

TURCK

DC Insertion Flow Monitors



FCS-N1/2 A4-NA-H1141
FCS-N3/4 A4-NA-H1141
FCS-G1/4 A4-NA-H1141
FCS-GL1/2 A4-NA-H1141/D500
FCS-G1/2 TN-NA-H1141
FCS-G1/2 HC22-NA
FCS-G1/4 A4-NA/D100
FCS-N1/2 A4-NA/D100
FCS-N1/2 T-NA
FCS-N3/4 T-NA

- Remote switch to be used with separate signal processor
- Dynamic pressure resistance:
 - Standard: up to 1450 psi
 - Extended: up to 7250 psi
- Temperature range:
 - Standard: 13° to 176°F
 - Extended: 32° to 212°F
- Housing material:
 - 316TI stainless steel
 - and Teflon

The insertion style flow monitors are used in applications where it is necessary to monitor liquid flows.

These devices are designed for direct installation into the pipeline by means of a pipe-tee or a welded pipe socket. The flow monitors are suitable for use in a 1/2 inch pipe diameter or larger.

The insertion style flow monitors are manufactured in 316TI stainless steel and Teflon. Models with extended temperature ranges are also available (denoted by the /D100 in part number.)

Insertion flow monitors are to be used in conjunction with a **TURCK** signal processor. All necessary settings for the correct function of the flow monitor are programmed at the signal processor.

MK96... *multimodul* style (see pages 53-58)

MS96... *multisafe* style (see pages 59-62)

Additional functions such as fluid temperature monitoring and off delay are provided when the flow monitor is used with a MS96-12R signal processor. Refer to pages 53-62 to select the appropriate processor for specific applications.

Notes: Ring gasket provided with G style flow monitors.

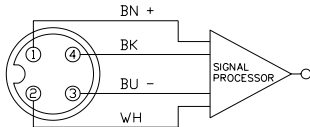
Ring gasket available for G1/4 style flow monitors. Consult factory.

Consult factory for other housing materials.

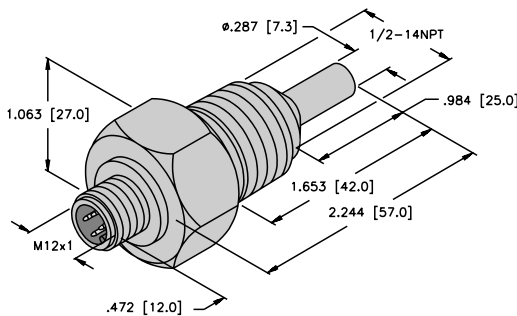
Insertion Flow Monitors 316TI Stainless Steel FCS-N1/2 A4-NA-H1141 FCS-N3/4 A4-NA-H1141

Type	FCS-N1/2 A4-NA-H1141	FCS-N3/4 A4-NA-H1141
ID Number	M6871303	M6871304
Temperature Range (fluid)	-25° to +80°C (-13° to +176°F) cont. up to 100°C (212°F) for approx. 10 min.	-25° to +80°C (-13° to +176°F) cont. up to 100°C (212°F) for approx. 10 min.
Operating Range (flow rate)		
Water	1-150 cm/s (2-295 ft./min.)	1-150 cm/s (2-295 ft./min.)
Oil	3-300 cm/s (6-590 ft./min.)	3-300 cm/s (6-590 ft./min.)
Repeatability	±5% of full range	±5% of full range
Time Delay Before Availability		
Switch ON time (above setpoint)	2-15 s (8 s typical)	2-15 s (8 s typical)
Switch OFF time (below setpoint)	1-13 s (2 s typical)	1-13 s (2 s typical)
Temperature gradient	1-15 s (2 s typical)	1-15 s (2 s typical)
Temperature gradient	max. 250°C/min. (450°F/min.)	max. 250°C/min. (450°F/min.)
Pressure Rating	1450 psi (100 bar)	1450 psi (100 bar)
Housing Material (DIN 2 462/17 440)	316TI stainless steel (1.4571)	316TI stainless steel (1.4571)
Enclosure (DIN 40 050)	IP 67, IP 65, NEMA 1,3,4,4x,12,13	IP 67, IP 65, NEMA 1,3,4,4x,12,13
Operating temperature	-25° to +80°C (-13° to +176°F)	-25° to +80°C (-13° to +176°F)
Torque	100 Nm (73.7 ft-lb)	100 Nm (73.7 ft-lb)

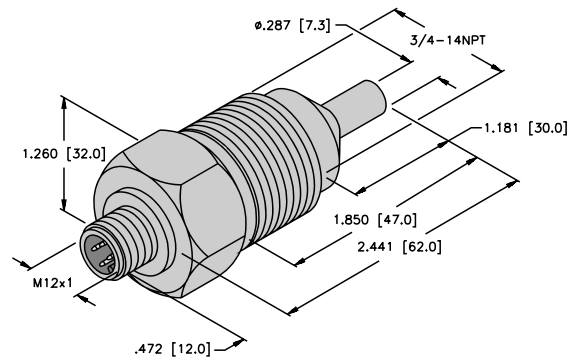
Connection	4-wire eurofast quick disconnect 150 m max. cable length (22 AWG) RK 4.4T-* or WK 4.4T-* (Page 65) * = length in meters	4-wire eurofast quick disconnect 150 m max. cable length (22 AWG) RK 4.4T-* or WK 4.4T-* (Page 65) * = length in meters
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See pages 53-62 for signal processor choices.



FCS-N1/2 A4-NA-H1141

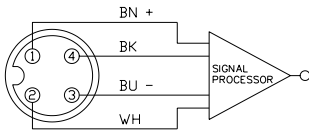


FCS-N3/4 A4-NA-H1141

Insertion Flow Monitors
316TI Stainless Steel
FCS-G1/4 A4-NA-H1141
FCS-GL1/2 A4-NA-H1141/D500

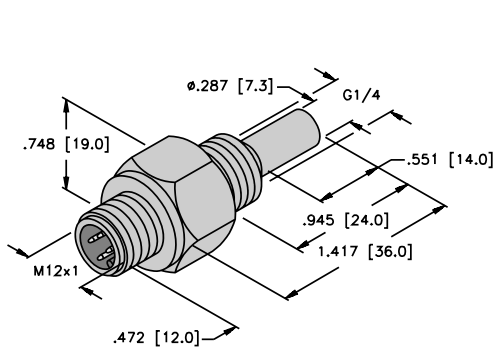
Type	FCS-G1/4 A4-NA-H1411	FCS-GL1/2 A4-NA-H1141/D500
ID Number	M6870304	M6870425
Temperature Range (fluid)	-25° to +80°C (-13° to +176°F) continu. up to 100°C (212°F) for approx. 10 min.	-25° to +80°C (-13° to +176°F) cont. up to 100°C (212°F) for approx. 10 min.
Operating Range (flow rate)		
Water	1-150 cm/s (2-295 ft/min)	1-150 cm/s (2-295 ft./min.)
Oil	3-300 cm/s (6-590 ft/min)	3-300 cm/s (6-590 ft./min.)
Repeatability	±5% of full range	±5% of full range
Time Delay Before Availability	2-15 s (8 s typical)	2-15 s (8 s typical)
Switch ON time (above setpoint)	1-13 s (2 s typical)	1-13 s (2 s typical)
Switch OFF time (below setpoint)	1-15 s (2 s typical)	1-15 s (2 s typical)
Temperature gradient	max. 250°C/min. (450°F/min)	max. 250°C/min. (450°F/min.)
Pressure Rating	1450 psi (100 bar)	7250 psi (500 bar)
Housing Material (DIN 2 462/17 440)	316TI stainless steel (1.4571)	316TI stainless steel (1.4571)
Enclosure (DIN 40 050)	IP 67, IP 65, NEMA 1,3,4,4x,12,13	IP 67, IP 65, NEMA 1,3,4,4x,12,13
Operating temperature	-25° to +80°C (-13° to +176°F)	-25° to +80°C (-13° to +176°F)
Torque	100 Nm (73.74 ft-lb)	100 Nm (73.7 ft-lb)

Connection
 4-wire **eurofast** quick disconnect
 150 m max. cable length (22 AWG)
 RK 4.4T -* or WK 4.4T -* (Page 65)
 * = length in meters

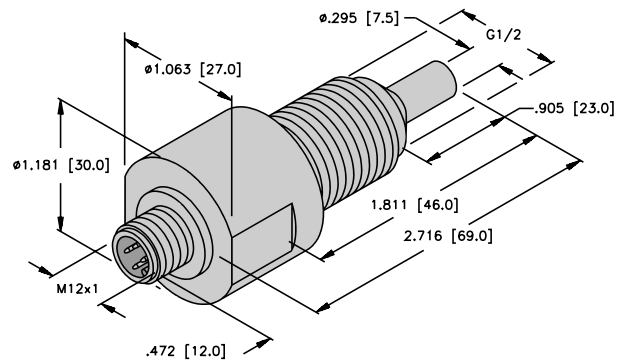


See pages 53-62 for signal processor choices.

NOTE: G threading refers to British parallel pipe (BSPP) threading.



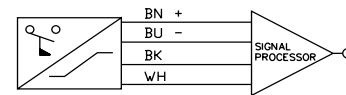
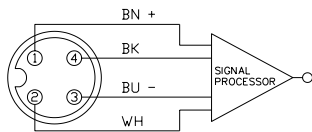
FCS-G1/4 A4-NA-H1141



FCS-GL1/2 A4-NA-H1141/D500

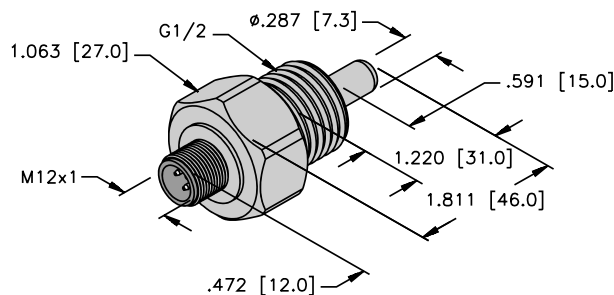
Insertion Flow Monitors For Corrosive Environments FCS-G1/2TN-NA-H1141 FCS-G1/2HC22-NA

Type	FCS-G1/2TN-NA-H1141	FCS-G1/2HC22-NA
ID Number	M6870311	M6870366
Temperature Range (fluid)	-25° to +80°C (-13° to +176°F) continue. up to 100°C (212°F) for approx. 10 min.	-25° to +80°C (-13° to +176°F) cont. up to 100°C (212°F) for approx. 10 min.
Operating Range (flow rate)		
Water	1-150 cm/s (2-295 ft/min)	1-150 cm/s (2-295 ft./min.)
Oil	3-300 cm/s (6-590 ft/min)	3-300 cm/s (6-590 ft./min.)
Repeatability	±5% of full range	±5% of full range
Time Delay Before Availability	2-15 s (8 s typical)	2-15 s (8 s typical)
Switch ON time (above setpoint)	1-13 s (2 s typical)	1-13 s (2 s typical)
Switch OFF time (below setpoint)	1-15 s (2 s typical)	1-15 s (2 s typical)
Temperature gradient	max. 250°C/min. (450°F/min)	max. 250°C/min. (450°F/min.)
Pressure Rating	1450 psi (100 bar)	1450 psi (100 bar)
Housing Material (DIN 2 462/17 440)	Titanium, B3 (3.7035) with ceramic coating	Hastelloy C22 (2.4602)
Enclosure (DIN 40 050)	IP 67, IP 65, NEMA 1,3,4,4x,12,13	IP 68, IP 65, NEMA 1,3,4,4x,12,13
Operating temperature	-25° to +80°C (-13° to +176°F)	-25° to +80°C (-13° to +176°F)
Torque	100 Nm (73.74 ft-lb)	100 Nm (73.7 ft-lb)
Connection	4-wire eurofast quick disconnect 150 m max. cable length (22 AWG) RK 4.4T -* or WK 4.4T -* (Page 65) * = length in meters	Teflon cable, 4-wire 2 m standard length (24 AWG)

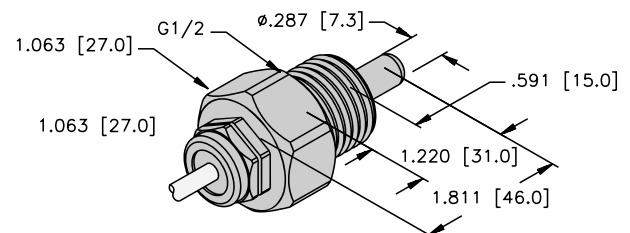


See pages 53-62 for signal processor choices.

NOTE: G threading refers to British parallel pipe (BSPP) threading.



FCS-G1/2TN-NA-H1141



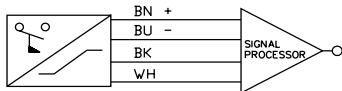
FCS-G1/2HC22-NA

TURCK

DC Insertion Flow Monitors

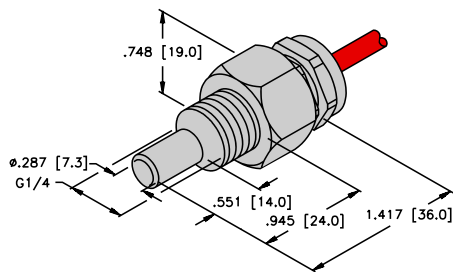
Insertion Flow Monitors 316 Stainless Steel with Extended Temperature Range FCS-G1/4 A4-NA/D100 FCS-N1/2 A4-NA/D100

Type	FCS-G1/4 A4-NA/D100	FCS-N1/2 A4-NA/D100
ID Number	M6870411	M6871412
Temperature Range (fluid)	0° to +120°C (32° to +248°F) cont.	0° to +120°C (32° to +248°F) cont.
Operating Range (flow rate)		
Water	1-150 cm/s (2-295 ft/min)	1-150 cm/s (2-295 ft/min)
Oil	3-300 cm/s (6-590 ft/min)	3-300 cm/s (6-590 ft/min)
Repeatability	±5% of full range	±5% of full range
Time Delay Before Availability	2-15 s (8 s typical)	2-15 s (8 s typical)
Switch ON time (above setpoint)	1-13 s (2 s typical)	1-13 s (2 s typical)
Switch OFF time (below setpoint)	1-15 s (2 s typical)	1-15 s (2 s typical)
Temperature gradient	max. 250°C/min. (450°F/min)	max. 250°C/min. (450°F/min)
Pressure Rating	1450 psi (100 bar)	1450 psi (100 bar)
Housing Material (DIN 2 462/17 440)	316TI stainless steel (1.4571)	316TI stainless steel (1.4571)
Enclosure (DIN 40 050)	IP 67, IP 65, NEMA 1,3,4,4x,12,13	IP 67, IP 65, NEMA 1,3,4,4x,12,13
Operating temperature	-25° to +100°C (-13° to +212°F)	-25° to +100°C (-13° to +212°F)
Torque	100 Nm (73.7 ft-lb)	100 Nm (73.7 ft-lb)
Connection	Teflon [®] cable, 4-wire 2 m standard length (24 AWG)	Teflon cable, 4-wire 2 m standard length (24 AWG)

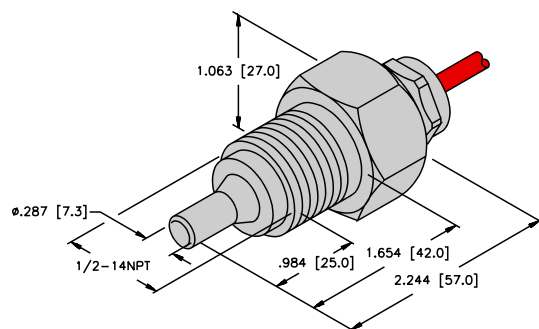


See pages 53-62 for signal processor choices.

Note: G threading refers to British parallel pipe (BSPP) threading.



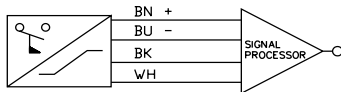
FCS-G1/4 A4-NA/D100



FCS-N1/2 A4-NA/D100

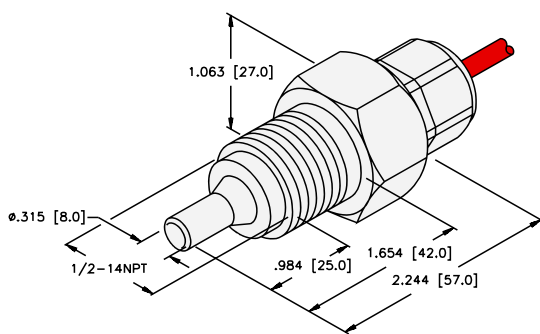
Insertion Flow Monitors Teflon® Housing FCS-N1/2 T-NA FCS-N3/4 T-NA

Type	FCS-N1/2 T-NA	FCS-N3/4 T-NA
ID Number	M6871422	M6871312
Temperature Range (fluid)	-10° to +70°C (14° to +158°F)	-10° to +70°C (14° to +158°F)
Operating Range (flow rate)		
Water	1-70 cm/s (2-138 ft/min)	1-70 cm/s (2-138 ft/min)
Oil	2-100 cm/s (4-197 ft/min)	2-100 cm/s (4-197 ft/min)
Repeatability	±5% of full range	±5% of full range
Time Delay Before Availability ¹⁾	40-100 s (60 s typical)	40-100 s (60 s typical)
Switch ON time (above setpoint) ¹⁾	20-50 s (30 s typical)	20-50 s (30 s typical)
Switch OFF time (below setpoint) ¹⁾	4-15 s (6 s typical)	4-15 s (6 s typical)
Temperature gradient	30°C/min. typical (54°F/min)	30°C/min. typical (54°F/min)
Pressure Rating	72 psi (5 bar)	72 psi (5 bar)
Housing Material	PTFE (Teflon)	PTFE (Teflon)
Enclosure (DIN 40 050)	IP 67, IP 65, NEMA 1,3,4,4x,12,13	IP 67, IP 65, NEMA 1,3,4,4x,12,13
Operating temperature	-10° to +70°C (14° to +158°F)	-10° to +70°C (14° to +158°F)
Torque	5 Nm (3.7 ft-lb)	5 Nm (3.7 ft-lb)
Connection	Teflon cable, 4-wire 2 m standard length (24 AWG)	Teflon cable, 4-wire 2 m standard length (24 AWG)

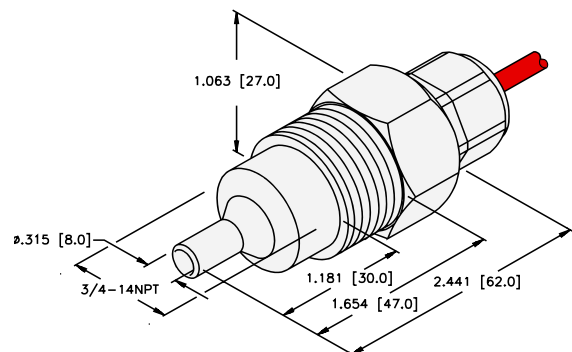


See pages 53-62 for signal processor choices.

1) Medium: water; flow rate 20 cm/s



FCS-N1/2 T-NA



FCS-N3/4 T-NA

TURCK

DC Insertion Flow Monitors



FCS-G1/4 A4-NAEx FCS-GL1/2 A4-NAEx/D500

- **Intrinsically safe insertion flow sensors with approval for zone 1, EEx ib IIC T6**
- **Switch-point accuracy during changes in flow temperature**
- **Enclosure meets IP 67**
- **Connection to intrinsically safe signal processors only**
- **316TI stainless steel housing**
- **Temperature range -20 to +70 C**
- **Pressure resistant up to 870 psi**

The FCS B series insertion flow sensor is used to monitor liquid flow speeds in hazardous areas. (The term “FCS B” is used to class all insertion-style sensors approved for use in zone 1 hazardous areas).

The device installs directly into the flow stream via a pipe tee or welded pipe socket, with the sensing probe positioned into the flow, which makes it ideal for a wide variety of pipe diameters.

This monitor requires an intrinsically safe signal processor to operate. The following signal processors are available:

MS96-11Ex-R: 50 mm wide modular housing (see page 59)

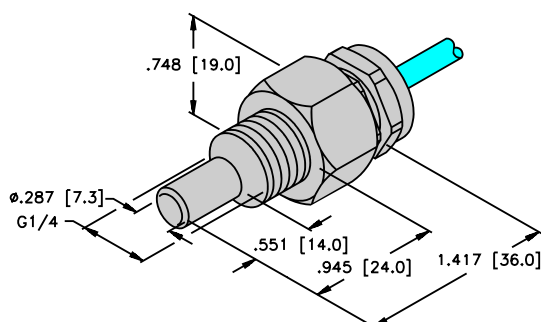
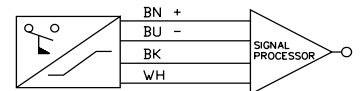
MC96...Ex: 19” Eurocard

All necessary settings for the correct function of the sensor are programmed on the signal processor.

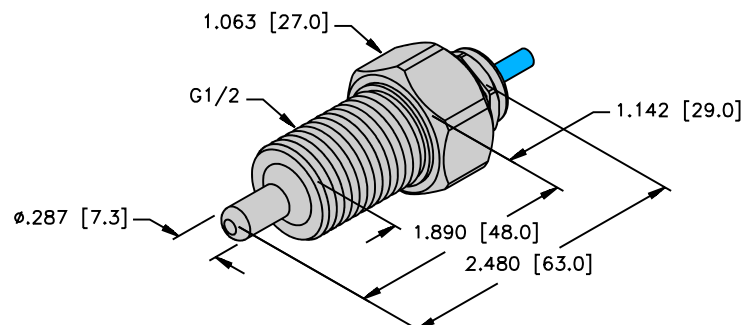
Insertion Flow Monitors Intrinsically Safe FCS-G1/4 A4-NAEx FCS-GL1/2 A4-NAEx/D500

Type	FCS-G1/4 A4-NAEx	FCS-GL1/2 A4-NAEx/D500
ID Number	M6870315	M6870431
Hazardous Area Approvals	PTB No Ex-94.C.4013 ASEV 94.1 00369X intrinsically safe, EEx ib IIC T6	
Protection class		
Maximum nominal values		
- Power P	0.69 W	
- External inductances / capacitances	negligible	
Temperature class	T6: $T_m \leq 50^\circ\text{C}$	
(depending on medium temperature T_m)	T5: $T_m \leq 65^\circ\text{C}$	
	T4: $T_m \leq 70^\circ\text{C}$	
Temperature Range (flow)	-20° to +85°C (-4° to +185°F)	
Operating Range (flow rate)		
Water	1-100 cm/s	
Oil	3-200 cm/s	
Repeatability	±5% of full range	
Time Delay Before Availability	2-15 (8 s typical)	
Switch ON time	1-13 (2 s typical)	
Switch OFF time	1-15 (2 s typical)	
Response time to change in temperature	≤12 s	
Temperature gradient	max. 250 K/min	
Pressure Rating	870 psi (60 bar)	7250 psi (500 bar)
Housing Material (DIN 2 462/ 17440)	316Ti stainless steel (1.4571)	
Protection type (IEC 60529/EN 60529)	IP 67, NEMA 1,3,4,4x,12,13	
Ambient temperature rating	-20° to +70°C (-4° to +158°F)	
Torque	100 Nm	
Accessories	2 sealing rings	
Connection	PUR cable, 4/24 AWG 2 m standard length (other lengths upon request) See pages 55-64 for signal processor choices.	

Note: G threading refers to British parallel pipe (BSPP) threading.



FCS-G1/4 A4-NAEx



FCS-GL1/2 A4-NAEx/D500