

## Float Level Transducer



measuring  
•  
monitoring  
•  
analyzing

NML



- Simple, Reliable Design
- Stainless Steel Construction
- Stem Lengths up to 8 Feet
- Resistive or 4-20 mA Output
- Max. Temperature: 250 °F
- Max. Pressure: 800 PSIG



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**Description**

Float level transducers are one of the simplest and most reliable means of measuring the level of non-coating, low viscosity liquids. Factors such as foaming, vapors, and liquid dielectric, which can cause other types of level sensing technologies to malfunction, will not affect the NML series. It consists of a guide tube (stem) onto which a float with an embedded permanent magnet is installed. As liquid level changes, the float will follow the liquid level. The magnet inside the float activates a network of reed switches attached to a series of precision resistors. The system acts as a 3-wire potentiometer with resistance that varies between approximately 0-5000Ω, as the liquid level changes.

The NML offers a variety of fitting, float, and housing options to suit your specific level sensing criteria. When ordering, the specific gravity of the liquid must be known. The float selected must have a lower minimum specific gravity limit than the specific gravity of the liquid. A variety of float types are available which can accommodate liquids with specific gravity as low as 0.47. Reliable operation and simple design make the NML an excellent choice for many tough level sensing applications.

For aggressive media applications, please see our NML-308 and NML-310 models.



**Specifications**

<b>Sensing Technology:</b>	Reed Switch, Chain Type
<b>Measuring Range:</b>	12" ...96" (300...2400 mm)
<b>Resolution:</b>	± 0.25" (6.5 mm)
<b>Dead Band:</b>	See Diagram and Table
<b>Minimum Liquid S.G.:</b>	See Float Information Table
<b>Maximum Pressure:</b>	See Float Information Table
<b>Wetted Parts</b>	
<b>Stem:</b>	316 Stainless Steel
<b>Float:</b>	See Float Information Table
<b>Fitting:</b>	316 Stainless Steel
<b>Fittings:</b>	1/2" NPT, 3/4" NPT, 2" NPT; 2" or 3" ANSI Flange; Others Available upon Request
<b>Protection</b>	
<b>Polyamide Enclosure:</b>	NEMA 4 / IP65
<b>SS Enclosure:</b>	NEMA 4X / IP66
<b>Aluminum Enclosure:</b>	NEMA 4X / IP66

**Output Transmitter Option (..RT)**

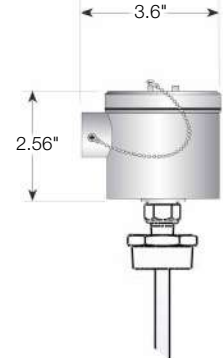
<b>Ambient Temperature:</b>	-4...140 °F (-20...60 °C)
<b>Storage Temperature:</b>	-40...176 °F (-40...80 °C)
<b>Media Temperature:</b>	-4...250 °F (-20...120 °C)
<b>Output:</b>	4-20 mA, 2-wire
<b>Max. Loop Resistance:</b>	$[V_{supply} - 9 V_{DC}] / 20 \text{ mA}$
<b>Accuracy:</b>	≤ ± 3.0 F.S. Maximum ≤ ± 1.5% F.S. Typical
<b>Open Circuit Detection:</b>	Over Scale Limit of 27.0 mA Under Scale Limit of 2.2 mA
<b>Sensing Voltage/Current:</b>	5 V <sub>DC</sub> Max., 2.5 mA Max.
<b>Warmup Time:</b>	30 seconds
<b>Supply Voltage:</b>	12-32 V <sub>DC</sub>
<b>Residual Ripple S.V.:</b>	≤ 5%
<b>Input Protection:</b>	Reverse Polarity, Excess Voltage, Override, and Short-circuit
<b>Supply Effect:</b>	< 0.02 % / V

**Dimensions**

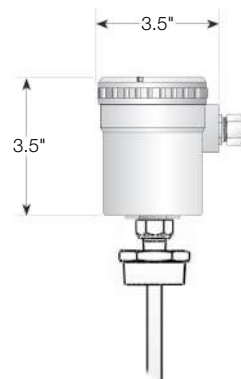
**Aluminum Housing**



**SS Housing**



**Polyamide Housing**

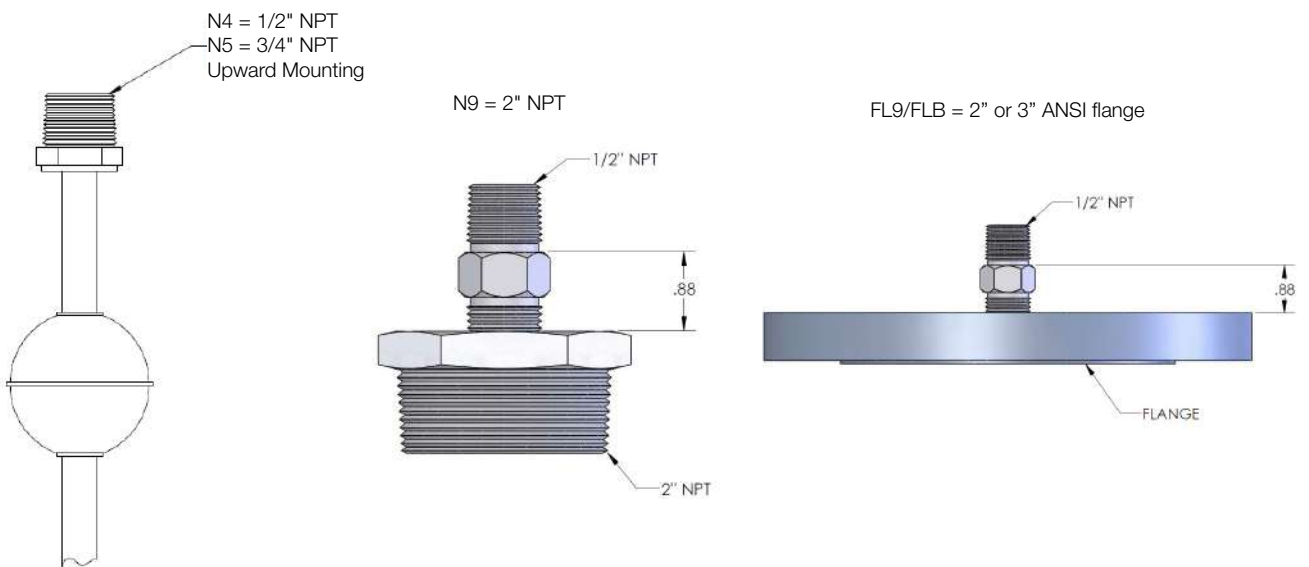


**Float Information**

Float Code	Description	Minimum Liquid Specific Gravity	Temp. Range	Max. Pressure	Additional Considerations
<b>FBN</b>	NBR 1-9/16" diameter, cylindrical	0.55	-40...180 °F in water -40...225 °F in oil	200 PSIG	---
<b>FS2</b>	316 stainless steel 2" diameter, spherical	0.59	-40...250 °F	600 PSIG	The standard float for stainless steel NML versions
<b>FS26</b>	316 stainless steel 2" dia. X 2.6" long	0.65	-40...250 °F	800 PSIG	Higher pressure float for stainless steel NML versions
<b>FS3</b>	316 stainless steel 3" diameter, spherical	0.47	-40...250 °F	500 PSIG	For low specific gravity liquids. Can install from outside of tank with 3" ANSI flange fitting

**Note:** Some fitting/float combinations will require access to the inside of the tank for installation due the diameter of the float versus the fitting. Review your desired float/fitting combination carefully to insure access to the inside of the tank is possible if necessary.

**Fitting Styles**





Order Details (Example: NML-2N9FS2RT1 L=60")

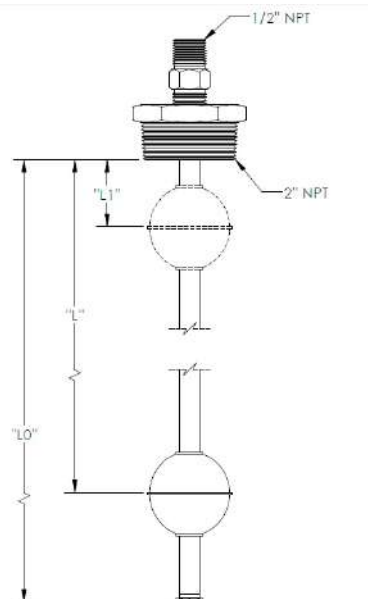
Model	Stem/Fitting Material	Fitting Style	Float Type	Output	Enclosure	Measuring Length
NML-	2.. = Stainless Steel	..00.. = No Fitting (open tube) ..N4.. = 1/2" NPT (facing up) ..N5.. = 3/4" NPT (facing up) ..N9.. = 2" NPT ..FL9.. = 2" 150 LB ANSI Flange ..FLB.. = 3" 150 LB ANSI Flange	..FBN.. = NBR S.G. - 0.55 ..FS2.. = 316 Stainless Steel 2" dia. S.G. - 0.59 ..FS26.. = 316 Stainless Steel 2" dia. x 2.6" S.G. - 0.65 ..FS3.. = 316 Stainless Steel 3" dia. S.G. - 0.47	..W.. = Resistive (0-5000 Ω) ..RT.. = 4-20 mA (2-wire)	..0 = None, Fitting or Open Tube Only (with 6" lead wire) ..J = Aluminum ..1 = Polyamide ..2 = Stainless Steel	L = Specified Measuring Length in Inches

Ordering Code Considerations:

- Enclosure type 0 with fitting style N9, FL9, & FLB comes standard with 1/2" NPT male conduit electrical connection
- Enclosure types J, 1, & 2 not available with fitting styles 00, N4, & N5
- Output type RT not available with fitting type 00, N4, or N5, and is also not available with enclosure type 0
- If additional lead wire length is requested, please add suffix .EW followed by the total length in inches (ex. NML-200FBNW0EW60" L=60")
- Please note that measuring length L in inches is not the over stem length; please reference the deadband information below for overall stem length
- Custom configurations available upon request

Upper Deadband and Overall Stem Length

Float Code	L1	L0
FBN	1-1/2"	L + 2"
FS2	1-1/2"	L + 2"
FS26	1-5/8"	L + 2 1/4"
FS3	2"	L + 2 1/4"



L = User Specified Measuring Length  
 L0 = Overall Length of Measuring Stem  
 L1 = Upper Stem Deadband