Electromagnetic product range

OPTIFLUX converters: All converters fit to all sensors



1 IFC 300 High-performance solution
2 IFC 010 Economical solution

OPTIFLUX sensors

1 OPTIFLUX 1000 Economical solution
2 OPTIFLUX 2000 Solution for the water and wastewater industry
3 OPTIFLUX 4000 Standard solution for the process industry
4 OPTIFLUX 5000 Solution with high-tech ceramics
5 OPTIFLUX 6000 Sanitary and hygienic solution

Special-purpose flowmeters

1 WATERFLUX 2070 Battery powered watermeter solution
2 OPTIFLUX 4040 C 2-wire solution
3 TIDALFLUX 4110 PF Solution for partially filled pipelines
4 BATCHFLUX 5015 C Solution for volumetric filling
5 OPTIFLUX 7300 C Electrode-free solution

Technical Data

Nominal diameter										
ASME [inch]	3/8"	1/2"	3/4"	1"	2"	2 1/2"	3"	4"	5"	6"
DN [mm]	10	15	20	25	50	65	80	100	125	150

Versions

Compact + IFC 040 C	■
with local display	■

Nominal pressure

ASME B16.5 - 150 lbs RF	■	■	■	■	■	■	■	■	■	■
ASME B16.5 - 300 lbs RF	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
DIN 2501 - PN 16						■		■	■	■
DIN 2501 - PN 25						▒		▒	▒	▒
DIN 2501 - PN 40	■	■	■	■	■		■			
JIS 10 K					■	■	■	■	■	■
JIS 20 K	■	■	■	■						

Flanges

Steel A105 (1.0038)	■	■	■	■	■	■	■	■	■	■
Stainless steel 304 (1.4306)										
Stainless steel 316 L (1.4404)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Stainless steel 316 Ti (1.4571)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒

Liner

PTFE	■	■	■							
PFA				■	■	■	■	■	■	■

Electrodes

Hastelloy C4	■	■	■	■	■	■	■	■	■	■
Hastelloy B2	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Platinum	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Stainless steel 1.4401 (AISI 316 L)	▒	▒	▒							
Stainless steel 1.4571 (AISI 316 Ti)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Titanium	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Tantalum	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Low noise HC4	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Low noise SS 316 Ti (1.4571)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
contruction	fixed mounted									

Grounding rings

Stainless steel 316 Ti (1.4571)**	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Hastelloy C4*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Hastelloy B2*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Titanium*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
Tantalum (ring No1 and No2 only)	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
	* ring No1, 2 and 3 available									
	** DN 2,5...6: ring No 1 available; DN 10...150: Ring No1, 2 and 3 available									

Nominal diameter										
ASME [inch]	3/8"	1/2"	3/4"	1"	2"	2 1/2"	3"	4"	5"	6"
DN [mm]	10	15	20	25	50	65	80	100	125	150

Protection category

IP 67 eq. NEMA 6	■	■	■	■	■	■	■	■	■	■
Iso insertion lenght		■	■	■	■	■	■	■	■	■

Conductivity

Non-water	≥ 5 µS/cm
Water	≥ 20 µS/cm

Performance

Process conditions	Liquids with maximum solid particle / gas content < 3% (by volume)
Inaccuracy (under reference conditions)	± 0,5 % of MV
Measuring range (see flow table)	0,3...12 m/s (1...40 ft/s)

Temperature limits

Process temperature	See table
Ambient temperature	See table
Storage temperature	-50...70°C (-58...158°F)

■ standard ■ optional □ on request

Current output

Function	All operating data configurable, galvanically isolated
	Standard HART communication
	For passive mode
Current	Fixed ranges: 4...20 mA
	Variable ranges
	for Q = 0%, I0% = 4...14 mA
	for Q = 100%, I100% = 10...20 mA
	for Q > 100%, Imax. = 21 mA
	(adjustable in 0,1 mA increments)
Error identification (to NE 43)	3,6...4 mA or 20...22,4 mA adjustable in 0,1 mA increments
Bidirectional flow measurement (forwards/reverse)	Direction identified via status output

Binary output

Function	Selectable at pulse or status output
	All operating data configurable, galvanically isolated
Pulse output	Digital pulse division, interpulse period non-uniform, therefore if frequency and cycle meters are connected allow for minimum counting interval:
	Gate time counter => 10/P100% [Hz]
	Pulse width: 30-1000 ms adjustable in 10 ms increments
Status output	Configurable as measuring range identification for automatic range change, indicator of flow direction, overflow, errors, trip point or empty pipe indication
Passive mode	Selectable according NAMUR (DIN 19 234) or as contact:
	Open: < 1 mA current, max. 36 V
	Closed: 100 mA, max. voltage drop < 2 V

Time constant

Time constant	0.2 to 99.9 seconds

Low flow cut-off

Cut-off ON-value	1...19 %
Cut-off OFF-value	2...20 %

Local display

	3-field LCD
Display functions	Actual flowrate, forward, reverse and sum totalizers (7-digit) and status messages
Units	Actual flowrate in liter/s, m3/h, US gallons/min or user-defined unit (e.g. US million gallons/day)
	Totalizers in liter, m3, US gallons or user-defined unit (e.g.hectoliter)
Language	English, German, French (others on request)
Display	Top field: 6-character, 7 segment numeral and sign display, plus symbols for key acknowledgements.
	Middle field: 4-character, 14 segment text display
	Bottom field: 6 markers to identify display in measuring mode and messages of outputs.

Power supply

Current output (2-wire connection)	4...20 mA via proprietary power supply, 14...36 V
Power booster (2 x 2 wire connection)	Optionally available, for demanding applications. Proprietary power supply 22 mA, 14..36 Vdc or to 24 V DC, max. 1 W

Cable connection

1/2" NPT	Optional
PF 1/2	Optional
M20 x 1,5	Standard

Approvals

Non-Ex	Standard
EEx zone 1 / 2	Optional
FM - class I div. 1 / 2	Optional
	Available approvals for combined flowmeter, OPTIFLUX 4040 C always
	Field selectable intrinsic safety "i", increased safety "e" or flameproof enclosure "d"

Housing

Material	Die-casted aluminium (polyurethane coated)
Ambient temperature	-25...60°C / -13...140°F
Protection category	IP67, equivalent to NEMA 6

Temperature and pressure limits

Ambient temperature [°C]:	Process temperature [°C]:
-25...60	-25...60
-25...40	-25...140

Ambient temperature [°F]:	Process temperature [°F]:
-13...140	-13...140
-13...104	-13...284

Liner	Diameter	Max. pressure	Vacuum load in mbar abs. at a process temperature [°C] of ...								
	[mm]	[bar]	40	60	70	80	90	100	120	140	180
PTFE	10...20	50	0	0	0	0	0	0	500	750	1000
PFA	25...150	50	0	0	0	0	0	0	0	0	0

Liner	Diameter	Max. pressure	Vacuum load in psia at a process temperature [°F] of ...								
	[inch]	[psi]	104	140	158	176	194	212	248	284	356
PTFE	3/8" - 3/4"	725	0	0	0	0	0	0	7,3	10,9	14,5
PFA	1"- 6"	725	0	0	0	0	0	0	0	0	0

Dimensions and weights

Nominal size		Dimensions [mm]					Approx. weight [kg]**
DN	PN	L*		H	W	T 040	
[mm]	[bar]	DIN	ISO 13 359				
10	40	150	150	165	121	330	7,5
15	40	150	150	165	121	330	7,5
25	40	150	150	165	121	330	9,5
50	40	200	200	218	160	383	10,5
80	40	200	200	235	173	400	14,5
100	16	250	250	286	233	451	17,5
150	16	300	300	327	257	492	24,5

Nominal size		Dimensions for 150 lbs flanges [inches]				Approx. weight [lbs]**
ASME	Pressure	L*	H	W	T 040	
[inch]	[psig]					
3/8"	284	5,12	8,23	3,5	14,72	19
1/2"	284	5,12	8,23	3,5	14,72	19
1"	284	5,91	5,39	4,3	11,89	25
2"	284	7,87	7,05	6	13,54	25
3"	284	7,87	8,03	7,5	14,53	36
4"	284	9,84	9,49	9	15,98	46
6"	284	11,81	11,69	11	18,19	46
		* Total fitting length:				
		Flowmeter supplied with separate grounding rings:				
		dimension L + 2 x 0.12" + 2 x gasket thickness				
		** approx. weigth of meter body with ASME flanges				
		All flanges according ASME B 16.5				

Nominal size		Dimensions for 150 lbs flanges [mm]				Approx. weight [kg]**
ASME	Pressure	L*	H	W	T 040	
DN	PN					
10	16	130	209	88,9	88,9	8,6
15	16	130	209	88,9	88,9	8,6
25	16	150	137	108	108	11,3
50	16	200	179	152,4	152,4	11,3
80	16	200	204	190,5	190,5	16,3
100	16	250	241	228,6	228,6	20,9
150	16	300	297	279,4	279,4	20,9
		* Total fitting length:				
		Flowmeter supplied with separate grounding rings:				
		dimension L + 2 x 0.12" + 2 x gasket thickness				
		** approx. weigth of meter body with ASME flanges				
		All flanges according ASME B 16.5				

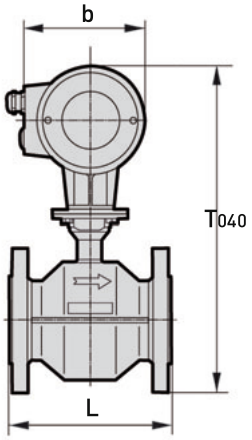
Nominal size		Dimensions for 300 lbs flanges [inches]				Approx. weight [lbs]**
ASME	Pressure	L*	H	W	T 040	
[inch]	[psig]*					
3/8"	739,5	5,12	8,23	3,75	14,72	1
1/2"	739,5	5,12	8,23	3,75	14,72	1
1"	739,5	5,91	5,71	4,87	12,2	1
2"	739,5	9,85	7,32	6,5	13,82	1
3"	739,5	9,85	8,43	8,25	14,92	1
4"	739,5	11,81	10	8,25	16,5	1
6"	739,5	12,6	12,44	12,5	18,94	1
		* Total fitting length:				
		Flowmeter supplied with separate grounding rings:				
		dimension L + 2 x 0.12" + 2 x gasket thickness.				
		** Approx. weight of flowmeter with ASME flanges.				
		Flanges according ASME B 16.5.				

1 on request

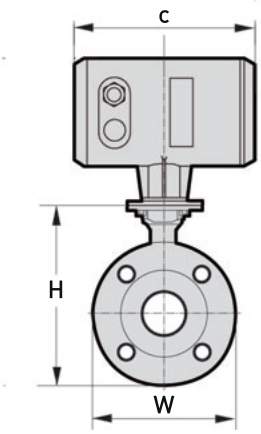
Nominal size		Dimensions for 300 lbs flanges [mm]				Approx. weight [kg]**
ASME	Pressure	L*	H	W	T 040	
DN	PN					
10	16	130	209	95,2	374	1
15	16	130	209	95,2	374	1
25	16	150	145	123,8	310	1
50	16	250	186	165,1	351	1
80	16	250	214	209,6	379	1
100	16	300	254	209,6	419	1
150	16	320	316	317,4	481	1
		* Total fitting length:				
		Flowmeter supplied with separate grounding rings:				
		dimension L + 2 x 0.12" + 2 x gasket thickness.				
		** Approx. weight of flowmeter with ASME flanges.				
		Flanges according ASME B 16.5.				

1 on request

Frontview OPTIFLUX 4040 C



Sideview OPTIFLUX 4040 C



	dimension b		dimension c	
	[mm]	[inch]	[mm]	[inch]
IFC 040 converter	136	5,3	208	8,2