# ANL-9107

24GHz FMCW Radar Level Transmitters

## Catalog V.2024

Phoenix. Chen

**CHINASIMBA** www.chinasimba.com

SN: DY.19.05.544

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# Contents

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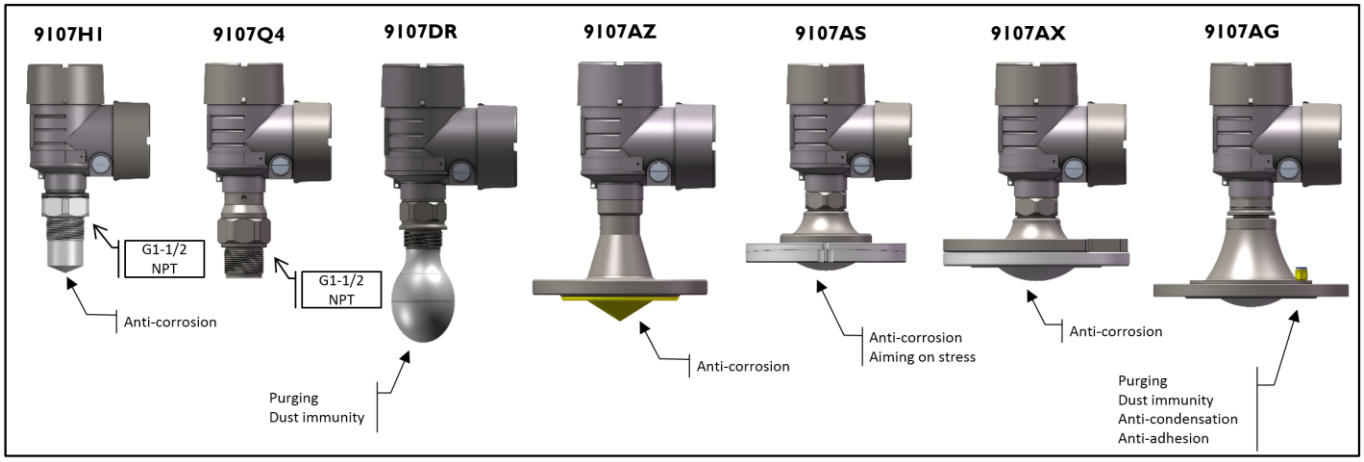
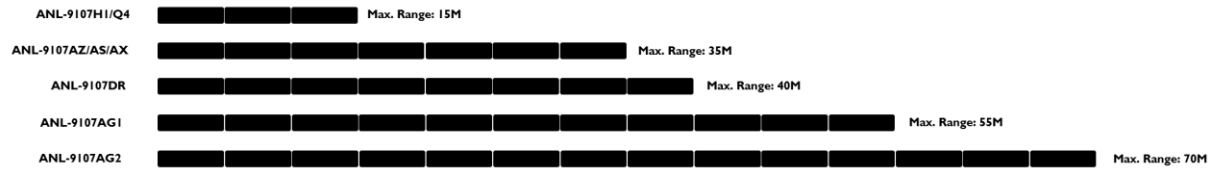
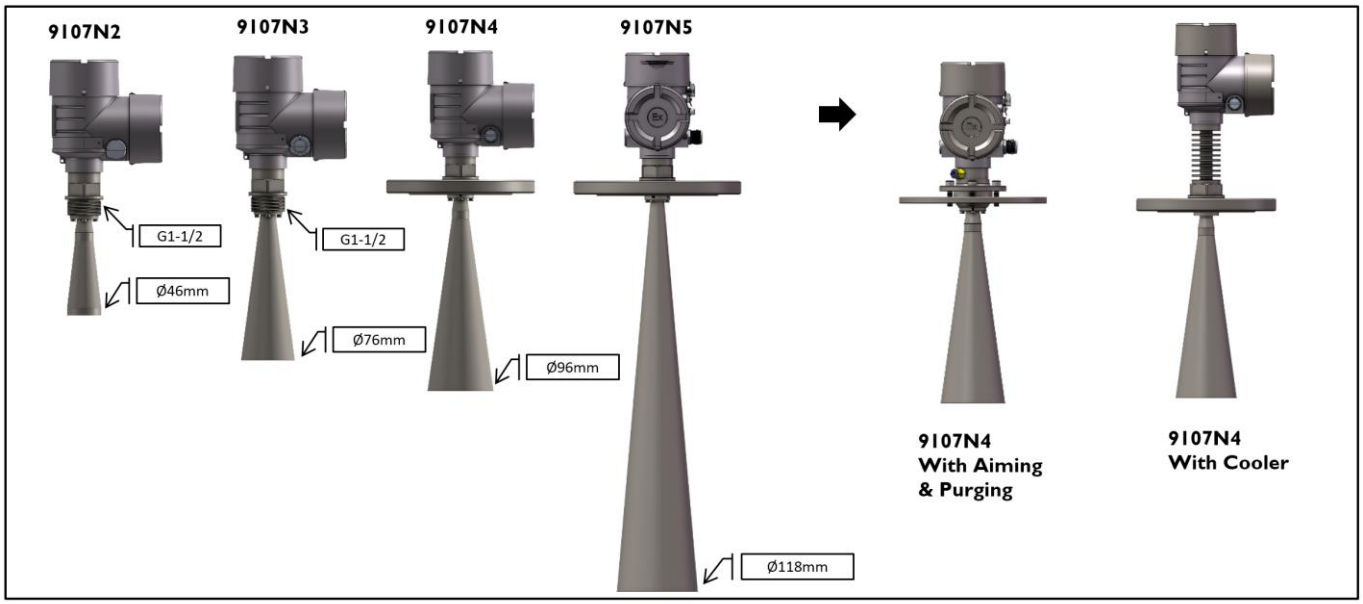
# ANL-9107 24GHz FMCW radar level Gauges Overview





## Housing Versions

The housings are available as single chamber or double chamber version in plastic, stainless steel or aluminum. They are available with protection ratings up to IP 68, and the process seal is made of FKM, FFKM or graphite. For instruments with double chamber housing two supplementary electronics such as radio module or a power pack are available.

You will find a complete overview of the available drawing in the Available enclosures: Housing Drawing.

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## Summary of the ANL-9107 model parameter table

| ANL-9107 model | Connection Type | Process contact surface material | Lens/Horn Ant. Diameter mm | Ant. Beam Angle ° | Antenna Gain dB | Min. Temp. : Max. Temp. Process Temp. ℃ | Min. : Max. Pressure Mpa | Max. Radar Range (M) Recommended medium | Cooler | Purging | Aiming | Anti-condensation | Anti-adhesion | Anti-corrosion | Dust immunity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9107H1 | Thread | SST/PTFE (default) | 38 | 18 | 18.3 | -40 150 | -0.5 0.8 | 0.15 ... 15M | | | | | | √ | |
| | G1-1/2 | Or PEEK | | 14 | 19.72 | -60 180 | -1.0 4.0 | | | | | | | | |
| 9107H1 | Thread | SST/PTFE (default) | 36 | 20 | 18.3 | -40 150 | -0.5 0.8 | 0.15 ... 15M | | | | | | √ | |
| | 1-1/2 NPT | Or PEEK | | 15 | 19.72 | -60 180 | -1.0 4.0 | | | | | | | | |
| 9107Q4 | Thread | SST/PTFE (default) | 35 | 20.5 | 19.7 | -40 200 | -0.5 1.5 | 0.15 ... 15M | | | | | | | |
| | G1-1/2 NPT | Or PEEK | | 19.5 | 19.7 | -60 250 | -1.0 5.0 | | | | | | | | |
| 9107DR | Min. flange | SST/PTFE (default) | 74 | 9.5 | 24 | -40 180 | -0.5 1.5 | 0.20 ... 40M | | | | √ | | | √ |
| | >= DN80 | Or PEEK | | 9.5 | 24.2 | -60 250 | -1.0 4.0 | | | | | | | | |
| 9107AZ | Min. flange | SST/PTFE (default) | 80 | 10 | 23.5 | -40 180 | -0.5 0.8 | 0.20 ... 35M | | | | √ | | √ | |
| | >= DN80 | Or PEEK | | 10 | 24.18 | -60 220 | -0.5 1.5 | | | | | | | | |
| 9107AX | Min. flange | SST/PTFE (default) | 50 | 14 | 20.8 | -60 200 | -0.3 1.0 | 0.20 ... 35M | | | | | | √ | |
| | >= DN100 | | | | | | | | | | | | | | |
| 9107AS | Min. flange | SST/PTFE (default) | 50 | 14 | 20.8 | -60 180 | -0.3 0.6 | 0.25 ... 35M | | | √ | | | √ | |
| | >= DN80 | | | | | | | | | | | | | | |
| 9107AG1 | Min. flange | SST/PTFE (default) | 80 | 8 | 25 | -40 180 | -0.3 0.6 | 0.20 ... 55M | | √ | | √ | √ | | √ |
| | >= DN80 | Or PEEK | | | | -60 250 | -1.0 2.5 | | | | | | | | |
| 9107AG2 | Min. flange | SST/PTFE (default) | 100 | 8 | 26.5 | -40 180 | -0.3 0.6 | 0.20 ... 70M | | √ | | √ | √ | | √ |
| | >= DN100 | Or PEEK | | | | -60 250 | -1.0 2.5 | | | | | | | | |
| 9107N2 | Min. flange | SST/PTFE (default) | 46 | 16 | 19.5 | -40 150 | -0.6 3.5 | 0.25 ... 30M | √** | √ | √* | | | | |
| | >= DN50 | Or PEEK | | | | -60 180 | -1.0 5.0 | | | | | | | | |
| 9107N3 | Min. flange | SST/PTFE (default) | 76 | 9 | 24 | -40 180 | -0.6 3.5 | 0.30 ... 55M | √** | √ | √* | | | | |
| | >= DN80 | Or PEEK | | | | -60 200 | -1.0 5.0 | | | | | | | | |
| 9107N4 | Min. flange | SST/PTFE (default) | 96 | 8 | 26 | -40 200 | -0.6 3.5 | 0.35 ... 70M | √** | √ | √* | | | | √ |
| | >= DN100 | Or PEEK | | | | -60 250 | -1.0 5.0 | | | | | | | | |
| 9107N5 | Min. flange | SST/PTFE (default) | 118 | 6 | 27 | -40 200 | -0.6 3.5 | 0.45 ... 80M | √** | √ | √* | √ | | | √ |
| | >= DN125 | Or PEEK | | | | -60 280 | -1.0 5.0 | | | | | | | | |

Note:

* Under the condition of purging function, the process pressure should not exceed 1.5MPa.

** With a cooler, ANL-9107Nx Max. process temperature will be up to 450℃

## Model selection guide for the ANL-9107 based on different process media characteristics

**ANL-9107 : Guidelines on which model and antenna to select, depending on application**

| ANL-9107 Model and Antenna Guide | | ANL-9107H1 | ANL-9107Q4 | ANL-9107DR | ANL-9107AZ | ANL-9107AX | ANL-9107AS | ANL-9107AG1 | ANL-9107AG2 | ANL-9107N2 | ANL-9107N3 | ANL-9107N4 | ANL-9107N5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 曝气池环境 | Aeration Tank | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 搅拌罐测量 | Agitation Tank | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! |
| 环境温度变化 | Ambient temperature changes | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 堆积 | build-up | ! | ✗ | ✓ | ! | ! | ! | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 沸腾/湍流表面（低/中） | Boiling / Turbulent surface (low/medium) | ! | ! | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 沸腾/湍流表面（重） | Boiling / Turbulent surface (heavy) | ✗ | ✗ | ! | ! | ! | ! | ✓ | ✓ | ✗ | ! | ✓ | ✓ |
| 沸腾/湍流表面（蒸馏管） | Boiling / Turbulent surface(still-pipe) | ! | ! | ✓ | ! | ! | ! | ✓ | ✓ | ! | ! | ! | ! |
| 腐蚀 | Corrosive products (options available) | ✓ | ✗ | ! | ✓ | ✓ | ✓ | ✗ | ✗ | ! | ! | ! | ! |
| 冷凝蒸汽/产品 | Condensing vapor / product | ! | ✗ | ✓ | ! | ! | ! | ✓ | ✓ | ! | ! | ! | ✓ |
| 改变密度/电介质/pH/压力/温度 | Changing density/dielectric/pH/ pressure/temperature | ! | ! | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 涂料/粘性/结晶液体 | Coating/viscous/crystallizing liquids | ✗ | ✗ | ! | ! | ! | ! | ✓ | ✓ | ! | ! | ! | ! |
| 灰尘 | Dust | ! | ! | ✓ | ✓ | ! | ! | ✓ | ✓ | ! | ✓ | ✓ | ✓ |
| 乳剂 | Emulsion | ✓ | ✓ | ! | ! | ! | ! | ✓ | ✓ | ! | ✓ | ✓ | ✓ |
| 泡沫 | Foam | ! | ! | ! | ! | ! | ! | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 泡沫（蒸馏管） | Foam (still-pipe) | ! | ! | ! | ! | ! | ! | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 工艺温度上限高 | High process temperature limits | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! |
| 容器压力限制高 | High vessel pressure limits | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! | ! |
| 内部障碍物 | Internal obstructions | ! | ! | ✓ | ! | ! | ✓ | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 工艺温度低（<-40） | Low process temperatures | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 低容器压力（真空） | Low vessel pressures (vacuum) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 具有极低介电性的材料 | Materials with very low dielectric | ! | ! | ! | ! | ! | ! | ✓ | ✓ | ! | ✓ | ✓ | ✓ |
| 噪声（EMI、电机） | Noise (EMI, motors) | ! | ! | ! | ! | ! | ! | ✓ | ✓ | ! | ✓ | ✓ | ✓ |
| 泥浆 | Slurries | ! | ! | ✓ | ✓ | ✓ | ! | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 固体、颗粒、粉末 | Solids, granules, powders (bulk solids) | ! | ! | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ! | ✓ | ✓ | ✓ |
| 粘性、粘性产品 | Viscous, sticky product | ✗ | ✗ | ! | ! | ! | ! | ✓ | ✓ | ! | ! | ! | ✓ |
| 持续蒸气（轻、中） | Vapor (light, medium) | ! | ! | ! | ✓ | ! | ! | ✓ | ✓ | ! | ! | ✓ | ✓ |
| 持续蒸气（重） | Vapor (heavy) | ✗ | ✗ | ✗ | ! | ! | ! | ✓ | ✓ | ! | ! | ! | ! |
| 辐射污染物 | Radiation contaminants | N | N | N | N | N | N | N | N | N | N | N | N |

✗ Not Recommended
! Application Dependent ( consult CHINASIMBA representative )
✓ Good, recommended

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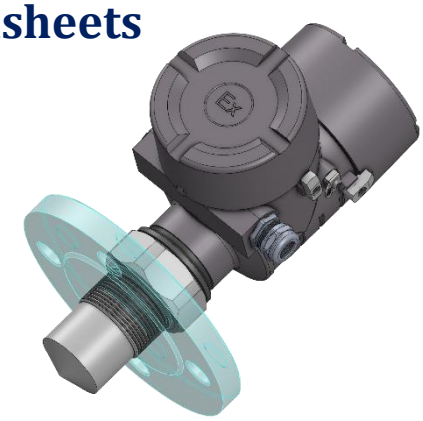
# ANL-9107H1 regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*



## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application of the Small tanks in liquids or solids.
- Chemical industry reaction tanks, corrosive environment applications.

## Specifications

| ANL-9107H1 | Antenna coupler material PTFE | Antenna coupler material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 8M/15M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 150mm from the antenna horn down edges | | |
| Meas. Principle | FMCW Radar System | | |
| Antenna Medium | PTFE Φ36mm (1½ NPT) / Φ38mm (G1½) | PEEK Φ36mm (1½ NPT) / Φ38mm (G1½) | |
| Antenna beam / Gain | Beam angle 20° / Gain 18.3 dB (1½ NPT)<br>Beam angle 20° / Gain 18.3 dB (G1½) | Beam angle 15° / Gain 19.72 dB (1½ NPT)<br>Beam angle 14° / Gain 19.72 dB (G1½) | |
| Meas. Resolution | 0.1mm (<10M range) | | |
| Meas. Accuracy | ±2 mm | | |
| Ambient temperature | -40 … +85 °C | | -60 … +105 °C |
| Process temperature | -40°C … +150°C | -60°C … +180°C | |
| Process pressure | -0.5 ~ +0.8MPa | -1.0 ~ +5.0MPa | |
| Process connection | Thread from G1½; 1½ NPT; flanges from DN40, 1½" | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor ≈ 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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# Dimensions

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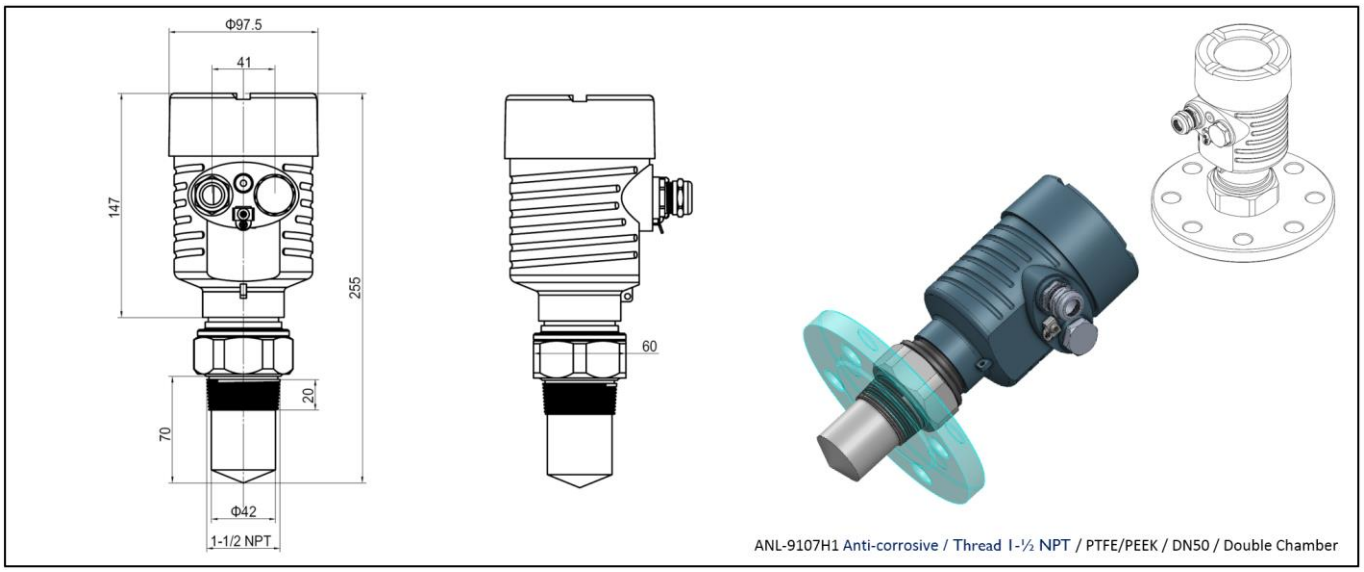
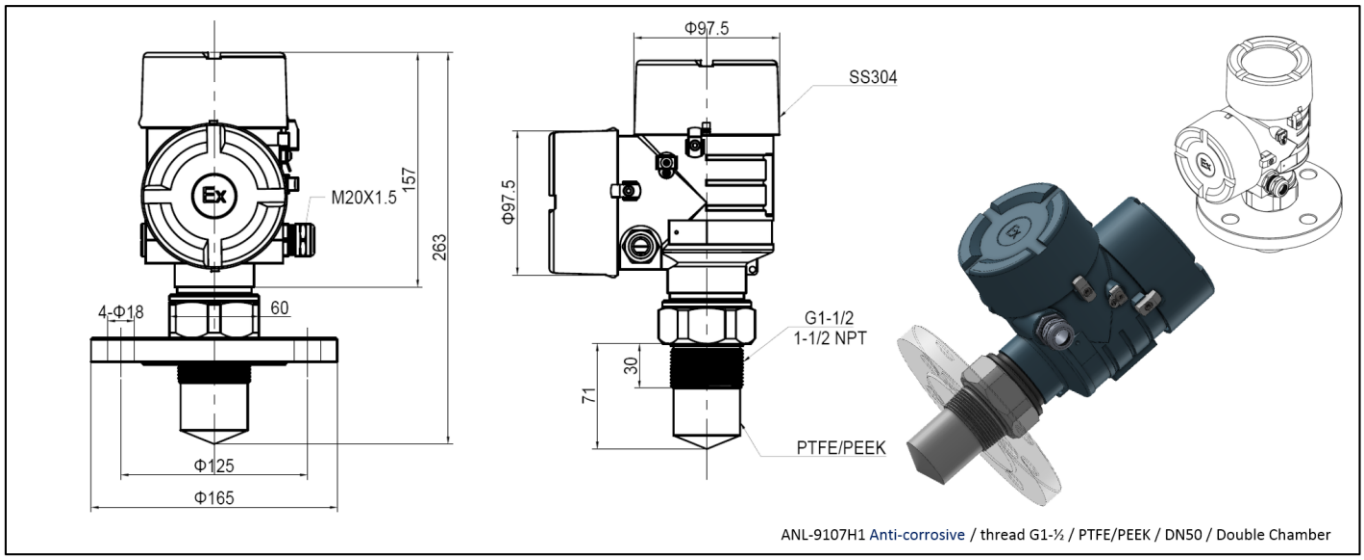
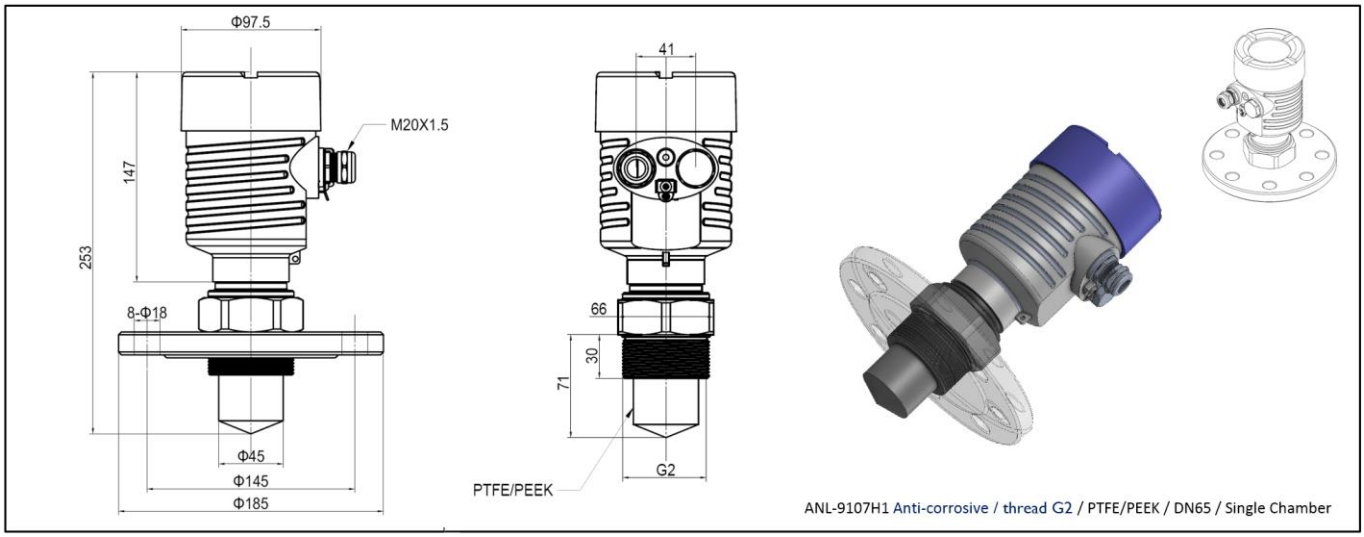



ANL-9107H1 Anti-corrosive / Thread 1-½ NPT / PTFE/PEEK / DN50 / Double Chamber




ANL-9107H1 Anti-corrosive / thread G1-½ / PTFE/PEEK / DN50 / Double Chamber




ANL-9107H1 Anti-corrosive / thread G2 / PTFE/PEEK / DN65 / Single Chamber

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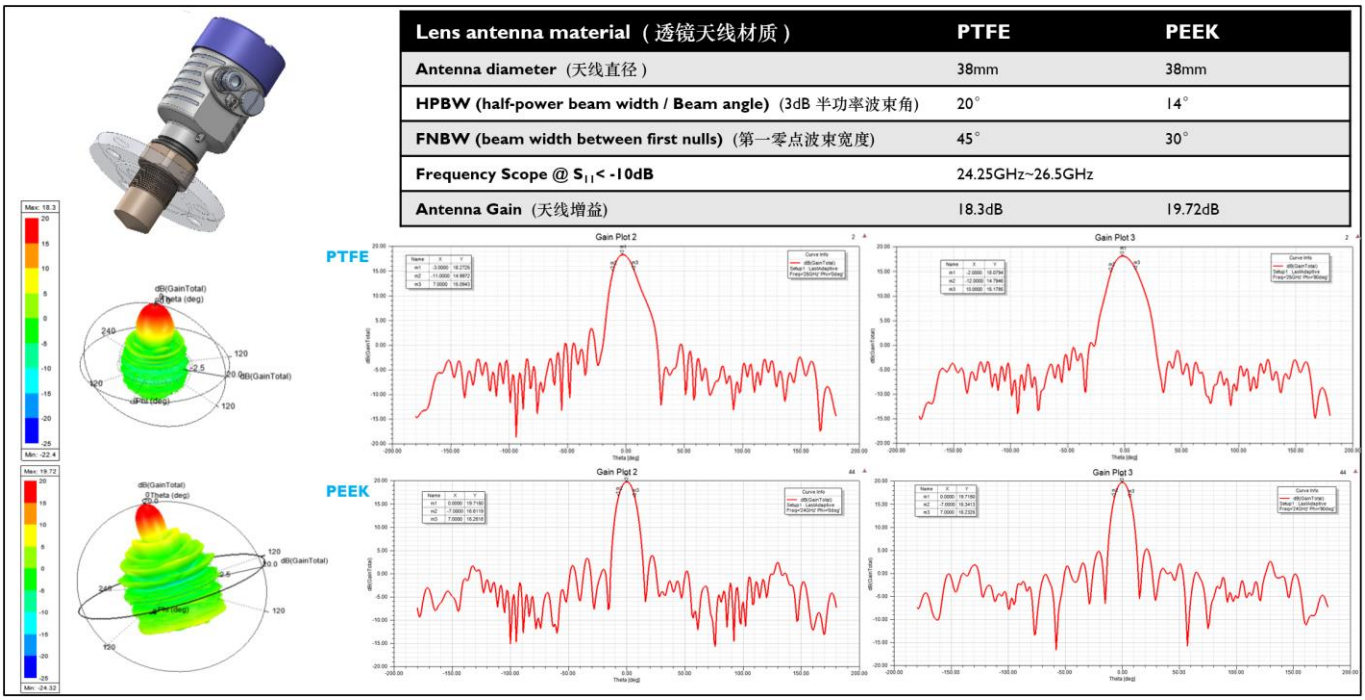
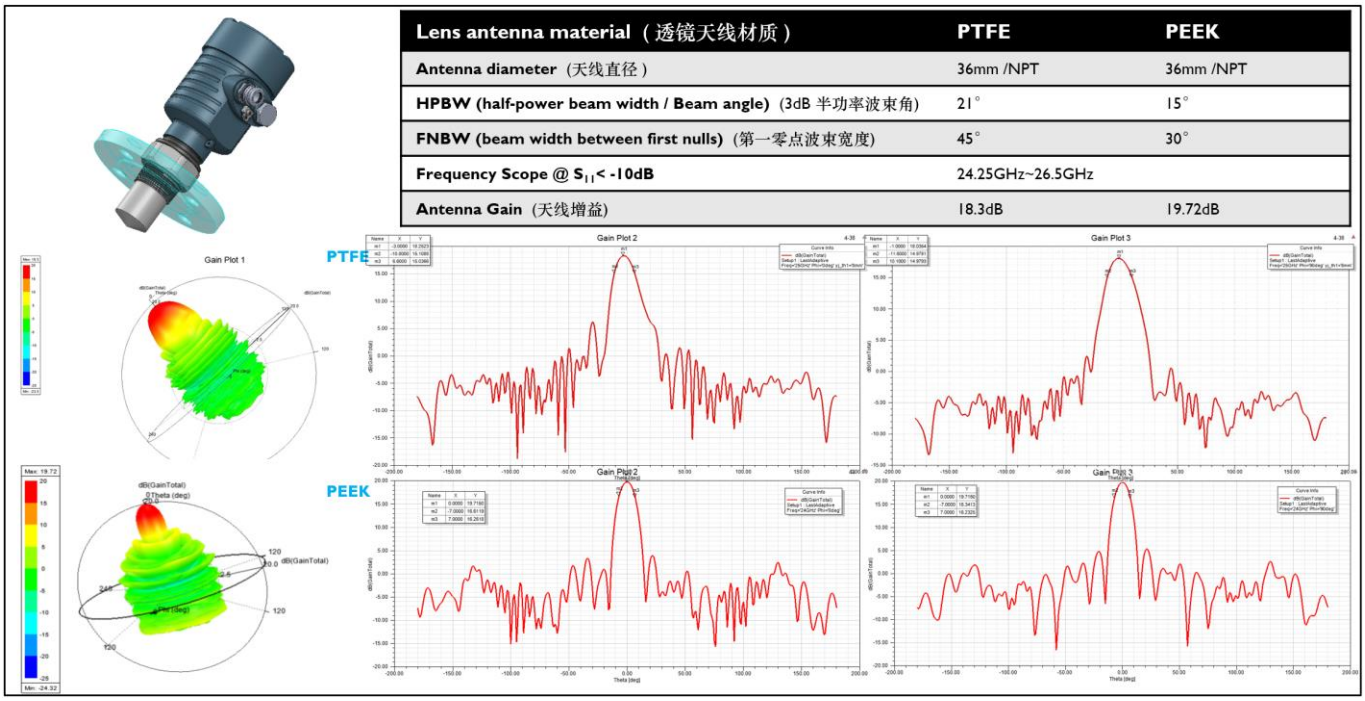
**The Radar Antenna Specification of the ANL-9107H1**



| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 38mm | 38mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 20° | 14° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 45° | 30° |
| Frequency Scope @ $S_{11}$< -10dB | 24.25GHz~26.5GHz | |
| Antenna Gain（天线增益） | 18.3dB | 19.72dB |



| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 36mm /NPT | 36mm /NPT |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 21° | 15° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 45° | 30° |
| Frequency Scope @ $S_{11}$< -10dB | 24.25GHz~26.5GHz | |
| Antenna Gain（天线增益） | 18.3dB | 19.72dB |

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# ANL-9107Q4 regular version

# Non-contact Radar Level Transmitter Datasheets

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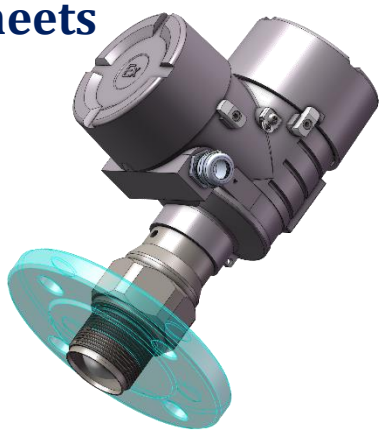

## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids/solid.
- Chemical industry small reaction tanks, reactors.

## Specifications

| ANL-9107Q4 | Antenna lens material PTFE | Antenna lens material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 8/15M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 100mm from the Lens surface | | |
| Meas. Principle | FMCW Radar System | | |
| Lens Antenna Medium | PTFE Φ35mm | PEEK Φ35mm | |
| Antenna beam / Gain | Beam angle 20.5° / Gain 17.9 dB | Beam angle 19.5°/ Gain 17.9dB | |
| Meas. Resolution | 0.1mm | | |
| Meas. Accuracy | ±2 mm | | |
| Ambient temperature | -40 … +85 °C | | -60 … +105 °C |
| Process temperature | -40°C … +200°C | -60°C … +250°C | |
| Process pressure | -0.5 ~ +1.5MPa | -1.0 ~ +5.0MPa | |
| Process connection | Thread from G1½; 1½ NPT; flanges from DN40, 1½" | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150µA | | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor ≈ 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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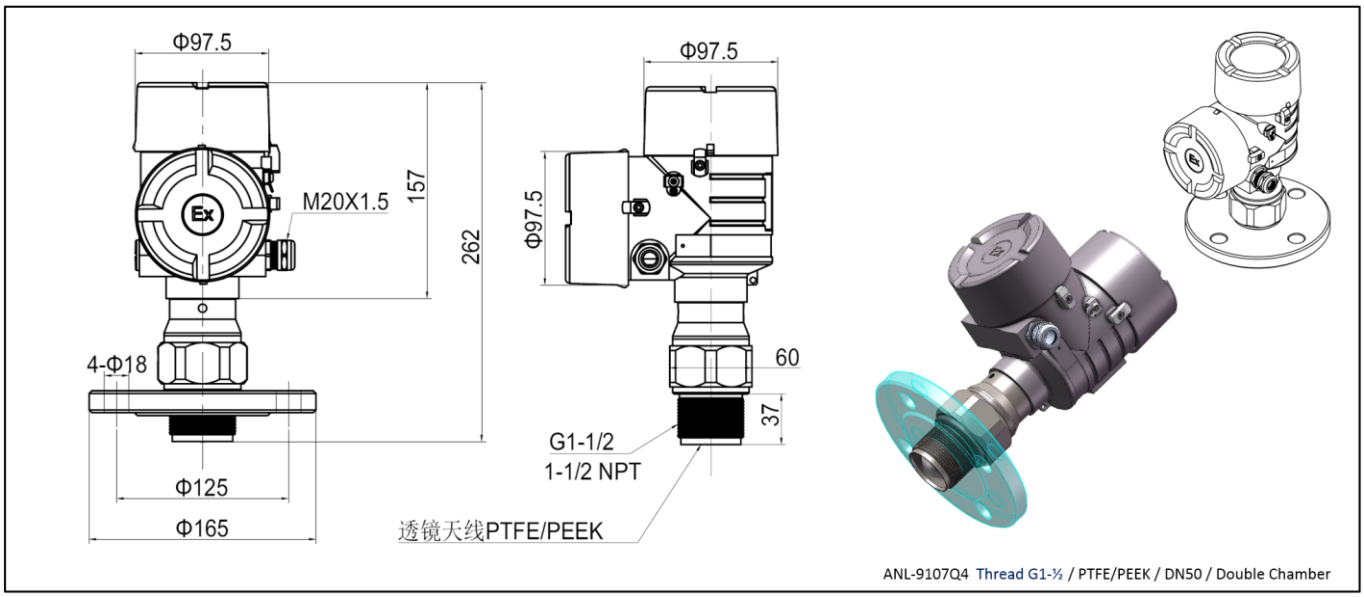
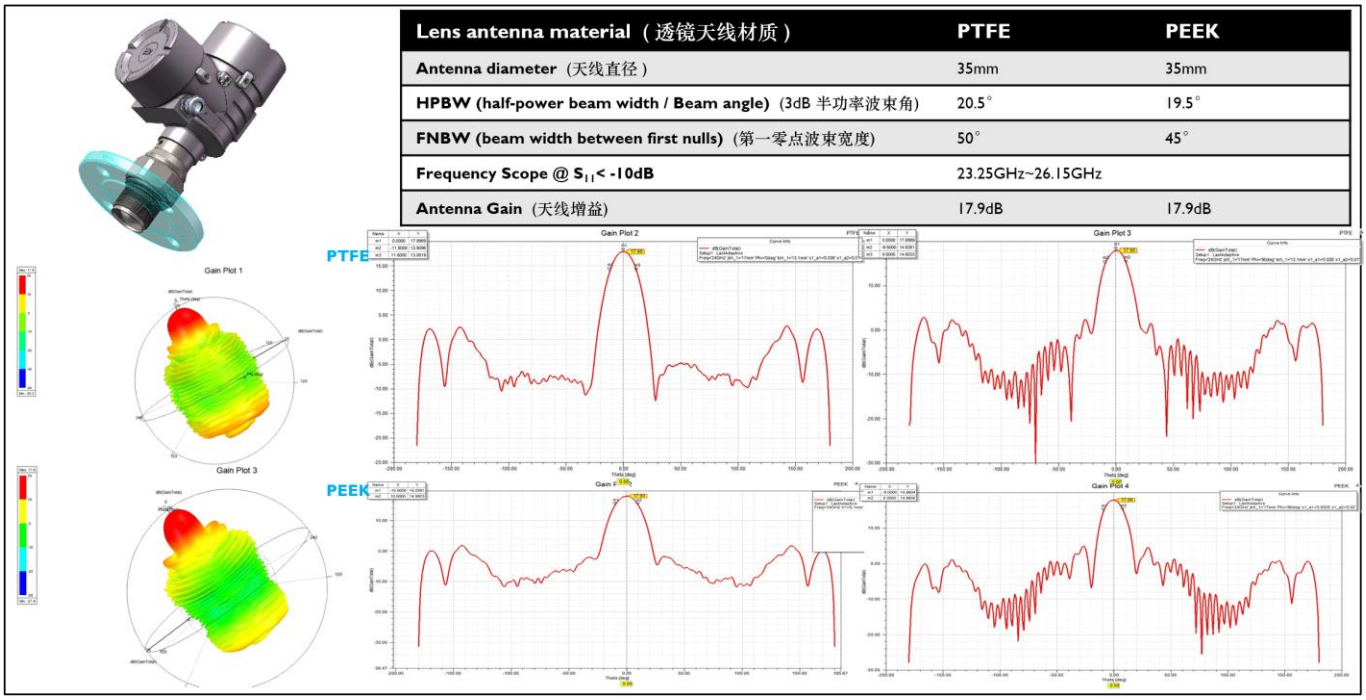



**The Radar Antenna Specification of the ANL-9107Q4**



| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 35mm | 35mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 20.5° | 19.5° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 50° | 45° |
| Frequency Scope @ $S_{11}$< -10dB | 23.25GHz~26.15GHz | |
| Antenna Gain（天线增益） | 17.9dB | 17.9dB |

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# ANL-9107DR Regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*

## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=80 mm.
- Suitable for dust applications, etc.

## Specifications

| ANL-9107DR | Antenna lens material PTFE | Antenna lens material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 40M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 100mm from the flange down surface | | |
| Meas. Principle | FMCW Radar System | | |
| Lens Antenna Medium | PTFE Φ74mm | PEEK Φ74mm | |
| Antenna beam / Gain | Beam angle 9.5°/ Gain 24.0dB | Beam angle 9.5°/ Gain 24.2dB | |
| Meas. Resolution | 0.1mm | | |
| Meas. Accuracy | ±2 mm | | |
| Ambient temperature | -40 … +85 °C | | -60 … +105 °C |
| Process temperature | -40°C … +180°C | -60°C … +250°C | |
| Process pressure | -0.5 ~ +1.5MPa | -1.0 ~ +4.0MPa | |
| Process connection | Flanges from DN80 | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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# Dimensions

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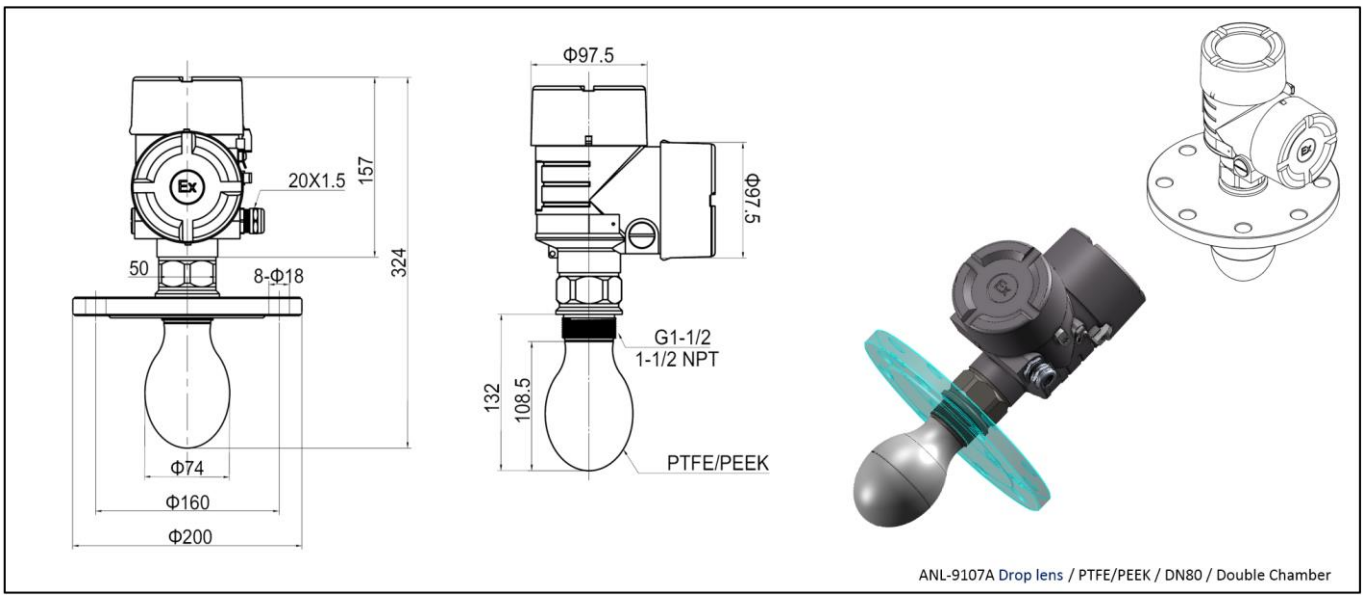
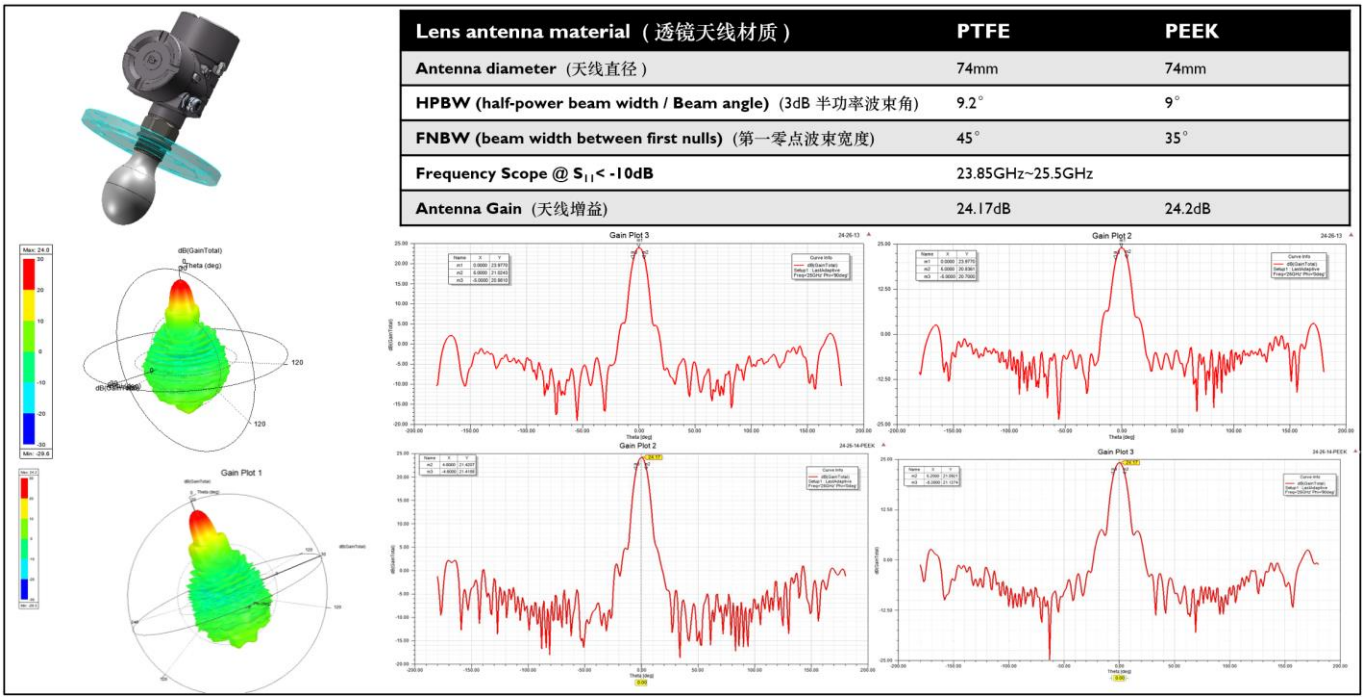


ANL-9107A Drop lens / PTFE/PEEK / DN80 / Double Chamber

**The Radar Antenna Specification of the ANL-9107DR**



| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 74mm | 74mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 9.2° | 9° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 45° | 35° |
| Frequency Scope @ $S_{11}$< -10dB | 23.85GHz~25.5GHz | |
| Antenna Gain（天线增益） | 24.17dB | 24.2dB |

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# ANL-9107AZ regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*

## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=80 mm.
- Suitable for corrosion applications, also the liquid which be heated with weak steam.

## Specifications

| ANL-9107AZ | Antenna cover material PTFE | Antenna cover material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 35M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 100mm from the flange down surface | | |
| Meas. Principle | FMCW Radar System | | |
| Lens Antenna Medium | PTFE Φ80mm | PEEK Φ80mm | |
| Antenna beam / Gain | Beam angle 10°/ Gain 23.5dB | Beam angle 10°/ Gain 24.18dB | |
| Meas. Resolution | 0.1mm | | |
| Meas. Accuracy | ±2 mm | | |
| Ambient temperature | -40 … +85 °C | | -60 … +105 °C |
| Process temperature | -40°C … +180°C | -40°C … +220°C | |
| Process pressure | -0.5 ~ +0.8MPa | -0.5 ~ +1.5MPa | |
| Process connection | Flanges >= DN80 | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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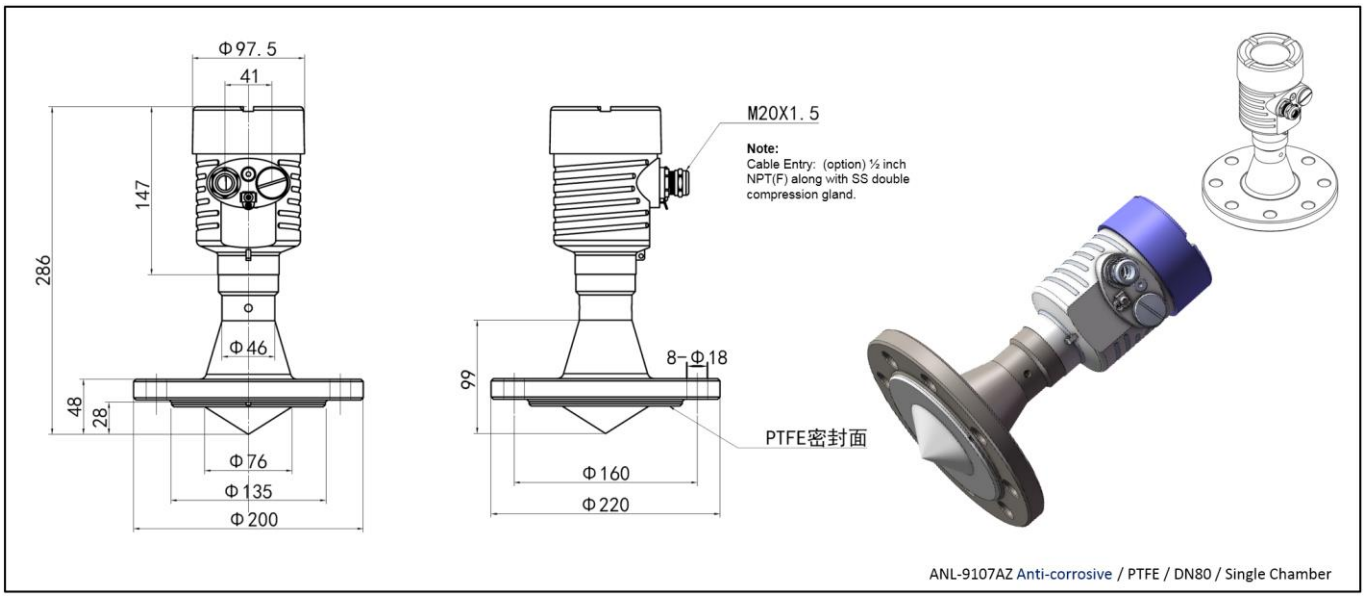
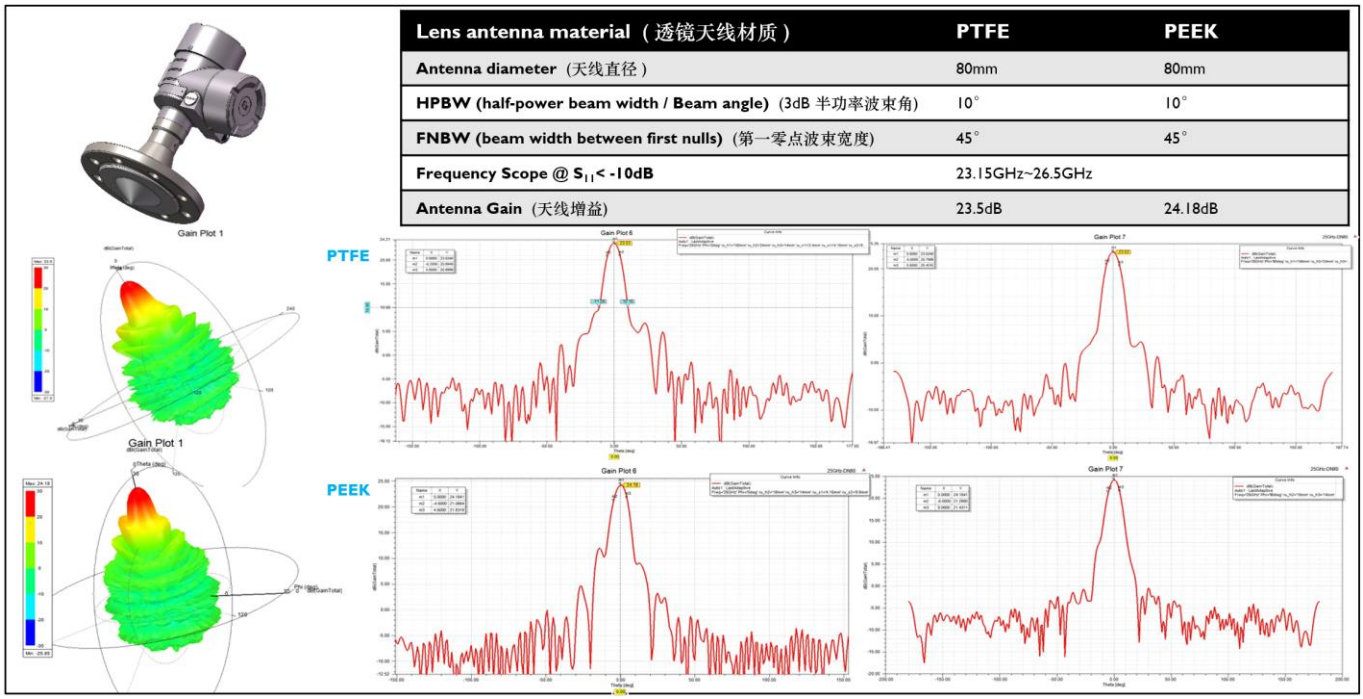



**The Radar Antenna Specification of the ANL-9107AZ**



| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 80mm | 80mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 10° | 10° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 45° | 45° |
| Frequency Scope @ $S_{11}$< -10dB | 23.15GHz~26.5GHz | |
| Antenna Gain（天线增益） | 23.5dB | 24.18dB |

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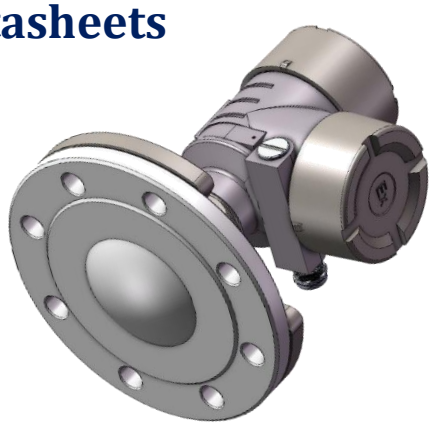
# ANL-9107AX regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*



## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=100 mm.
- Suitable for corrosion applications, also the liquid which be heated with steam.

## Specifications

| ANL-9107AX | Antenna coupler material PTFE | N60 (cool module version) |
|---|---|---|
| Max. measuring range | 35M | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | |
| Near blind spot | < 100mm from the flange down surface | |
| Meas. Principle | FMCW Radar System | |
| Lens Antenna Medium | PTFE Φ80mm | |
| Antenna beam / Gain | Beam angle 14°/ Gain 20.8dB | |
| Meas. Resolution | 0.1mm | |
| Meas. Accuracy | ±2 mm | |
| Ambient temperature | -40 … +85 °C | -60 … +105 °C |
| Process temperature | -60°C … +200°C | |
| Process pressure | -0.3 ~ +1.0 MPa | |
| Process connection | Flanges >= DN100 | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150µA | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | |

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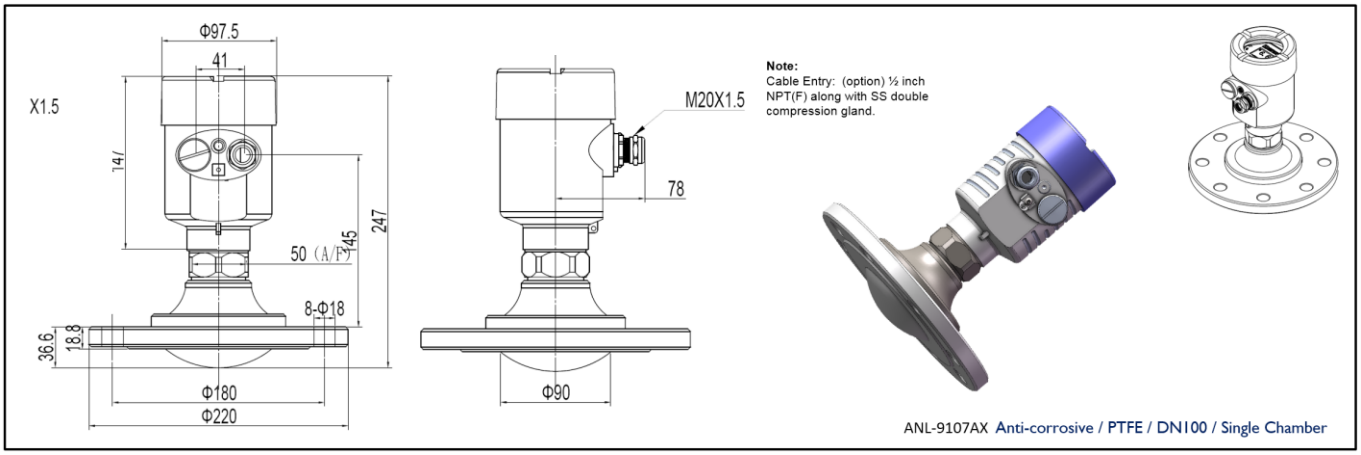
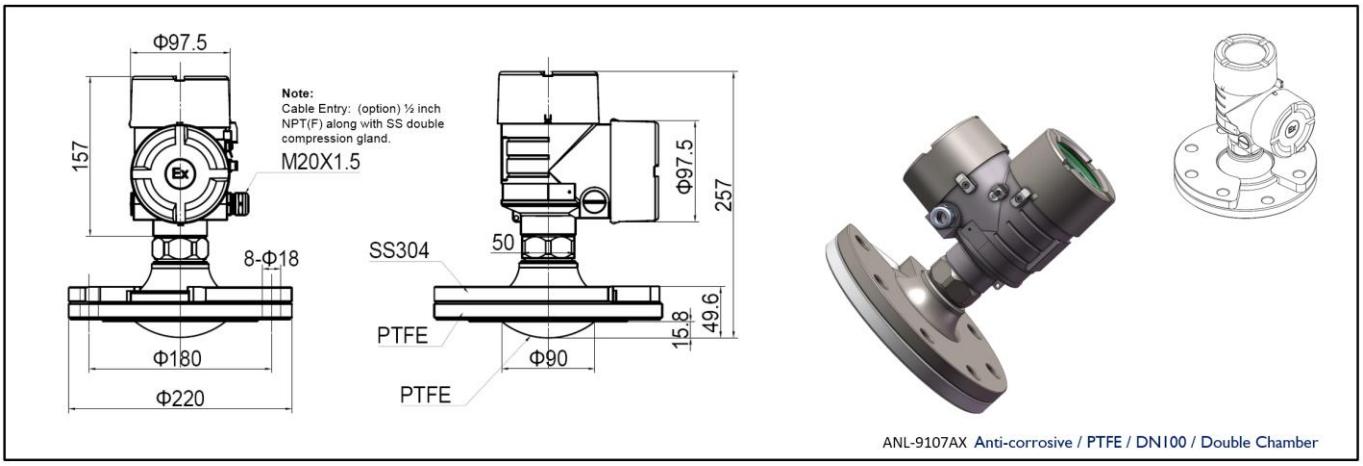
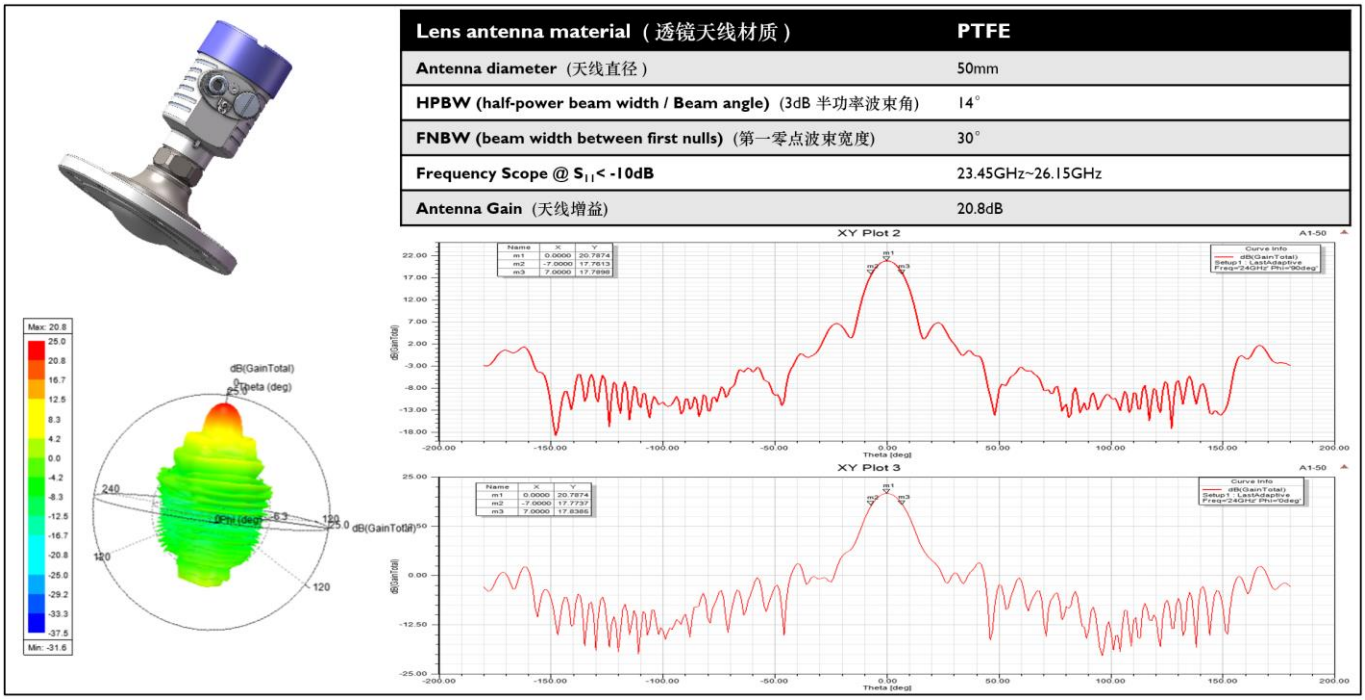



**The Radar Antenna Specification of the ANL-9107AX**



| | |
|---|---|
| **Lens antenna material** (透镜天线材质) | **PTFE** |
| **Antenna diameter** (天线直径) | 50mm |
| **HPBW (half-power beam width / Beam angle)** (3dB 半功率波束角) | 14° |
| **FNBW (beam width between first nulls)** (第一零点波束宽度) | 30° |
| **Frequency Scope @ $S_{11}$< -10dB** | 23.45GHz~26.15GHz |
| **Antenna Gain** (天线增益) | 20.8dB |

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# ANL-9107AS regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*

## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=80 mm.
- With aiming and anti-corrosion.

## Specifications

| ANL-9080N100 | Antenna coupler material PTFE | N60 (cool module version) |
|---|---|---|
| Max. measuring range | 35M | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | |
| Near blind spot | < 150mm from the flange down surface | |
| Meas. Principle | FMCW Radar System | |
| Lens Antenna Medium | PTFE Φ80mm | |
| Antenna beam / Gain | Beam angle 14°/ Gain 20.8dB | |
| Meas. Resolution | 0.1mm | |
| Meas. Accuracy | ±2 mm | |
| Ambient temperature | -40 … +85 °C | -60 … +105 °C |
| Process temperature | -60°C … +180°C | |
| Process pressure | -0.3 ~ +0.6 MPa | |
| Process connection | Flanges >= DN80 | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | |
| Indication/Adjustment (LOI) | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>(APP) Radar MobileManager via BT wireless connection<br>(PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | |

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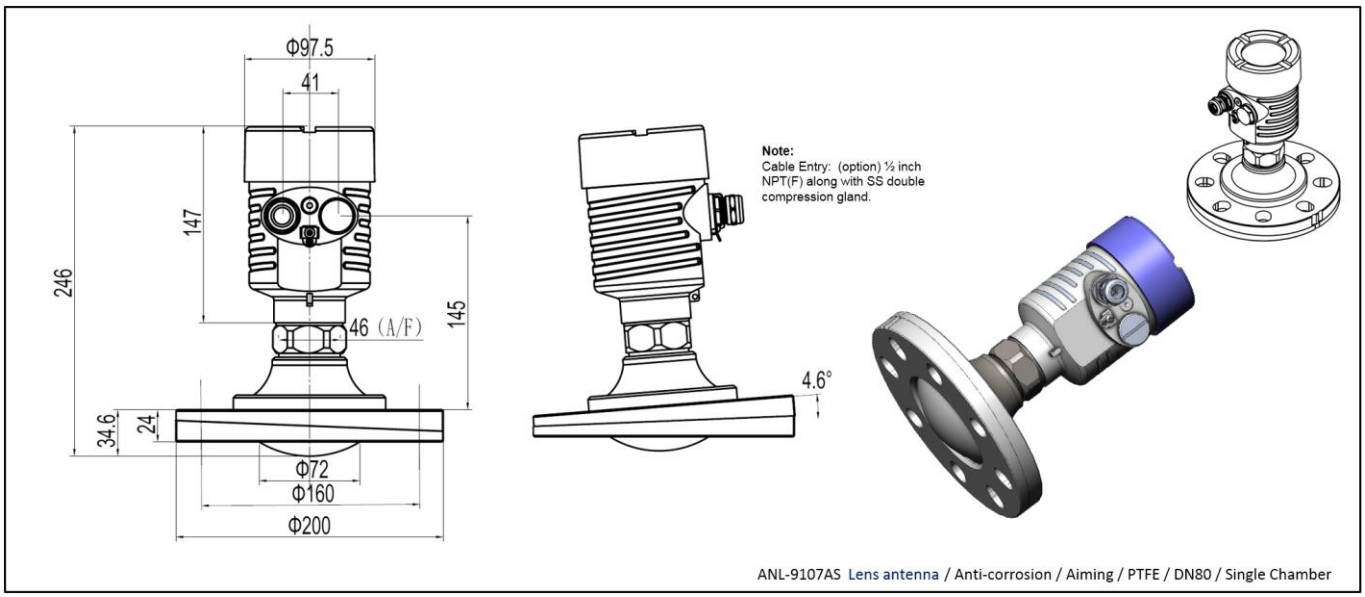


ANL-9107AS Lens antenna / Anti-corrosion / Aiming / PTFE / DN80 / Single Chamber

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# ANL-9107AG regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*

## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=80 mm.
- Suitable for level measurement in storage containers, reactors and process vessels, etc.

## Specifications

| ANL-9080N100 | Antenna coupler material PTFE | Antenna coupler material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 55M/70M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 150mm from the flange down surface | | |
| Meas. Principle | FMCW Radar System | | |
| Lens Antenna Medium | PTFE Φ80mm / Φ100mm | PEEK Φ80mm / Φ100mm | |
| Antenna beam / Gain | Beam angle 8.6°/ Gain 25.2dB (Φ80mm)<br>Beam angle 8.0°/ Gain 26.9dB (Φ100mm) | Beam angle 8.2°/ Gain 25.6dB (Φ80mm)<br>Beam angle 7.5°/ Gain 26.2dB (Φ100mm) | |
| Meas. Resolution | 0.1mm | | |
| Meas. Accuracy | ±2 mm | | |
| Ambient temperature | -40 … +85 °C | | -60 … +105 °C |
| Process temperature | -40°C … +180°C | -60°C … +250°C | |
| Process pressure | -0.3 ~ +0.6MPa | -1.0 ~ +2.5MPa | |
| Process connection | Flanges >= DN80 | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max(for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | | |
| Indication/Adjustment (LOI) | 1. 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C … 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C … 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C … 70°C. (option only for 4-wrie system)<br>2. (APP) Radar MobileManager via BT wireless connection<br>3. (PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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# Dimensions

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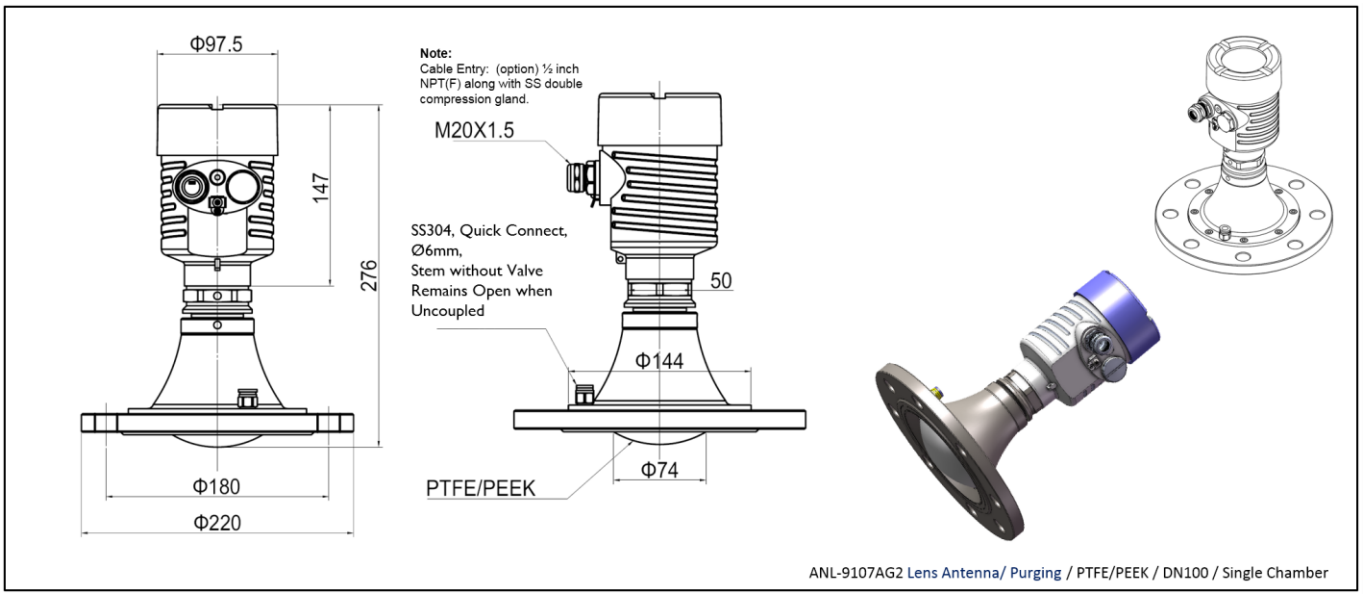
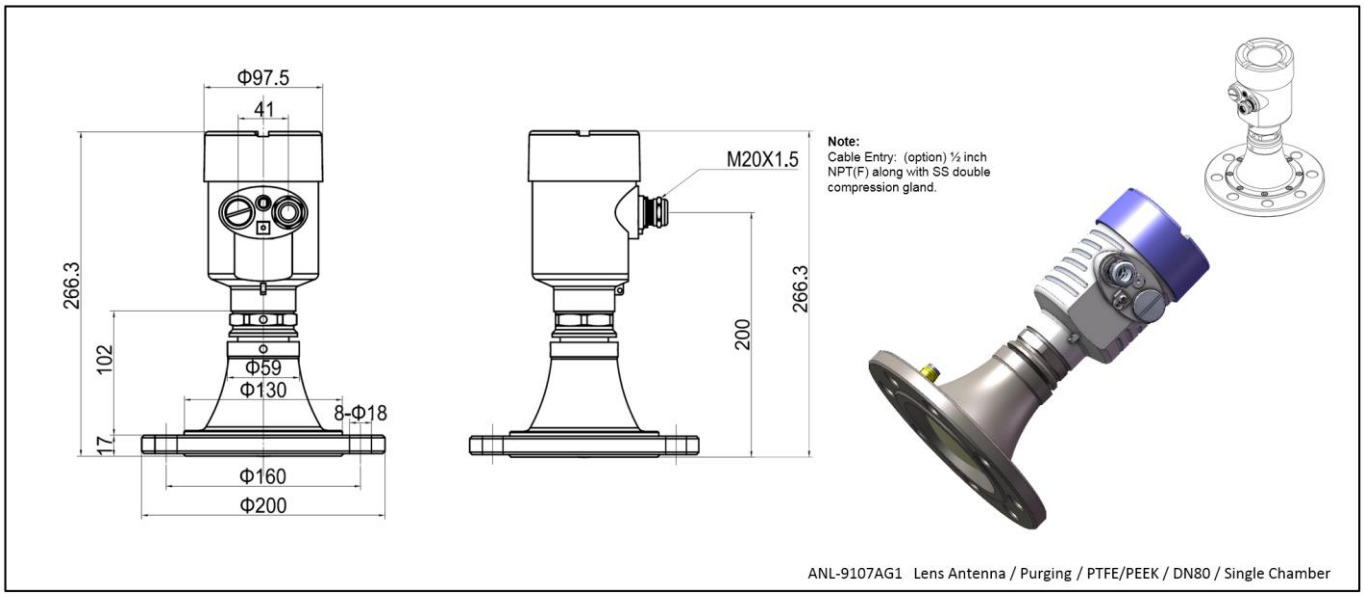



ANL-9107AG2 Lens Antenna/ Purging / PTFE/PEEK / DN100 / Single Chamber




ANL-9107AG1 Lens Antenna / Purging / PTFE/PEEK / DN80 / Single Chamber

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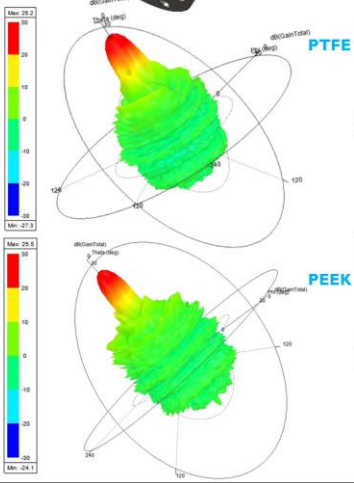
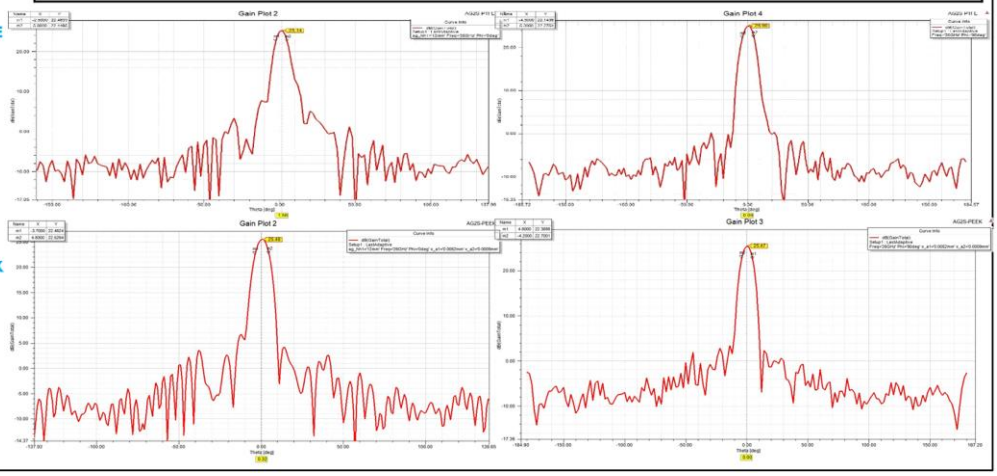
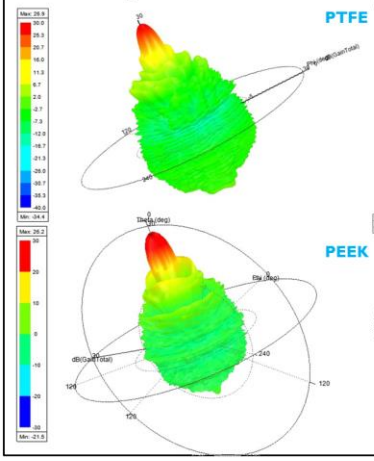
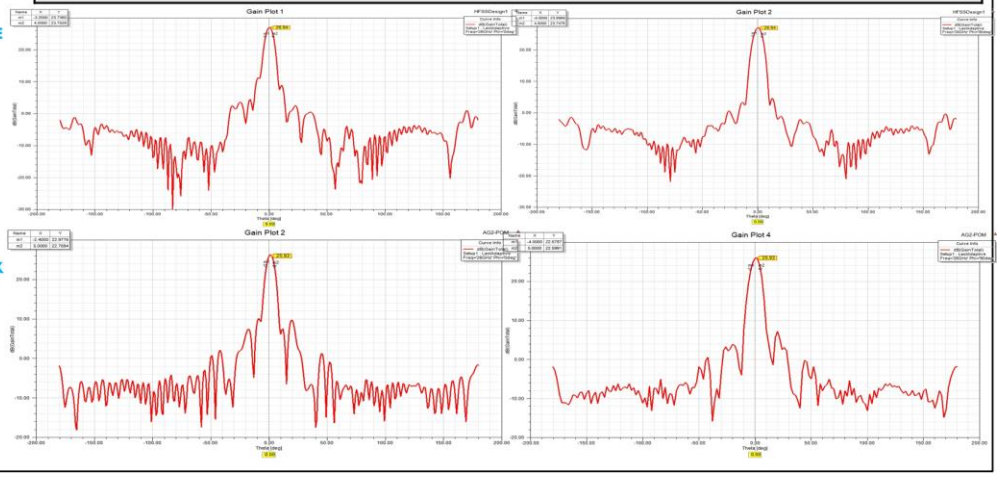
| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 80mm | 80mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 8.6° | 8.2° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 35° | 20° |
| Frequency Scope @ $S_{11}$< -10dB | 20.75GHz~27.05GHz | |
| Antenna Gain（天线增益） | 25.2dB | 25.5dB |




| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 100mm | 100mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 8° | 7.5° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 30° | 25° |
| Frequency Scope @ $S_{11}$< -10dB | 20.45GHz~27.25GHz | |
| Antenna Gain（天线增益） | 26.9dB | 26.2dB |



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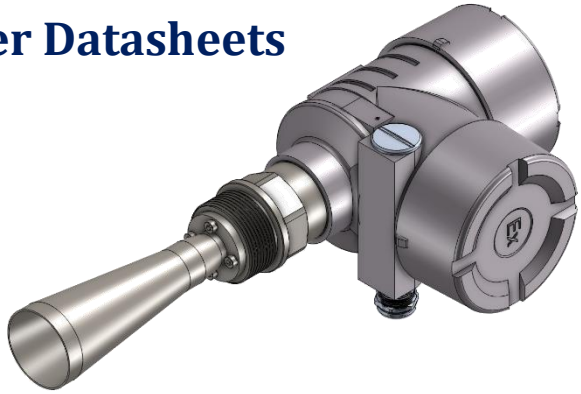
# ANL-9107Nx regular version

# Non-contact Radar Level Transmitter Datasheets

*Version V.2024*



## Characteristics

- 24GHz Frequency FMCW radar system.
- Measurement application in liquids, solids, the nozzle diameter >=50 mm.
- Suitable for storage containers, reactors and process vessels process conditions.

## Specifications

| ANL-9107N | Antenna coupler material PTFE | Antenna coupler material PEEK | N60 (cool module version) |
|---|---|---|---|
| Max. measuring range | 30M / 55M / 70M / 80M | | |
| Tx/Rx frequency | Tx/Rx frequency 24.05.2 to 26.60GHz Dynamic FM Sweep Bandwidth 2GHz<br>(The adjustment FM range can be customized according to the ISM requirements of the customer's region) | | |
| Near blind spot | < 150mm from the antenna horn down edges | | |
| Meas. Principle | FMCW Radar System | | |
| Horn Antenna Diameter | Φ46mm / Φ76mm/ Φ96mm/ Φ118mm | | |
| Antenna beam / Gain | Beam angle 6°... 16° / Gain 20 ... 28 dB | | |
| Meas. Resolution | 0.1mm | | |
| Meas. Accuracy | ±2 mm (<30m range) | | |
| Ambient temperature | -40 ... +85 °C | | -60 ... +105 °C |
| Process temp. scope | -40°C ... up to +200°C<br>-40°C ... +350°C (with Belt Cooling Neck) | -60°C ... up to +300°C<br>-60°C ... +450°C (with Belt Cooling Neck) | |
| Process pressure | -0.6 ~ +3.5 MPa | -1.0 ~ +5.0 MPa | |
| Process connection | Thread from G1½; 1½ NPT; flanges from DN50 | | |
| Signal output | 4-20 mA/HART7 2-wire, 4-20 mA/HART7 4-wire, Profibus PA / DP, Ethernet-APL, Modbus protocol 4-wire | | |
| Variables influencing meas. accuracy | Specifications for the digital measured value<br>Temperature drift - Digital output: ±0.2mm/10K, max. 5 mm<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm<br>Specifications apply also to the current output<br>Temperature drift - Current output: < 0.03 %/10K; < 0.01 %/10K or 0.15 % Max (for N60)<br>Deviation in the current output due to digital/analogue conversion<br>Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA<br>Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA | | |
| Indication/Adjustment (LOI) | 4. 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C ... 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C ... 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C ... 70°C. (option only for 4-wrie system)<br>5. (APP) Radar MobileManager via BT wireless connection<br>6. (PC software) Radar PCManager /or Via a PC with PACTware/DTM (an interface converter AiW-305 USB CONNECT is required) | | |
| Power supply | 16V ~ 40 VDC / Load resistor > 600Ω | | |
| Wireless communication | Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m | | |
| Approvals | CLEx/CNEx: Ex ia IIC T6 Ga IP68; Ex d IIC T6 Gb IP68 // SIL2 (No. 6G230714.CSETW61) | | |
| Housing | Single chamber / Double chamber, Aluminum / Stainless steel / Plastic PBT, IP66 / IP67 / IP68 | | |

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ALTHOUGH WE HAVE RECONCILED THE CONTENTS OF THE MANUAL WITH DESCRIPTION OF INSTRUMENT, THERE MAY STILL BE CHANGES WE CANNOT ENSURE THAT IT IS FULLY CONSISTENT. THE CONTENT WILL BE CHECKED AND CORRECTED IN AN ORDERLY, AND THE ERRATA WILL BE IN SUBSEQUENT RELEASES. WE WELCOME USERS TO MAKE VARIOUS SUGGESTIONS FOR IMPROVEMENT. [TECHNICAL DATA SUBJECT TO CHANGE]

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# Dimensions

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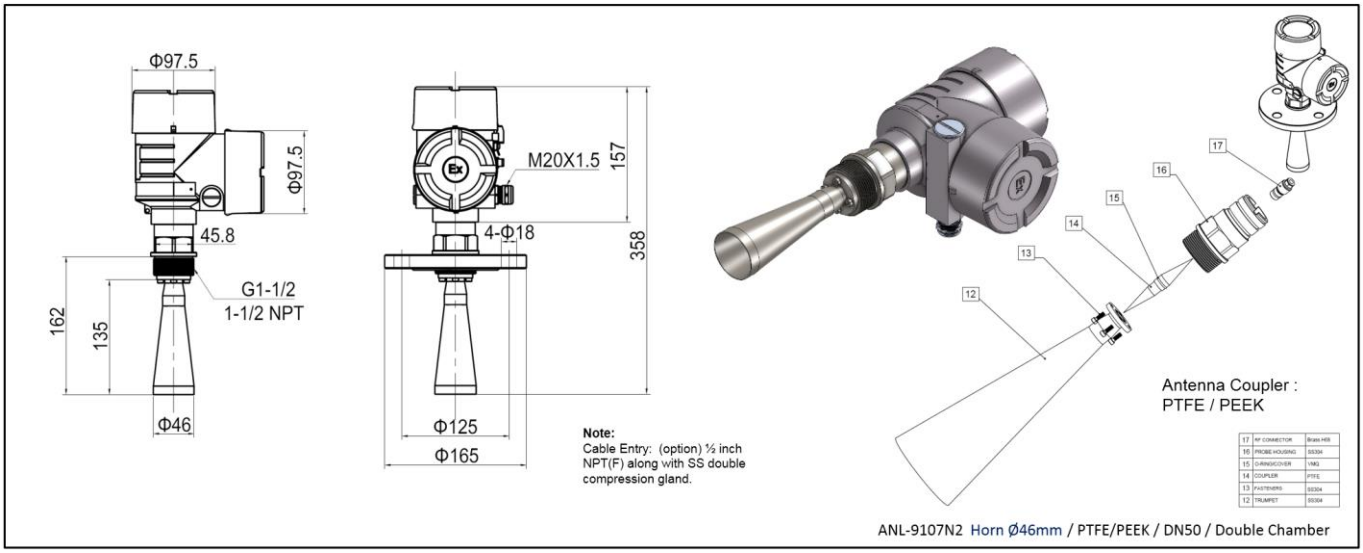


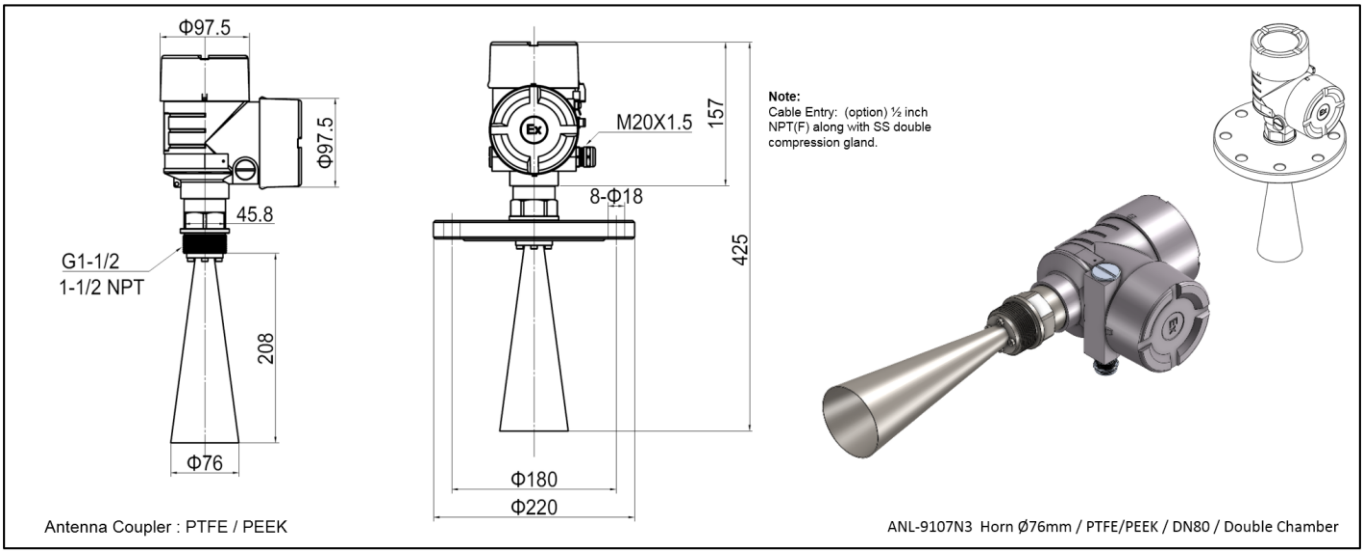


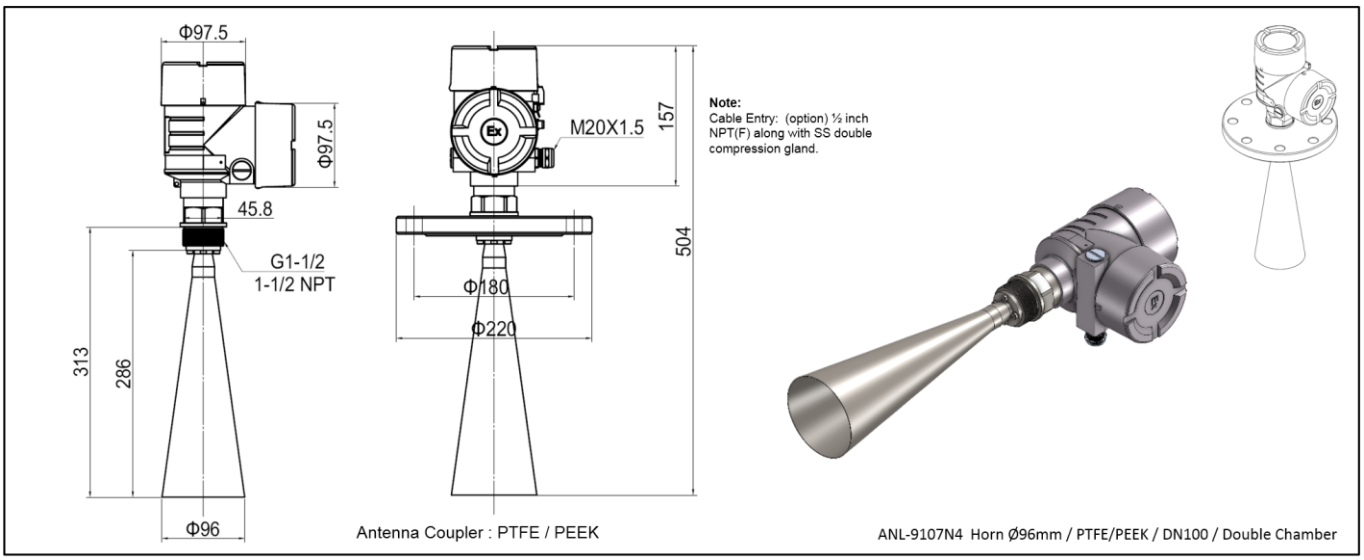

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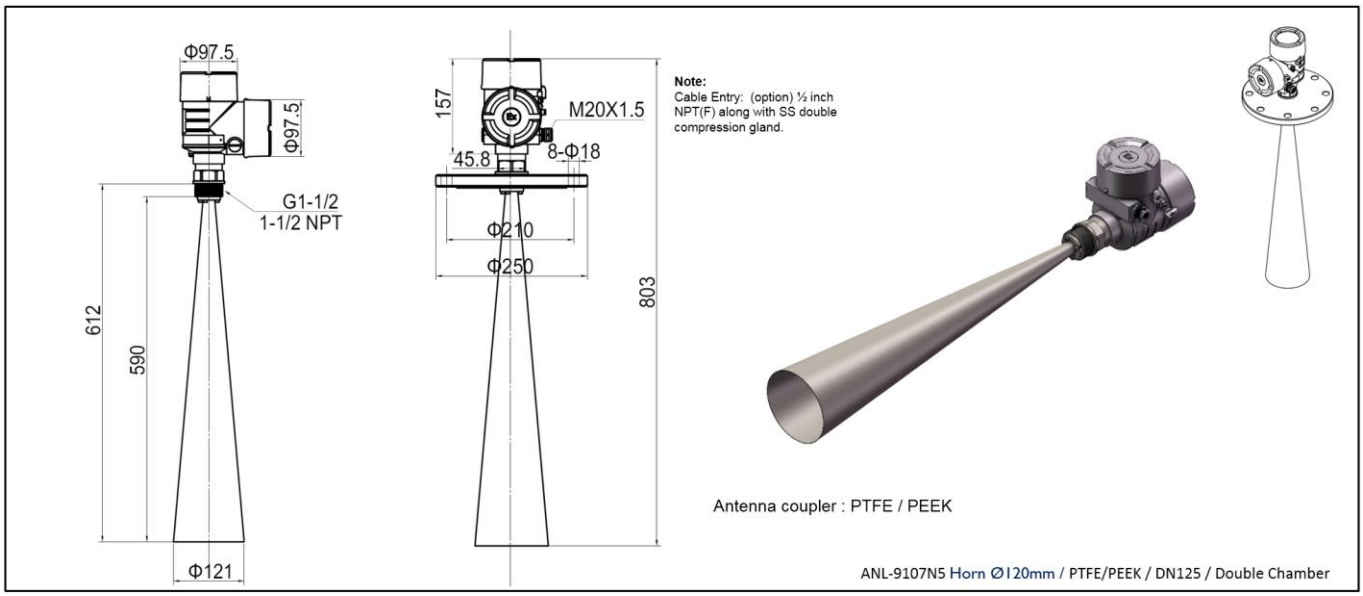


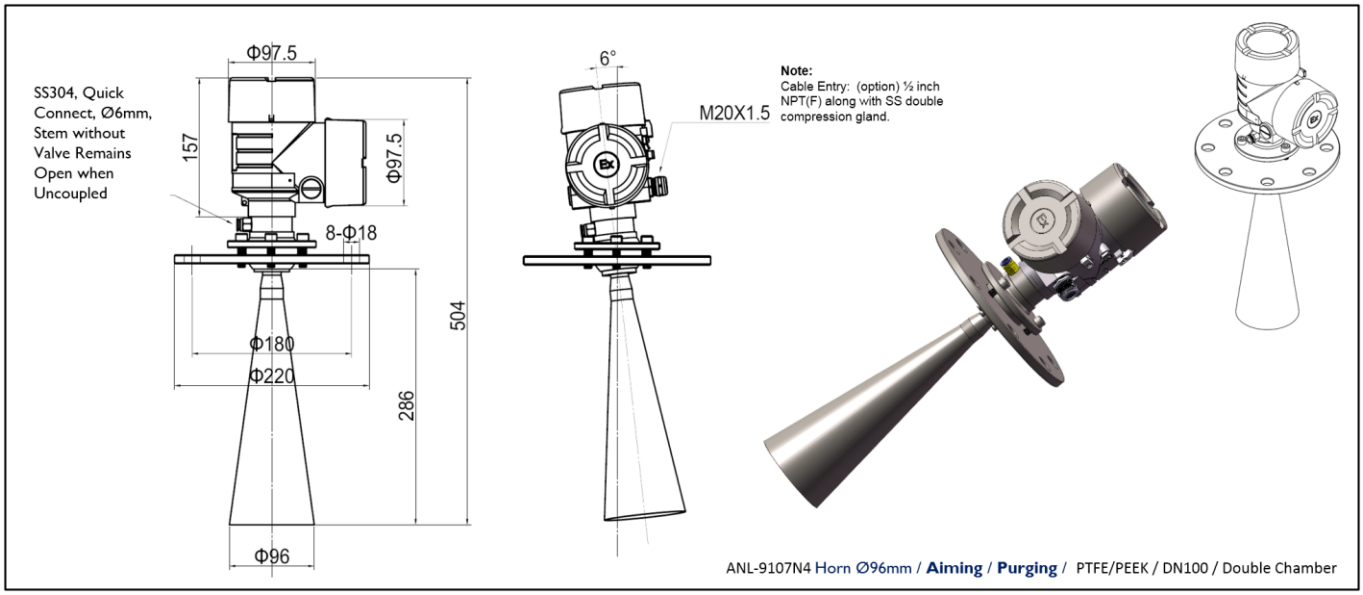


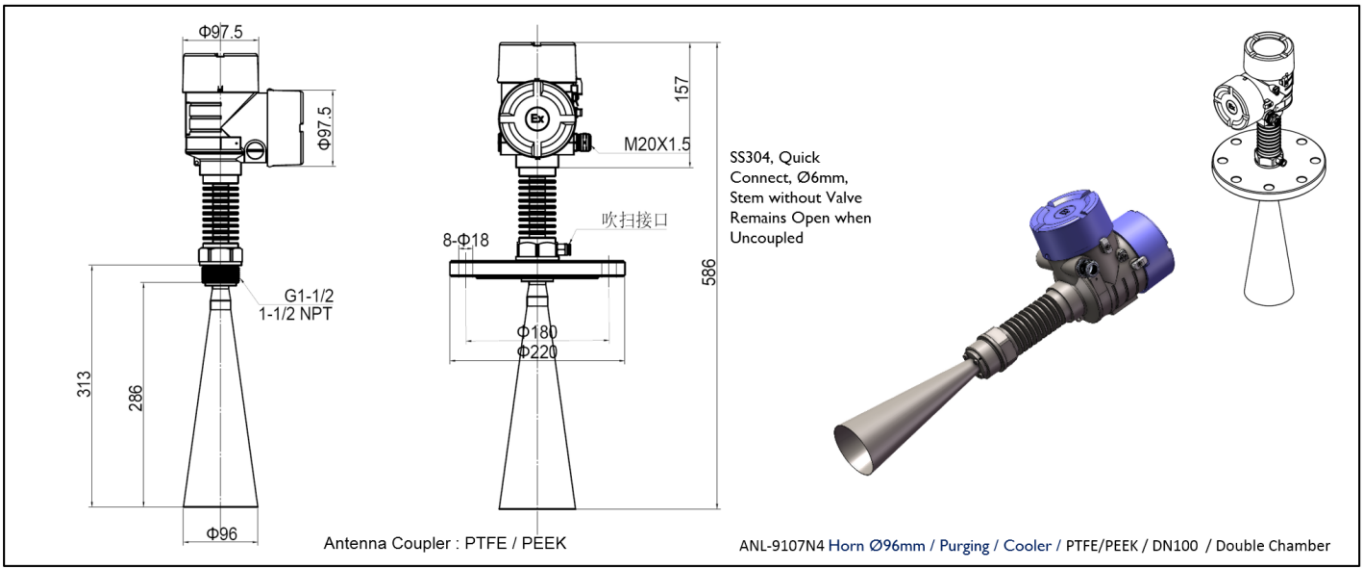

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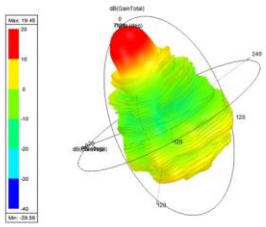
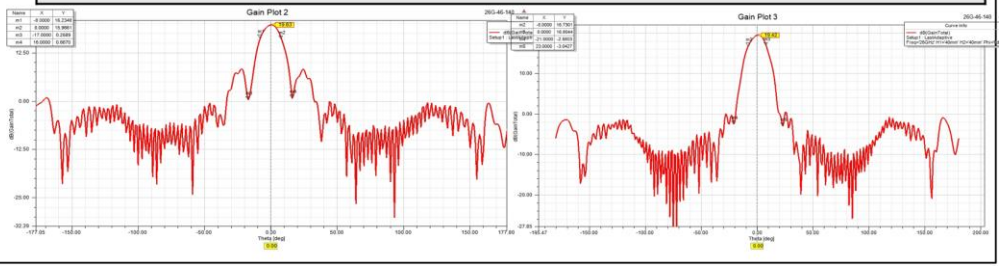
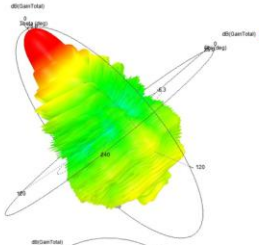
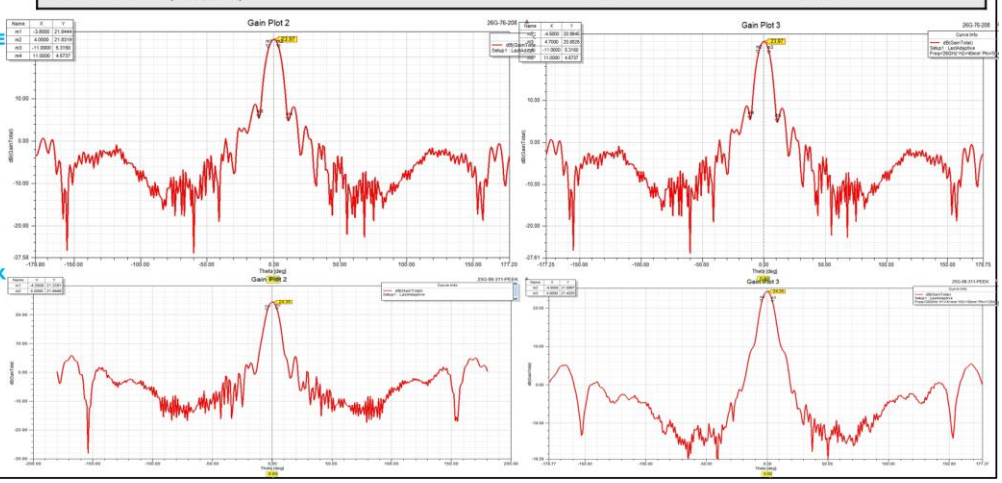
**The Radar Antenna Specification of the ANL-9107N**





| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 46mm | 46mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 16° | 16.4° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 35° | 35° |
| Frequency Scope @ $S_{11}$< -10dB | 23.00GHz~26.90GHz | |
| Antenna Gain（天线增益） | 19.45dB | 19.63dB |





| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 76mm | 76mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 9.2° | 9° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 22° | 30° |
| Frequency Scope @ $S_{11}$< -10dB | 22.50GHz~26.90GHz | |
| Antenna Gain（天线增益） | 24.0dB | 24.3dB |

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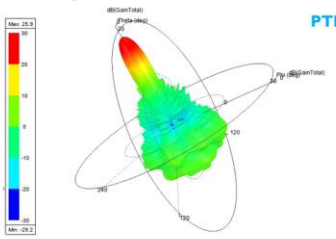
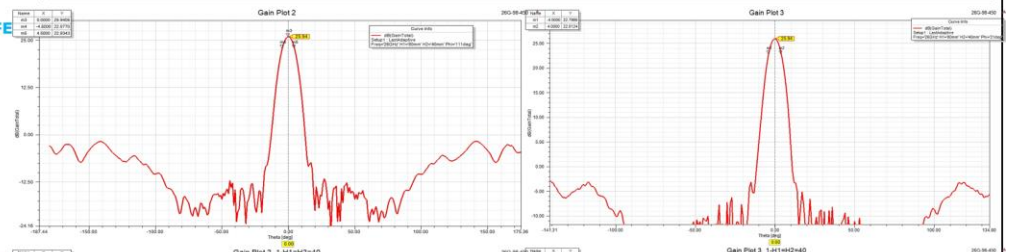
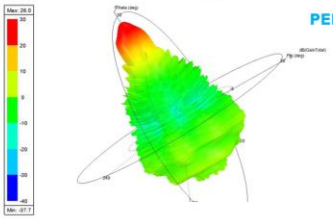
| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 96mm | 96mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 8° | 7.6° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 30° | 35° |
| Frequency Scope @ $S_{11}$< -10dB | 22.50GHz~26.90GHz | |
| Antenna Gain（天线增益） | 25.9dB | 26.0dB |

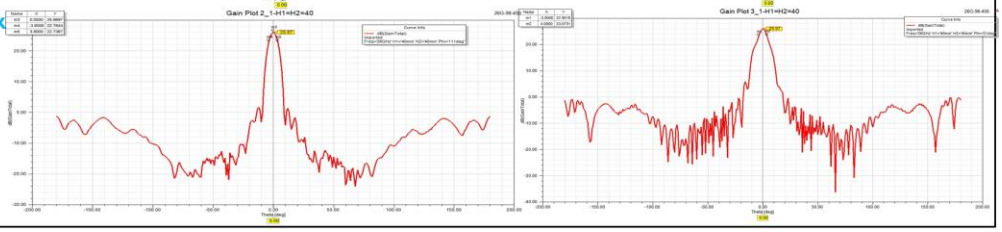
PTFE





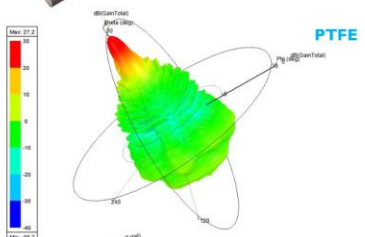
PEEK

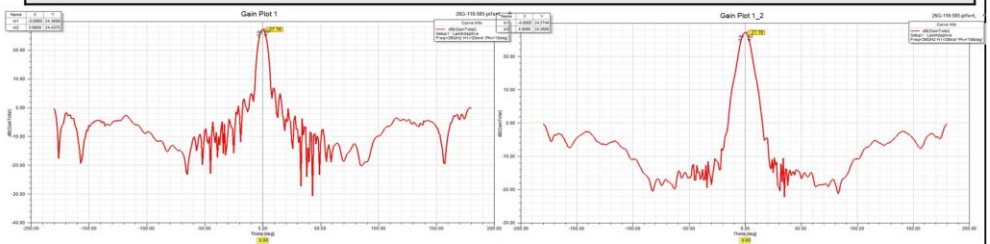




| Lens antenna material（透镜天线材质） | PTFE | PEEK |
|---|---|---|
| Antenna diameter（天线直径） | 118mm | 118mm |
| HPBW (half-power beam width / Beam angle)（3dB 半功率波束角） | 5.8° | 5.3° |
| FNBW (beam width between first nulls)（第一零点波束宽度） | 20° | 20° |
| Frequency Scope @ $S_{11}$< -10dB | 22.50GHz~26.90GHz | |
| Antenna Gain（天线增益） | 27.2dB | 27.47dB |

PTFE





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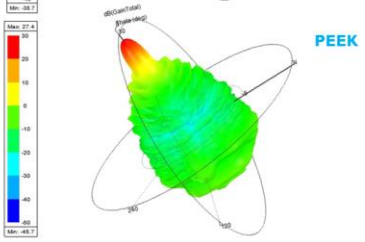

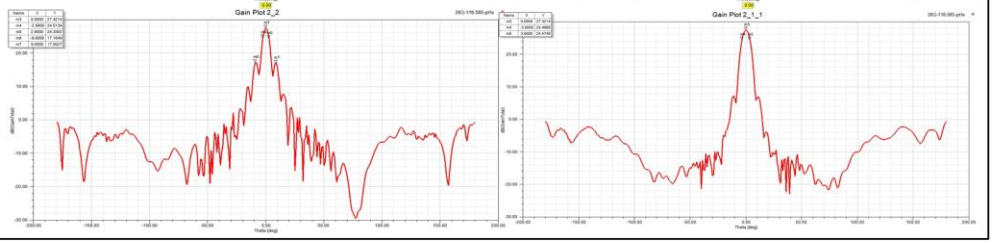

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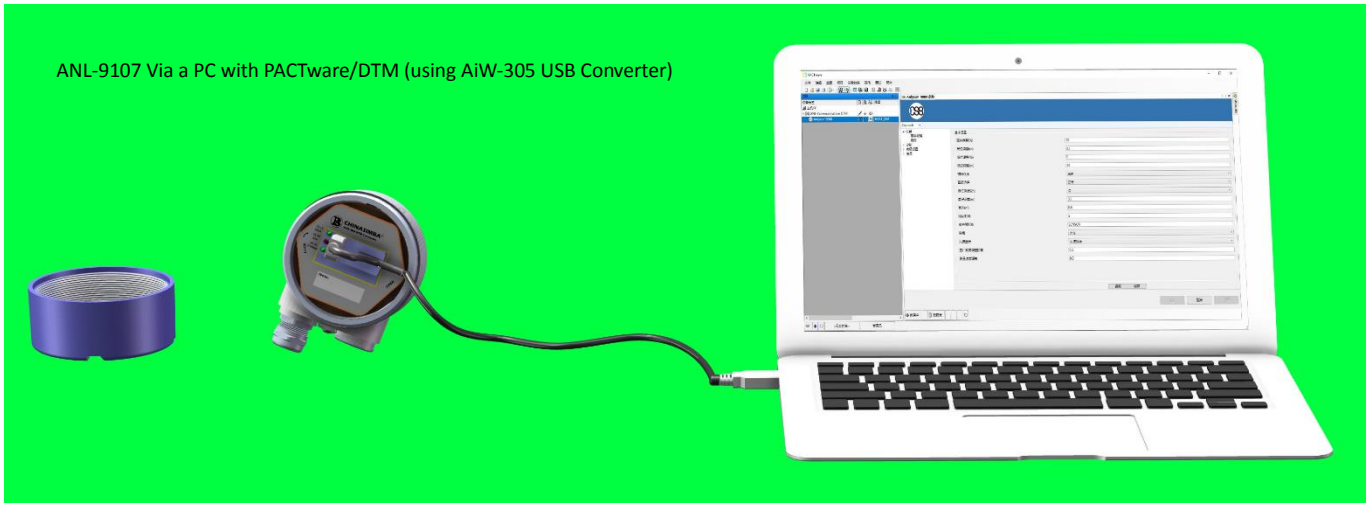
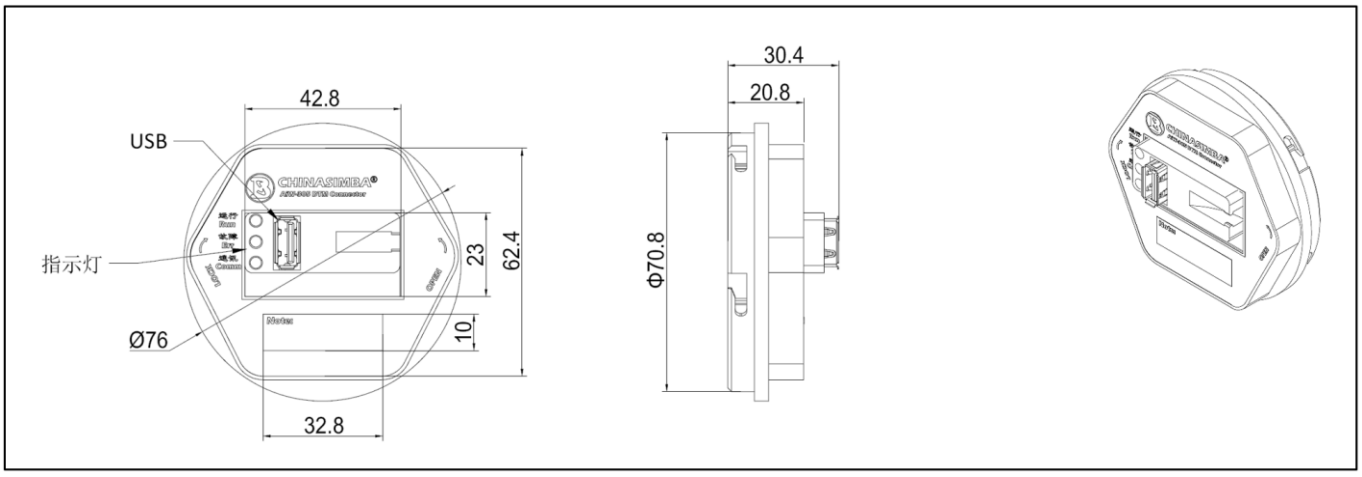
# Adapters / Accessories

The Adapter: AiW-305 (Master Mode), AiW-315 (Slave Mode), which is carried out via a PC with the adjustment software PACTware and corresponding DTM.

## DTM Adapter for ANL-9107




### *AiW-305 USB Converter Adapter*

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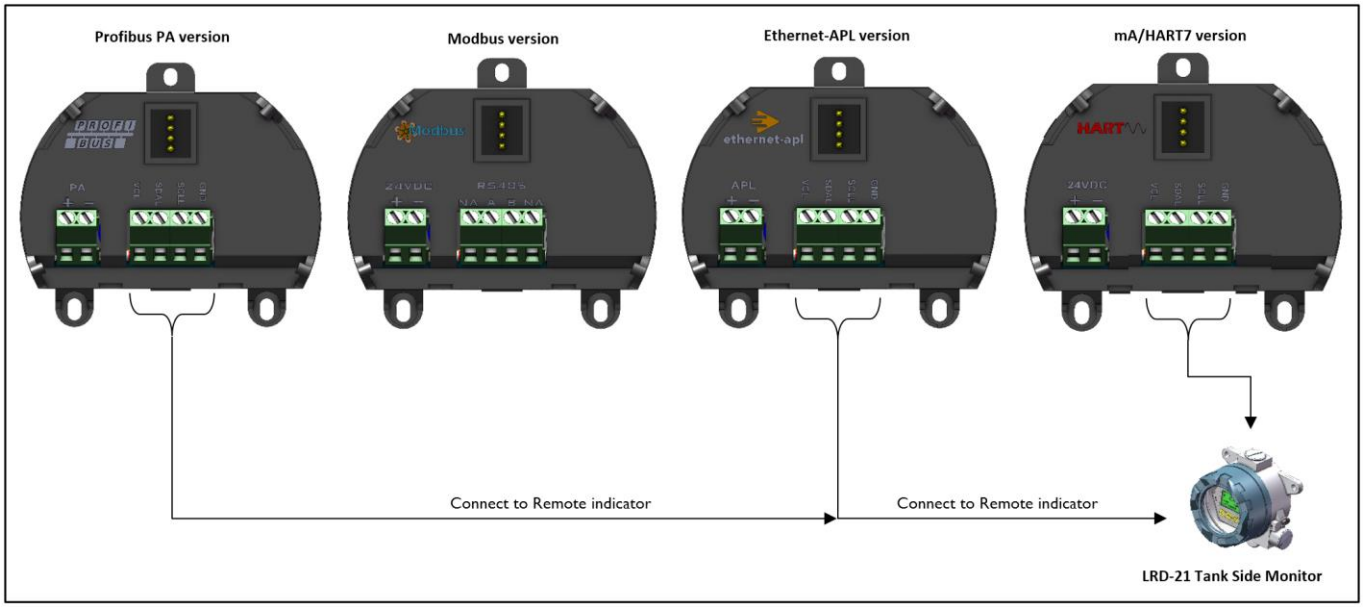
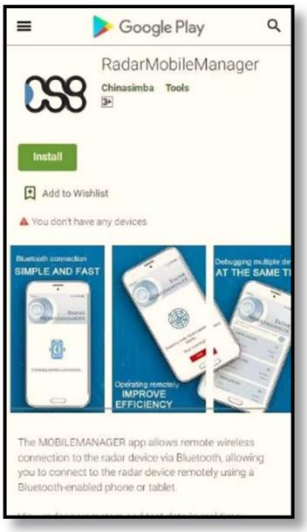
# Remote programmer cum Indicator Adapters

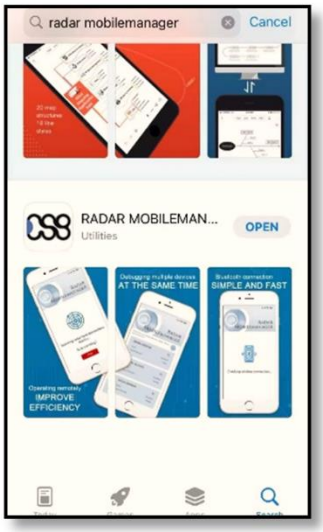
## Remote indicator connects for ANL-9107

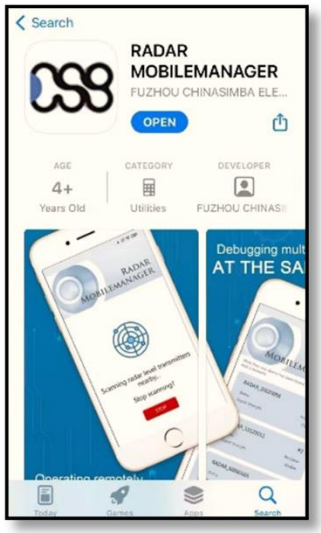


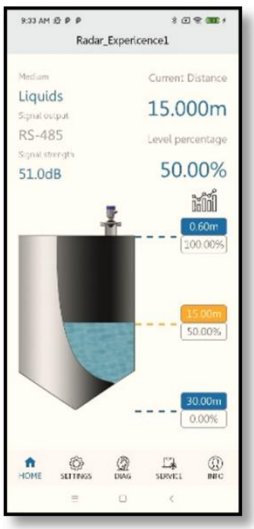

### *Remote indicator via Bluetooth communication*

ANL-9107 radar level transmitters (with Bluetooth function) can be connected to mobile phone through Bluetooth wireless system. The mobile phone needs to install the RadarMobileManager APP. This is a free registered APP (Android and IOS etc.) software, which can be downloaded and installed directly in major APP Stores, or please contact the relevant product suppliers.



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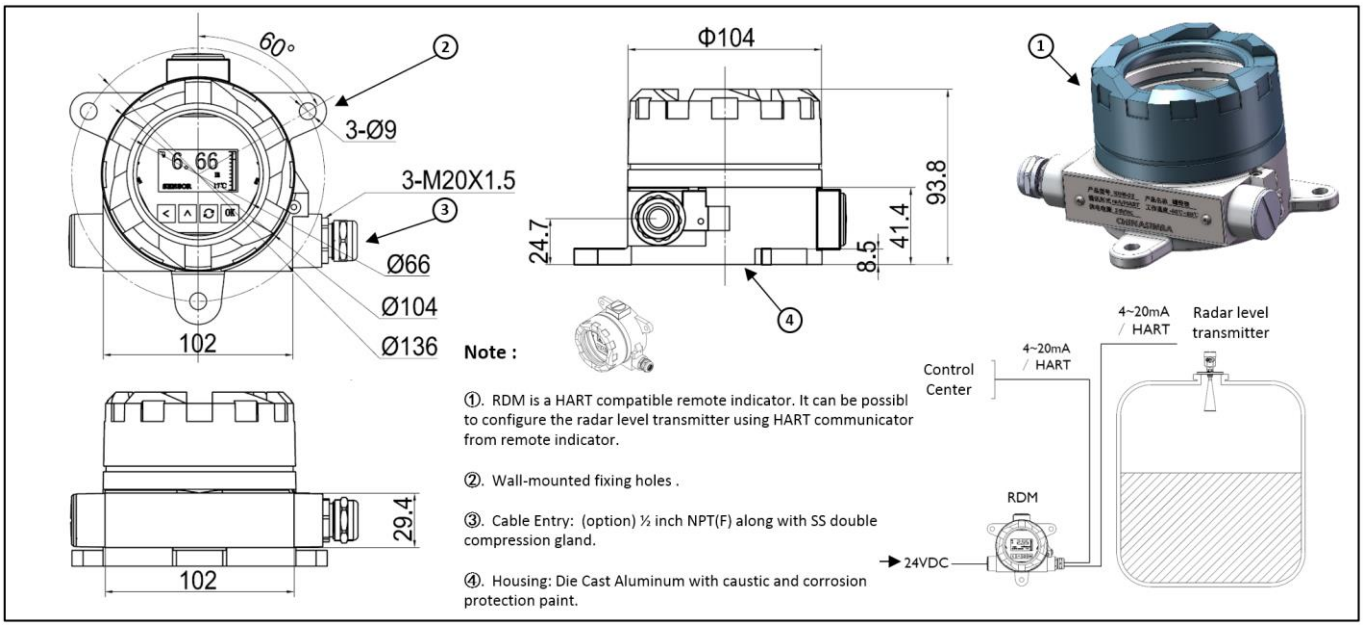
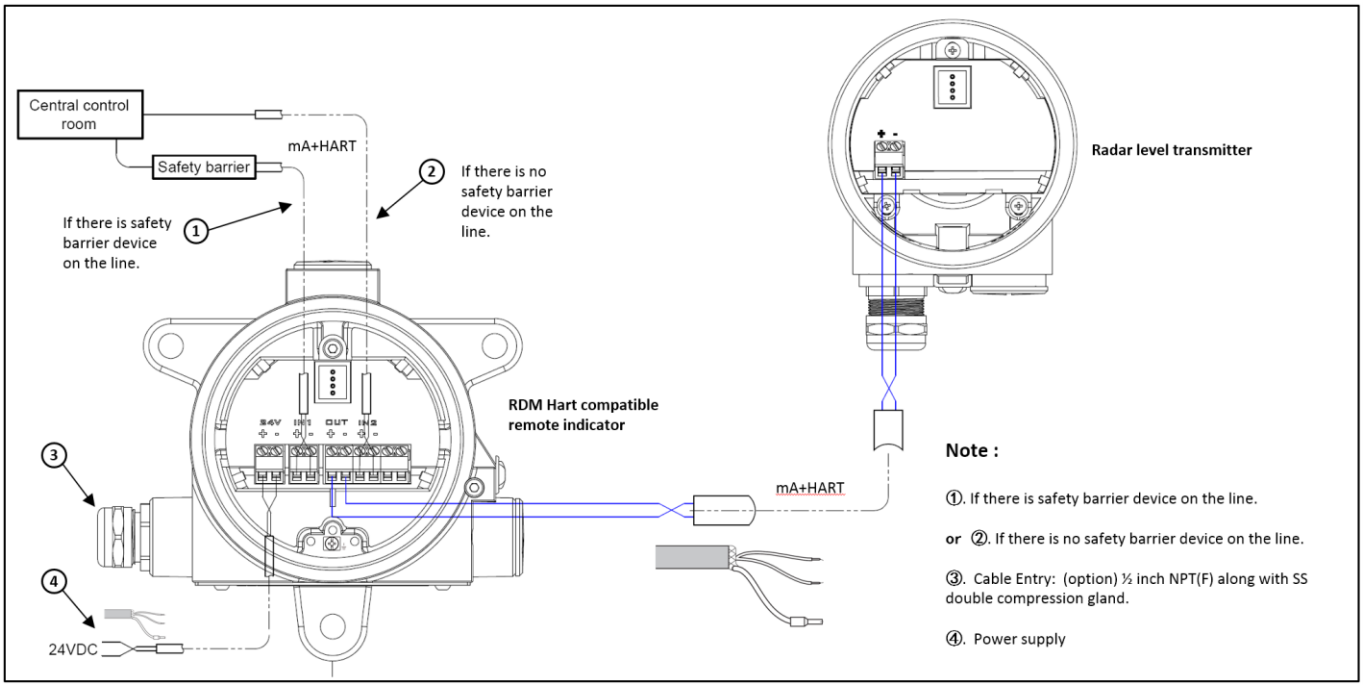
*Remote indicator with HART compatible (RDM-25)*



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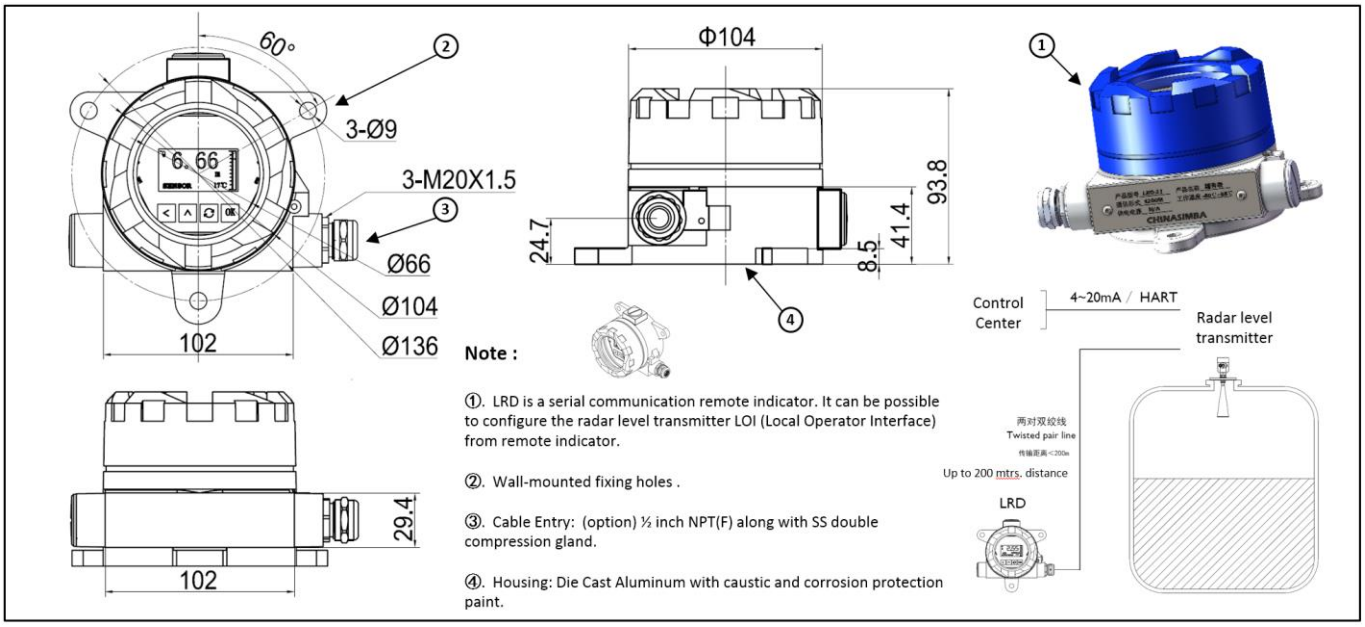
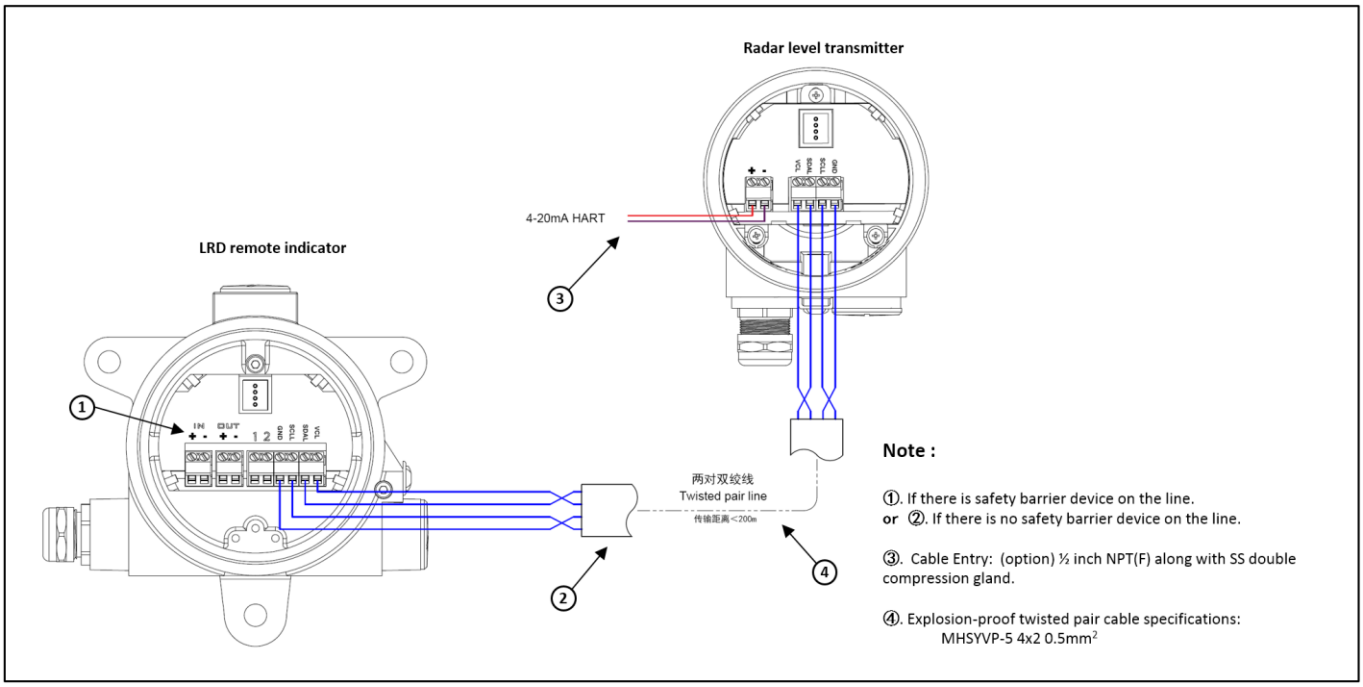
*Remote indicator via Serial communication (LRD-21)*



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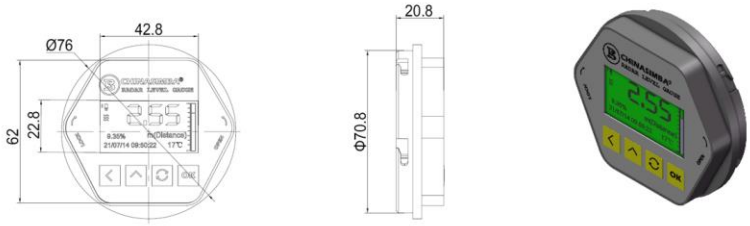
# Indication/Adjustment LOI Adapter

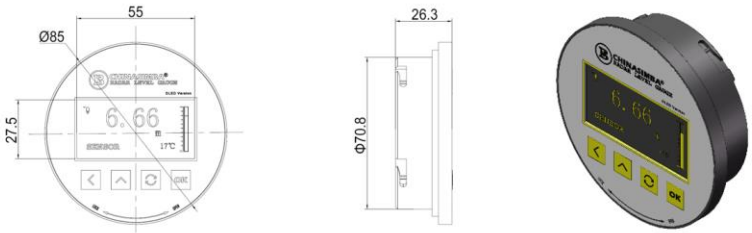
### 160x80 LCD RGB Backlight Monitor Adapter

Display type: FSTN
View direction: 6 o'clock
Operation temperature : -20°C ... 70°C



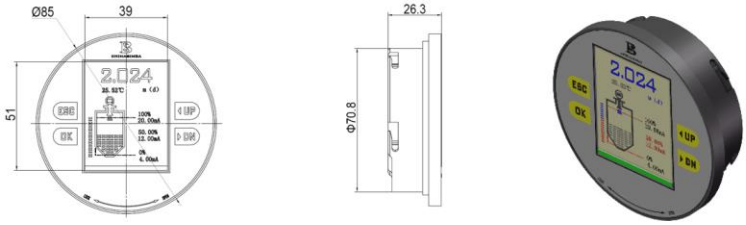

### 128x64 OLED graphic Monitor Adapter

Display type: OLED
View direction: 180 o'clock
Operation temperature : -55°C ... 80°C




### 320x240 LCD TFT colors Monitor Adapter

Display type: 2.4" TFT 65K/262K colors
View direction: 6 o'clock
Operation temperature : -20°C ... 70°C



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# 24Ghz Electronics Units Technical data

Note: The technical data in the corresponding safety instructions included in the delivery are valid for approved instruments (approved for explosion protection). These data may differ from those listed here, for example with regard to process conditions or voltage supply.

| 24GHz Electronics Module Schema<br>M9107 | | 24GHz Radar Electronics Module Specification Datasheets | | | |
|---|---|---|---|---|---|
| | |  |  |  |  |
| Version: DY0506 | Module Model: | 24GHz Electronic modules 2 Wired<br>S0/S1/S2 | 24GHz Electronic modules 2 Wired / PA<br>PA S0/S1/S2 | 24GHz Electronic modules 2 Wired<br>N60 S0/S1/S2 | 24GHz Electronic modules 4 Wired<br>HART/ModBus/APL<br>4W S0/S1/S2 |
| **1. Materials and weights** | | | | | |
| | **Materials, wetted parts** | | | | |
| | Antenna, process fitting | 24GHz RF Coaxial Interface (Bandwidth 22.5 ~ 26.5 GHz) | | | |
| | Process seala | | | | |
| | For the process conditions, please also note the specifications on the nameplate.<br>The lowest value (amount) always applies. | | | | |
| | Flange nozzle length | | | | |
| | Process installation | | | | |
| | Process temperature | | | | |
| | Process pressure | | | | |
| | **Materials, non-wetted parts** | | | | |
| | PCBA Housing (inner shell) | Nylon PA6 (Polyamide), Fiberglass | | | |
| | PCBA Housing operating temperature | inner shell operating temperature: -65 ~ 120 °C;<br>Vicat softening point: 110°C for conventional inner tank shell for regular module, 210°C for low temperature inner shell for N60 module | | | |
| | PCBA Housing seals | Dielectric Silicone Gel potting, gel insulation resistance >100MΩ, thermal conductivity according to T6 standard, gel potting density/viscosity: 0.97g/cm3 / 800cPs | | | |
| | Cable gland | Regular specifications: M20*1.5 metal cable gland, threading cable diameter range: 9 ~ 12mm | | | |
| | Blind plug, cable gland | | | | |
| | Inspection window for the indication | Display module ejector pin: Material C3604 brass / Elastic force: 80gF / Lifespan: >50000 times, maximum current>1A, contact resistance<0.03R | | | |
| | **Weight** | | | | |
| | Product weight | < 0.3 kg (including weight of potting seal) | | | |
| | Contains package weight | | | | |
| **2. Torques** | | | | | |
| | Max. torque mounting boss | | | | |
| | Max. torque for NPT cable glands and Conduit tubes | | | | |
| **3. Input variable** | | | | | |
| | Measured variable | The measured value is the distance between the flange side of the sensor and the surface of the medium. The flange face is also the reference plane for measurement. | | | |
| | Max.measuring range (Depending on M9107 Module model ) | 10/30/35/40/55/70M | | | |
| | **Minimum measuring distance** | Depending on the operating conditions and Antenna type | | | |
| | mode 1, 2, 4 | | | | |
| | mode 3 | | | | |
| **4. Switch-on phase** | | | | | |
| | Run-up time for $U_B$ = 16 V DC, 18 V DC, 24 V DC | < 45 s | | | < 6 s |
| | Starting current for run-up time | ≤ 3.6 mA | | | ≤ 15mA |
| | **Power consumption** | The peak current duration at power-on instantaneous ≤ 5uS, and the current stabilization time is ≤50uS | | | |
| | @ ≤ 3.6 mA | <45mW@12VDC; <65mW@18VDC; <90mW@24VDC ( 2 Wired ) | | | |
| | @ 4mA | <50mW@12VDC; <75mW@18VDC; <100mW@24VDC ( 2 Wired ) | | | |
| | @ 20mA | <245mW@12VDC; <370mW@18VDC; <485mW@24VDC ( 2 Wired ) | | | |
| **5. Output variable** | | | | | |
| | Output signal | 4 ... 20 mA/HART | | | 4 ... 20 mA/HART |
| | Range of the output signal | 3.6 ... 20.5 mA/HART (factory setup) | | | |
| | Analog Signal resolution | 0.3 µA | | | |
| | Resolution, digital | 0.5 mm | | | |
| | Fault signal, current output (adjustable) | ≤ 3.6 mA, ≥ 21 mA ，The latest applicable measurements | | | |
| | Max. output current | 23.5mA | | | |
| | Starting current | ≤ 3.6 mA ; ≤ 4 mA @After power turn-on 18s | | | |
| | Load | ~600 Ohm @ 24V DC (670 Ohm @ 24V DC Option)<br>Load resistor min-max parameters for Hart 4-wired connection: 100 ... 750 Ohm | | | |
| | Damping (63 % of the input variable), adjustable | 0 ... 999 s | | | |
| | **HART output values** | | | | |
| | PV (Primary Value) | Linear percentage value | | | |
| | SV (Secondary Value) | Distance / Level / Space | | | |
| | TV (Third Value) | Measurement reliability | | | |
| | QV (Fourth Value) | Electronic module temperature | | | |
| | Fulfilled HART specification | HART V7.0 (programmable via PACTware/DTM) | | | |
| | Further information on Manufacturer ID, Device ID, Device Revision | See the FieldComm Group of Companies' webpage | | | |
| | **Other optional output protocols (be arbitrarily selected)** | | | | |
| | MODBUS (RS485) | Modbus RTU | | | |
| | Profibus PA ( Process Automation ) | V3.02 Process automation data transfer enables sensors and actuators to be connected to a single bus | | | |
| | Profibus DP ( Decentralized Periphery ) | High-speed data communication is provided for device-level control systems and distributed I/O front-end sensors | | | |
| | Ethernet APL | HART-IP, Permitted segment class: Spur/Trunk | | | |
| | SDI-12 | V1.3 is applied in multi-parameter measurement and control in industry and agriculture, river and lake hydrology and meteorology and other global environment monitoring, aquaculture and food industries, and can transmit data far away | | | |
| | IO-Link | IEC 61131-9 | | | |
| **6. Deviation (according to DIN EN 60770-1)** | | | | | |
| | **Reference conditions according to DIN EN 61298-1** | | | | |
| | Temperature | +18 ... +30 ℃ (+64 ... +86 ℉) | | | |
| | Relative humidity | 45 ... 75 % | | | |
| | Air pressure | 860 ... 1060 mbar/86 ... 106 kPa (12.5 ... 15.4 psig) | | | |
| | **Installation reference conditions** | | | | |
| | Distance to installations | > 100 mm @Antenna edge (with 98mm aperture horn antenna condition) | | | |
| | Reflector | Flat plate reflector | | | |
| | False reflections | Biggest false signal, 20 dB smaller than the useful signal | | | |
| | **Deviation with liquids** | | | | |
| | Measuring distance > 0.30 m | ≤ 2 mm | | | |
| | Measuring distance ≤ 0.30 m | ≤ 10 mm | | | |
| | Non-repeatability (already included in the meas. deviation) | ≤ 1 mm | | | |
| | Deviation with bulk solids | The values depend to a great extent on the application. Binding specifications are thus not possible. | | | |

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| | | | |
|---|---|---|---|
| **7. Variables influencing measurement accuracy** | | | |
| | **Specifications apply to the digital measured value** | ** Additional error of the digital output from a change in ambient temperature by 10°C from the normal 20°C* | |
| | **Temperature drift - Digital value** | < 0.2 mm/10K, Max. 5 mm | |
| | **Specifications apply also to the current output** | ** Additional error of the analog output 4/20 mA from a change in ambient temperature by 10°C from the normal 20°C* | |
| | **Temperature drift - Current output** | < 0.03 %/10K or 0.3 % Max, for the 16.7 mA range (regular); < 0.01 %/10K or 0.15 % Max, for the 16.7 mA range(for N60) | |
| | **Deviation in the current output due to digital/analogue conversion** | 1µA *(Additional error of converting a digital signal into an analogue 4/20 mA with a two-wire power supply connection)* | |
| | **Additional deviation through electromagnetic interference** | | |
| | **According to NAMUR NE 21** | < 80 µA | |
| | **According to EN 61326-1** | | |
| | **According to IACS E10 /IEC 60945** | < 250 µA | |
| **8. Characteristics and performance data** | | | |
| | **Measuring frequency** | 24GHz FM technology (ISM compliant) | |
| | **Measuring cycle time @With operating voltage $U_B$ ≥ 24 VDC** | ≤ 1000ms (Depends on the energy supply) | ≤ 800ms |
| | **Step response time @Time span after a sudden distance change from 1 m to 5 m until the output signal reaches 90 % of the final value for the first time (IEC 61298-2). Valid with operating voltage $U_B$ ≥ 24 V DC.** | ≤ 5 s | ≤ 3 s |
| | **Beam angle @Outside the specified beam angle, the energy level of the radar signal is 50% (-3 dB) less.** | 6° ~ 20° Depends on the configured antenna type | |
| | **Dielectric constant** | > 1.6 | |
| **9. Ambient conditions** | | | |
| | **Ambient temperature device** | -40 ... 85 ℃ ( Regular version module )<br>-60 ... 105 ℃ ( low cold version module N60 ) | |
| | **Ambient temperature display** | -65 ...120 ℃ | |
| | **Storage and transport temperature** | -55 ... 85 ℃ | |
| **10. Mechanical environmental conditions** | | | |
| | **Vibrations (oscillations)** | Class 4M8 acc. to IEC 60271-3-4 (5 g at 4 ... 200 Hz) | |
| | **Impacts (mechanical shock)** | Class 6M4 acc. to IEC 60271-3-6 (50 g, 2.3 ms) | |
| | **Impact resistance** | IK07 acc. to IEC 62262 | |
| **11. Electromechanical data** | | | |
| | **Cable entry** | | |
| | **• Options** | M20 x 1.5; ½ NPT | |
| | **• Cable gland** | M20 x 1.5 (cable diameter 9 ... 12 mm) | |
| | **• Closing cap** | ½ NPT | |
| | **Wire cross-section (spring-loaded terminals)** | | |
| | **• Stranded wire** | 0.2 mm² (AWG 24) ... 2.5 mm² (AWG 14) with a minimum insulation thickness of 0.5 mm or more | |
| **12. Bluetooth interface** | | | |
| | **Bluetooth standard** | V5.0 /or V4.2 | |
| | **Frequency** | 2.402 ... 2.480 GHz | |
| | **Max. emitted power** | +2.2 dBm | |
| | **Max. number of participants** | 1 | |
| | **Effective range typ.(Depending on the local conditions)** | 25 m (82 ft) | |
| **13. Indication** | | | |
| | **Measured value and menu display** | | |
| | **• Optional HMI (LOI)** | 160x80 LCD FSTN RGB backlight monitor adapter with keyboard module, operation Temp. -20°C ... 70°C.<br>or 128x64 OLED monitor adapter with keyboard module, operation Temp. -55°C ... 80°C. (option)<br>or 230x240 LCD TFT colors monitor adapter with keyboard module, operation Temp. -20°C ... 70°C. (option only for 4-wrie system) | |
| | **• Max. indicating range** | -99999 ... 99999 | |
| **14. Adjustment** | | | |
| | **Optional HMI** | 4 buttons for operating menus | |
| | **Tank side meter** | LRD type tank side meter (serial digital communication), RDM type tank side meter (HART protocol communication) | |
| | **Field DTM communicator** | AiW-305 (Master Mode), AiW-315 (Slave Mode)<br>The adjustment of the instrument is carried out via the optional display and adjustment module or via a PC with the adjustment software PACTware and corresponding DTM. | |
| | **PC/Notebook** | CHINASIMBA® PC Manager software | |
| | **Mobile terminal equipment** | CHINASIMBA® Radar Mobile Manager software | |
| **15. Voltage supply** | | | |
| | **Operating voltage $U_B$** | | |
| | **• at 4 mA** | 12 ... 40 V DC | 9 ... 40 V DC |
| | **• at 20 mA** | 9 ... 40 V DC | 9 ... 40 V DC |
| | **Operating voltage scope $U_B$ - with illuminated LCD display and adjustment module** | 16 ... 40 V DC | 9 ... 40 V DC |
| | **Reverse voltage protection** | Built in | |
| **16. Overvoltage protection** | | | |
| | **Dielectric strength against metallic mounting parts** | >10KV | |
| | **Overvoltage resistance (test impulse voltages 1.2KV/50 µs at 42 Ω)** | > 1KV | |
| | **Insulation resistance** | ∞ | |
| | **Dielectric strength** | ≤ 5mA @500VDC | |
| | **Power frequency magnetic field immunity** | 100A/m @X,Y | |
| | **Electrostatic discharge immunity** | > 4KV | |
| | **Radiated immunity to radio frequency electromagnetic fields** | 10V/m @80MHz ~ 1000MHz | |
| | **Electrical fast transient burst immunity** | > 2KV | |
| | **Additional overvoltage arrester** | Due to the floating structure of the electronics and comprehensive insulation measures generally not necessary | |
| **17. Electrical protective measures** | | | |
| | **Protection rating** | IP66/IP67/IP68 according to IEC 605294X and UL 50 | |
| | **Altitude above sea level** | 5000 m (16404 ft) | |
| | **Protection class** | III | |
| | **Pollution degree** | 4 | |

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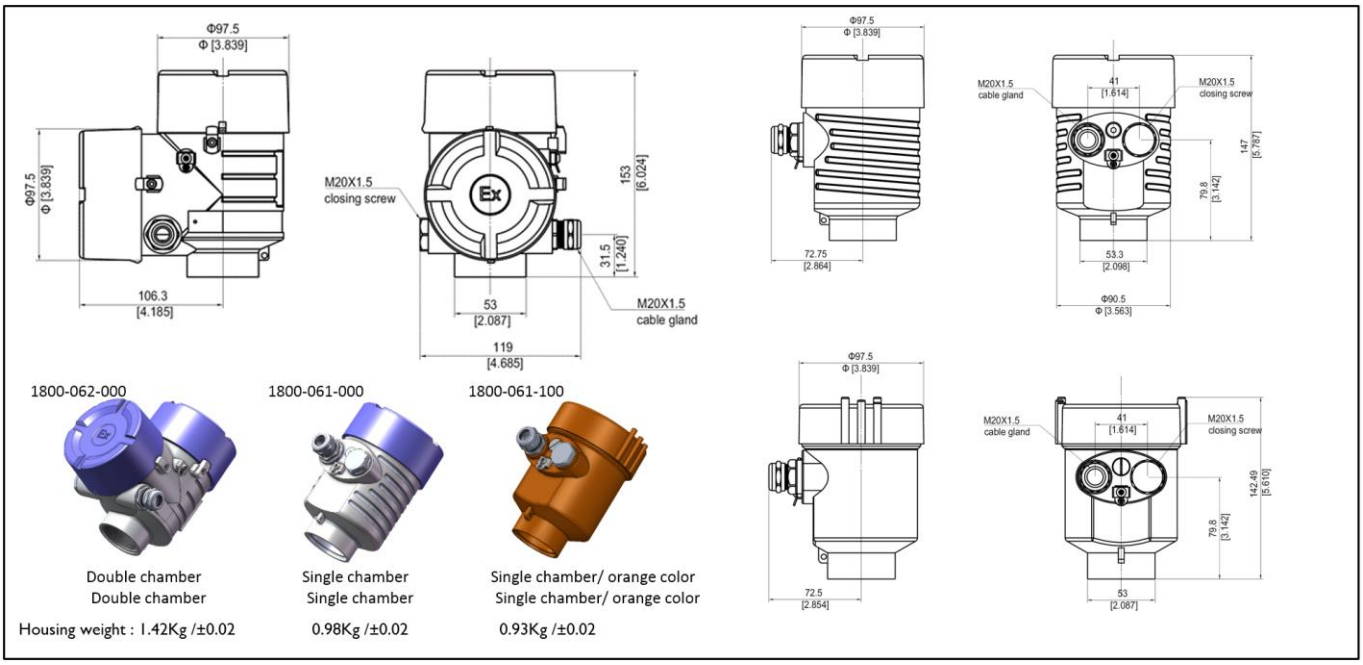
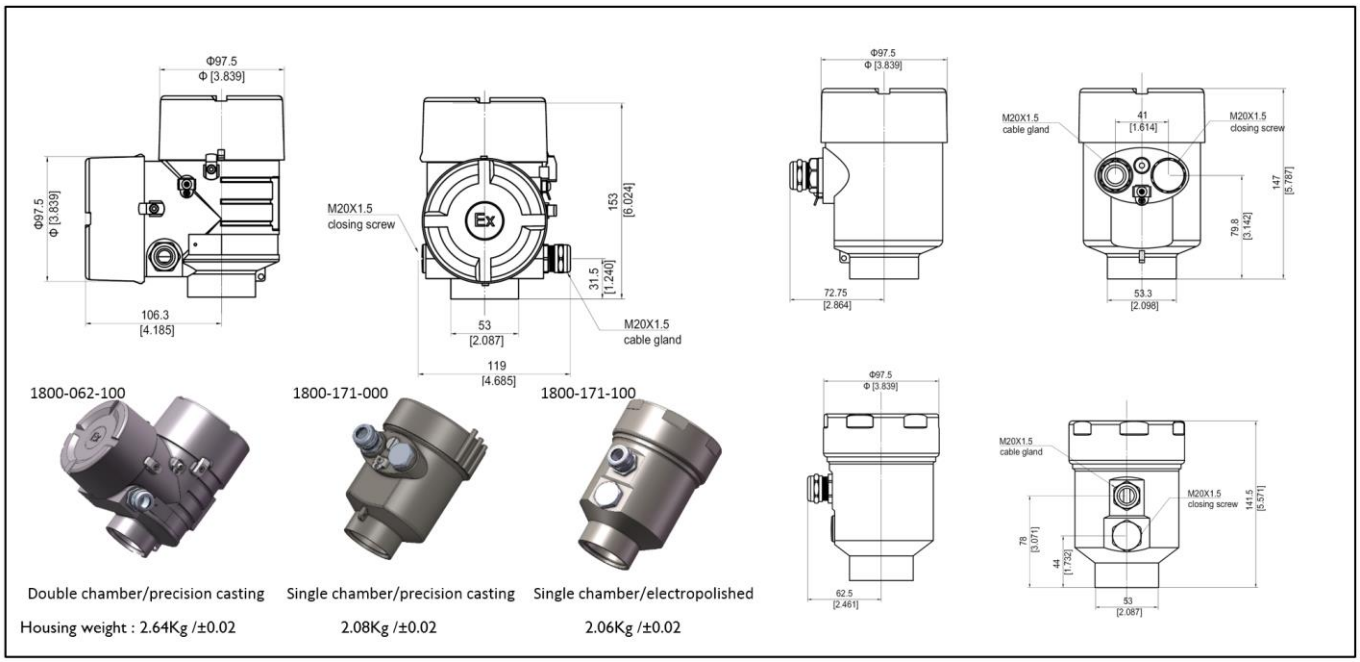
# Available enclosures: Housing Drawing

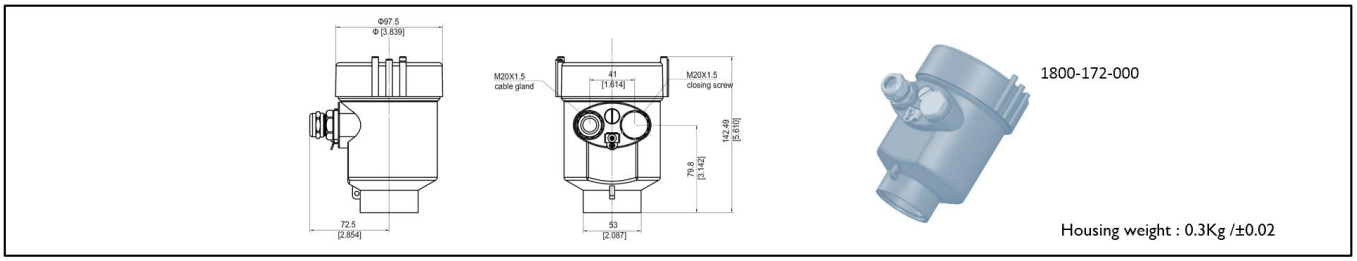
## Aluminum housing




## Stainless steel housing




## Plastic housing



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