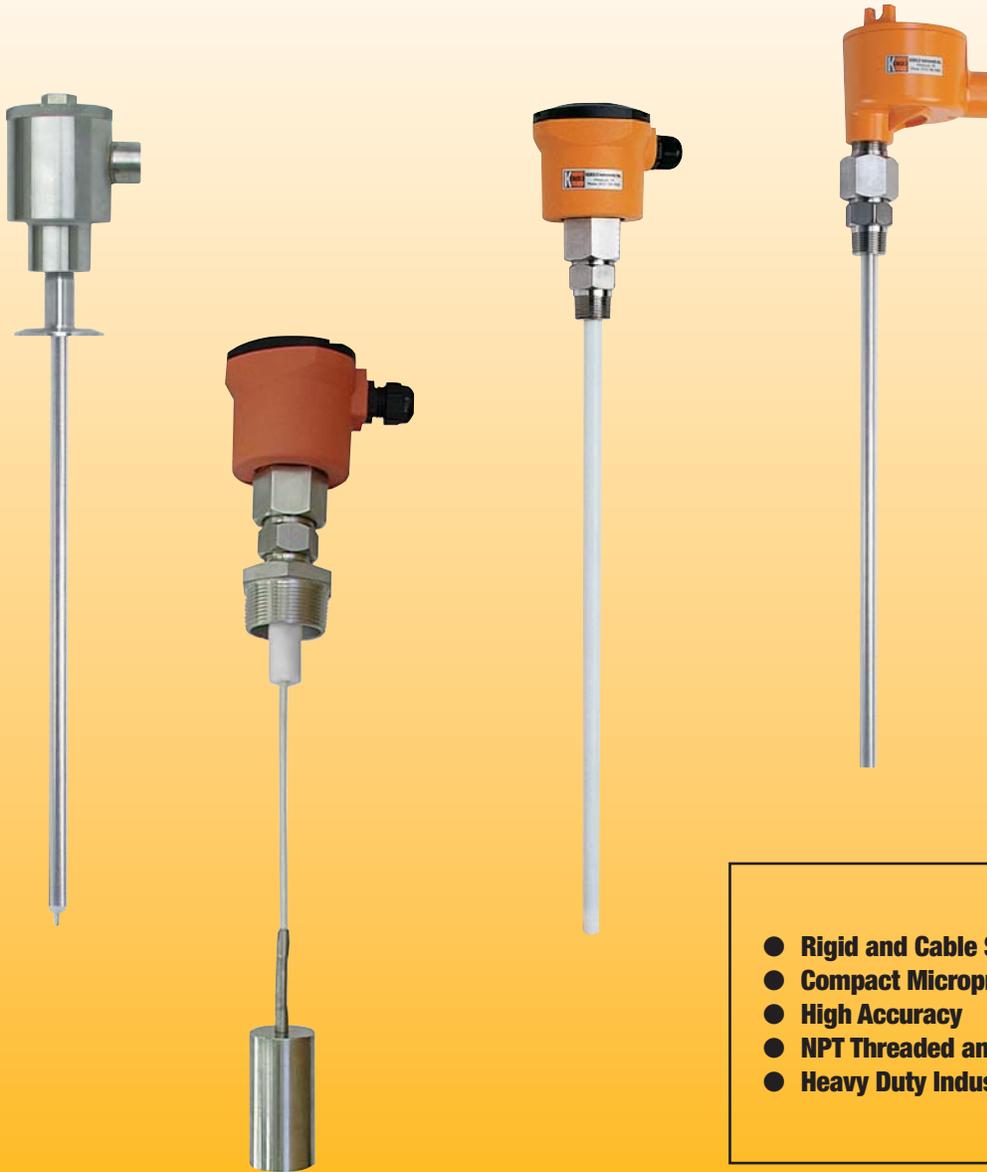


NRF CAPACITANCE LEVEL TRANSMITTER



Flow
Pressure
Level
Temperature
measurement
monitoring
control



- Rigid and Cable Suspended Designs
- Compact Microprocessor Based Designs
- High Accuracy
- NPT Threaded and Tri-Clamp® Mountings
- Heavy Duty Industrial Designs

N2



USA

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Visit KOBOLD Online at
www.kobold.com

Model:
NRF

Product Line Overview



- NRF-1 Series**
- **Single Rigid Capacitance Level Probe**
 - Designed for water-based liquids or oils in metal tanks
 - NPT threaded or Tri-Clamp fittings
 - PFA clad stainless steel probe standard, up to 20 feet long
 - Un-clad stainless steel probes as an economical solution for non-conductive liquids



- NRF-1D Series**
- **Dual Rigid Capacitance Level Probe**
 - Dual probe design for use with acids in non-metallic tanks
 - Concentric probe design for oils or water-based liquids in non-metallic tanks
 - NPT threaded fittings in stainless steel or PVC
 - PFA clad stainless steel probes up to 12 feet long



- NRF-1C Series**
- **Cable Suspended Capacitance Level Probe**
 - Probe lengths up to 200 feet
 - Water-based liquids or oils
 - Single cable versions for metal tanks
 - Dual cable versions for non-metallic tanks



- NRF-1F Series**
- **High Sensitivity Fuel Level Probe**
 - Special high-gain design for fuels and solvents
 - Rigid stainless steel probe in lengths up to 12 feet
 - Special designs for taller tanks available on request

Features

- Compact design for water-based liquids or oils in metal tanks
- Accuracy 1% of span in metal tanks
- NPT threads or Tri-Clamp®
- Heavy duty industrial design

The KOBOLD series NRF capacitance level transmitter is designed to measure water-based liquids or oils in metal or tanks. The probe measures level by measuring the change in capacitance as level changes in the tank. The microprocessor-based electronics converts this capacitance change into a linear, highly accurate 4-20 mA signal. The compact, microprocessor-based design makes installation and setup a simple task. The advanced signal conditioning circuitry greatly minimizes the adverse effects of coating media.

The NRF is available in rigid and flexible probe versions. An NPT threaded fitting and Tri-Clamp® sanitary fittings are available as standard items. The standard probes are PFA clad to stand up to aggressive media. The series NRF is truly designed with tough applications in mind.

Other versions of the NRF Series are available for applications. High sensitivity versions for fuels and solvents are also available. Consult the NRF product line overview for details on other models.



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KOBOLD NRF-1 Capacitance Level Probe

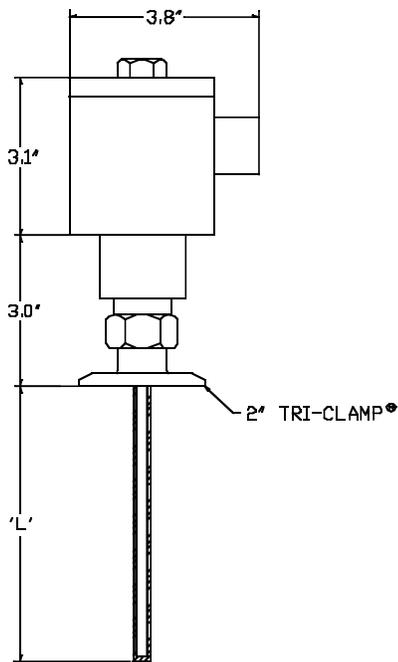
Specifications

<p>Accuracy: ±1% of span (constant liquid dielectric)</p> <p>Repeatability: ±0.1% of span</p> <p>Maximum Length: 20 feet</p> <p>Wetted Materials</p> <p>Fitting: 316 stainless steel or PTFE</p> <p>Probe: Fully PFA clad * 316 Stainless Steel probe only for non-conductive liquids</p> <p>Temperature Range</p> <p>Process: -100 to 350°F</p> <p>Ambient: -58 to 140°F</p>	<p>Electrical Specifications</p> <p>Input Power: 12-36 VDC</p> <p>Output: 4-20 mA, 2-wire</p> <p>Enclosures: NEMA 4 Polyamide, aluminum or stainless steel</p> <p>Maximum Pressure</p> <p>316 SS Fitting: 500 PSIG @ 70°F 250 PSIG @ 300°F 100 PSIG @ 350°F</p> <p>PTFE Fitting: 150 PSIG @ 70°F 0 PSIG @ 300°F</p> <p>Tri-Clamp®: Per the clamp rating</p>
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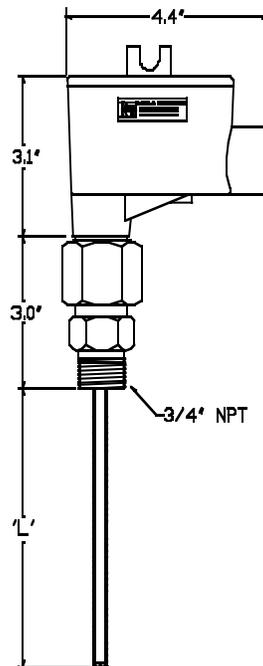
Applications

- Waste treatment plants
- Refineries
- Food and beverage industry
- Fire protection systems
- Water storage tanks
- Chemical holding tanks
- Many others

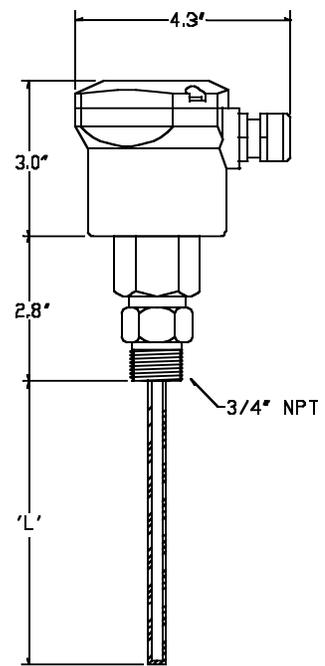
Dimensions



Tri-Clamp Connection
Stainless Steel Housing



Aluminum Housing



Polyamide Housing

NRF Ordering Information					
NRF-1	= Rigid Capacitance Level Probe				
	-1	= Polyamide (NEMA 4)	Housing		
	-2	= Stainless Steel			
	-3	= Epoxy Coated Aluminum (Not available with Tri-Clamp fittings)			
		-1	= 3/4" NPT Stainless Steel	Fitting	
		-2	= 3/4" NPT PTFE		
		-3	= 1 1/2" Tri-Clamp®		
		-4	= 2" Tri-Clamp®		
		-1	= Rigid Probe, PFA Clad	Probe Style	
		-7	= Rigid Probe 316 Stainless Steel Un-clad (non-conductive liquid only.)		
			-L	= Probe Length	
NRF-1	-1	-2	-1	L=60"	Sample NRF Part Number

For each order or request for quotation, please complete the application datasheet at the end of this section.

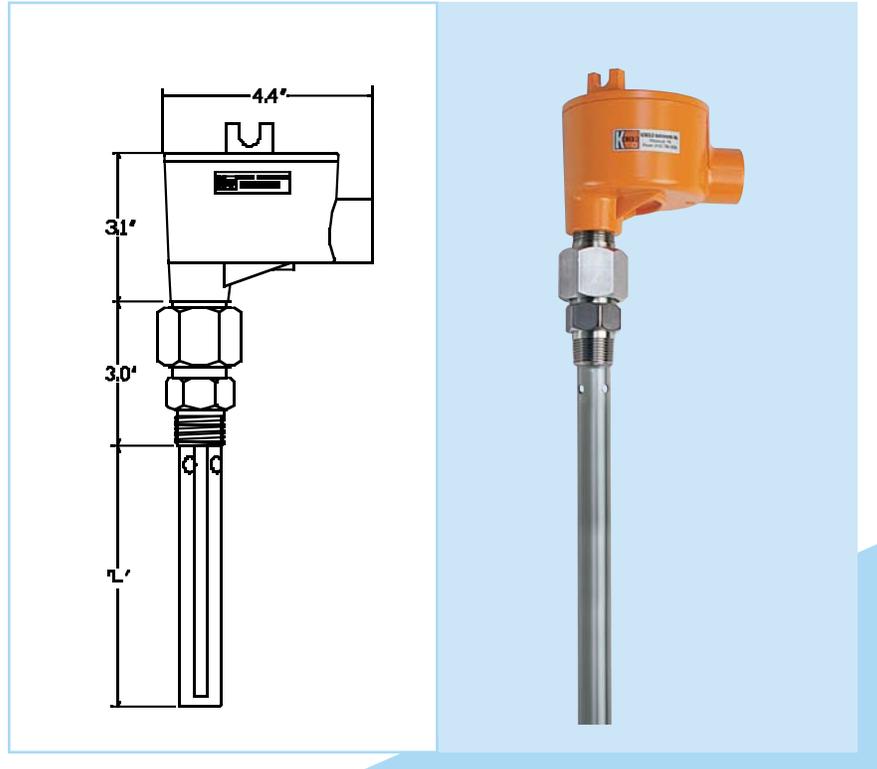
Features

- For fuel and solvents
- Compact tube design
- Accuracy $\pm 1\%$ of span
- 3/4" NPT thread standard
- Heavy duty industrial design

The KOBOLD series NRF fuel capacitance level transmitter is designed to measure level of low dielectric liquids such as fuels and solvents in tanks. The probe measures level by measuring the change in capacitance as level changes in the tank.

The microprocessor-based electronics converts this capacitance change into a linear, highly accurate 4-20 mA signal. The compact, microprocessor-based design makes installation and setup a simple task. The advanced signal conditioning circuitry provides the high sensitivity required for measuring fuels, solvents and other low dielectric liquids.

The series NRF is truly designed with tough applications in mind.



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KOBOLD NRF-1F Fuel Capacitance Level Probe

Specifications

- Accuracy:** $\pm 1\%$ of span (at calibration conditions)
- Repeatability:** $\pm 0.1\%$ of span
- Maximum Length:** 12 feet

- Wetted Materials**
- Standard Fitting:** 3/4" NPT 316 SS
- Probe:** 316 Stainless Steel
- Spacers:** PTFE

- Temperature Range**
- Process:** -100 to 350°F
- Ambient:** -58 to 140°F

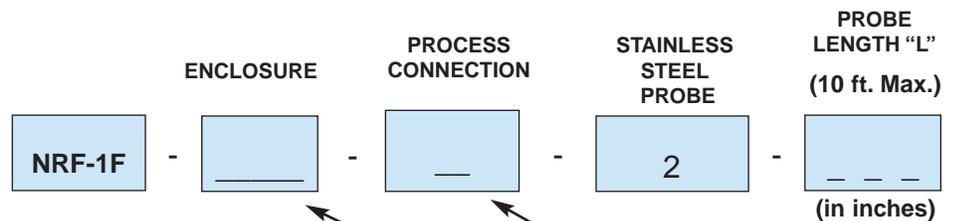
- Electrical Specifications**
- Input Power:** 12-36 VDC
- Output:** 4-20 mA, 2-wire

- Enclosures:** NEMA 4 Polyamide, aluminum or stainless steel

- Maximum Pressure**
- 316 SS Fitting:** 100 PSIG @ 70°F
- PTFE Fitting:** 50 PSIG @ 300°F 14 PSIG @ 350°F

Applications

- Diesel fuel tanks
- Refineries
- Vegetable oils
- Chemical holding tanks
- MEK and other solvents
- Many other, non-conductive liquids



Enclosure	CODE
Polyamide	1
Stainless Steel	2
Aluminum	3

CODE	Process Connection
1	3/4" NPT Stainless Steel
5	1-1/2" NPT Stainless Steel

** Example: NRF-1F212-L=72 inches
For each order or request for quotation, please complete the application datasheet at the end of this section.



Features

- Lengths to 200 feet available
- Accuracy ±1% of span
- Ease of installation in tall tanks
- Dual cable version available for non-metallic tanks
- Heavy duty industrial design

The KOBOLD series NRF cable capacitance level transmitter is designed to measure liquids in tall tanks. The probe measures level by measuring the change in capacitance as level changes in the tank.

The microprocessor-based electronics converts this capacitance change into a linear, highly accurate 4-20 mA signal. The compact, microprocessor-based design makes installation and setup a simple task. The advanced signal conditioning circuitry greatly minimizes the adverse effects of coating media.

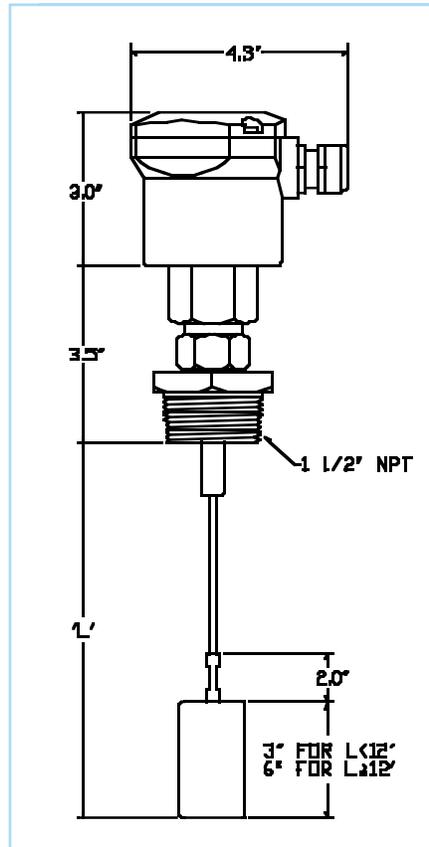
Single cable versions for metal tanks and dual cable versions for non-metallic tanks are available. The series NRF is truly designed with tough applications in mind.

Specifications

- Accuracy:** ±1% of span (constant liquid dielectric)
- Repeatability:** ±0.1% of span
- Maximum Length:** 200 feet
- Wetted Materials**
- Standard Fitting:** 1-1/2" NPT
316 SS or CPVC
- Cable:** PFA-clad or 316 SS
(Note: 316 SS cable not for use with conductive liquids)
- Cable Weight:** 316 SS
- Temperature Range**
- Process:**
- 316 SS fitting:** -100 to 350°F
- CPVC fitting:** -58 to 185°F
- Ambient:** -40 to 140°F

Electrical Specifications

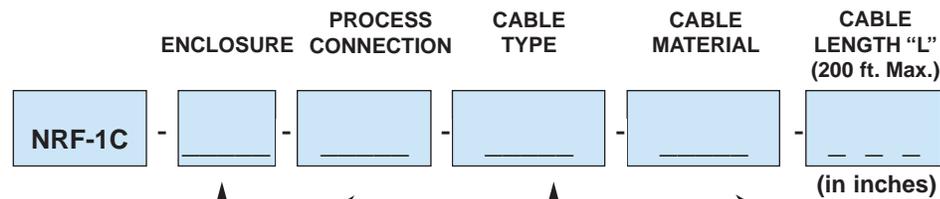
- Input Power:** 12-36 VDC
- Output:** 4-20 mA, 2-wire
- Enclosures:** NEMA 4 Polyamide, Aluminum or 316 SS
- Maximum Pressure**
- 316 SS Fitting:** 100 PSIG @ 70°F
50 PSIG @ 300°F
14 PSIG @ 350°F
- CPVC Fitting:** 50 PSIG @ 70°F
0 PSIG @ 185°F



KOBOLD NRF-1C Capacitance Level Probe

Applications

- Waste treatment plants
- Refineries
- Food and beverage industry
- Fire protection systems
- Water storage tanks
- Chemical holding tanks



Enclosure	CODE	CODE	Process Connection	CODE	Cable Type	CODE	Cable Material
Polyamide (NEMA 4)	1	5	1-1/2" NPT 316 SS	2	Single Cable	1	PFA-clad Cable
Stainless Steel	2	6	1-1/2" NPT CPVC	4	Dual Cable	2	316 SS * Cable
Aluminum	3						

* 316 SS Cable not for use with conductive liquids.

** Example: NRF-1C1521 L=72 inches

For each order or request for quotation, please complete the application datasheet at the end of this section.

Features

- For non-metallic tanks
- Compact dual or concentric probe design
- Accuracy ±1% of span
- 1-1/2" NPT thread standard
- Heavy duty industrial design

The KOBOLD series NRF dual probe design allows for measurement of liquids in non-metallic tanks. The probe measures level by measuring the change in capacitance as level changes in the tank.

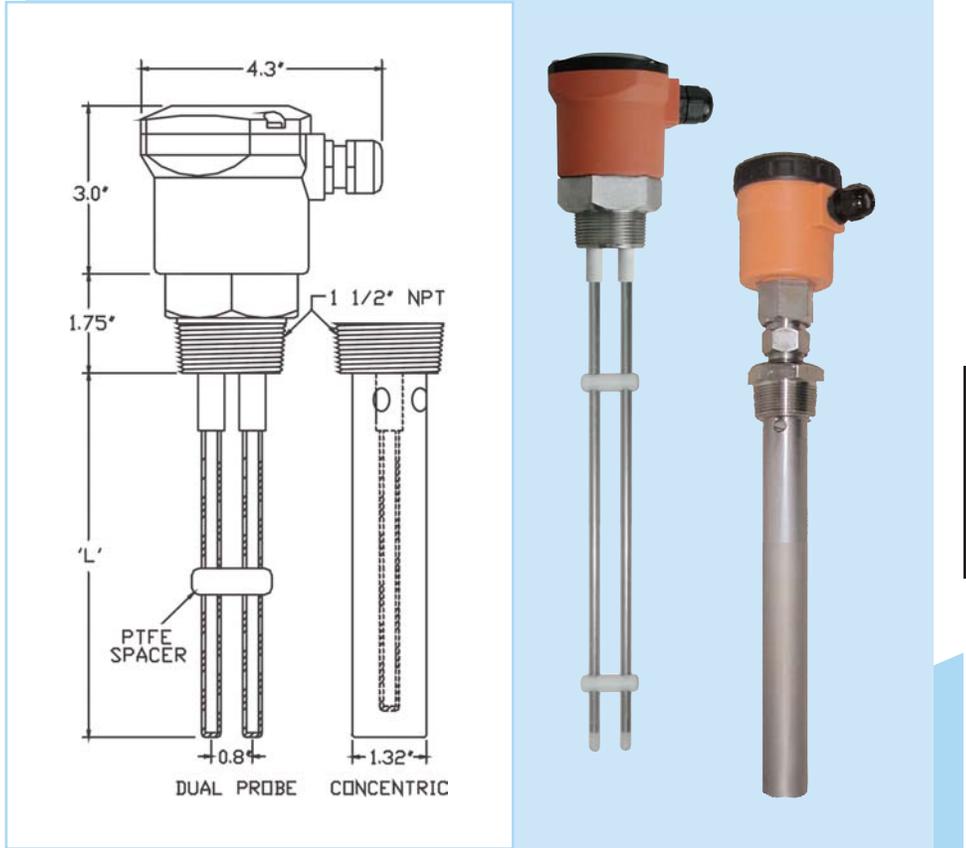
The microprocessor-based electronics converts this capacitance change into a linear, highly accurate 4-20 mA signal. The compact, microprocessor-based design makes installation and setup a simple task. The advanced signal conditioning circuitry greatly minimizes the adverse effects of coating media.

Probe Selection Criteria

Two probe styles are available, probe type 3 is a dual rigid probe, fully PFA clad. This probe is best for acids and highly aggressive media in plastic tanks. Probe type 5 is a PFA clad inner probe with a concentric 316 stainless steel outer probe. This probe type is suited for oil and water-based liquids, compatible with 316 stainless steel.

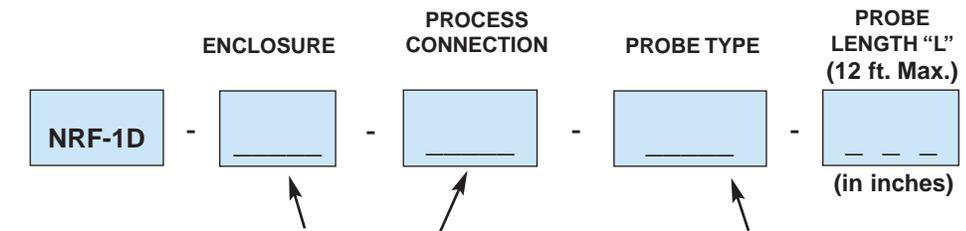
Specifications

- Accuracy:** ±1% of span (constant liquid dielectric)
- Repeatability:** ±0.1% of span
- Maximum Length:** 12 feet
- Wetted Materials**
- Fitting Probe** 316 SS or CPVC
- Dual:** PFA
- Concentric:** PFA, 316 SS
- Temperature Range**
- Process:**
- 316 SS fitting;** -100 to 350°F
- CPVC fitting:** -58 to 185°F
- Ambient:** -40 to 140°F
- Electrical Specifications**
- Input Power:** 12-36 VDC
- Output:** 4-20 mA, 2-wire
- Enclosures:** NEMA 4 Polyamide or SS
- Maximum Pressure**
- 316 SS Fitting:** 100 PSIG @ 70°F
50 PSIG @ 300°F
14 PSIG @ 350°F
- CPVC Fitting:** 50 PSIG @ 70°F
0 PSIG @ 185°F



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KOBOLD NRF-1D Capacitance Level Probe



Enclosure	CODE	CODE	Process Connection	CODE	Process Connection
Polyamide	1	5	1-1/2" NPT 316 SS	3	Dual Probe PFA Clad
Stainless Steel	2	6	1-1/2" NPT CPVC*	5	Concentric Probe PFA & 316SS

* Probe type 3 only
** Example: NRF-1D253-L=72 inches

For each order or request for quotation, please complete the application datasheet at the end of this section.



**NRF Capacitance Level Transmitter
Application Guide**

Form #NRF-001
Rev. 02/01/04

FAX to:
KOBOLD Instruments Inc.
412-788-4890 (USA)
514-428-8899 (Canada)

Customer Name: _____

Company Name: _____

Phone: _____

Fax: _____

Quote #: _____ Date: _____ Price: _____ Each Part Number: _____

1. Pressure: Normal _____ PSIG Maximum _____ PSIG

2. Temperature: Normal _____ °F Maximum _____ °F

3. Is the liquid temperature constant under normal conditions:

Yes No (If No, state normal operating range) _____ °F

4. Liquid Type: _____

5. Liquid Dielectric Constant (if known) _____

* To ensure fast order processing, please retain the completed quote form and send it along with your purchase order.

Process Conditions

Accurate process information is essential to ensure the proper operation of your level indicator. Please fill out accurately and completely.

Tank Information

Tank Material: _____

Does the tank have an internal liner? Yes No

(If Yes, specify liner material) _____

Heavy buildup on tank walls? Yes No

Agitation: None Light Heavy

Does the tank have a mixer? Yes No

Tank Dimensions: Height(H): _____ Width(W): _____

Fitting Type:

- 3/4" NPT (NRF-1, NRF-1F, NRF-2, NRF-3 only)
- 1-1/2" NPT (NRF-1C and NRF-1D only)
- 1-1/2" Tri-Clamp
- 2" Tri-Clamp
- Other (specify): _____

Measuring Probe Length(L): _____ inches

Any additional comments or special requirements:

Quoted By: _____

