# Optical level monitoring

Function

Levels can be measured simply and accurately using infrared light, without the need for any electrical or thermal connection between the target medium and sensor. The operating principle is illustrated in the drawing. The ratio of reflective indices changes, depending on whether the tip of the sensor is surrounded by liquid or air. If the sensor tip is immersed in liquid, the light rays will be deflected into the liquid and the electronics of the receiver changes its switching status. The operating principle remains the same, irrespective of whether the liquid medium can conduct electricity or not. The medium can also be clear or cloudy.

Sensing level not reached

lateral mounting
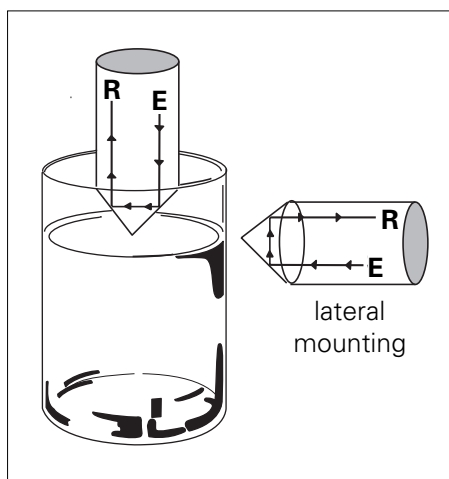
Sensing level reached
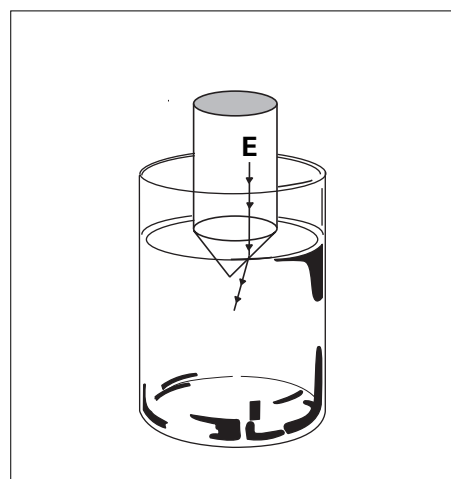
Housing

The housing material of the FFAK series is polysulphone (PSU), a special plastic chemically resistant to acids, lyes or oils. The FFAM series housing consists of stainless steel, which is also resistant to many liquids. Its compact size allows it to be installed even where space is at a premium. The sensor can be installed vertically or horizontally.

Application

The chemical resistance of Polysulphone (PSU) or stainless steel (with glass tip) to various liquids, lends itself to many applications. Under normal conditions the sensor can be used with the following media:

- alcohol   - vinegar
- ether   - mineral oils
- battery acid   - diluted lyes
- water   - lactic acid
- hydrochloric acid

This list shows only the most significant media; the suitability for applications with other media should be checked with a chemical compatibility test.

Liquid level monitoring sensors / plastic housing

		G 3/8"	G 3/8"

Type	switched when dipped	pulsed light	non pulsed light
PNP		**FFAK 17PTD1001/L**	**FFAK 17PTL1001**
NPN		**FFAK 17NTD1001/L**	**FFAK 17NTL1001**

technical data		
voltage supply range Vs	10 - 30 VDC	24 VDC ±20%
supply current average value / peak value	14 mA / 15 mA	40 mA / 40 mA
max. switching current *)	200 mA	100 mA
voltage drop	≤ 2 VDC	≤ 3 VDC
light source / wave length	pulsed infrared LED / 880 nm	infrared LED / 880 nm
output indicator	red LED	-
nominal pressure (tip)	10 bar	10 bar
short circuit protection *)	no	no
reverse polarity protection	yes / +Vs	yes / +Vs
temperature range **)	0...+65 °C	0...+65 °C
housing material **)	polysulphone	polysulphone
max. torque	7 Nm	7 Nm
protection class	IP 67	IP 67

Available with potentiometer	PNP	**FFAK 17PTD1002/L**	
	NPN	**FFAK 17NTD1002/L**	

Type with thread M16x1	PNP	**FFAK 16PTD1001/L**	**FFAK 16PTL1001**
	NPN	**FFAK 16NTD1001/L**	**FFAK 16NTL1001**

*) a short circuit might damage the device
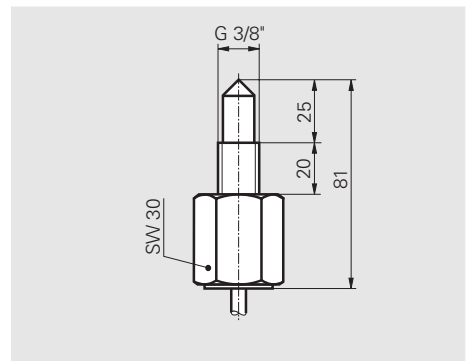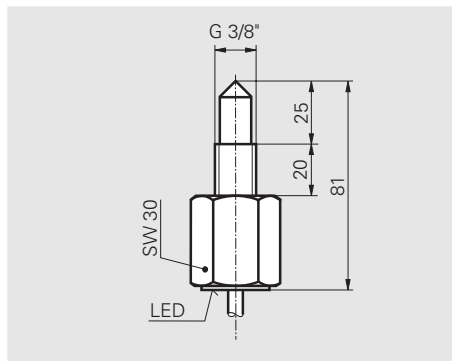
**) other housing materials on request

Liquid level monitoring sensors

G 3/8"

Type	switched when dipped	pulsed light	
PNP		**FFAM 17PTD1002/L**	

technical data			
voltage supply range Vs		10 - 30 VDC	
supply current average value / peak value		14 mA / 15 mA	
max. switching current *)		200 mA	
voltage drop		≤ 2 VDC	
light source / wave length		pulsed infrared LED / 880 nm	
output indicator		yellow LED	
sensitivity adjustment		Pot	
nominal pressure (tip)		40 bar	
short circuit protection *)		no	
reverse polarity protection		yes / +Vs	
temperature range **)		0...+65 ˚C	
housing material **)		stainless steel DIN 1.4305 / AISI 303	
tip material		glass (borosilikat)	
max. torque		18 Nm	
protection class		IP 67	

Type with thread M16x1	PNP	**FFAM 16PTD1002/L**	

*) a short circuit might damage the device

**) other housing materials on request