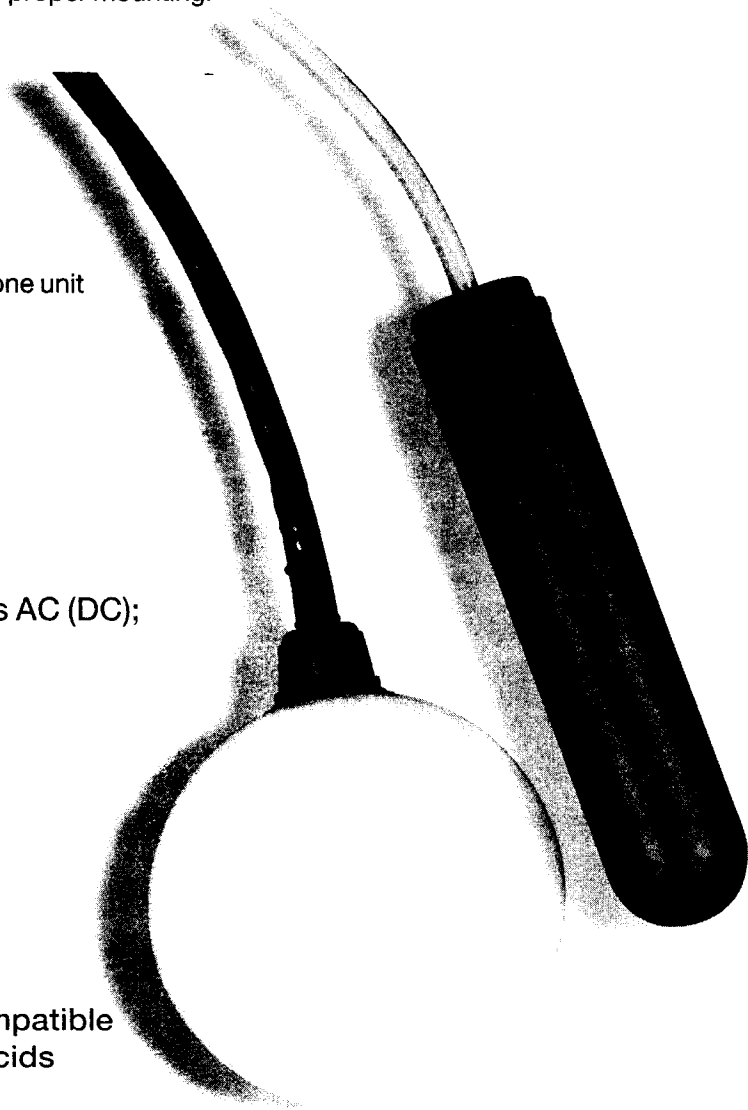


# FLOAT SWITCH SOLUTIONS

Pepperl+Fuchs' mercury-free float switches are economical solutions for a wide variety of industrial and municipal level applications. Whether you're monitoring wastewater, fuel, grease, acids or caustics, we offer a variety of float housing materials and highly flexible cables to fit your application. P+F's heavy-duty construction requires virtually no maintenance after proper mounting!

- **Easy installation**
  - Thread into a 1" or 2" NPT coupling
  - Operate independently of mounting
  - Side or top mount configurations
- **Cost-effectiveness**
  - Pump-up and pump-down control in one unit
  - Reduce stocking requirements
  - Extremely low installation costs
  - Inexpensive components
  - Simple interface
- **NAMUR output (DIN 19234) for hazardous area use**
- **Contact output rated at 250 volts AC (DC); 3(1) amp**
- **Mercury-free!**
  - Environmentally friendly
- **Rugged design**
  - Highly flexible cable
  - Integrated strain relief
  - Heavy-duty construction
- **PVC, PUR and CSM cables compatible with caustics, chemicals and acids**



Heavy-duty ball and cylindrical float switches

## THEORY OF OPERATION

A float switch is an electric switch controlled by a float on a liquid. This method of point level control can be used for overflow, low level and min-max control of most media.

# FLOAT SWITCH SOLUTIONS



For sump control, the float switch is mounted at the point the liquid should not exceed. For low level detection, the switch is mounted at the point the liquid should not drop below. A float switch with an attached weight mounts from above the tank, allowing for reliable control even in hard to reach or space critical applications. Multiple point control allows the medium to be measured at numerous levels.

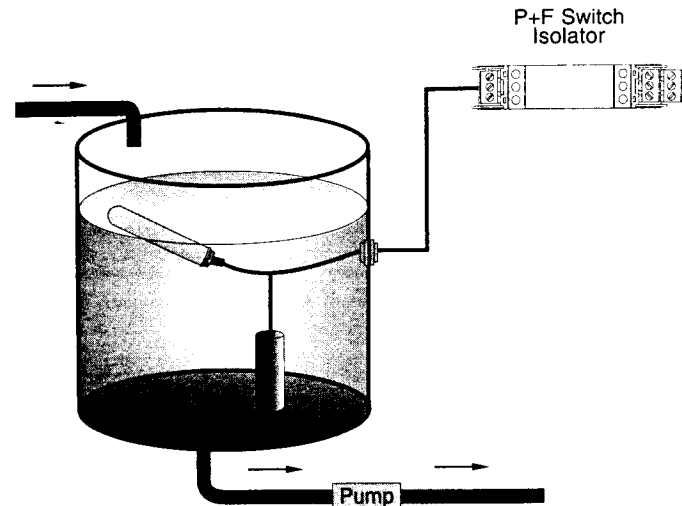
P+F float switches provide SPDT contacts or NAMUR outputs for pump-up and pump-down control with one unit or can be used as a single point control. Stocking requirements can be greatly reduced by using the unit for both functions.

A WE77/JR is a logic module provides a latching relay function for level control and pump up/pump down applications. Our float switches are, however, compatible with other manufacturers' products and can be used as a stand-alone control.

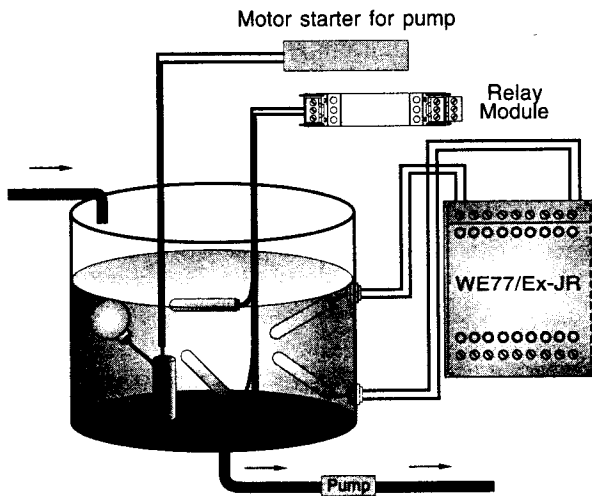
## Hazardous Location Intrinsically Safe Solution

Hazardous Area

Safe Area



## Nonhazardous Location



## APPLICATION

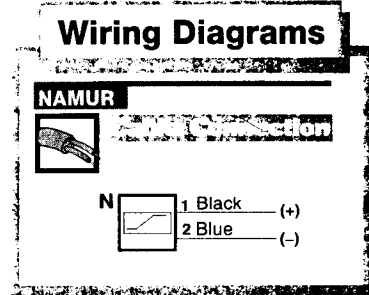
Float switches are simple, sturdy and inexpensive. Float switches are well-suited for applications involving viscous and nonviscous media. They are not suitable for crust forming and agitated applications with densities less than 0.6 gr/cm<sup>3</sup>.

### Common applications include:

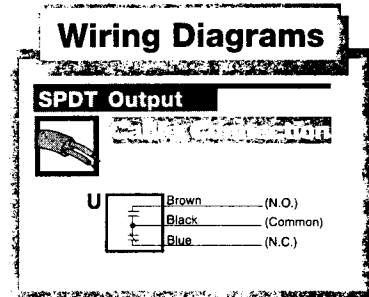
- Wastewater treatment
- Sump control
- Overflow protection
- Pump protection
- Low level protection
- Min-Max control
- High-high alarm

# TECHNICAL SPECIFICATIONS

ELECTRICAL CONNECTION	
<b>NAMUR (DIN 19234)</b>	
NOMINAL VOLTAGE	8 V
<b>SPDT</b>	
SWITCHING VOLTAGE	250 VAC (DC) max.
SWITCHING CURRENT	3 (1) A



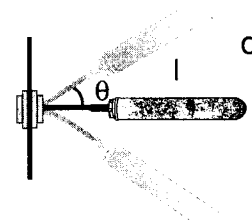
PROCESS CONDITIONS	
<b>TEMPERATURE RANGES</b>	
PVC	-4°F to +158°F (-20°C to +70°C)
PUR, CSM	-4°F to +185°F (-20°C to +85°C)
<b>PRESSURE (-4°F)</b>	
Cylindrical	≤43 psi (≤3 bar)
Ball	≤29 psi (≤2 bar)
<b>DENSITY</b>	
Cylindrical	≥0.8 g/cm <sup>3</sup>
Ball	≥0.6 g/cm <sup>3</sup>



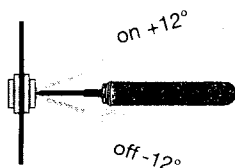
SWITCHING ANGLE	
<b>NAMUR</b>	
Upper switching point	+12°
Lower switching point	-12°
<b>MECHANICAL</b>	
Upper switching point	+18°(±6°)
Lower switching point	+5°(±3°)

**Trigonometric Functions for Float Movement**  
 The following formula, diagrams and chart will simplify your calculations. Simply place the values required for your application into the formula.

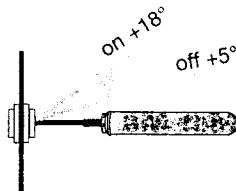
$d = l \times \tan \theta$   
 $d$  = linear distance  
 $l$  = cable length  
 $\theta$  = upper or lower switching point



**NAMUR**



**CONTACT (SPDT)**



$\theta$	$\tan \theta$
+5	0.087
+12	0.213
+18	0.325
+23	0.424
+24	0.445





# TECHNICAL SPECIFICATIONS

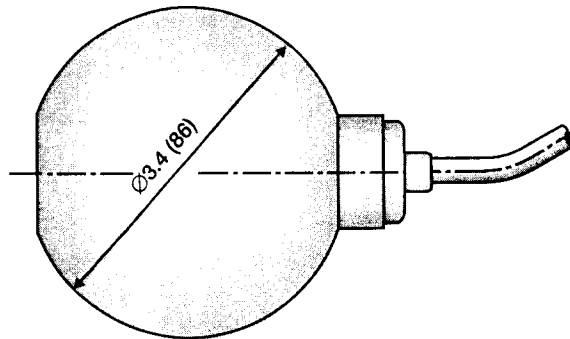
<b>HOUSING</b>	
<b>FLOAT MATERIAL</b>	Polypropylene
<b>CABLE</b>	
<b>MATERIAL</b>	PVC, PUR, CSM
<b>LENGTH</b>	9.8 ft. (3 m), 16.4 ft. (5 m)*

\* These are standard lengths. Consult factory for other lengths.

## DIMENSIONS inches (mm)



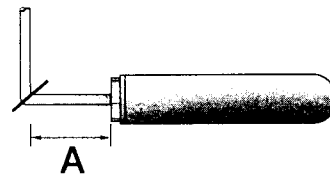
Cylindrical float switch



Ball float switch

<b>COMPATIBILITY</b>	
<i>PVC</i>	Water, wastewater and corrosive media
<i>PUR</i>	Fuel and greasy media
<i>CSM</i>	Acids and bases

<b>MOUNTING</b>		
<b>CABLE LENGTH BETWEEN MOUNTING AND FLOAT</b>		
(A)min.	<i>PVC</i>	≥1.96 in. (50 mm)
	<i>PUR, CSM</i>	≥3.94 in. (100 mm)
<b>OUTSIDE OR SIDE MOUNT</b>		with cable gland (cylindrical)
<b>TOP MOUNT</b>		with additional weight



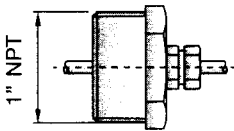
FLOAT SWITCHES

# ACCESSORIES

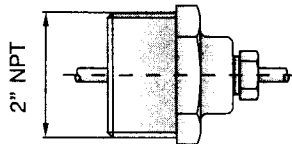
DESCRIPTION	Order Model Number
Cable gland, 1" NPT, PVC	LFL-Z431
Cable gland, 1" NPT, brass	LFL-Z432
Cable gland 2" NPT, PVC	LFL-Z461
Cable gland, G1A, PVC	LFL-Z131
Cable gland, G1A, brass	LFL-Z132
Cable gland, G2A, PVC	LFL-Z161
Counter weight, 2 in	LFL-Z13

## DIMENSIONS

### Cable Glands

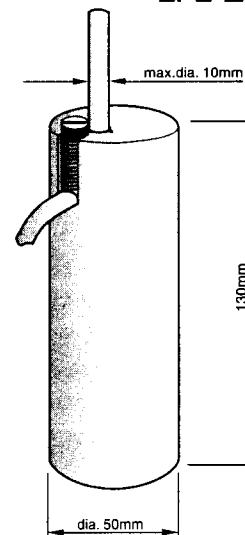


LFL-Z432



LFL-Z461

### Counter Weight LFL-Z13



## APPROVALS

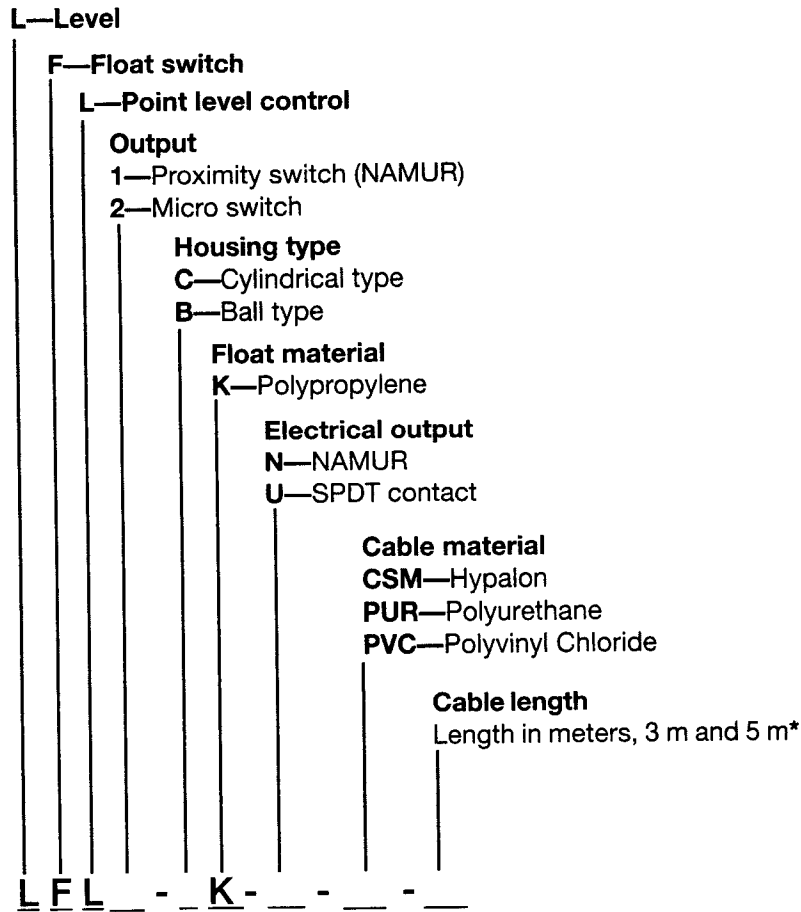
The LFL2 float switch is recognized by approval agencies as a simple apparatus and doesn't need certification from a third party. The switch should, however, be connected to an intrinsic safety barrier for hazardous location use. Refer to "Controls for Use with Point Level Devices" on page 87.



The LFL1 float switch featuring a NAMUR output is intrinsically safe according to DIN 19234.



# KEY TO MODEL NUMBERS



\* For additional cable lengths, please consult factory.

**FLOAT SWITCHES**

*Don't hesitate to call a P-F application engineer to ask about your special requirements. We're always there to assist you! Call (330) 425-3555.*