AiW-4120

120GHz FMCW Radar Level Transmitters

Catalog V.2024

Phoenix. Chen

CHINASIMBA www.chinasimba.com

SN: DY.11.05.218

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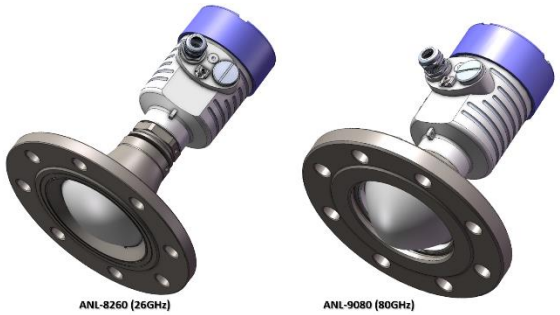
ANL/AiW-4120 series 120GHz FMCW radar level Gauges Overview

The ANL/AiW-4120MP/MC/MP/MG/GX series of intelligent radar level transmitters provide accurate continuous level measurement in a wide range of process applications. Its versatile design enables fit-for-purpose solutions and flexibility of use, especially in the chemical industry and wastewater treatment and green energy applications. For example, ANL-4120 transmitters can be used in tanks/vessels with small process fittings, corrosive environments, and open-air installations. It is certified for use in hazardous locations and complies with NAMUR recommendations.

And for solar- or battery-powered applications, the **AiW-4120MB** series is recommended. This model supports fast output measuring data (< 2s) when the power supply is powered on, instantaneous low power consumption, low voltage, intermittent wake-up operation mode, and support LoRa, IoT communication.

In particular, the **ANL-4120MC** is ideally suited for Liquid Nitrogen Tank measurement applications, as it does not require an antenna to be mounted inside the LN vessel, but directly outside the vessel, and instead uses the radar electromagnetic wave transmission technology to achieve level measurement, this is already a very successful story.

ANL/AiW-4120 model is a product based on FMCW radar technology with 120GHz frequency. Different industrial radar level transmitters have different frequencies, and the frequency can affect the measurement performance. When measuring in the absence (or less) of steam and foam, 120 GHz frequency radar level transmitters are preferred in most normal applications due to greater installation flexibility. However, in some heavy-duty industrial and extreme environments, the ANL/AiW-4120 model is not suitable. We recommend other products for these applications.



For large-scale smelting, cement, coal power and mining industry applications, we recommend customers to use **ANL-9080** or **ANL-8260** radar products, which are based on 80GHz and 26GHz radar technology, which are more suitable for process applications in extreme environments, especially solids measuring applications under high dust and pollution conditions.

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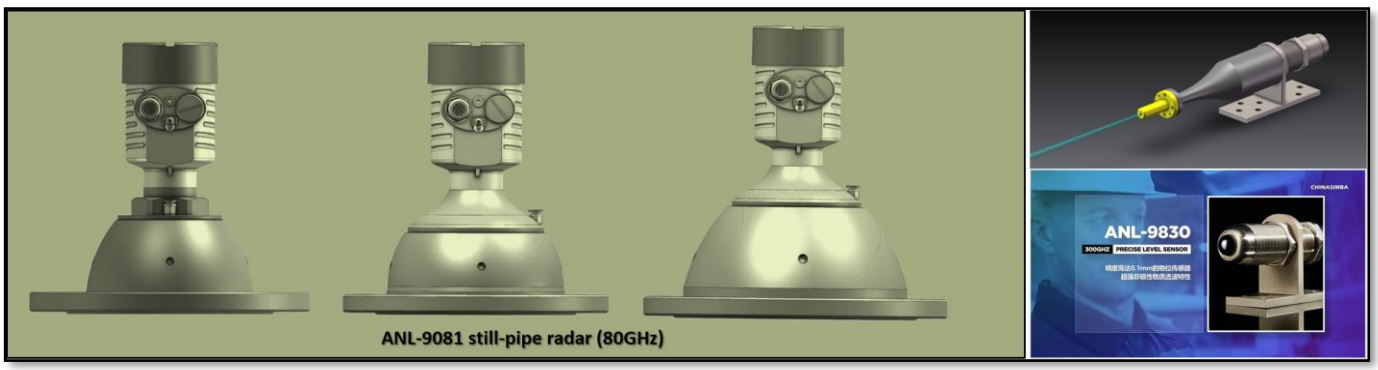
For applications such as sea surface detection or material height measurement on conveyor belts, we recommend **ANL-9127** or **ANL-8341** products, which are radar level transmitters for high-speed measurements, suitable for measurement applications that require a response time in < 1s.
If the application of high-precision and high-speed measurement is high-precision, it is recommended to use the **ANL-9107** high-speed and high-precision version of the radar level transmitter product, which is based on 24GHz FM radar technology.

And for the crude oil custody transfer or still pipe measuring with floating roofs and gasoline/product tanks with or without inner floating roofs application, it is recommended to use the **ANL-9081** high-precision NC-radar model (80GHz radar technology) or **ANL-9830** Extremely high-precision NC-radar model (300GHz radar technology) product.



Note. For more product information, please contact CHINASIMBA sales manager.

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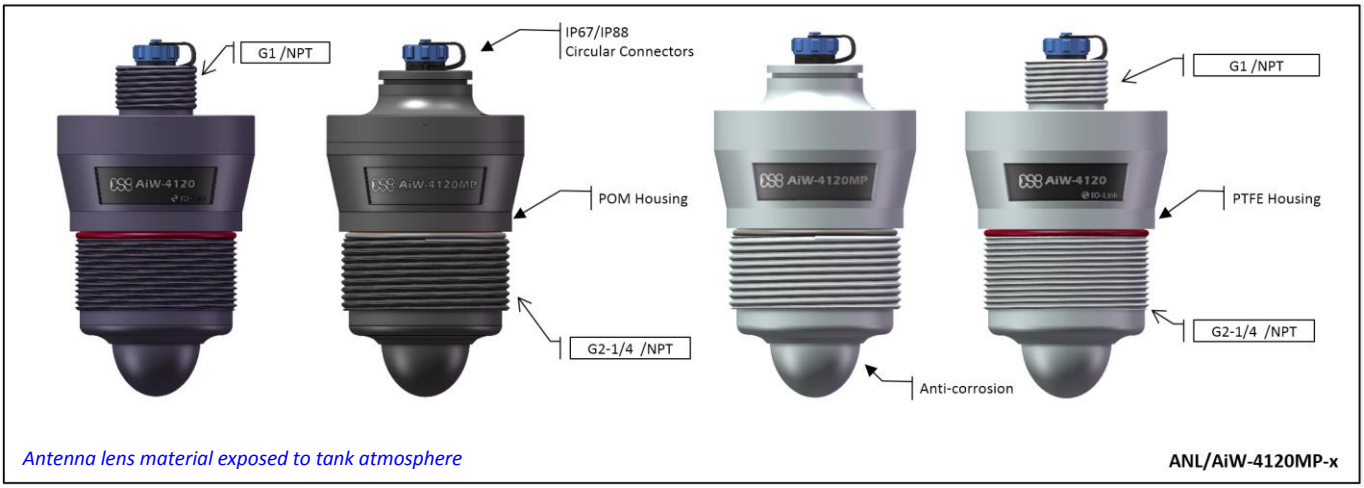
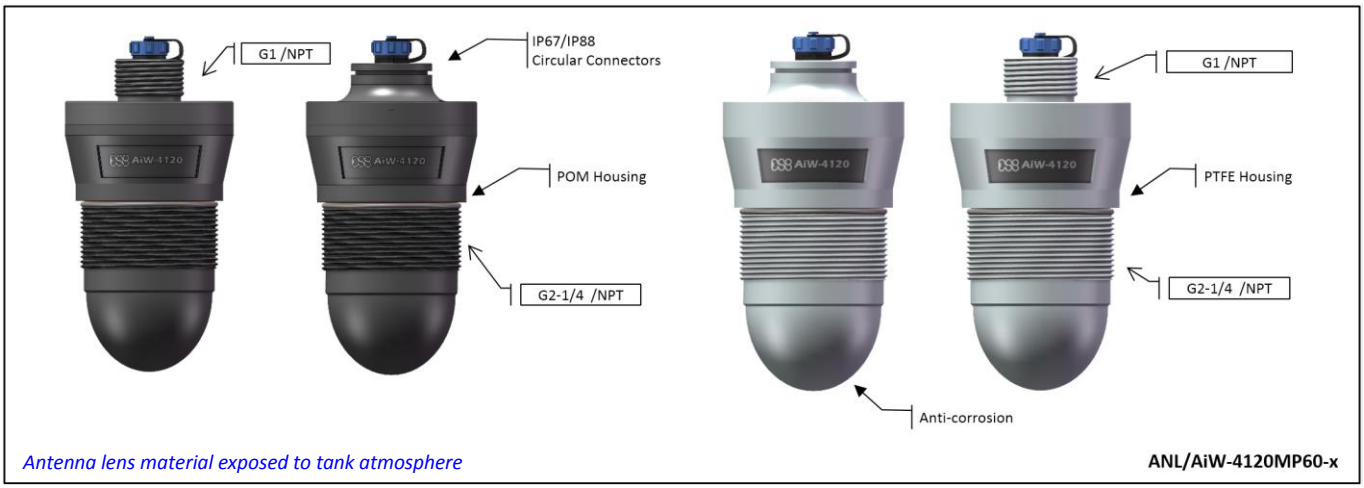
ANL/AiW-4120MP/MP60 version

Housing and antenna material:	POM(Polyoxymethylene) /or PTFE
Minimum coupling thread size:	Up-clasp /or thread G1; Down-thread G2-¼ NPT
Suitable Process Temperature Scope (*Min. … Max.*):	-40˚C … 120˚C
Suitable Process Pressure scope (*Min. … Max.*):	-0.1 … 2.5 MPa @POM antenna lens
	-0.1 … 2.3 MPa @PTFE antenna lens
Antenna Lens Aperture:	Diameter Ø30mm (Ø60mm for MP60)
Antenna Beam Angle interval:	4.5˚…6˚
Max. measuring limit range:	40M @liquid medium



Antenna lens material exposed to tank atmosphere

ANL/AiW-4120MP-x



Antenna lens material exposed to tank atmosphere

ANL/AiW-4120MP60-x

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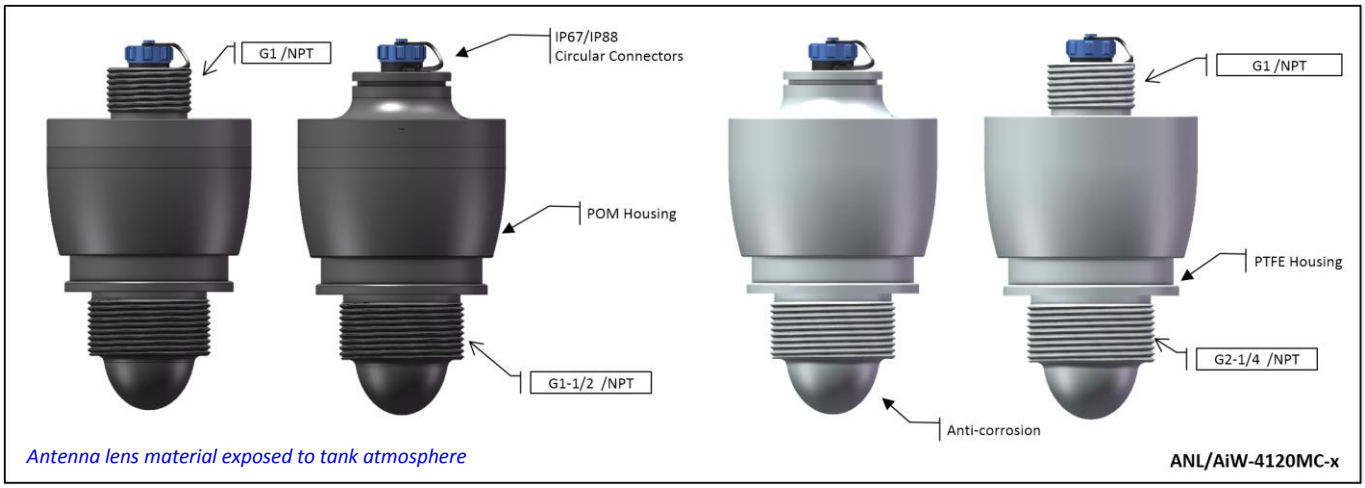
ANL/AiW-4120MC version

Housing and antenna material:	POM(Polyoxymethylene) /or PTFE
Minimum coupling thread size:	Up-clasp /or thread G1; Down-thread G1-½ NPT
Suitable Process Temperature Scope (*Min. … Max.*):	-40˚C … 120˚C
Suitable Process Pressure scope (*Min. … Max.*):	-0.1 … 2.5 MPa @POM antenna lens
	-0.1 … 2.3 MPa @PTFE antenna lens
Antenna Lens Aperture:	Diameter Ø30mm
Antenna Beam Angle interval:	4.5˚ … 6˚
Max. measuring limit range:	40M @liquid medium



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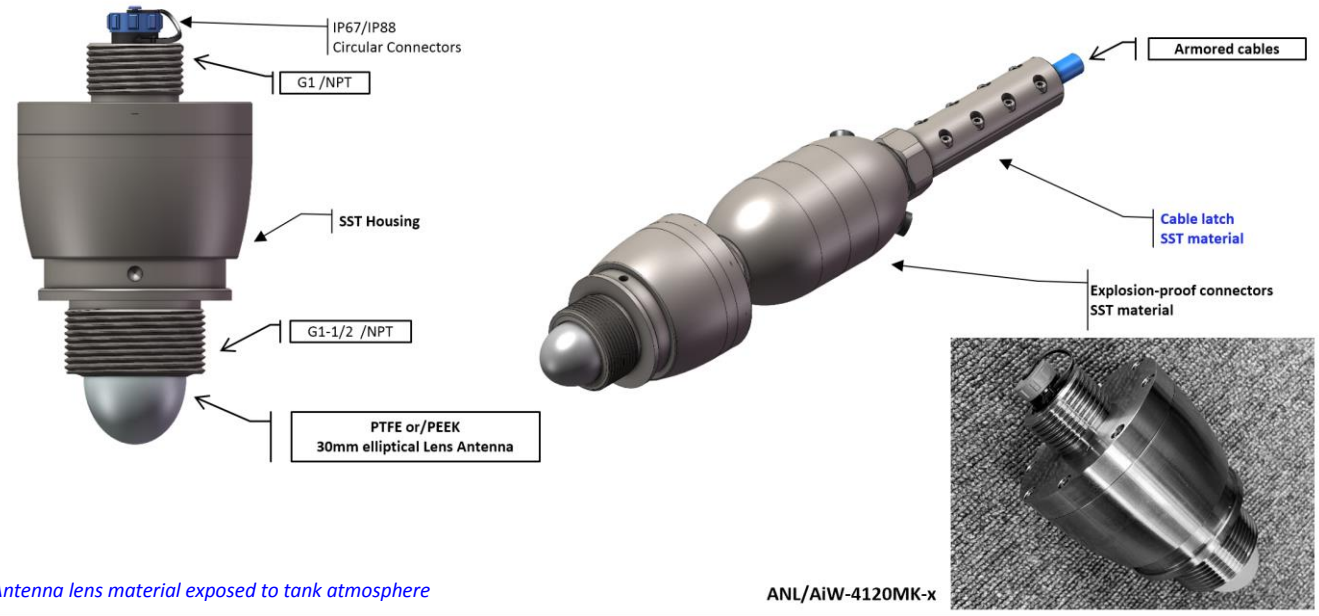
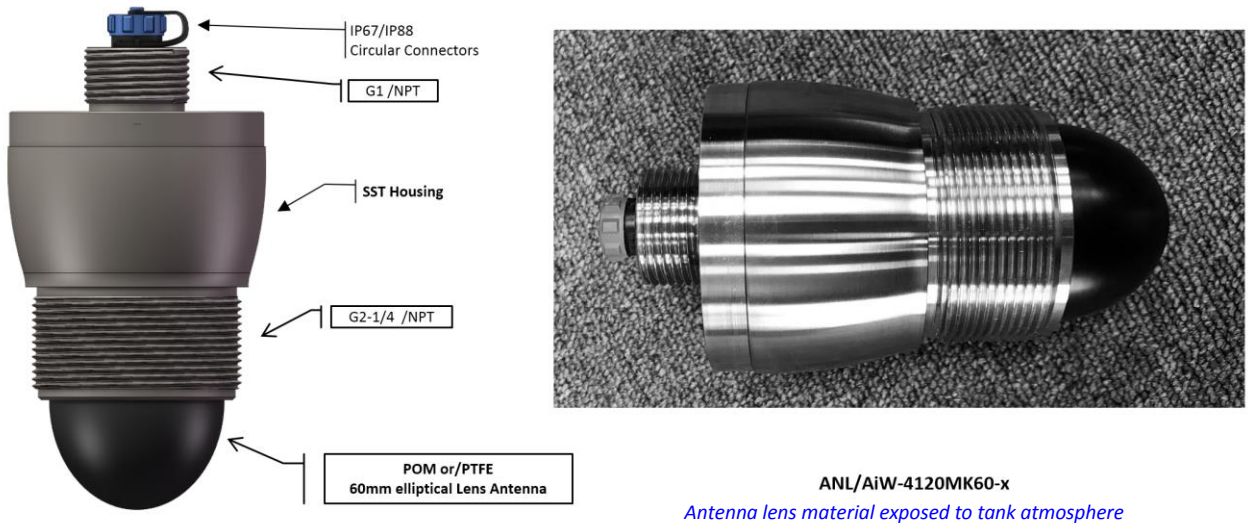
ANL/AiW-4120MK/MK60 version

Housing and antenna material:	SST304/316 housing, PTFE/PEEK/POM antenna lens
Minimum coupling thread size:	Up-thread G1, Down-thread G1-½ NPT / G2-¼ NPT (for MK60)
Suitable Process Temperature Scope (*Min. … Max.*):	-40˚C … 200˚C
Suitable Process Pressure scope (*Min. … Max.*):	-0.1 … 3.5 MPa @PTFE antenna lens
	-1.0 … 4.0MPa @PEEK/POM antenna lens
Antenna Lens Aperture:	Diameter Ø30mm, Ø60mm (MK60)
Antenna Beam Angle interval:	4.5˚ … 5˚
Max. measuring limit range:	40M @liquid medium



Antenna lens material exposed to tank atmosphere

ANL/AiW-4120MK-x



ANL/AiW-4120MK60-x

Antenna lens material exposed to tank atmosphere

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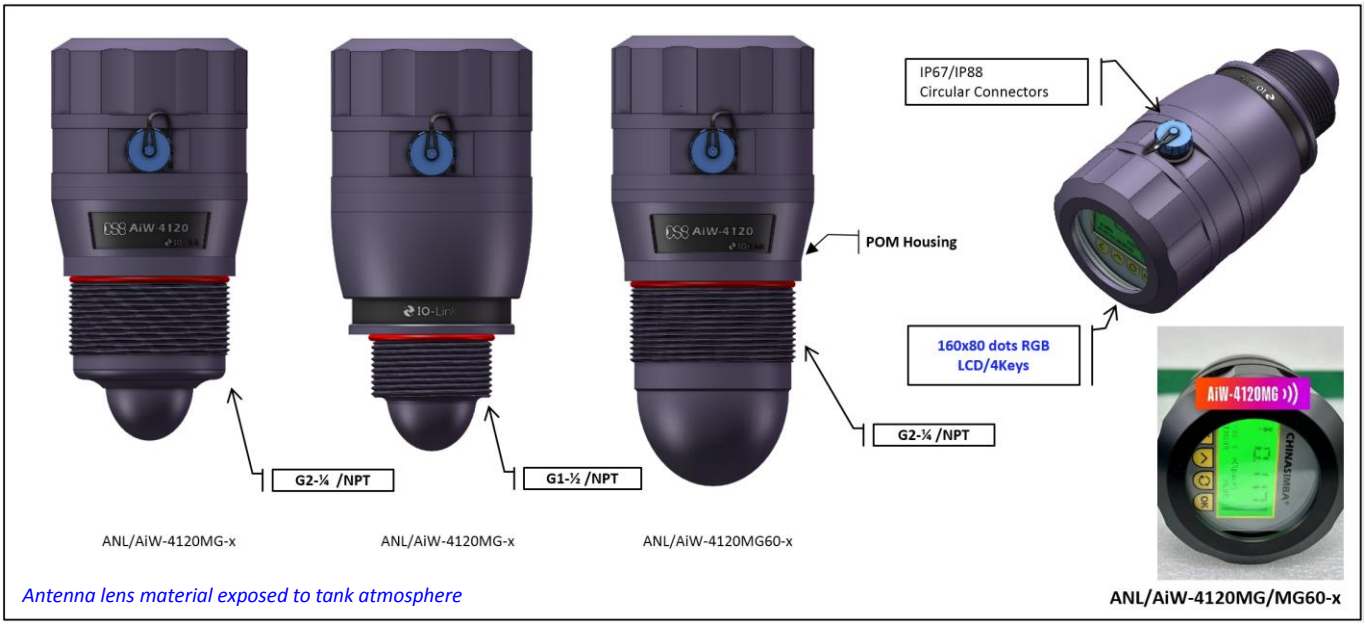
ANL/AiW-4120MG/MG60 version

Housing and antenna material:	POM(Polyoxymethylene) /or PTFE
Minimum coupling thread size:	thread G2-¼ NPT or G1-½ NPT
Suitable Process Temperature Scope (*Min. … Max.*):	-40˚C … 120˚C
Suitable Process Pressure scope (*Min. … Max.*):	-0.1 … 2.5 MPa @POM antenna lens
	-0.1 … 2.3 MPa @PTFE antenna lens
Antenna Lens Aperture:	Diameter Ø30mm, Ø60mm (for MG60)
Antenna Beam Angle interval:	3˚ … 5˚
Max. measuring limit range:	40M @liquid medium



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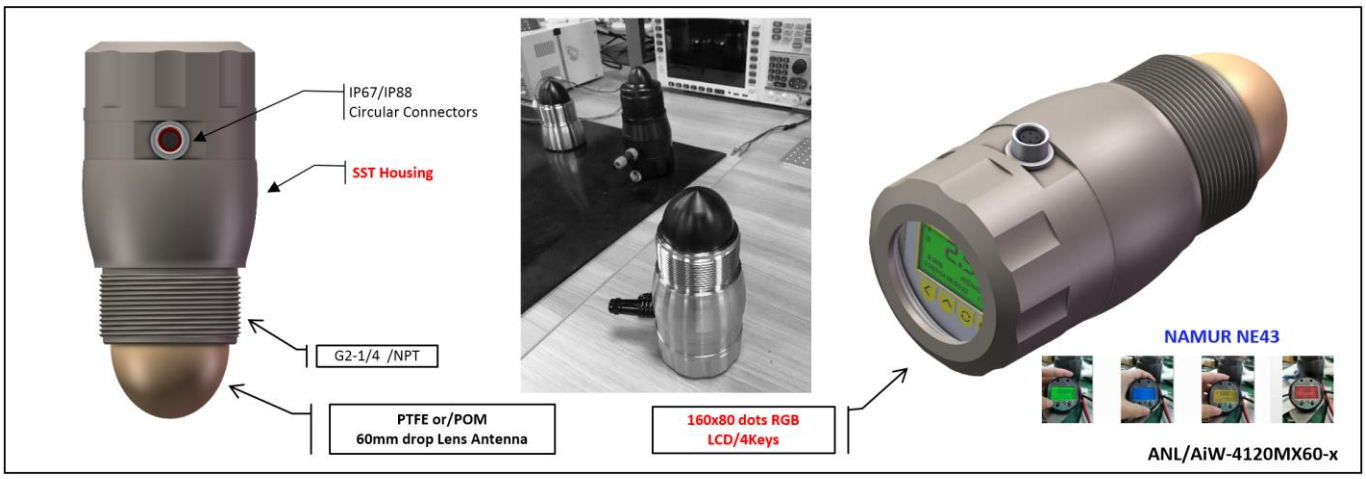
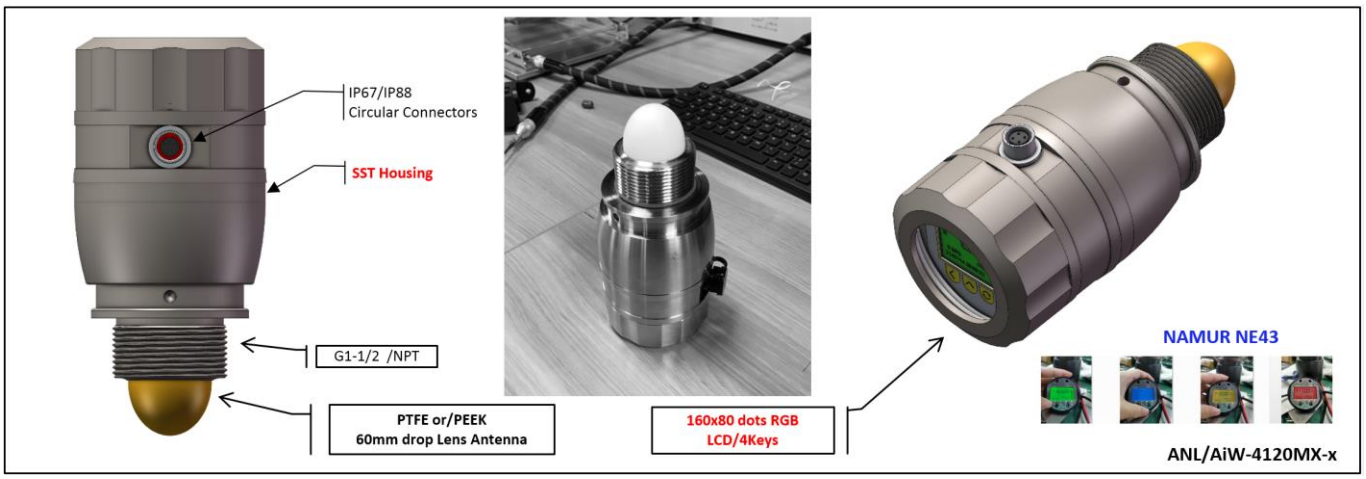
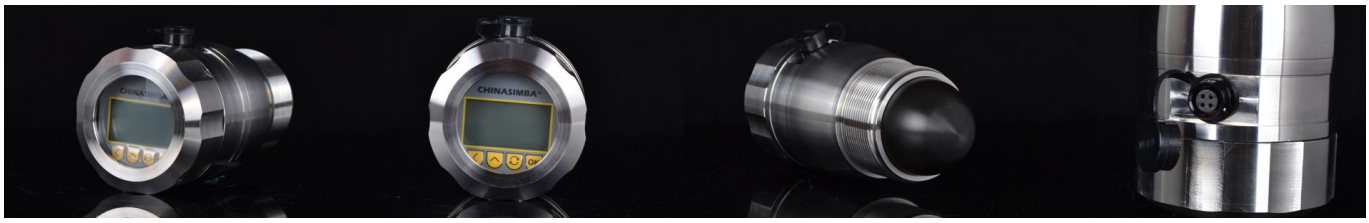
ANL/AiW-4120MX/MX60 version

Housing and antenna material:	SST Housing, PTFE/PEEK/POM antenna lens
Minimum coupling thread size:	G1-1/2, G2-1/4 (MX60)
Suitable Process Temperature Scope (*Min. … Max.*):	-40˚C … 200˚C
Suitable Process Pressure scope (*Min. … Max.*):	-0.1 … 3.5 MPa @PTFE antenna lens
	-1.0 … 4.0MPa @POM/PEEK antenna lens
Antenna Lens Aperture:	Diameter Ø30mm or Ø60mm (MX60)
Antenna Beam Angle interval:	3˚ … 5˚
Max. measuring limit range:	40M @liquid medium







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Summary of the ANL/AiW-4120 radar level transmitter models parameter table

ANL-4120 model	Process Connection Type	Process contact surface material	Lens Ant. Diameter mm	Ant. Beam Angle ˚ (degree)	Antenna Gain dB	Min. Temp. : Max. Temp. Process Temp. ℃	Min. : Max. Pressure Mpa	Max. Radar Range (M) Recommended medium	Vapor (light)	Condensing (light)	Boiling Turbulent (low)	Foam (Thinner)	Anti-corrosion
4120MP	G2-1/4	POM (default)	30	6	25.8	-40 120	-0.1 2.5	40M for liquid, 15M for solid			√		
	>= DN32	Or PTFE		4.5	31.7		-0.1 2.3						√
4120MP60	G2-1/4	POM (default)	60	4.5	30.8	-40 120	-0.1 2.5	40M for liquid, 30M for solid	√	√	√	√	
	>= DN80	Or PTFE		2.6	32		-0.1 2.3						√
4120MC	G1-1/2	POM (default)	30	6	25.8	-40 120	-0.1 2.5	40M for liquid, 15M for solid			√		
	>= DN32	Or PTFE		4.5	31.7		-0.1 2.3						√
4120MG	G1-1/2	POM (default)	30	6	25.8	-40 120	-0.1 2.5	40M for liquid, 20M for solid			√		
	>= DN32	Or PTFE		3.5	30.7		-0.1 2.3						√
4120MG60	G2-1/4	POM (default)	60	4.5	30.8	-40 120	-0.1 2.5	40M for liquid, 30M for solid	√	√	√	√	
	>= DN80	Or PTFE		2.6	32		-0.1 2.3						√
4120MK	G1-1/2	SST/PTFE (default)	30	4.5	31.7	-40 200	-0.1 3.5	40M for liquid, 20M for solid		√	√		√
	>= DN32	Or SST/PEEK		4.6	30.1		-1.0 4.0						
4120MK60	G2-1/4	SST/POM (default)	60	4.5	30.8	-40 200	-1.0 4.0	40M for liquid, 30M for solid	√	√	√	√	
	>= DN80	Or SST/PTFE		2.6	32		-0.1 3.5						√
4120MX	G1-1/2	SST/PTFE (default)	30	4.6	30.1	-40 200	-0.1 3.5	40M for liquid, 20M for solid		√	√		√
	>= DN32	Or SST/PEEK		4.5	31.7		-1.0 4.0						
4120MX60	G2-1/4	SST/POM (default)	60	4.5	30.8	-40 200	-1.0 4.0	40M for liquid, 30M for solid	√	√	√	√	
	>= DN80	Or SST/PTFE		2.6	32.1		-0.1 3.5						√

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ANL/AiW-4120MP regular G2-¼ plastic housing version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 122GHz Frequency FMCW radar system.
- Measurement application of the Small tanks in liquids, bulk solids.
- Chemical industry reaction, corrosive environment applications.

Specifications

ANL/AiW-4120MP	Housing/Antenna material POM	Housing/Antenna material PTFE	Note
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (The adjustment FM range can be customized according to the ISM requirements of the customer's region)		
Near blind spot	< 100mm from the Antenna down surface		
Meas. Principle	FMCW Radar System, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	POM Φ30mm	PTFE Φ30mm	Material exposed to tank atmosphere
Antenna beam / Gain	Beam angle 6°/ Gain 25.8dB	Beam angle 4.5°/ Gain 31.7dB	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +120°C	-40°C … +120°C	
Process pressure	-0.1 ~ +2.5MPa	-0.1 ~ +2.3MPa	
Process connection	Thread G2-¼ or NPT		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.02%/10K relating to the 16.7 mA span or max. ±0.2% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA Additional deviation through electromagnetic interference acc. to EN-61326: < ±150μA		
Indication/Adjustment (LOI)	(APP) connecting RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
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 IP67; Ex d IIC T6 Gb IP67		
Housing	Plastic POM or PTFE, IP67 / IP68		
Applications	Liquids, solids, and corrosive environment applications		

SERVICE CONTACT: 86-13799977915, 86-18965063391(TECHNICAL SUPPORT), 86-18106067295(AFTER SALE SERVICE)
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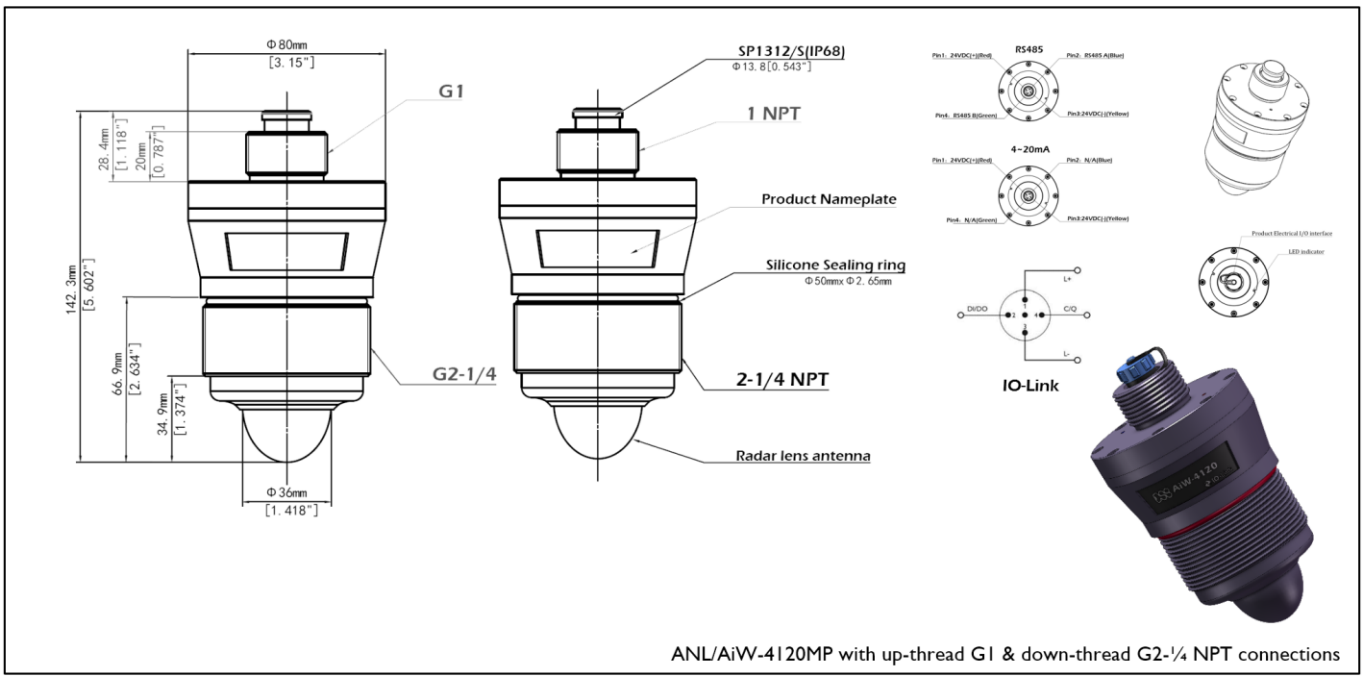
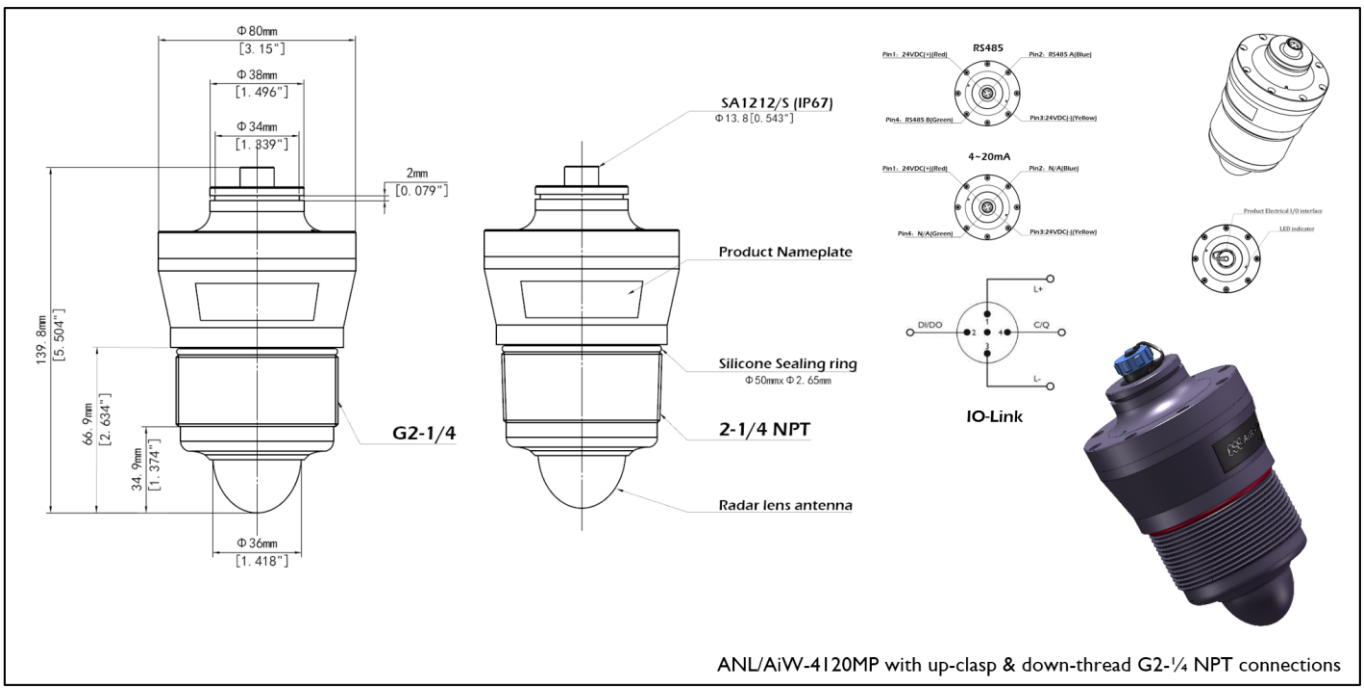
Dimensions

The following dimensional drawings represent only an extract of all possible versions. Detailed dimensional drawings can be downloaded at https://www.chinasimba.com/downloads.html "Drawings".



ANL/AiW-4120MP with up-thread G1 & down-thread G2-¼ NPT connections



ANL/AiW-4120MP with up-clasp & down-thread G2-¼ NPT connections

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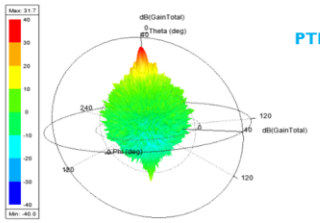
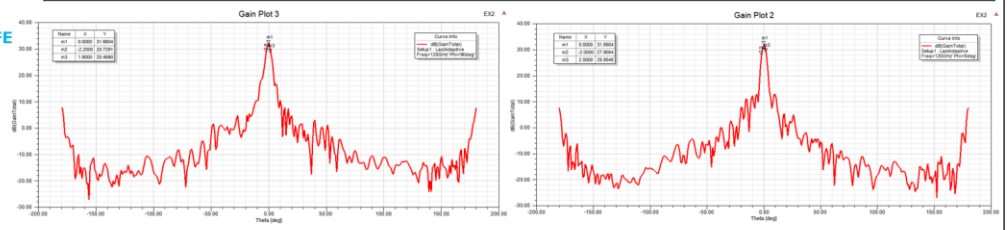
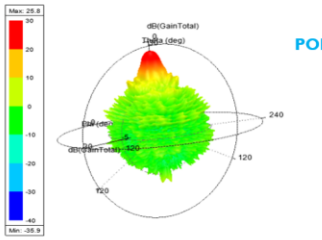
The Radar Antenna Specification of the ANL/AiW-4120MP

Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	37mm	37mm
HPBW (half-power beam width)（3dB 半功率波束角）	4.5°	6° (*) average value
FNBW (beam width between first nulls)（第一零点波束宽度）	12°	18°
Antenna Gain（天线增益）	31.7dB	25.8dB

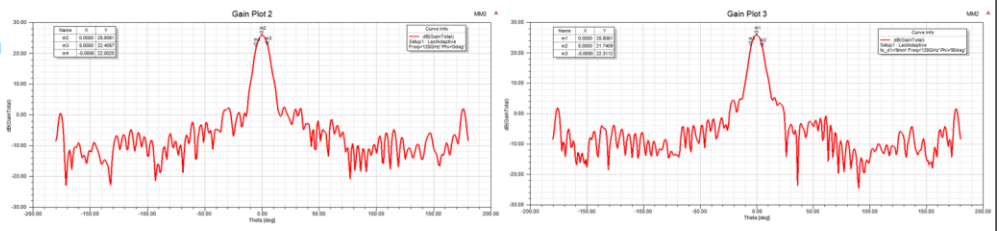


PTFE





POM



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ANL/AiW-4120MP60 enhanced G2-¼ plastic housing version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 122GHz Frequency FMCW radar system.
- Measurement application in liquids, solids.
- Chemical industry reaction tanks, environment applications, also in steam.

Specifications

ANL/AiW-4120PM60	Housing/Antenna material POM	Housing/Antenna material PTFE	Note
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (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, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	POM Φ60mm	PTFE Φ60mm	Material exposed to tank atmosphere
Antenna beam / Gain	Beam angle 4.5°/ Gain 30.8dB	Beam angle 2.6°/ Gain 32.0dB	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +120°C	-40°C … +120°C	
Process pressure	-0.1 ~ +2.5MPa	-0.1 ~ +2.3MPa	
Process connection	Thread G2-¼ or NPT		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.02%/10K relating to the 16.7 mA span or max. ±0.2% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA Additional deviation through electromagnetic interference acc. to EN-61326: < ±150µA		
Indication/Adjustment (LOI)	(APP) RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
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 IP67; Ex d IIC T6 Gb IP67 // SIL2 (No. 6G230714.CSETW60)		
Housing	Plastic POM or PTFE, IP67 / IP68		
Applications	Liquids, solids, powder, and stirring & corrosive environment applications		

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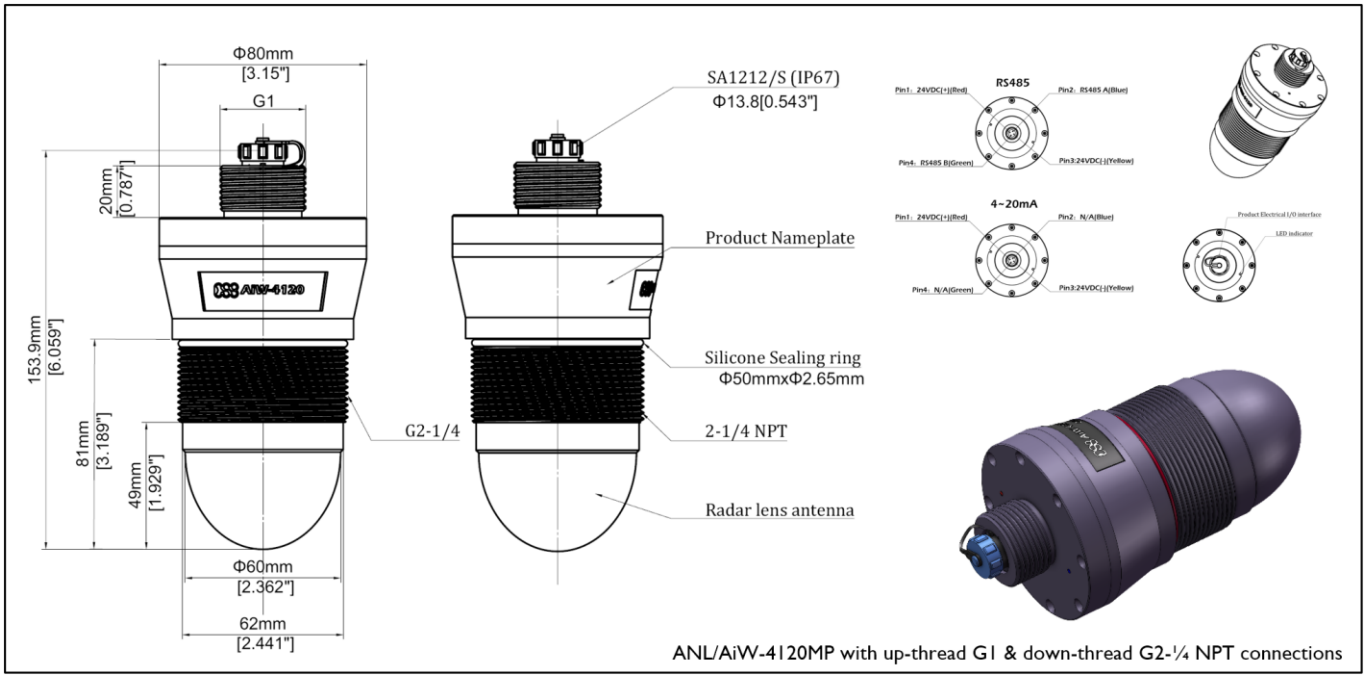
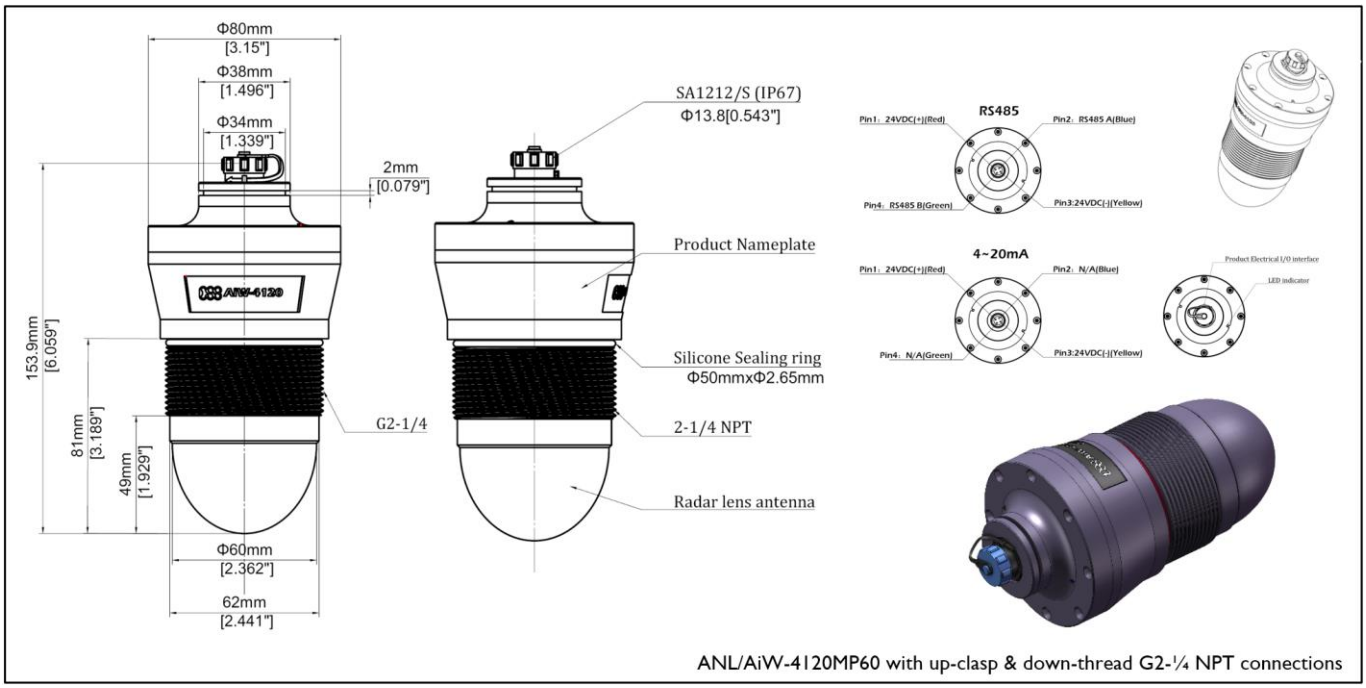


ANL/AiW-4120MP with up-thread G1 & down-thread G2-¼ NPT connections



ANL/AiW-4120MP60 with up-clasp & down-thread G2-¼ NPT connections

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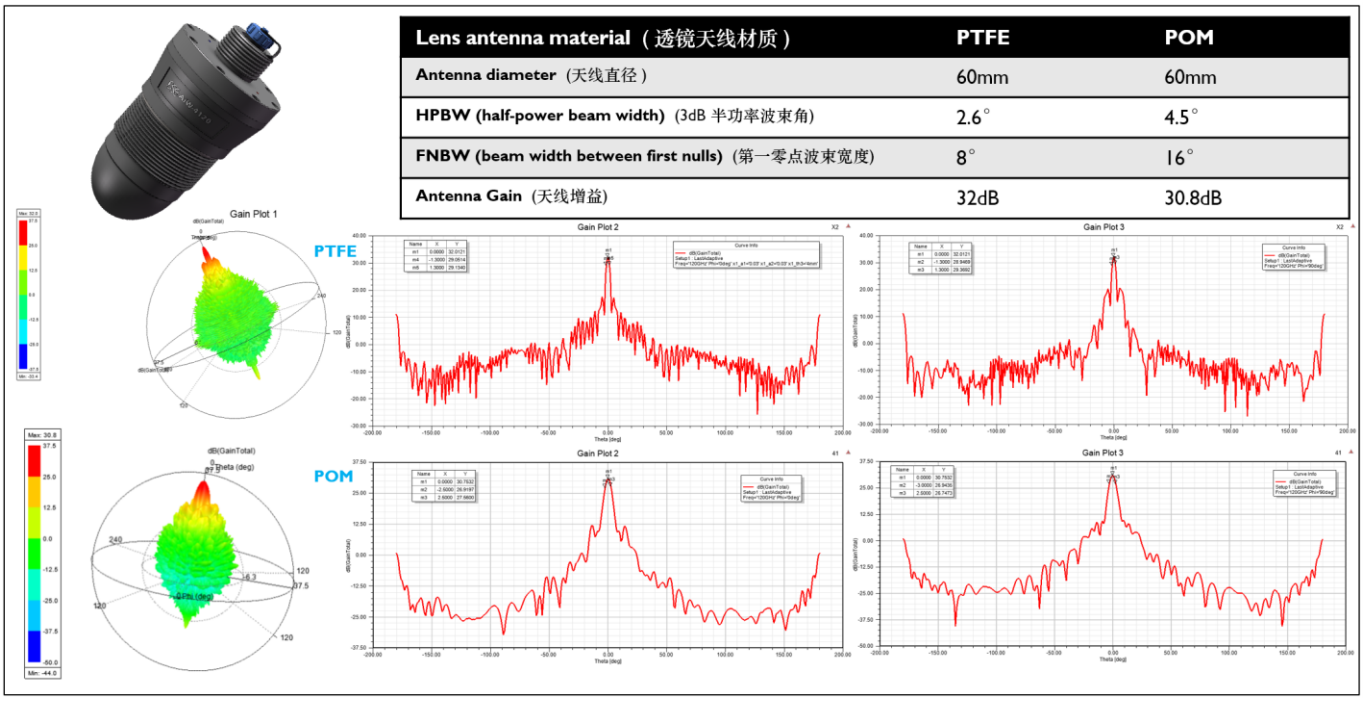
The Radar Antenna Specification of the ANL/AiW-4120MP60

Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	60mm	60mm
HPBW (half-power beam width)（3dB 半功率波束角）	2.6°	4.5°
FNBW (beam width between first nulls)（第一零点波束宽度）	8°	16°
Antenna Gain（天线增益）	32dB	30.8dB



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ANL/AiW-4120MC Regular G1-½ plastic housing version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 24GHz Frequency FMCW radar system.
- Measuring application in liquids, solids.
- Suitable for water/sewage treatment applications.

Specifications

ANL/AiW-4120MC	Lens material POM	Lens material PTFE	Note
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (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, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	POM Φ30mm	PTFE Φ 30mm	Material exposed to tank atmosphere
Antenna beam / Gain	Beam angle 6.0°/ Gain 25.8dB	Beam angle 4.5°/ Gain 31.7dB	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +120°C	-40°C … +120°C	
Process pressure	-0.1 ~ +2.3MPa	-0.1 ~ +2.5MPa	
Process connection	Thread G1-1/2 NPT		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.01%/10K relating to the 16.7 mA span or max. ±0.15% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA Additional deviation through electromagnetic interference acc. to EN-61326: < ±150µA		
Indication/Adjustment (LOI)	(APP) RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
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 IP67; Ex d IIC T6 Gb IP67		
Housing	Plastic POM or PTFE, IP67 / IP68		
Applications	liquids, solids applications		

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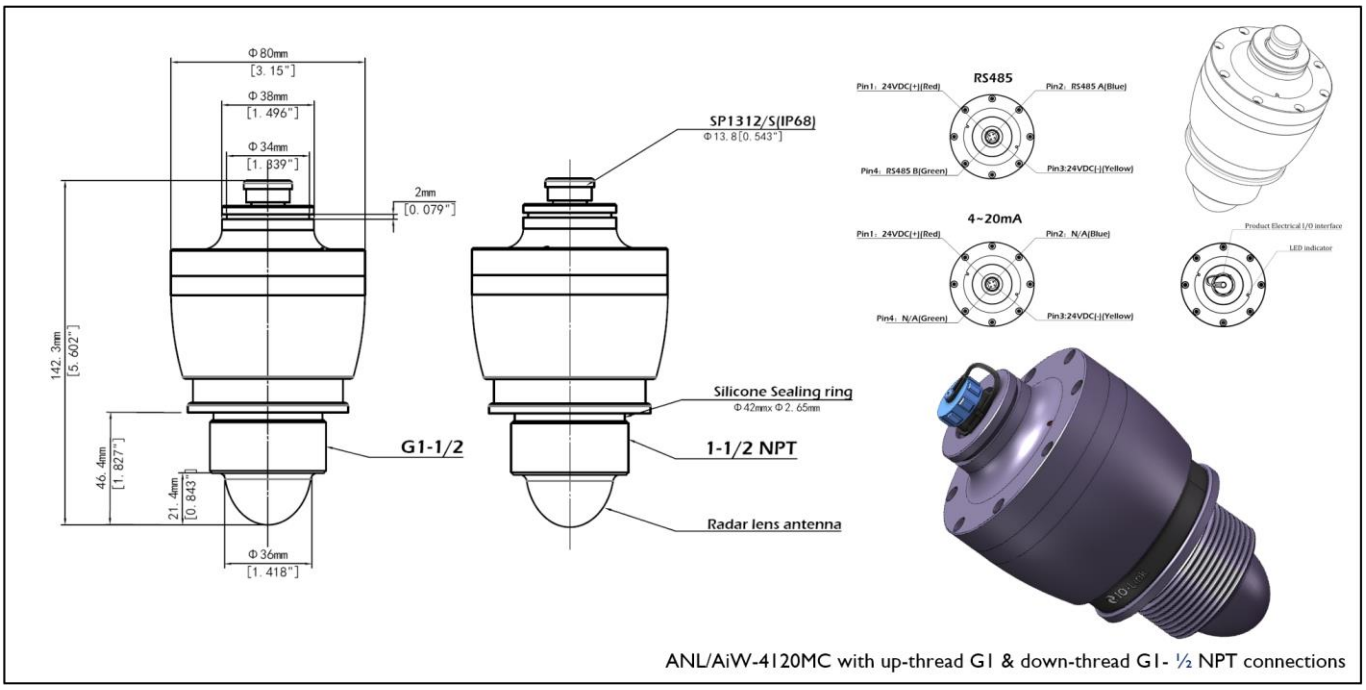
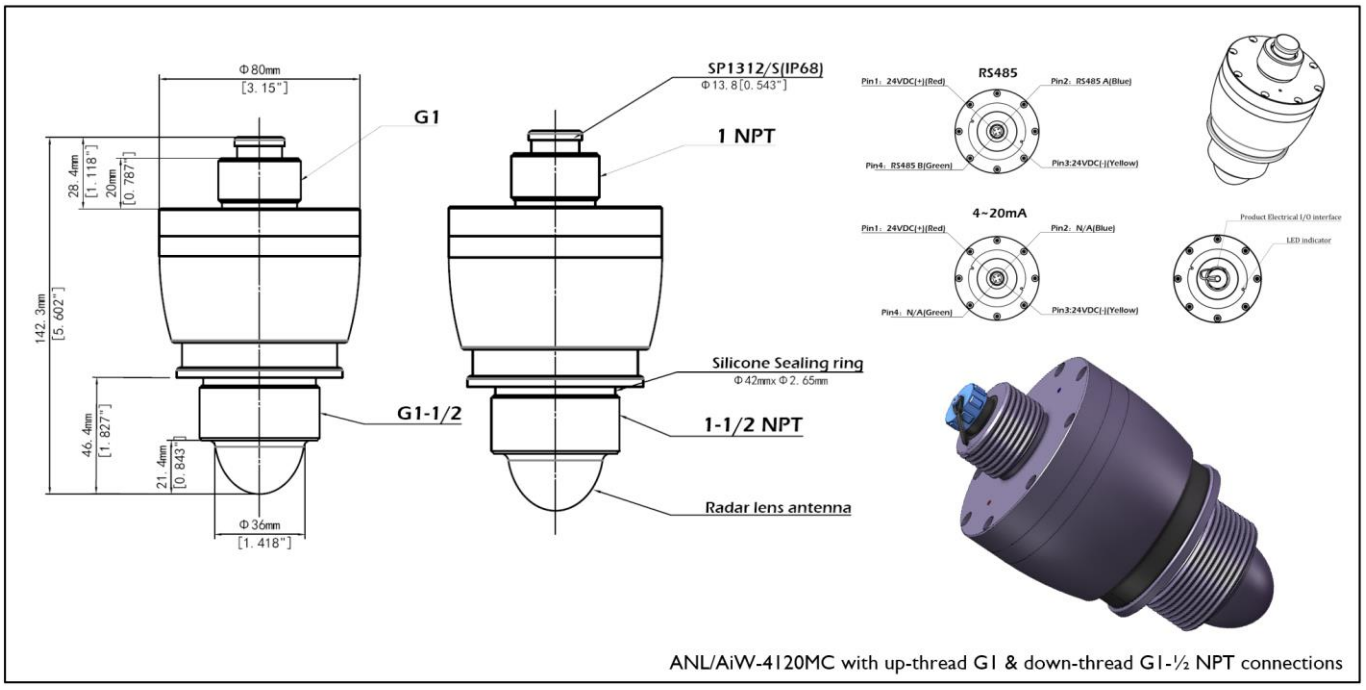


ANL/AiW-4120MC with up-thread G1 & down-thread G1- ½ NPT connections



ANL/AiW-4120MC with up-thread G1 & down-thread G1-½ NPT connections

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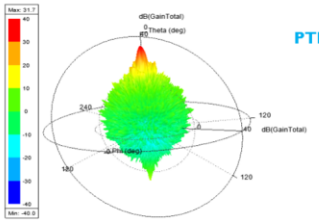
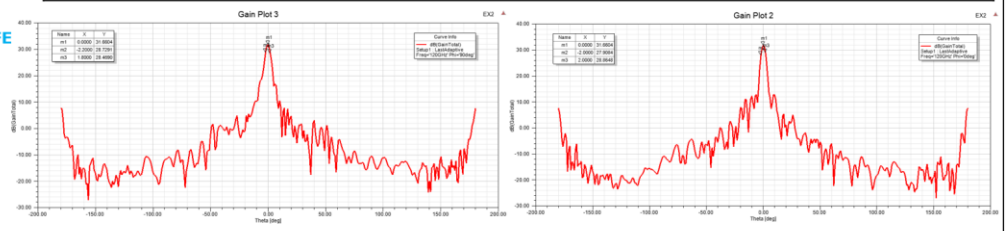
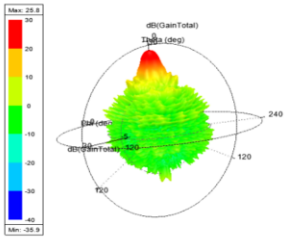
The Radar Antenna Specification of the AiW/ANL-4120MC

Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	37mm	37mm
HPBW (half-power beam width)（3dB 半功率波束角）	4.5°	6° (*) average value
FNBW (beam width between first nulls)（第一零点波束宽度）	12°	18°
Antenna Gain（天线增益）	31.7dB	25.8dB

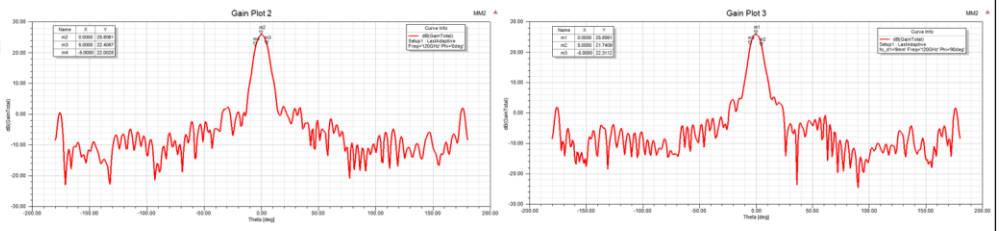


PTFE





POM



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ANL/AiW-4120MK/MK60 Regular SST housing Ex version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 120GHz Frequency FMCW radar system.
- Measuring applications in liquids, solids, the nozzle diameter >=50 mm.
- Suitable for underground / pipes applications.

Specifications

ANL/AiW-4120MK/MK60	Lens material PTFE	Lens material PEEK/POM	Note
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (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, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	PTFE Φ30mm / Φ60mm (MK60)	PEEK Φ30mm /POM Φ60mm (MK60)	Material exposed to tank atmosphere
Antenna beam / Gain	Beam angle 4.5°/ Gain 31.7dB @ Φ30mm Beam angle 2.6°/ Gain 32.0dB @ Φ60mm	Beam angle 4.6°/ Gain 30.1dB @PEEK Φ30mm Beam angle 4.5°/ Gain 30.8dB @POM Φ60mm	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +200°C	-40°C … +200°C	
Process pressure	-0.2 ~ +3.5MPa	-1.0 ~ +4.0MPa	
Process connection	Thread G1-1/2 NPT (for MK), or G2-1/4 NPT (for MK60)		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.01%/10K relating to the 16.7 mA span or max. ±0.15% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA Additional deviation through electromagnetic interference acc. to EN-61326: < ±150µA		
Indication/Adjustment (LOI)	(APP) RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
Wireless communication	Bluetooth 5.0 (Bluetooth 4.0 LE compatible), communication range 40m, in rainy day 20m		
Approvals	Ex ia IIC T6 Ga IP67; Ex d IIC T6 Gb IP67		
Housing	Stainless steel 304/316, IP67 / IP68		
Applications	liquids, solids applications		

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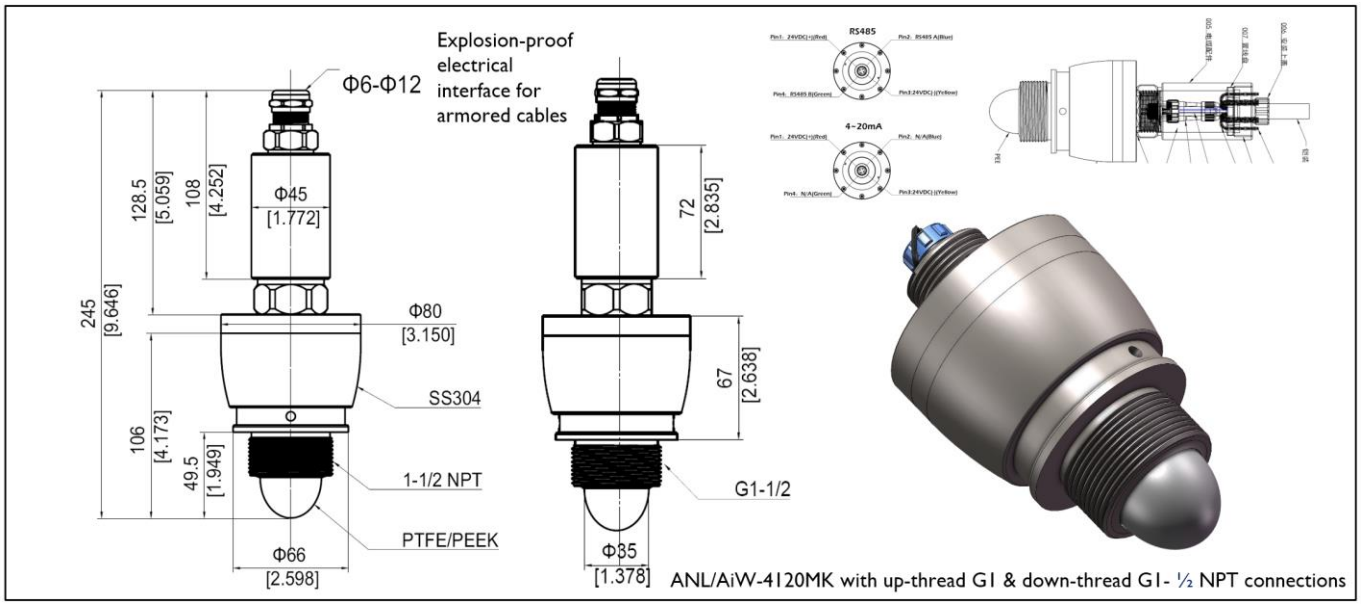

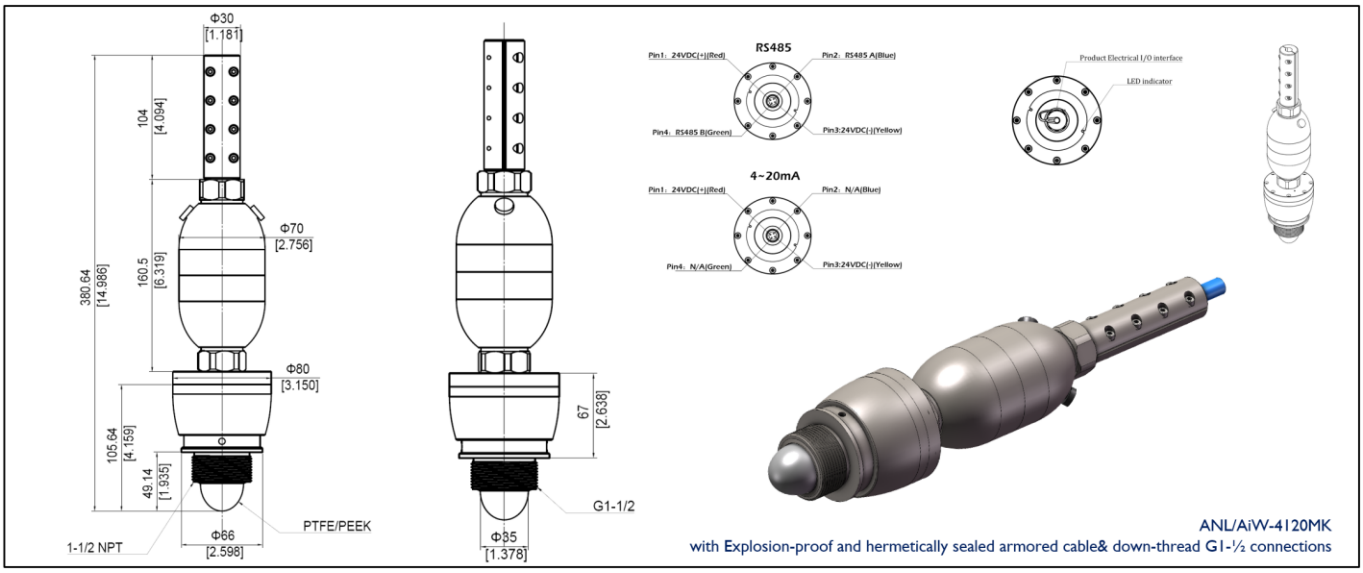

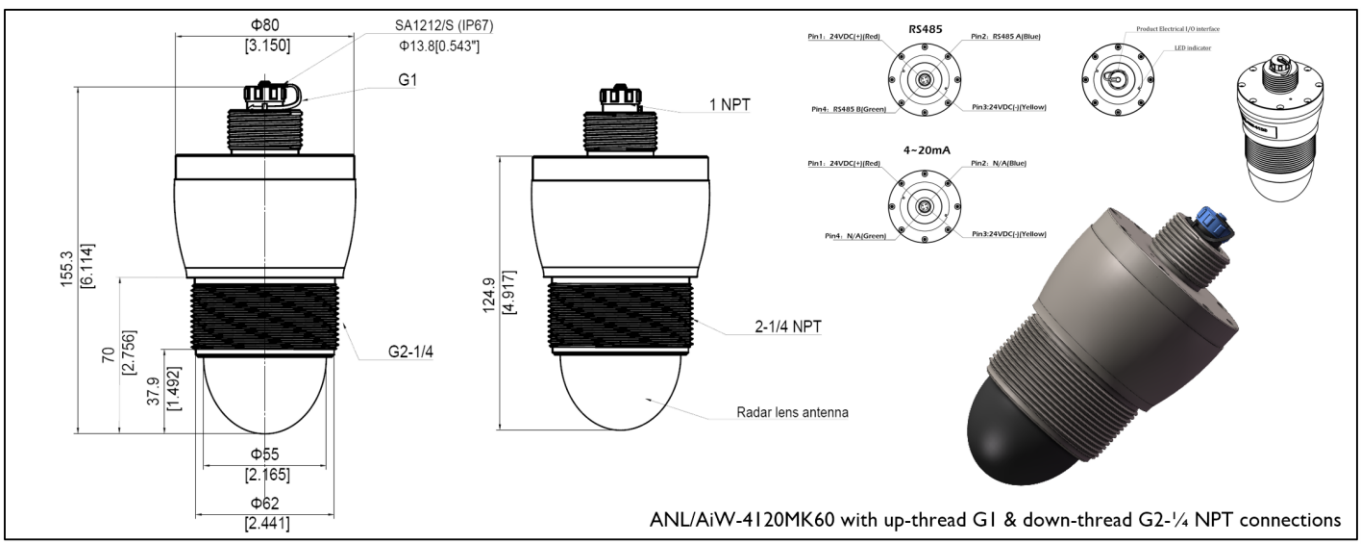

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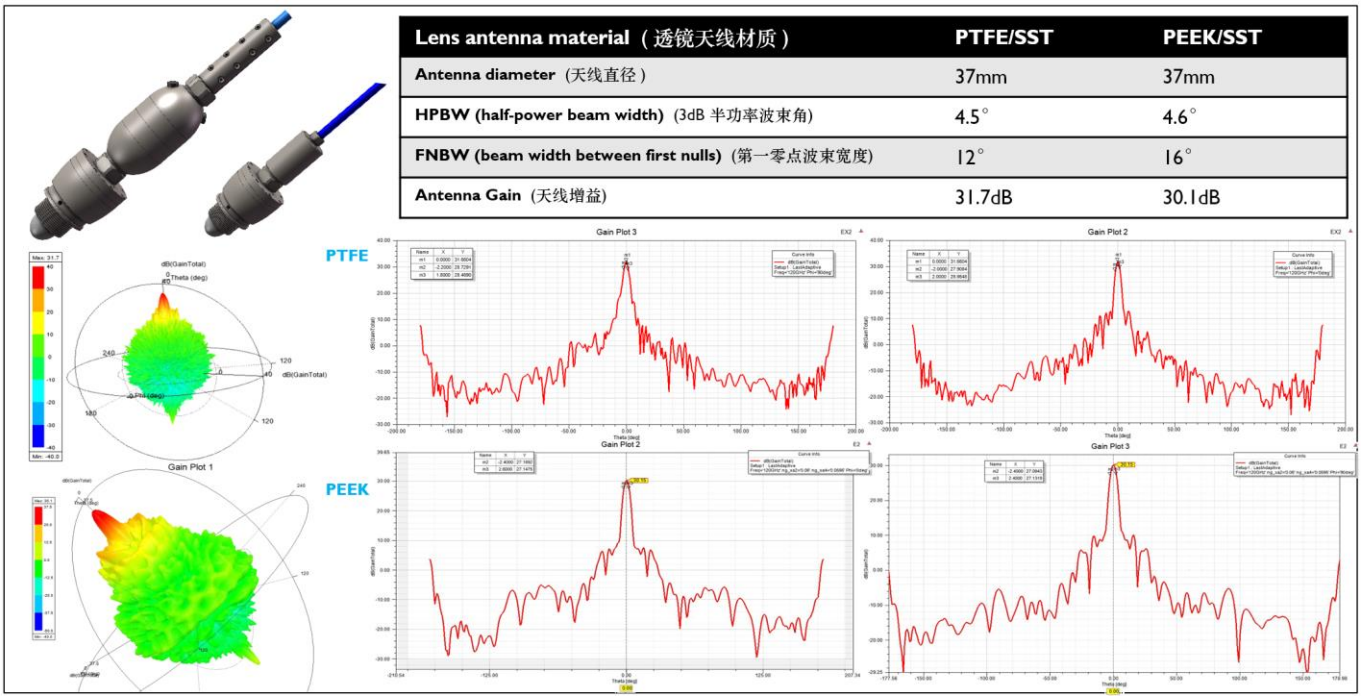
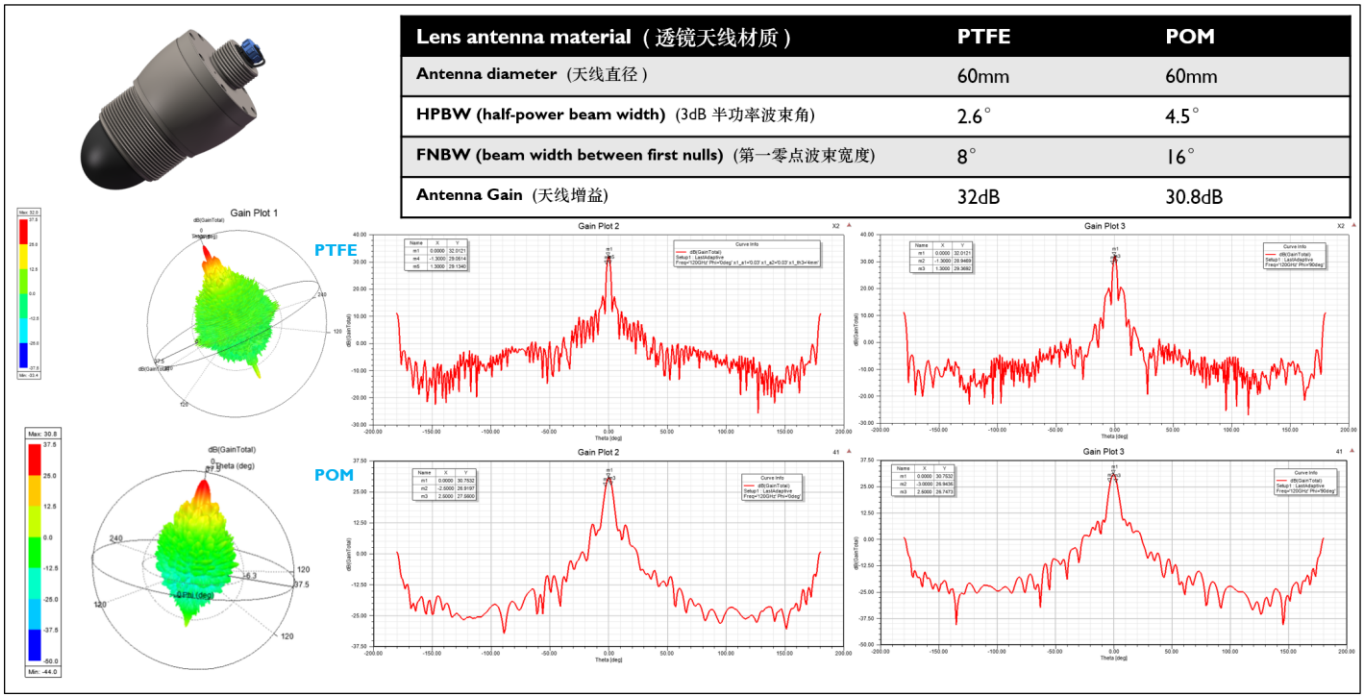
The Radar Antenna Specification of the AiW/ANL-4120MK



Lens antenna material（透镜天线材质）	PTFE/SST	PEEK/SST
Antenna diameter（天线直径）	37mm	37mm
HPBW (half-power beam width)（3dB 半功率波束角）	4.5°	4.6°
FNBW (beam width between first nulls)（第一零点波束宽度）	12°	16°
Antenna Gain（天线增益）	31.7dB	30.1dB



Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	60mm	60mm
HPBW (half-power beam width)（3dB 半功率波束角）	2.6°	4.5°
FNBW (beam width between first nulls)（第一零点波束宽度）	8°	16°
Antenna Gain（天线增益）	32dB	30.8dB

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ANL/AiW-4120MG/MG60 regular plastic housing with LOI version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 120GHz Frequency FMCW radar system.
- Measuring applications in liquids, solids, compatible with NAMUR specifications.
- MG60 model suitable for light dust, vapor and condensation environments.

Specifications

ANL/AiW-4120MG/MG60	Lens material POM	Lens material PTFE	NOTE
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (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, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	POM Φ30mm for MG / Φ60mm for MG60	PTFE Φ30mm for MG / Φ60mm for MG60	Material exposed to tank atmosphere
Antenna beam / Gain	Beam angle 6.0°/ Gain 25.8dB (for MG) Beam angle 4.5°/ Gain 30.8dB (for MG60)	Beam angle 3.5°/ Gain 30.7dB (for MG) Beam angle 2.6°/ Gain 32.0dB (for MG60)	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +120°C	-60°C … +120°C	
Process pressure	-0.2 ~ +0.5MPa	-1.0 ~ +3.5MPa	
Process connection	Thread G1-1/2 NPT (for MG), or G2-1/4 NPT (for MG60)		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.01%/10K relating to the 16.7 mA span or max. ±0.15% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1µA; Ex-d-ia version: < ±1µA 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. (APP) RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
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 IP67; Ex d IIC T6 Gb IP67		
Housing	Plastic POM or PTFE, IP67 / IP68		
Applications	liquids, solids, dust, powder, and stirring & corrosive environment applications		

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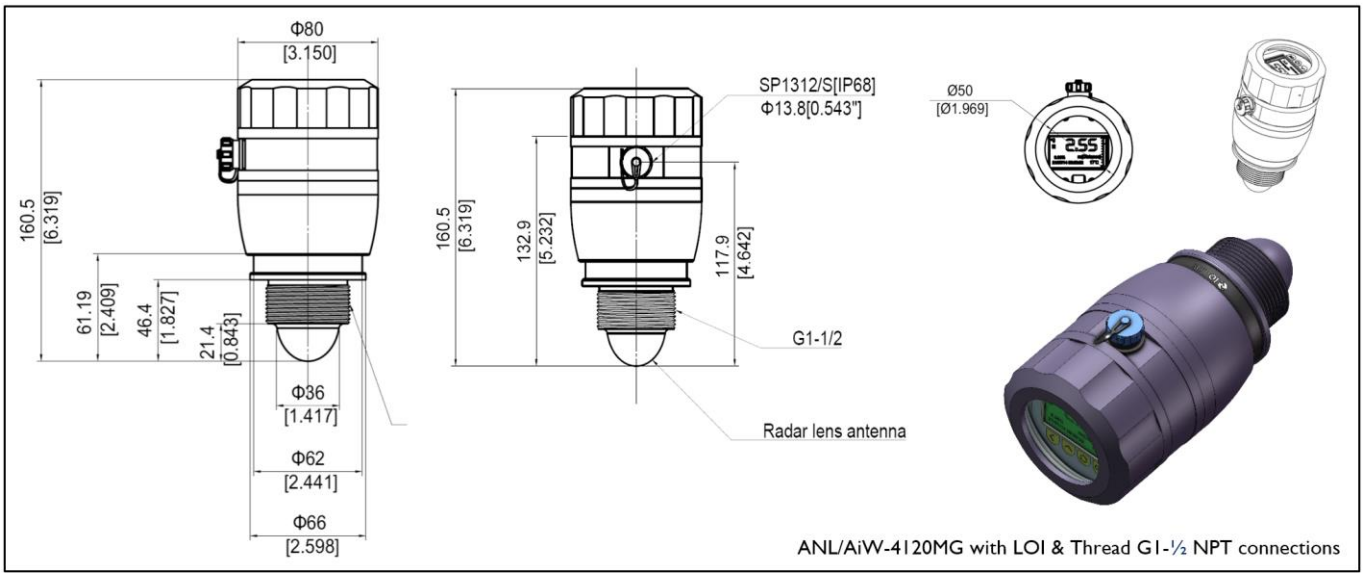
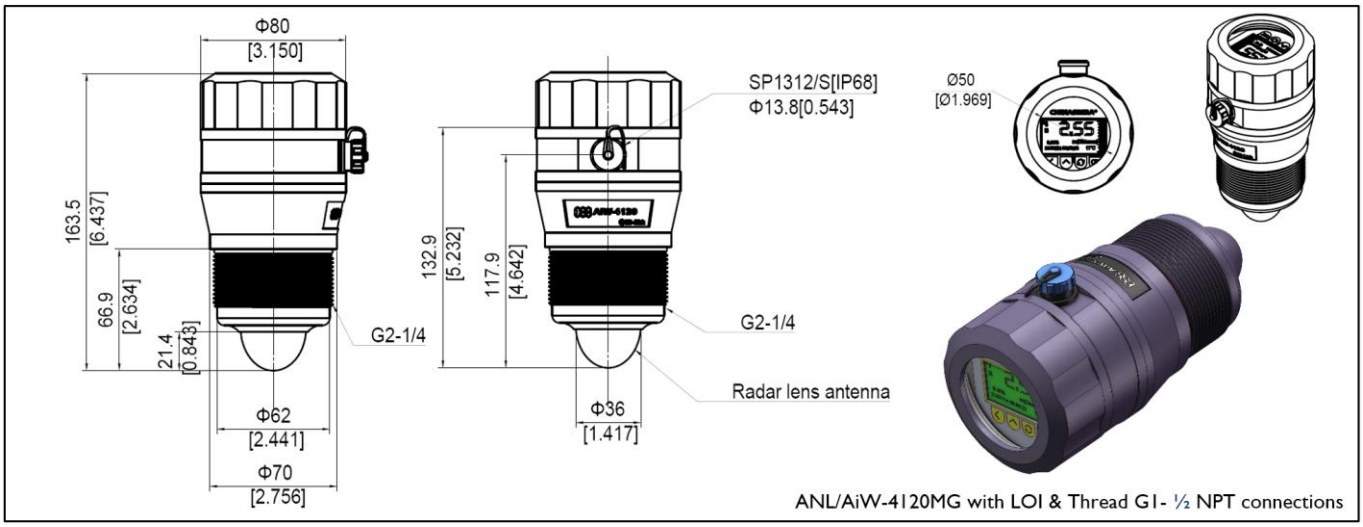
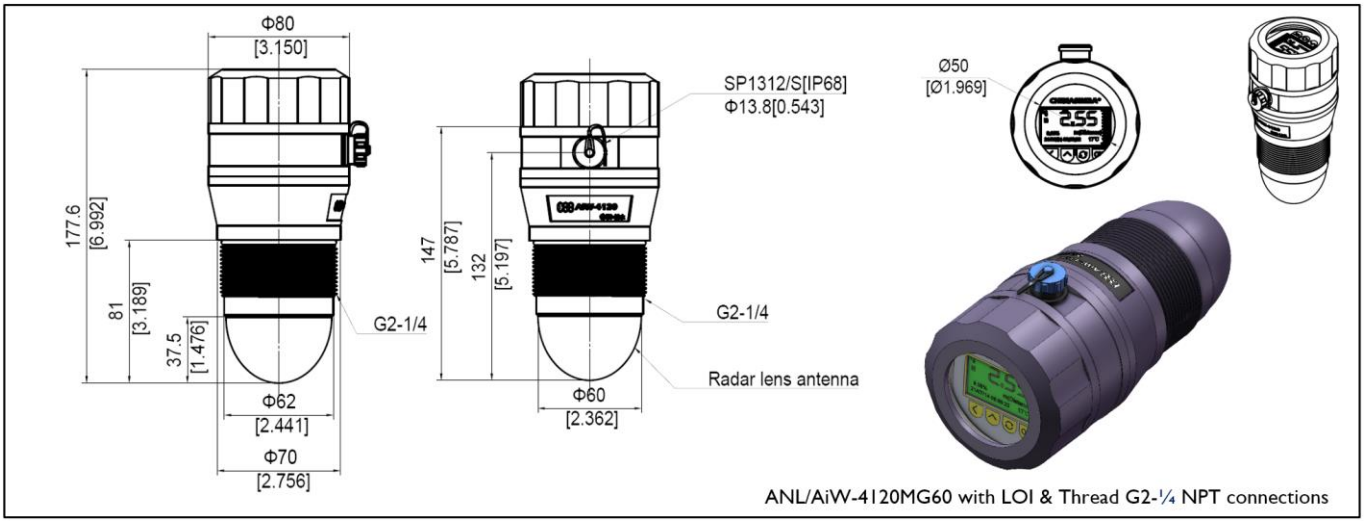


ANL/AiW-4120MG with LOI & Thread G1-½ NPT connections



ANL/AiW-4120MG with LOI & Thread G1- ½ NPT connections



ANL/AiW-4120MG60 with LOI & Thread G2-¼ NPT connections

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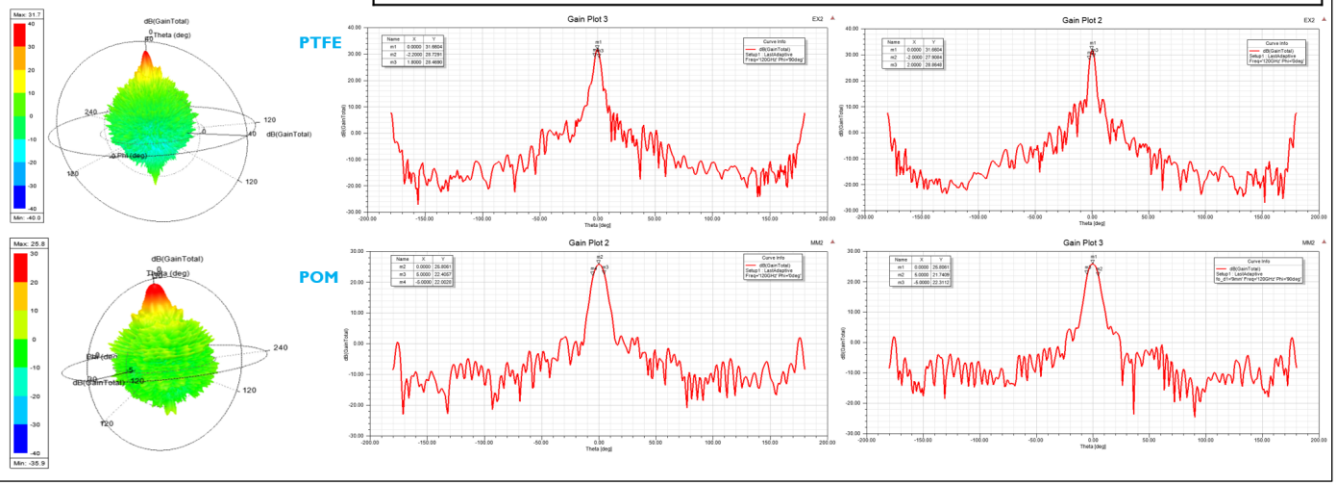
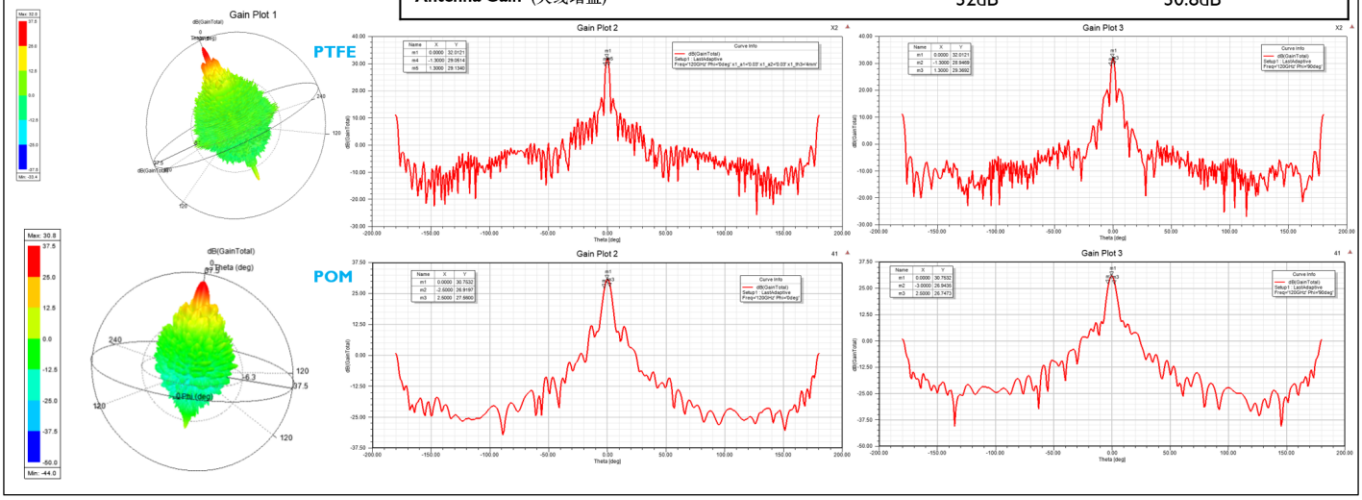
The Radar Antenna Specification of the ANL-4120MG/MG60

Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	37mm	37mm
HPBW (half-power beam width)（3dB 半功率波束角）	4.5°	6° (*) average value
FNBW (beam width between first nulls)（第一零点波束宽度）	12°	18°
Antenna Gain（天线增益）	31.7dB	25.8dB



Lens antenna material（透镜天线材质）	PTFE	POM
Antenna diameter（天线直径）	60mm	60mm
HPBW (half-power beam width)（3dB 半功率波束角）	2.6°	4.5°
FNBW (beam width between first nulls)（第一零点波束宽度）	8°	16°
Antenna Gain（天线增益）	32dB	30.8dB



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ANL/AiW-4120MX/MX60 enhanced SST housing with LOI version

Non-contact Smart Radar Level Gauges Datasheets

Version V.2024

Characteristics

- 122GHz Frequency FMCW radar system.
- Chemical industry, clean energy measurement applications in liquids, solids.
- Also suitable for light dust, vapor and condensation environments.
- Compatible with NAMUR specifications.

Specifications

ANL/AiW-4120MX/MX60	Lens material PTFE	Lens material PEEK/POM	NOTE
Max. measuring range	10M/18M/20M/30M/40M		40M only for HART/IO-Link/APL version
Tx/Rx frequency	Tx/Rx frequency 120 to 125GHz Dynamic FM Sweep Bandwidth 1~5GHz (The adjustment FM range can be customized according to the ISM requirements of the customer's region)		
Near blind spot	< 100mm from the antenna down surface		
Meas. Principle	FMCW Radar System, TX power -3dBm (not included antennas), RX Input compression point -20dBm & Gain 10dB (not included antennas)		
Lens Antenna Medium	PTFE Φ30 for MX / Φ60mm for MX60	PEEK Φ30 for MX / POM Φ60mm for MX60	Material exposed to tank atmosphere
Antenna beam / Gain	MX: Beam angle 4.5°/ Gain 31.7dB MX60：Beam angle 2.6°/ Gain 32.1dB	MX: Beam angle 4.6°/ Gain 30.1dB (PEEK) MX60：Beam angle 4.5°/ Gain 30.8dB (POM)	
Meas. Resolution	0.1mm (<10m range)		Depends on the bandwidth and range
Meas. Accuracy	±1mm (<10m range) / ±2mm (18m/20m range) / ±4mm (30m/40m range)		
Ambient temperature	-40 … +85 °C		
Process temperature	-40°C … +200°C	-40°C … +200°C	
Process pressure	-0.1 ~ +3.5MPa	-1.0 ~ +4.0MPa	
Process connection	Thread G1-1/2 NPT (MX) or G2-1/4 NPT (MX60)		
Signal output	4-20 mA (regular), or/ 4-20 mA/HART7, or/ (RS-485) Modbus, or/ IO-Link, or/ Ethernet-APL (option issue)		
Variables influencing meas. accuracy	Specifications for the digital measured value Temperature drift - Digital output: ±1mm/10K relating to the max. measuring range or max. 15 mm Additional deviation through electromagnetic interference acc. to EN-61326: < ±10 mm Specifications apply also to the current output Temperature drift - Current output: ±0.01%/10K relating to the 16.7 mA span or max. ±0.15% Deviation in the current output due to digital/analogue conversion Non-Ex and Ex-ia version: < ±1μA; Ex-d-ia version: < ±1μA 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. (APP) RadarMobileManager via BT wireless connection		
Meas. output update rate	< 3s. (Run-up time to get first Reading: <5s forRS485; <45s for mA loop) @U_B=16VDC		
Power supply	16V … 40 VDC / Load resistor > 500Ω (for mA version), 12V… 36VDC (for RS485 version)		
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 IP67; Ex d IIC T6 Gb IP67		
Housing	Stainless steel 304/316, IP67 / IP68		
Applications	liquids, solids, dust, powder, and stirring environment applications		

SERVICE CONTACT: 86-13799977915, 86-18965063391(TECHNICAL SUPPORT), 86-18106067295(AFTER SALE SERVICE)
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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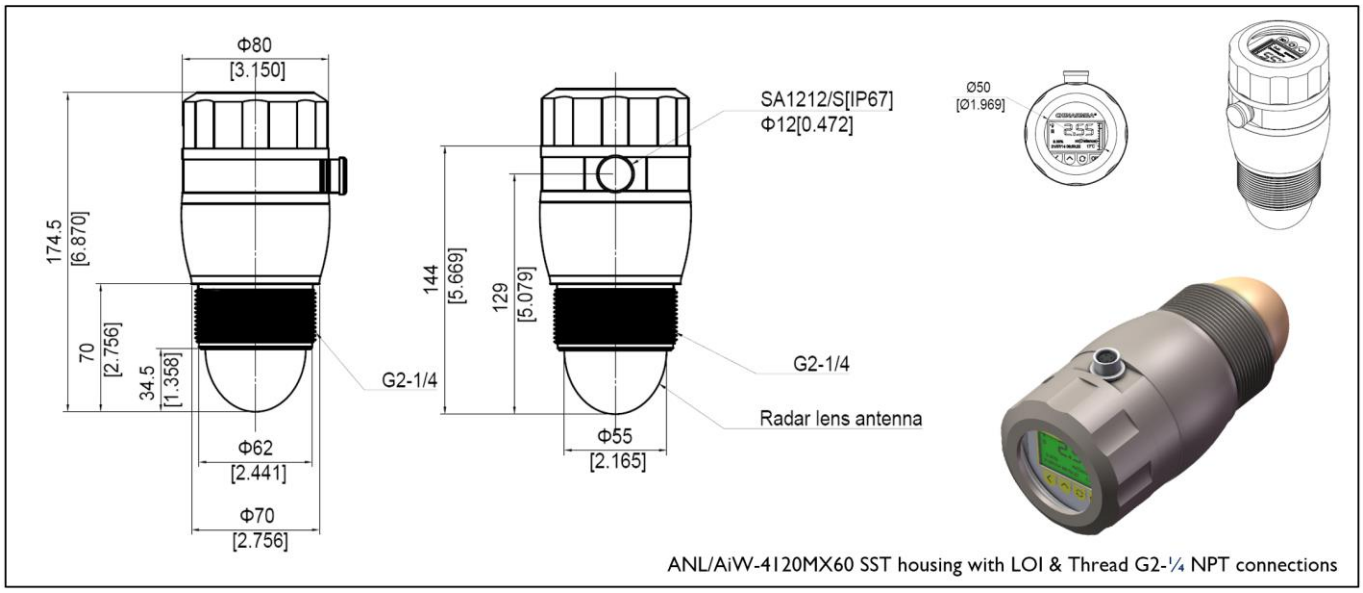
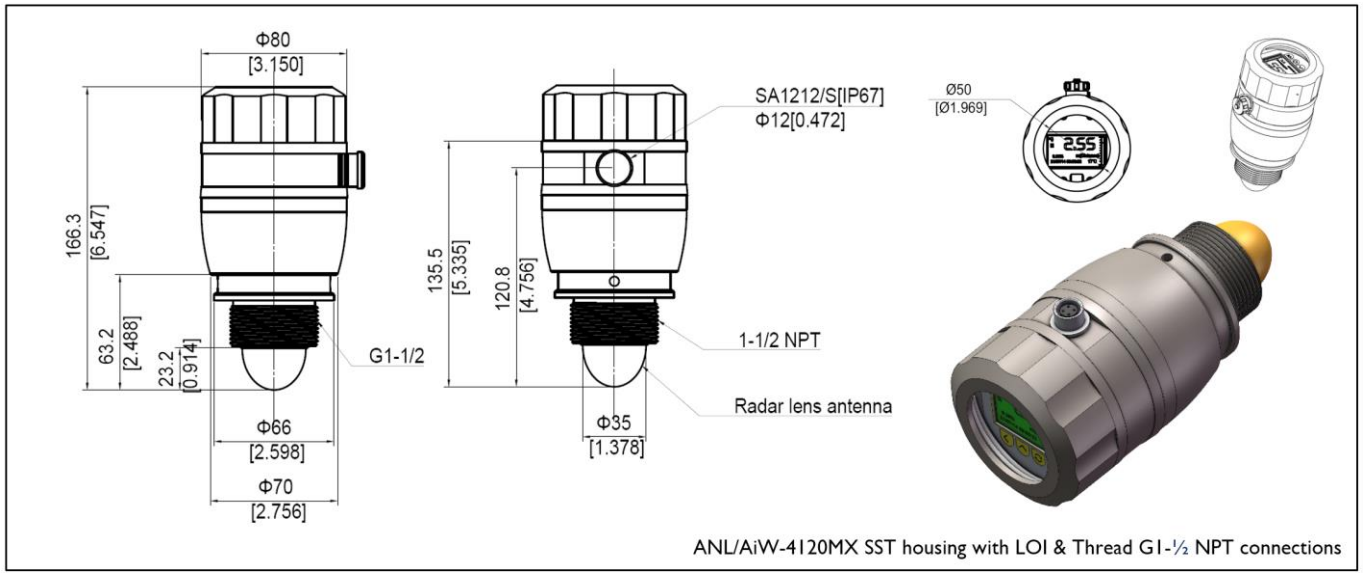
Dimensions

The following dimensional drawings represent only an extract of all possible versions. Detailed dimensional drawings can be downloaded at https://www.chinasimba.com/downloads.html "Drawings".



ANL/AiW-4120MX60 SST housing with LOI & Thread G2-¼ NPT connections



ANL/AiW-4120MX SST housing with LOI & Thread G1-½ NPT connections

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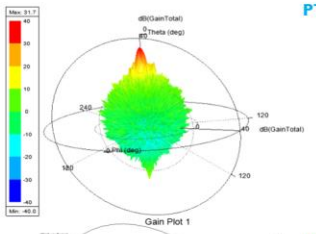
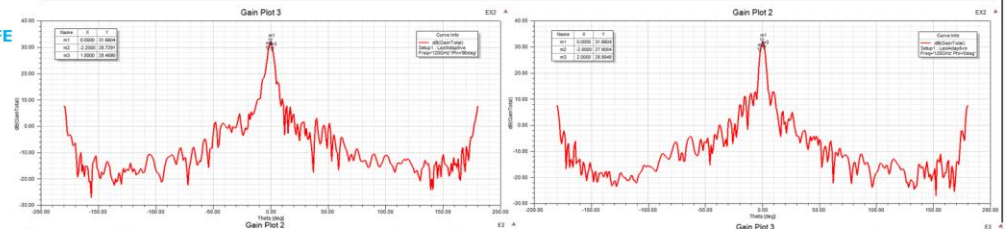
The Radar Antenna Specification of the ANL-4120MX/MX60

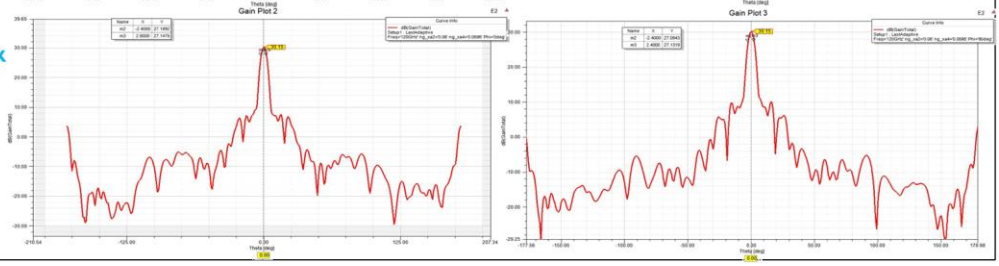
Lens antenna material（透镜天线材质）	PTFE/SST	PEEK/SST
Antenna diameter（天线直径）	37mm	37mm
HPBW (half-power beam width)（3dB 半功率波束角）	4.5°	4.6°
FNBW (beam width between first nulls)（第一零点波束宽度）	12°	16°
Antenna Gain（天线增益）	31.7dB	30.1dB



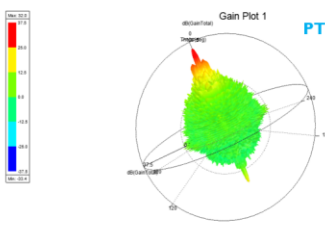
PTFE



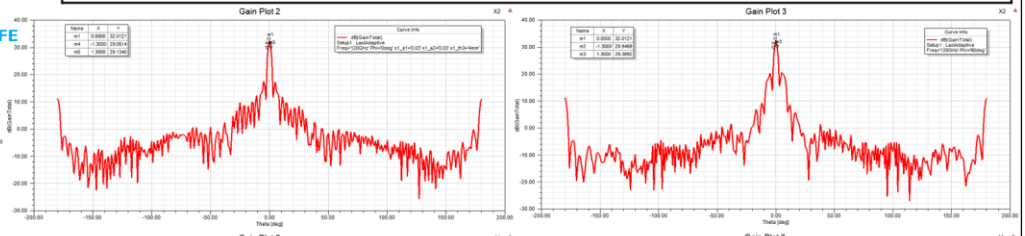
PEEK



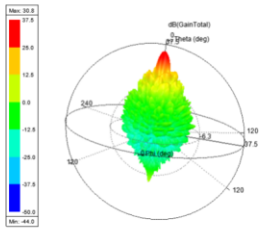
Lens antenna material（透镜天线材质）	PTFE/SST	POM/SST
Antenna diameter（天线直径）	60mm	60mm
HPBW (half-power beam width)（3dB 半功率波束角）	2.6°	4.5°
FNBW (beam width between first nulls)（第一零点波束宽度）	8°	16°
Antenna Gain（天线增益）	32dB	30.8dB

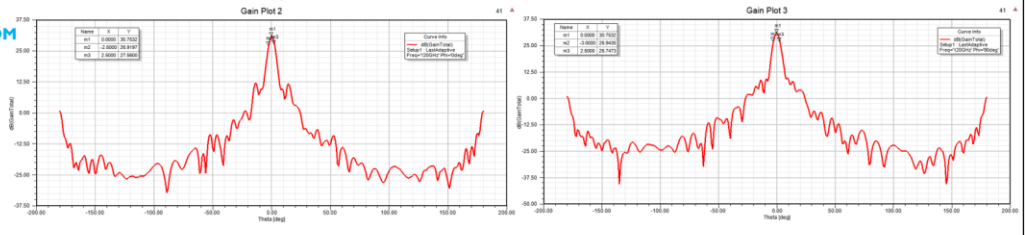


PTFE



POM





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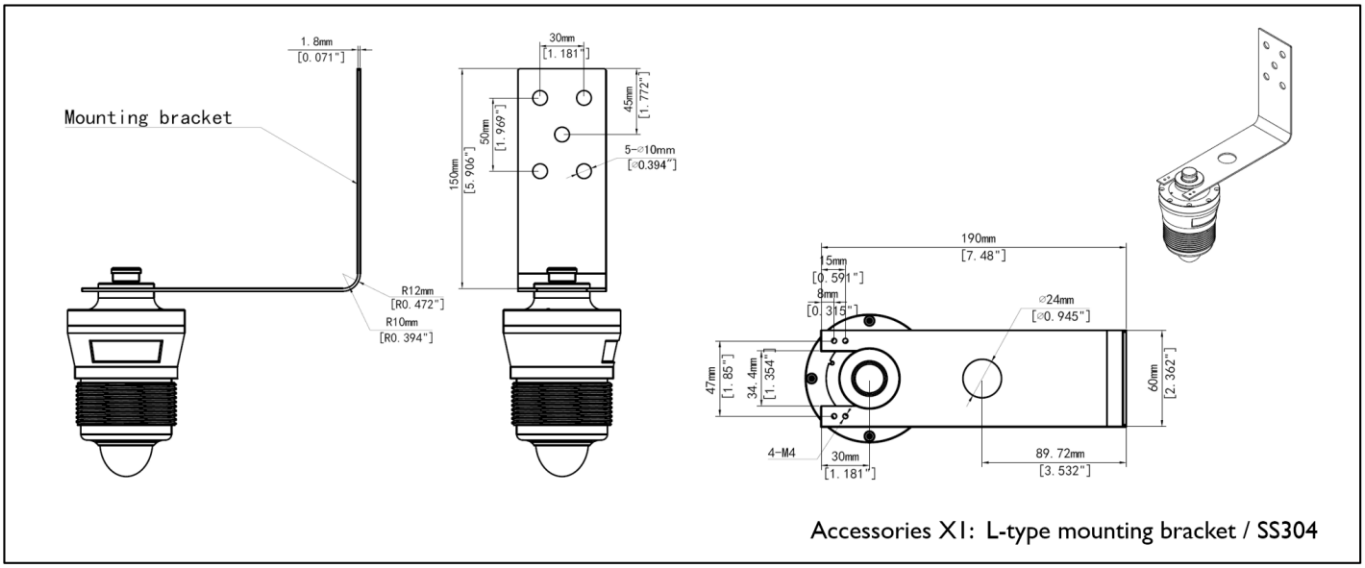
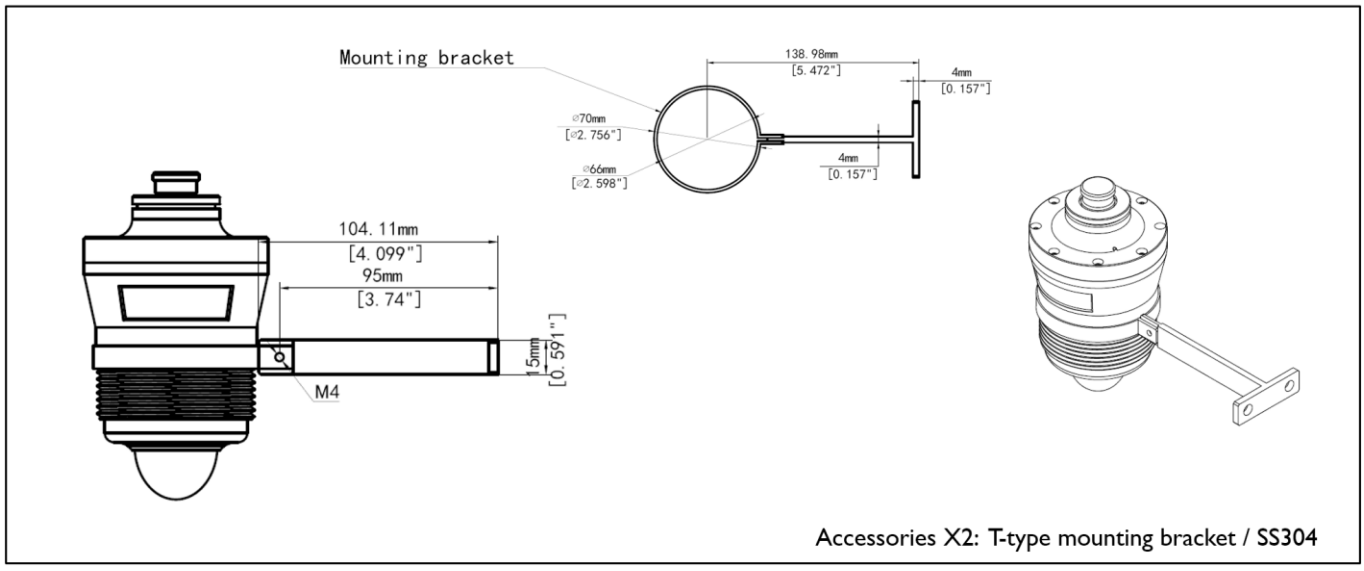
ANL/AiW-4120 Adapters/Accessories



Accessories X1: L-type mounting bracket / SS304



Accessories X2: T-type mounting bracket / SS304

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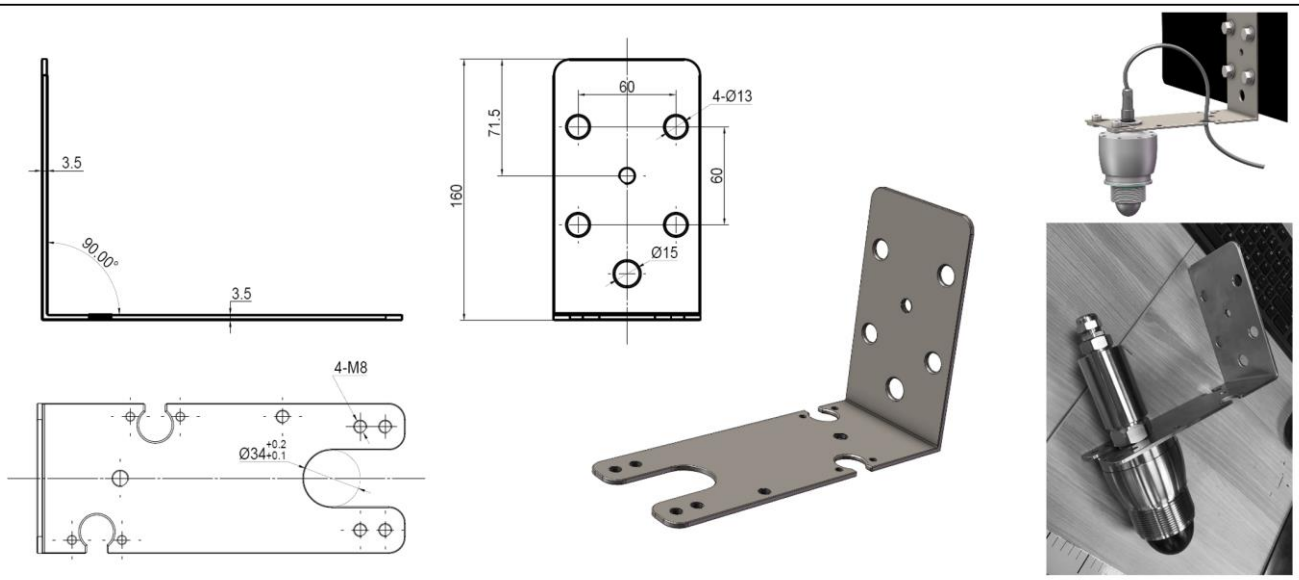
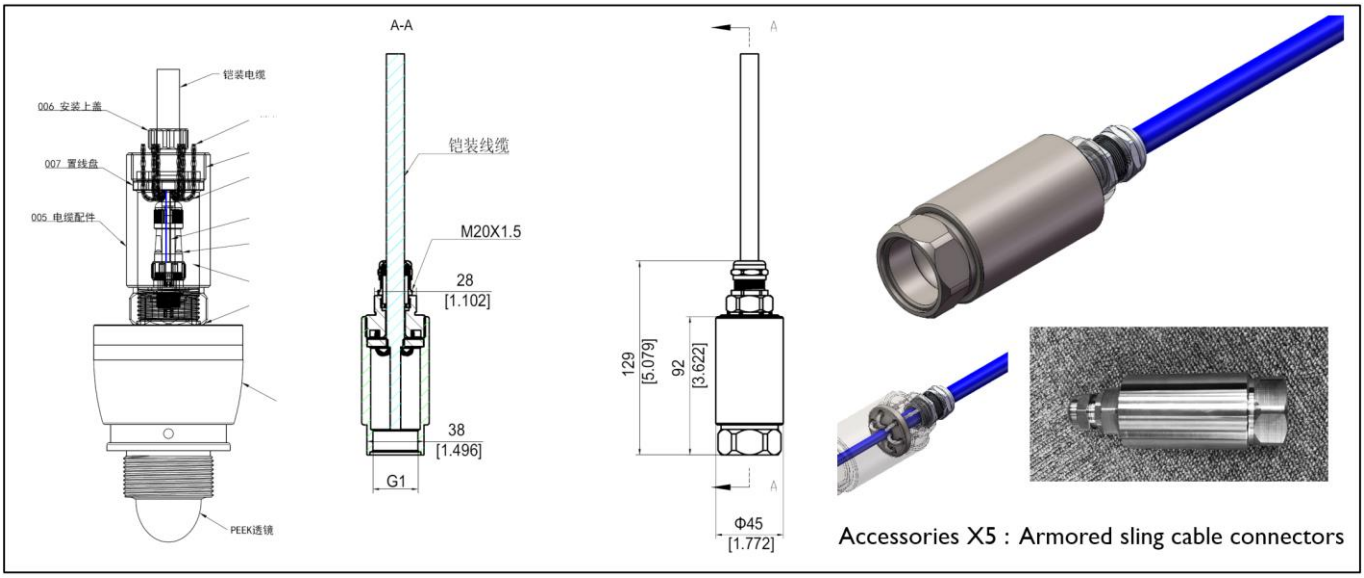
Accessories X3: Flood protection cover



Accessories X4 : Heavy L-type mounting bracket / SS304



Accessories X5 : Armored sling cable connectors

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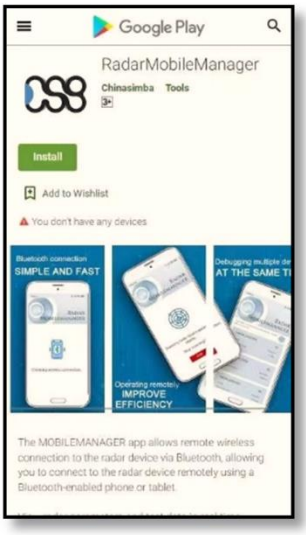
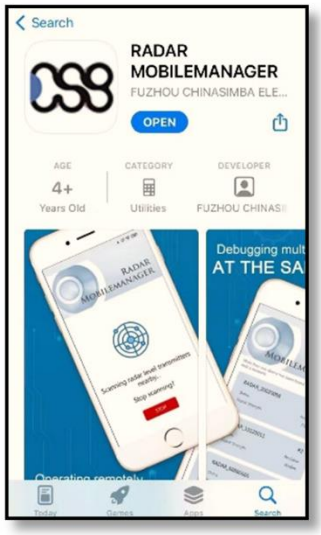
Remote programmer cum Indicator Adapters

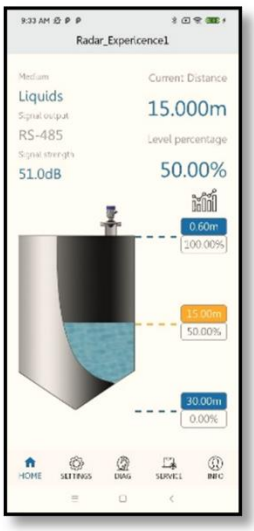
Mobile App via Bluetooth communication

ANL/AiW-4120 smart radar level transmitters 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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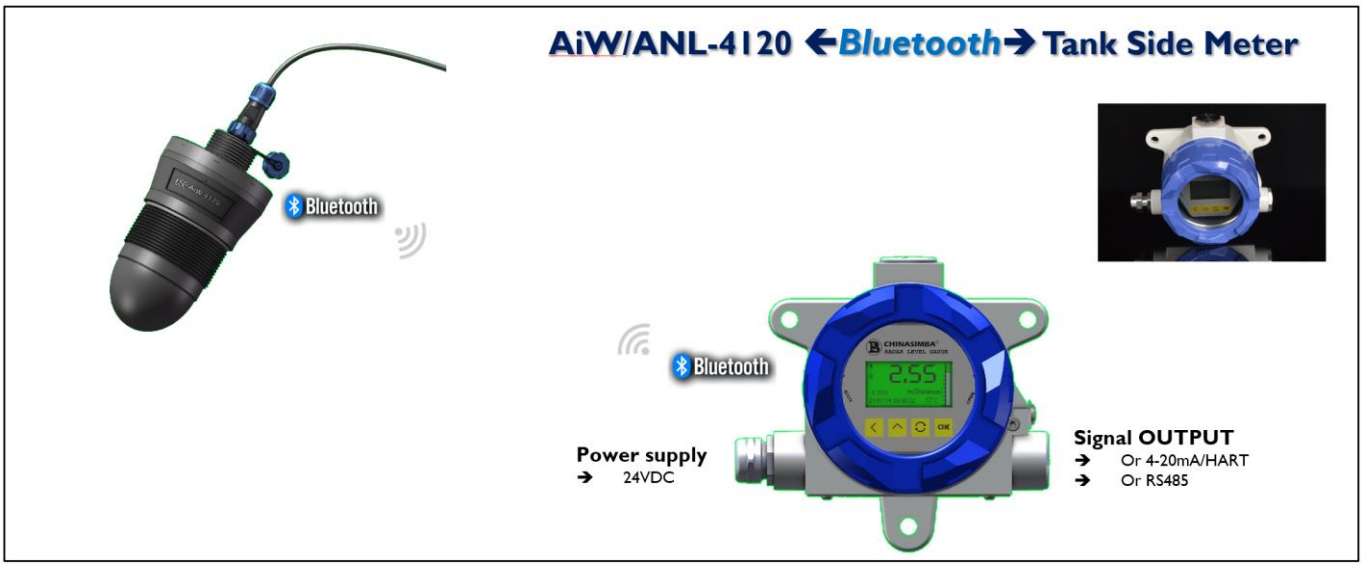
Remote indicator RMD-25 via Bluetooth communication

AiW/ANL-4120 also connect RMD-25 tank side meter for indicator or debugger via Bluetooth wireless communication.



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