

Description

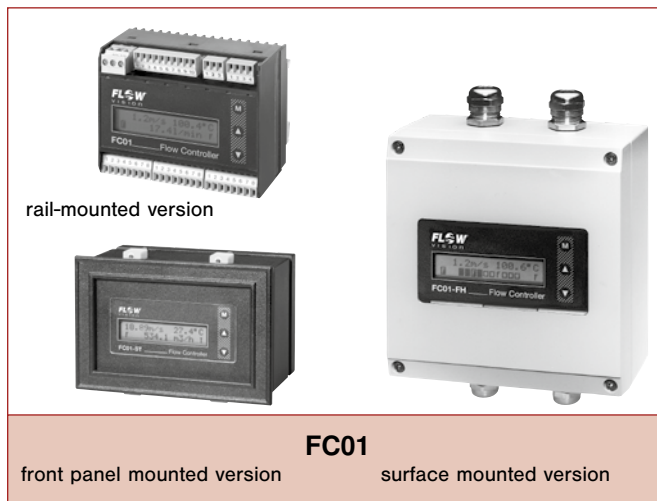
Microcontroller operated Flow Meter to monitor and display flow rates and temperature. Once correctly adjusted it can also be used for mass flow measurements. Factory preset for air and water.

Features

- Menu driven (keypads)
- LC display (2 x 16 digits) of:
 - actual flow velocity, volume flow, temperature
 - bargraph status indication of limit contacts, actual flow rate/quantity or temperature
 - directions for parameter assignment, configuration, diagnosis and error correction
 - base value indication
- Two scalable analogue outputs
- Minimum/maximum memory of flow rate and temperature
- Two freely selectable limit contacts
- Quantity-related pulse output
- Versions for rail, front panel and surface mounting

Ordering information FC01

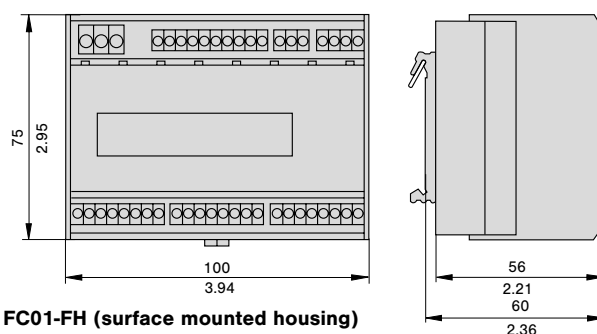
Type	
FC01	Flow Meter, in rail-mounted housing
FC01-FH	Flow Meter, in surface mounted housing (IP65)
FC01-ST	Flow Meter, in front panel mounted housing (IP65)
Input voltage	
U1	DC 19 ... 32 V
Signal outputs	
R2	2 relay outputs (2 limit values)
T4	4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)
Analogue outputs	
C1	0/4-20 mA (self-powered, physically isolated)
Specification of medium	
xxx	
FC01 - U1 R2 C1 - ...	ordering example



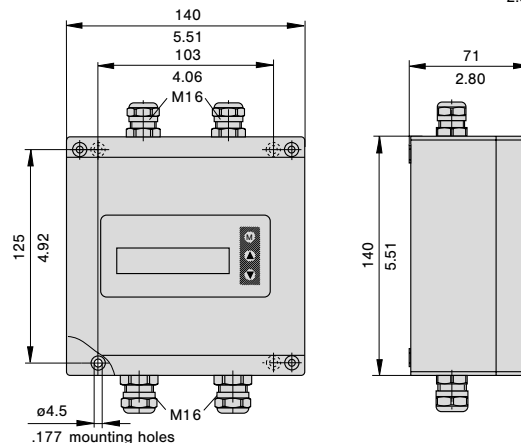
FC01
 rail-mounted version front panel mounted version surface mounted version

Dimensions

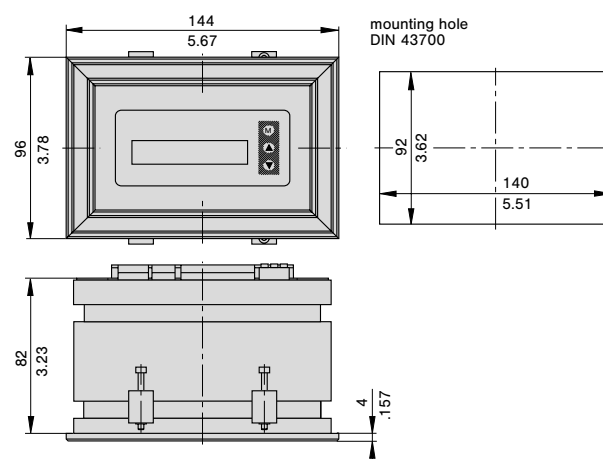
FC01 (rail-mounted housing)



FC01-FH (surface mounted housing)



FC01-ST (front panel mounted housing)



This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

TECHNICAL DATA

Flow Meter FC01		with CST/CSF calorimetric monitoring heads	with TST turbine type sensors
General data			
Suitable for		gases, liquids (water, oil etc.)	gases, liquids (clean and particle-free)
Measuring functions		flow velocity, volume flow, temperature	flow velocity, volume flow
Display		2 x 16-digit LC display	
Parameter assignment, calibration by		keypads	
Temperature range (electronic control unit in circulating air)		+10 ... +50 °C/+50 ... +122 °F *)	
Electrical data			
Input voltage		DC 24 V (18 ... 32 V)	
Power consumption		DC 200 mA **)	DC 110 mA
Analogue outputs	flow and temperature (temperature N/A with TST heads)	0/4-20 mA or 0/2-10 V or 0/1-5 V	
Signal outputs	2 relay outputs (2 limit values)	2 SPDT contacts AC/DC 50 V/1 A/50 W	
	4 transistor outputs (2 limit values + 2 status, or 2 limits values + 1 status + 1 pulse output)	open collector outputs DC 36 V/150 mA/1,5 W	
Flow measurement			
Measuring range (display range)	water	0,05 ... 3 m/s (0 ... 4 m/s)/	0,1 ... 5 m/s (0 ... 5 m/s)/
	air	0,1 ... 20 m/s (0 ... 100 m/s)/ standard flow speed referred to 20 °C and 1,01325 bar	1 ... 20 m/s (0 ... 20 m/s)/
Accuracy (related to the velocity at the sensor)	water	see failure diagram	± 1 % of measuring range final value, ± 3 % of measured value
	air	see failure diagram	± 1 % of measuring range final value, ± 3 % of measured value
Repeatability ⁽¹⁾ (5 % ... 100 % of measuring range final value)	water	≤ 1 % of measured value	≤ 0,5 % of measured value
	air	≤ 1 % of measured value	≤ 0,5 % of measured value
Temperature drift ⁽⁴⁾ (electronic control unit)	water	0,35 %/°C/MRFV / 0,63 %/°F/MRFV	none
	air	0,1 %/°C/MRFV / 0,18 %/°F/MRFV	none
Response delay	water ⁽²⁾	2,5 s	1 s
	air ⁽³⁾	3 s	1 s
Temperature measurement	measuring range	-40 ... +130 °C/-40 ... +266 °F	N/A
	accuracy	± 1 % of measuring range	
Mechanical data (electronic control unit)			
Degree of protection	rail-mounted	IP20	
	surface mounted	IP66	
	front panel mounted	IP65	
Materials	rail-mounted	acrylic vinyl/ styrene/ polycarbonate; heat sink aluminium	
	surface mounted	aluminium Acryl	
	front panel mounted	aluminium, black coated; display polyester foil	
Housing dimensions (LxWxH)		see dimension diagram (previous page)	
Weight	rail-mounted	485 g/1.07 lb	
	surface mounted	1250 g/2.76 lb	
	front panel mounted	900 g/1.98 lb	
Cables	voltage supply	3x0,75 mm ² (AWG 18)	
	to monitoring head	LifYCY 4x2x0,2 mm ² (AWG 24)	LifYCY 3x0,35 mm ² (AWG 22)
	analogue outputs	2 x LifYCY 2x0,25 mm ² (AWG 24)	2 x LifYCY 2x0,25 mm ² (AWG 24)
	limit value output	2 x LifYCY 3x0,38 mm ² (AWG 22)	2 x LifYCY 3x0,38 mm ² (AWG 22)
Max. cable length to monitoring head		200 m/656 ft	

*) With output C1 the max. admissible ambient temperature for the rail-mounted version is limited to +40 °C/104 °F.

***) With output C1, power consumption may be up to 300 mA ±10 %.

⁽¹⁾ of the set value, at constant temperature and flow conditions, and stable thermal conductivity.

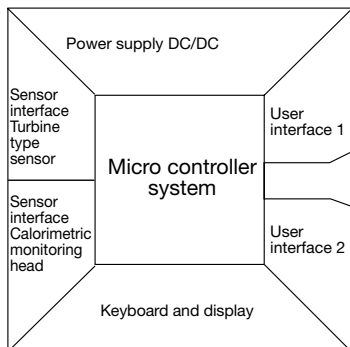
⁽²⁾ Delay with the switch point set to 1 m/s / 3.28 fps and the flow at 2 m/s / 6.56 fps, after a sudden complete stop.

⁽³⁾ Delay with the switch point set to 10 m/s / 32.8 fps and the flow at 20 m/s / 65.6 fps, after a sudden complete stop.

⁽⁴⁾ Warm-up time to full accuracy: 15 minutes.

MRFV = measuring range final value

Block diagram



Input voltage: DC 19...32 V

Keyboard/display: keypads
LC display
2 x 16 digits

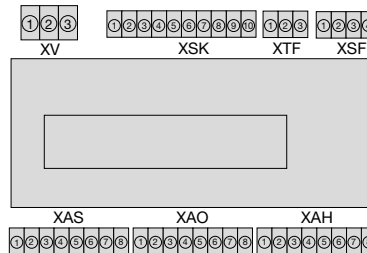
User interface 1: relay outputs: 2 limit values
transistor outputs: 2 limit values +
1 error indication +
1 busy or pulse output (software selected)

User interface 2: analogue outputs
current or voltage

Controller system: signal processing
I/O - controlling
monitoring
parameter memory

Sensor interfaces: calorimetric monitoring head
and turbine type sensor

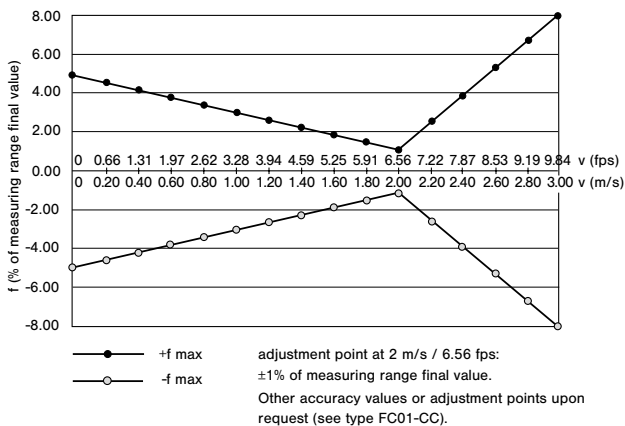
Connection diagram



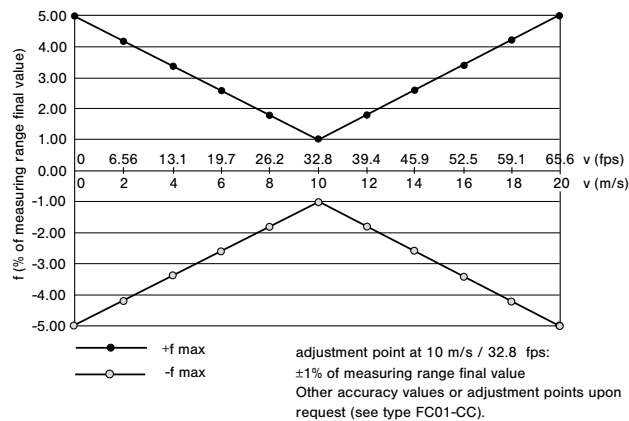
Wire size: 0.14 mm² to 1.5 mm² single or stranded conductor
Strip length: 6.5 mm
Clamping screw: M2 (nickel-plated brass)
Contact material: pre-tinned tin bronze

XV: power supply
XSK: calorimetric monitoring head
XTF: keyboard release
XSF: turbine-type sensor
XAS: not released for user
XAO: analogue outputs
XAH: signal outputs

Failure diagram for water

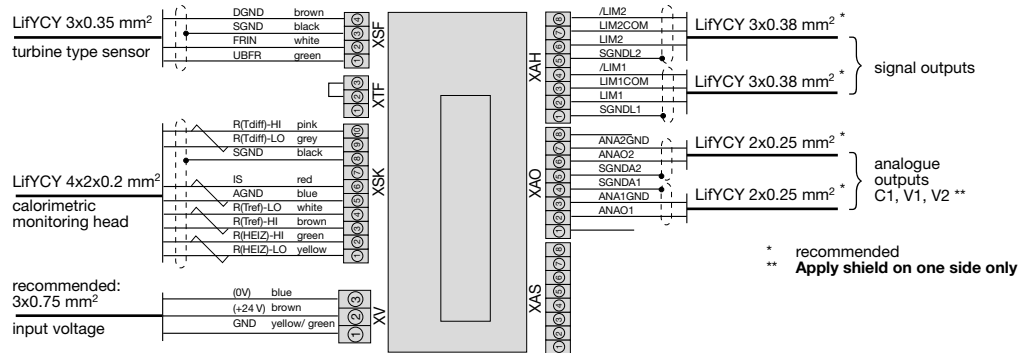


Failure diagram for air

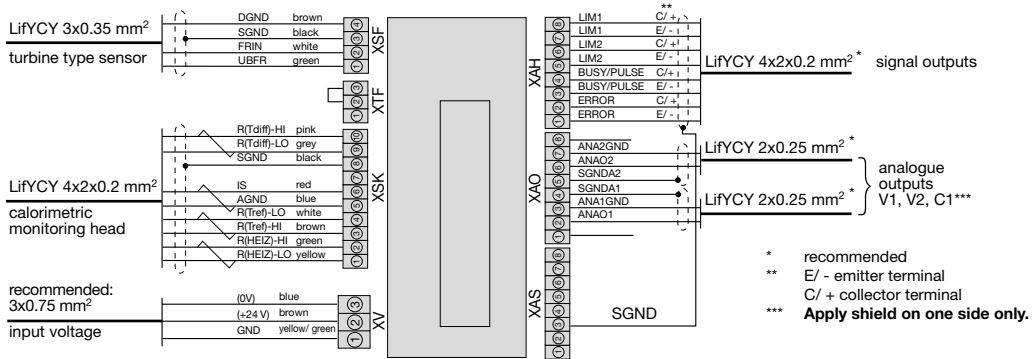


Connection diagrams

FC01 with relay outputs

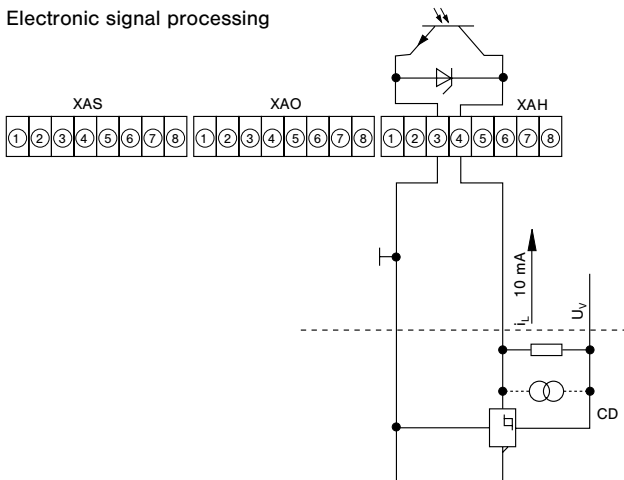


FC01 with transistor outputs

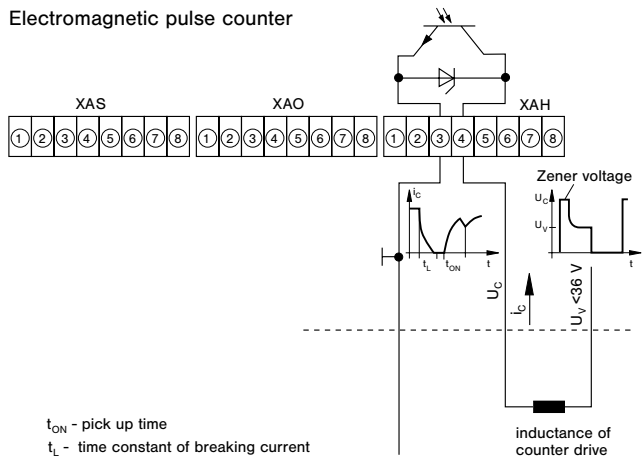


FC01 - Recommended connection of pulse output

Electronic signal processing



Electromagnetic pulse counter



All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.

Description

Thread-mounted calorimetric monitoring head for flow Meter FC01, suitable for general industry applications.

Features

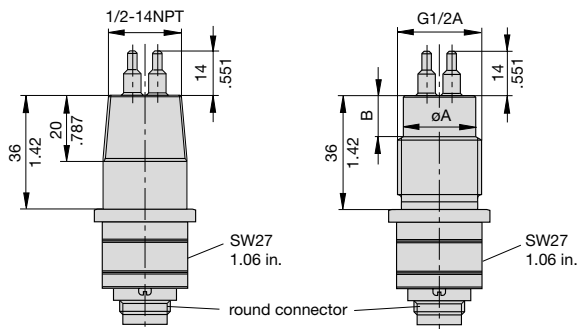
- Suitable for installation in welding bushes
- Medium temperature: -40 °C ... +130 °C/-40 °F ... +266 °F
- Material: stainless steel 1.4571/AISI 316 Ti, Hastelloy alloy C4 2.4610 or titanium G7 3.7235

Ordering information

Type No.	
CST	Thread-mounted monitoring head with calorimetric sensors
	Process connection
01	thread size G1/2A
03	thread size NPT 1/2"
	Medium
A	air
W	water
	Material of areas exposed to medium
M1	stainless steel 1.4571/AISI 316 Ti (standard)
M2	nickel-based alloy Hastelloy alloy C4 2.4610
M6	titanium G7 3.7235
	Length of shank/thread
L10	36 mm/1.42 in. (standard)
	Electrical connection
E10	round connector with tinned contacts (plug and cable to order separately)
	Certification
T0	without certificate (standard) *
	Specification of medium
xxx	
CST - 01 A M1 L10 E10 T0 - ...	ordering example

*) for detailed information please see section 0.

Dimensions



	øA		B	
	mm	inch	mm	inch
G1/2A	18	.709	10	.394

This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

Thread-mounted calorimetric monitoring head



CST-01

Technical data

Type of head	thread-mounted
Thread	G1/2A (standard), NPT 1/2"
Length of shank	36 mm/1.42 in.
Length of sensor	14 mm/.551 in.
Suitable for	air, water
Temperature range *)	-40 °C ... +130 °C/-40 °F ... +266 °F
(of gas/water)	
Temperature drift of monitoring head	± < 0.05 %/°C/measuring range / ± < 0.09 %/°F/measuring range (T = +20 °C ... +80 °C/+68 °F ... +176 °F)
Measuring ranges	
air:	0 ... 20 m/s / 0 ... 65.6 fps
water:	0 ... 3 m/s / 0 ... 9.84 fps
Pressure resistance ⁽¹⁾	100 bar/1450 psi
Degree of protection ⁽²⁾	IP67
Material	stainless steel 1.4571/AISI 316 Ti Hastelloy C4 2.4610 titanium G7 3.7235
Cable to electronic control unit	LifYCY 4x2x0.2 mm ² /4x2x0.31·10 ⁻³ in. ² (AWG 24)

⁽¹⁾ Admissible operating pressure DIN 2401, measured at max. temperature (= max. medium temperature)

⁽²⁾ with mating connector

^{*)} max. +85 °C/+185 °F in the connector area

Cable types 15/18 with connectors

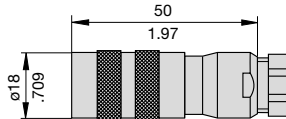


Do + Ka type 15
Do + Ka type 18

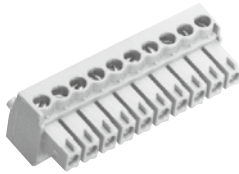
Do + Ka type 15-ST
Do + Ka type 18-ST

Accessories

8-pole round connector
(without cable, for individual wiring by customer)
OZ112Z003124



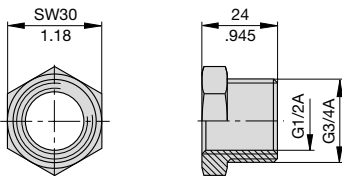
10-pole clamping connector for cable types 15 and 18
(without cable, for individual wiring by customer)
OZ112Z000167



10-pole clamping connector for cable types 15-ST and 18-ST
(without cable, for individual wiring by customer)
OZ112Z000205



Reducing piece
from G3/4 to G1/2
Material: stainless steel 1.4571/AISI Ti 316
OZ032Z000149



This is a metric design and millimeter dimensions take precedence (^{mm}/_{inch})

Caution: Standard warranty cover will be invalidated if the correct FlowVision monitoring head/control unit connecting cable is not used.

Description

Cable between Flow Meter FC01-xxx and calorimetric monitoring head type CST.

- Connection to monitoring head by means of 8-pole round connector
- Connection to FC01-xxx by means of 10-pole clamping connector (XSK)

Technical data

Cable type 15 and 15-ST

Features: highly flexible, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance: 92 Ω/km

Insulation resistance: 20 MΩ x km

Operating voltage: 250 V

Withstand voltage: 500 V

Max. load: 2 A

Temperature range: -10 °C ... +80 °C/+14 °F ... +176 °F (processing and operation)
-30 °C ... +80 °C/-22 °F ... +176 °F (transport and storage)

Cable type 18 and 18-ST

Features: non-halogenous, highly flexible, cold- and heat resistant, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance: 80 Ω/km

Insulation resistance: 1200 MΩ x km

Operating voltage: 300 V

Withstand voltage: 1500 V

Max. load: 3 A

Temperature range: -50 °C ... +180 °C/-58 °F ... +356 °F

Ordering information

Type between calorimetric monitoring heads CST and FC01, FC01-FH

Do + Ka type 15 PVC insulated cable, type LiYCY 4x2x0.2 mm² (AWG 24)

8-pole round connector + 10-pole clamping connector

Do + Ka type 18 silicone insulated cable, type 4x2x0.2 mm² (AWG 24)

8-pole round connector + 10-pole clamping connector

Available cable lengths

...m 2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)

Do + Ka type 15 - 2 m/6.56 ft ordering example

Type between calorimetric monitoring heads CST and FC01-ST

Do + Ka type 15-ST PVC insulated cable, type LiYCY 4x2x0.2 mm² (AWG 24)

8-pole round connector + 10-pole clamping connector

Do + Ka type 18-ST silicone insulated cable, type 4x2x0.2 mm² (AWG 24)

8-pole round connector + 10-pole clamping connector

Available cable lengths

...m 2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)

Do + Ka type 15-ST - 2 m/6.56 ft ordering example

Description

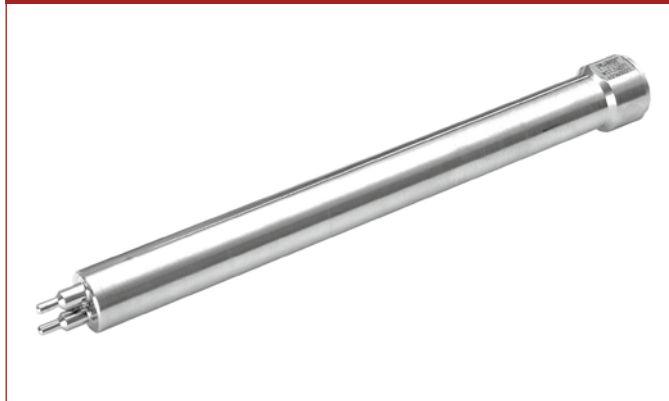
Extended calorimetric monitoring head with variable immersion depth for Flow Meter FC01, suitable for use in pipelines with process connections DN 50 plus.

Caution: Fix with locking set 01 (see accessories).

Features

- Medium temperature range: -40 °C ... +130 °C/-40 °F ... +266 °F
- Material: stainless steel 1.4571/AISI 316 Ti

Monitoring head CSF



CSF
variable immersion depth

Ordering information

Type	CSF	Extended monitoring head with calorimetric sensors
Monitoring head design	01	Monitoring head with variable immersion depth
Medium	A	air
	W	water
Material of areas exposed to medium	M1	stainless steel 1.4571/AISI 316 Ti
Process connection	00	without flange; see accessories for connections
Length of shank/thread	L43	188 mm/7.40 in. (standard) other lengths upon request
Electrical connection	E10	round connector with tinned contacts (plug and cable to order separately)
Certification	T0	without certificate (standard *)
Specification of medium	xxx	

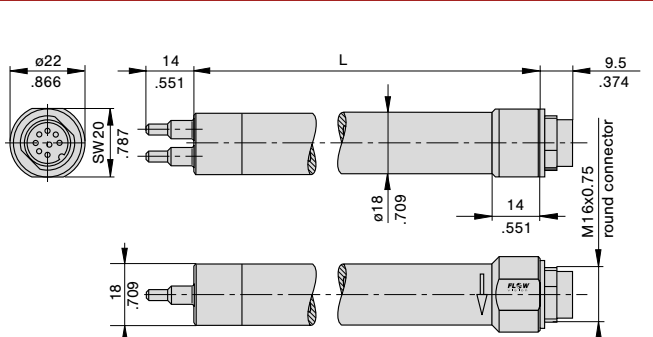
CSF - 01 A M1 00 L43 E10 T0 - ... ordering example

*) for detailed information please see section 0

Technical data

Type of head	push-in
Shank diameter	18 mm/.709 in.
Length of shank	188 mm/7.40 in.
Length of sensor	14 mm/.551 in.
Suitable for	air, water
Temperature range*)	-40 °C ... +130 °C/-40 °F ... +266 °F (of gas/water)
Temperature drift of sensor	± < 0.05 %/°C/measuring range ± < 0.09 %/°F/measuring range (T = +20 °C ... +80 °C/+68 °F ... +176 °F)
Measuring ranges	air: 0 ... 20 m/s / 0 ... 65.6 fps (atm. press.) water: 0 ... 3 m/s / 0 ... 9.84 fps
Pressure resistance (1)	100 bar/1450 psi (sensor)
Pressure resistance (1)	depending on connection (see accessories)
Degree of protection (2)	IP67
Material	stainless steel 1.4571/AISI 316 Ti
Cable to electronic unit	LifYCY 4x2x0.2 mm ² /4x2x0.31·10 ⁻³ in. ² (AWG 24)

Dimensions



Type	L	
	mm	inch
CSF-...L43...	188	7.40
CSF-...L30...	300	11.81
CSF-...L40...	400	15.75

monitoring head should be aligned in direction of flow (see arrow)

Only CSF-...L30... and CSF-...L40...:
Additional wetted o-ring (FKM)

This is a metric design and millimeter dimensions take precedence (mm/inch)

(1) Admissible operating pressure DIN 2401, measured at max. temperature (= max. medium temperature)
(2) with mating connector
*) max. +85 °C/+185 °F in the connector area

Cable types 15/18 with connectors



Do + Ka type 15
Do + Ka type 18

Do + Ka type 15-ST
Do + Ka type 18-ST

Technical data

Cable type 15 and 15-ST

Features: highly flexible, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance:	92 Ω/km
Insulation resistance:	20 MΩ x km
Operating voltage:	250 V
Withstand voltage:	500 V
Max. load:	2 A
Temperature range:	-10 °C ... +80 °C/+14 °F ... +176 °F (processing and operation) -30 °C ... +80 °C/-22 °F ... +176 °F (transport and storage)

Cable type 18 and 18-ST

Features: non-halogenous, highly flexible, cold- and heat resistant, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance:	80 Ω/km
Insulation resistance:	1200 MΩ x km
Operating voltage:	300 V
Withstand voltage:	1500 V
Max. load:	3 A
Temperature range:	-50 °C ... +180 °C/-58 °F ... +356 °F

Description

Cable between Flow Meter FC01-xxx and calorimetric monitoring head type CSF.

- Connection to monitoring head by means of 8-pole round connector
- Connection to FC01-xxx by means of 10-pole clamping connector (XSK)

Ordering information

Type between calorimetric monitoring heads CSF and FC01, FC01-FH

Do + Ka type 15	PVC insulated cable, type LiFYCY 4x2x0.2 mm ² (AWG 24) 8-pole round connector + 10-pole clamping connector
Do + Ka type 18	silicone insulated cable, type 4x2x0.2 mm ² (AWG 24) 8-pole round connector + 10-pole clamping connector

Available cable lengths

...m	2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)
------	---

Do + Ka type 15 - 2 m/6.56 ft ordering example

Type between calorimetric monitoring heads CSF and FC01-ST

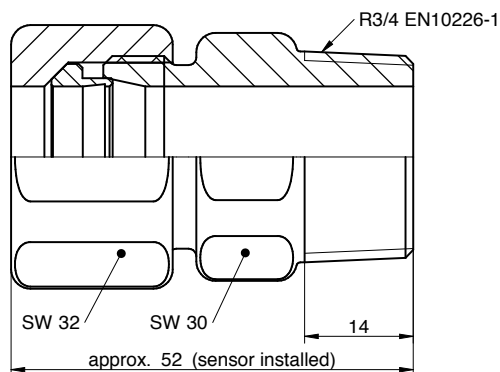
Do + Ka type 15-ST	PVC insulated cable, type LiFYCY 4x2x0.2 mm ² (AWG 24) 8-pole round connector + 10-pole clamping connector
Do + Ka type 18-ST	silicone insulated cable, type 4x2x0.2 mm ² (AWG 24) 8-pole round connector + 10-pole clamping connector

Available cable lengths

...m	2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)
------	---

Do + Ka type 15-ST - 2 m/6.56 ft ordering example

Compression fitting



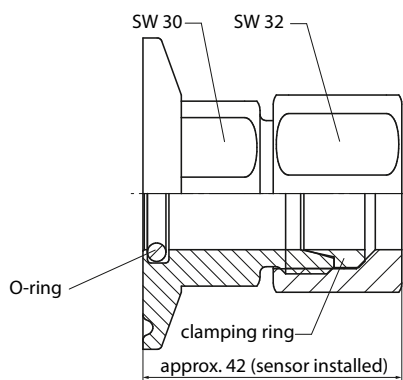
Description and ordering information

Compression fitting for push-in sensors with R3/4 thread

Compression fitting for push-in sensors

EEF	Compression fitting
Process connection	
04	Thread R3/4
Material double nipple and cap nut	
M1	Stainless steel 1.4571
M2	Hastelloy C4 2.4610
Material clamping ring	
CR1	Stainless steel 1.4571 PN 25 bar abs.
CR2	PTFE PN 5 bar abs.
CR3	Hastelloy C4 2.4610 PN 25 bar abs.
EEF - 04 - M1 - CR1	ordering example

Hygiene flange

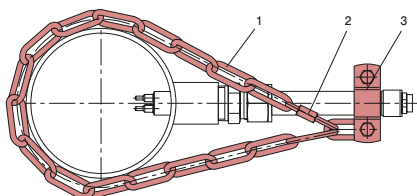


Description and ordering information

Hygiene flange for push-in sensors with front-flush o-ring with FDA approval

HEF	Hygiene flange
Process connection	
TF1	Triclamp DIN 32676
Material flange and cap nut	
M1	Stainless steel 1.4571
M2	Hastelloy C4 2.4610
O-ring	
R1	VMQ (Silicone) blue FDA (standard)
R2	VMQ (Silicone) white FDA
Material clamping ring	
CR1	Stainless steel 1.4571 PN 25 bar abs.
CR2	PTFE PN 5 bar abs.
CR3	Hastelloy C4 2.4610 PN 25 bar abs.
HEF - TF1 - M1 - R1 - CR1	ordering example

Locking set



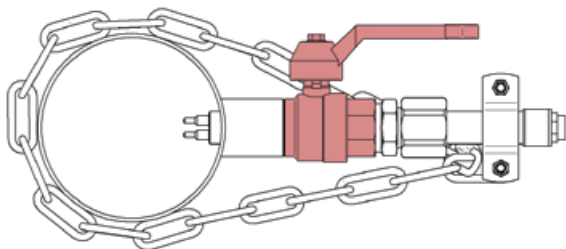
Description and ordering information

Locking set for push-in sensors.

- 1 Chain 4 x 32 DIN 5685 (approx. 1 m)
- 2 Catch for chain NG 5
- 3 Clip with screw and nuts DN15 to DIN 11850

Ordering no.: 0Z122Z000204

Ball valve for installation under pressure



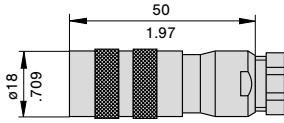
Description and ordering information

Material (body, ball): Brass nickel plated	Material (body, ball): Stainless steel 1.4408, 1.4401
Material (ball seal): PTFE	Material (ball seal): PTFE
Length: 65 mm	Length: 78 mm
Outside thread: G3/4", L = 13 mm	Outside thread: R3/4", L = 17 mm
Inside thread: G3/4", L = 15 mm	Inside thread: Rp3/4", L = 13 mm
Fluid temperature: -20...120 °C	Fluid temperature: -30...180 °C
Ambient temperature: 0...80 °C	Ambient temperature: 0...80 °C
Pressure: PN 25 bar (up to 80 °C)	Pressure: PN 64 bar (up to 80 °C)
Ordering number: BV-02M3-PI	Ordering number: BV-02M15-PI

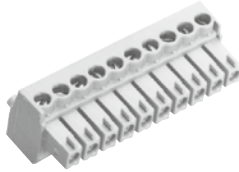
Further accessories

A

8-pole round connector
(without cable, for individual wiring by customer)
OZ112Z003124



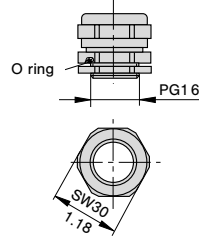
10-pole clamping connector for cable types 15 and 18
(without cable, for individual wiring by customer)
OZ112Z000167



10-pole clamping connector for cable types 15-ST and 18-ST
(without cable, for individual wiring by customer)
OZ112Z000205

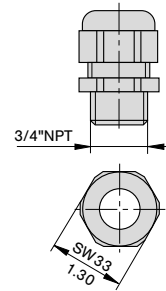


PG16 nickel-plated brass
(standard)
OZ122Z000128



pressure resistant up to 2 bar/29.0 psi

NPT3/4" moulded, black
OZ122Z000131



pressure resistant up to 2 bar/29.0 psi

This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

Caution: Standard warranty cover will be invalidated if the correct FlowVision monitoring head/control unit connecting cable is not used.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

B

Flange-mounted calorimetric monitoring head



CSF-03
Tri-Clamp

Technical data

Type of head	flange-mounted monitoring head
Process connection	DIN 32676 Tri-Clamp® DN 1
Shank dia.	18 mm/0.709 in.
Length of shank	15 mm/0.591 in.
Length of sensor	14 mm/0.551 in.
Suitable for	water
Temperature range *)	-40 °C...+130 °C/-40 °F ... +266 °F
Temperature drift of monitoring head	± < 0.05 %/°C/measuring range ± < 0.09 %/°F/measuring range (T = +20 ... +80 °C/+68 ... +176 °F)
Measuring range	0 ... 3 m/s / 0 ... 9.84 fps
Pressure resistance ⁽¹⁾	40 bar/580 psi
Degree of protection ⁽²⁾	IP67
Material	stainless steel 1.4571/AISI 316 Ti
Cable to electronic control unit	LifYCY 4x2x0.2 mm ² /4x2x0.31·10 ⁻³ in. ² (AWG 24)

⁽¹⁾ Admissible operating pressure DIN 2401, measured at max. temperature (= max. medium temperature)
⁽²⁾ with mating connector
^{*)} max. +85 °C/+185 °F in the connector area

Description

Flange-mounted calorimetric monitoring head for Flow Meter FC01. Recommended for food-processing (Tri-Clamp®).

Features

- Medium temperature range: -40 °C ... +130 °C/-40 °F ... +266 °F
- Material: stainless steel 1.4571/AISI 316 Ti

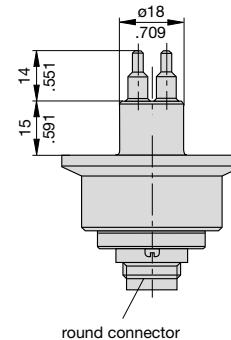
Ordering information

Type	CSF flange-mounted monitoring head with calorimetric sensors
Monitoring head design	03 monitoring head with flange DIN 32676
Medium	W water
Material of areas exposed to medium	M1 stainless steel 1.4571/AISI 316 Ti
Process connection	91 flange DIN 32676-Tri-Clamp® DN1
Length of shank/thread	L90 15 mm/0.591 in. (standard)
Electrical connection	E10 round connector with tinned contacts (plug and cable to separate order)
Certification	T0 without certificate (standard *)
Specification of medium	xxx

CSF - 03 W M1 91 L90 E10 T0 - ... ordering example

*) for detailed information please see section 0.

Dimensions



This is a metric design and millimeter dimensions take precedence (mm/inch)

Description

Cable between Flow Meter FC01-xxx and calorimetric monitoring head type CSF-03.

- Connection to monitoring head by means of 8-pole round connector
- Connection to FC01-xxx by means of 10-pole clamping connector (XSK)

Technical data

Cable type 15 and 15-ST

Features: highly flexible, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance:	92 Ω/km
Insulation resistance:	20 MΩ x km
Operating voltage:	250 V
Withstand voltage:	500 V
Max. load:	2 A
Temperature range:	-10 °C ... +80 °C/+14 °F ... +176 °F (processing and operation) -30 °C ... +80 °C/-22 °F ... +176 °F (transport and storage)

Cable type 18 and 18-ST

Features: non-halogenous, highly flexible, cold- and heat resistant, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance:	80 Ω/km
Insulation resistance:	1200 MΩ x km
Operating voltage:	300 V
Withstand voltage:	1500 V
Max. load:	3 A
Temperature range:	-50 °C ... +180 °C/-58 °F ... +356 °F

Ordering information

Type between calorimetric monitoring heads CSF and FC01, FC01-FH

Do + Ka type 15 PVC insulated cable, type LiYCY 4x2x0.2 mm² (AWG 24)
8-pole round connector + 10-pole clamping connector

Do + Ka type 18 silicone insulated cable, type 4x2x0.2 mm² (AWG 24)
8-pole round connector + 10-pole clamping connector

Available cable lengths
...m 2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)

Do + Ka type 15 - 2 m/6.56 ft ordering example

Type between calorimetric monitoring heads CSF and FC01-ST

Do + Ka type 15-ST PVC insulated cable, type LiYCY 4x2x0.2 mm² (AWG 24)
8-pole round connector + 10-pole clamping connector

Do + Ka type 18-ST silicone insulated cable, type 4x2x0.2 mm² (AWG 24)
8-pole round connector + 10-pole clamping connector

Available cable lengths
...m 2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)

Do + Ka type 15-ST - 2 m/6.56 ft ordering example

Cable types 15/18 with connectors

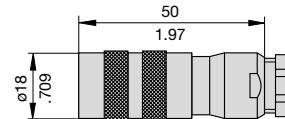


Do + Ka type 15
Do + Ka type 18

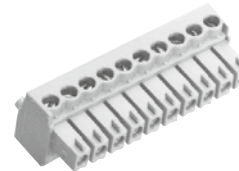
Do + Ka type 15-ST
Do + Ka type 18-ST

Accessories

8-pole round connector
(without cable, for individual wiring by customer)
0Z112Z003124



10-pole clamping connector for cable types 15 and 18
(without cable, for individual wiring by customer)
0Z112Z000167



10-pole clamping connector for cable types 15-ST and 18-ST
(without cable, for individual wiring by customer)
0Z112Z000205



This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

Caution: Standard warranty cover will be invalidated if the correct FlowVision monitoring head/control unit connecting cable is not used.

Monitoring head with turbine-type sensor



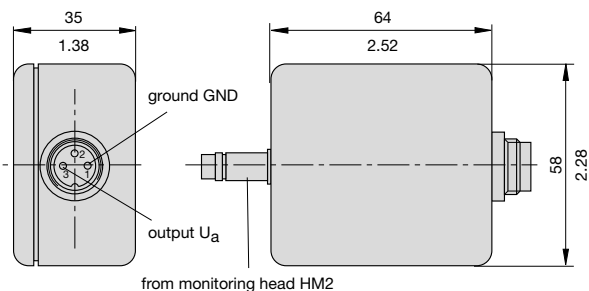
TST-..HM2

Technical data

Type of head	thread-mounted monitoring head
Nominal thread dia.	G1/2A
Length of shank	36 mm/1.42 in.
Length of sensor	19 mm/0.75 in.
Suitable for	water, air
Temperature range	
Medium:	0 ... +250 °C/+32 ... +482 °F air *)
Monitoring head:	0 ... +250 °C/+32 ... +482 °F
Preamplifier:	-10 ... +50 °C/+14 ... +122 °F
Measuring range	
air:	1 ... 20 m/s / 3.28 ... 65.6 fps
water:	0.1 ... 5 m/s / 0.328 ... 16.4 fps
Pressure resistance ⁽¹⁾	10 bar/145 psi (please enquire for higher pressure)
Degree of protection	
Monitoring head/cable:	IP68
Monitoring head/cable connector:	IP67
Preamplifier:	IP65
Material	
fitting:	stainless steel 1.4571/AISI 316 Ti
housing and turbine:	chrome nickel/molybdenum steel VUA
bearings	
jewel bearing:	sapphire
pivot bearing:	nivadur
Cable to electronic control unit	LifYCY 3 x 0.35 mm ² (AWG 24)

⁽¹⁾ Admissible operating pressure to DIN 2401, measured at max. temperature (= max. medium temperature)
 *) Please observe that ice build up on the sensor at water temperatures ≤ 0 °C/+32 °F will destroy the sensor.

Preamplifier for monitoring head TST-..HM2



Description

Thread mounted monitoring head with turbine-type sensor for Flow Meter FC01. Recommended for high medium temperature applications. The unit consists of the turbine HM2 and a pre-amplifier which is connected with the HM2 by means of a 2 m cable.

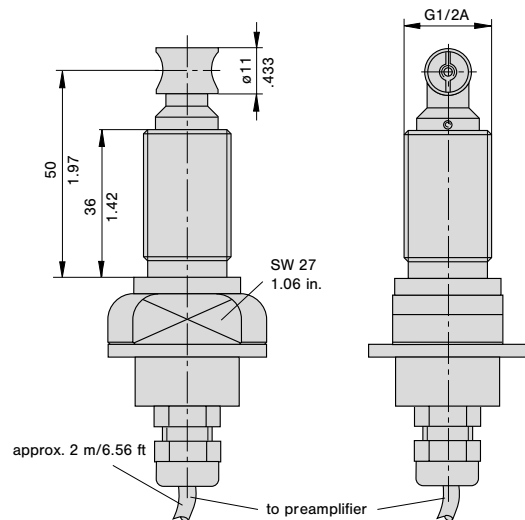
Features

- Medium temperature 0 ... +250 °C/+32 ... +482 °F

Ordering information

Type	TST	thread-mounted monitoring head with turbine-type sensor
Process connection	01	G1/2A thread
Application range - Material of the area exposed to medium	HM2	+250 °C/+482 °F, air 20 m/s/65.6 fps, water 5 m/s/16.4 fps - stainless steel, jewel bearing, hardened tips, incl. 2 m/6.56 ft connecting cable to the pre-amplifier
Length of shank/thread	L10	36 mm/1.42 in. (standard)
Accuracy	0	±1 % of final value, ±3 % of measured value (standard)
Electrical connection to FC01	E10	round connector with tinned contacts (plug and cable to separate order)
Ordering example	TST - 01 HM2 L10 0 E10	

Dimensions of monitoring head TST-..HM2



This is a metric design and millimeter dimensions take precedence (mm/inch)

Description

A Electronic flow meters with mechanical sensing rely upon a turbine mounted in the pipeline. The rotational speed of the turbine in the flowstream is proportional to the flow rate. Turbine rotation is remotely measured by an inductive proximity switch and transmitted as a frequency signal to the electronic control unit.

Mechanical sensing by means of turbine-type sensors is recommended:

- where temperatures may be above the temperature range of the calorimetric heads (>+130 °C/+266 °F),
- where the media may change,
- where the properties (thermal conductivity) of the medium may vary significantly,
- for media with air bubbles,
- where an immediate response to flow rate changes is required.

Advantages and limitations of mechanical flow rate sensing

Advantages:

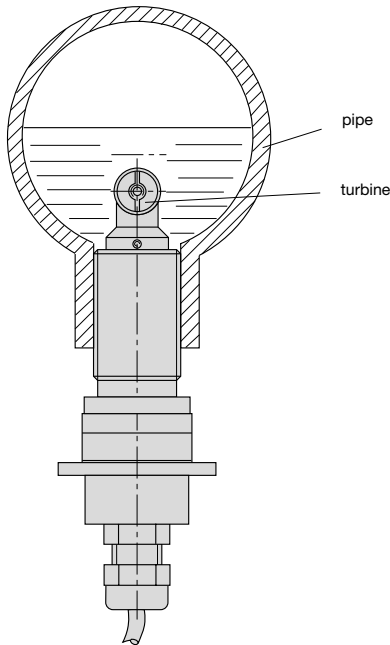
- wide medium temperature range: 0 ... +250 °C/+32 ... +482 °F
- independent of temperature variations
- short reaction time

Limitations:

- not suitable for media with solid particles
- can be overloaded only to a limited extent
- measuring signals depend on the viscosity of the medium
- shock-sensitive

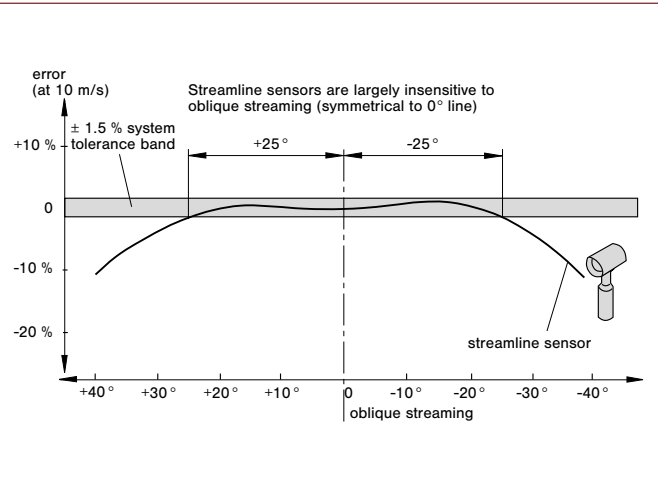
- 1
- 2
- 3
- 4
- 5
- 6
- 7**
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19

Monitoring head with turbine-type sensor



Installation of monitoring head

Flow monitoring is often necessary in places that are not accessible and where practical difficulties may prevent the correct alignment of the sensors with respect to flow direction. The special aerodynamic shape of the FlowVision sensors reduces this danger. The following diagram clearly shows that the “streamlined” FlowVision sensors have a very good alignment angle.



Cable type 16 with connectors



Do + Ka type 16

Technical data

Cable type 16

Features: highly flexible, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance:	< 92 Ω/km
Insulation resistance:	> 200 MΩ/km
Operating voltage:	max. 100 V AC
Withstand voltage:	800 V ~
Max. load:	0.5 A
Temperature range:	-10 ... +80 °C/+14 ... +176 °F (processing and operation) -30 °C...+80 °C/-22 ... +176 °F (transport and storage)

Ordering information

Type	between monitoring head TST and FC01
Do + Ka type 16	PVC insulated cable, type LifYCY 3x0.35 mm ² (AWG 22) 3-pole round connector + 4-pole clamping connector
	Available cable lengths
...m	2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)
Do + Ka type 16	- 2 m/6.56 ft ordering example

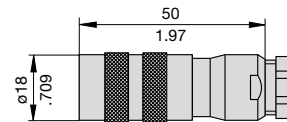
Description

Cable between turbine-type monitoring head TST and Flow Meter FC01.

- Connection to monitoring head by means of 3-pole round connector
- Connection to FC01 by means of 4-pole clamping connector (XSK)

Accessories

3-pole round connector
(without cable, for individual wiring by customer)
OZ112Z000138



4-pole clamping connector
(without cable, for individual wiring by customer)
Y 306 245 03



This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

Caution: Standard warranty cover will be invalidated if the correct FlowVision monitoring head/control unit connecting cable is not used.

A

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

B

Description

Thread-mounted monitoring head with turbine-type sensor for Flow Meter FC01.

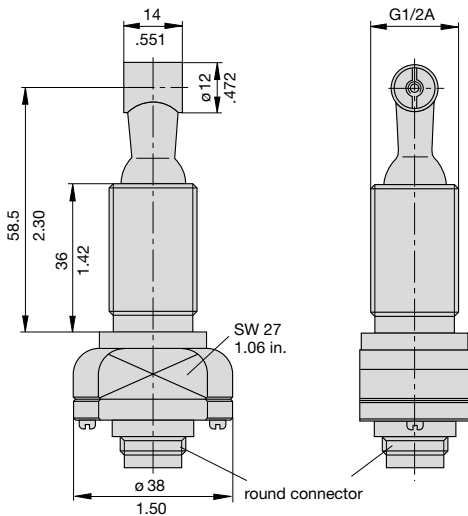
Features

- Medium temperature range:
TST-..WM1 (water): +5 ... +80 °C/+41 ... +176 °F
TST-..AM1 (air): -30...+140 °C/-22 ... +284 °F

Ordering information

Type	
TST	thread-mounted monitoring head with turbine-type sensor
Process connection	
01	G1/2A thread
Application range - Material of the area exposed to medium	
AM1	+140 °C/+284 °F, air 20 m/s / 65.6 fps; PSU, beryllium support, hardened tips
WM1	+80 °C/+176 °F, water 5 m/s / 16.4 fps; PSU, beryllium support, hardened tips
Length of shank/thread	
L10	36 mm/1.42 in. (standard)
Accuracy	
0	±1 % of final value, ±3 % of measured value (standard)
Electrical connection	
E10	round connector with tinned contacts (plug and cable to separate order)
TST - 01 AM1 L10 0 E10 ordering example	

Dimensions of monitoring heads TST-.-AM1/WM1



Monitoring head with turbine-type sensors



TST-.-AM1/WM1

Technical data

Type of head	thread-mounted	
	TST-AM1	TST-WM1
Length of shank	36 mm/1.42 in.	
Length of sensor	28.5 mm/1.12 in.	
Suitable for	air	water
Temperature range *) (of medium)	-30 ... +140 °C -22 ... +284 °F	+5 ... +80 °C +41 ... +176 °F
Measuring range	air: 1 ... 20 m/s / 3.28 ... 65.6 fps water: 0,1 ... 5 m/s / 0.328 ... 16.4 fps	
Pressure resistance ⁽¹⁾	10 bar/145 psi	
Degree of protection (connector) ⁽²⁾	IP67	
Material	fitting: stainless steel 1.4571/AISI 316 turbine housing PSU: TK-PSU, polysulfone, udel turbine: aluminium bearings: jewel bearing: berivac (bronze-beryllium-alloy) pivot bearing: nivadur	
Cable to electronic unit	LifYCY 3 x 0.35 mm ² (AWG 24)	

⁽¹⁾ Admissible operating pressure DIN 2401, measured at max. temperature (= max. medium temperature)

⁽²⁾ with mating connector

^{*)} max. +85 °C/+185 °F in the connector area

This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

Description

Electronic flow meters with mechanical sensing rely upon a turbine mounted in the pipeline. The rotational speed of the turbine in the flowstream is proportional to the flow rate. Turbine rotation is remotely measured by an inductive proximity switch and transmitted as a frequency signal to the electronic control unit.

Mechanical sensing by means of turbine-type sensors is recommended:

- where temperatures may be above the temperature range of the calorimetric heads (>+130 °C/+266 °F),
- where the media may change,
- where the properties (thermal conductivity) of the medium may vary significantly,
- for media with air bubbles,
- where an immediate response to flow rate changes is required.

Advantages and limitations of mechanical flow rate sensing

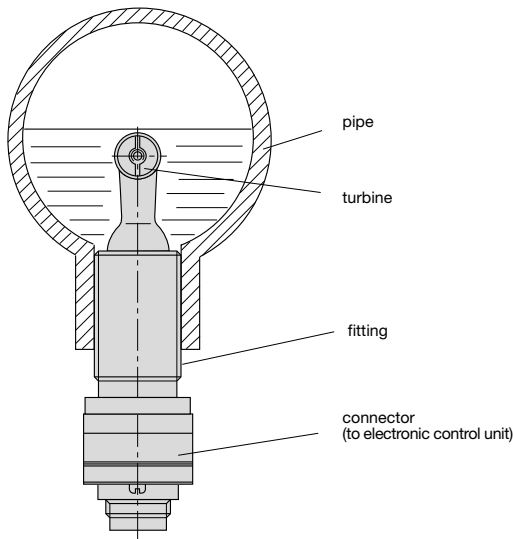
Advantages:

- wide medium temperature range:
 - water: +5 ... +80 °C/+41 ... +176 °F
 - air: -30 ... +140 °C/-22 ... +284 °F
- independent of temperature variations
- short reaction time

Limitations:

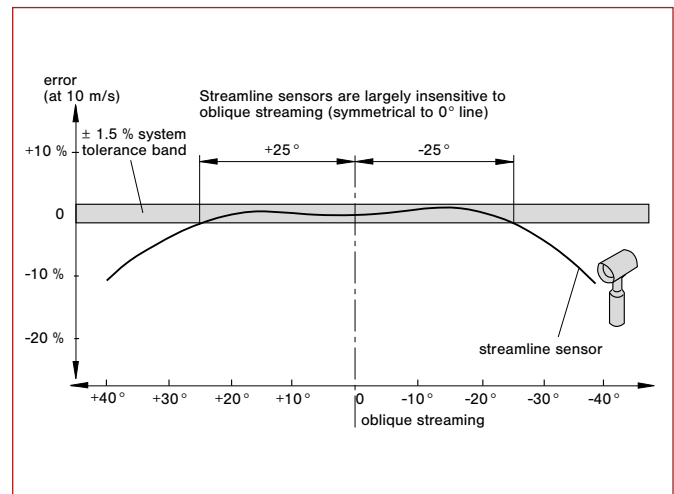
- not suitable for media with solid particles
- can be overloaded only to a limited extent
- measuring signals depend on the viscosity of the medium
- shock-sensitive

Monitoring head with turbine-type sensor



Installation of monitoring head

Flow monitoring is often necessary in places that are not accessible and where practical difficulties may prevent the correct alignment of the sensors with respect to flow direction. The special aerodynamic shape of the FlowVision sensors reduces this danger. The following diagram clearly shows that the “streamlined” FlowVision sensors have a very good alignment angle.



A

1
2
3
4
5
6

7
8
9

10
11
12
13
14
15
16
17
18

19

B

Description

Cable between turbine-type monitoring head TST and Flow Meter FC01.

- Connection to monitoring head by means of 3-pole round connector
- Connection to FC01 by means of 4-pole clamping connector (XSK)

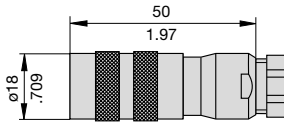
Cable type 16 with connectors



Do + Ka type 16

Accessories

3-pole round connector
(without cable, for individual wiring by customer)
OZ112Z000138



4-pole clamping connector
(without cable, for individual wiring by customer)
Y 306 245 03



This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

Caution: Standard warranty cover will be invalidated if the correct FlowVision monitoring head/control unit connecting cable is not used.

Technical data

Cable type 16

Features: highly flexible, paired, fully shielded, electrical and thermal properties at +20 °C/+68 °F

Conductor resistance: < 92 Ω/km

Insulation resistance: > 200 MΩ/km

Operating voltage: max. 100 V AC

Withstand voltage: 800 V ~

Max. load: 0.5 A

Temperature range: -10 ... +80 °C/+14 ... +176 °F
(processing and operation)
-30 °C...+80 °C/-22 ... +176 °F
(transport and storage)

Ordering information

Type	between monitoring head TST and FC01
Do + Ka type 16	PVC insulated cable, type LifYCY 3x0.35 mm ² (AWG 22) 3-pole round connector + 4-pole clamping connector
Available cable lengths	
...m	2 m, 3 m, 5 m, 8 m, 10 m, 15 m, 20 m, 25 m, 30 m, 40 m, 50 m, 60 m, 70 m, 80 m, 90 m, 100 m, 110 m, 120 m, 130 m, 140 m, 150 m, 160 m, 170 m, 180 m, 190 m, 200 m (up to max. 656 ft)

Do + Ka type 16 - 2 m/6.56 ft ordering example