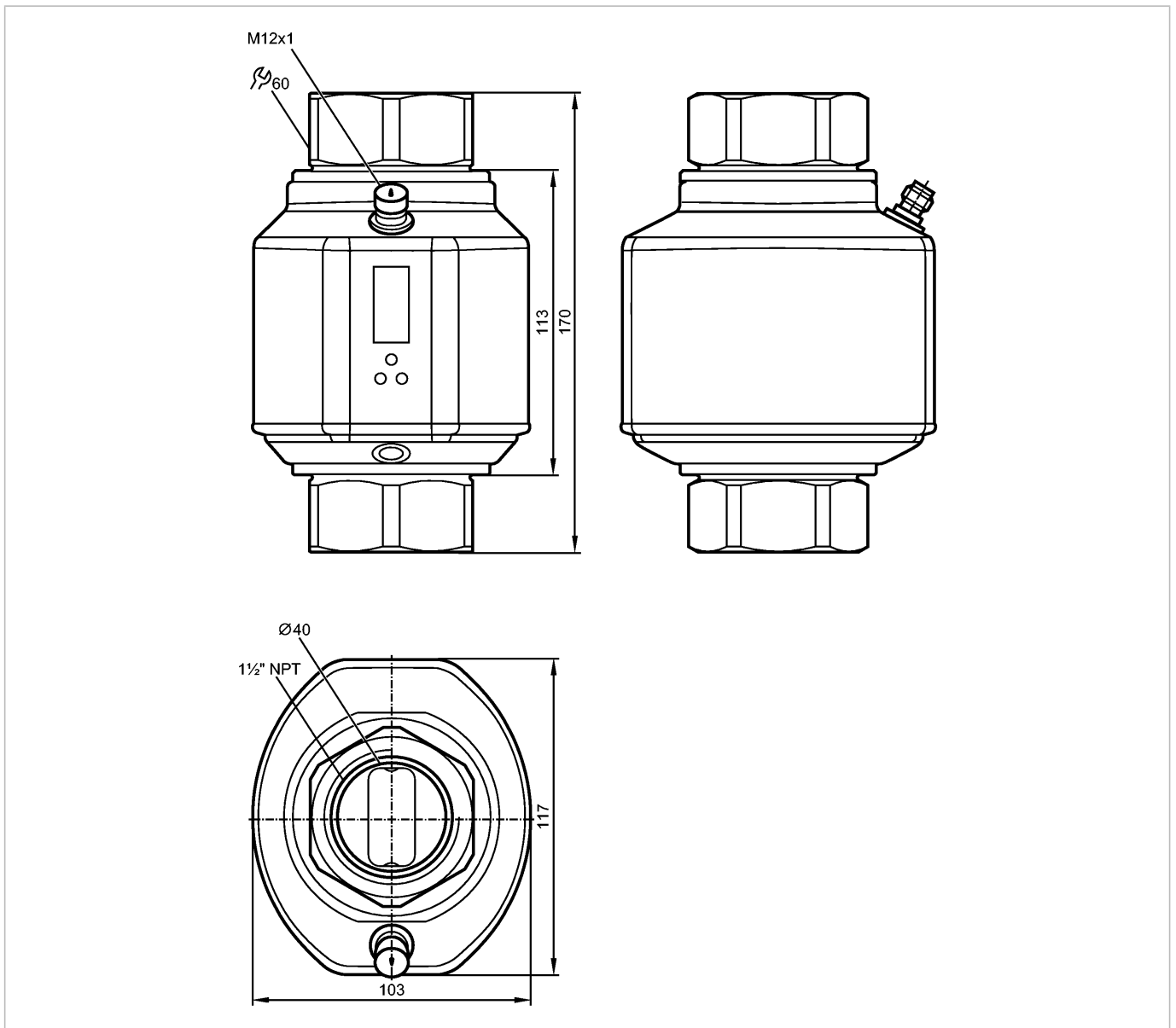


**SM9601**

SMN32XGXFRKG/US-100

Flow sensors



**Product characteristics**

Magnetic-inductive flow meter

Quick disconnect

Process connection: 1½" NPT

connection to pipe by means of an adapter

Function programmable

Totalizer function

Empty pipe detection

2 outputs

OUT1 = flow monitoring (binary), flow rate meter (pulse), preset meter (binary)

OUT2 = flow monitoring or temperature monitoring (analog or binary)

Input for counter reset

4-digit alphanumeric display

Measuring range

1.3...80 gpm

**Application**

**SM9601**

SMN32XGXFRKG/US-100

**Flow sensors**

Application	conductive liquids of the fluid group 2 according to the Pressure Equipment Directive (PED) (conductivity: $\geq 20 \mu\text{S/cm}$ / viscosity: $< 70 \text{ mm}^2/\text{s}$ at $40^\circ\text{C}$ )	
Pressure rating [bar]	16	
Medium temperature [°F]	14...158	

Electrical data		
Electrical design	DC PNP/NPN	
Operating voltage [V]	18...32 DC <sup>1)</sup>	
Current consumption [mA]	$< 150$	
Insulation resistance [MΩ]	$> 100$ (500 V DC)	
Protection class	III	
Reverse polarity protection	yes	

Outputs		
Output function	OUT1: normally open / normally closed programmable or pulse or frequency or empty pipe detection or IO-Link OUT2: normally open / normally closed programmable or analogue (4...20 mA; 0...10 V, scalable) or empty pipe detection	
Current rating [mA]	2 x 250	
Voltage drop [V]	$< 2$	
Short-circuit protection	yes (non-latching)	
Overload protection	yes	
Analog output	4...20 mA; 0...10 V	
Max. load [Ω]	500 (4...20 mA)	
Min. load [Ω]	2000 (0...10 V)	
Pulse output	flow rate meter	
Frequency range [Hz]	0.1...10000	

Measuring / setting range			
Empty pipe detection	normally closed / open		
Flow monitoring			
Measuring range	80...4800 gph	1.3...80 gpm	
Display range	-5760...5760 gph	-96...96 gpm	
Resolution	5 gph	0.1 gpm	
Set point, SP	105...4800 gph	1.7...80 gpm	
Reset point, rP	80...4775 gph	1.3...79.6 gpm	
Analog start point, ASP	0...3840 gph	0...64 gpm	
Analog end point, AEP	960...4800 gph	16...80 gpm	
Flow end point, FEP	320...4800 gph; 5.2...80 gpm		
Low flow cut-off, LFC	80...240 gph	1.3...4 gpm	
in steps of	5 gph	0.1 gpm	
Frequency end point, FrEP	0.01...10 kHz		
in steps of	10 Hz		
Measuring dynamics	1:60		
Volumetric flow quantity monitoring			
Measuring range [gal]	0.0...9999 E06		
Display range [gal]	0.0...9999 E06		
Set point, SP [gal]	0.02...9999 E06		
Pulse value	0.02...80 E06 gal		

## SM9601

SMN32XGXFRKG/US-100

Flow sensors

in steps of		0.02 gal
Pulse length	[s]	0.016...2
Temperature monitoring		
Measuring range	[°F]	-4...176
Display range	[°F]	-40...212
Resolution	[°F]	0.5
Set point, SP	[°F]	-2...176
Reset point, rP	[°F]	-3...175
Analog start point, ASP	[°F]	-4...140
Analog end point, AEP	[°F]	32...176
in steps of	[°F]	0.5

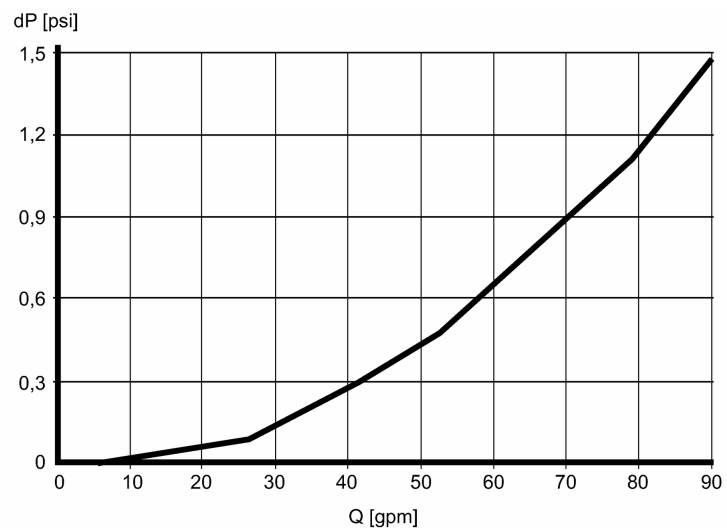
### Accuracy / deviations

#### Flow monitoring

Accuracy [% of the final value]  $\pm (0.8\% MW + 0.5\% MEW)^2$

Repeatability  $\pm 0.2\% MEW$

#### Pressure loss (dP) / flow rate (Q)



#### Temperature monitoring

Accuracy [K]  $\pm 1 (77\text{ °F}; Q > 4\text{ gpm})$

Temperature drift  $\pm 0.0185\text{ °F / K}$

### Reaction times

Power-on delay time [s] 5

#### Flow monitoring

Start-up delay [s] 0...50

Response time [s]  $< 0.35 (dAP = 0)$

Damping, dAP [s] 0...5

#### Temperature monitoring

Response time [s]  $T09 = 3 (Q > 4\text{ gpm})$

### Software / programming

Programming options Hysteresis / window; NO / NC; output logic; current / voltage / frequency / pulse output; start-up delay; display can be deactivated; display unit; empty pipe detection

### Interfaces

#### IO-Link Device

Transfer type COM2 (38.4 kBaud)

IO-Link revision 1.1

## SM9601

SMN32XGXFRKG/US-100

Flow sensors

SDCI standard	IEC 61131-9 CDV
IO-Link Device ID	392 d / 00 01 88 h
Profiles	Smart Sensor: Process Data Variable; Device Identification
SIO mode	yes
Required master port class	A
Process data analogue	3
Process data binary	2
Min. process cycle time [ms]	5

Environment	
Ambient temperature [°F]	14...140
Storage temperature [°F]	-13...176
Protection	IP 65 / IP 67

Tests / approvals	
Pressure equipment directive	article 3, section 3 - sound engineering practice
EMC	DIN EN 60947-5-9 DIN EN 61000-6-2
Shock resistance	DIN EN 60068-2-27 20 g (11 ms)
Vibration resistance	DIN EN 60068-2-6 5 g (10...2000 Hz)
MTTF [Years]	78

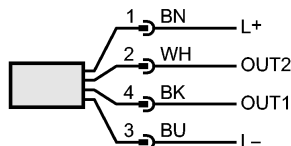
Mechanical data	
Process connection	1½" NPT
Materials (wetted parts)	stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEEK (polyether ether ketone); Hastelloy C-4 (2.4610); FKM
Housing materials	stainless steel 316L / 1.4404; stainless steel 316Ti / 1.4571; PEI; FKM; PBT-GF 20; elastolan
Weight [kg]	2.744

Displays / operating elements	
Display	Display unit 6 x LED green (gpm, gph, gal, °F, 10 <sup>3</sup> , 1000 x 10 <sup>3</sup> ) Switching status 2 x LED yellow Measured values 4-digit alphanumeric display Programming 4-digit alphanumeric display

Electrical connection	
Connection	M12 connector; gold-plated contacts

### Wiring

Core colors  
 BK black  
 BN brown  
 BU blue  
 WH white



Colours to DIN EN 60947-5-2

-----  
 OUT1: 6 options:  
 switching output empty pipe detection  
 switching output flow rate monitoring  
 frequency output flow rate monitoring  
 pulse output quantity meter  
 signal output preset counter



**SM9601**

SMN32XGXFRKG/US-100

IO-Link  
-----

OUT2: 6 options:  
switching output empty pipe detection  
switching output flow rate monitoring  
switching output temperature monitoring  
analogue output flow rate  
analogue output temperature  
Input for counter reset

**Accessories**

Accessories (included)	Label
------------------------	-------

**Remarks**

Remarks	<p>1) to DIN EN 50178, SELV, PELV 2) at 4 gpm, medium and ambient temperature +72 °F ± 7 °F MW = measured value MEW = final value of the measuring range</p>
---------	--

Pack quantity	[piece]	1
---------------	---------	---