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Golden Rules Co.,Ltd

Liquid, Solid, Powder
Radar Level Meter

KC-2021M Series
RADAR LEVEL METER

The nation's development item, 100% domestic goods,Patent **NO.** 10-1660226

12. Non-contact type Radar Level Transmitter

12-2. Powder, Liquid, Solid type KC-2021M Series

Non-contact type
KC-2021M

Radar Level Transmitter

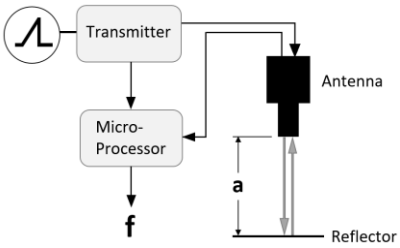
Feature

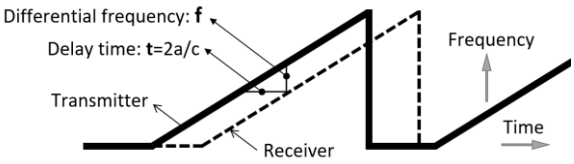
- Based on the newly developed CMOS millimeter wave RF chip, more sophisticated RF architecture was realized and the signal-to-noise ratio was increased to have a small dead band (dead band: 80mm).
- The 5 GHz operating frequency bandwidth means higher measurement resolution and accuracy. The antenna beam angle is 8°, so that interference from the surrounding environment and water vapor can be minimized. The accuracy is good enough to have an error of 2mm. A shorter wavelength is designed to increase the reflection characteristic of the frequency.
- It has 8° beam angle and self-adaptive automatic gain algorithm function. It is easy to find the surface reflection point of the target object.
- Short response time (80~100ms) and adjustable measuring cycle (0.5~300m/Min) Fake echo frequencies can be easily removed.
- Because the PTFE lens antenna is completely sealed, there is no frequency leakage and it can be used safely.
- The high-temperature and high-pressure special antenna can be supplied separately, meter can be selected.
- By designing only liquid measurement, the product price has been drastically reduced. With Hangul, anyone can easily adjust it.
- Accuracy (mm): Liquid < ±2mm
- Power: 24V DC, 22.5mA
- Protection class: IP67
- Connection Pressure : -1 ~ 2.0 Mpa
- Signal output: DC 4~20 mA current output @HART

*The KC-2021R high-performance version of the radar level transmitter shows excellent performance even in harsh environments where the sensor part is heavily dusted and coated.

Description

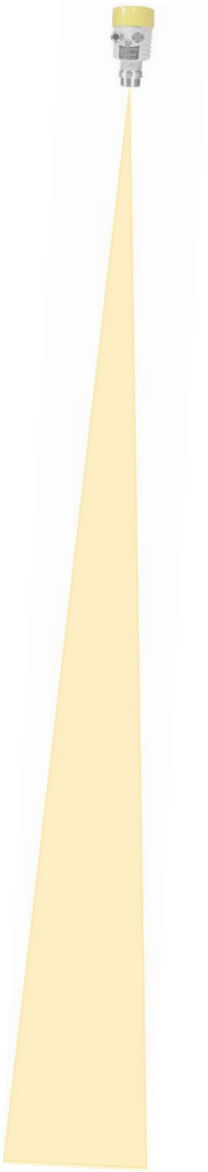
The KC-2021M high-performance version radar level transmitter is a powerful level meter that utilizes the "frequency continuous modulation method" theory, which can meet the level measurement requirements of solids, liquids and solids. The KC-2021M Series uses high-performance version radar technology to provide superior signal processing and takes high-frequency measurement technology to a new level, with lower measurement limits and improved stability and accuracy. It is a non-contact radar level meter with Frequency Modulated Continuous Wave method (FMCW) and is a radar level meter dedicated to liquids in water treatment and all industries.





- Using the frequency difference (Δf) from the received signal by continuously emitting a frequency modulated signal
- The transmission frequency increases linearly with time and the modulation duration remains longer than the time the reflected wave returns.
- The frequency difference of the transmitted and received signals is proportional to the time delay difference (T) of the transmitted signal

Δf = (df/dt)*T (df/dt is the swept frequency rate of change)
a = c*T/2



Product Performance

- **Precision**
  Accuracy (mm): Liquid, Solid, Powder < ±2mm
- **Repeatability**
  < 1mm
- **Response time**
  < 80 ~ 100ms
- **Measuring range**
  General type : 10m, 20m , Broad type : 30m, 60m, 120m
- **Frequency**
  76 to 81 GHz
- **Resolution**
  1-2mm
- **Beam angle**
  3'
- **Measured minimum DK value**
  > 2.0
- **Measurement time**
  1m/min to 300m/min (adjustable)

Operating Specification

- **Measurement object**
  Liquid
- **Measured object pressure range (assembly part)**
  Flange : -1 ~ 4.0 MPa Std.

◆ Fluid & Ambient Temperature

Fluid : Std. -40 ~ 85 ℃, Option : -40 ~ 120℃, -40 ~ 180℃, max. -40 ~ 1200℃
Ambient : -40 ~ 85 ℃
Humidity : ≤ 95% RH

◆ Input Power

DC 24V, 22.5mA

◆ Output Signal (Std.)

Linear 4~20mA @HART 2-wire

◆ Error Output

4mA, 22mA or 20.5mA (configurable)

◆ LCD Display

LCD display 128 X 64 pixels / level, distance (space), 4-20mA current, % Adjustment in the window window by the 4 push button attached to the instrument panel Adjustment variable: Level range: (0 ~ 10m, 0 ~ 20m) Level unit: m, % Response time / correction value: (1 ~ 7) sec / 0.5 ~ 5 Zero & Span

Body Specification

◆ Wetted Parte

Antenna Body – SUS304 (Option : SUS316, PTFE)
Antenna Lens – PTFE, PVDF
Thread / Flange – 304SS (Option : SUS316, PTFE, PVDF)
Housing – AL.-Casting (Option : Stainless steel)

◆ Flow meter body

Water Proof IP67

◆ Conduit connection (Selection)

½" NPT(F), ½" PF(F), M20X1.5
AWG18 or 0.75m2 Calbe

◆ Flow meter mounting (Selection)

G1.5" Thread, Flange
JIS 10k RF Flange

◆ Certificate

KC (CASE All) Certificate

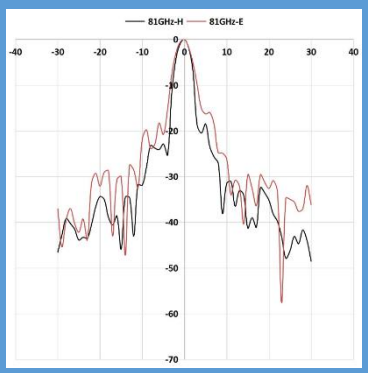
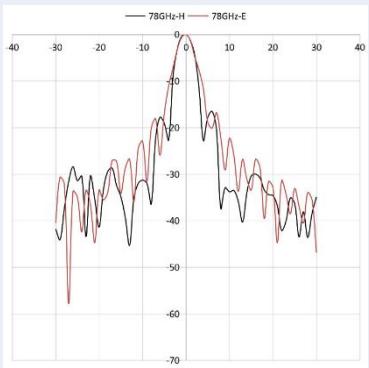
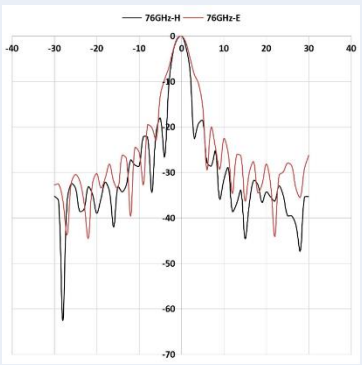
Beam Angle Test

● Test Data :

	Frequency	3dB Beamwidth (°)		Sidelobe (dB)	
		H	E	H	E
3° Lens	76GHz	2.9	3.0	-18.1	-19.6
	78GHz	2.9	3.0	-16.5	-16.8
	81GHz	2.8	3.0	-18.5	-16.3

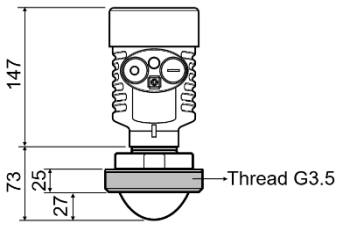
● Radiation pattern : **Normalized Radiation Pattern**

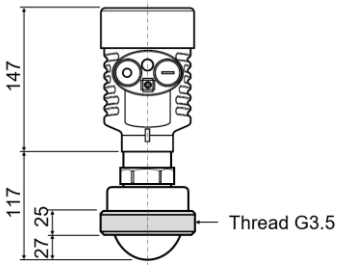
-------H ------E

81GHz	78GHz	76GHz
		

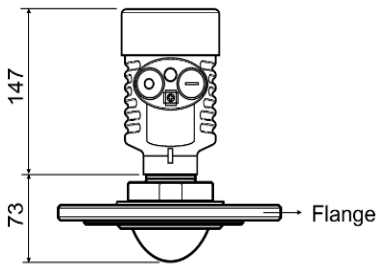
Standard antenna dimensions and basic configuration III

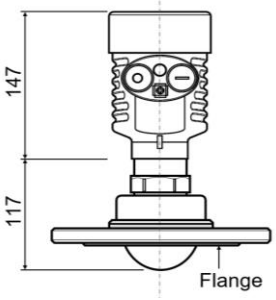
● G3.5" Screw : Material : SUS304/SUS316/PTFE



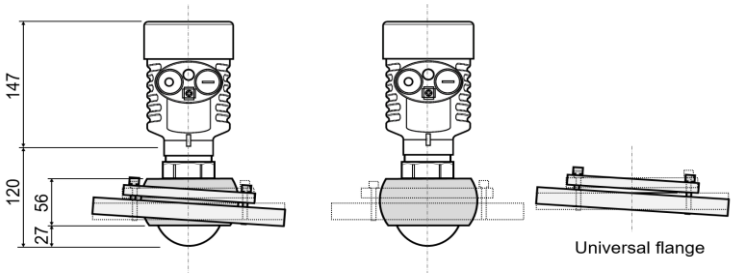


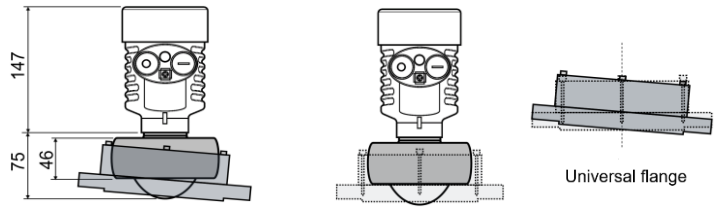
● General Flange/ JIS, ANSI, DIN Material : SUS304/SUS316/PTFE





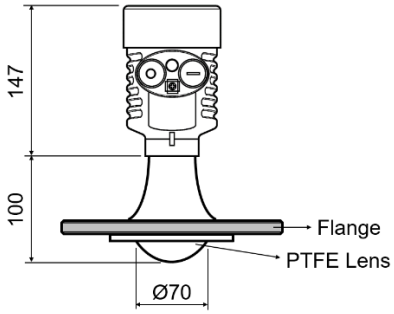
● Flange for angle adjustment / JIS, ANSI, DIN: Universal flange, Air Nozzle



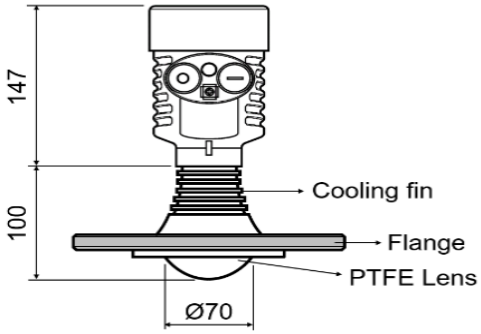


Optional antenna types and specifications IV

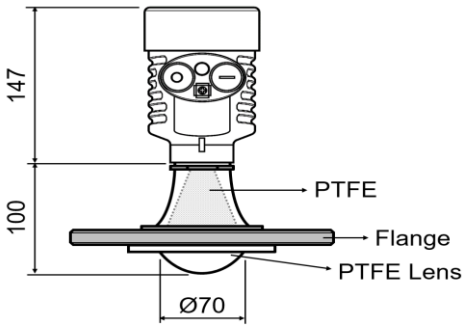
- **High Pressure :** Temperature: Max. 85°C/ Pressure: PN40 Mat'l : SUS304/SUS316/PTFE



- **High Pressure & Temp' :** Temp': Max. 150°C/ Pressure: PN40 Mat'l: SUS304/SUS316/PTFE

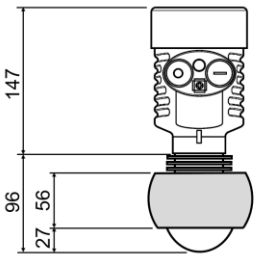


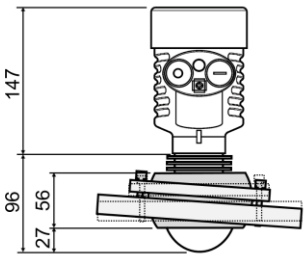
- **High Temp' :** Temperature: Max. 180°C/ Pressure: Mat'l: SUS304/SUS316/PTFE



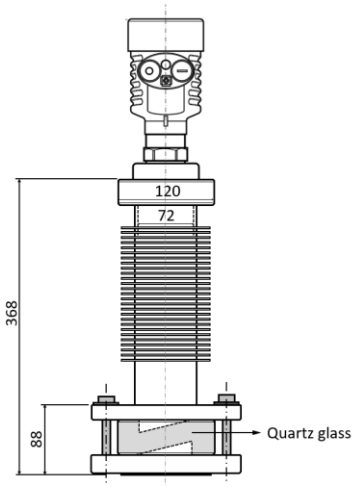
Optional antenna types and specifications IV

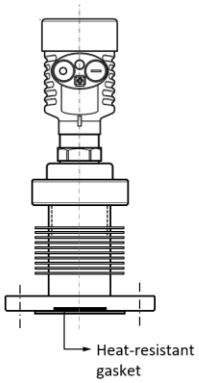
- For high temp' angle adjustment: **Temp': Max. 150°C/ Cooling fin Air Nozzle Mat'l: SUS304/SUS316**





- Heat-resistant structure for high temp': **Temperature: Max. 1200°C/ Cooling fin for high temp' filter**





Note: The size and shape of the cooling fins may change depending on the site conditions, so please inquire separately when ordering. These cooling fins can be applied to all antennas regardless of the type of fluid.

On-site installation photos V









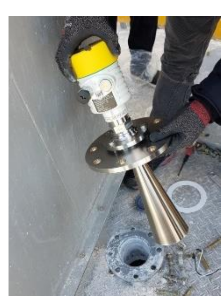
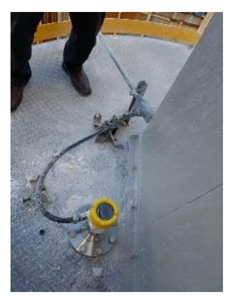













Order Code_ KC-2021M Series (Radar Level Transmitter)

	Type		Conn' spec'		Antenna/mat'l			Fluid		Power		Output		Display		Temp'		P-grade		Option
KC-20	2	–		–					–	P	–		–		–		–		–	
	1		2		3	4	5	6		7		8		9		10		11		12

structure type	Code 1
Standard type (10m, 20m)	1R
Special type (30m, 60m, 120m)	2R
Agency approved, customer specified	W

Measured Mediem	Code 6
Liquid, Solid	1
Powder	2
Agency approved, customer specified	W

Housing/protection grade	Code 11
AL-Casting/ IP67	1
SUS304/ IP67 (Option)	2
Agency approved, customer specified	W

Connection Spec'	Code 2
Thread G1.5" Male	T
DIN Flange DN50	50
DN Flange DN80	80
DIN Flange DN100	100
DIN Flange DN125	125
Agency approved, customer specified	W

Input Power	Code 7
24V DC, 22.5mA	1
Agency approved, customer specified	W

Option	Code 12
Cooling fin for high temp'	H
Cooling fin for high temp' & filter	HF
Adpter, Wave guid UV protection visor	A
Agency approved, customer specified	w

Output Signal	Code 8
4-20mA with HART/ 2-wire	1
4-2mA with, RS-485, 4-wire, 6-wire	2
Agency approved, customer specified	W

Antenna type/ Mat'l	Code 3,4,5	
type	Material	
Lens	PTFE	
Housing	AL-Casting	SUS304
Thread or Flange	SUS304	SUS316
Agency approved, customer specified		

Display	Code 9
No Readout	NR
Digital Display(LCD)	DD
Agency approved, customer specified	W

프로세스 온도(process temp')	Code 10
-40 ~ 85'C (Std.)	1
-40 ~ 120'C (Option)	2
-40 ~ 180'C (Option)	3
-40 ~ 1200'C (Option)	4
Agency approved, customer specified	W

Requirements when ordering products	1) Product base model 2) Measuring range and highest upper level 3) Fluid type, operating temperature, operating pressure 4) Meter connection method and size 5) Connection flange type and antenna material (standard: SUS304, option: SUS316, PTFE, PVDF) 6) Antenna body material (SUS304, SUS316, PTFE) 7) Tank shape and size: W, D, H 8) Tank nozzle (connection single pipe) size 9) Wire connector size (M20 X 1.5 or 1/2" NPT) 10) Additional options and caveats

Delivery Performance ~ 125 EA

Enduser	Application	Model
Gyeongine Corporation		**KC-2021R**
Daeshin Plant Co., Ltd.		**KC-2021R**
Daegu Facility Management Corporation		**KC-2021R**
Daegu Flood Management System		**KC-2021R**
Dongyang Cement		**KC-2021R**
Yuhan Chemical		**KC-2021R**
Inseong Industry		**KC-2021R**
ILJIN Material		**KC-2021R**
Asia Paper		**KC-2021R**
Samsung Corning		**KC-2021R**
Shinsung Ascon		**KC-2021R**
Jeil Feed		**KC-2021R**
Hyundai Cement		**KC-2021R**
Hyundai Steel		**KC-2021R**
Hyundai Environment		**KC-2021R**
Hwaseung Industry		**KC-2021R**
Posco		**KC-2021R**
Posce Steel		**KC-2021R**
Posco Comtech		**KC-2021R**
JNC		**KC-2021R**
KCC		**KC-2021R**
Rural Community Corporation		**KC-2021R**

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water quality analyzer/TMS
professional manufacturing

Distributer

Certified in accordance with

KC Q ISO 9001 : 2015

KC Q ISO 14001 : 2015

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