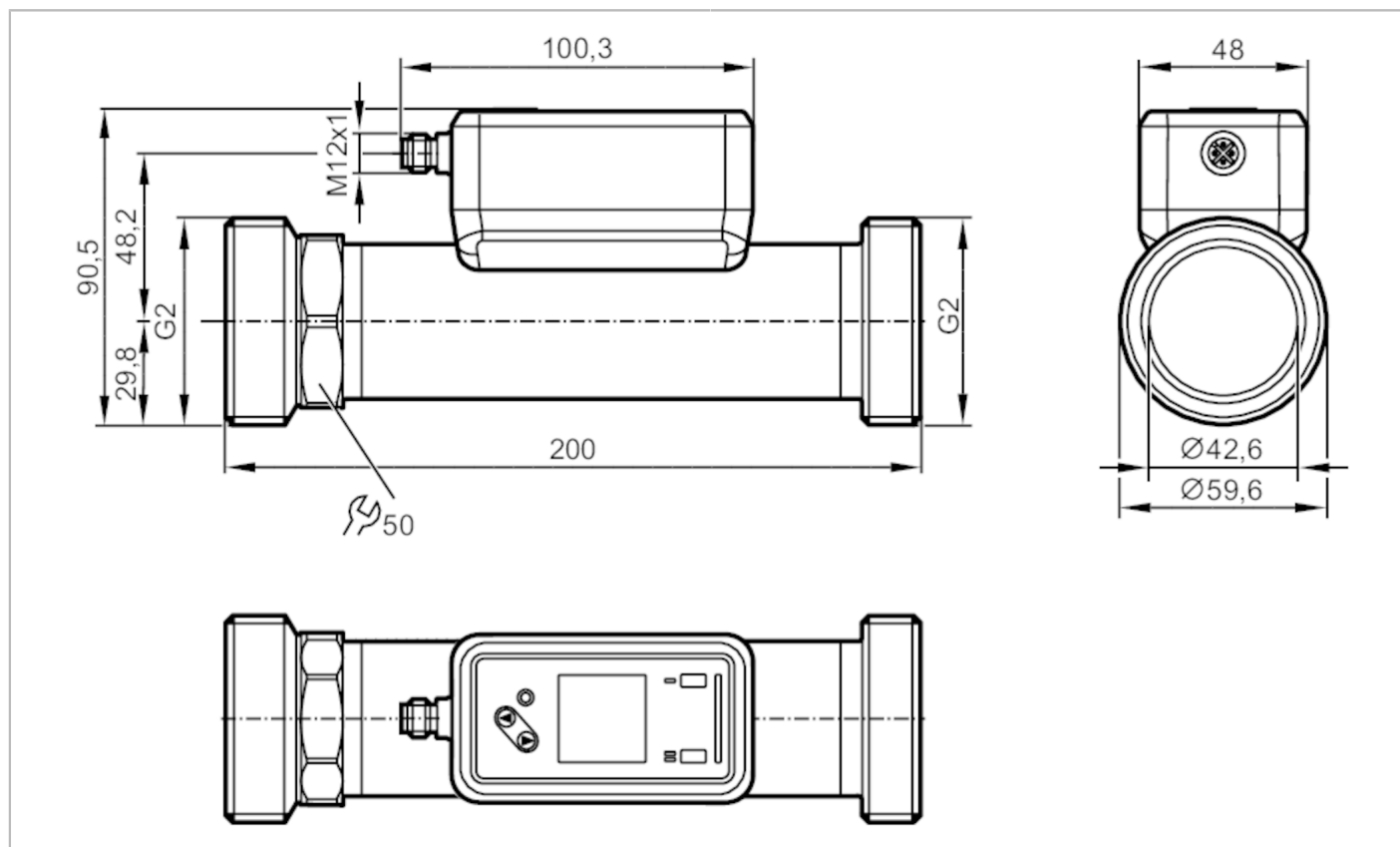


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Ultrasonic flow meter

SUR21XFBFRKG/US



ACS CE PA CRN cUL US LISTED IO-Link KTW/W270 NSF Reg31

Product characteristics				
Measuring range	5...1000 l/min	300...60000 l/h	0.058...11.666 m/s	0.3...60 m³/h
Process connection	threaded connection G 2 external thread DN50			
Application				
System	gold-plated contacts			
Media	ultra-pure water; water; water-based media			
Note on media	water-based media: for media with >10 % additives, the repeatability is the only available value			
Medium temperature [°C]	-20...100			
Min. burst pressure	150 bar		15 MPa	
Pressure rating	100 bar		10 MPa	
Vacuum resistance [mbar]	-1000			
MAWP (for applications according to CRN)	36.6 bar		3.66 MPa	
Electrical data				
Operating voltage [V]	18...32 DC; (to SELV/PELV)			
Current consumption [mA]	< 75			
Protection class	III			
Reverse polarity protection	yes			
Power-on delay time [s]	5			
Measuring principle	ultrasonic			



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Inputs					
Inputs		counter reset			
Outputs					
Total number of outputs		2			
Output signal		switching signal; pulse signal; analog signal; IO-Link; frequency signal; diagnostic signal; totalizer switching signal			
Electrical design		PNP/NPN			
Output function		normally open / closed; (configurable)			
Max. voltage drop switching output DC	[V]	2			
Permanent current rating of switching output DC	[mA]	100			
Switching frequency DC	[Hz]	0...10000			
Analog current output	[mA]	4...20			
Max. load	[Ω]	500			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		yes (non-latching)			
Overload protection		yes			
Measuring/setting range					
Measuring range		5...1000 l/min	300...60000 l/h	0.058...11.666 m/s	0.3...60 m³/h
Display range		-1200...1200 l/min	-72000...72000 l/h	-13.999...13.999 m/s	-72...72 m³/h
Resolution		0.1 l/min	1 l/h	0.001 m/s	0.002 m³/h
Set point SP		10.5...1000 l/min	630...60000 l/h	0.122...11.666 m/s	0.63...60 m³/h
Reset point rP		5.3...994.8 l/min	318...59688 l/h	0.062...11.605 m/s	0.318...59.688 m³/h
Analog start point ASP		-1000...800 l/min	-60000...48000 l/h	-11.666...9.333 m/s	-60...48 m³/h
Analog end point AEP		-800...1000 l/min	-48000...60000 l/h	-9.333...11.666 m/s	-48...60 m³/h
Low flow cut-off LFC		5...50 l/min	300...3000 l/h	0.058...0.583 m/s	0.3...3 m³/h
Frequency end point, FEP		200.6...1000 l/min	12037...60000 l/h	2.34...11.666 m/s	12.037...60 m³/h
Frequency at the end point FRP	[Hz]	1...10000			
Volumetric flow quantity monitoring					
Pulse length	[s]	0.002...2			
Pulse value		0.1...99990000 l			
Temperature monitoring					
Measuring range	[°C]	-20...100			
Display range	[°C]	-44...124			
Resolution	[°C]	0.1			
Set point SP	[°C]	-19.6...100			
Reset point rP	[°C]	-20...99.6			
Analog start point	[°C]	-20...76			
Analog end point	[°C]	4...100			
Frequency start point, FSP	[°C]	-20...76			
Frequency end point, FEP	[°C]	4...100			



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Frequency at the end point FRP	[Hz]	1...10000
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Accuracy / deviations

Flow monitoring		
Accuracy (in the measuring range)		$\pm (1,0 \% MW + 0,5 \% MEW)$
Repeatability		$\pm 0,2 \% MEW$
Temperature monitoring		
Accuracy	[K]	$\pm 2,5 (Q > 5 \% MEW)$
Temperature coefficient [% of the span / 10 K]		0,2

Reaction times

Flow monitoring		
Response time	[s]	$< 0.25; (dAP = 0, T09)$
Damping process value dAP	[s]	0...5
Temperature monitoring		
Dynamic response T05 / T09	[s]	5,7 / 86

Software / programming

Diagnostic functions	direction of flow detection; signal quality
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Interfaces

Communication interface	IO-Link	
Transmission type	COM2 (38,4 kBaud)	
IO-Link revision	1.1.3	
SDCI standard	IEC 61131-9: 2013-07	
Profiles	BLOB	Binary Large Object transfer
	Common - I&D	Identification and Diagnosis
Required master port class	A	
Process data analog	3	
Process data binary	2	
Min. process cycle time	[ms]	9.6
IO-Link process data (cyclical)	Function	bit length
	totalizer	32
	Flow monitoring	32
	Temperature monitoring	32
	status	4
	Output 1	1
	Output 2	1
Supported DeviceIDs	Type of operation	DeviceID
	default	1461

Operating conditions

Ambient temperature	[°C]	-20...60
Storage temperature	[°C]	-25...80
Protection		IP 65; IP 67

Tests / approvals

EMC	DIN 61326-1:2021	
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CPA approval	model number	002US
	accuracy class	1,5
Shock resistance	DIN IEC 68-2-27	20 g (11ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000Hz)
MTTF [years]		160
UL approval	UL approval number	I033
	File number UL	E174189
Pressure equipment directive	can be used for group 2 fluids; group 1 fluids on request	

Mechanical data

Weight [g]	1180
Housing	rectangular
Type of mounting	inlet pipe length 5xDN; outlet pipe length 1xDN
Dimensions [mm]	200 x 59.6 x 90.5
Material	housing: stainless steel (1.4404 / 316L); Display: PFA; sealing Display: FKM; connector: PBT
Materials (wetted parts)	Pipe section: stainless steel (1.4404 / 316L); Process connection sealing: NBR fiber-reinforced Gasket
Process connection	threaded connection G 2 external thread DN50
Surface characteristics Ra/Rz of the wetted parts	Ra < 1.25 µm

Displays / operating elements

Display	Color display 1,44", 128 x 128 pixels
Switching function	2 x LED, yellow
diagnosis	1 x LED, three-color
Display unit	l/min; l/h; m³/h; m/s

Accessories

Items supplied	Gasket 2, Centellen package insert
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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 the accuracy indications are adhered to over the entire application area
Pack quantity	1 pcs.

Electrical connection

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

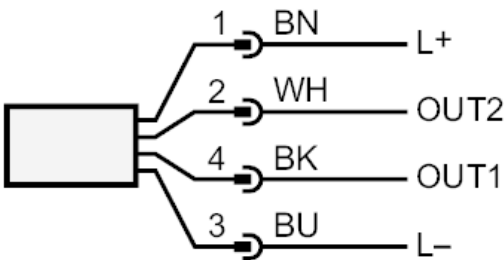




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Connection



- OUT1/IO-Link:
- Switching output Volumetric flow quantity monitoring
 - Switching output Temperature monitoring
 - Pulse output quantity meter
 - Frequency output Volumetric flow quantity monitoring
 - Frequency output Temperature monitoring
 - signal output Preset counter
- OUT2/InD:
- Switching output Volumetric flow quantity monitoring
 - Switching output Temperature monitoring
 - Pulse output quantity meter
 - analog output flow
 - analog output temperature
 - signal output Preset counter
 - Input counter reset

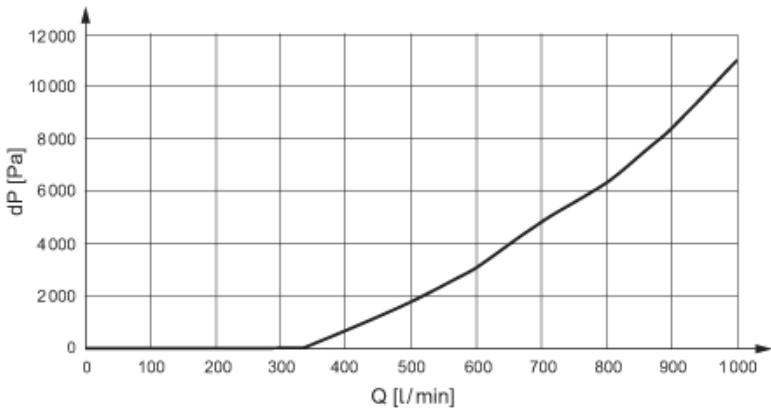
Colors to DIN EN 60947-5-2

Core colors

- BK= black
- BN= brown
- BU= blue
- WH= white

Diagrams and graphs

Note on pressure loss



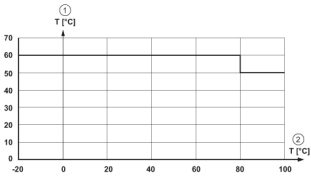
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derating ambient temperature



- 1 Ambient temperature
- 2 Medium temperature