


FF03

Rotating Vane Level Switch for Bulk Materials

- for bulk materials up to a grain size of 150 mm and bulk densities from 0,01 to over 2,0 t/m³
- robust aluminium die-cast housing or stainless steel housing
- low-cost version
- industrial versions with pendulum shaft, rope shaft, reinforced bearings
- temp. range -40 °C ... +500 °C
- easy mounting
- can be used as full and empty detector
- protection class IP66
-  Ex version according to ATEX optional



Description:

A geared motor mounted in the extension of a shaft and rotatable by a certain angle is held by a spring at a stop. The motor drives the blade protruding into a container via the shafts. As soon as the product reaches the vane, it is prevented from rotating. The reverse torque turns the motor out of its end position and actuates a switch. The motor is switched off by a second switch. If the filling level drops, the leaf is released and the motor is retracted by the spring to its end position. The motor is switched on again and the output signal is switched back.

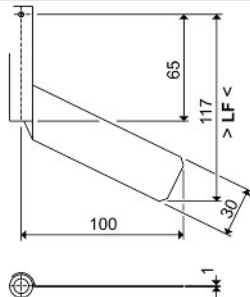
The geared motor and the two switches are mounted in a plastic housing. The exact running of the blade shaft is ensured by ball bearings. A locking clutch prevents damage to the motor in the event of blockages. An optional special seal on the shaft protects against penetration of dust and moisture into the housing or ball bearing.

Typical applications:

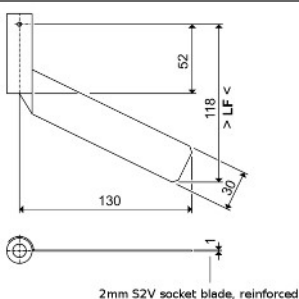
For all bulk materials from free-flowing to difficult to flow and for goods that tend to bridge, mat or crust.

Models and Dimensions of Measuring Blades:

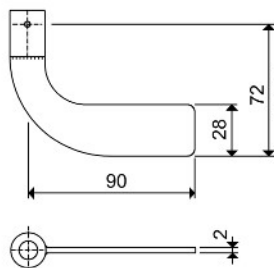
S1 Socket blade



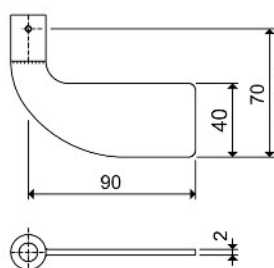
S2 Socket blade



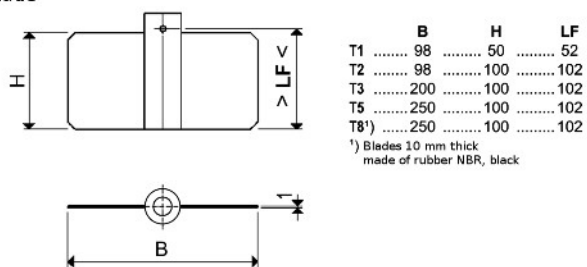
M1V Socket blade, reinforced



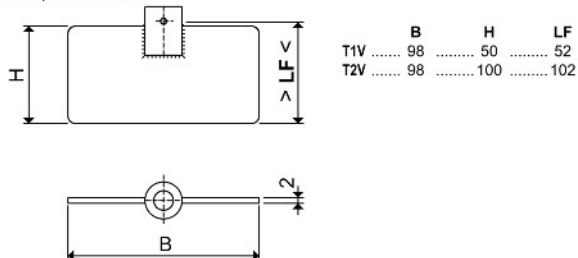
M2V Socket blade, reinforced



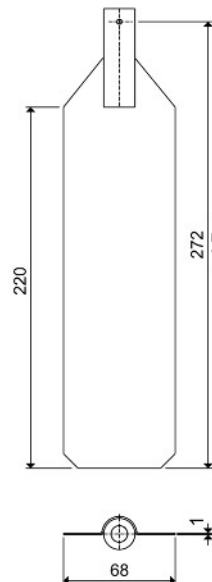
T-blade



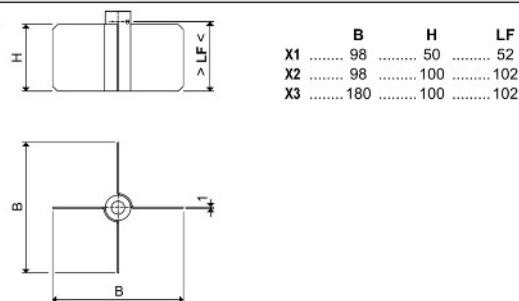
T-blade, reinforced



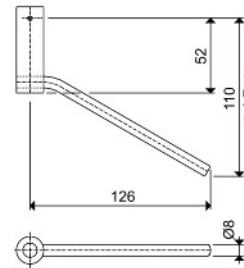
TO blade



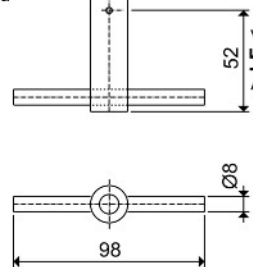
X blade



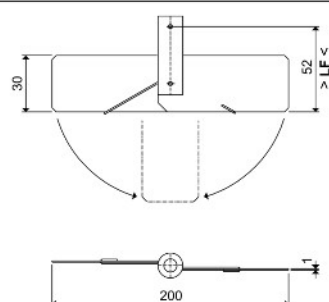
SG socket blade, reinforced



TG blade, reinforced



K1 Flap- blade



Models:

Full, empty and demand detectors for general applications.
Inexpensive version with aluminium housing.

ATEX version on request

Technical Data:

Materials:

Housing:	aluminium die-cast
Process connection:	aluminium
Wave rope:	stainless steel 1.4301
Gravity weight:	stainless steel 1.4301
Blade TK:	plastic PP
Blade TD:	stainless steel 1.4301

Electrical Data:

Power consumption:	AC: 4 VA DC: 4 W
Terminal blocks:	max: 1,5 mm ²
Cable entry:	screw connection M20x1,5
Signal contact:	2 A / 250 V AC potential free
Protection class:	IP66 acc. to DIN EN 60529
Temp. range:	-20...70 °C
Pressure range:	-0,5...1 bar
Maintenance:	none

Accessories:

- **SH00** weather protection hood made of PVC, RAL 7001
only approved for zone 22 and zone free
- **SM1A** hexagon nut G1, aluminium
- **SM2A** hexagon nut G 1 1/4, aluminium
- **SM3A** hexagon nut G 1 1/2, aluminium
- **SM5A** hexagon nut M30 x1,5, aluminium
- **SM6A** hexagon nut M32 x 1,5, aluminium

Order Code:

Order number: FF03-11 C1. H5. G1A. X1. W0

Rotating vane level switch

Model:

11 = for general applications

Operating voltage:

C1 = 220...240 VAC (50...60 Hz)

C2 = 110...120 VAC (50...60 Hz)

C3 = 48 VAC (50...60 Hz)

C4 = 24 VAC (50...60 Hz)

C5 = 24 VDC

Signal lights:

0 = without

H5 = with function LEDs

H6 = function LEDs with calotte

H7 = signal lights LED, yellow/green

Process connection: (aluminium)

G1A = G 1

G2A = G 1 1/4

G3A = G 1 1/2

G5A = M 30x1,5

G6A = M 32x1,5

Measuring blades: (versions see page „Measuring Blade“)

M0 = without measuring blades

TK = 150 x 27 (plastic)

TK3 = 150 x 27,3 pieces (plastic)

TD = 140 x 85 (st. steel, not with extension)

S1 = sleeve blade 100 x 30 diagonal

X1 = blade 98 x 50

X2 = blade 98 x 100

X3 = blade 180 x 100

Shaft extension:

W0 = without extension

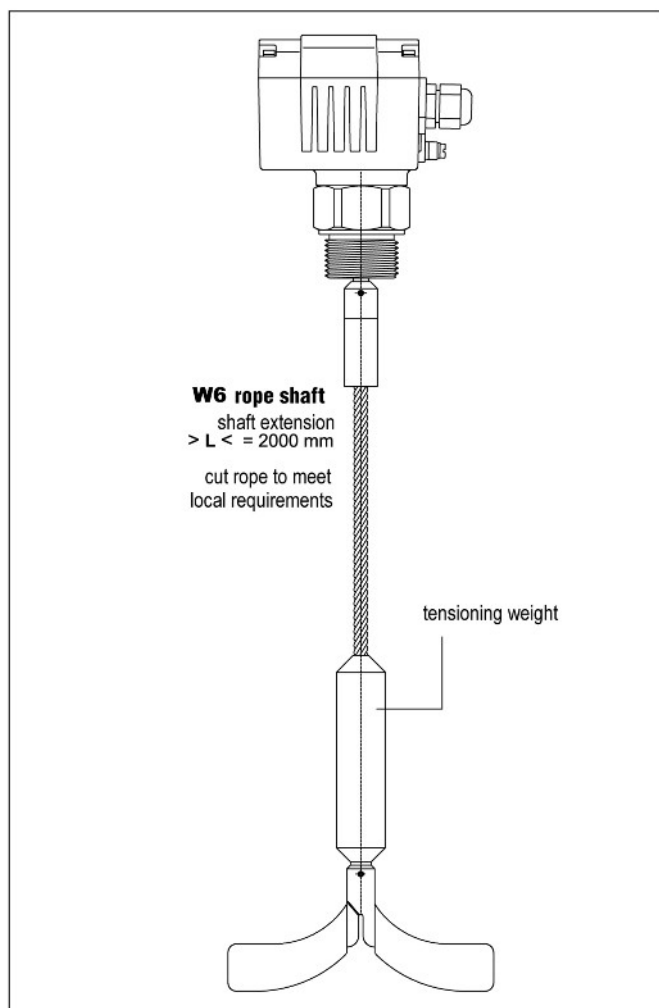
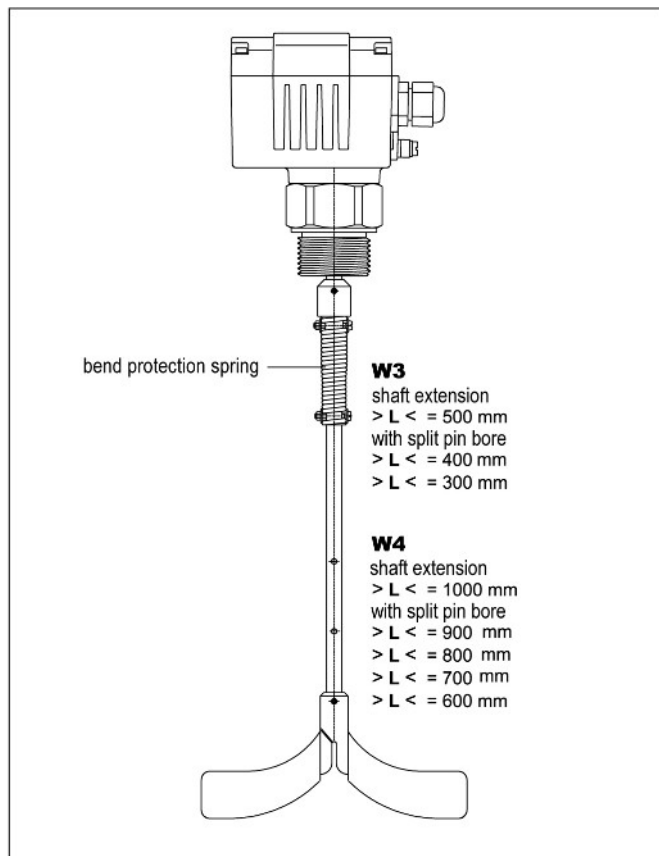
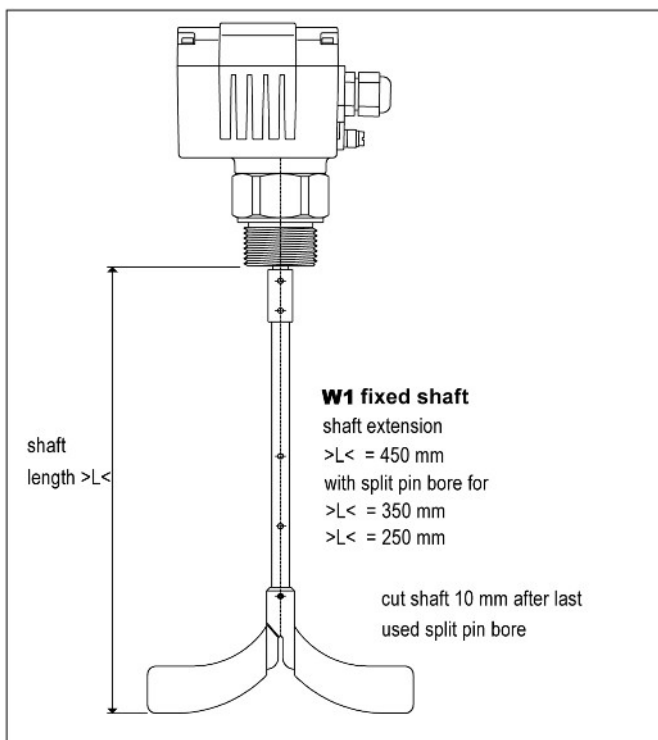
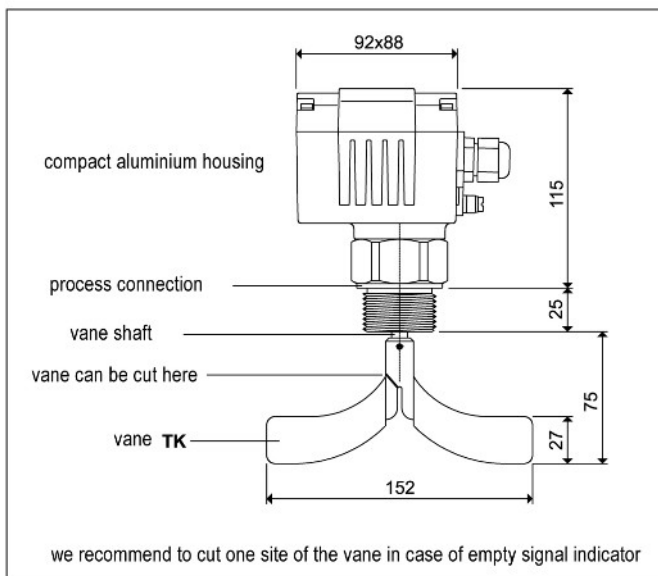
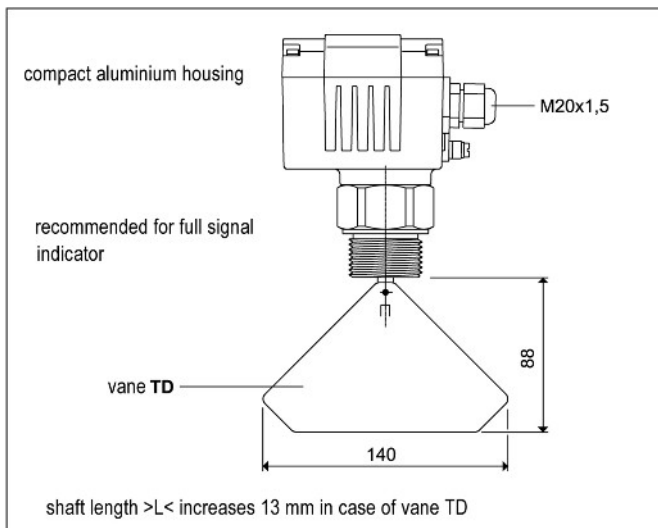
W1 = fixed wave 450 mm

W3 = pendulum wave 500 mm

W4 = pendulum wave 1000 mm

W6 = rope wave 2000 mm

Models and Dimensions FF03-11:



Level

Models:

Full, empty and demand detectors for a wide range of applications and any installation position..

ATEX version on request

Technical Data:

Materials:

Housing:	aluminium compact housing stainless steel compact housing
Blade:	stainless steel 1.4301
Process connection:	aluminium (only for bulk material temperature up to 80 °C) or stainless steel

Electrical Data:

Power consumption:	AC: 4 VA DC: 4 W
Terminal blocks:	max: 1,5 mm ²
Cable entry:	screwing M20x1,5
Signal contact:	potential free changeover contact

Self monitoring:

Function monitoring of:

- cable break
- voltage drop
- DC/AC converter for motor voltage
- motor
- gearbox

Voltage monitoring:

Monitoring of:

- cable break
- voltage drop

Accessories:

- **SH00** weather protection hood made of PVC, RAL 7001 only approved for zone 22 and zone free
- **SM1** hexagon nut G 1
- **SM2** hexagon nut G 1 ¼
- **SM3** hexagon nut G 1 ½
- **SM5** hexagon nut M30 x1,5
- **SM6** hexagon nut M32 x 1,5

Material nut:

A-aluminium
E-stainless steel

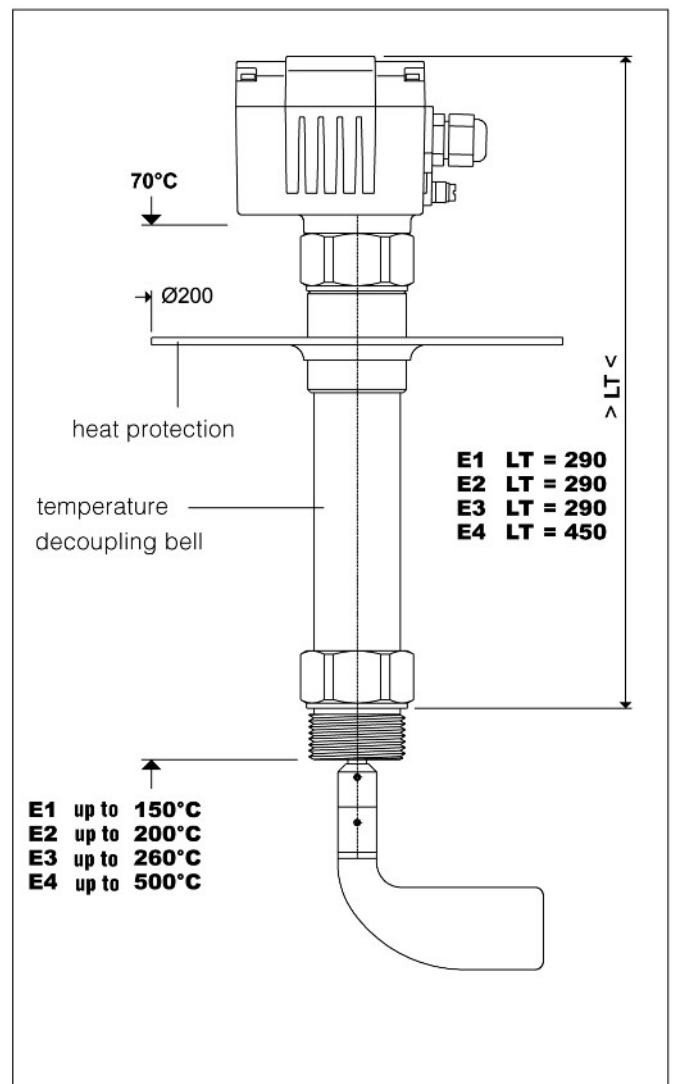
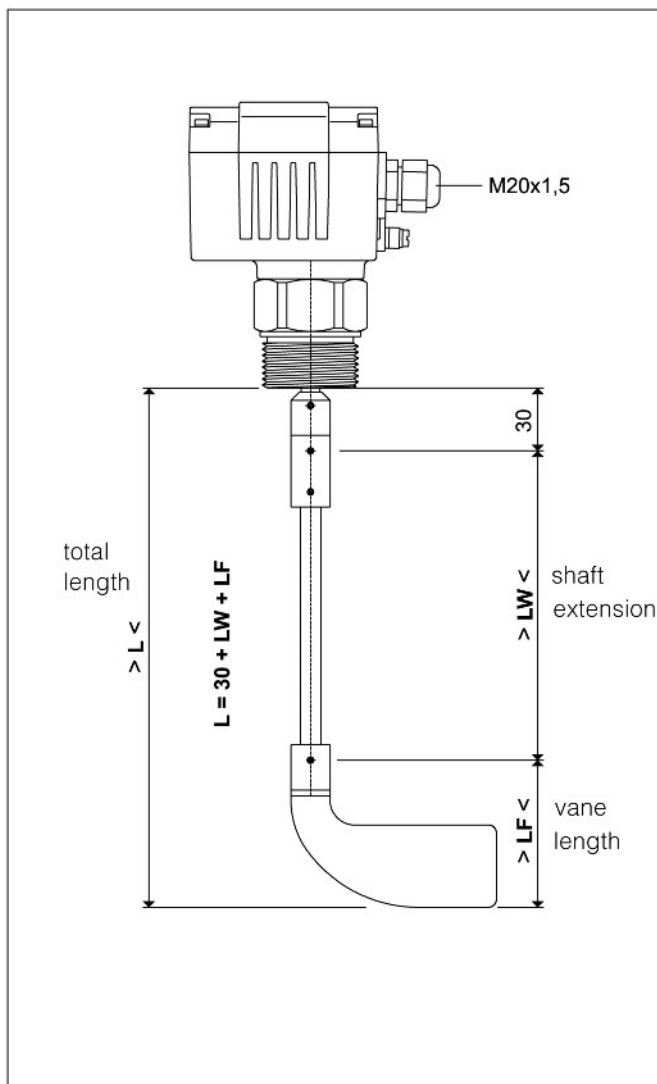
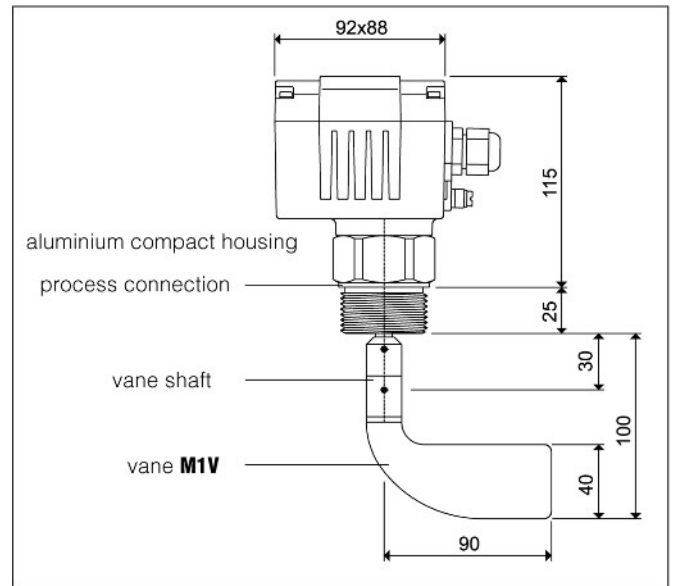
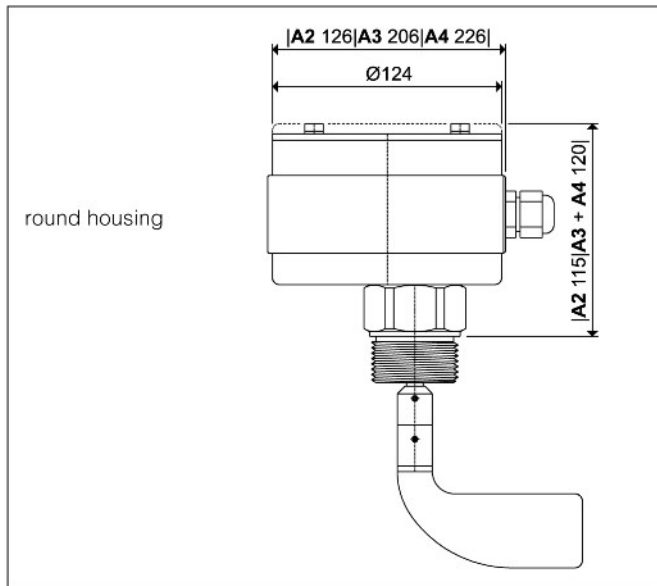
Order Code:

Order number:	FF03-21	A1.	C1.	0.	H0.	E0.	P0.	G1.	A.	T8.	W0
Rotating vane level switch											
Model: 21 = Industrial version											
Housing selection: A1 = aluminium compact housing A2 = st. steel compact housing											
Operating voltage: C1 = 220...240 VAC (50...60 Hz) C2 = 110...120 VAC (50...60 Hz) C3 = 48 VAC (50...60 Hz) C4 = 24 VAC (50...60 Hz) C5 = 24 VDC C9 = special voltage (on request)											
Self monitoring: 0 = without monitoring D1 = function monitoring D2 = voltage monitoring											
Signal lights: H0 = with function LEDs (standard) H1 = calotte for function LEDs H2 = signal lights, LED green H8 = large Signal lights LED, green											
Bulk material temperature: E0 = -25...80 °C (standard) E1 = -40...150 °C (only with process conn. st. st. E) E2 = -25...200 °C (only with process conn. st. st. E) E3 = -25...260 °C (only with process conn. st. st. E) E4 = -25...500 °C (only with process conn. st. st. E) E7 = device heating 2,5 Watt E9 = +1000 °C (on request)											
Tank pressure: P0 = -0,5...5 bar (standard) P1 = -0,5...10 bar P2 = -0,95...25 bar** P6 = -0,9...10 bar P7 = -0,9...10 bar**											
Process connection: G1 = G 1 G2 = G 1 1/4 G3 = G 1 1/2 G5 = M30x1,5 G6 = M32x1,5 G9 = other threads (on request) F1 = flange F70 diameter.110, 4 x diameter.9, bolt circle 90 F2 = flange F100 150x150, 4 x diameter.18, bolt circle 170 F5 = flange DN 32 PN 10 (only in stainless steel) F6 = flange DN 100 PN 6 (only in stainless steel)											
Material process connection: A = aluminium (only up to 80 °C bulk material temperature) E = stainless steel X = other materials (on request)											
Measuring blade: (versions see page „Measuring Blades“) M0 = without measuring blade S2V = sleeve blade 130x30 diagonal* M1V = sleeve blade 90x28* M2V = sleeve blade 90x40* T1V = blade T50 98x50 * T2V = blade T100 98x100* T8 = rubber blade X1 = blade X50 98x50 X2 = blade X100 98x100 X3 = blade X200 180x100 K1 = folding blade T230 200x30 M9 = other measuring blades on request											
Shaft extension: W0 = without extension Wxxx = specify desired length in mm (e.g. W1-300)											

* reinforced version

** with pressure decoupling lantern

Models and Dimensions FF03-21:



Models:

Full, empty and demand detectors for a wide range of applications and any mounting position with reinforced bearing.

ATEX version on request

Technical Data:

Materials:

Housing:	aluminium compact housing stainless steel compact housing
Blade:	stainless steel 1.4301
Process connection:	aluminium (only for bulk material temperature up to 80 °C) or stainless steel

Electrical Data:

Power consumption:	AC: 4 VA DC: 4 W
Terminal blocks:	max: 1,5 mm ²
Cable entry:	screwing M20 x 1,5
Signal contact:	potential free changeover contact

Self monitoring:

Function monitoring of:

- cable break
- voltage drop
- DC/AC converter for motor voltage
- motor
- gearbox

Voltage monitoring:

Monitoring of:

- cable break
- voltage drop

Accessories:

- **SH00** weather protection hood made of PVC, RAL 7001 only approved for zone 22 and zone free

- **SM4** hexagon nut G 2

Material nut:

A-aluminium
E-stainless steel

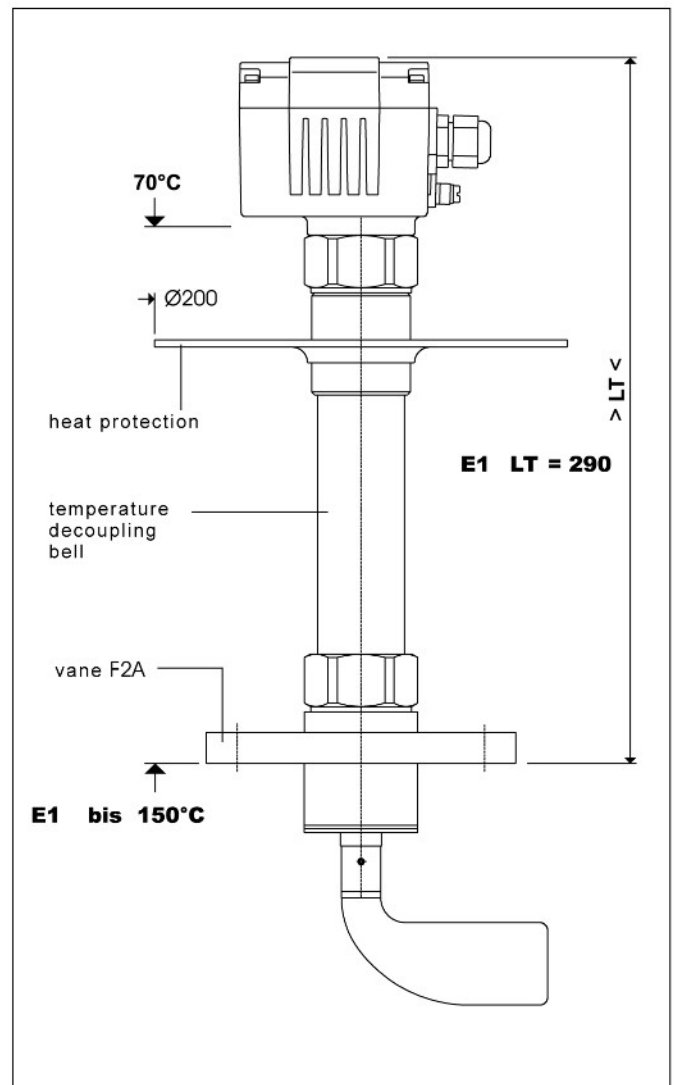
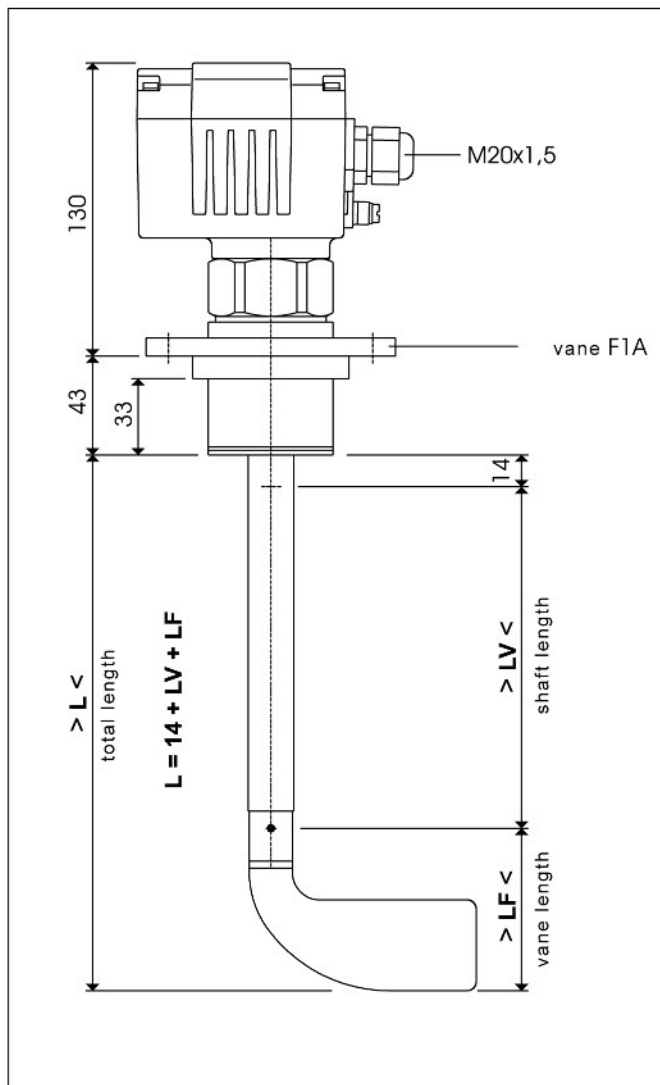
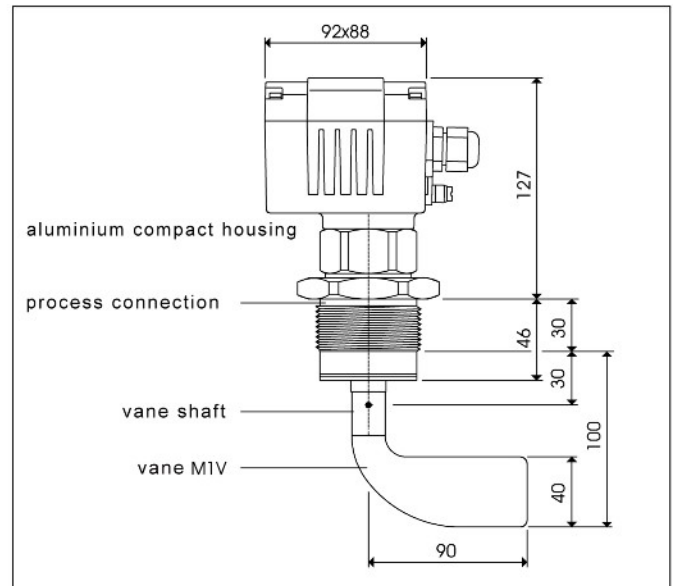
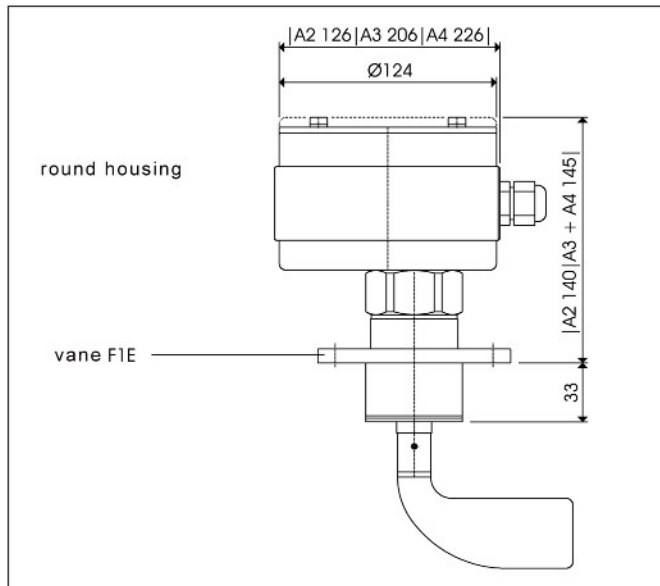
Order Code:

Order number:	FF03-23	A1.	C1.	0.	H0.	E0.	P0.	G4.	A.	M0.	W0
Rotating vane level switch											
Model: 23 = with reinforced bearing											
Housing selection: A1 = aluminium compact hou. A2 = st. steel compact hou.											
Operating voltage: C1 = 220...240 VAC (50...60 Hz) C2 = 110...120 VAC (50...60 Hz) C3 = 48 VAC (50...60 Hz) C4 = 24 VAC (50...60 Hz) C5 = 24 VDC C9 = special voltage (on request)											
Self monitoring: 0 = without monitoring D1 = function monitoring D2 = voltage monitoring											
Signal lights: H0 = with function LEDs (standard) H1 = calotte for function LEDs H2 = signal lights, LED green H8 = large Signal lights LED, green											
Bulk material temperature: E0 = -25...80 °C (standard) E1 = -40...150 °C (only with process conn. st. st. E) E7 = device heating 2,5 Watt											
Tank pressure: P0 = -0,5...5 bar (standard) P1 = -0,5...10 bar P2 = -0,95...25 bar** P6 = -0,9...10 bar P7 = -0,9...10 bar**											
Process connection: G4 = G2 F1 = flange F70 diameter.110, 4 x diameter.9, bc 90 F2 = flange F100 150 x 150, 4 x diameter.18, bc 170 F9 = other materials on request											
Material process connection: A = aluminium (only up to 80 °C bulk material temperature) E = stainless steel											
Measuring blade: (versions see page „Measuring Blades“) M0 = without measuring blades S2V = sleeve blade 120 x 30 diagonal* SGV = sleeve blade 120 x 8* M2V = sleeve blade 90 x 40* T1V = blade T50 98 x 50 * M9 = other measuring blades on request											
Shaft extension: W0 = without extension Wxxxx = specify desired length in mm (e.g. W1-300), max. 2000 mm*											

* reinforced version

** with pressure decoupling lantern

Models and Dimensions FF03-23:



Models:

Full, empty and demand detectors for a wide range of applications and vertical mounting position with pendulum shaft.

ATEX version on request

Technical Data:

Materials:

Housing:	aluminium compact housing stainless steel compact housing
Blade:	stainless steel 1.4301
Process connection:	aluminium (only for bulk material temperature up to 80 °C) or stainless steel

Electrical Data:

Power consumption:	AC: 4 VA DC: 4 W
Terminal blocks:	max: 1,5 mm ²
Cable entry:	screwing M20 x 1,5
Signal contact:	potential free changeover contact

Self monitoring:

Function monitoring of:

- cable break
- voltage drop
- DC/AC converter for motor voltage
- motor
- gearbox

Voltage monitoring:

Monitoring of:

- cable break
- voltage drop

Accessories:

- **SH00** weather protection hood made of PVC, RAL 7001
only approved for zone 22 and zone free
- **SM2** hexagon nut G 1 ¼
- **SM3** hexagon nut G 1 ½

Material nut:

A-aluminium
E-stainless steel

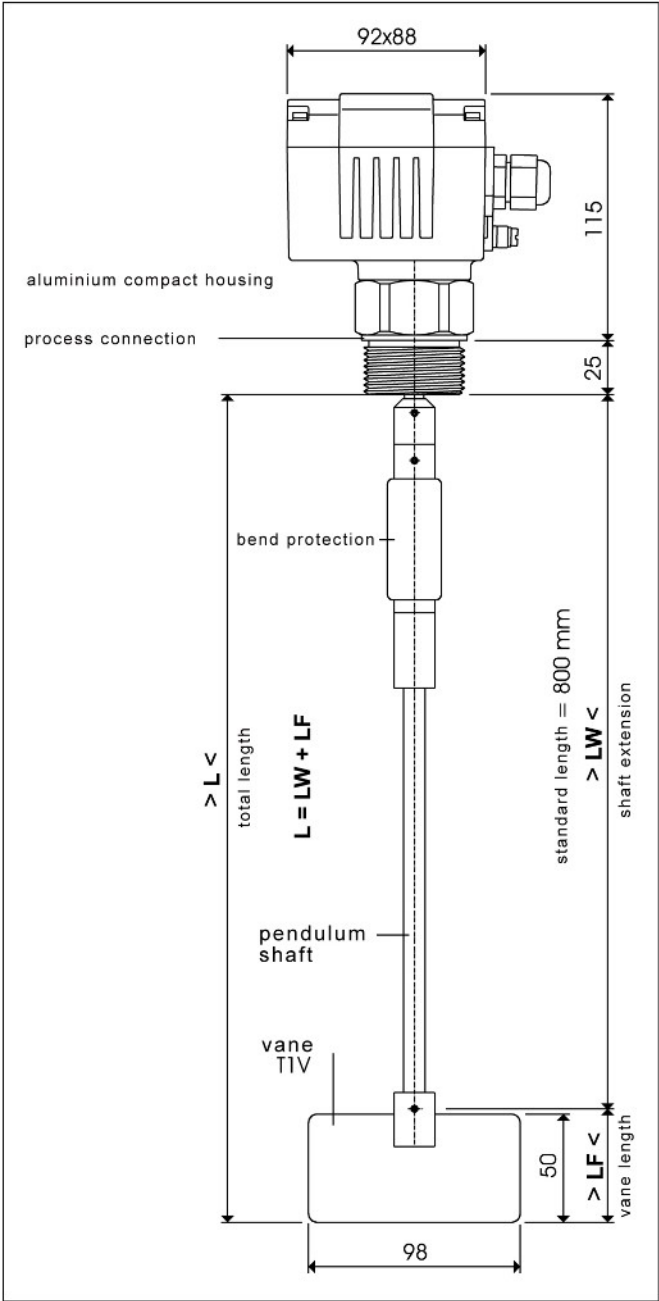
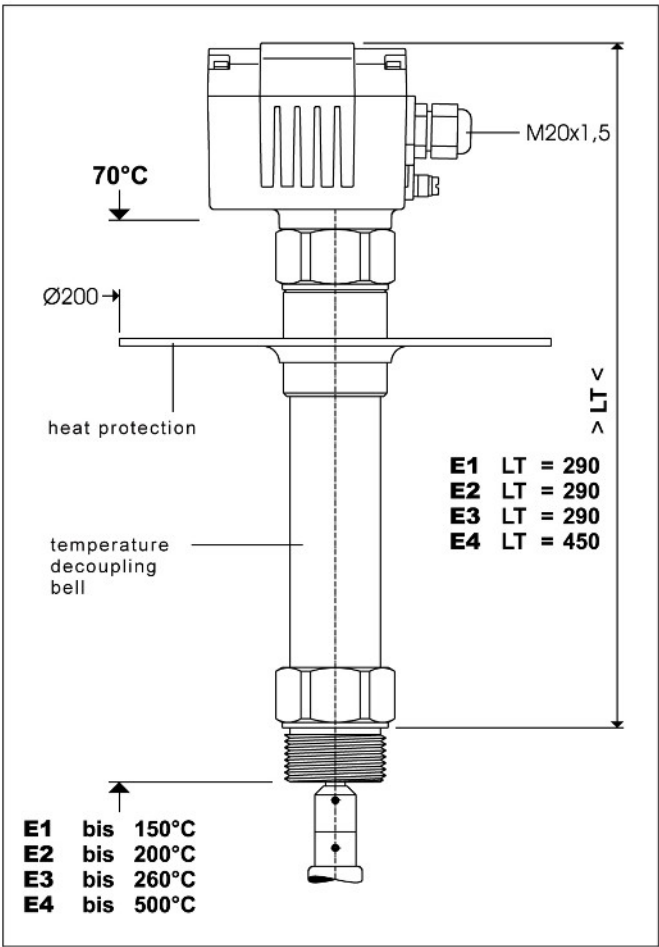
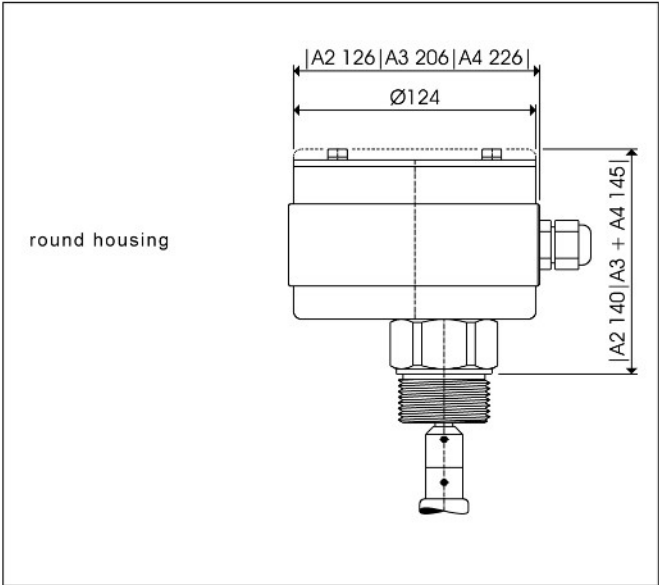
Order Code:

Order number:	FF03-26	A1.	C1.	0.	H0.	E0.	P0.	G2.	A.	T0.	W8
Rotating vane level switch											
Model: 26 = with pendulum shaft											
Housing selection: A1 = aluminium compact hou. A2 = st. steel compact housing											
Operating voltage: C1 = 220...240 VAC (50...60 Hz) C2 = 110...120 VAC (50...60 Hz) C3 = 48 VAC (50...60 Hz) C4 = 24 VAC (50...60 Hz) C5 = 24 VDC C9 = special voltage (on request)											
Self monitoring: 0 = without monitoring D1 = function monitoring D2 = voltage monitoring											
Signal lights: H0 = with function LEDs (standard) H1 = calotte for function LEDs H2 = signal lights, LED green H8 = large Signal lights LED, green											
Bulk material temperature: E0 = -25...80 °C (standard) E1 = -40...150 °C (only with process conn. st. st. E) E2 = -25...200 °C (only with process conn. st. st. E) E3 = -25...260 °C (only with process conn. st. st. E) E4 = -25...500 °C (only with process conn. st. st. E) E7 = device heating 2,5 Watt											
Tank pressure: P0 = -0,5...5 bar (Standard) P1 = -0,5...10 bar P2 = -0,95...25 bar** P6 = -0,9...10 bar P7 = -0,9...10 bar**											
Process connection: G2 = G 1 ¼ G3 = G 1 ½ G9 = other threads on request F1 = flange F70 diameter.110, 4 x diameter.9, bc 90 F2 = flange F100 150x150, 4 x diameter.18, bc 170 F5 = flange DN 32, PN 10 (only in stainless steel) F6 = flange DN 100, PN 6 (only in stainless steel) F9 = other flanges on request											
Material process connection: A = aluminium (only up to 80 °C bulk material temperature) E = stainless steel X = other materials on request											
Measuring blade: (versions see page „Measuring Blades“) T0 = blade T220 68x220 T1V = blade T50 98x50* T2V = blade T100 98x100* T5 = blade T250 250x100 T8 = rubber blade 250x100 X1 = blade X50 98x50 X2 = blade X100 98x100 X3 = blade X200 180x100 K1 = folding blade T230 200x30 M9 = other measuring blades on request											
Shaft extension: W8 = 800 mm (standard) Wxxxx = special length (e.g. W1-1000), max. 1500 mm											

* reinforced version

** with pressure decoupling lantern

Models and Dimensions FF03-26:



Level

Models:

Full, empty and demand detectors for a wide range of applications and vertical mounting position with rope shaft.

ATEX version on request

Technical Data:

Materials:

Housing:	aluminium compact housing stainless steel compact housing
Blade:	stainless steel 1.4301
Process connection:	aluminium (only for bulk material temperature up to 80 °C) or stainless steel

Electrical Data:

Power consumption:	AC: 4 VA DC: 4 W
Terminal blocks:	max: 1,5 mm ²
Cable entry:	screwing M20 x 1,5
Signal contact:	potential free changeover contact

Self monitoring:

Function monitoring of:

- cable break
- voltage drop
- DC/AC converter for motor voltage
- motor
- gearbox

Voltage monitoring:

Monitoring of:

- cable break
- voltage drop

Accessories:

- **SH00** weather protection hood made of PVC, RAL 7001 only approved for zone 22 and zone free
- **SM2** hexagon nut G 1 ¼
- **SM3** hexagon nut G 1 ½

Material nut:

A-aluminium
E-stainless steel

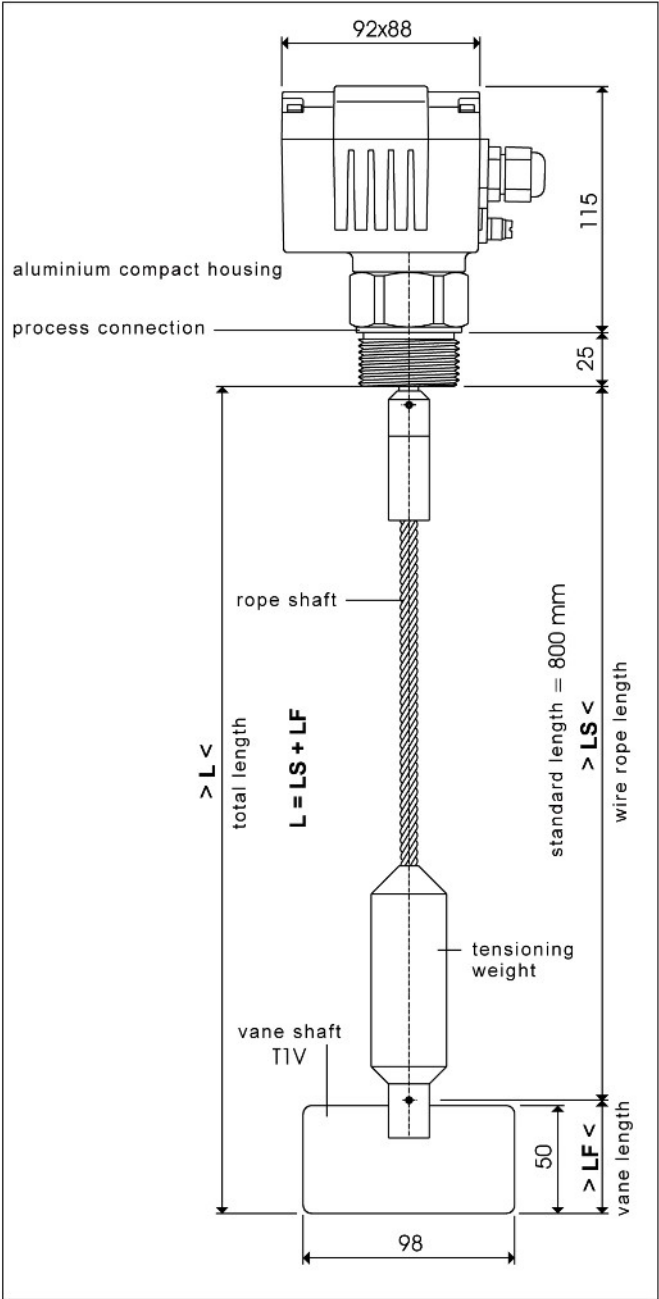
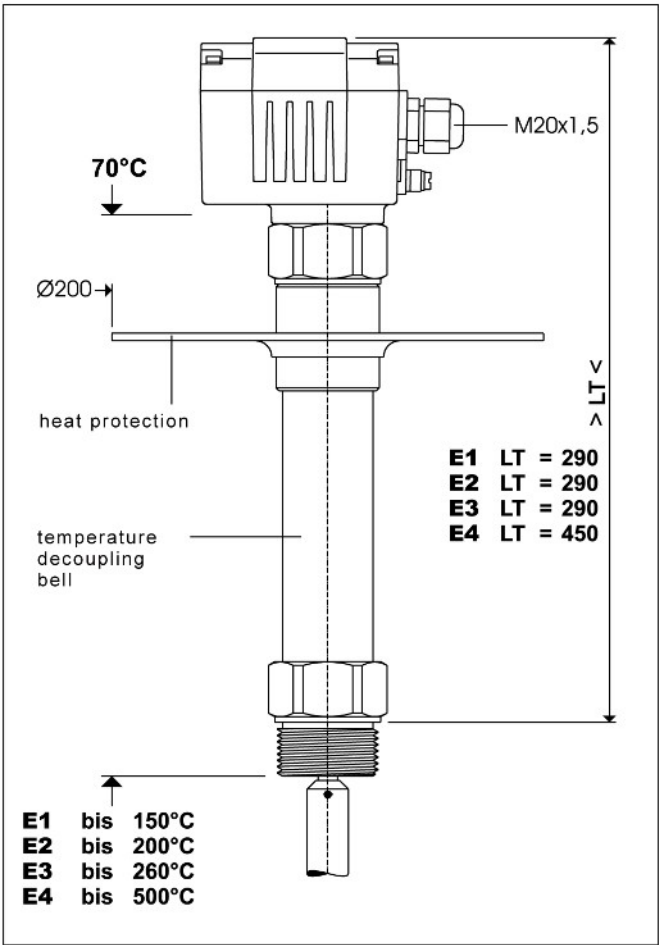
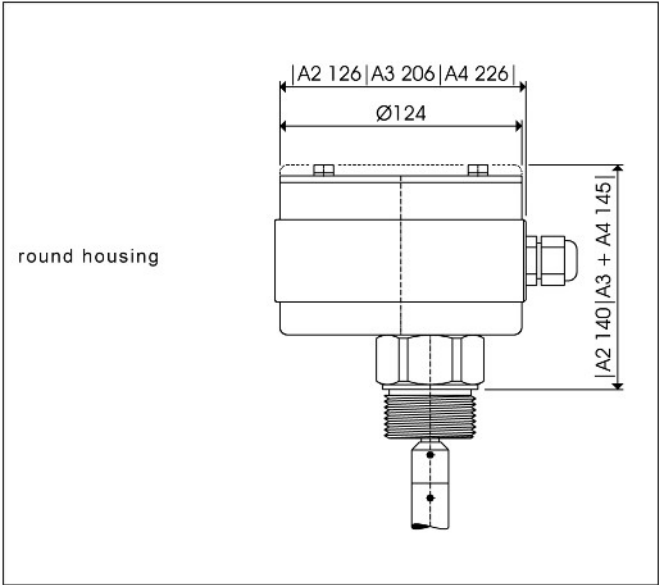
Order Code:

Order number:	FF03-27	A1.	C1.	0.	H0.	E0.	P0.	G2.	A.	T0.	W8
Rotating vane level switch											
Model: 27 = with rope shaft											
Housing selection: A1 = aluminium compact housing A2 = st. steel compact housing											
Operating voltage: C1 = 220...240 VAC (50...60 Hz) C2 = 110...120 VAC (50...60 Hz) C3 = 48 VAC (50...60 Hz) C4 = 24 VAC (50...60 Hz) C5 = 24 VDC C9 = special voltage (on request)											
Self monitoring: 0 = without monitoring D1 = function monitoring D2 = voltage monitoring											
Signal lights: H0 = with function LEDs (standard) H1 = calotte for function LEDs H2 = signal lights, LED green H8 = large Signal lights LED, green											
Bulk material temperature: E0 = -25...80 °C (standard) E1 = -40...150 °C (only with process conn. st. st. E) E2 = -25...200 °C (only with process conn. st. st. E) E3 = -25...260 °C (only with process conn. st. st. E) E4 = -25...500 °C (only with process conn. st. st. E) E7 = device heating 2,5 Watt											
Tank pressure: P0 = -0,5...5 bar (standard) P1 = -0,5...10 bar P2 = -0,95...25 bar** P6 = -0,9...10 bar P7 = -0,9...10 bar**											
Process connection: G2 = G 1 ¼ G3 = G 1 ½ G9 = other threads on request F1 = flange F70 diameter.110, 4 x diameter.9, bc 90 F2 = flange F100 150x150, 4 x diameter.18, bc 170 F5 = flange DN 32, PN 10 (only in stainless steel) F6 = flange DN 100, PN 6 (only in stainless steel) F9 = other flanges on request											
Material process connection: A = aluminium (only up to 80 °C bulk material temperature) E = stainless steel X = other materials on request											
Measuring blade: (versions see page „Measuring Blades“) T0 = blade T220 68x220 T1V = blade T50 98x50* T2V = blade T100 98x100* T5 = blade T250 250x100 T8 = rubber blade 250x100 X1 = blade X50 98x50 X2 = blade X100 98x100 X3 = blade X200 180x100 K1 = folding blade T230 200x30 M9 = other measuring blades on request											
Shaft extension: W8 = 800 mm (standard) Wxxxx = special length (e.g. W1-1000), max. 1500 mm											

* reinforced version

** with pressure decoupling lantern

Models and Dimensions FF03-27:



Level