



# DF-02

## Rotating Vane Level Switch for Industrial Applications

### Features

- / Robust aluminium pressure cast or stainless steel housing
- / Easy to assemble
- / Can be used as full and empty alerter
- / Available optionally with shaft extension
- / Capacity of the contact: 1mA/4VDC up to 2A/250VAC

### Description:

A gear motor situated at a certain rotatable angle in the extension of a shaft is held by means of a spring on a stopper. Over the shaft, the motor drives the vane projecting into a vessel. As soon as the filling material reaches the vane, it is prevented from its further rotation. The reverse torque twists the motor from its end position and actuates a switch. Subsequently, a second switch turns off the motor. If the level goes down, the vane is released and the motor is drawn back by the spring into its end position. In this, the motor is switched on again and the output signal is switched back. The gear motor and both the switches are mounted in an aluminium pressure housing. Precise running of the vane shaft is ensured by 2 encapsulated ball-bearings. In the event of a blockage, a retention coupling prevents damage to the motor. A special type sealing on the shaft prevents dust and humidity from infiltrating into the housing and the ball-bearing.

### Application:

The device is suitable for all freely trickling or hardly flowing bulk goods and for goods that tend to bridge, felting or crusting.



## Tehcnical Specifications:

### Materials /

Housing:	Alu pressure casting (Standard), stainless steel (Option)
Sealing ring:	NBR (optionally Viton or PTFE)
Shaft and Vane:	stainless steel 1.4301 (optionally 1.4571)
Nuts:	steel, Zn plated

### Temperature range /

Ambient temp.:	-20...+70°C
Bulk goods temp.:	-25...+80°C (Standard) (up to +1000°C with high temp.-option)

### Pressure range /

-0.5...+ 5 bar (Standard),  
(optional -0.9...+10 bar)

### Consumption /

4 VA (AC), 4 W (DC)

### Switching load /

potential-free change-over  
1mA/4VDC to 2A/250VAC

### Cable insertion /

1 x M20 x 1,5

### RPM /

1rpm, 5 or 8 rpm on request

### Protection class /

IP 66, IP65 with control lamp

## Seelection guide for measuring vanes:

Lowest bulk weight  $\rho_b$  for which the  
measuring blade can be set.

bulk weight  $\rho_b$  in:

Filling level up to 100 mm above measuring blade	kg/l	t/m <sup>3</sup>
Filling level until blade is completely covered	t/m <sup>3</sup>	kg/l

Measuring blade	Blade size	Spring force setting		Measuring vane for opening
		light	medium	
<b>S2 Socket blade</b>	130 x 30	$\frac{0.2}{0.35}$	$\frac{0.3}{0.5}$	G1 ¼", G1 ½" and all flanges
<b>M1 Socket blade</b>	90 x 28	$\frac{0.15}{0.3}$	$\frac{0.2}{0.5}$	G1", G1 ¼", G1 ½" and all flanges
<b>M2 Socket blade</b>	90 x 40	$\frac{0.1}{0.2}$	$\frac{0.15}{0.3}$	G1 ½" and all flanges
<b>T0 Blade T200</b>	68 x 220	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F70, F100, DN32 PN16, DN100 PN6
<b>T1 Blade T50</b>	98 x 50	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F100 and DN100 PN6
<b>T2 Blade T100</b>	98 x 100	$\frac{0.1}{0.2}$	$\frac{0.2}{0.45}$	F100 and DN100 PN6
<b>X1 Blade X50</b>	98 x 50	$\frac{0.15}{0.3}$	$\frac{0.25}{0.5}$	F100 and DN100 PN6
<b>X2 Blade X100</b>	98 x 100	$\frac{0.1}{0.2}$	$\frac{0.2}{0.45}$	F100 and DN100 PN6
<b>X3 Blade X200</b>	180 x 100	$\frac{0.025}{0.05}$	$\frac{0.075}{0.15}$	Must be fitted from inside after mounting the housing
<b>K1 Hinged Blade T230</b>	200 x 30	$\frac{0.05}{0.08}$	$\frac{0.07}{0.12}$	G1 ¼", G1 ½" and all flanges
<b>SG Blade</b>	126 x 8	$\frac{0.45}{0.55}$	$\frac{0.65}{0.75}$	G1 ¼", G1 ½" and all flanges
<b>TG Blade</b>	98 x 8	$\frac{0.5}{0.6}$	$\frac{0.7}{0.8}$	F100 and DN100 PN6

All values given are approximate values and depend on the characteristics of the bulk goods such as consistency and flow behaviour, for example.



# Ordering Codes:

## Order number

DF-02. 1. 0. 1. 0. 1. 1. 1. 3. 1. 1. 0. 0

## DF-02 Rotating Vane Level Switch

### Housing /

- 1 = aluminium compact housing
- 2 = stainless steel round housing

### Ex approval /

- 0 = none
- 1 = dust Ex ATEX II 1D T70°C IP66 (always with function or voltage monitoring)

### Operating voltage /

- 1 = 220-240 VAC, 50-60 Hz
- 2 = 110-120 VAC, 50-60 Hz
- 3 = 48 VAC, 50-60 Hz
- 4 = 24 VAC, 50-60 Hz
- 5 = 24 VDC +10%/-15%

### Self-monitoring /

- 0 = none
- 1 = function monitoring
- 2 = voltage monitoring

### Signal lamps /

- 1 = standard with function LEDs on board
- 2 = calotte for function LEDs (not for Ex-version)
- 3 = signal lamps LED green (not for Ex-version)
- 4 = large signal lamps LED, green (not for Ex-version)

### Bulk material temperature (max. -25°C to 45°C for dust Ex version) /

- 1 = standard -25...+80°C
- 2 = -40...+150°C
- 3 = -25...+200°C
- 4 = -25...+260°C
- 5 = -25...+500°C
- 6 = up to +1000°C on request

### Vessel pressure /

- 1 = standard -0.5...+5 bar (-80...+80mbar for dust Ex version)
- 2 = -0.5...+10 bar
- 3 = -0.9...+10 bar

### Process connection /

- 1 = G 1"-male
- 2 = G1 ¼"-male
- 3 = G1 ½"-male
- 4 = M30x1.5-male
- 5 = M32x1.5-male
- 6 = flange F70, diameter 110 mm, 4 holes with diameter of 9 mm, hole circle 90 mm
- 7 = flange F100, 150x150 mm, 4 holes with diameter of 18 mm, hole circle 170 mm
- 8 = flange DN32 PN10 (stainless steel only)
- 9 = flange DN100 PN6 (stainless steel only)

### Material for process connection /

- 1 = aluminium
- 2 = stainless steel 1.4301

### Measuring vane /

- 0 = no measuring vane
- 1 = S2 bushing vane 130x30 mm inclined, fits through G1 ¼" and G1 ½" and all flange variants
- 2 = M1 bushing vane 90x28 mm, fits through G1", G1 ¼" and G1 ½" and all flange variants
- 3 = M2 bushing vane 90x40 mm, fits through G1 ½" and all flange variants
- 4 = T50 vane 98x50 mm, fits through flanges F100 and DN100
- 5 = T100 vane 98x100 mm, fits through flanges F100 and DN100
- 6 = X50 vane 98x50 mm, fits through flanges F100 and DN100
- 7 = X100 vane 98x100 mm, fits through flanges F100 and DN100
- 8 = X200 vane 180x100 mm, must be fitted from inside after mounting the housing
- 9 = T0 flat paddle 68x220 mm, fits through flanges F70, F100 and DN100
- 10 = SG L rod vane for very rough bulk material mm, fits through G1 ¼" and G1 ½" and all flange variants
- 11 = TG T rod vane for very rough bulk material mm, fits through flanges F100 and DN100
- 12 = T230 flap vane 200x30 mm, fits through G1 ¼", G1 ½" and all flange variants

### Measuring vane reinforcement (for bushings and T vanes only) /

- 0 = no reinforcement
- 1 = with reinforcement

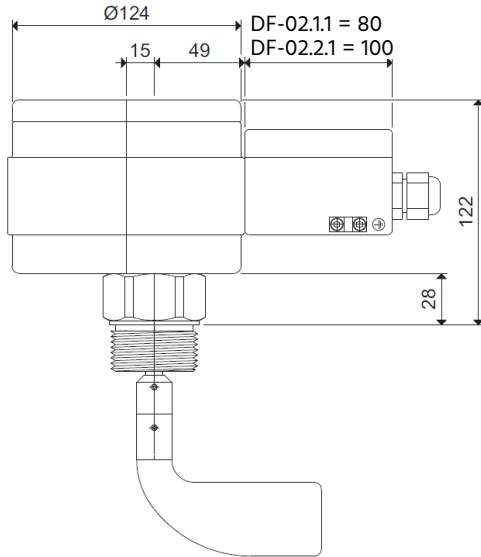
### Options /

- 0 = no options
- 1 = sideways mounting with reinforced bearing
- 2 = with flexible wire rope extension (specify length in detailed text)
- 3 = with rigid shaft extension (specify length in detailed text)

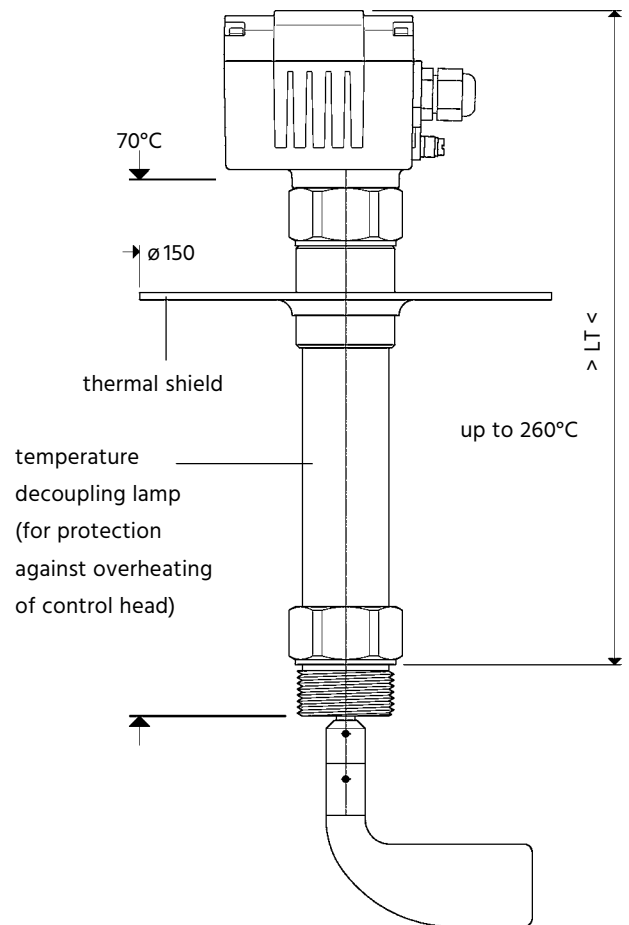
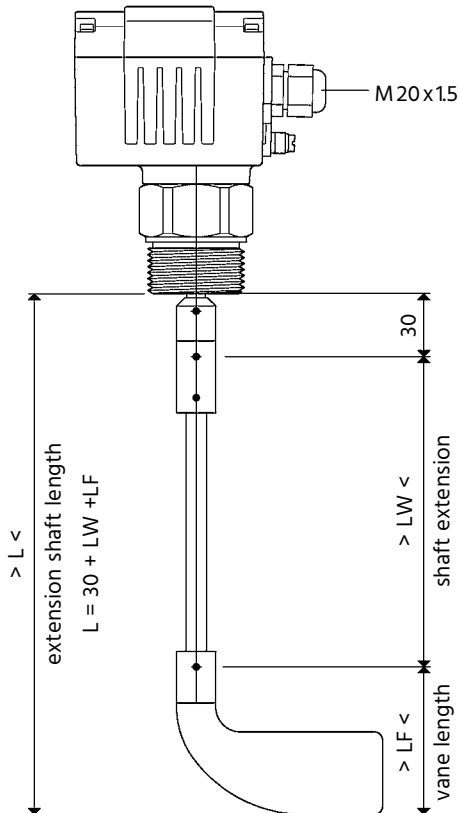
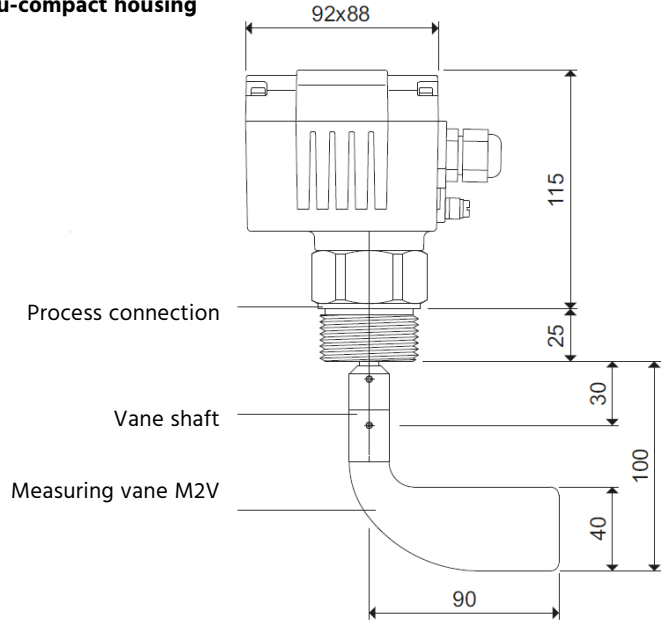


# Dimensions and versions in mm:


## St. steel rounded housing



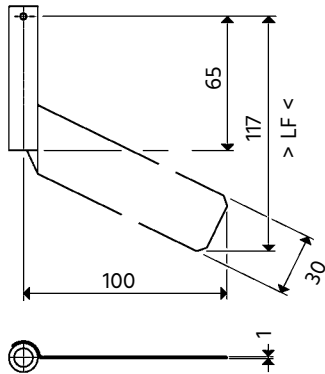
## Alu-compact housing



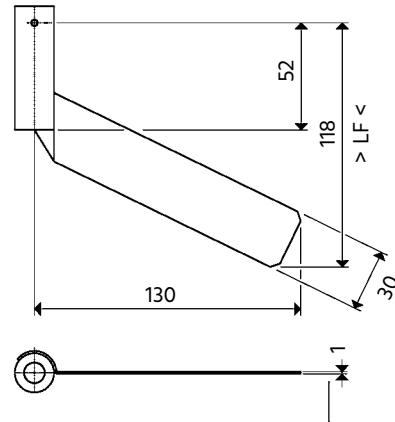


Flame protection for all measuring vanes shown:  II 1GD c IIC TX

**S1 bushing blade**

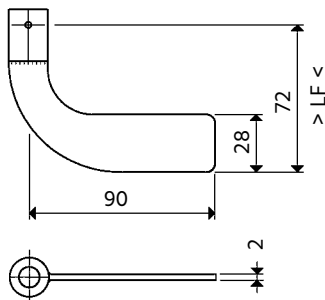


**S2 bushing blade**

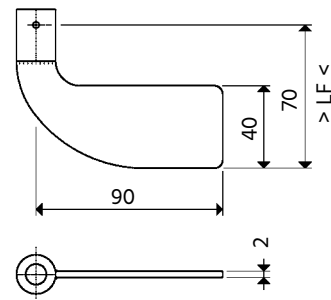


2mm for S2V bushing vane, reinforced

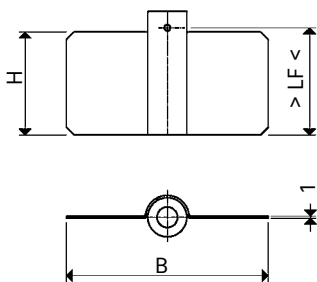
**M1V bushing blade, reinforced**



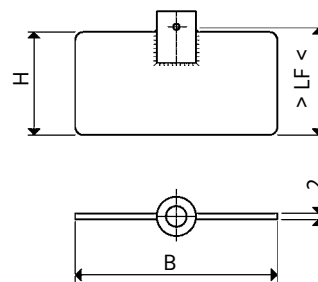
**M2V bushing blade, reinforced**



**T - blade**



**T - blade, reinforced**



	<b>B</b>	<b>H</b>	<b>LF</b>
<b>T1</b>	98	50	52
<b>T2</b>	98	100	102
<b>T3</b>	200	100	102
<b>T5</b>	250	100	102
<b>T8*</b>	250	100	102

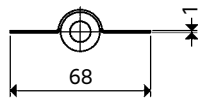
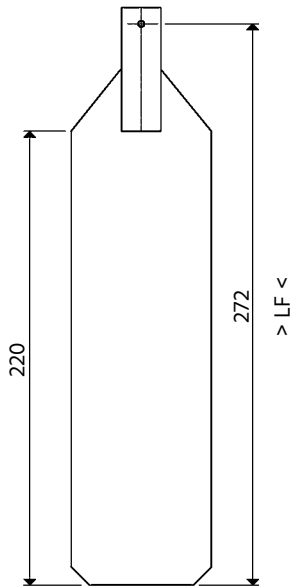
	<b>B</b>	<b>H</b>	<b>LF</b>
<b>T1V</b>	98	50	52
<b>T2V</b>	98	100	102

\* vanes 10 mm thick  
made of rubber NBR, black

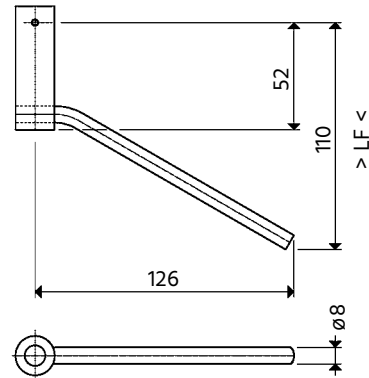


Flame protection for all measuring vanes shown: II 1GD c IIC TX

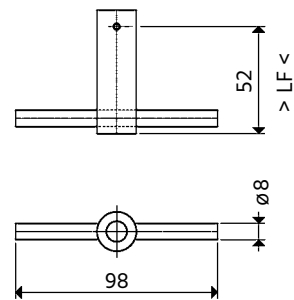
**TO blade**



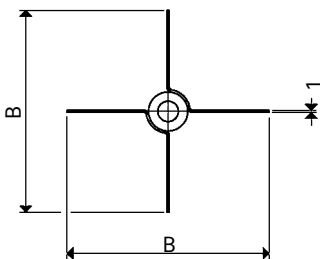
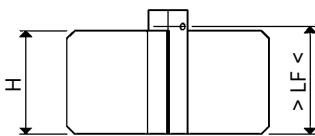
**SG bushing blade, reinforced**



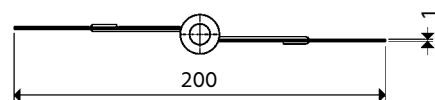
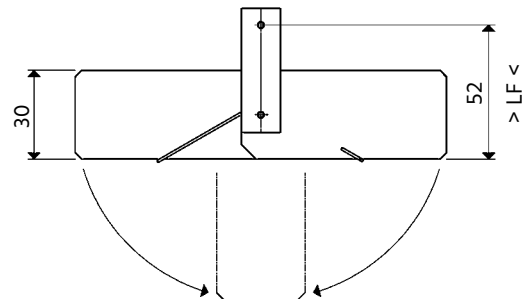
**TG blade, reinforced**



**X blade**



**K1 flap-blade**



	<b>B</b>	<b>H</b>	<b>LF</b>
<b>X1</b>	98	50	52
<b>X2</b>	98	100	102
<b>X3</b>	180	100	102