Brief Introduction

TJL series Radar Level Meter adopts advanced system of Microwave Process technology. Extremely short microwave pulses are emitted by the antenna system in the direction of the measured product, reflected by the product surface and received back again by the antenna system. They propagate at the speed of light. The time from emission to reception of the signals is proportional to the level in the vessel.

Product Features

26GHz Microwave Processing Technology

- **Short angular beam-width, Strong anti-interference;**
- **Short wavelength, Strong penetrability;**
- **Short blind section, specialized in measurement with small range;**
- **TCRDSKL Technology, Fast Processing Speed;**
- **Stable Performance of Output;**
- **Wide Range of Application;**
- **Ex Approved**

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Overview

TJL815

TJL816

TJL817

Microwave Frequency	26GHz	26GHz	26GHz
Antenna/Material	PTFE	316L/PTFE	PTFE
Process fitting	Thread G1 $^{1/2}$A	Thread G1 $^{1/2}$A, 1$^{1/2}$NPT, Flange	Flange
Seal Part/Process temperature	Viton/-40~150℃ FFPM/-20~250℃ Graphite/-60~400℃	Viton/-40~150℃ FFPM/-20~250℃ Graphite/-60~400℃	Viton/-40~150℃ FFPM/-20~250℃ Graphite/-60~400℃
Process Temperature	-40~130℃	-40~130℃ /-60~250℃	-40~150℃
Process Pressure	-0.1~0.3MPa	-0.1~4MPa	-0.1~0.5MPa
Accuracy	±5mm	±3mm	±3mm
Signal output	24VDC 2-wire/4-20mA 24VDC 4-wire/4-20mA 220VAC 4-wire/4-20mA	24VDC 2-wire/4-20mA 24VDC 4-wire/4-20mA 220VAC 4-wire/4-20mA	24VDC 2-wire/4-20mA 24VDC 4-wire/4-20mA 220VAC 4-wire/4-20mA
Measuring Range	10m	30m	20m

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TJL818

TJL819

Microwave Frequency	26GHz	26GHz
Antenna/Material	316L	316L/PTFE
Process fitting	Thread G1 $^{1/2}$A	Thread G1 $^{1/2}$A, 1$^{1/2}$NPT, Flange
Seal Part/Process temperature	Viton/-40~150℃ FFPM/-20~250℃ Graphite/-60~400℃	Viton/-40~150℃ FFPM/-20~250℃ Graphite/-60~400℃
Process Temperature	-40~130℃ -60~250℃	-40~130℃ -60~250℃
Process Pressure	-0.1~4MPa	-0.1~4MPa
Accuracy	±15mm	±15mm
Signal output	24VDC 2-wire/4-20mA 24VDC 4-wire/4-20mA 220VAC 4-wire/4-20mA	24VDC 2-wire/4-20mA 24VDC 4-wire/4-20mA 220VAC 4-wire/4-20mA
Measuring Range	10m	30m

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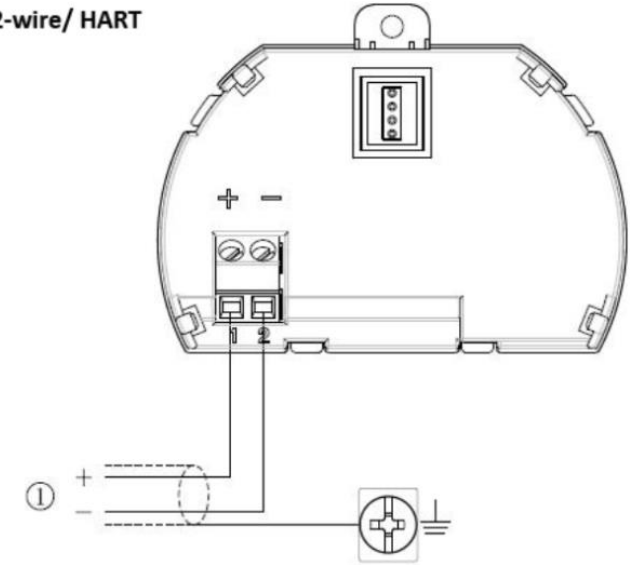
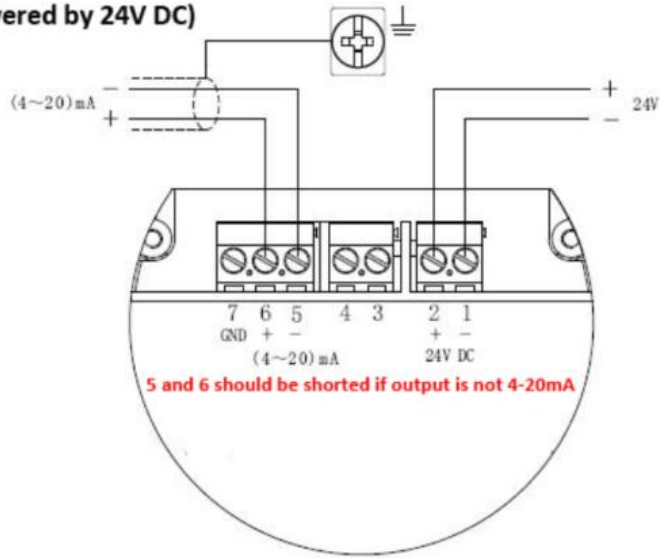
Electric Connection

4-20mA/HART: twin-core cable should be shared by both power-line and output-line. For Intrinsically safe Type, safety barrier should be applied power supply and the instrument.
4-20mA/HART: twin-core cable should be applied by power-line and output-line separately.
Normal twin-core cable for power-line is available. outer diameter of the cable: 5-9mm. The joint of the cable should be sealed. If the electromagnetic interference exist, please use shielded-cable
Shielded-cable(GND): the ends of the shielded-cable should be GND. Inside the instrument, the shielding layer should be connected to the GND-Terminal. The GND-Terminal outside the enclosure should be ground-connected.

2-wire/ HART



4-wire (powered by 24V DC)



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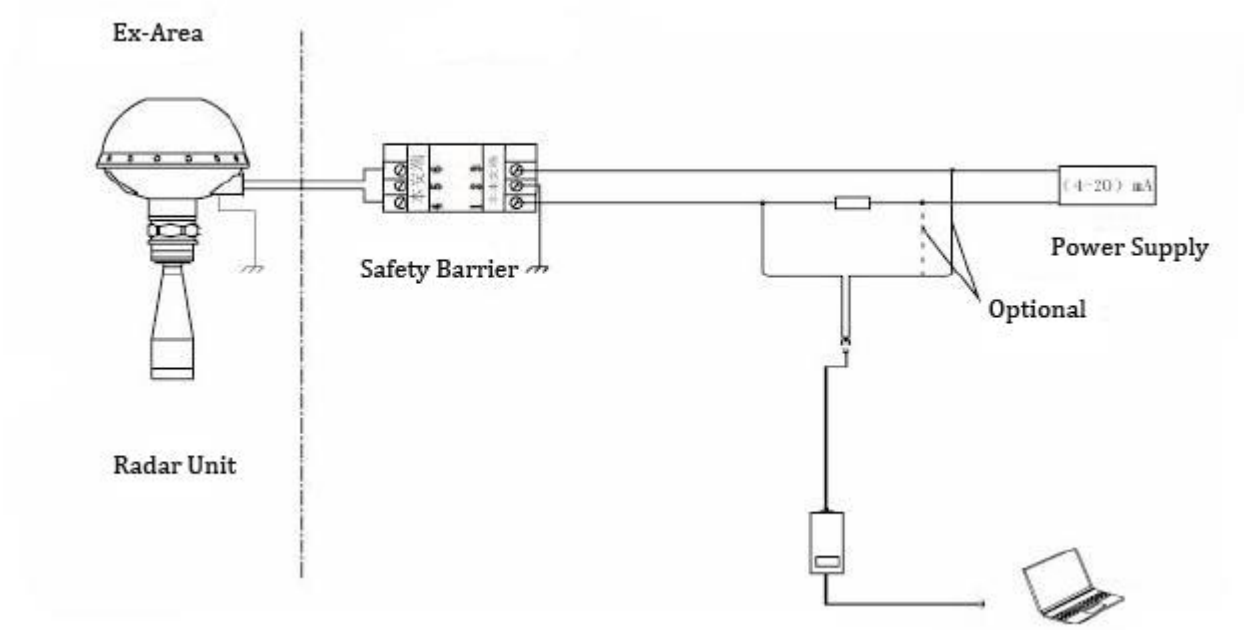
Ex-proof connection

Parameter: Ui：28VDC，Li：93mA，Pi：0.65W，Ci：0uF，Li:0mH



Intrinsic safety, Explosion-proof

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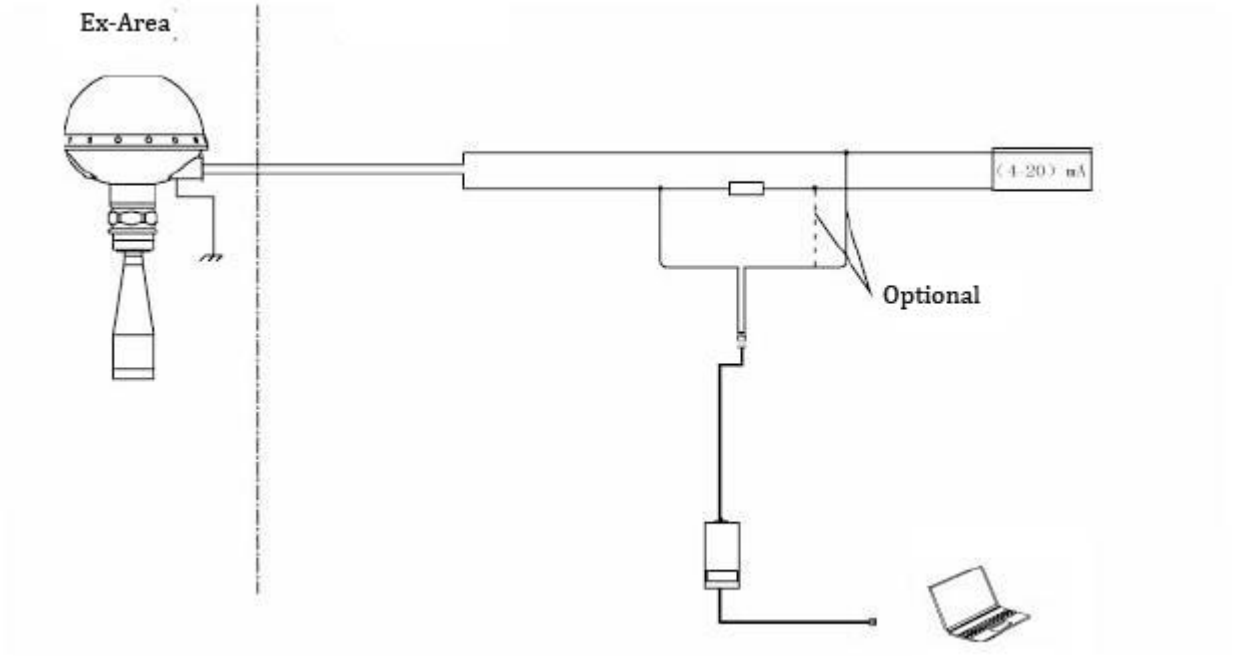

Intrinsic safety , EXd

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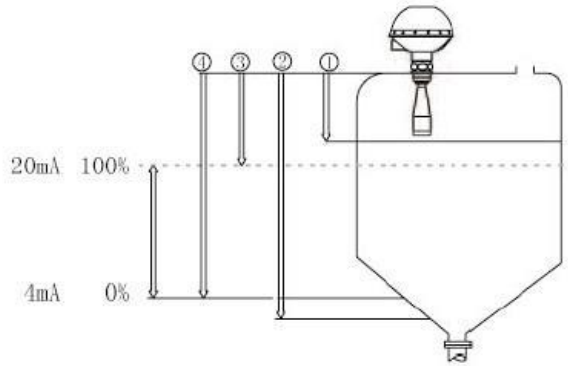
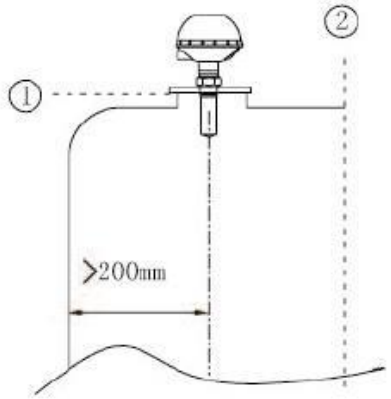
Installation

Please pay attention to the emission angle during the emission of microwave
During the installation, please pay attention to the object which may be covered by the microwave
The distance between the shell wall and the radar instrument shall be kept.
The Max. level of the object should not be over the blind section.
The Antenna of the Radar Instrument should be vertical hold.
The GND contact is necessary if Ex-proof Type is applied



1. Blind Area
2. Measuring Range
3. Upper Adjustment Range
4. Lower Adjustment Range



Please pay attention to the distance between the antenna and the tank wall (＞200mm)

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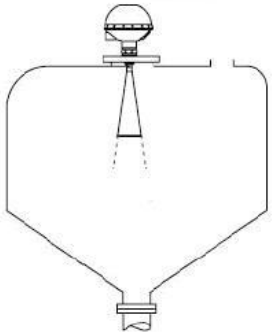
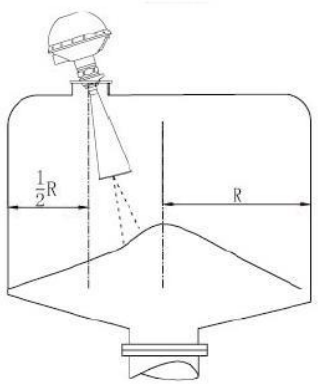


For Conical Tank, please keep the antenna to be installed in the central position



Multi-Direction Type

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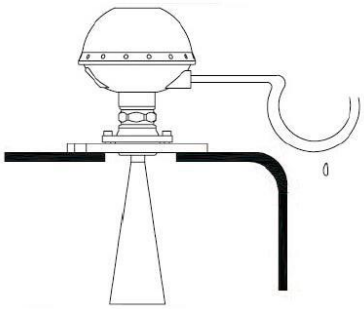
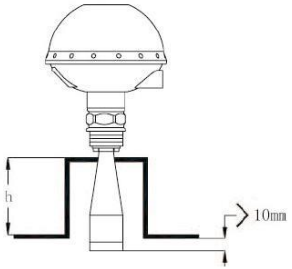
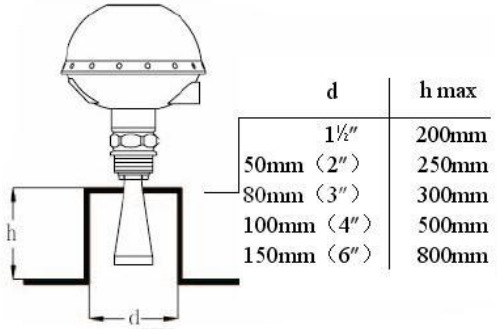


Please apply the 5-9mm cable if the radar unit is applied in the condition of high-humidity. And make sure the sealed joint is fixed. Bend the cable refer to the illustration shown



The bottom of the antenna should be 10mm lower than the install-pipe



d	h max
1½″	200mm
50mm（2″）	250mm
80mm（3″）	300mm
100mm（4″）	500mm
150mm（6″）	800mm

The bottom of the antenna should be 10mm lower than the install-pipe. If the media measured has good reflection-character, the length of the antenna can be lower. In this condition, please make sure that the bottom of the install tube should be horizontally straight and smooth. The data is for reference.

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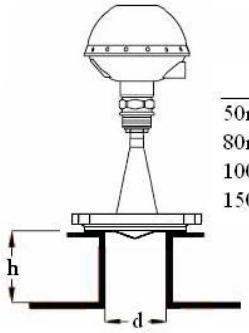
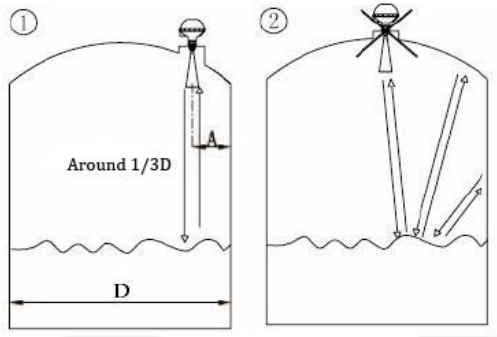


d	h max
50mm（2″）	100mm
80mm（3″）	150mm
100mm（4″）	250mm
150mm（6″）	400mm

The bottom of the antenna should be 10mm lower than the install-pipe. If the media measured has good reflection-character, the length of the antenna can be lower. In this condition, please make sure that the bottom of the install tube should be horizontally straight and smooth. The data is for reference.



Please keep the distance between the radar unit and the tank wall. Please note that "A" should be around 1/3D

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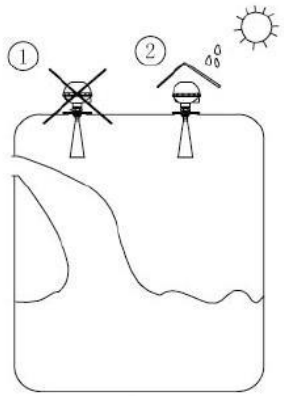
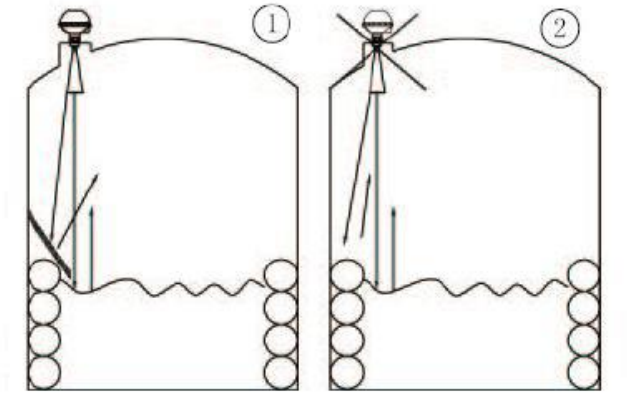


Keep the distance between the radar unit and the "feed-point"
If necessary, please apply shelter if the radar unit is installed outside



If there is metal object influence the wave emitted, please apply metal board.

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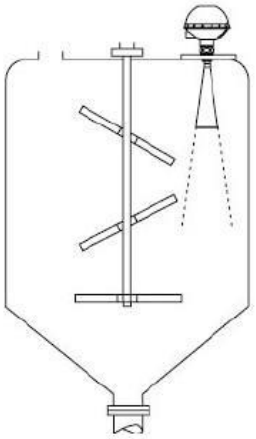
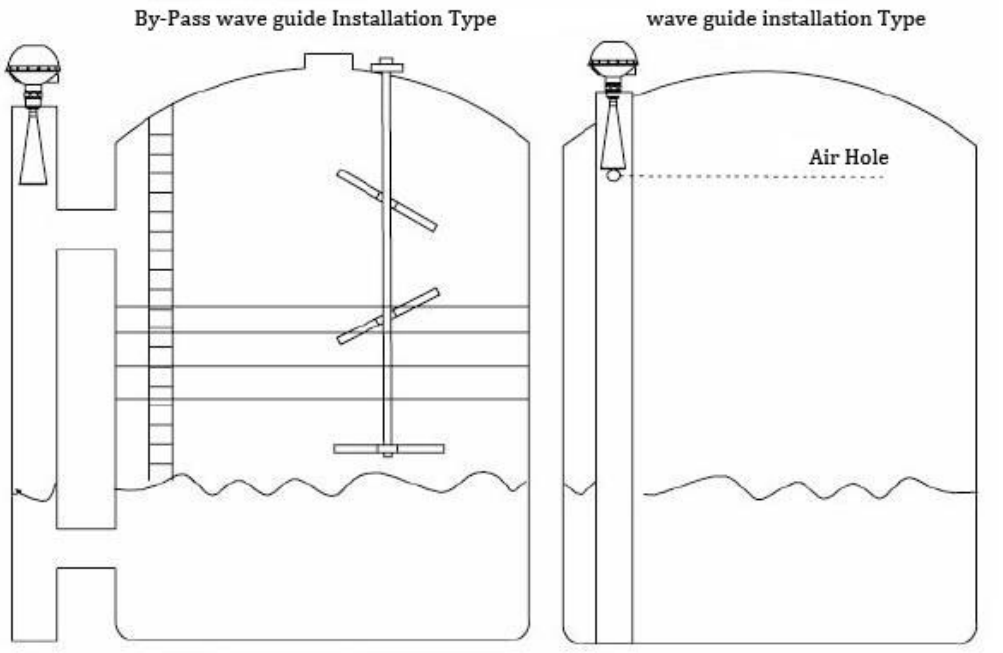


As for the Mixing Tank, the position of the mixer should be taken into consideration. After the installation, spurious-signal should be stored and marked in order to eliminate the effect of the mixer.



As for the mixing tank or other process condition where the signal may be effected by the foam on the surface of the media, please apply "wave guide" tube. The diameter of the "wave guide tube" should be more than 50m. Please make sure that the inner tube wall is smooth. And spurious-signal should be stored.

1. Diameter of the air hole should be 5-10mm

2. If the media is viscous, wave guide tube is not available

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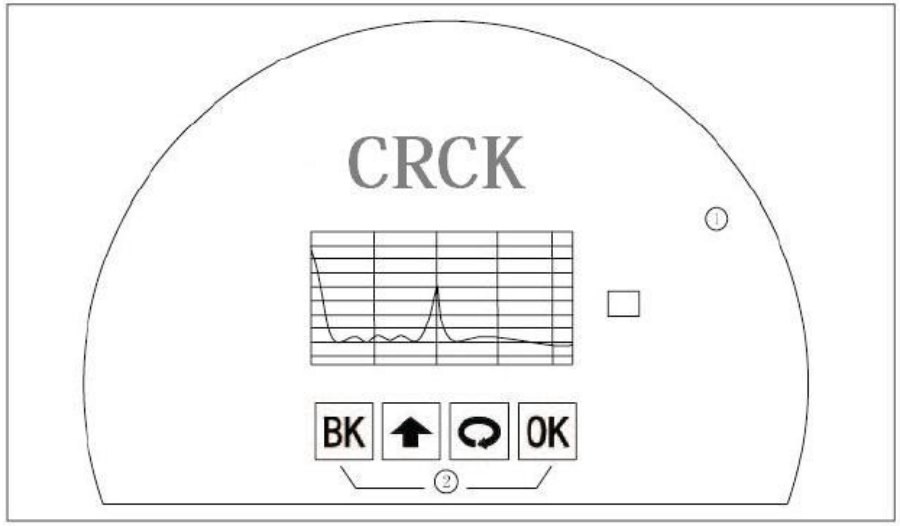
Debugging

Solution
1. Button Operation
2. By Software
3. Potable Hart Data Logger

Button Operation



【OK】
-Enter Menu
-Confirm Item
-Confirm Setting

【↻】
-Select Item
-Select Parameter adjusted
-Show Parameter

【↑】
-Adjust Data

【BK】
-Quit
-Back

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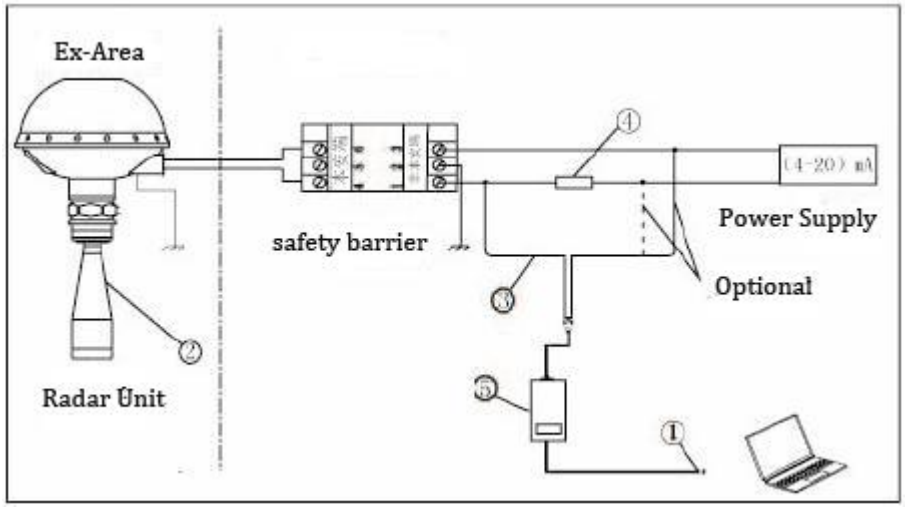
By Host computer



1. RS232 interface/USB interface
2. Radar Unit
3. Hart adapter for the application of COMWAY convertor
4. 250Ω resistance
5. COMWAY convertor

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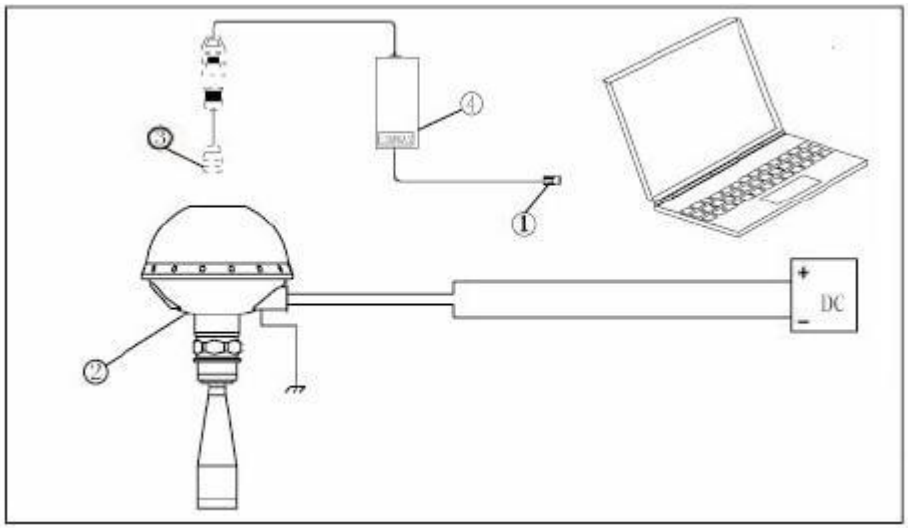
I²C Connection with Host computer



1. **RS232 interface/USB interface**
2. **Radar Unit**
3. **Hart adapter for the application of COMWAY convertor**
4. **COMWAY convertor**

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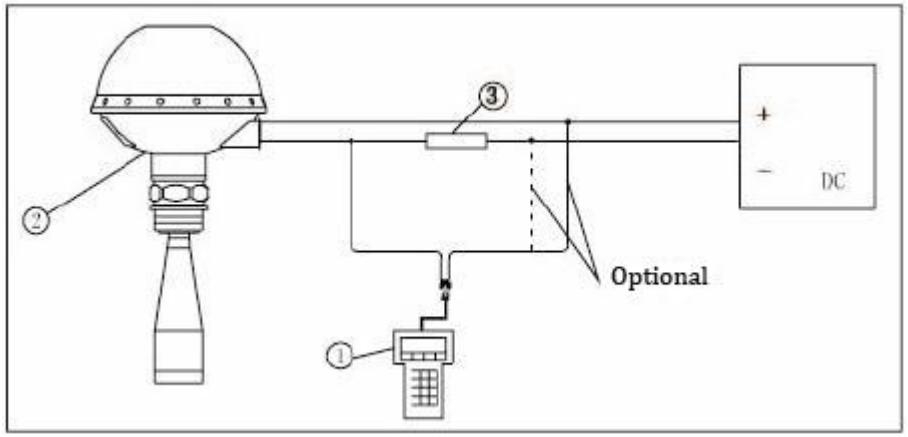
Potable Hart Data Logger



1. Hart Potable Data Logger
2. Radar Unit
3. 250Ω resistance

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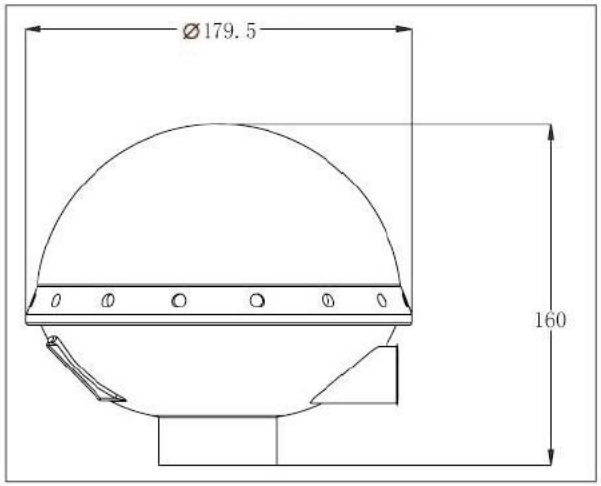
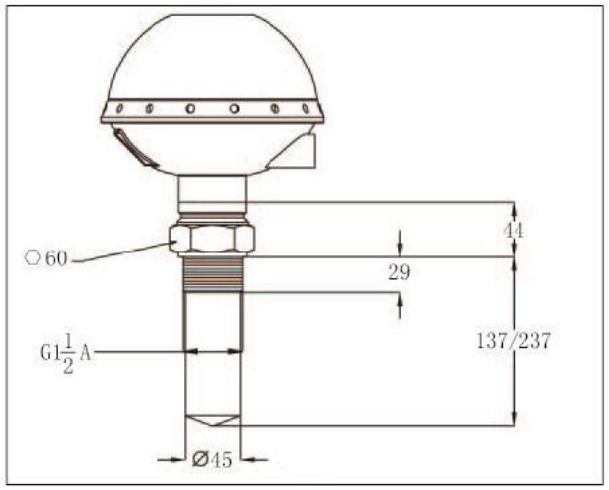
Outline Structure



Enclosure

Material: PBT/AL/316L



Thread Connection

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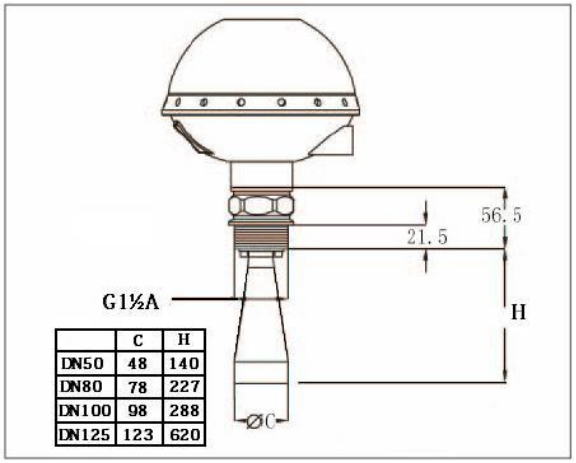
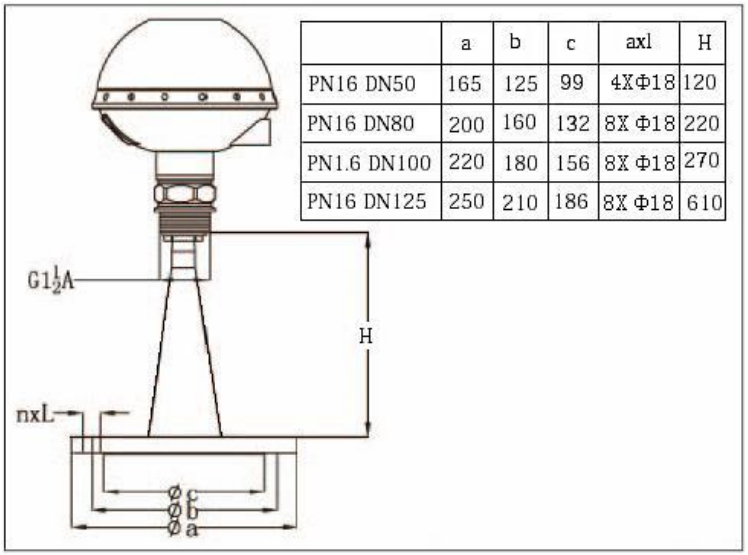


	C	H
DN50	48	140
DN80	78	227
DN100	98	288
DN125	123	620

Thread Connection



	a	b	c	axl	H
PN16 DN50	165	125	99	4XΦ18	120
PN16 DN80	200	160	132	8X Φ18	220
PN1.6 DN100	220	180	156	8X Φ18	270
PN16 DN125	250	210	186	8X Φ18	610

Flange Installation

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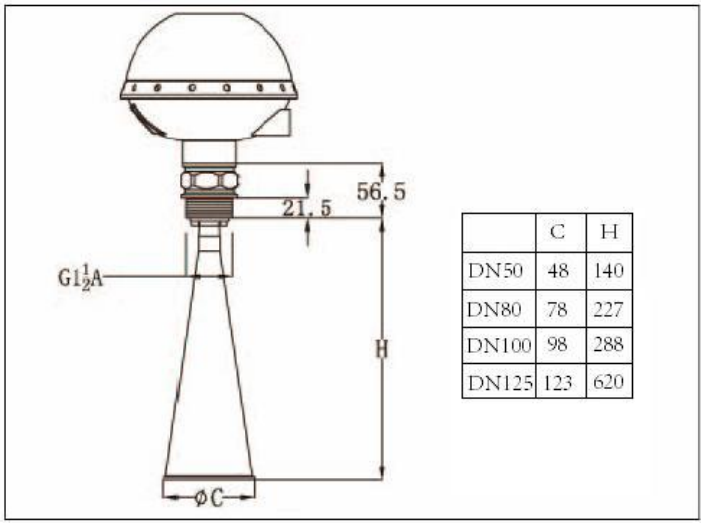
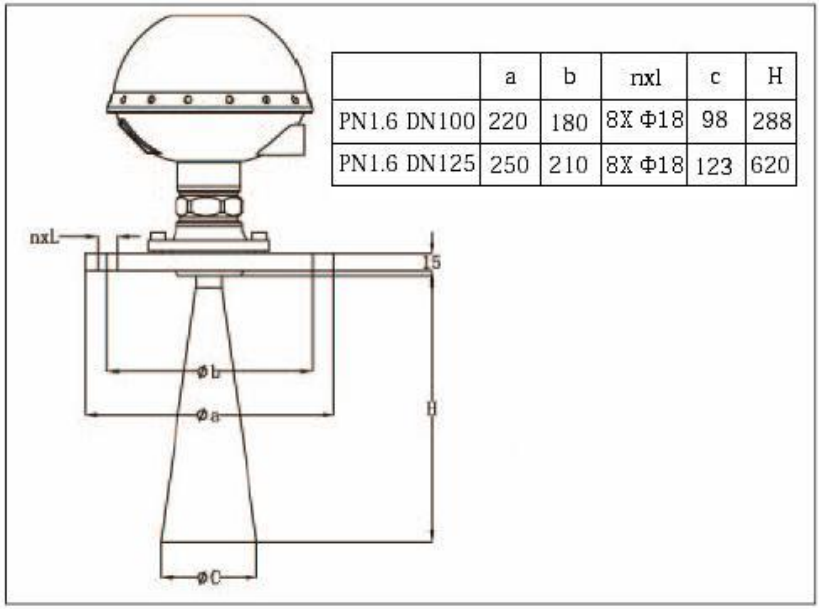
Thread Connection



	C	H
DN50	48	140
DN80	78	227
DN100	98	288
DN125	123	620

Multi-Direction Type



	a	b	nxl	c	H
PN1.6 DN100	220	180	8X Φ18	98	288
PN1.6 DN125	250	210	8X Φ18	123	620

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Technical Parameter

General Information

Model	TJL815	TJL816	TJL817	TJL818	TJL819
Process Connection	G1½A, Thread	G1½A, Thread		G1½A, Thread	G1½A, Thread
		1½NPT, Thread		1½NPT, Thread	1½NPT, Thread
		Flange	Flange	Flange	Flange
Material of the Antenna	PTFE	316L/PTFE	PTFE	316L/PTFE	316L/PTFE
Weight for Reference (kg)	2	3	4	7	7
Max Measuring Range (m)	10	30	20	80	30
Frequency	26GHz	26GHz	26GHz	26GHz	26GHz
Measuring Interval (adjustable)	＞1s	＞1s	＞1s	＞1s	＞1s
Storage Temperature	-40~80℃	-40~80℃	-40~80℃	-40~80℃	-40~80℃
Resolution of Display	1mm	1mm	1mm	1mm	1mm
Process Temperature	-40~130℃	-40~200℃	-40~150℃	-40~200℃	-40~60℃
Working Humidity	＜95%	＜95%	＜95%	＜95%	＜95%
Working Pressure	Max.4MPa	Max.4MPa	Max.4MPa	Max.4MPa	Max.4MPa
Vibration Resistance	10m/s2,(10~150)Hz	10m/s2,(10~150)Hz	10m/s2,(10~150)Hz	10m/s2,(10~150)Hz	10m/s2,(10~150)Hz

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Material	**Enclosure**	**Sealed Part (Enclosure)**	**GND Terminal**
	Aluminum/ plastic/316L	Silicone Rubber	Stainless Steel
Power Supply	2-Wire	Standard Type	16~36V DC
		Intrinsic Safety	21.6~26.4V DC
		Power Consumption	max.22.5mA
		Ripple Allowed	—＜100Hz , Uss＜1V
			—(＜100~＜100K)Hz, Uss＜10mV
	4-Wire	Intrinsic Safety & EXd	21.6~26.4V DC，198~242V AC
		Power Consumption	max.1VA,1W
Cable	Cable Entry/Plug	M20x1.5	
	Diameter of the Cable	5~9mm	
	Spring Terminal Block	cross section of the cable	2.5mm
Output	Signal	4~20Ma/HART	
	Resolution	1.6Ua	
	Fault Signal	20.5mA；22mA；3.9mA	
	2-wire Load Resistance	See the illustration	
	4-wire Load Resistance	≤500Ω	
	Integral Time	0~99s，adjustable	

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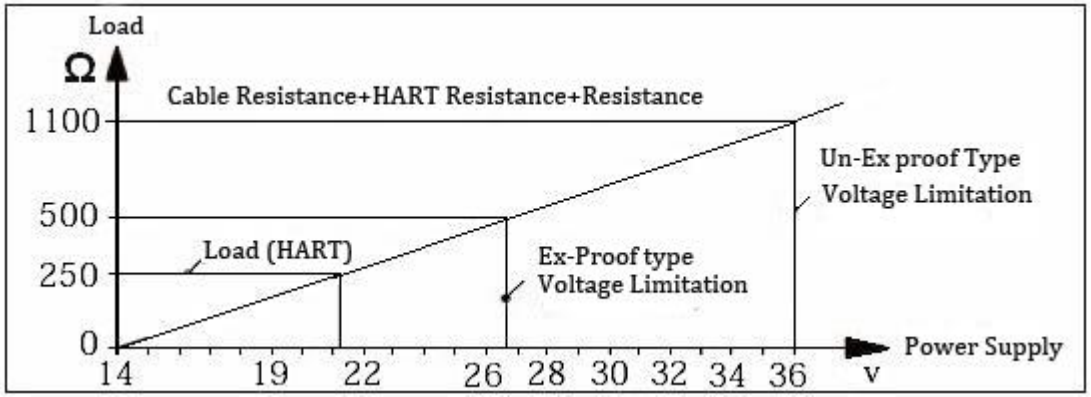
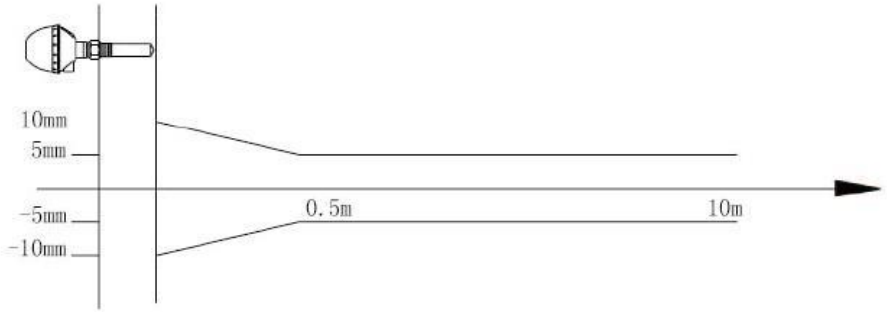
2-wire Load Resistance



Precision Graph Recorder

TJL815	*3dB emission angle*	*22 °*



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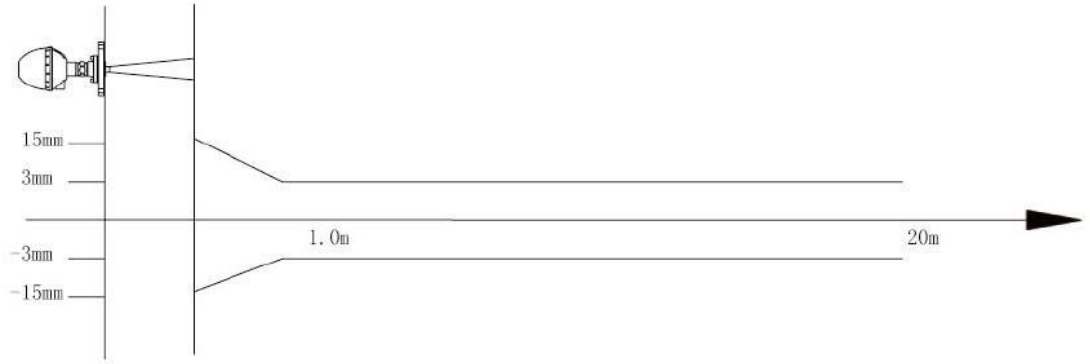
TJL816	*Specification of the Antenna*	*3dB emission angle*
	Φ48mm	*18°*
	Φ78mm	*12°*
	Φ98mm	*8°*



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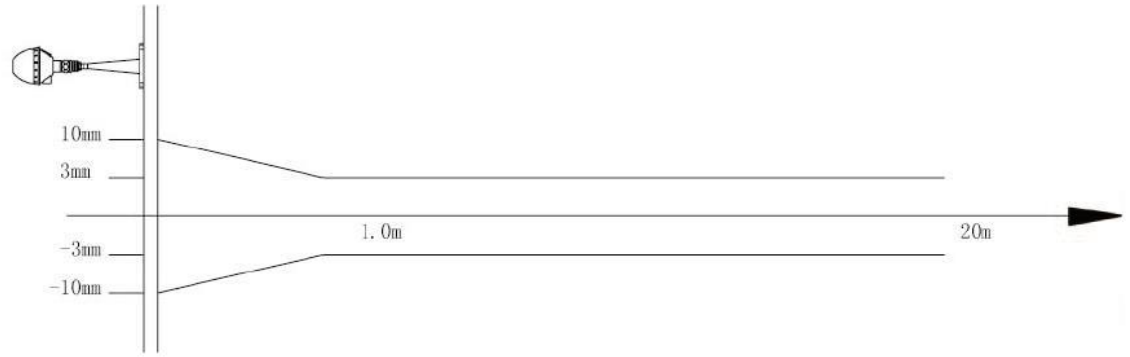
TJL817	*Specification of the Antenna*	*3dB emission angle*
	DN50 Flange	*18°*
	DN50 Flange	*12°*
	DN50 Flange	*8°*



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TJL818	*Specification of the Antenna*	*3dB emission angle*
	Φ48mm	*18°*
	Φ78mm	*12°*
	Φ98mm	*8°*
	Φ123mm	*6°*

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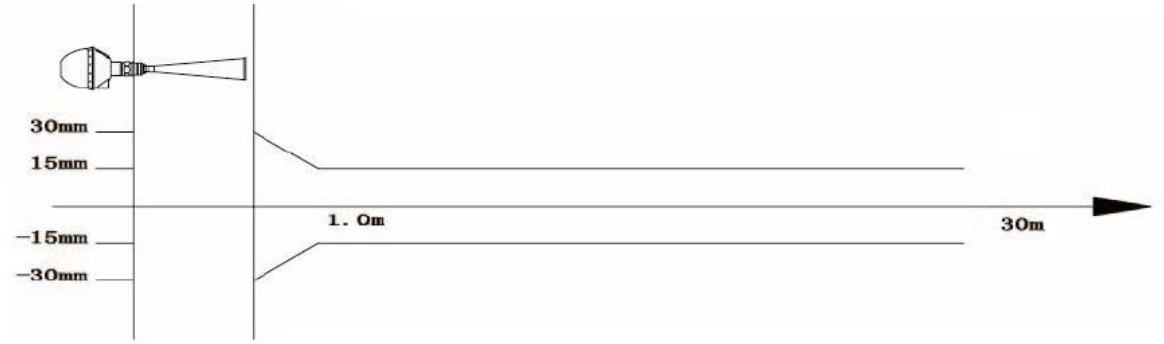
TJL819	*Specification of the Antenna*	*3dB emission angle*
	Φ48mm	*18°*
	Φ78mm	*12°*
	Φ98mm	*8°*
	Φ123mm	*6°*



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Order Guide

TJL815

Approval			
P	Standard Type (Un-Ex Proof)		
I	Exia IICT6		
C	Exia IICT6 (boat)		
G	Exd [ia] ia IICT6		
Antenna Type / Material / Process Temperature			
RP	R-Type Seal , Stick Type / PP / -40~80℃		
RF	R-Type Seal , Stick Type / PTFE / -40~130℃		
Process Connection			
GP	G1 1/2A		
NP	1/2NPT		
FA	DN50 Flange (PTFE)		
FX	As required		
(Optional) Flange / Material			
DN50	PA (PP)	FA (PTFE)	QA (Stainless Steel)
DN80	PB (PP)	FB (PTFE)	QB (Stainless Steel)
DN100	PC (PP)	FC (PTFE)	QC (Stainless Steel)
Draft Tube Length			
A	100mm		
B	200mm		
Electrical Characteristic			

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B	(4~20)ma / (22.8~26.4)VDC HART, 2-wire
C	(4~20)mA / (22.8~26.4)VDC / Modbus, 4-wire
D	(198~242)V AC / Modbus, 4-wire
Enclosure/ Class of Protection	
L	Aluminum / IP67
P	Plastic / IP66
Q	316L / IP67
Electrical Connection	
M	M20x1.5
N	1/2 NPT
LCD Display	
B	With LCD
X	Without LCD

Add: No.229, Daqing Rd, Lianhu Dist, Xi'an, Shaanxi, China 710082
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TJL816

Approval			
P	Standard Type (Un-Ex Proof)		
I	Exia IICT6		
C	Exia IICT6 (boat)		
G	Exd [ia] ia IICT6		
Process Connection / Material			
QG	G1 1/2A / 304/316L		
QN	1 1/2NPT / 304/316L		
SG	G1 1/2A / 304/316L		
XX	As required		
(Optional) Flange / Material			
DN50	PA (PP)	FA (PTFE)	QA (Stainless Steel)
DN80	PB (PP)	FB (PTFE)	QB (Stainless Steel)
DN100	PC (PP)	FC (PTFE)	QC (Stainless Steel)
DN125	PD (PP)	FD (PTFE)	QD (Stainless Steel)
DN150	PE (PP)	FE (PTFE)	QE (Stainless Steel)
F0	null	FX (PTFE)	As required
Antenna Type / Material			
Φ48mm Horn antenna	TA (316L)		
Φ78mm Horn antenna	TB (316L)		
Φ98mm Horn antenna	TC (316L) SC (PP) with PTFE cover		
Φ123mm Horn antenna	TA (316L) SD (PP) with PTFE cover		
XX	As required		

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Seal / Process Temperature	
1	Viton (-60~150)℃
2	Kalrez (-60~250)℃
3	Graphite (-60~400)℃
Electrical Characteristic	
B	(4~20)ma / (22.8~26.4)VDC HART, 2-wire
C	(4~20)mA / (22.8~26.4)VDC / Modbus, 4-wire
D	(198~242)V AC / Modbus, 4-wire
Enclosure/ Class of Protection	
L	Aluminum / IP67
P	Plastic / IP66
Q	316L / IP67
Electrical Connection	
M	M20x1.5
N	1/2 NPT
LCD Display	
B	With LCD
X	Without LCD

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TJL817

Approval	
P	Standard Type (Un-Ex Proof)
I	Exia IICT6
C	Exia IICT6 (boat)
G	Exd [ia] ia IICT6
Antenna Material / Process Temperature	
A	(U Type)Stainless Steel + PTFE DN50 Flange
B	(U Type)Stainless Steel + PTFE DN80 Flange
C	(U Type)Stainless Steel + PTFE DN100 Flange
X	As required
Electrical Characteristic	
B	(4~20)ma / (22.8~26.4)VDC HART, 2-wire
C	(4~20)mA / (22.8~26.4)VDC / Modbus, 4-wire
D	(198~242)V AC / Modbus, 4-wire
Enclosure/ Class of Protection	
L	Aluminum / IP67
P	Plastic / IP66
Q	316L / IP67
Electrical Connection	
M	M20x1.5
N	1/2 NPT
LCD Display	
B / X	With LCD / Without LCD

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TJL818

Approval				
P	Standard Type (Un-Ex Proof)			
I	Exia IICT6			
C	Exia IICT6 (boat)			
G	Exd [ia] ia IICT6			
Process Connection / Material				
QG	G1 1/2A / 304/316L			
QN	1 1/2NPT / 304/316L			
SG	G1 1/2A / 304/316L			
XX	As required			
(Optional) Flange / Material				
DN80	PB (PP)	FB (PTFE)	QB (Stainless Steel)	EB (Multi-Direction)
DN100	PC (PP)	FC (PTFE)	QC (Stainless Steel)	EC (Multi-Direction)
DN125	PD (PP)	FD (PTFE)	QD (Stainless Steel)	ED (Multi-Direction)
F0	null	FX (PTFE)	As required	As required
Antenna Type / Material				
TB	Φ78mm Horn Antenna / 316L			
TC	Φ98mm Horn Antenna / 316L			
TD	Φ123mm Horn Antenna / 316L			
VC	Φ98mm Horn Antenna / 316L (with PTFE cover)			
VD	Φ123mm Horn Antenna / 316L (with PTFE cover)			
WF	Φ198mm Paraboloid Antenna / 316L			
WG	Φ248mm Paraboloid Antenna / 316L			

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XX	As required
Seal / Process Temperature	
1	Viton (-60~150)℃
2	Kalrez (-60~250)℃
3	Graphite (-60~400)℃
Electrical Characteristic	
B	(4~20)ma / (22.8~26.4)VDC HART, 2-wire
C	(4~20)mA / (22.8~26.4)VDC / Modbus, 4-wire
D	(198~242)V AC / Modbus, 4-wire
Enclosure/ Class of Protection	
L	Aluminum / IP67
P	Plastic / IP66
Q	316L / IP67
Electrical Connection	
M	M20x1.5
N	1/2 NPT
LCD Display	
B	With LCD
X	Without LCD

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TJL819

Approval				
P	Standard Type (Un-Ex Proof)			
I	Exia IICT6			
C	Exia IICT6 (boat)			
G	Exd [ia] ia IICT6			
Process Connection / Material				
QG	G1 1/2A / 304/316L			
QN	1 1/2NPT / 304/316L			
SG	G1 1/2A / 304/316L			
XX	As required			
(Optional) Flange / Material				
DN80	PB (PP)	FB (PTFE)	QB (Stainless Steel)	EB (Multi-Direction)
DN100	PC (PP)	FC (PTFE)	QC (Stainless Steel)	EC (Multi-Direction)
DN125	PD (PP)	FD (PTFE)	QD (Stainless Steel)	ED (Multi-Direction)
F0	null	FX (PTFE)	As required	As required
Antenna Type / Material				
TB	Φ78mm Horn Antenna / 316L			
TC	Φ98mm Horn Antenna / 316L			
TD	Φ123mm Horn Antenna / 316L			
VC	Φ98mm Horn Antenna / 316L (with PTFE cover)			
VD	Φ123mm Horn Antenna / 316L (with PTFE cover)			
WF	Φ198mm Paraboloid Antenna / 316L			
WG	Φ248mm Paraboloid Antenna / 316L			

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XX	As required
Seal / Process Temperature	
1	Viton (-60~150)℃
2	Kalrez (-60~250)℃
3	Graphite (-60~400)℃
Electrical Characteristic	
B	(4~20)ma / (22.8~26.4)VDC HART, 2-wire
C	(4~20)mA / (22.8~26.4)VDC / Modbus, 4-wire
D	(198~242)V AC / Modbus, 4-wire
Enclosure/ Class of Protection	
L	Aluminum / IP67
P	Plastic / IP66
Q	316L / IP67
Electrical Connection	
M	M20x1.5
N	1/2 NPT
LCD Display	
B	With LCD
X	Without LCD

SCHEDULED WORKING TIME

Morning	*Afternoon*
8:00 - 12:00	**13:30 - 17:30**

*** One relax hour must always be foreseen ***

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