

# FMR60 Radar Tank Gauge

Smart 80 GHz radar tank gauge for continuous and non-contact level measurement with an accuracy rate of  $\pm 1$  mm

Varec®

## Highlights

- 2-wire technology: Reduces on tank wiring costs and allows easy implementation into existing systems.
- Non-contact measurement: Tank top is almost independent from product properties.
- 2"/50 mm PTFE drip-off antenna.
- Standard range to 164 ft (50 m).
- Easy onsite operation using built-in touch control display without opening enclosure (or optional push button display with cover removed).
- Access historic data from device integrated memory (HistoROM) and transfer configuration setting from device to device.
- Easy commissioning and diagnostics using Windows® based software.
- HART protocol.
- High temperatures: Suitable for process temperatures from -40° C (-40° F), up to 130° C (266° F) with high-temperature antenna.
- Pressure: -1 to +16 bar (-14.5 to +232 psi)
- Approved for use in explosive hazardous locations.
- Optional: Integrated over voltage protection.
- SIL 2 approved for overspill protection system applications or SIL 3 for standalone applications.
- Optional remote display (FHX50).
- *Bluetooth®* wireless technology for commissioning, operation, and maintenance via free iOS/Android app SmartBlue, with optional BT10 Bluetooth module



## Product Options

### Approvals & Certifications

- FM, CSA, ATEX, IECEx, NEPSI, KC, INMETRO, JPN, and TIIS

### Antenna & Seals

- Drip-off, PTFE 50mm/2" antenna
- Seal: FKM Viton GLT (-40...80° C/-40...176° F or -40...130° C/-40...266° F) and EPDM (-40...130° C/-40...266° F)

### Process Connections

- Threaded ISO0228 G1-1/2", 316L
- Thread ANSI MNPT1-1/2", 316L
- PP or 316L - UNI flange 3"/DN80/80, max 4bar abs/58psia, suitable for NPS 3" Cl.150/DN80 PN16/10K 80
- PP or 316L - UNI flange 4"/DN100/100, max 4bar abs/58psia, suitable for NPS 4" Cl.150/DN100 PN16/10K 100
- PP or 316L - UNI flange 6"/DN150/150, max 4bar abs/58psia, suitable for NPS 6" Cl.150/DN150 PN16/10K 150

### Output Options

- HART

### Gland Entry

- Metric, NPT, G

### Languages

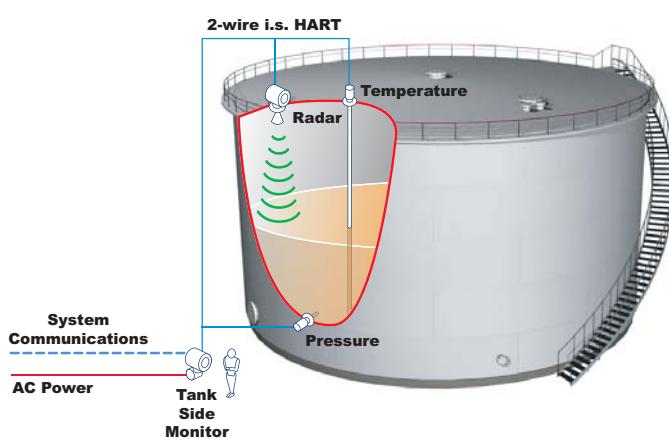
- Over 15 national languages available

## Technical Specifications

**Note!** This product conforms to all applicable industry standards and approvals, such as climate class, electromagnetic (EMC), vibration and radio frequency (RF). See product installation manual.

**Note!** These specifications apply to the FMR60 under reference operating conditions (DIN EN IEC 61298-2 / DIN EN IEC 60770-1) with no major interference reflections inside the signal beam.

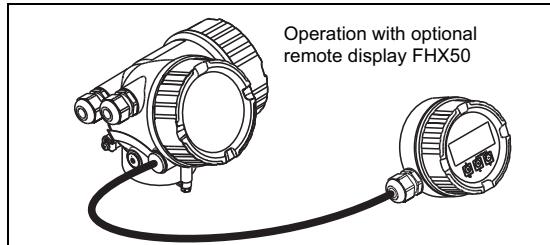
- Temperature = +24 °C (+75 °F)  $\pm 5$ ° F ( $\pm 9$ ° C)
- Pressure = 960 mbar abs. (14 psia)  $\pm 100$  mbar ( $\pm 1.45$  psi)
- Humidity = 60%  $\pm 15$ %
- Reflector: metal plate with a minimum diameter of 1 m (40 in)
- No major interference reflections inside the signal beam



Example tank gauging system using the 4590 Tank Side Monitor and NMT532/NMT539 Average Temperature Converter

<b>Reference Accuracy</b>	Measuring distance up to 0.8 m (2.62 ft): max. $\pm 4$ mm ( $\pm 0.16$ in) - digital, $\pm 0.03\%$ analog Measuring distance $> 0.8$ m (2.62 ft): $\pm 1$ mm ( $\pm 0.04$ in), digital, $\pm 0.02\%$ analog Non-repeatability - $\leq 1$ mm (0.04 in)
<b>Power Consumption</b>	<ul style="list-style-type: none"> <li>2-wire; 4–20mA HART: &lt; 0.9 W</li> <li>2-wire; 4–20mA HART, switch output: &lt; 0.9 W</li> <li>2-wire; 4–20mA HART, 4–20mA: &lt; 2 x 0.7 W</li> </ul>
<b>Current Consumption</b>	HART: Nominal current: 3.6 to 22mA. The start-up current for multidrop mode can be parametrized (is set to 3.6mA on delivery)  Breakdown signal (NAMUR NE43): adjustable: 3.59 to 22.5mA
<b>Weight</b>	3.2 - 3.9 kg (7.11 - 8.61 lb) plus flange weight
<b>Enclosure</b>	Degree of protection: <ul style="list-style-type: none"> <li>With closed housing tested according to: <ul style="list-style-type: none"> <li>IP68, NEMA6P (24 h at 1.83 m under water surface)</li> <li>For plastic housing with transparent cover (display module): IP68 (24 h at 1.00 m under water surface)</li> <li>IP66, NEMA4X</li> </ul> </li> <li>With open housing: IP20, NEMA1</li> <li>Display module: IP22, NEMA2</li> <li>Housing GT19: plastic</li> <li>Housing GT20: aluminium, seawater repellent, powder coated</li> </ul>
<b>Antenna</b>	IP 68 (NEMA 6P)
<b>Conduit Entries</b>	Gland M20; Material dependent on the approval: <ul style="list-style-type: none"> <li>For Non-Ex, ATEX, IECEx, NEPSI Ex ia/ic: Plastics M20x1.5 for cable <math>\phi 5</math> to 10 mm (0.2 to 0.39 in)</li> <li>For Dust-Ex, FM Is, CSA Is, CSA GP, Ex nA: Metal M20x1.5 for cable <math>\phi 7</math> to 10 mm (0.28 to 0.39 in)</li> <li>For Ex d: No gland available</li> </ul> Thread <ul style="list-style-type: none"> <li><math>\frac{1}{2}</math>" NPT</li> <li><math>G \frac{1}{2}</math>"</li> <li>M20 x 1.5</li> </ul> Plug M12 / Plug 7/8" <ul style="list-style-type: none"> <li>Only available for Non-Ex, Ex ic, Ex ia</li> </ul>
<b>Ambient Temperature</b>	Unit: -40 °F and +176 °F (-40 °C and +80 °C) Display: -4 °F and +158 °F (-20 °C and +70 °C)
<b>Operating Frequency</b>	Approx. 80 GHz, up to 8 devices can be installed in the same tank
<b>Dielectric Constants</b>	A0 - 1.2 to 1.4 - Butane, liquid nitrogen, liquefied hydrogen A - 1.4 to 1.9 - non-conducting liquids, e.g. liquefied gas B - 1.9 to 4 - non-conducting liquids, e.g. benzene, oil, toluene, etc... C - 4 to 10 - e.g. concentrated acids, organic solvents, esters, aniline, alcohol, acetone, etc... D - > 10 - conducting liquids, e.g. aqueous solutions, dilute acids, and alkalis
<b>Hygienic Approvals</b>	CoC-ASME BPE

**Note!** Please complete an Application Data Sheet for this equipment to facilitate proper selection of options for your unique application. Contact your Varec Sales Representative for more information.



## Dimensions

**Note!** Aluminum housing shown with example antenna (not all possible configurations shown).

