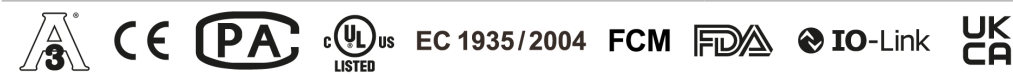
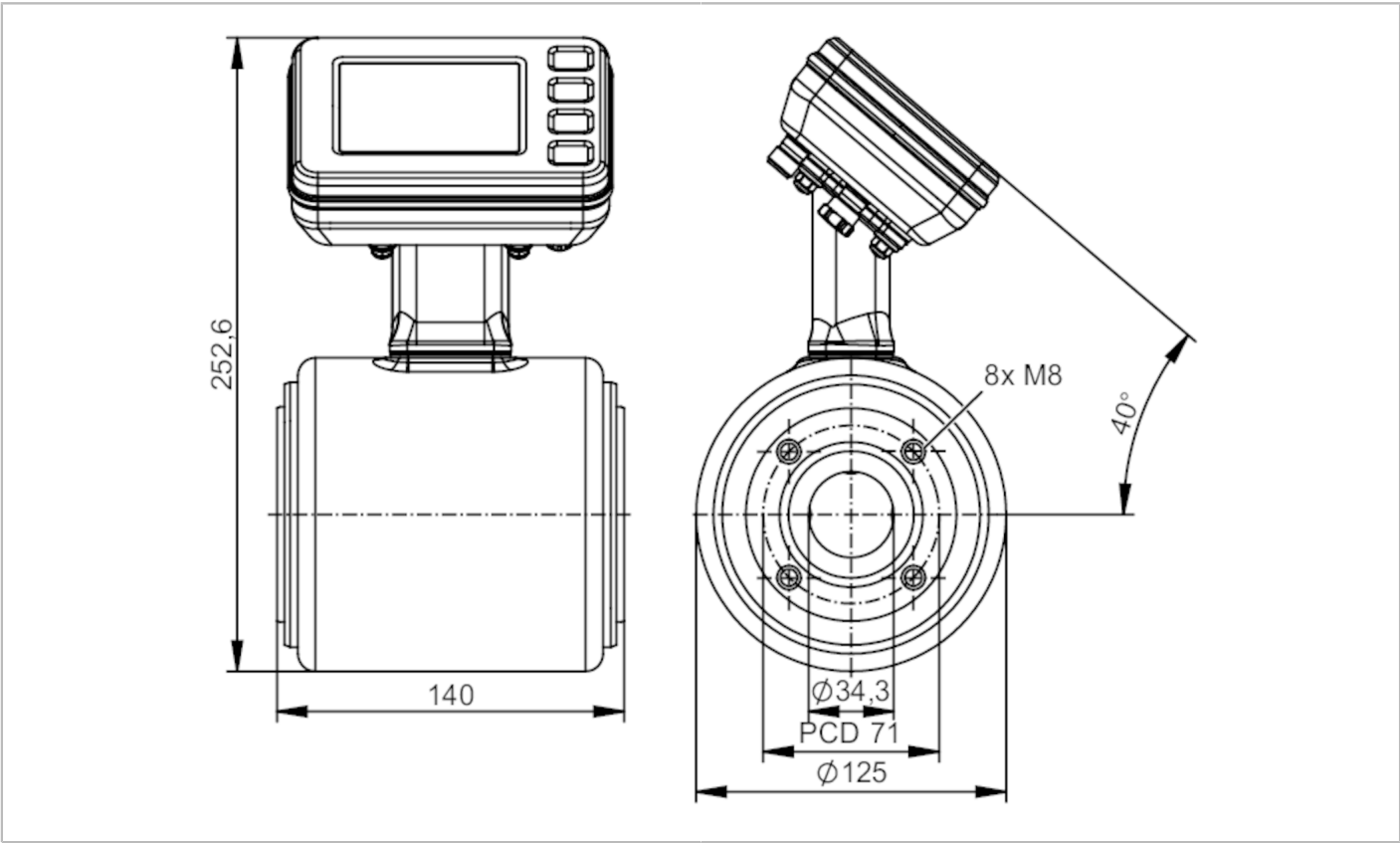


SMF321



Magnetic-inductive flow meter

SMG40KGFFRKG/USD



Product characteristics

Measuring range	5...750 l/min	300...45000 l/h	1.4...198.2 gpm	0.22...32.42 ft/s
Nominal diameter	DN40 (1 1/2")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature	-20...150 °C	-4...302 °F		
Min. bursting pressure	870 psi	6 MPa		
Pressure rating	580.1 psi	4 MPa		

Electrical data

Operating voltage	[V]	18...32 DC
Current consumption	[mA]	250; (24V)
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	< 5
Measuring principle		magnetic-inductive



Magnetic-inductive flow meter

SMG40KGFFRKG/USD

Inputs / outputs					
Total number of inputs and outputs		2			
Inputs					
Inputs		OUT2	external totalizer reset		
Outputs					
Total number of outputs		2			
Output signal		OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
		OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design		PNP/NPN			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Analog					
Number of analog outputs		1			
Analog current output [mA]		4...20; (skalierbar)			
Max. load [Ω]		500			
Resolution of analog output		0.38 μA			
Digital					
Number of digital outputs		2			
Max. voltage drop switching output DC [V]		2			
Permanent current rating of switching output DC [mA]		100			
Switching frequency DC [Hz]		0...10000			
Measuring/setting range					
Measuring range		5...750 l/min	300...45000 l/h	1.4...198.2 gpm	0.22...32.42 ft/s
Display range		-900...900 l/min	-54000...54000 l/h	-237.75...237.75 gpm	-39.4...39.4 ft/s
Resolution		0.01 l/min	50 l/h	0.01 gpm	0.01 ft/s
Note on factory setting		0...50 gpm			
Analog start point ASP		-750...600 l/min	-45000...36000 l/h	-198.15...158.52 gpm	-32.8...26.24 ft/s
Analog end point AEP		-600...750 l/min	-36000...45000 l/h	-158.52...198.15 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC		0...600 l/min	0...36000 l/h	0...158.52 gpm	0...26.24 ft/s
Pulse length [s]		0.00005...2			
Pulse value		0.004...99990000 l			
Temperature monitoring					
Measuring range		-20...150 °C		-4...302 °F	
Display range		-20...150 °C		-4...302 °F	
Resolution		0.01 °C		0.1 °F	
Analog start point		-20...116 °C		-4...240.8 °F	
Analog end point		14...150 °C		57.2...302 °F	
Conductivity monitoring					
Measuring range [μS/cm]		100...100000			

SMF321



Magnetic-inductive flow meter

SMG40KGFFRKG/USD

Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000

Accuracy / deviations

Volumetric flow monitoring

Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW

Temperature monitoring

Accuracy	[K]	± 1
Repeatability	[K]	± 0,5

Conductivity monitoring

Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW

Reaction times

Volumetric flow monitoring

Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5

Temperature monitoring

Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
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Conductivity monitoring

Response time	[s]	< 2
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Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	

SMF321



Magnetic-inductive flow meter

SMG40KGFFRKG/USD

Min. process cycle time	[ms]	1.9
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1790
Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	
Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF	[years]	81
UL approval	UL approval number	I031
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight	[g]	5324.8
Housing	tubular	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Dimensions	[mm]	Ø 125 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN40 (1 1/2")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	
Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	

SMF321



Magnetic-inductive flow meter

SMG40KGFFRKG/USD

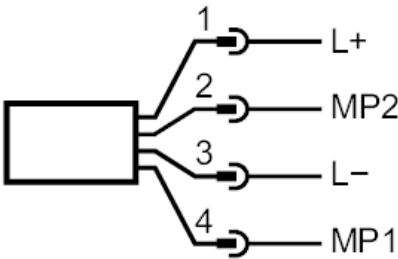
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons
Remarks		
Remarks	MW = Measured value	
	MEW = Final value of the measuring range	
	pulse and totalizer signal are only available for one of the two outputs	
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection	
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up	
	accuracy specifications according to factory certificate on delivery	
Pack quantity	1 pcs.	

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

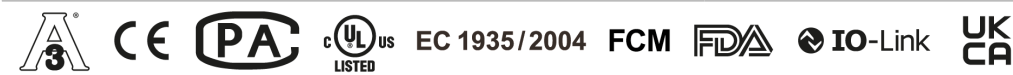
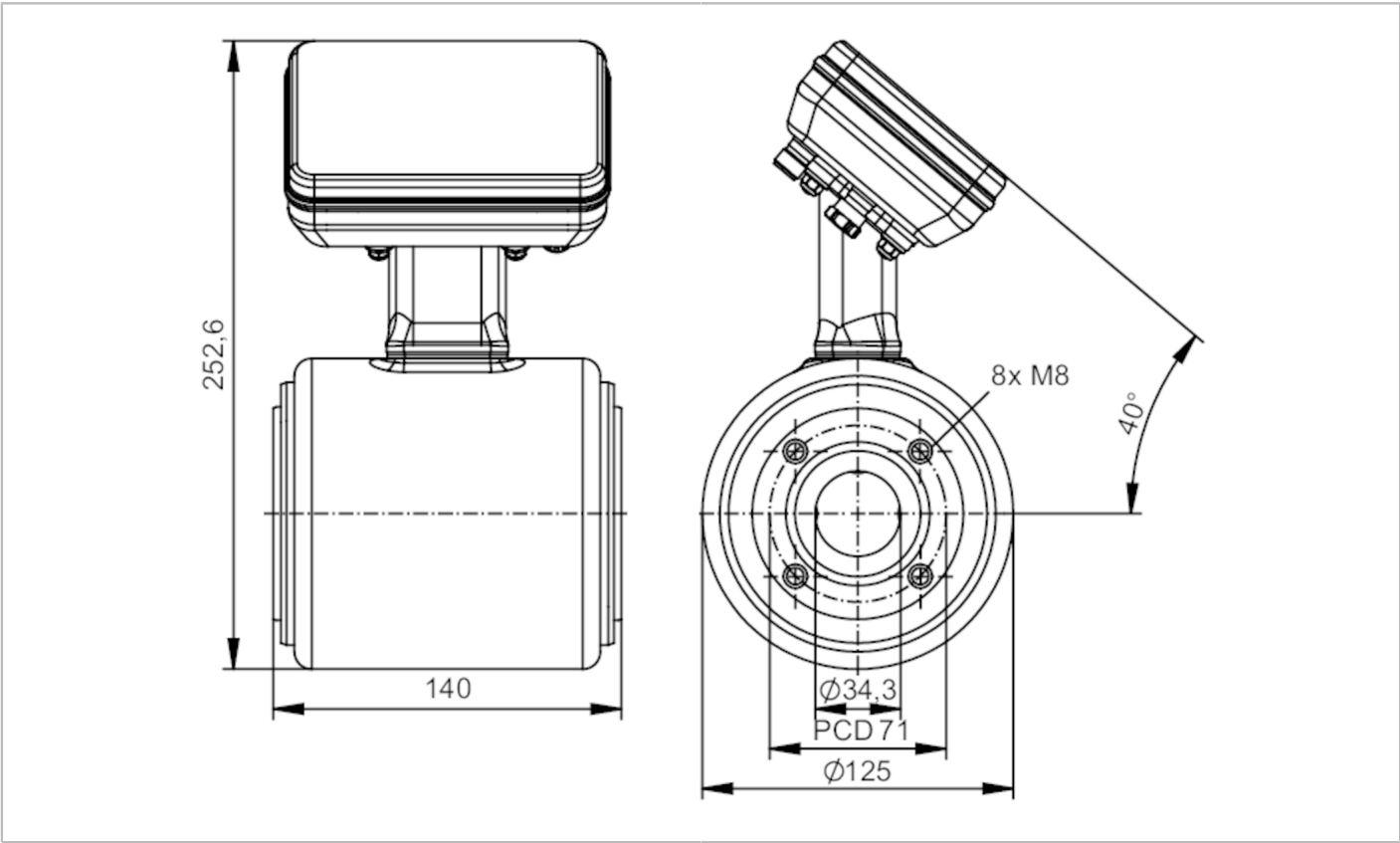
AO: analog output; DO: digital output; MP: multi-function connection

SMF350



Magnetic-inductive flow meter

SMG40KGFFRKG/UST



Product characteristics				
Measuring range	5...750 l/min	0.3...45 m³/h	1.32...198.15 gpm	0.23...32.8 ft/s
Nominal diameter	DN40 (1 1/2")			
Process connection	ifm-specific device flange			
Application				
System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 µS/cm			
Medium temperature	[°C]	-20...150		
Min. bursting pressure	60 bar	870 psi	6 MPa	
Pressure rating	40 bar	580.1 psi	4 MPa	
Electrical data				
Operating voltage	[V]	18...32 DC		
Current consumption	[mA]	250; (24V)		
Protection class		III		
Reverse polarity protection		yes		
Power-on delay time	[s]	< 5		
Measuring principle		magnetic-inductive		

SMF350



Magnetic-inductive flow meter

SMG40KGFFRKG/UST

Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totalizer reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 μA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	5...750 l/min	0.3...45 m³/h	1.32...198.15 gpm	0.23...32.8 ft/s
Note on factory setting	0...11,0 m³/h			
Analog start point ASP	-750...600 l/min	-45...36 m³/h	-198.15...158.52 gpm	-32.8...26.24 ft/s
Analog end point AEP	-600...750 l/min	-36...45 m³/h	-158.52...198.15 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...600 l/min	0...36 m³/h	0...158.52 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.002...99999000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	
Conductivity monitoring				
Measuring range [μS/cm]	100...100000			
Analog start point [μS/cm]	0...80000			
Analog end point [μS/cm]	20000...100000			

SMF350



Magnetic-inductive flow meter

SMG40KGFFRKG/UST

Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability	0,1% MW	
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 µS/cm	±10% MW
	in the range of 20000...100000 µS/cm	±20% MW
Repeatability	± 5% MW	
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions	direction of flow detection; liquid detection	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time	[ms]	1.9

SMF350



Magnetic-inductive flow meter

SMG40KGFFRKG/UST

IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1791

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		82
UL approval	UL approval number	I032
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		5300
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 125 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN40 (1 1/2")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF350



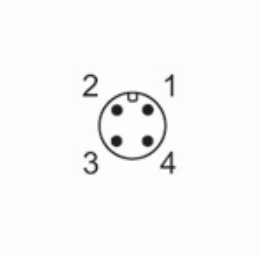
Magnetic-inductive flow meter

SMG40KGFFRKG/UST

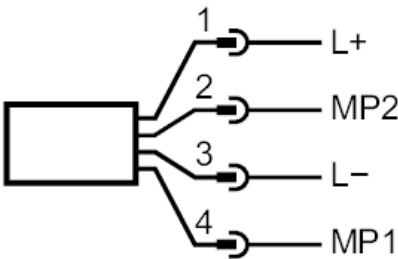
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

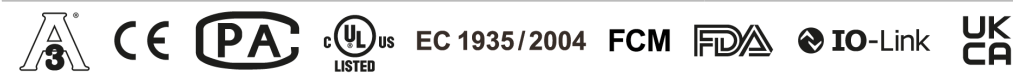
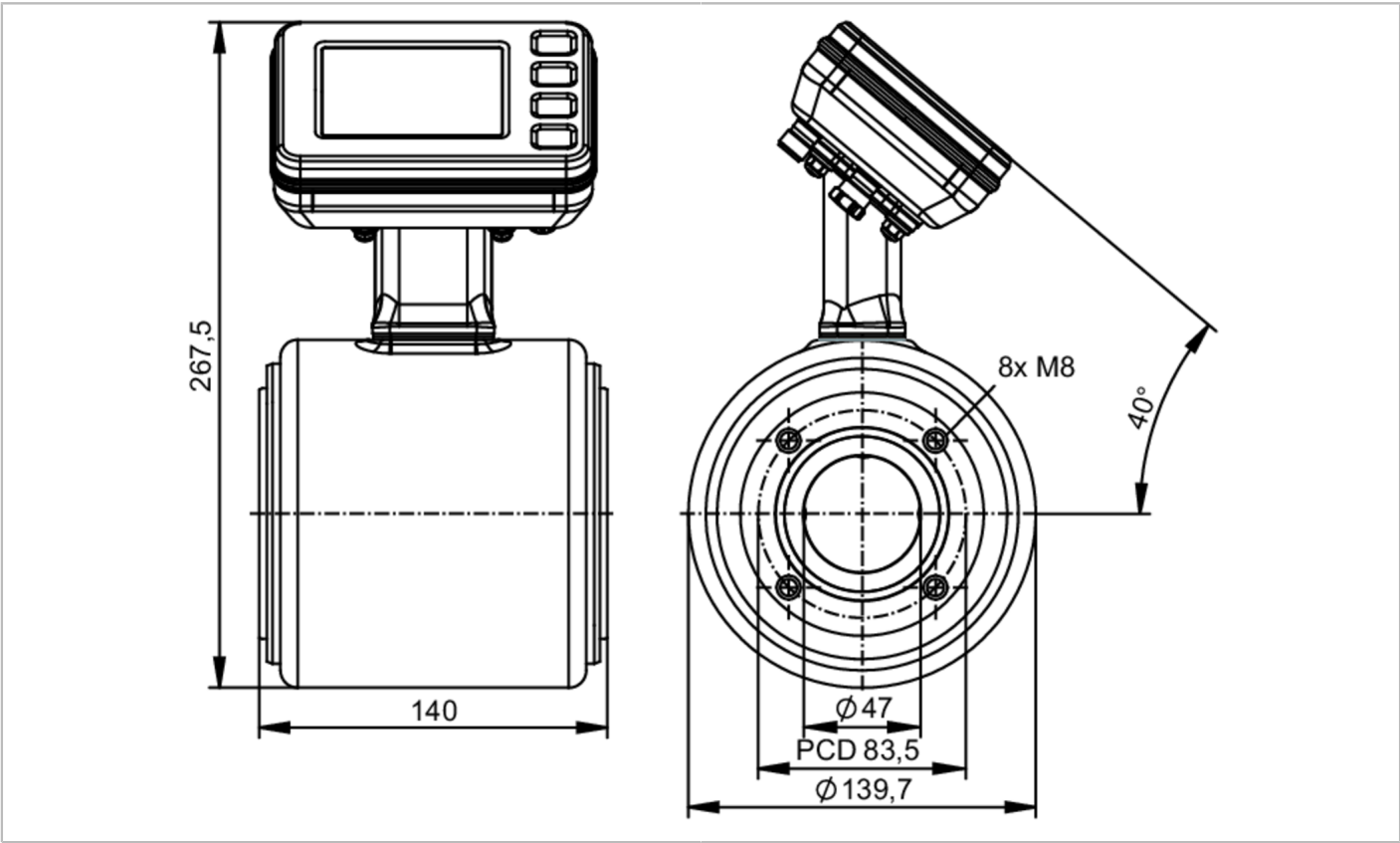
AO: analog output; DO: digital output; MP: multi-function connection

SMF421



Magnetic-inductive flow meter

SMG50KGFFRKG/USD



Product characteristics

Measuring range	10...1200 l/min	600...72000 l/h	2.6...317 gpm	0.28...33.42 ft/s
Nominal diameter	DN50 (2")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature	-20...150 °C	-4...302 °F		
Min. bursting pressure	543.75 psi	3.75 MPa		
Pressure rating	362.5 psi	2.5 MPa		

Electrical data

Operating voltage	[V]	18...32 DC
Current consumption	[mA]	250; (24V)
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	< 5
Measuring principle		magnetic-inductive

SMF421



Magnetic-inductive flow meter

SMG50KGFFRKG/USD

Inputs / outputs					
Total number of inputs and outputs		2			
Inputs					
Inputs		OUT2	external totalizer reset		
Outputs					
Total number of outputs		2			
Output signal		OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
		OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design		PNP/NPN			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Analog					
Number of analog outputs		1			
Analog current output [mA]		4...20; (skalierbar)			
Max. load [Ω]		500			
Resolution of analog output		0.38 μA			
Digital					
Number of digital outputs		2			
Max. voltage drop switching output DC [V]		2			
Permanent current rating of switching output DC [mA]		100			
Switching frequency DC [Hz]		0...10000			
Measuring/setting range					
Measuring range		10...1200 l/min	600...72000 l/h	2.6...317 gpm	0.28...33.42 ft/s
Display range		-1440...1440 l/min	-86400...86400 l/h	-380.41...380.41 gpm	-39.4...39.4 ft/s
Resolution		0.1 l/min	50 l/h	0.01 gpm	0.01 ft/s
Note on factory setting		0...80 gpm			
Analog start point ASP		-1200...960 l/min	-72000...57600 l/h	-317.04...253.63 gpm	-32.8...26.24 ft/s
Analog end point AEP		-960...1200 l/min	57600...72000 l/h	-253.63...317.04 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC		0...960 l/min	0...57600 l/h	0...253.63 gpm	0...26.24 ft/s
Pulse length [s]		0.00005...2			
Pulse value		0.004...99990000 l			
Temperature monitoring					
Measuring range		-20...150 °C		-4...302 °F	
Display range		-20...150 °C		-4...302 °F	
Resolution		0.01 °C		0.1 °F	
Analog start point		-20...116 °C		-4...240.8 °F	
Analog end point		14...150 °C		57.2...302 °F	
Conductivity monitoring					
Measuring range [μS/cm]		100...100000			

SMF421



Magnetic-inductive flow meter

SMG50KGFFRKG/USD

Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000

Accuracy / deviations

Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW

Reaction times

Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2

Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	

SMF421



Magnetic-inductive flow meter

SMG50KGFFRKG/USD

Min. process cycle time	[ms]	1.9
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1793
Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	
Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF	[years]	81
UL approval	UL approval number	I031
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight	[g]	5815.1
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN50 (2")
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	
Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons

SMF421



Magnetic-inductive flow meter

SMG50KGFFRKG/USD

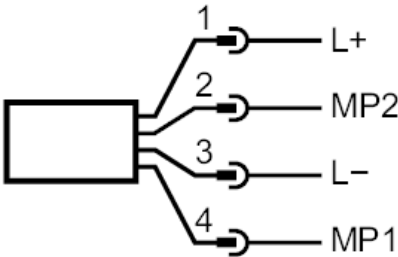
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

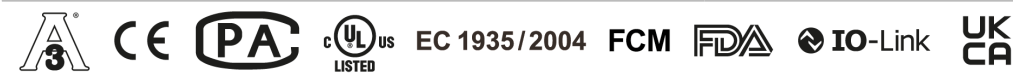
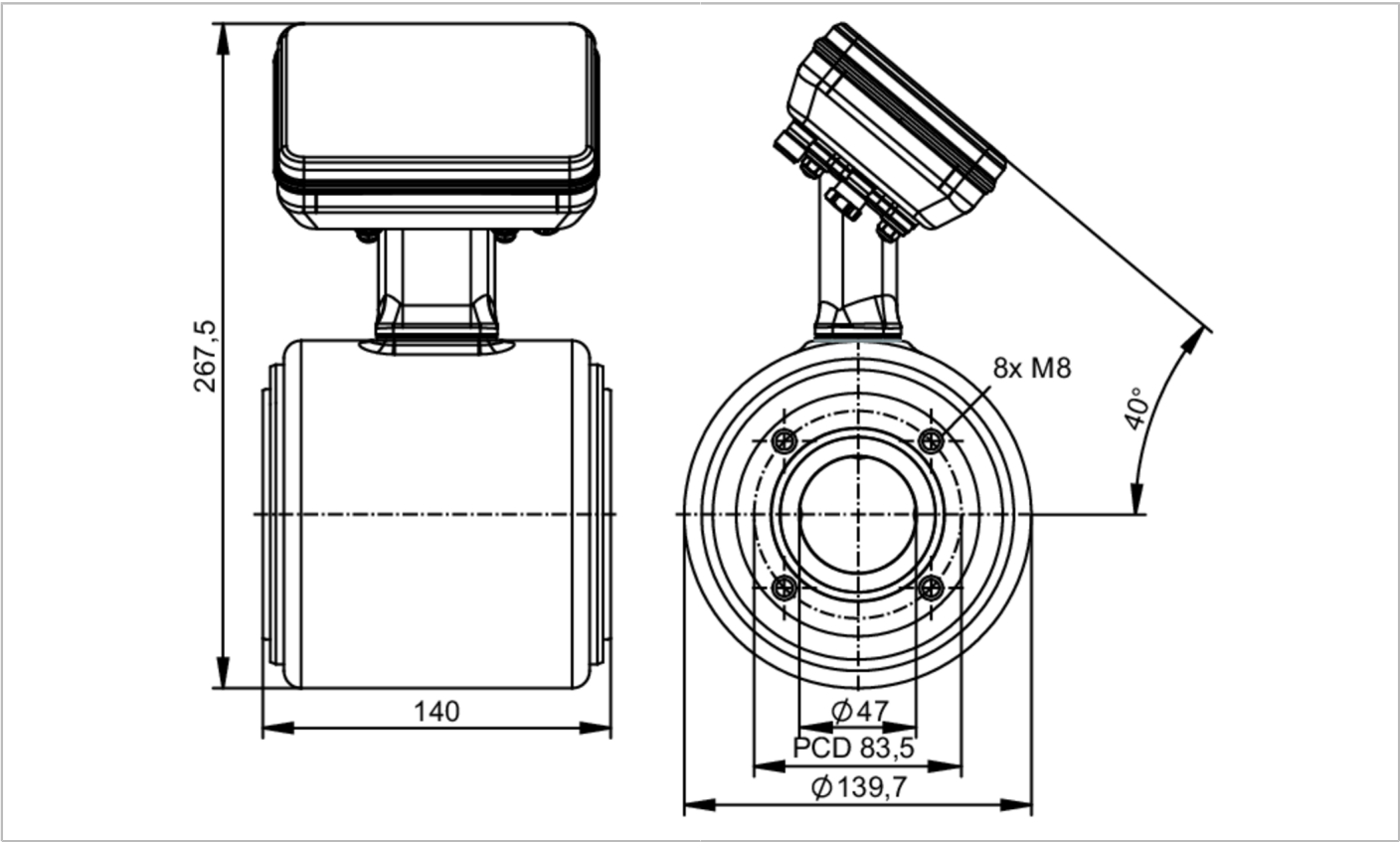
AO: analog output; DO: digital output; MP: multi-function connection

SMF450



Magnetic-inductive flow meter

SMG50KGFFRKG/UST



Product characteristics

Measuring range	10...1200 l/min	0.6...72 m³/h	2.64...317.04 gpm	0.3...32.8 ft/s
Nominal diameter	DN50 (2")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature [°C]	-20...150			
Min. bursting pressure	37.5 bar	543.75 psi	3.75 MPa	
Pressure rating	25 bar	362.5 psi	2.5 MPa	

Electrical data

Operating voltage [V]	18...32 DC			
Current consumption [mA]	250; (24V)			
Protection class	III			
Reverse polarity protection	yes			
Power-on delay time [s]	< 5			
Measuring principle	magnetic-inductive			

SMF450



Magnetic-inductive flow meter

SMG50KGFFRKG/UST

Inputs / outputs					
Total number of inputs and outputs		2			
Inputs					
Inputs		OUT2	external totalizer reset		
Outputs					
Total number of outputs		2			
Output signal		OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
		OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design		PNP/NPN			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Analog					
Number of analog outputs		1			
Analog current output [mA]		4...20; (skalierbar)			
Max. load [Ω]		500			
Resolution of analog output		0.38 µA			
Digital					
Number of digital outputs		2			
Max. voltage drop switching output DC [V]		2			
Permanent current rating of switching output DC [mA]		100			
Switching frequency DC [Hz]		0...10000			
Measuring/setting range					
Measuring range		10...1200 l/min	0.6...72 m³/h	2.64...317.04 gpm	0.3...32.8 ft/s
Note on factory setting		0...18,0 m³/h			
Analog start point ASP		-1200...960 l/min	-72...57.6 m³/h	-317.04...253.63 gpm	-32.8...26.24 ft/s
Analog end point AEP		-960...1200 l/min	-57.6...72 m³/h	-253.63...317.04 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC		0...960 l/min	0...57.6 m³/h	0...253.63 gpm	0...26.24 ft/s
Pulse length [s]		0.00005...2			
Pulse value		0.002...99999000 l			
Temperature monitoring					
Measuring range		-20...150 °C		-4...302 °F	
Analog start point		-20...116 °C		-4...240.8 °F	
Analog end point		14...150 °C		57.2...302 °F	
Conductivity monitoring					
Measuring range [µS/cm]		100...100000			
Resolution [µS/cm]		1			
Analog start point [µS/cm]		0...80000			
Analog end point [µS/cm]		20000...100000			

SMF450



Magnetic-inductive flow meter

SMG50KGFFRKG/UST

Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability	0,1% MW	
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 µS/cm	±10% MW
	in the range of 20000...100000 µS/cm	±20% MW
Repeatability	± 5% MW	
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions	direction of flow detection; liquid detection	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time	[ms]	1.9

SMF450



Magnetic-inductive flow meter

SMG50KGFFRKG/UST

IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1794

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		82
UL approval	UL approval number	I032
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		5815.2
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 139.7 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN50 (2")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF450



Magnetic-inductive flow meter

SMG50KGFFRKG/UST

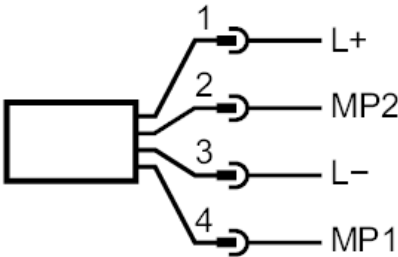
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

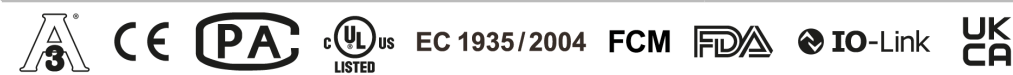
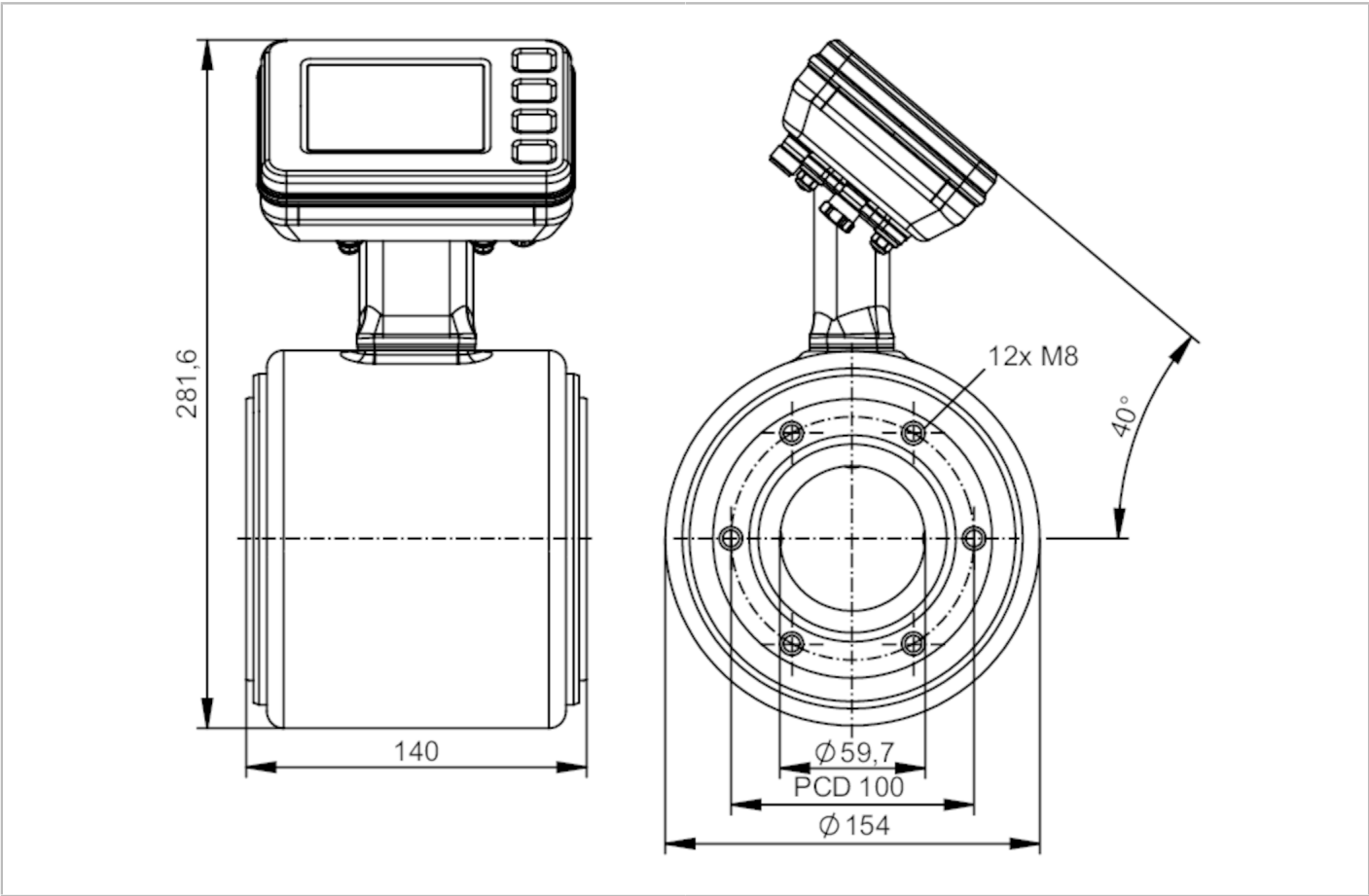
AO: analog output; DO: digital output; MP: multi-function connection

SMF521



Magnetic-inductive flow meter

SMG65KGFFRKG/USD



Product characteristics				
Measuring range	20...2000 l/min	1200...120000 l/h	5.5...528.5 gpm	0.32...32.96 ft/s
Nominal diameter	DN65 (2 1/2")			
Process connection	ifm-specific device flange			
Application				
System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 μS/cm			
Medium temperature	-20...150 °C		-4...302 °F	
Min. bursting pressure	543.75 psi		3.75 MPa	
Pressure rating	362.5 psi		2.5 MPa	
Electrical data				
Operating voltage	[V]	18...32 DC		
Current consumption	[mA]	250; (24V)		
Protection class		III		
Reverse polarity protection		yes		
Power-on delay time	[s]	< 5		

SMF521



Magnetic-inductive flow meter

SMG65KGFFRKG/USD

Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totalizer reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 μA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	20...2000 l/min	1200...120000 l/h	5.5...528.5 gpm	0.32...32.96 ft/s
Display range	-2400...2400 l/min	-144000...144000 l/h	-634.01...634.01 gpm	-39.4...39.4 ft/s
Resolution	0.1 l/min	100 l/h	0.01 gpm	0.01 ft/s
Note on factory setting	0...130 gpm			
Analog start point ASP	-2000...1600 l/min	-120000...96000 l/h	-528.4...422.72 gpm	-32.8...26.24 ft/s
Analog end point AEP	-1600...2000 l/min	-96000...120000 l/h	-422.72...528.4 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...1600 l/min	0...96000 l/h	0...422.72 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.038...99990000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Display range	-20...150 °C		-4...302 °F	
Resolution	0.01 °C		0.1 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	

SMF521



Magnetic-inductive flow meter

SMG65KGFFRKG/USD

Conductivity monitoring		
Measuring range	[μS/cm]	100...100000
Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000
Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions		direction of flow detection; liquid detection
Interfaces		
Communication interface		IO-Link
Transmission type		COM3 (230,4 kBaud)
IO-Link revision		1.1.3
SDCI standard		IEC 61131-9
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode		yes

SMF521



Magnetic-inductive flow meter

SMG65KGFFRKG/USD

Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time [ms]	1.9	
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1796

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]	81	
UL approval	UL approval number	I031
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]	6897	
Housing	tubular	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Dimensions [mm]	Ø 154 / L = 140	
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN65 (2 1/2")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	

SMF521



Magnetic-inductive flow meter

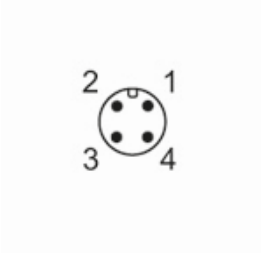
SMG65KGFFRKG/USD

Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons

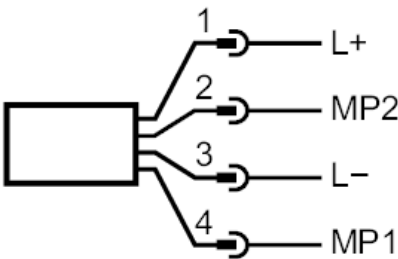
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
	accuracy specifications according to factory certificate on delivery
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



SMF521



Magnetic-inductive flow meter

SMG65KGFFRKG/USD

Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

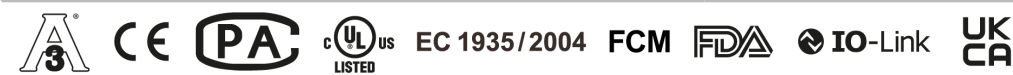
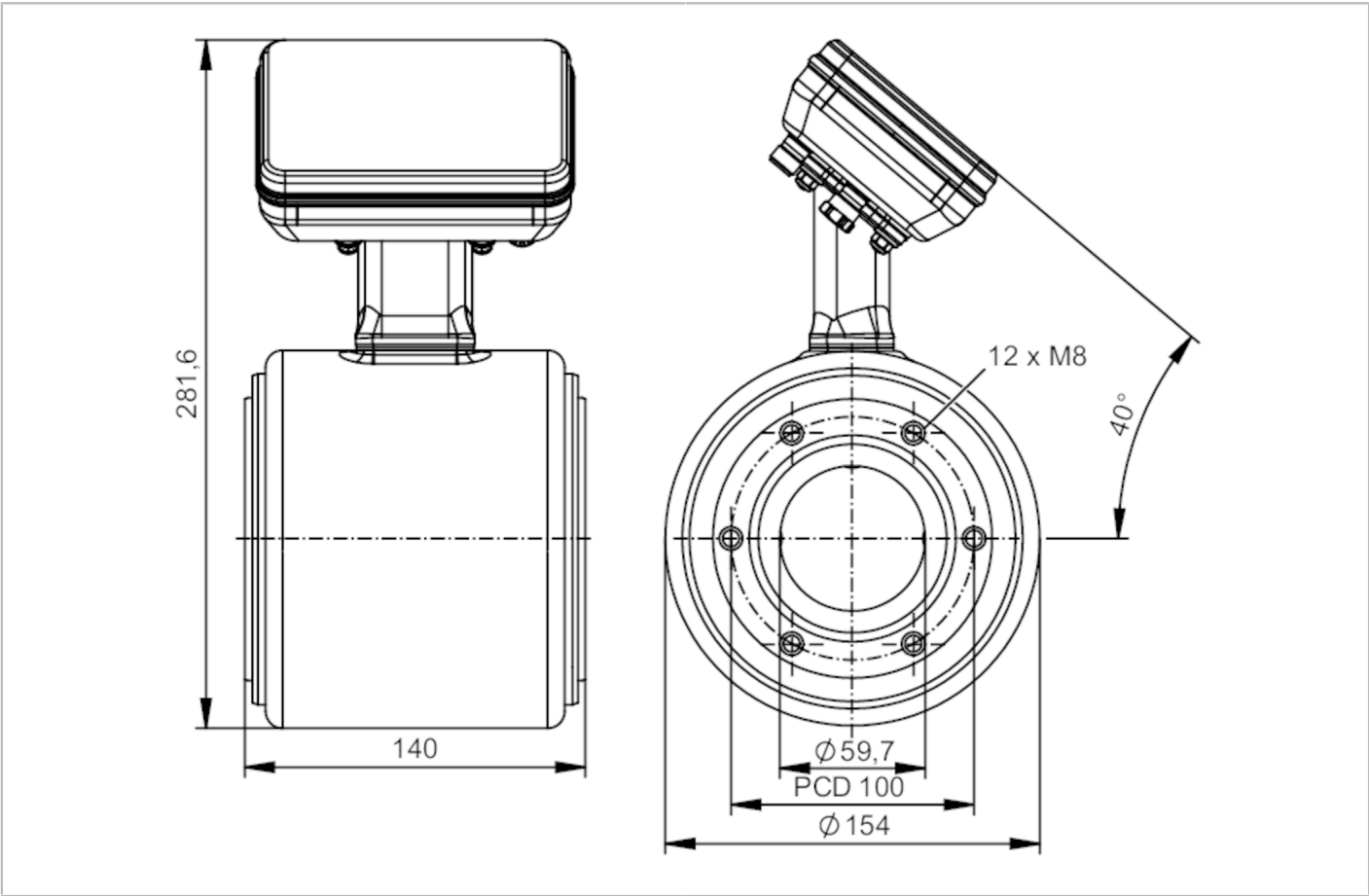
AO: analog output; DO: digital output; MP: multi-function connection

SMF550



Magnetic-inductive flow meter

SMG65KGFFRKG/UST



Product characteristics				
Measuring range	20...2000 l/min	1.2...120 m³/h	5.28...528.4 gpm	0.33...32.8 ft/s
Nominal diameter	DN65 (2 1/2")			
Process connection	ifm-specific device flange			
Application				
System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 µS/cm			
Medium temperature	[°C]	-20...150		
Min. bursting pressure	37.5 bar	543.75 psi	3.75 MPa	
Pressure rating	25 bar	362.5 psi	2.5 MPa	
Electrical data				
Operating voltage	[V]	18...32 DC		
Current consumption	[mA]	250; (24V)		
Protection class		III		
Reverse polarity protection		yes		
Power-on delay time	[s]	< 5		

SMF550



Magnetic-inductive flow meter

SMG65KGFFRKG/UST

Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totalizer reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 μA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	20...2000 l/min	1.2...120 m³/h	5.28...528.4 gpm	0.33...32.8 ft/s
Note on factory setting	0...30,0 m³/h			
Analog start point ASP	-2000...1600 l/min	-120...96 m³/h	-528.4...422.72 gpm	-32.8...26.24 ft/s
Analog end point AEP	-1600...2000 l/min	-96...120 m³/h	-422.72...528.4 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...1600 l/min	0...96 m³/h	0...422.72 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.004...99999000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	
Conductivity monitoring				
Measuring range [μS/cm]	100...100000			
Resolution [μS/cm]	1			
Analog start point [μS/cm]	0...80000			

SMF550



Magnetic-inductive flow meter

SMG65KGFFRKG/UST

Analog end point	[μS/cm]	20000...100000
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Accuracy / deviations

Volumetric flow monitoring

Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability	0,1% MW	

Temperature monitoring

Accuracy	[K]	± 1
Repeatability	[K]	± 0,5

Conductivity monitoring

Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability	± 5% MW	

Reaction times

Volumetric flow monitoring

Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5

Temperature monitoring

Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
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Conductivity monitoring

Response time	[s]	< 2
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Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time	[ms]	1.9

SMF550



Magnetic-inductive flow meter

SMG65KGFFRKG/UST

IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1797

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		82
UL approval	UL approval number	I032
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		6979
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 154 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN65 (2 1/2")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF550



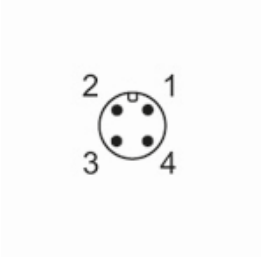
Magnetic-inductive flow meter

SMG65KGFRRKG/UST

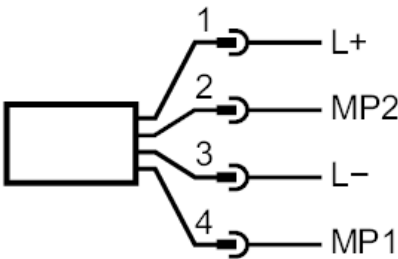
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
	accuracy specifications according to factory certificate on delivery
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

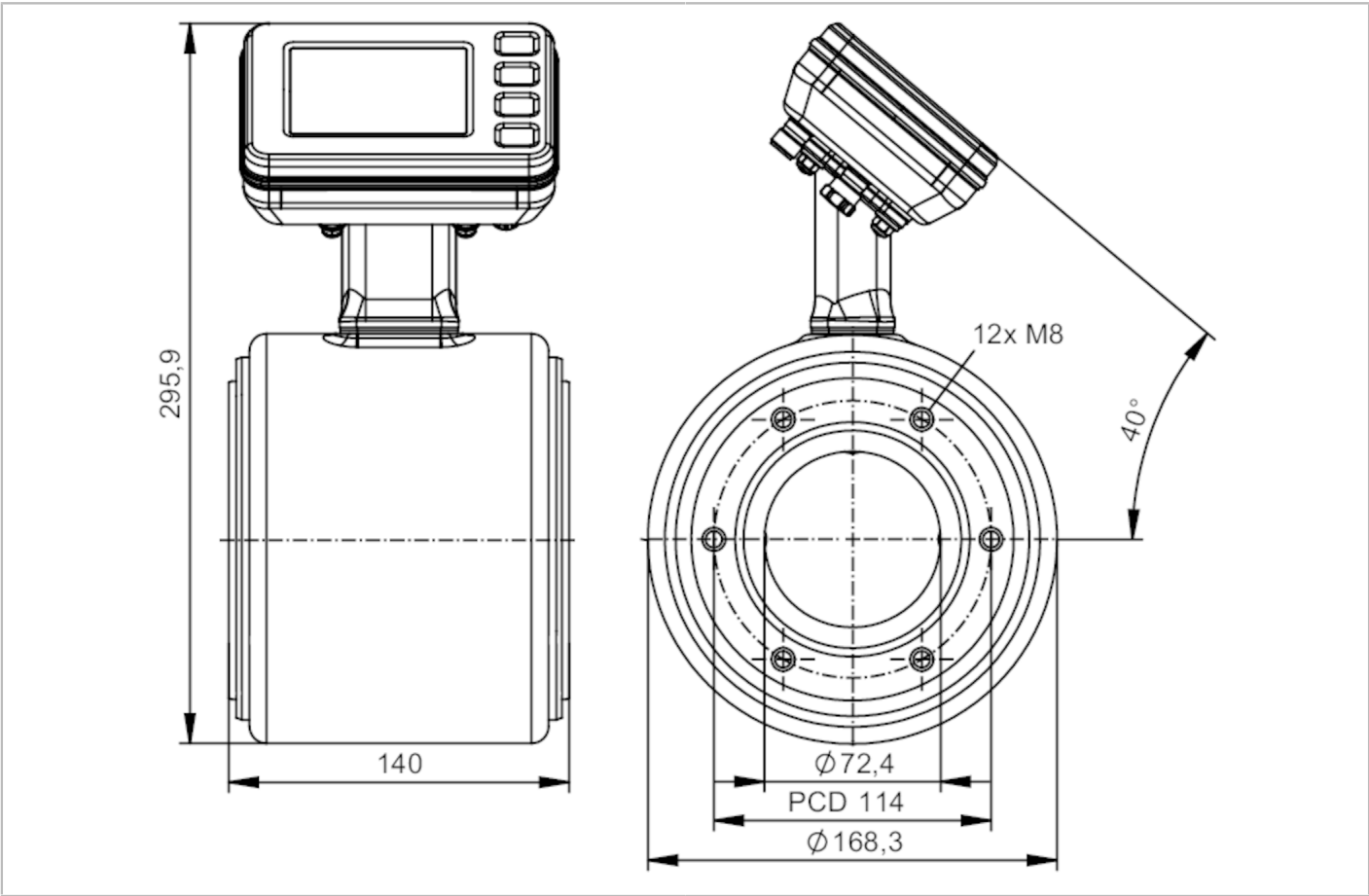
AO: analog output; DO: digital output; MP: multi-function connection

SMF621



Magnetic-inductive flow meter

SMG80KGFFRKG/USD



EC 1935/2004

FCM



Product characteristics

Measuring range	30...3000 l/min	1800...180000 l/h	8...792.5 gpm	0.32...32.64 ft/s
Nominal diameter	DN80 (3")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts		
Application	food and beverage industry		
Media	Conductive liquids; water; water-based media		
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream		
	conductivity: $\geq 5 \mu\text{S/cm}$		
Medium temperature	-20...150 °C	-4...302 °F	
Min. bursting pressure	543.75 psi	3.75 MPa	
Pressure rating	362.5 psi	2.5 MPa	

Electrical data

Operating voltage	[V]	18...32 DC
Current consumption	[mA]	250; (24V)
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	< 5

SMF621



Magnetic-inductive flow meter

SMG80KGFFRKG/USD

Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totalizer reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 μA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	30...3000 l/min	1800...180000 l/h	8...792.5 gpm	0.32...32.64 ft/s
Display range	-3600...3600 l/min	-216000...216000 l/h	-951.02...951.02 gpm	-39.4...39.4 ft/s
Resolution	0.1 l/min	200 l/h	0.01 gpm	0.01 ft/s
Note on factory setting	0...200 gpm			
Analog start point ASP	-3000...2400 l/min	-180000...144000 l/h	-792.5...778.08 gpm	-32.8...26.24 ft/s
Analog end point AEP	-2400...3000 l/min	-144000...180000 l/h	-778.08...792.5 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...2400 l/min	0...144000 l/h	0...778.08 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.038...99990000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Display range	-20...150 °C		-4...302 °F	
Resolution	0.01 °C		0.1 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	

SMF621



Magnetic-inductive flow meter

SMG80KGFFRKG/USD

Conductivity monitoring		
Measuring range	[μS/cm]	100...100000
Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000
Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions		direction of flow detection; liquid detection
Interfaces		
Communication interface		IO-Link
Transmission type		COM3 (230,4 kBaud)
IO-Link revision		1.1.3
SDCI standard		IEC 61131-9
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode		yes

SMF621



Magnetic-inductive flow meter

SMG80KGFFRKG/USD

Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time [ms]	1.9	
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1799

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]	81	
UL approval	UL approval number	I031
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]	7630.9	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN80 (3")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	

Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	

SMF621



Magnetic-inductive flow meter

SMG80KGFFRKG/USD

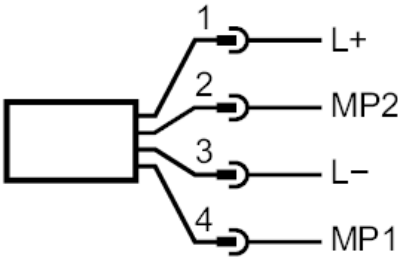
Factory setting	gpm; °F; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons
Remarks		
Remarks	MW = Measured value	
	MEW = Final value of the measuring range	
	pulse and totalizer signal are only available for one of the two outputs	
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection	
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up	
	accuracy specifications according to factory certificate on delivery	
Pack quantity	1 pcs.	

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

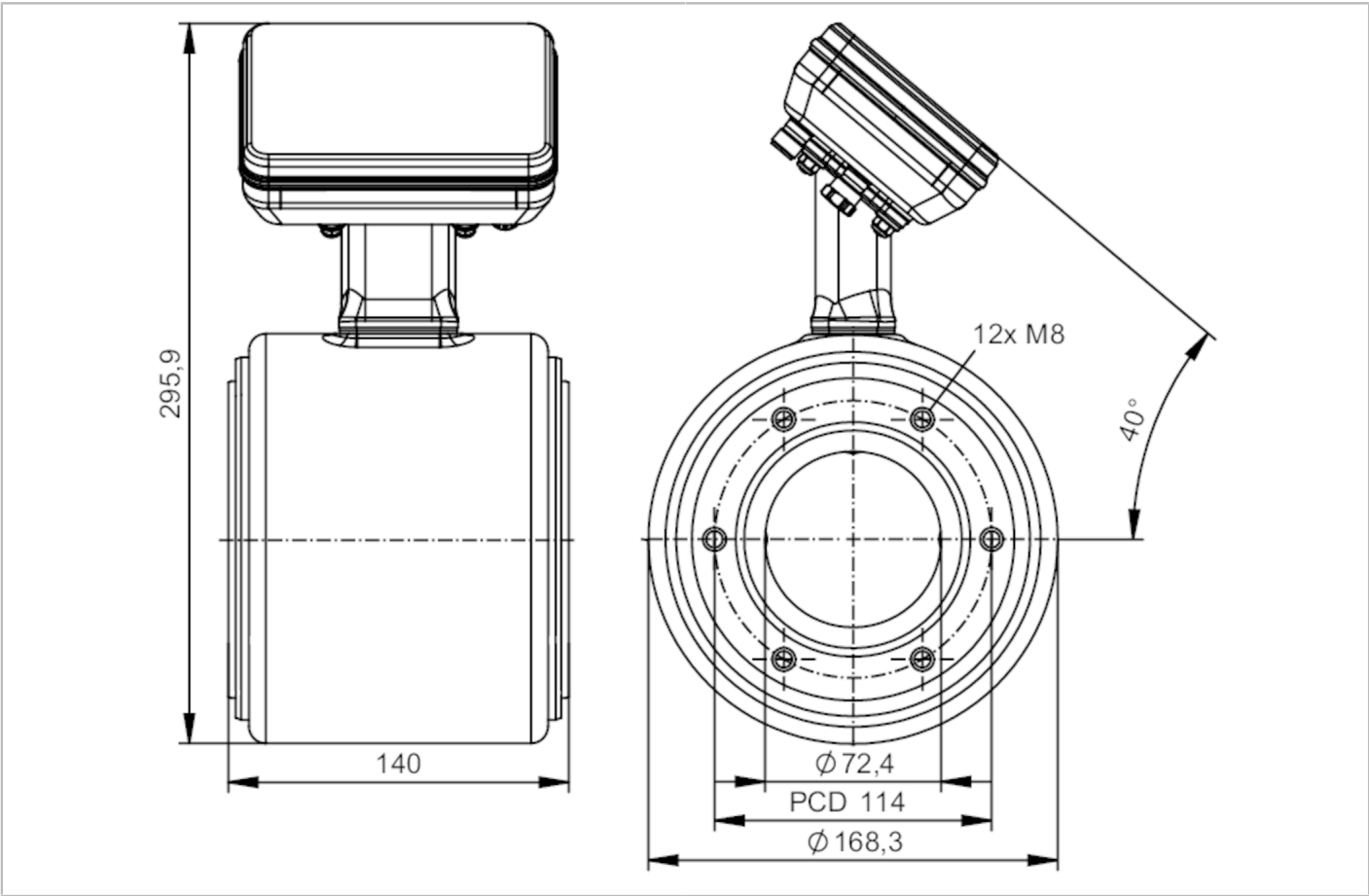
AO: analog output; DO: digital output; MP: multi-function connection

SMF650



Magnetic-inductive flow meter

SMG80KGFFRKG/UST



EC 1935/2004

FCM



Product characteristics

Measuring range	30...3000 l/min	1.8...180 m³/h	7.93...792.6 gpm	0.33...32.8 ft/s
Nominal diameter	DN80 (3")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature [°C]	-20...150			
Min. bursting pressure	37.5 bar	543.75 psi	3.75 MPa	
Pressure rating	25 bar	362.5 psi	2.5 MPa	

Electrical data

Operating voltage [V]	18...32 DC			
Current consumption [mA]	250; (24V)			
Protection class	III			
Reverse polarity protection	yes			
Power-on delay time [s]	< 5			

SMF650



Magnetic-inductive flow meter

SMG80KGFFRKG/UST

Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totalizer reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 μA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	30...3000 l/min	1.8...180 m³/h	7.93...792.6 gpm	0.33...32.8 ft/s
Note on factory setting	0...45,0 m³/h			
Analog start point ASP	-3000...2400 l/min	-180...144 m³/h	-972.6...778.08 gpm	-32.8...26.24 ft/s
Analog end point AEP	-2400...3000 l/min	-144...180 m³/h	-778.08...972.6 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...2400 l/min	0...144 m³/h	0...778.08 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.005...99999000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	
Conductivity monitoring				
Measuring range [μS/cm]	100...100000			
Analog start point [μS/cm]	0...80000			
Analog end point [μS/cm]	20000...100000			

SMF650



Magnetic-inductive flow meter

SMG80KGFFRKG/UST

Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability	0,1% MW	
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 µS/cm	±10% MW
	in the range of 20000...100000 µS/cm	±20% MW
Repeatability	± 5% MW	
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions	direction of flow detection; liquid detection	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
Function	ProductURI	
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time	[ms]	1.9

SMF650



Magnetic-inductive flow meter

SMG80KGFFRKG/UST

IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1800

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		82
UL approval	UL approval number	I032
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		7657.8
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 168.3 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN80 (3")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF650



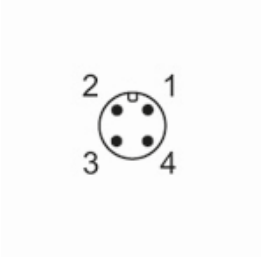
Magnetic-inductive flow meter

SMG80KGFFRKG/UST

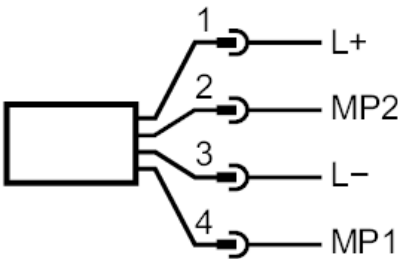
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

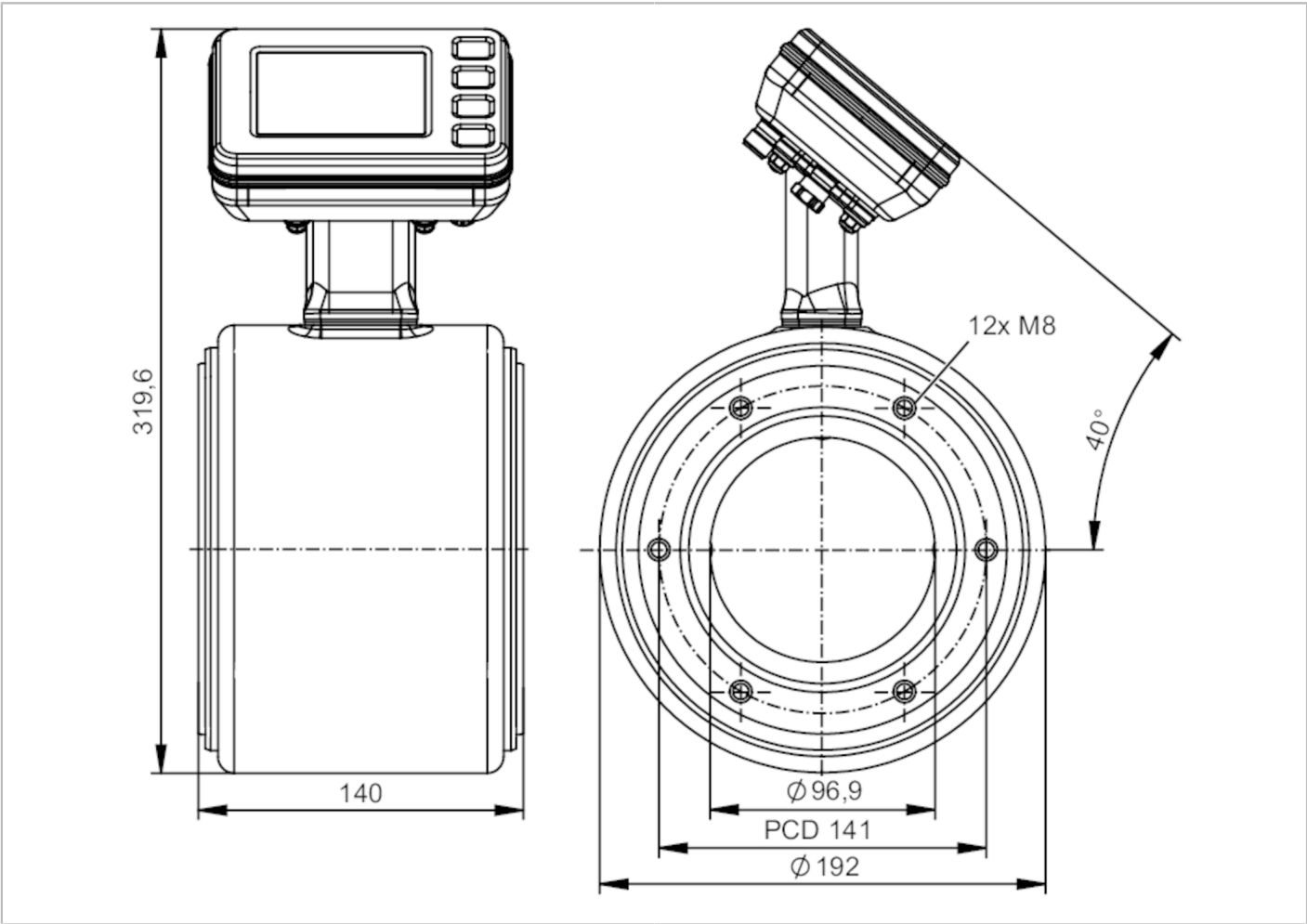
AO: analog output; DO: digital output; MP: multi-function connection

SMF721



Magnetic-inductive flow meter

SMGX0KGFFRKG/USD



Product characteristics				
Measuring range	50...5000 l/min	3000...300000 l/h	13...1321 gpm	0.34...34.82 ft/s
Nominal diameter	DN100 (4")			
Process connection	ifm-specific device flange			
Application				
System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 μS/cm			
Medium temperature	-20...150 °C		-4...302 °F	
Min. bursting pressure	543.75 psi		3.75 MPa	
Pressure rating	362.5 psi		2.5 MPa	
Electrical data				
Operating voltage	[V]	18...32 DC		
Current consumption	[mA]	250; (24V)		
Protection class	III			

SMF721



Magnetic-inductive flow meter

SMGX0KGFFRKG/USD

Reverse polarity protection	yes			
Power-on delay time [s]	< 5			
Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2		external totalizer reset	
Outputs				
Total number of outputs	2			
Output signal	OUT1		pulse signal; totalizer switching signal; diagnostic signal; IO-Link	
	OUT2		analog signal; pulse signal; totalizer switching signal; diagnostic signal	
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 µA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	50...5000 l/min	3000...300000 l/h	13...1321 gpm	0.34...34.82 ft/s
Display range	-6000...6000 l/min	-360000...360000 l/h	-1585.03...1585.03 gpm	-39.4...39.4 ft/s
Resolution	0.1 l/min	200 l/h	0.01 gpm	0.01 ft/s
Note on factory setting	0...310 gpm			
Analog start point ASP	-5000...4000 l/min	-300000...240000 l/h	-1321...1056.8 gpm	-32.8...26.24 ft/s
Analog end point AEP	-4000...5000 l/min	-240000...300000 l/h	-1056.8...1321 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...4000 l/min	0...240000 l/h	0...1056.8 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.038...99990000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Display range	-20...150 °C		-4...302 °F	
Resolution	0.01 °C		0.1 °F	

SMF721



Magnetic-inductive flow meter

SMGX0KGFFRKG/USD

Analog start point	-20...116 °C	-4...240.8 °F
Analog end point	14...150 °C	57.2...302 °F

Conductivity monitoring		
Measuring range	[μS/cm]	100...100000
Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000

Accuracy / deviations

Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW

Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5

Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW

Reaction times

Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5

Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)

Conductivity monitoring		
Response time	[s]	< 2

Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI

SMF721



Magnetic-inductive flow meter

SMGX0KGFFRKG/USD

SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time [ms]	1.9	
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1802
Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	
Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]	81	
UL approval	UL approval number	I031
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight [g]	8759.6	
Housing	tubular	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Dimensions [mm]	Ø 192 / L = 140	
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN100 (4")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	

SMF721



Magnetic-inductive flow meter

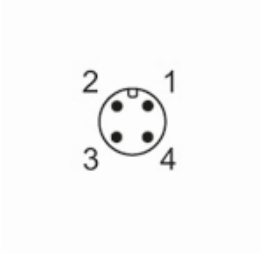
SMGX0KGFFRKG/USD

Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons

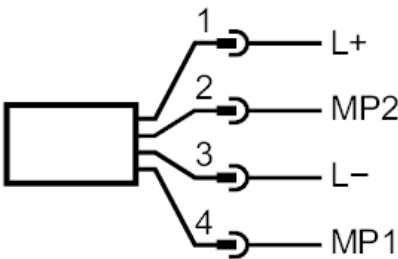
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
	accuracy specifications according to factory certificate on delivery
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



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Magnetic-inductive flow meter

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Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

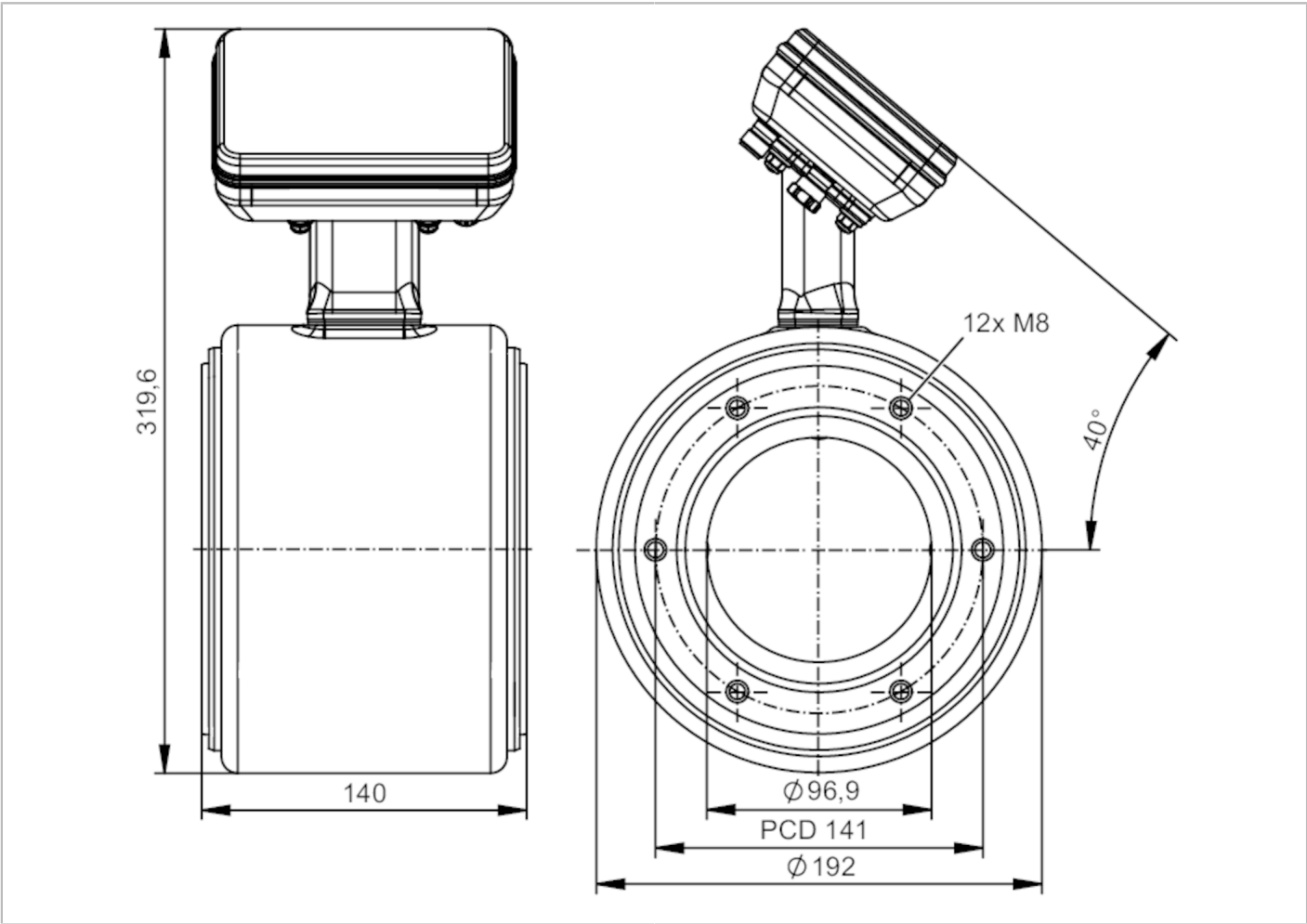
AO: analog output; DO: digital output; MP: multi-function connection

SMF750



Magnetic-inductive flow meter

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Product characteristics				
Measuring range	50...5000 l/min	3...300 m³/h	13.2...1321 gpm	0.33...32.8 ft/s
Nominal diameter	DN100 (4")			
Process connection	ifm-specific device flange			
Application				
System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 µS/cm			
Medium temperature	°C]	-20...150		
Min. bursting pressure	37.5 bar	543.75 psi	3.75 MPa	
Pressure rating	25 bar	362.5 psi	2.5 MPa	
Electrical data				
Operating voltage	[V]	18...32 DC		
Current consumption	[mA]	250; (24V)		
Protection class	III			

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Magnetic-inductive flow meter

SMGX0KGFFRKG/UST

Reverse polarity protection	yes			
Power-on delay time [s]	< 5			
Measuring principle	magnetic-inductive			
Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2		external totalizer reset	
Outputs				
Total number of outputs	2			
Output signal	OUT1		pulse signal; totalizer switching signal; diagnostic signal; IO-Link	
	OUT2		analog signal; pulse signal; totalizer switching signal; diagnostic signal	
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	yes (non-latching)			
Overload protection	yes			
Analog				
Number of analog outputs	1			
Analog current output [mA]	4...20; (skalierbar)			
Max. load [Ω]	500			
Resolution of analog output	0.38 µA			
Digital				
Number of digital outputs	2			
Max. voltage drop switching output DC [V]	2			
Permanent current rating of switching output DC [mA]	100			
Switching frequency DC [Hz]	0...10000			
Measuring/setting range				
Measuring range	50...5000 l/min	3...300 m³/h	13.2...1321 gpm	0.33...32.8 ft/s
Note on factory setting	0...70,0 m³/h			
Analog start point ASP	-5000...4000 l/min	-300...240 m³/h	-1321...1056.8 gpm	-32.8...26.24 ft/s
Analog end point AEP	-4000...5000 l/min	-240...300 m³/h	-1056.8...1321 gpm	-26.24...32.8 ft/s
Low flow cut-off LFC	0...4000 l/min	0...240 m³/h	0...1056.8 gpm	0...26.24 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.009...99999000 l			
Temperature monitoring				
Measuring range	-20...150 °C		-4...302 °F	
Analog start point	-20...116 °C		-4...240.8 °F	
Analog end point	14...150 °C		57.2...302 °F	
Conductivity monitoring				
Measuring range [µS/cm]	100...100000			

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Magnetic-inductive flow meter

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Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000
Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions		direction of flow detection; liquid detection
Interfaces		
Communication interface		IO-Link
Transmission type		COM3 (230,4 kBaud)
IO-Link revision		1.1.3
SDCI standard		IEC 61131-9
Profiles	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
	Extension	Sensor Control Wide
	Extension	Quantity detection, switches when value exceeds the setpoint
	Function	Locator
	Function	ProductURI
SIO mode		yes
Required master port class		A
Process data analog		6
Process data binary		8
Min. process cycle time	[ms]	1.9

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Magnetic-inductive flow meter

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IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1803

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
CPA approval	model number	SMF
	accuracy class	0,5
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		82
UL approval	UL approval number	I032
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		8818.2
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 192 / L = 140
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN100 (4")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF750



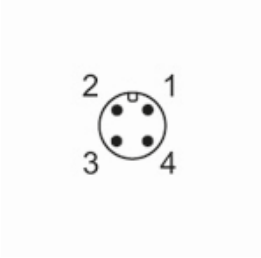
Magnetic-inductive flow meter

SMGX0KGFFRKG/UST

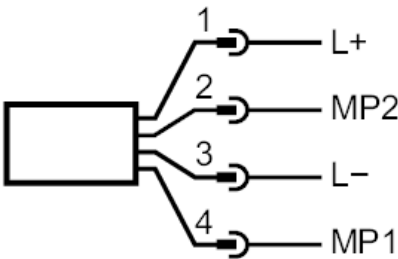
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



Electrical connection - plug

1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

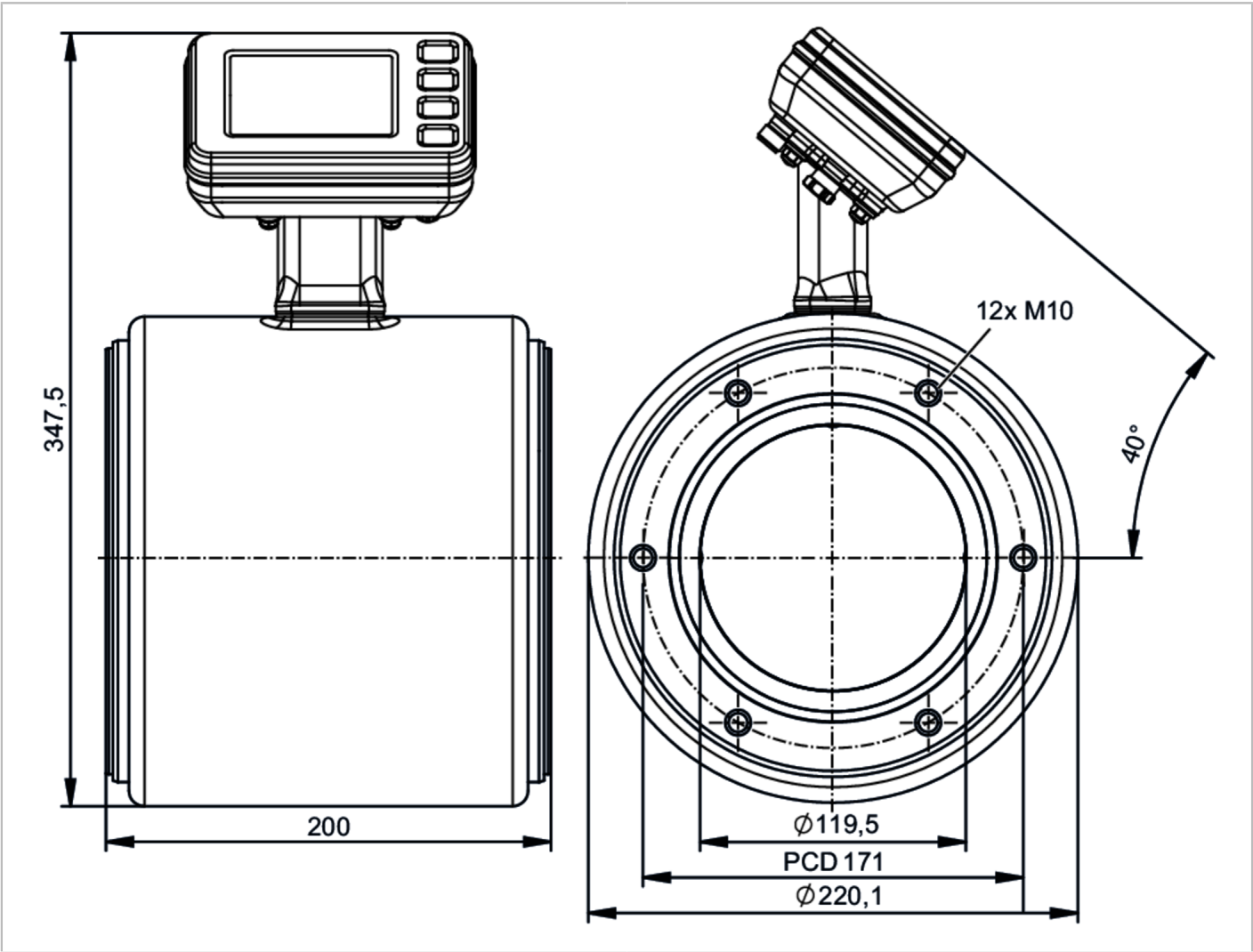
AO: analog output; DO: digital output; MP: multi-function connection

SMF821



Magnetic-inductive flow meter

SMGX1KGFFRKG/USD



Product characteristics

Measuring range	75...7500 l/min	4500...450000 l/h	20...1981 gpm	0.33...33.42 ft/s
Nominal diameter	DN125 (5")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature	-20...150 °C	-4...302 °F		
Min. bursting pressure	348 psi	2.4 MPa		
Pressure rating	232 psi	1.6 MPa		

Electrical data

Operating voltage	[V]	18...32 DC
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SMF821



Magnetic-inductive flow meter

SMGX1KGFFRKG/USD

Current consumption [mA]	250; (24V)
Protection class	III
Reverse polarity protection	yes
Power-on delay time [s]	< 5
Measuring principle	magnetic-inductive

Inputs / outputs

Total number of inputs and outputs	2
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Inputs

Inputs	OUT2	external totalizer reset
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Outputs

Total number of outputs	2	
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal
Electrical design	PNP/NPN	
Pulse output	flow rate meter	
Short-circuit protection	yes	
Type of short-circuit protection	yes (non-latching)	
Overload protection	yes	

Analog

Number of analog outputs	1
Analog current output [mA]	4...20; (skalierbar)
Max. load [Ω]	500
Resolution of analog output	0.38 μA

Digital

Number of digital outputs	2
Max. voltage drop switching output DC [V]	2
Permanent current rating of switching output DC [mA]	100
Switching frequency DC [Hz]	0...10000

Measuring/setting range

Measuring range	75...7500 l/min	4500...450000 l/h	20...1981 gpm	0.33...33.42 ft/s
Display range	-9000...9000 l/min	-540000...540000 l/h	-2378...2378 gpm	-40.1...40.1 ft/s
Resolution	0.1 l/min	500 l/h	1 gpm	0.01 ft/s
Note on factory setting	0...485 gpm			
Analog start point ASP	-7500...6000 l/min	-450000...360000 l/h	-1981...1585 gpm	-33.42...26.73 ft/s
Analog end point AEP	-6000...7500 l/min	-360000...450000 l/h	-1585...1981 gpm	-26.73...33.42 ft/s
Low flow cut-off LFC	0...6000 l/min	0...360000 l/h	0...1585 gpm	0...26.73 ft/s
Pulse length [s]	0.00005...2			
Pulse value	0.038...99990000 l			

Temperature monitoring

Measuring range	-20...150 °C	-4...302 °F
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Magnetic-inductive flow meter

SMGX1KGFFRKG/USD

Display range	-20...150 °C	-4...302 °F
Resolution	0.01 °C	0.1 °F
Analog start point	-20...116 °C	-4...240.8 °F
Analog end point	14...150 °C	57.2...302 °F

Conductivity monitoring		
Measuring range	[μS/cm]	100...100000
Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000

Accuracy / deviations

Volumetric flow monitoring		
Accuracy (in the measuring range)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW

Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5

Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW

Reaction times

Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5

Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)

Conductivity monitoring		
Response time	[s]	< 2

Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Common - I&D	Identification and Diagnosis
	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
SIO mode	yes	
Required master port class	A	
Process data analog	6	

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Magnetic-inductive flow meter

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Process data binary	8	
Min. process cycle time [ms]	1.9	
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1805

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]	81	
UL approval	UL approval number	I031
	File number UL	E174189
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]	15076	
Housing	tubular	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Dimensions [mm]	Ø 220.1 / L = 200	
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN125 (5")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	

Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	

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Magnetic-inductive flow meter

SMGX1KGFFRKG/USD

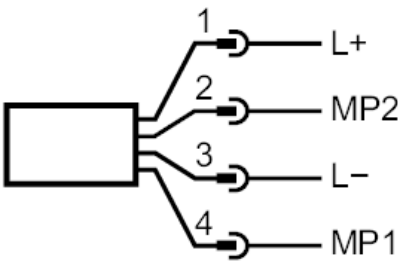
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons
Remarks		
Remarks	MW = Measured value	
	MEW = Final value of the measuring range	
	pulse and totalizer signal are only available for one of the two outputs	
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection	
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up	
Pack quantity	accuracy specifications according to factory certificate on delivery	
	1 pcs.	

Electrical connection - plug

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

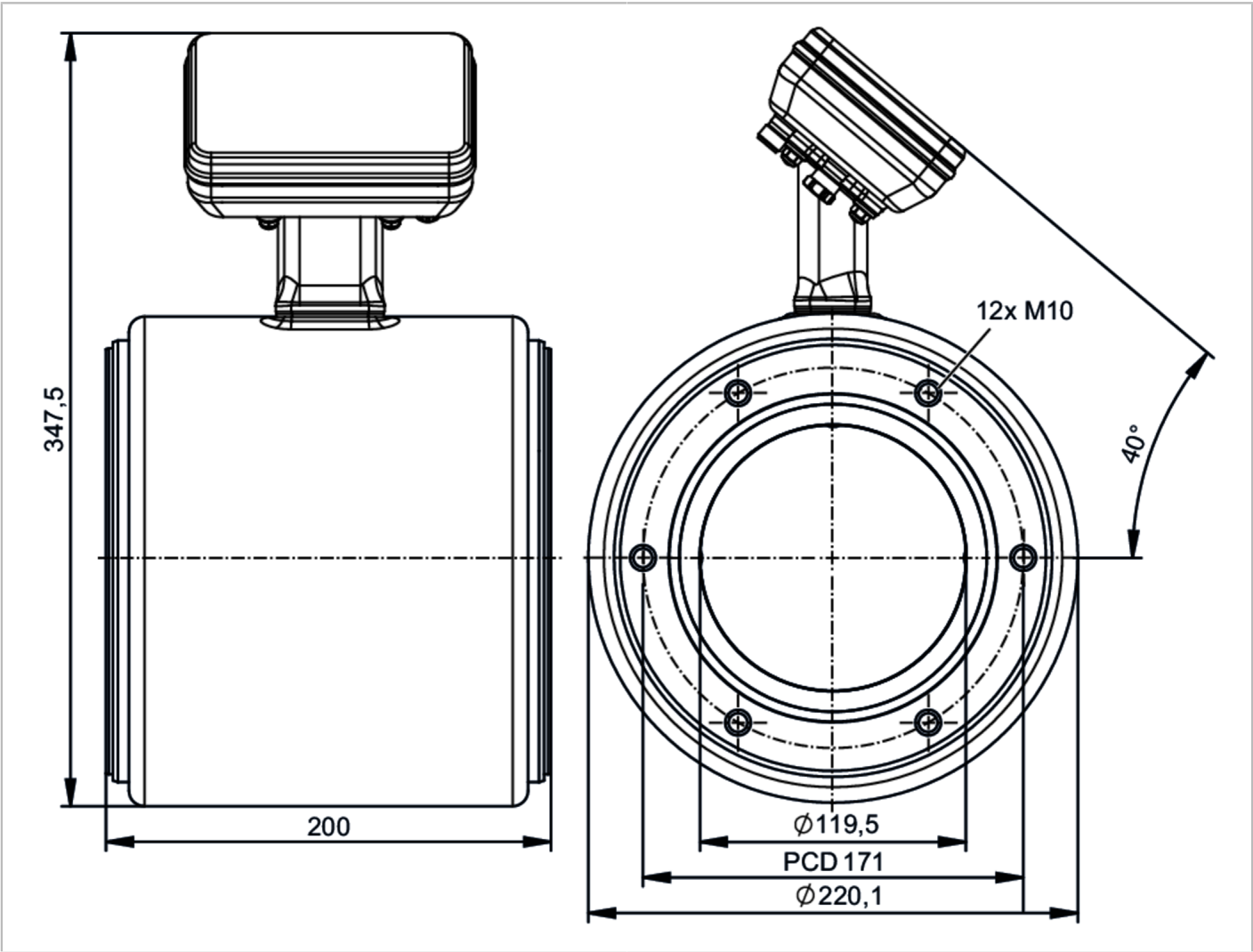
AO: analog output; DO: digital output; MP: multi-function connection

SMF850



Magnetic-inductive flow meter

SMGX1KGFFRKG/UST



Product characteristics

Measuring range	75...7500 l/min	4.5...450 m³/h	20...1981 gpm	0.33...33.42 ft/s
Nominal diameter	DN125 (5")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: ≥ 5 µS/cm			
Medium temperature [°C]	-20...150			
Min. bursting pressure	24 bar	348 psi	2.4 MPa	
Pressure rating	16 bar	232 psi	1.6 MPa	

Electrical data

Operating voltage [V]	18...32 DC
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SMF850



Magnetic-inductive flow meter

SMGX1KGFFRKG/UST

Current consumption	[mA]	250; (24V)
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	< 5
Measuring principle		magnetic-inductive

Inputs / outputs

Total number of inputs and outputs	2
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Inputs

Inputs	OUT2	external totalizer reset
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Outputs

Total number of outputs	2	
Output signal	OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link
	OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal
Electrical design	PNP/NPN	
Pulse output	flow rate meter	
Short-circuit protection	yes	
Type of short-circuit protection	yes (non-latching)	
Overload protection	yes	

Analog

Number of analog outputs		1
Analog current output	[mA]	4...20; (skalierbar)
Max. load	[Ω]	500
Resolution of analog output		0.38 μA

Digital

Number of digital outputs		2
Max. voltage drop switching output DC	[V]	2
Permanent current rating of switching output DC	[mA]	100
Switching frequency DC	[Hz]	0...10000

Measuring/setting range

Measuring range	75...7500 l/min	4.5...450 m³/h	20...1981 gpm	0.33...33.42 ft/s
Note on factory setting		0...110,0 m³/h		
Analog start point ASP	-7500...6000 l/min	-450...360 m³/h	-1981...1585 gpm	-33.42...26.73 ft/s
Analog end point AEP	-6000...7500 l/min	-360...450 m³/h	-1585...1981 gpm	-26.73...33.42 ft/s
Low flow cut-off LFC	0...6000 l/min	0...360 m³/h	0...1585 gpm	0...26.73 ft/s
Pulse length	[s]	0.00005...2		
Pulse value		0.013...99999000 l		

Temperature monitoring

Measuring range	-20...150 °C	-4...302 °F
Analog start point	-20...116 °C	-4...240.8 °F
Analog end point	14...150 °C	57.2...302 °F

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Magnetic-inductive flow meter

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Conductivity monitoring		
Measuring range	[μS/cm]	100...100000
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000
Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (in the measuring range)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions		direction of flow detection; liquid detection
Interfaces		
Communication interface		IO-Link
Transmission type		COM3 (230,4 kBaud)
IO-Link revision		1.1.3
SDCI standard		IEC 61131-9
Profiles	Common - I&D	Identification and Diagnosis
	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
SIO mode		yes
Required master port class		A
Process data analog		6
Process data binary		8
Min. process cycle time	[ms]	1.9

SMF850



Magnetic-inductive flow meter

SMGX1KGFFRKG/UST

IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1806

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		83
UL approval	UL approval number	I032
	File number UL	E174189
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		15024
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 220.1 / L = 200
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN125 (5")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting		m³/h; °C; µS/cm

SMF850



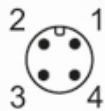
Magnetic-inductive flow meter

SMGX1KGFFRKG/UST

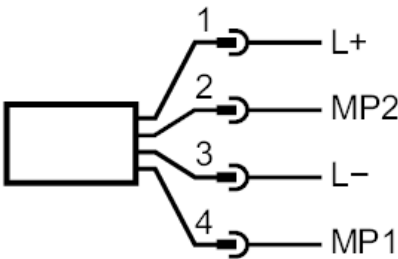
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection - plug

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

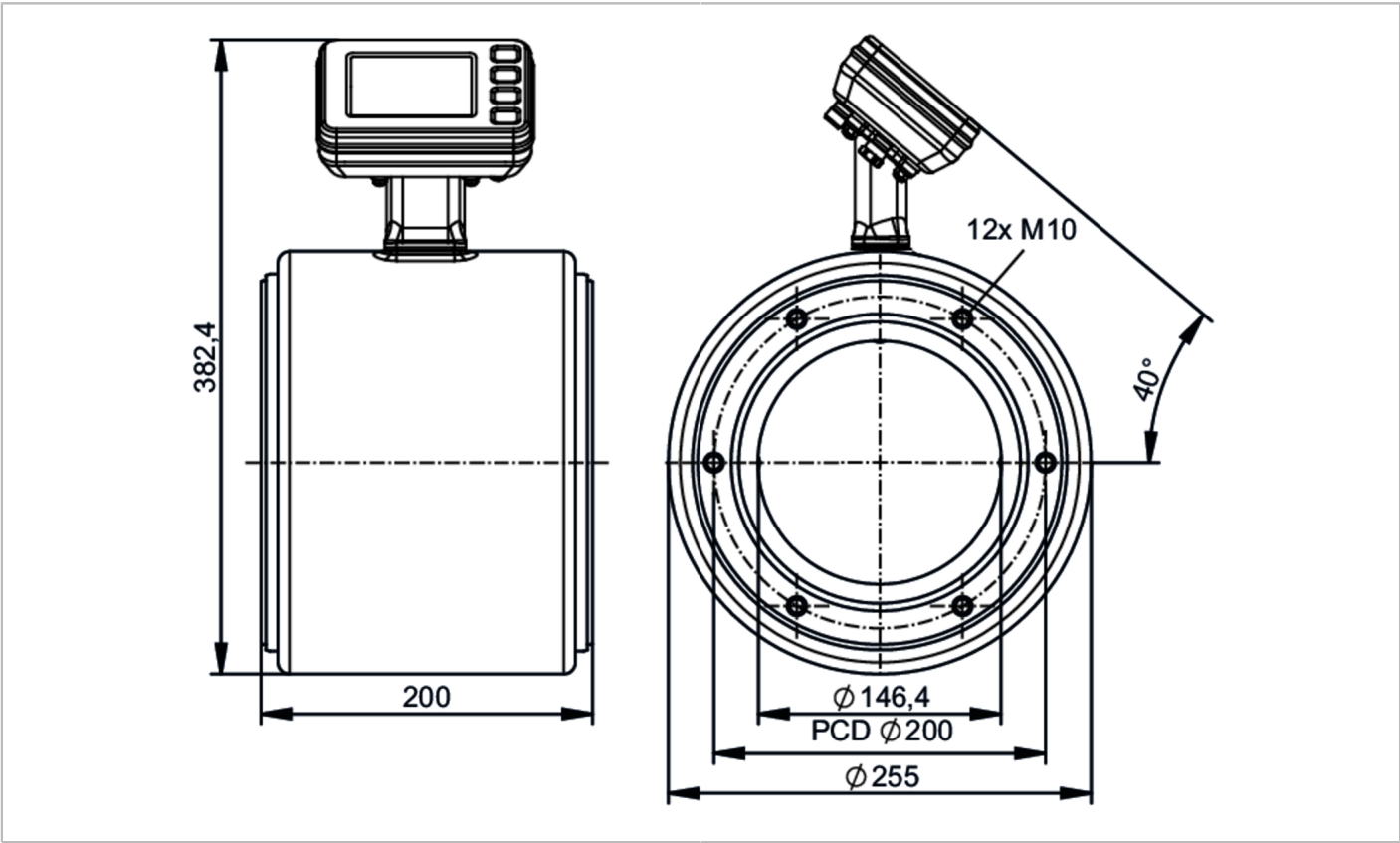
AO: analog output; DO: digital output; MP: multi-function connection

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Magnetic-inductive flow meter

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Product characteristics

Measuring range	100...10000 l/min	6000...600000 l/h	26...2642 gpm	0.31...30.94 ft/s
Nominal diameter	DN150 (6")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts		
Application	food and beverage industry		
Media	Conductive liquids; water; water-based media		
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream		
	conductivity: $\geq 5 \mu\text{S/cm}$		
Medium temperature	-20...150 °C	-4...302 °F	
Min. bursting pressure	348 psi	2.4 MPa	
Pressure rating	232 psi	1.6 MPa	

Electrical data

Operating voltage	[V]	18...32 DC
Current consumption	[mA]	250; (24 V)
Protection class		III
Reverse polarity protection		yes
Power-on delay time	[s]	< 5
Measuring principle		magnetic-inductive

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Magnetic-inductive flow meter

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Inputs / outputs					
Total number of inputs and outputs		2			
Inputs					
Inputs		OUT2	external totalizer reset		
Outputs					
Total number of outputs		2			
Output signal		OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
		OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design		PNP/NPN			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Analog					
Number of analog outputs		1			
Analog current output [mA]		4...20; (skalierbar)			
Max. load [Ω]		500			
Resolution of analog output		0.38 μA			
Digital					
Number of digital outputs		2			
Max. voltage drop switching output DC [V]		2			
Permanent current rating of switching output DC [mA]		100			
Switching frequency DC [Hz]		0...10000			
Measuring/setting range					
Measuring range		100...10000 l/min	6000...600000 l/h	26...2642 gpm	0.31...30.94 ft/s
Display range		-12000...12000 l/min	-720000...720000 l/h	-3170...3170 gpm	-37.14...37.14 ft/s
Resolution		0.1 l/min	100 l/h	1 gpm	0.01 ft/s
Note on factory setting		0...700 gpm			
Analog start point ASP		-10000...8000 l/min	-600000...480000 l/h	-2642...2113 gpm	-30.94...24.75 ft/s
Analog end point AEP		-8000...10000 l/min	-480000...600000 l/h	-2113...2642 gpm	-24.75...30.94 ft/s
Low flow cut-off LFC		0...8000 l/min	0...480000 l/h	0...2113 gpm	0...24.75 ft/s
Pulse length [s]		0.00005...2			
Pulse value		0.038...99990000 l			
Temperature monitoring					
Measuring range		-20...150 °C		-4...302 °F	
Display range		-20...150 °C		-4...302 °F	
Resolution		0.01 °C		0.1 °F	
Analog start point		-20...116 °C		-4...240.8 °F	
Analog end point		14...150 °C		57.2...302 °F	
Conductivity monitoring					
Measuring range [μS/cm]		100...100000			

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Display range	[μS/cm]	0...10000000
Resolution	[μS/cm]	1
Analog start point	[μS/cm]	0...80000
Analog end point	[μS/cm]	20000...100000

Accuracy / deviations

Volumetric flow monitoring		
Accuracy (in the measuring range)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 μS/cm	±10% MW
	in the range of 20000...100000 μS/cm	±20% MW
Repeatability		± 5% MW

Reaction times

Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2

Software / programming

Diagnostic functions	direction of flow detection; liquid detection
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Common - I&D	Identification and Diagnosis
	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time [ms]	1.9	

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Magnetic-inductive flow meter

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IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	Type of operation	DeviceID
	default	1808

Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	

Tests / approvals		
EMC	DIN 61326-1	
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]		81
UL approval	UL approval number	I031
	File number UL	E174189
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		17312
Housing		tubular
Inlet pipe length		5 x DN
Outlet pipe length		2 x DN
Dimensions [mm]		Ø 255 / L = 200
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); Display: polysulfone; Display-sealing: FKM; LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter		DN150 (6")
Process connection		ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts		Ra < 0.4 µm

Displays / operating elements		
Display	process value	full graphics TFT display, multi-color 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-color
Display unit	l/min; l/h; hl/min; hl/h; m³/min; m³/h; m/s; gpm; gph; ft/s; °C; °F; µS/cm; S/m; ms/cm	
Factory setting	gpm; °F; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons

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Magnetic-inductive flow meter

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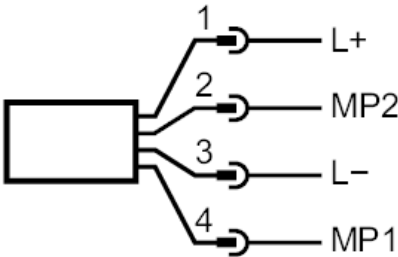
Remarks	
Remarks	MW = Measured value
	MEW = Final value of the measuring range
	pulse and totalizer signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up
Pack quantity	1 pcs.

Electrical connection - plug

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

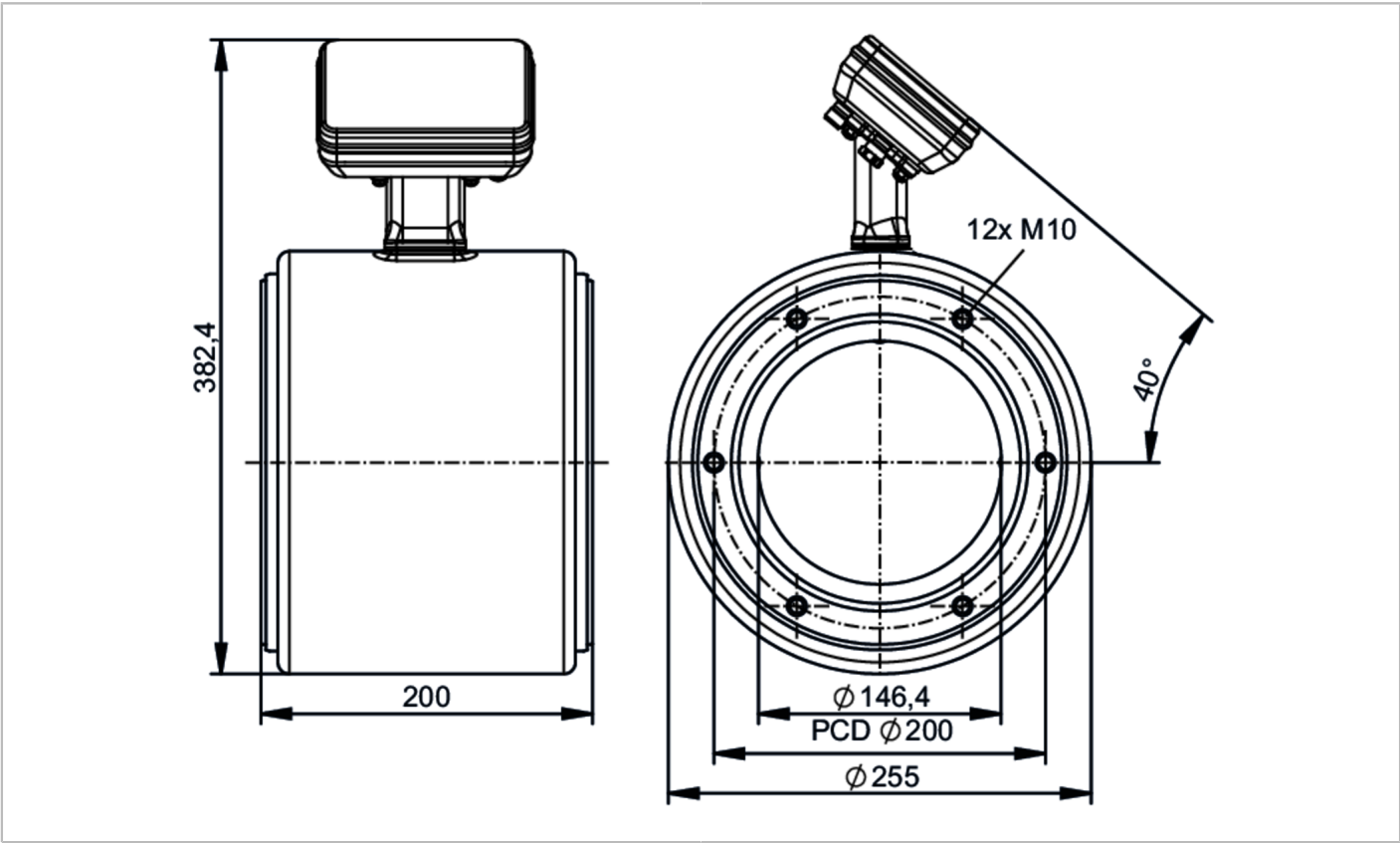
AO: analog output; DO: digital output; MP: multi-function connection

SMF950



Magnetic-inductive flow meter

SMGX2KGFFRKG/UST



Product characteristics

Measuring range	100...10000 l/min	6...600 m³/h	26...2642 gpm	0.31...30.94 ft/s
Nominal diameter	DN150 (6")			
Process connection	ifm-specific device flange			

Application

System	gold-plated contacts			
Application	food and beverage industry			
Media	Conductive liquids; water; water-based media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yogurt, yogurt toppings, ice cream			
	conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature [°C]	-20...150			
Min. bursting pressure	24 bar	348 psi	2.4 MPa	
Pressure rating	16 bar	232 psi	1.6 MPa	

Electrical data

Operating voltage [V]	18...32 DC			
Current consumption [mA]	250; (24 V)			
Protection class	III			
Reverse polarity protection	yes			
Power-on delay time [s]	< 5			
Measuring principle	magnetic-inductive			



Magnetic-inductive flow meter

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Inputs / outputs					
Total number of inputs and outputs		2			
Inputs					
Inputs		OUT2	external totalizer reset		
Outputs					
Total number of outputs		2			
Output signal		OUT1	pulse signal; totalizer switching signal; diagnostic signal; IO-Link		
		OUT2	analog signal; pulse signal; totalizer switching signal; diagnostic signal		
Electrical design		PNP/NPN			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Analog					
Number of analog outputs		1			
Analog current output [mA]		4...20; (skalierbar)			
Max. load [Ω]		500			
Resolution of analog output		0.38 μA			
Digital					
Number of digital outputs		2			
Max. voltage drop switching output DC [V]		2			
Permanent current rating of switching output DC [mA]		100			
Switching frequency DC [Hz]		0...10000			
Measuring/setting range					
Measuring range		100...10000 l/min	6...600 m³/h	26...2642 gpm	0.31...30.94 ft/s
Note on factory setting		0...160,0 m³/h			
Analog start point ASP		-10000...8000 l/min	-600...480 m³/h	-2642...2113 gpm	-30.94...24.75 ft/s
Analog end point AEP		-8000...10000 l/min	-480...600 m³/h	-2113...2642 gpm	-24.75...30.94 ft/s
Low flow cut-off LFC		0...8000 l/min	0...480 m³/h	0...2113 gpm	0...24.75 ft/s
Pulse length [s]		0.00005...2			
Pulse value		0.017...99999000 l			
Temperature monitoring					
Measuring range		-20...150 °C		-4...302 °F	
Analog start point		-20...116 °C		-4...240.8 °F	
Analog end point		14...150 °C		57.2...302 °F	
Conductivity monitoring					
Measuring range [μS/cm]		100...100000			
Analog start point [μS/cm]		0...80000			
Analog end point [μS/cm]		20000...100000			

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Magnetic-inductive flow meter

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Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (in the measuring range)	with optional factory calibration (availability is being planned)	± (0,2 % MW + 2 mm/s)
	standard	± (0,5 % MW + 1,5 mm/s)
Repeatability	0,1% MW	
Temperature monitoring		
Accuracy	[K]	± 1
Repeatability	[K]	± 0,5
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 µS/cm	±10% MW
	in the range of 20000...100000 µS/cm	±20% MW
Repeatability	± 5% MW	
Reaction times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (Flow velocity: ≥ 0,5m/s)
Conductivity monitoring		
Response time	[s]	< 2
Software / programming		
Diagnostic functions	direction of flow detection; liquid detection	
Interfaces		
Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9	
Profiles	Common - I&D	Identification and Diagnosis
	Smart Sensor - SSP 4.3.4	Measuring and Switching Sensor, floating point, 4 channel
SIO mode	yes	
Required master port class	A	
Process data analog	6	
Process data binary	8	
Min. process cycle time	[ms]	1.9
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totalizer; memory; operating hours counter; internal temperature; simulation function	

SMF950



Magnetic-inductive flow meter

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Supported DeviceIDs	Type of operation	DeviceID
	default	1809
Operating conditions		
Ambient temperature	-20...65 °C	-4...149 °F
Storage temperature	-20...80 °C	-4...176 °F
Protection	IP 67; IP 69; (to DIN EN 60529)	
Tests / approvals		
EMC	DIN 61326-1	
Shock resistance	DIN IEC 68-2-27	20 g (18ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [years]	83	
UL approval	UL approval number	I032
	File number UL	E174189
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	
Mechanical data		
Weight [g]	20800	
Housing	tubular	
Inlet pipe length	5 x DN	
Outlet pipe length	2 x DN	
Dimensions [mm]	Ø 255 / L = 200	
Material	housing: stainless steel (1.4404 / 316L); flange: stainless steel (1.4301 / 304); electronics fixture: stainless steel (1.4301 / 304); electronics: stainless steel (1.4404 / 316L); LED ring: PP	
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (1.4435 / 316L)	
Nominal diameter	DN150 (6")	
Process connection	ifm-specific device flange	
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm	
Displays / operating elements		
Display	operating status	LED ring, three-color
Factory setting	m³/h; °C; µS/cm	
Remarks		
Remarks	MW = Measured value	
	MEW = Final value of the measuring range	
	pulse and totalizer signal are only available for one of the two outputs	
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection	
	reference conditions (2/2): inlet pipe length 10xDN, outlet pipe length 5xDN, device settling time: 30 minutes, device orientation: horizontal, display orientation: up	
	accuracy specifications according to factory certificate on delivery	
Pack quantity	1 pcs.	

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Magnetic-inductive flow meter

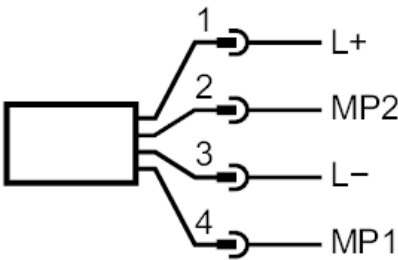
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Electrical connection - plug

Connector: 1 x M12; coding: A; Contacts: gold-plated



Connection



1	L+	
2	MP2	DO2, AO, Reset
3	L-	
4	MP1	DO1, IO-Link

AO: analog output; DO: digital output; MP: multi-function connection