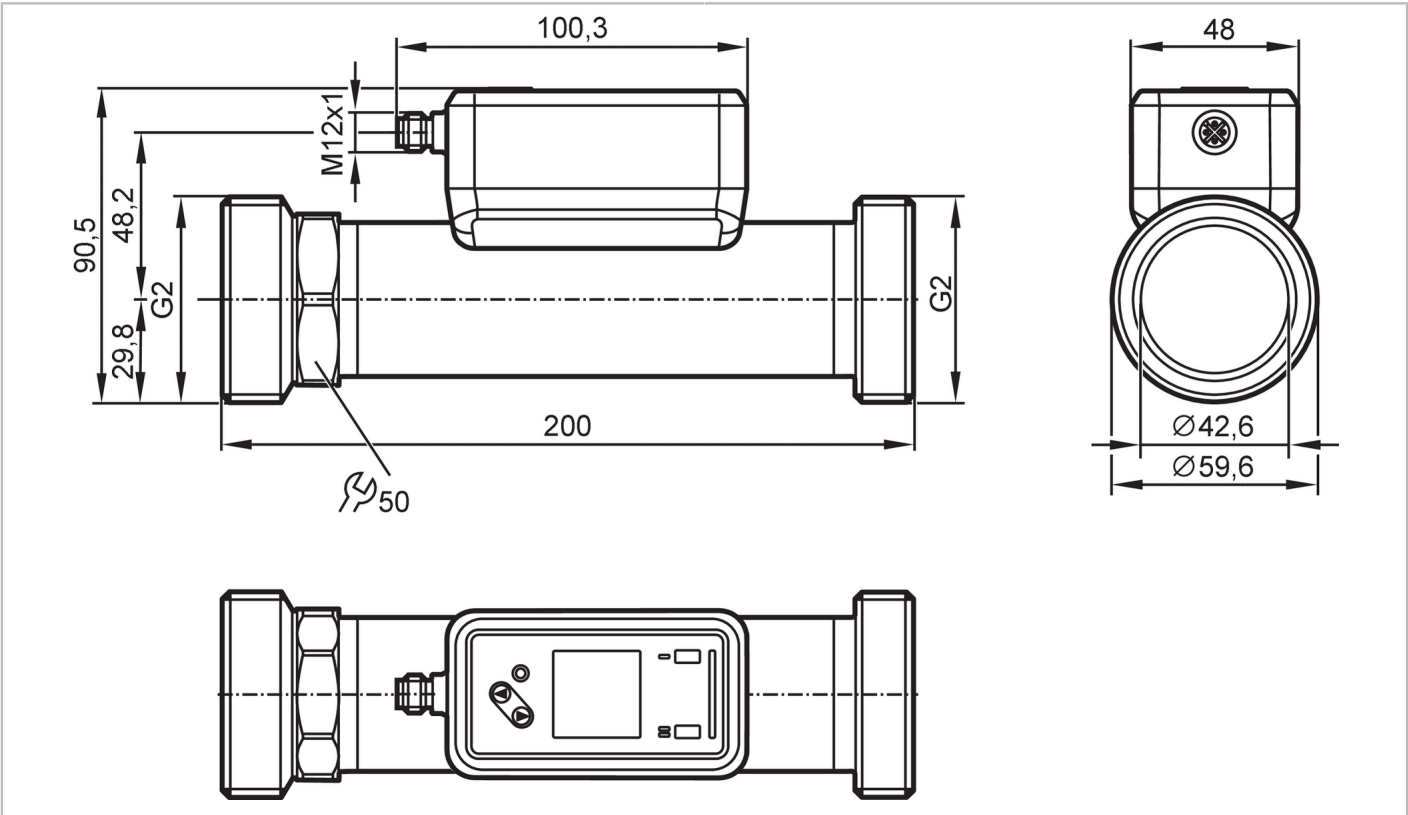


SU2020



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				
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. 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		
Inputs				
Inputs		counter reset		



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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			
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 [% of the span / 10 K]		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
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 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 65; 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	20 g (10...2000Hz)
MTTF [years]	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
Housing	rectangular
Type of mounting	inlet pipe length 5xDN; outlet pipe length 1xDN
Dimensions [mm]	200 x 59.6 x 90.5
Materials	housing: stainless steel (316L/1.4404); Display: PFA; Sealing Display: FKM; connector: PBT
Materials (wetted parts)	Pipe section: stainless steel (316L/1.4404); Process connection sealing: NBR reinforced fibre Flat seal
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		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	

Accessories

Items supplied	Flat seal 2, Centellen
	package insert

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: 4, 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

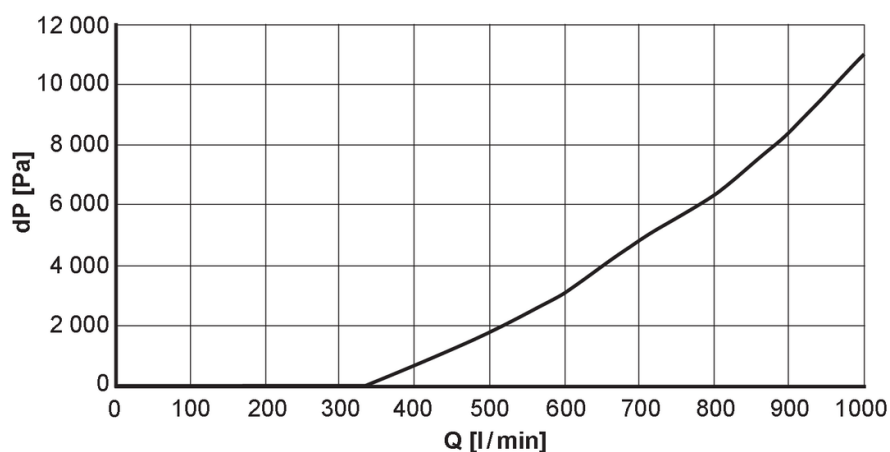
colours to DIN EN 60947-5-2

Core colours

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

Diagrams and graphs

Note on pressure loss





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derating ambient temperature

