Data Sheet

Centurion
Guided Radar
CGR Series

For more information, please visit >
www.hawkmeasure.com
Overview / Dimensions
Centurion Guided Radar

Principle of Operation
Guided-wave technology sends the radar pulse down a probe to measure either liquids or solids.
The pulse hits the surface and is reflected back up the probe to the sensor, where the transit time is translated into a distance using time of flight and time expansion.
The amplitude of the reflection depends on the dielectric constant of the product.

Function
The HAWK range of Guided Radar products are ideal for level measurement of liquids, solids, bulk materials, sludge, powders and granules to a distance of 18.5m.
This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

Features
- IECEx Ex d [ia] ia IIC T6 Gb Ga
- Up to 18.5m (60ft 8in) range
- Very short minimum range (150mm, 6”)
- Simple setup
- Auto-Calibration to any dielectric ≥ 1.5
- Adjustable Sensitivity
- Precise & continuous measurement
- 2 wire loop
- 4-20mA, HART Universal / Common practice commands
- Protection class IP66, Nema 4x
- Measures extremely low dielectric (1.5)
- Programmable fail safe mode

Primary Areas of Application
- Chemicals
- Petrochemicals
- Cement
- Building Aggregates
- Mining / Minerals
- Food & Beverages
- Oil & Gas
- Pharmaceutical
- Pulp & Paper
- Wastewater

Wiring Terminal Compartment

Dimensions - Reference

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Housing</td>
</tr>
<tr>
<td>2</td>
<td>Gland / High Temp extension with Gland</td>
</tr>
<tr>
<td>3</td>
<td>Threaded Connection / Flange</td>
</tr>
<tr>
<td>4</td>
<td>Probe Length</td>
</tr>
</tbody>
</table>
### Dimensions Housing + Gland

**Wiring & Dimensions**

**Centurion Guided Radar**

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**Dimensions Housing + Gland**

**Cable Gland Length (GL)**

<table>
<thead>
<tr>
<th>Process Temperature Option*</th>
<th>Approval Option*</th>
<th>Length</th>
</tr>
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<tbody>
<tr>
<td>1XX</td>
<td>1D</td>
<td>50 2.0</td>
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<tr>
<td>1D</td>
<td>2XX</td>
<td>136 5.3</td>
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<tr>
<td>2D</td>
<td>1D</td>
<td>97 3.5</td>
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</tbody>
</table>

*Consult Part Numbering / Specifications for technical information*

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**Dimensions - Probe Variants**

**A04 / A06 / A08**

**Threaded**

**Welded Flange**

**B04 / B06 / B08**

**Threaded**

**Welded Flange**

---

**Probe / Cable Dimensions**

<table>
<thead>
<tr>
<th>Probe Type</th>
<th>THD BSP or NPT</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>D Internal Threads (A04, A06, A08 only)</th>
<th>J (Torque Tightening = 20Nm)</th>
<th>Set Screw</th>
<th>Hex Key Size</th>
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<tbody>
<tr>
<td>A04, B04</td>
<td>3/4</td>
<td>4</td>
<td>0.16</td>
<td>22</td>
<td>0.9</td>
<td>120</td>
<td>4.7</td>
<td>45</td>
<td>1.8</td>
<td>40</td>
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<tr>
<td>A06, B06</td>
<td>1</td>
<td>6</td>
<td>0.24</td>
<td>28</td>
<td>1.1</td>
<td>150</td>
<td>5.9</td>
<td>45</td>
<td>1.8</td>
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<td>A08, B08</td>
<td>1-1/2</td>
<td>8</td>
<td>0.31</td>
<td>36</td>
<td>1.4</td>
<td>200</td>
<td>7.8</td>
<td>72</td>
<td>2.8</td>
<td>64</td>
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**Welded Flange**

<table>
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<th></th>
<th>G</th>
<th>H</th>
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<tbody>
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<td>A04, B04</td>
<td>45</td>
<td>1.8</td>
</tr>
<tr>
<td>A08, B08</td>
<td>72</td>
<td>2.8</td>
</tr>
</tbody>
</table>

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**Housing with Process Temperature option ‘2’. Visual Reference only**

*Approval Option 1D*  
*Approval Option XX*
Part Numbering
Centurion Guided Radar

Centurion Guided Radar System

Model
CGR2  2 wire Centurion Guided Radar

Communication
H  4-20mA with HART

Housing
1  Aluminium, Epoxy Painted
2  316L Stainless Steel

Gland Entry
1  1/2" NPT Cable gland entry
2  3/4" NPT Cable gland entry
3  M20 x 1.5 Cable gland entry
4  M25 x 1.5 Cable gland entry

Probe Type
A04  4mm flexible cable
A06  6mm flexible cable
A08  8mm flexible cable
B04  4mm rigid probe
B06  6mm rigid probe
B08  8mm rigid probe

Probe variant / materials
S  316L

Mounting
TN07  3/4" NPT Thread (316L) or threaded flange mount
TB07  3/4" BSP Thread (316L)
TN10  1" NPT Thread (316L)
TB10  1" BSP Thread (316L)
TN15  1.5" NPT Thread (316L) or threaded flange mount
TB15  1.5" BSP Thread (316L)
FXXX  Pre-Welded Flange (replace XXX with 3 character Welded Flange Code)

Process O-ring seal
V  FKM (Viton) (-20°C to +204°C)
B  NBR (-35°C to +110°C)
S  Silicone (-60°C to +230°C)

Process Temperature
1  -40°C to +80°C (-40 to +176°F)
2  -40°C to +150°C (-40 to +302°F)

Process Pressure
1  5 bar
3  20 bar
4  40 bar

Approval Standard
XX  Not Required
1D  IECEx Ex d [ia] ia IIC T6 Gb Ga

Probe Length
Specify in cm to the nearest 10cm

CGR2  H  1  3  B04  S  TN07  S  1  1  1D  200

Probe / Mounting Combination Table (subject to change)

<table>
<thead>
<tr>
<th>Probe Code</th>
<th>Variant / Materials</th>
<th>Mounting</th>
<th>Flange Sizes</th>
<th>Max. Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A04</td>
<td>S</td>
<td>TN07, TB07, FXXX</td>
<td>1&quot;, DN25, 25mm</td>
<td>1850cm</td>
</tr>
<tr>
<td>A06</td>
<td>S</td>
<td>TN10, TB10</td>
<td>N/A</td>
<td>1850cm</td>
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<tr>
<td>A08</td>
<td>S</td>
<td>TN15, TB15, FXXX</td>
<td>2&quot;, DN50, 50mm</td>
<td>1850cm</td>
</tr>
<tr>
<td>B04</td>
<td>S</td>
<td>TN07, TB07, FXXX</td>
<td>1&quot;, DN25, 25mm</td>
<td>400cm</td>
</tr>
<tr>
<td>B06</td>
<td>S</td>
<td>TN10, TB10</td>
<td>N/A</td>
<td>400cm</td>
</tr>
<tr>
<td>B08</td>
<td>S</td>
<td>TN15, TB15, FXXX</td>
<td>2&quot;, DN50, 50mm</td>
<td>400cm</td>
</tr>
</tbody>
</table>

1 See Weld Code selection in Flange Table.
2 Order flange as separate line item. See Probe / Mounting combination table matching size and variants options. See Flange Table Accessory Code for ordering.
3 See Probe Table for valid Probe, Variant / Materials, Mounting and Length combinations prior to selection.
4 Select O-Ring based on application requirements.
<table>
<thead>
<tr>
<th>Accessory Code</th>
<th>Welded Code</th>
<th>Type (all options Blind Flanges)</th>
<th>Material</th>
<th>Bore Hole (threaded type only)</th>
<th>Matching Mounting Thread (threaded type only)</th>
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</thead>
<tbody>
<tr>
<td>FLA-1A1-SS-TN07</td>
<td>F1A1</td>
<td>1&quot; ANSI B16.5 150LB</td>
<td>316L</td>
<td>3/4&quot; NPT</td>
<td>TN07</td>
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<tr>
<td>FLA-1A3-SS-TN07</td>
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<td>3/4&quot; NPT</td>
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<td>3/4&quot; NPT</td>
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<tr>
<td>FLA-1A9-SS-TN07</td>
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<td>3/4&quot; NPT</td>
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<tr>
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</tr>
<tr>
<td>FLA-1AB-SS-TN07</td>
<td>F1AB</td>
<td>1&quot; ANSI B16.5 2500LB</td>
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<td>3/4&quot; NPT</td>
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</tr>
<tr>
<td>FLA-HA1-SS-TN07</td>
<td>FHA1</td>
<td>1-1/2&quot; ANSI B16.5 300LB</td>
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<tr>
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<tr>
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<td>FLA-HAB-SS-TN07</td>
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<td>FLA-1J4-SS-TN07</td>
<td>F1J4</td>
<td>JIS 25mm 40k</td>
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<td>FLA-HJ1-SS-TN07</td>
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<td>JIS 40mm 40k</td>
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<tr>
<td>FLA-2J1-SS-TN15</td>
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<td>JIS 50mm 16k</td>
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<tr>
<td>FLA-2J4-SS-TN15</td>
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<td>JIS 50mm 40k</td>
<td>316L</td>
<td>1.5&quot; NPT</td>
<td>TN15</td>
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<tr>
<td>FLA-3J1-SS-TN15</td>
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<td>JIS 80mm 16k</td>
<td>316L</td>
<td>1.5&quot; NPT</td>
<td>TN15</td>
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<tr>
<td>FLA-3J4-SS-TN15</td>
<td>F3J4</td>
<td>JIS 80mm 40k</td>
<td>316L</td>
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<td>TN15</td>
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<tr>
<td>FLA-4J1-SS-TN15</td>
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<td>JIS 100mm 16k</td>
<td>316L</td>
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<td>TN15</td>
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<td>FLA-4J4-SS-TN15</td>
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<td>JIS 100mm 40k</td>
<td>316L</td>
<td>1.5&quot; NPT</td>
<td>TN15</td>
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Specifications

Centurion Guided Radar

Electronics

Power

• 2 wire loop powered
• 24VDC (14 to 28VDC)

Power Consumption

• <500mW @ 24VDC

Analog Output

• 14V @ 0 Ohm
• 19V @ 250 Ohms
• 24V @ 500 Ohms
• Current park at 4mA, 8mA, 12mA

Communications

• HART (Revision 5, Universal & Common Practice commands)
• GoshawkII via HART. Full parameter list

Maximum Range

• Flexible cable probe: 18.5m (60ft 8in)
• Rigid probe: 4m (13ft 1in)

Minimum Range (Blanking)

• 150mm

Dielectric Range

• ≥ 1.5

Frequency

• 2.2 GHz

Resolution

• Analog: 1uA
• Display: 1.0mm

Accuracy

• +/- 3mm

Measurements per second

• 3

Response Time

• <1 second (application dependant)

Sum of non linearity, non repeatability, hysteresis

• Analog +/- 0.02%
Overview

Specifications

Centurion Guided Radar

Enclosure

Type

• Dual Compartment with Glass window

Material

• Die-cast Copper-Free Aluminium, Epoxy Painted
• 316L Stainless

Cable Entries

• 1/2” NPT
• 3/4” NPT
• M20 x 1.5
• M25 x 1.5

IP Rating

• NEMA 4X
• IP66

Probe

Probe Size / Materials

• 4mm SS316L rod
• 4mm DIN3055 (7x7 strand) SS316L flexible cable
• 6mm SS316L rod
• 6mm DIN3055 (7x7 strand) SS316L flexible cable
• 8mm SS316L rod
• 8mm DIN3055 (7x7 strand) SS316L flexible cable

Probe Entry Materials

• TN07 / TB07 / TN10 / TB10 / Welded Flange - PEEK
• TN15 / TB15 / Welded Flange - PTFE + GF25

Probes / Mounting Combination Table for flange types

Probe O-Ring Seals

• Silicone / VMQ (-60°C to +230°C)
• Nitrile / NBR (-35°C to +110°C)
• Viton (-20°C to +204°C)

Process Connections

• 3/4” NPT or BSP
• 3/4” NPT with Flange
• 1” NPT or BSP
• 1.5” NPT or BSP
• 1.5” NPT with Flange
• Welded Flange

Process Pressure*

• -1 to 40 BAR

Process Temperature*

• -40°C to +80°C (-40 to +176°F)
• -40°C to +150°C (-40 to +302°F)

Tensile Load (flexible cable probes)

• Probe Type: A04 0.5 ton
• Probe Type: A06 1.0 ton
• Probe Type: A08 4.0 ton

Laterial Load (rigid probes)

• Probe Type: B04 1 Nm
• Probe Type: B06 3 Nm
• Probe Type: B08 8 Nm

Maximum Probe Length

• Probe Type: A04 1850cm
• Probe Type: A06 1850cm
• Probe Type: A08 1850cm
• Probe Type: B04 400cm
• Probe Type: B06 400cm
• Probe Type: B08 400cm

Minimum Probe Length

• Probe Type: A04 100cm
• Probe Type: A06 100cm
• Probe Type: A08 100cm
• Probe Type: B04 20cm
• Probe Type: B06 20cm
• Probe Type: B08 20cm

*Specifications model dependent. Consult part number listing.

2 Probe Entry

1 See Probe / Mounting Combination Table for flange types
Ordering Instructions

Threaded unit type
Assemble part number taking note of the valid combinations and exclusions for the full system. The unit is ordered as a single line item. For example:

CGR2H13B08STB15B11XX0200

Flanged type - Threaded flange
Assemble part number taking note of the valid combinations and exclusions for the full system (noting smaller flanges require TN07 threaded unit and larger flanges require TN15 threaded unit). The unit and the threaded flange are ordered as separate line items. For example:

CGR2H13B08STN15B11XX200
FLA-FA4-SS-TN15
or
CGR2H13B08STN07B11XX200
FLA-FA1-SS-TN07

Flanged type - Welded flange
Assemble part number taking note of the valid combinations and exclusions for the full system. In the Mounting part code enter 4 character Welded flange code from the table. All Welded flanges have F as the first character. For example.

CGR2H13B08SF4A1B11XX200