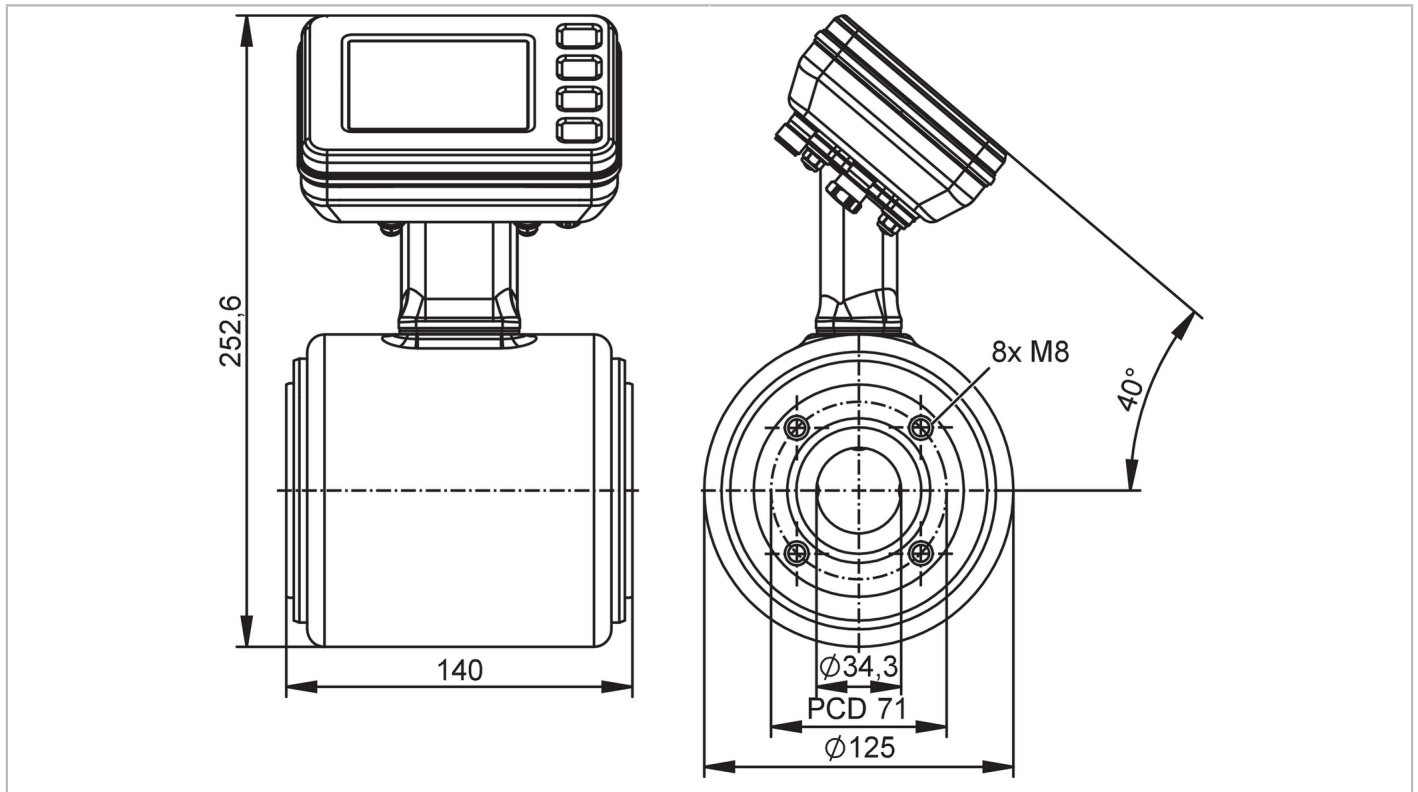


# SMF320



## Magnetic-inductive flow meter

SMG40KGFFRKG/USD



EC 1935/2004

FCM



### Product characteristics

Measuring range	5...750 l/min	300...45000 l/h	0.07...10 m/s	0.3...45 m³/h
Nominal diameter	DN40 (1 1/2")			
Process connection	ifm-specific device flange			

### Application

Special feature	Gold-plated contacts			
Application	food and beverage industry			
Media	conductive liquids; water; hydrous media			
Note on media	food products such as beer, milk, fruit juices, soft drinks, ketchup, yoghurt, yoghurt toppings, ice cream conductivity: $\geq 5 \mu\text{S/cm}$			
Medium temperature [°C]	-20...150			
Min. burst pressure	60 bar	6 MPa		
Pressure rating	40 bar	4 MPa		
MAWP for applications according to CRN [MPa]	4			

### 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			

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Inputs / outputs				
Total number of inputs and outputs	2			
Inputs				
Inputs	OUT2	external totaliser reset		
Outputs				
Total number of outputs	2			
Output signal	OUT1	pulse signal; totaliser switching signal; diagnostic signal; IO-Link		
	OUT2	analogue signal; pulse signal; totaliser switching signal; diagnostic signal		
Electrical design	PNP/NPN			
Pulse output	flow rate meter			
Short-circuit protection	yes			
Type of short-circuit protection	pulsed			
Overload protection	yes			
Analogue				
Number of analogue outputs	1			
Analogue current output [mA]	4...20; (skalierbar)			
Max. load [ $\Omega$ ]	500			
Resolution of analogue output	0.38 $\mu$ A			
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	0.07...10 m/s	0.3...45 m <sup>3</sup> /h
Display range	-900...900 l/min	-54000...54000 l/h	-12...12 m/s	-54...54 m <sup>3</sup> /h
Resolution	0.01 l/min	50 l/h	0.01 m/s	0.05 m <sup>3</sup> /h
Note on factory setting	0...11,0 m <sup>3</sup> /h			
Analogue start point ASP	-750...600 l/min	-45000...36000 l/h	-9.95...7.95 m/s	-45...36 m <sup>3</sup> /h
Analogue end point AEP	-600...750 l/min	-36000...45000 l/h	-7.95...9.95 m/s	-36...45 m <sup>3</sup> /h
Low flow cut-off LFC	0...600 l/min	0...36000 l/h	0...7.95 m/s	0...36 m <sup>3</sup> /h
Pulse length [s]	0.00005...2			
Pulse value	0.002...99990000 l			
Temperature monitoring				
Measuring range [°C]	-20...150			
Display range [°C]	-20...150			
Resolution [°C]	0.01			
Analogue start point [°C]	-20...116			
Analogue end point [°C]	14...150			

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Conductivity monitoring		
Measuring range	[ $\mu$ S/cm]	100...100000
Display range	[ $\mu$ S/cm]	0...10000000
Resolution	[ $\mu$ S/cm]	1
Analogue start point	[ $\mu$ S/cm]	0...80000
Analogue end point	[ $\mu$ S/cm]	20000...100000
Accuracy / deviations		
Volumetric flow monitoring		
Accuracy (under reference conditions)	with optional factory calibration (availability is being planned)	$\pm (0,2 \% \text{ MW} + 2 \text{ mm/s})$
	standard	$\pm (0,5 \% \text{ MW} + 1,5 \text{ mm/s})$
Repeatability		0,1% MW
Temperature monitoring		
Accuracy	[K]	$\pm 1 (v > 0,5 \text{ m/s})$
Repeatability	[K]	$\pm 0,5 (v > 0,5 \text{ m/s})$
Conductivity monitoring		
Accuracy (in the measuring range)	in the range of 100...20000 $\mu$ S/cm	$\pm 10\% \text{ MW}$
	in the range of 20000...100000 $\mu$ S/cm	$\pm 20\% \text{ MW}$
Repeatability		$\pm 5\% \text{ MW}$
Response times		
Volumetric flow monitoring		
Response time	[s]	< 0.3
Damping process value dAP	[s]	0...5
Temperature monitoring		
Response time	[s]	< 3; (v > 0,5 m/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

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Required master port type	A	
Process data analogue	6	
Process data binary	8	
Min. process cycle time [ms]	1.9	
IO-Link process data (cyclical)	<b>function</b>	<b>bit length</b>
	totaliser	32
	flow	32
	temperature	32
	conductivity	32
	status	4
	binary switching information	8
IO-Link functions (acyclical)	direction of flow detection; totaliser; memory; operating hours counter; internal temperature; simulation function	
Supported DeviceIDs	<b>Type of operation</b>	<b>DeviceID</b>
	default	1789

### Operating conditions

Ambient temperature [°C]	-20...65
Storage temperature [°C]	-20...80
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 no.	I031
Pressure Equipment Directive	Sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

### Mechanical data

Weight [g]	5399.3
Housing	cylindrical
Inlet pipe length	5 x DN
Outlet pipe length	2 x DN
Dimensions [mm]	Ø 125 / L = 140
Materials	housing: stainless steel (316L/1.4404); flange: stainless steel (304/1.4301); electronics fixture: stainless steel (304/1.4301); electronics: stainless steel (316L/1.4404); Display: polysulfone; Display-Sealing: FKM; LED ring: PP
Materials (wetted parts)	Pipe section: PFA; electrodes: stainless steel (316L/1.4435)
Nominal diameter	DN40 (1 1/2")
Process connection	ifm-specific device flange
Surface characteristics Ra/Rz of the wetted parts	Ra < 0.4 µm

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Displays / operating elements		
Display	process value	full graphics TFT display, multi-colour 3,5" 320 x 240 Pixel
		display layouts: 4
		display rotation: 4 x 90°
	operating status	LED ring, three-colour
	totaliser Display range	-999990...999990 m <sup>3</sup>
	totaliser Resolution	0,00001 m <sup>3</sup>
Display unit	l/min; l/h; hl/min; hl/h; m <sup>3</sup> /min; m <sup>3</sup> /h; m/s; µS/cm; S/m; ms/cm	
Factory setting	m <sup>3</sup> /h; °C; µS/cm	
Language	German; English; Spanish; French; Italian; Japanese; Korean; Portuguese; Chinese	
Operating elements	4	capacitive pushbuttons

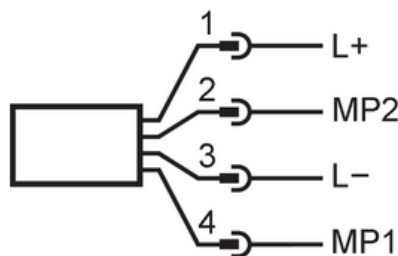
Remarks	
Remarks	MW = measured value
	MEW = Final value of the measuring range
	pulse and totaliser signal are only available for one of the two outputs
	reference conditions (1/2): water (free of gas bubbles), 15...35 °C, process connection: DIN32676 series A, pipe standard suitable for process connection
	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: 4, gold-plated



### Connection



### Electrical connection - plug

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

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