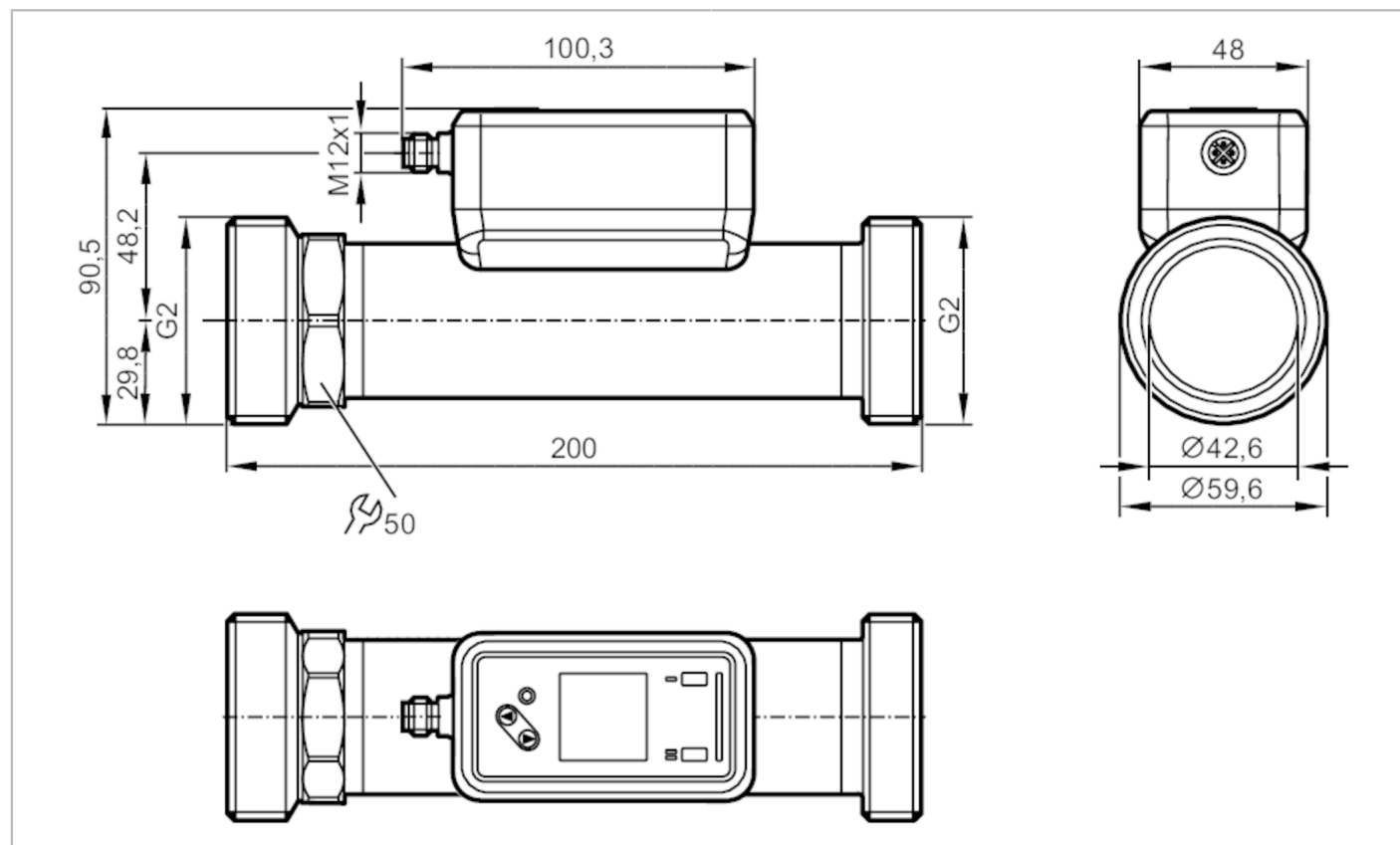


Ultrasonic flow meter

SUR21XFBFRKG/US



ACS CE PA c UL US LISTED IO-Link KTW/W270 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	G 2 DN50 external thread			

Application

Special feature	Gold-plated contacts	
Media	ultra-pure water; water; hydrous media	
Note on media	hydrous media: for media with >10 % additives, the repeatability is the only available value	
Medium temperature [°C]	-20...100	
Min. bursting pressure	150 bar	15 MPa
Pressure rating	100 bar	10 MPa
Vacuum resistance [mbar]	-1000	
MAWP (for applications according to CRN) [bar]	100	

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; analogue signal; IO-Link; frequency signal; diagnostic signal; totaliser switching signal			
Electrical design		PNP/NPN			
Output function		normally open / normally closed; (parameterisable)			
Max. voltage drop switching output DC	[V]	2			
Permanent current rating of switching output DC	[mA]	100			
Switching frequency DC	[Hz]	0...10000			
Analogue current output	[mA]	4...20			
Max. load	[Ω]	500			
Pulse output		flow rate meter			
Short-circuit protection		yes			
Type of short-circuit protection		pulsed			
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
Analogue start point ASP		-1000...800 l/min	-60000...48000 l/h	-11.666...9.333 m/s	-60...48 m³/h
Analogue 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			
Analogue start point	[°C]	-20...76			
Analogue 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)		$\pm (1,0 \% \text{ MW} + 0,5 \% \text{ MEW})$
Repeatability		$\pm 0,2 \% \text{ MEW}$
Temperature monitoring		
Accuracy	[K]	$\pm 2,5 (Q > 5 \% \text{ MEW})$
Temperature coefficient	[X22]	0,2

Response 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	Identification and Diagnosis (0x4000)	
Required master port type	A	
Process data analogue	3	
Process data binary	2	
Min. process cycle time	[ms]	9.6
IO-Link process data (cyclical)	function	bit length
	totaliser	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 67

Tests / approvals

EMC	DIN 61326-1:2021	
CPA approval	model number	002US
	accuracy class	1,5



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Shock resistance	DIN IEC 68-2-27	20 g (11ms)
Vibration resistance	DIN IEC 68-2-6	5 g (10...2000Hz)
MTTF [ANN]		160
UL approval	UL Approval no.	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
Type of mounting	inlet pipe length 5xDN; outlet pipe length 1xDN
Materials	housing: stainless steel (1.4404 / 316L); Display: PFA; Sealing Display: FKM; connector: POKAN
Materials (wetted parts)	Pipe section: stainless steel (1.4404 / 316L); Process connection sealing: Centellen Flat seal
Process connection	G 2 DN50 external thread
Surface characteristics Ra/Rz of the wetted parts	1.25 µm

Displays / operating elements

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

Аксессуары

Items supplied	Flat seal 2, Centellen package insert
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Remarks

Remarks	MW = measured value
	MEW = Final value of the measuring range
	pulse and totaliser 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

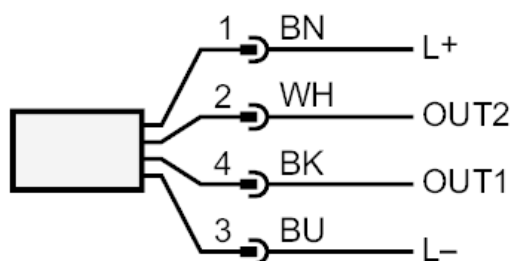




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Connection



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

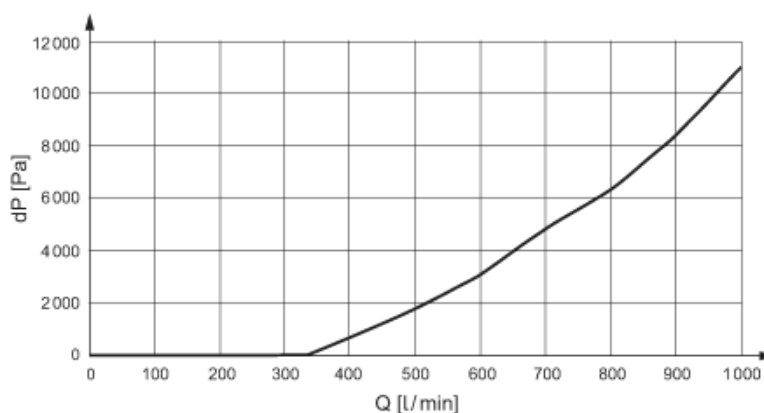
OUT2/InD: switching output volumetric flow quantity monitoring
switching output Temperature monitoring
Pulse output quantity meter
analogue output flow
analogue output temperature
signal output Preset counter
input counter reset

colours to DIN EN 60947-5-2

Core colours
BK= black
BN= brown
BU= blue
WH= white

Diagrams and graphs

Note on pressure loss



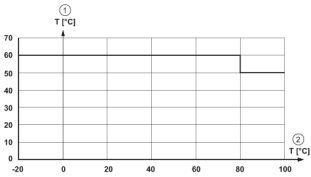
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derating ambient temperature



- 1 Ambient temperature
- 2 Medium temperature