Capacitive two-rod probe for continuous level measurement in liquids

Liquicap T FMI21

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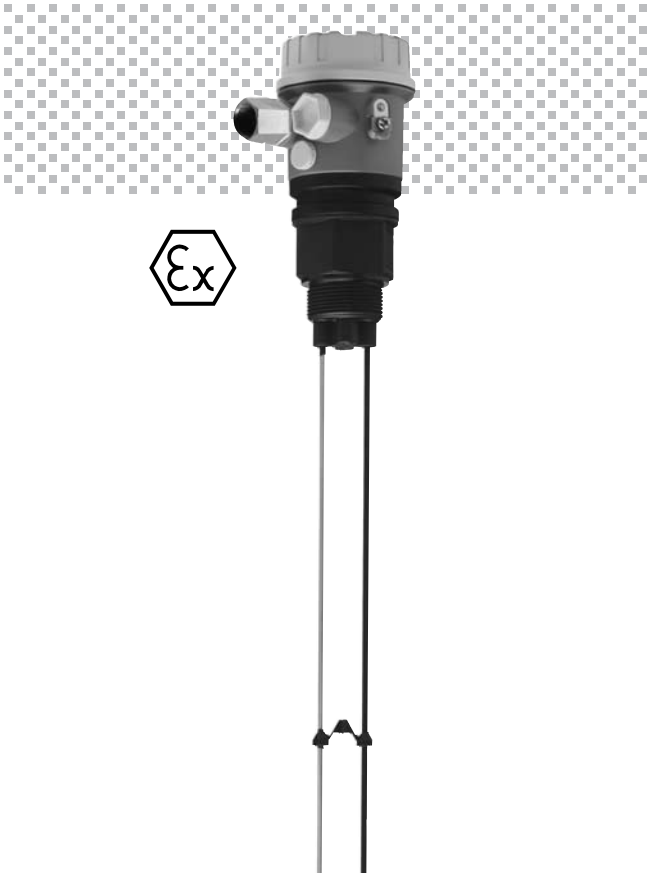


- No calibration needed (preconfigured from factory 0 - 100 %
- Non-corrosive materials (carbon fiber, stainless steel)
- Optimized storage by simply shortening the probe rods on site
- Safe operation – regardless of tank geometry

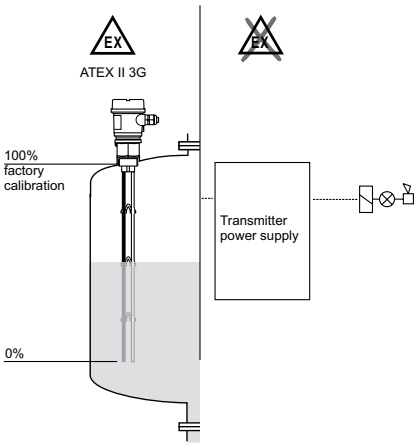
Application

The Liquicap T sensor is used in conductive liquids for continuous level measurement. The Liquicap T is particularly suited to small measuring tanks and independent of the tank material (plastic, stainless steel, concrete…) or the tank shape.
Resistant to agressive liquids like acids or alkalis.

Function

The probe and medium form an electric capacitor. If the probe is in the air, a certain low initial capacitance is measured. When the tank is filled, the capacitance of the capacitor increases the more the probe is covered. The electronic insert of the probe converts the capacitance measured to a 4 to 20 mA signal in proportion to the level.

Application Example



The measuring system consists of:
- The components of a capacitive probe Liquicap T FMI21 (the probe rods should never be in contact with the tank) with
- Electronic insert FEI20
- Display and housing cover (optional)
- A transmitter power supply unit RN221N, RMA421, RMA422, RTA421, RIA250 or RIA452

Product: conductive liquids as of 30 µS/cm	**Approval:** ATEX II 3G EEx nA IIC T6
Probe length: 5.9" to 98.4" (150 to 2500 mm)	**Product temperature:** -40 to +212°F (-40 to +100°C)
Process pressure: -14.5 to 145 psi	**Viscosity:** max. 2000 cSt

Technical Datasheet
TD 046E/US/ae/10.09
US/INDD CS

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Liquicap T FMI21

Technical Data

Input	
Maximum viscosity	2000 cSt
Measuring range	0 pF to 2000 pF
Probe length	5.9” to 98.4” (150 to 2500 mm)
Permitted span	ΔC = 10 pF to 2000 pF
Measuring frequency	250 kHz
Input signal	Probes covered => high capacitance Probes exposed => low capacitance

Output (electronic insert FEI20/4 to 20mA)	
Output signal	4 to 20 mA
Switch-on current	max. 20 mA (< 500 ms)
Signal on alarm	> 21 mA

Power supply	
Connection voltage	U = 10 to 30 VDC, reverse polarity
Power consumption	P < 0.7 W
Current consumption	I < 22 mA
Cable entries	½” NPT thread

Performance characteristics (with installed electronic insert)	
Reference operating conditions	Ambient temperature 73.4°F, atmospheric pressure, probe installation vertical from above
Max. measured error	≤ 1% of full scale value (0 to 2000 pF)
Repeatability	0.25% of full scale value (0 to 100 pF)
Start-up settling time	< 2 s
Influence of ambient temperature	< 0.02%/K (-40 to 158°F)
Integration time	1 s
Calibration	In an installed state, recalibration is only necessary if: - the 0% and 100% value should be adjusted to suit customer specifications - after the probe rods have been shortened

Operating conditions	
Ambient temperature	-40 to +158°F (-40 to +70°C)
Storage temperature	-40 to +176°F (-40 to +80°C)
Climate class	Tropicalized as per DIN IEC 68 Part 2-38
Degree of protection	IP 66
Shock resistance	DIN EN 60068-2-27/IEC 68-2-27: 30g
Vibration resistance	DIN EN 60068-2-64/IEC 68-2-64: 20 to 2000 Hz, 1 $(m/s^2)^2/Hz$ (with min. rod length 5.9" (150 mm))
EMC	Interference emission to EN 61326, electrical equipment class B; Interference immunity to EN 61326, annex A (industrial)
Conductivity of medium	≥ 30 µS/cm
Process pressure	14.5 psi to 145 psi
Process temperature	-40 to +212°F (-40 to +100°C)
Lateral loading capacity	2 Nm

Materials in contact with medium	
Probe rods	Rod: 1.4404/316L; Optional: carbon fiber CFC; Sealing ring: EPDM; Insulation: PP; Spacer: PP
Process connections	ANSI NPT 1½" PPS
Seals	Sealing ring for process connection: Elastomer fiber asbestos-free (resistant to oils, solvents, steam, weak acids and alkalis)

Display	
Display elements	Green LED: operational status (slow flashing), calibration status (fast flashing) Red LED: for key enter validation (short flashing), alarm or warning (flashing); display for measured value in % (optional)

Approvals	
Ex approval	ATEX II 3G EEx nA IIC T6

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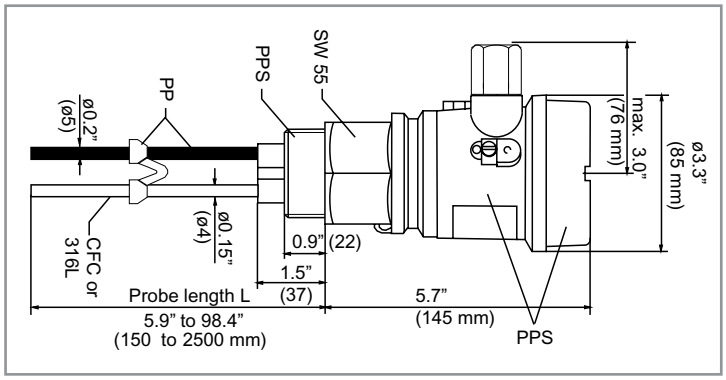
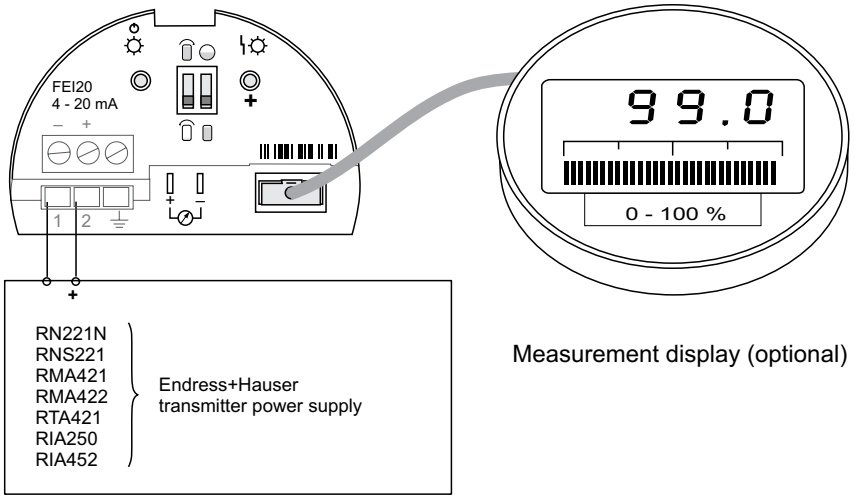
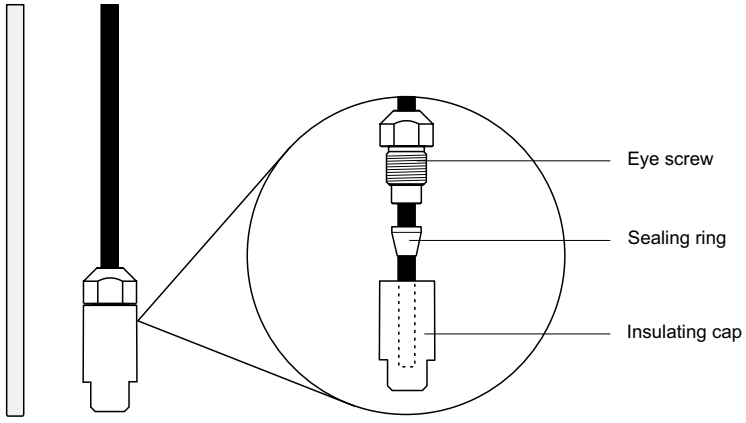
Dimensions in inches (mm)



Electrical Connection



Shortening kit



Liquicap T FMI21

Many other models, versions and options are available. Please contact Endress+Hauser for more information.

Standard delivery time is 5 working days for the following versions.

Liquicap T FMI21		Order no.	Price/pcs. in $				
Version			1 to 5	6 to 15	16 to 35	We hereby order:	Total:
FMI21	with display, 96 inch, 316L, shortening kit included	FMI21-A2D2C2	$588.50	Consult factory		pcs.	$
	with display, 96 inch, carbon fiber, shortening kit included	FMI21-A2F2C2	$696.50	Consult factory		pcs.	$

Net excluding cost of shipping and taxes.
Acceptance per our Standard Terms and Conditions (find at www.e-direct.us).

at the total price of: **$**
FOB Greenwood, IN; shipped pre-paid; shipping charges and applicable taxes added to invoice.

☐ **E-direct catalog (free)**

Shipping Method ☐ **Ground** ☐ **Priority One Day** ☐ **Priority Two Day**

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Endress+Hauser, Inc.
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Greenwood, IN 46143

(For customers in the USA only)

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Order: by phone **888-EH DIRECT (343-4732)**
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For special requests, e-mail us: **e-direct@us.endress.com**

Warranty	Should an instrument fail during the 1 year warranty period, a replacement unit will be provided.
Delivery	Shipment from receipt of order for quantities 1–3 within 5 business days.

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