Data sheet DS/MT5000-EN Rev. K 05.2012

MT5000
Guided Wave Radar Level Transmitters

State-of-the-art loop powered, 4-20 mA output guided wave radar transmitter for liquid level applications
K-TEK Products

Features
- Graphic Display with Waveform Screen
- Widest Selection of Wetted Materials
- Radar Signal Travels Along the Waveguide –
- Eliminates False Echoes and Minimizes Signal Loss
- No Moving Parts
- Linearization Table
- Lengths from 1 to 200 ft. / 0.3 to 61 meters
- Rigid, Flexible Cable & Coaxial Probes
- All Digital Electronics

Options
- HART Protocol
- Glass Viewing Window
- 316L Stainless Steel Enclosure
- MODBUS
- Foundation Fieldbus

Accessories
- K-COM™ Communications Software
- External Chambers
- Stilling Wells
- Loop Indicators

Power and productivity for a better world™

SPECIFICATIONS

Housing	Dual Compartment Powder Coated Aluminum or Stainless Steel
Electrical Connection	1/2” FNPT or M20
Power	13.5 – 36 VDC, Standard; 9-32 VDC Foundation Fieldbus; 10 - 18 VDC MODBUS
Wiring	Standard and Foundation Fieldbus - 2 wire MODBUS - 4 wire plus shield (2 power, 2 data - half duplex)
Output	Single 4-20 mA, HART, Foundation Fieldbus (ITK 5.0.1), MODBUS (RTU or ASCII)
Graphic Display	Field Selectable Units in Feet, Inches, Millimeters, Centimeters, Meters or Percentage and Waveform Screens
Accuracy	+/- 0.1 in / 3mm for coaxial probes*, +/- 0.2 in / 5 mm for all other configurations
Resolution	+/- 0.063 in / 1.6 mm
Repeatability	0.1 in. / 3 mm *
Range	1 to 200 ft. / 0.3 to 61 meters
Process Connection	3/4” NPT Standard
Sensor Material	316L SS Standard, Other Materials Optional

Process Pressure	Up to 5000 psi (344 bar)
Process Temperature	Up to 800°F (427°C)
Dielectric Constant	Minimum 1.4
Process Max Viscosity	1500 cp

Approvals

Factory Mutual Research Corporation

XP-IS / I / 1 / ABCD / T6	Ta = 77ºC
DIP / II, III / 1 / EFG / T6	Ta = 77ºC
IS / I / 1 / ABCD / T4	Ta = 77ºC - ELE1034
NI / I / 2 / ABCD / T4	Ta = 77ºC
S / II,III / 2 / FG / T4	Ta = 77ºC

ANI / I / 2 / ABCD / T4 - ELE1034
Type 4X

Canadian Standards Association
XP CL 1, DIV 1, GP ABCD; CL 2, DIV 1, GP EFG; CL 3 - T6
CL 1, DIV 2, GP ABCD; CL 2, DIV 2, GP EFG - T5
IS CL 1, DIV 1, GP CD; CL 2, DIV 1, GP EFG - T4
- when installed per ELE1034
Type 4X

* based on non-changing dielectric constant.
May require use of included Linearization Table

UKRSEPRO
1ExdiaIICT6; 0ExiaIIBT4

IEC International Electromechanical Commission
IECEx ITS 08.0036X
II 1/2 G/D
Ex ia IIB T4 (-40°C ≤ TAMB ≤ 66°C)
Ex iaD 20/21 IP6X T80°C (-40°C ≤ 66°C)
IECx ITS 08.0037X
Ex ia d IIC T4
Ex iaD tD 20/A21 IP6X T80°C

ATEX
ITS 08ATEX25865X
II 1/2 G/D
Ex ia IIB T4 (-40°C ≤ Tamb ≤ 66°C)
Ex iaD 20/21 IP6X T80°C (-40°C Tamb ≤ 66°C)
ITS08 ATEX15870X
II 1/2 G/D Ex ia d IIC T6
Ex tD 20/A21 IP6X T80°C

0575
0871

ORDERING INFORMATION

MT5000 a/b/c/d/e/f/g/h/i/j/k

/a Probe Material

S6	316L Stainless Steel Standard
S4	304L (Rigid Probe Only)
HC	Hastelloy C-276 (Rigid Probes Only, P43 probe HSC-270)
HB	Hastelloy B3 (Rigid Probes Only)
MO	Monel
TI	Titanium (Rigid Probes Only)
IN25	Inconel 625

/b Transmitter Configuration

L	Local Transmitter Standard
LW	Local Transmitter with Window Cover Standard
R	Remote Mounted Electronics with 5 ft. Cable (Dielectric > 35)
RW	Remote Mounted Electronics with Window Cover and 5 ft. Cable (Dielectric > 35)

/c Transmitter Housing

A	Dual Compartment Aluminum Housing Standard
S	Dual Compartment 316L Stainless Steel Housing

/d Process Connection / Waveguide Coupler

Cxxonn	**xx**	Process Connection & Waveguide Coupler **(Table 1)**
	o	Seal Code (no code required for C8 or C9) **(Table 2)**
	nn	Tri-clamp Size C6 & C7 Sanitary Couplers, NPT for C10 Coupler

/e Probe Type

X	**None**	
Pxxoo	**xx**	Probe Code **(Table 3)**
	oo	Sanitary Probe Finish (P41, P42 and P43 Sanitary Probes Only) 1F - 180 Grit 2F - 240 Grit EP - 240 Grit and Electro-polish

/f Probe Attachment

X	None
CDyyz-ww	Clamp On Centering Disk (Solid Rod Probes) Note: Rigid probes installed in stilling wells or external chambers require centering disk
CWyyz-ww	Clamp On Centering Weight (Cable Probes) Note: Cable probes require a centering weight or end fitting to stabilize bottom of cable
E	Eyelet (Cable Probes)

/g Process Temperature

H0	32 to 250ºF / 0 to 121ºC
H6	C1 thru C7 and C10 couplers: Above 250ºF / 121ºC or below 32ºF / 0ºC Electronics enclosure is extended 6” above process connection C8 and C9 couplers: Above 500ºF / 260ºC Extends electronics enclosure an additional 6” above process connection (Refer to **Table 1** for maximum and minimum process temperatures)

/h Electronic Module

X	None
M7A	One Level, Graphic Display , 4-20 mA Output, HART Add suffix “M” for MODBUS (not Intrinsically Safe) Add suffix “F” for Foundation Fieldbus

/i Select the Approval

X	None
FM	Factory Mutual Research Corporation and Canadian Standards Association
CEX	ATEX Flameproof
CEI	ATEX I.S.
IEI	International Electromechanical Commission I.S.
IEX	International Electromechanical Commission Flameproof
UKR	Ukraine SEPRO

/j Process Connection

P	Standard as shown on Probe Process Connection Table **(Table 1)**
FL	Loose flange or plug for use with probe NPT threads; Specify type, material and rating from Flange Designation Chart (SLG-0001-1)
WP	Welded process connection Specify type, material and rating from Flange Designation Chart (SLG-0001-1)

The Flange Designation Guide is available under Data Sheets on the MT5000 Product Page on ABB's Website (www.abb.com/level)

Welded Flanges 400# and above may require the use of an H6 extension.

/k Length

L	Insertion length from face of coupler in inches or millimeters. -12in / 305mm minimum - maximum based on probe type

Available Accessories:

M20 ISO Fitting: M20 Female Electrical Connection (Brass or Stainless Steel)

MM	Brass
MMS	Stainless Steel

DESCRIPTION

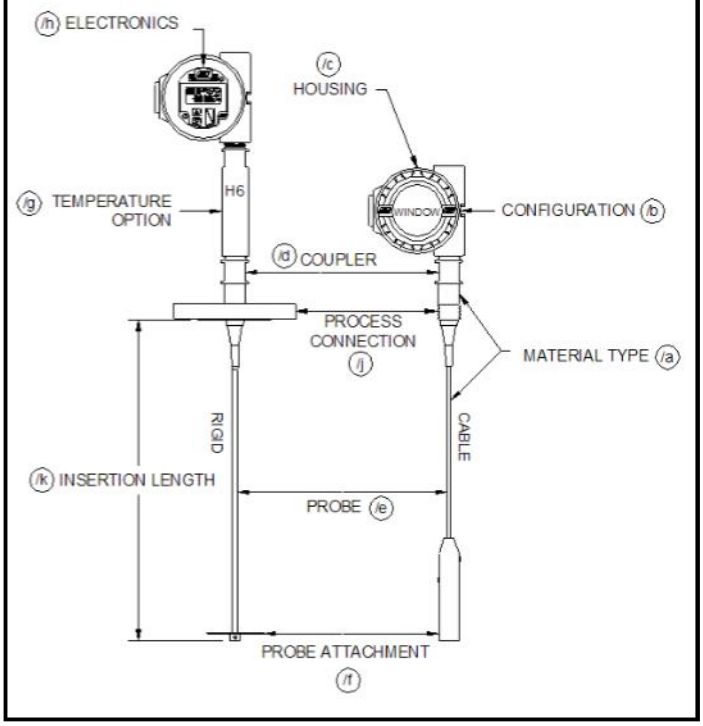


Table 1 - PROCESS CONNECTION / WAVEGUIDE COUPLER

Base Code[4]	Insulator	Process Connection	Seal Options Table 2	Maximum Pressure	Min Temp[6]	Max Temp[6]	Compatible Probes
SINGLE PROBE / COAXIAL PROBE							
C1o[1,2]	Teflon	3/4" NPT[8]	V, K E, A	1500 psi @ 100°F / 103 bar @ 38°C 600 psi @ 400°F / 41 bar @ 204°C	-60ºF -50ºC	400ºF 204ºC	P01, P03, P11, P51, P91[8]
C2o[1,2]		1.5" NPT					P02, P12, P43
C8 **(316SS only)**	Borosilicate Glass	1.5" NPT	Hermetic	5000 psi @ 100ºF / 344 bar @ 38ºC 1500 psi @ 800ºF / 103 bar @ 427ºC Not for Hot Water or Steam Service	-60ºF -50ºC	800ºF 427ºC	P11[9], P71 (316SS only)
C9 **(316SS only)**	Alumina Ceramic	1" NPT	Aegis	2000 psi @ 635ºF / 138 bar @ 335ºC	-60ºF -50ºC	635ºF 335ºC	P11[5], P81 (316SS only)
DUAL PROBE							
C4o[1,2]	Teflon	1.5" NPT	V, K E, A	1500 psi @ 100°F / 103 bar @ 38°C 600 psi @ 400°F / 41 bar @ 204°C	-60ºF -50ºC	400ºF 204ºC	P31
C5o[1,2]		2" NPT					P22, P32
TRI-TAPE PROBE							
C10on[1,2,7]	Teflon	2" or 3" NPT	V, K E, A	1500 psi @ 100°F / 103 bar @ 38°C 600 psi @ 400°F / 41 bar @ 204°C	-60ºF -50ºC	400ºF 204ºC	P34 (316SS only)
SANITARY PROBE							
C6onn[2,3]	Teflon	1.5" or larger Tri-Clamp	V, K E, A	50 psi / 13.4 bar	-60ºF -50ºC	400ºF 204ºC	P41, P43
C7onn[2,3]		2.5" or larger Tri-Clamp					P42, P43
CUSTOM							
CXo	Custom (Consult Factory)						

Notes:

1. Add the suffix "H" to the Base Code (example: /C1HV) to increase the maximum pressure to:
   3000 psi @ 100 F / 207 bar @ 38 C
   1200 psi @ 400 F / 83 bar @ 204 C
2. Add the suffix "S" to the Base Code to include a hermetic seal (example: /C4SV)
3. Tri-Clamp size "nn" as follows: 1.5" = 15, 2" = 20, 2.5" = 25, 3.0" = 30 (example: /C6V20)
4. o - Enter seal code from table 2 (example /C2V. Not required for /C8)
5. Requires installation in a stilling well or external chamber
6. Consult Table 2 for o-ring temperature specifications.
7. Thread size "n" as follows: 2" NPT = 2, 3" NPT = 3 (example: /C10V3)
8. The P91 probe has a 1" MNPT adjustable compression fitting equipped with Teflon ferrules as the standard process connection. The maximum process pressure utilizing the Teflon ferrules is 50 psi (3.4 bars).
9. Requires installation in a stilling well or external chamber - minimum L1 is 12"

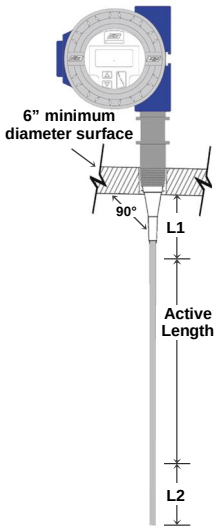
Table 2 - O-RING SEALS

Suffix	Description	Min. Temp	Max. Temp	Compatible With	Not Compatible With
V	Viton	-15ºF -26ºC	400ºF 204ºC	General Purpose, Ethylene	Ketones (MEK, Acetone), Skydrol Fluids, Amines, Anhydrous Ammonia, Low Molecular Weight Esters and Ethers, Hot Hydrofluoric or Chlorosulfuric Acids, Sour HCs
K	Kalrez	-40ºF -40ºC	400ºF 204ºC	Inorganic and Organic Acids to Include HH and Nitric, Aldehydes, Ethylene, Glycols, Organic Oils, Silicone Oils, Vinegar, Sour HCs, Amines, Ethylene Oxide, Propylene Oxide	Black Liquor, Hot Water, Hot Aliphatic Amines, Molten Sodium, Molten Potassium
E	EPDM	-60ºF -50ºC	250ºF 125ºC	Acetone, MEK, Skydrol Fluids, Anhydrous Ammonia	Petroleum Oils, Di-Ester Base Lubricants, Propane
A	Aegis	-14ºF -10ºC	572ºF 300ºC	Most Chemicals	Brake Fluid

Table 3 - PROBE TYPES				
Code	**O.D**	**Notes**	**Max Length**	**Attachment Options**
SINGLE RIGID ROD				
P01	0.25in (6mm)		10ft (3.05m)[1]	CD
P02	0.50in (13mm)		20ft (6.10m)[2]	
P03	0.375in (9mm)		10ft (3.05m)[1]	
SINGLE FLEXIBLE CABLE				
P11	0.1875in (5mm)		100ft (30.5m)[3]	CD, CW, E
P12	0.25in (6mm)			
DUAL RIGID ROD				
P22	0.50in (13mm)		30ft (9.14m)	CD
DUAL FLEXIBLE CABLE				
P31	0.1875in (5mm)		100ft (30.5m)	CW
P32	0.25in (6mm)			
TRI-TAPE				
P34	2.00in (51mm)	316SS only	50ft (15.24m)	CW (included)
SANITARY RIGID ROD				
P41	0.25in (6mm)	Finish Options: 1F - 180 Grit Finish (std) 2F - 240 Grit Finish EP - 240 Grit and Electro polished[4]	10ft (3.05m)	CD (custom)
P42	0.50in (13mm)		20ft (6.10m)	
P43	0.125in (3mm)	316 SS and HSC-270	50ft (15.24m)	CW (included)
COAXIAL (clean liquids only)				
P51	0.875in (22mm)		22ft (6.71m)	
P71	1.315in (34mm)	316SS only		
P81	0.875in (22mm)	316SS only		
P91	1.00in (25mm)			
CUSTOM				
/PXX	Custom Probe, Consult Factory			
Notes:	1. 5ft (1.52m) maximum probe length when installed in a stilling well or EC chamber (minimum 2" diameter) 2. 10ft (3.05m) maximum probe length when installed in a stilling well or EC chamber (minimum 3" diameter) 3. Lengths greater than 7ft (2.13m) require cable spacers at 5ft (1.52m) maximum intervals when installed in a 2" or smaller stilling well or EC chamber. Lengths greater than 10ft (3.05m) require cable spacers at 10ft (3.05m) maximum intervals when installed in 2.5" - 3" stilling well or EC chamber. 4. Certificate of RA and Passivation available upon request. Specify RA finish.			

MT5000 Recommended Installation

NOTE: The following guidelines are very conservative. If you have an application that exceeds these limits consult factory for application recommendations.

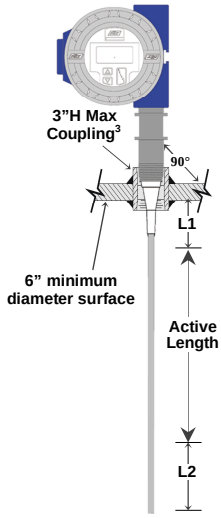


1. SINGLE PROBE - FLAT PLATE

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
2.5	20 ft. / 6.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (cable)
10	40 ft. / 12.2 m	3 in. / 7.5 cm	0[1] (Rod) WH + 3" / 7.6 cm (cable)
35	100 ft. / 30.5 m	0[1] in. / 0[1] cm	1[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.

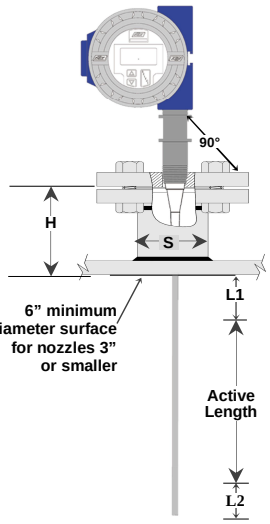


2. SINGLE PROBE - FLAT PLATE WITH COUPLING

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
2.5	20 ft. / 6.1 m	8 in. / 20.3 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.5 cm (Cable)
10	40 ft. / 12.2 m	4 in. / 10.2 cm	0[1] (Rod) WH + 3 in. / 7.5 cm (Cable)
35	100 ft. / 30.5 m	1 in. / 2.5 cm	1[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. The coupling should not extend into the vessel more than 1 in. / 2.5 cm.



3A. SINGLE PROBE - NOZZLE & FLANGE

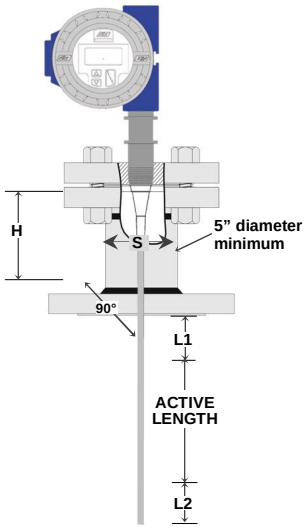
[height of nozzle (H) greater than width of nozzle (S)]

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
2.5	20 ft. / 6.1 m	8 in. / 20.3 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.5 cm (Cable)
10	40 ft. / 12.2 m	4 in. / 10.2 cm	0[1] (Rod) WH + 3 in. / 7.5 cm (Cable)
35	100 ft. / 30.5 m	2[1] in. / 5.1[1] cm	1[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. A one time startup adjustment is required to eliminate the effect of the nozzle. For details refer to the Blanking Parameter in the Commissioning section of the Installation & Operation Manual.

NOTE: The following guidelines are very conservative. If you have an application that exceeds these limits consult factory for application recommendations.

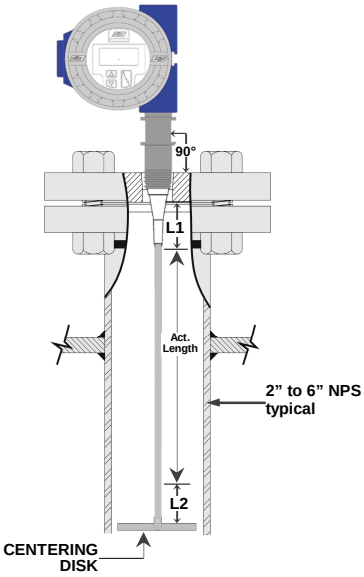


3B. SINGLE PROBE - NOZZLE & FLANGE

[height of nozzle (H) less than width of nozzle (S)]

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
2.5	20 ft. / 6.1 m	6 in. / 15.24 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	40 ft. / 12.2 m	3 in. / 7.5 cm	0[1] (Rod) WH + 3 in. / 7.6 cm (Cable)
35	100 ft. / 30.5 m	2[1] in. / 5.1[1] cm	1[1] (Rod / Cable)

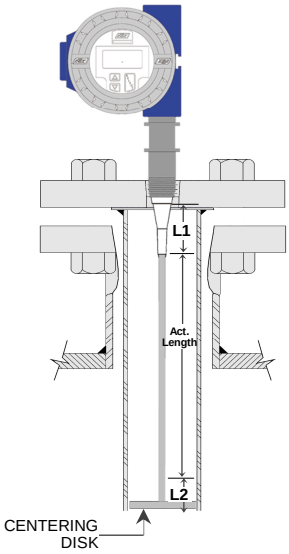
NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. A one time startup adjustment is required to eliminate the effect of the nozzle. For details refer to the Blanking Parameter in the Commissioning section of the Installation & Operation Manual.



4. SINGLE PROBE - PERMANENT STILLING WELL

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
1.6[3]	20 ft. / 6.1 m	8 in. / 20.3 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
3	30 ft. / 9.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	50 ft. / 15.2 m	3 in. / 7.5 cm	0[1] (Rod) WH + 3 in. / 7.6 cm (Cable)
35	50 ft. / 15.2 m	0[1] in. / 0[1] cm	1[1] (Rod / Cable)

NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. Stilling well size will determine minimum dielectric constant.



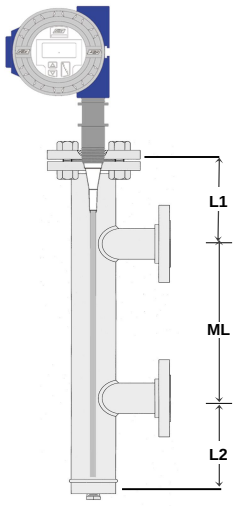
5. SINGLE PROBE - REMOVABLE STILLING WELL & TRI-TAPE

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
1.6[3]	20 ft. / 6.1 m	8 in. / 20.3 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
3	30 ft. / 9.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	50 ft. / 15.2 m	3 in. / 7.5 cm	0[1] (Rod) WH + 3 in. / 7.6 cm (Cable)
35	50 ft. / 15.2 m	0[1] in. / 0[1] cm	1[1] (Rod / Cable)

NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. Stilling well size will determine minimum dielectric constant.

NOTE: The following guidelines are very conservative. If you have an application that exceeds these limits consult factory for application recommendations.

6. SINGLE PROBE - EXTERNAL CHAMBER

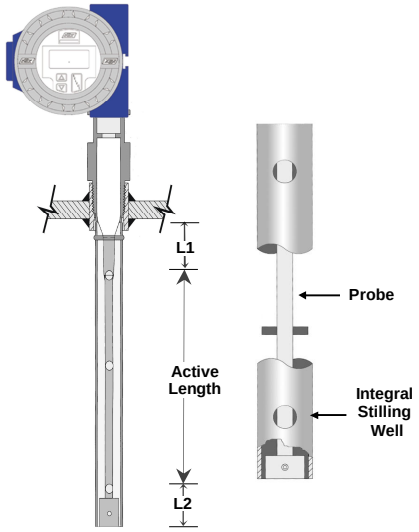


MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
1.6[3]	20 ft. / 6.1 m	9 in. / 22.86 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
3	30 ft. / 9.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	50 ft. / 15.2 m	3 in. / 7.5 cm	0[1] (Rod) WH + 3 in. / 7.6 cm (Cable)
35	50 ft. / 15.2 m	0[1] in. / 0[1] cm	1[1] (Rod / Cable)

NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. Chamber size will determine minimum dielectric constant.

7. COAXIAL PROBE

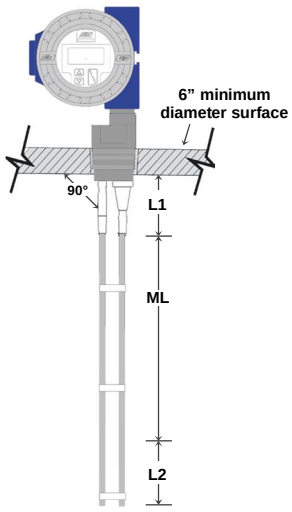
[(rod inside of outer tube) clean liquids only]



MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1]
1.4	20 ft. / 6.1 m	4 in. / 10.2 cm	1 in. / 2.5 cm
2.0	20 ft. / 6.1 m	2 in. / 5.1 cm	1 in. / 2.5 cm
4.0	20 ft. / 6.1 m	0 in. / 0 cm	1 in. / 1.3 cm

NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. Typically used in low dielectric, clean liquids.

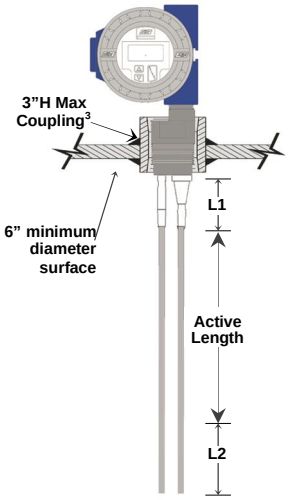
8. DUAL PROBE - FLAT PLATE



MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1] (WH = Weight Height)
2.5	20 ft. / 6.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
4	20 ft. / 6.1 m	3 in. / 7.5 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	100 ft. / 30.5 m	0[1] in. / 0[1] cm	2[1] (Rod / Cable)

NOTES:
1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.

NOTE: The following guidelines are very conservative. If you have an application that exceeds these limits consult factory for application recommendations.

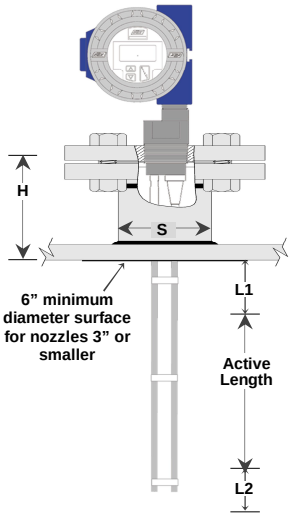


9. DUAL PROBE - FLAT PLATE WITH COUPLING

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1]
2.2	20 ft. / 6.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
4	20 ft. / 6.1 m	3 in. / 7.5 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	100 ft. / 30.5 m	0[1] in. / 0[1] cm	2[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. The coupling should not extend into the vessel more than 1" / 25 mm.



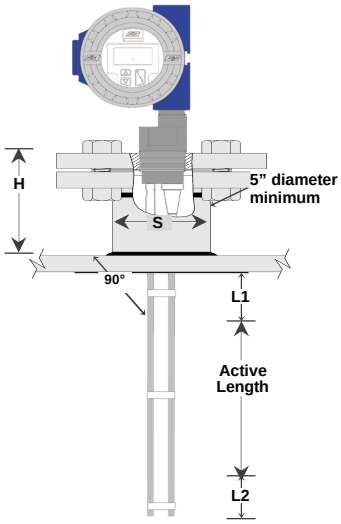
10A. DUAL PROBE - NOZZLE & FLANGE

[height of nozzle (H) greater than width of nozzle (S)]

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1]
2.5	20 ft. / 6.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
4	20 ft. / 6.1 m	3 in. / 7.5 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	100 ft. / 30.5 m	0[1] in. / 0[1] cm	2[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.
3. A one time startup adjustment is required to eliminate the effect of the nozzle. For details refer to the Blanking Parameter in the Commissioning section of the Installation & Operation Manual.



10B. DUAL PROBE - NOZZLE & FLANGE

[height of nozzle (H) less than width of nozzle (S)]

MINIMUM DIELECTRIC CONSTANT	L MAXIMUM PROBE LENGTH[2]	L1 Unmeasurable[1]	L2 Unmeasurable[1]
2.5	20 ft. / 6.1 m	6 in. / 15.2 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
4	20 ft. / 6.1 m	3 in. / 7.5 cm	3 in. / 7.6 cm (Rod) WH + 3 in. / 7.6 cm (Cable)
10	100 ft. / 30.5 m	0[1] in. / 0[1] cm	2[1] (Rod / Cable)

NOTES:

1. L1 & L2 unmeasurable lengths of 0 may require use of linearization table and latching feature. For easiest startup use $L1_{min} \geq 3$" or as listed if greater and $L2_{min} \geq 3$" (rod) or WH + 3" (cable).
2. Maximum probe lengths are limited as indicated in Table 2A.

MT5000 Guided Wave Radar Probe Attachments

Cable Weights					
Part No.	**Material**	**O.D.**	**Weight Height (WH)**	**Weight**	**Compatible Probes**
CW09D-S6	316SS	0.875 in. / 22.2 mm	4.0 in. / 101.6 mm	0.7 lbs / 301 g	P11
CW09D-S4	304SS				
CW09D-MO	Monel			0.8 lbs / 324 g	
CW10D-S6	316SS	1.0 in. / 25.4 mm	6.0 in. / 152.4 mm	1.3 lbs / 590 g	P11
CW10D-S4	304SS				
CW10D-MO	Monel			1.4 lbs / 635 g	
CW10E-S6	316SS			1.3 lbs / 590 g	P12
CW10E-S4	304SS				
CW10E-MO	Monel			1.4 lbs / 635 g	
CW16F-S6	316SS	1.625 in. / 41.3 mm	2.0 in. / 50.8 mm	1.1 lbs / 499 g	P11, P31
CW16F-S4	304SS				
CW16F-MO	Monel			1.2 lbs / 544 g	
CW19G-S6	316SS	1.875 in. / 47.6 mm	2.0 in. / 50.8 mm	1.5 lbs / 680 g	P12, P32
CW19G-S4	304SS				
CW19G-MO	Monel			1.6 lbs / 726 g	
CW29F-S6	316SS	2.875 in. / 73.3 mm	1.0 in. / 25.4 mm	1.8 lbs / 816 g	P11, P31
CW29F-S4	304SS				
CW29F-MO	Monel			2.0 lbs / 907 g	
CW29G-S6	316SS			1.8 lbs / 816 g	P12, P32
CW29G-S4	304SS				
CW29G-MO	Monel			2.0 lbs / 907 g	
For included weights on /P34 and /P43 probes use code /CW-S6					

Centering Disks				
Part No.	**O.D.**	**Height**	**Compatible Probes**	**Minimum Stilling Well Size**
CD15B-%	1.5 in / 38.1 mm	0.375 in / 9.5 mm	P01	1.5 in sch. 40
CD15C-%		0.5 in / 12.7 mm	P02	
CD15I-%		0.4375 in / 11 mm	P03	
CD20B-%	2.0 in. / 50.8 mm	0.375 in / 9.5 mm	P01	2 in sch. 40
CD20C-%		0.5 in / 12.7 mm	P02	
CD20I-%		0.4375 in / 11 mm	P03	
CD23B-%	2.3 in. / 58.7 mm	0.375 in / 9.5 mm	P01	2.5 in sch. 40
CD23C-%		0.5 in / 12.7 mm	P02	
CD23I-%		0.4375 in / 11 mm	P03	
CD28B-%	2.8 in. / 71.1 mm	0.375 in / 9.5 mm	P01	3 in sch. 80
CD28C-%		0.5 in / 12.7 mm	P02	
CD28I-%		0.4375 in / 11 mm	P03	
CD38B-%	3.75 in. / 95.3 mm	0.375 in / 9.5 mm	P01	4 in sch. 80
CD38C-%		0.5 in / 12.7 mm	P02	
CD38I-%		0.4375 in / 11 mm	P03	
% - enter material code from /a				

Quotation Request - MT5000 SERIES Guided Wave Radar

Tel (1) 225-673-6100 Email:sales@ktekcorp.com Date: _____

Fax (1) 225-673-2525 Attn: _____

Customer: _____ Contact: _____

Phone # : _____ Fax # : _____

Email: _____ Project: _____

Rep Firm: _____ Contact: _____

Phone # : _____ Fax # : _____

Email: _____

Process Conditions: **TAG:** _____

Material To Be Measured: _____ Dielectric Constant: _____

Is Material: ☐ **Solid** ☐ **Liquid** ☐ **Liquid/Liquid Interface** **(Refer to MT5100 Level and Interface Level Measurement Data Sheet (MT5100-0202-1) for more information.**

If Solid: Particle Diameter: _____ Bulk Density _____ **pcf / kg/m^3**

If Liquid / Liquid Interface: Upper Dielectric Constant: _____ Lower Dielectric Constant: _____

☐ Flooded Sensor ☐ Non-flooded Sensor

Temperature: Operating: _____ Maximum: _____ **°F / °C / °K**

Pressure: Operating: _____ Maximum: _____ **PSIG / KG / BAR**

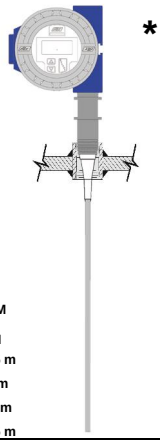
Agitation: ☐ None ☐ Minimal ☐ Heavy

Foam : ☐ No ☐ Yes: Foam Density: ☐ Light ☐ Heavy

Buildup: ☐ None ☐ Light ☐ Heavy (Single Probe designs recommended with heavy buildup)

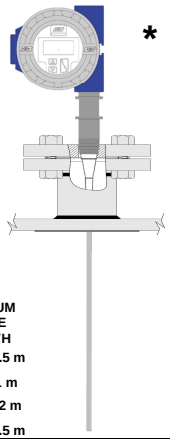
Select mounting configuration closest to your application: (*Not for liquid / liquid interface)

Flat Plate Or Coupling *



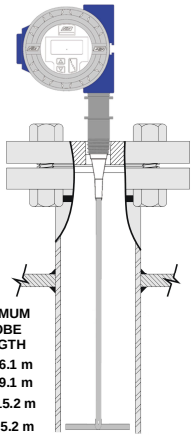
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.3[1]	100 ft./30.5 m
4	20 ft./6.1 m
10	40 ft./12.2 m
35	100 ft./30.5 m

Nozzle & Flange *



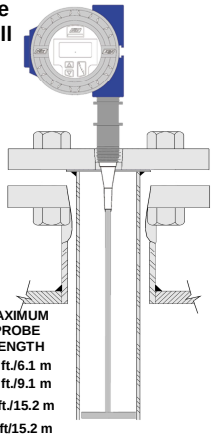
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.3[1]	100 ft./30.5 m
4	20 ft./6.1 m
10	40 ft./12.2 m
35	100 ft./30.5 m

Permanent Stilling Well



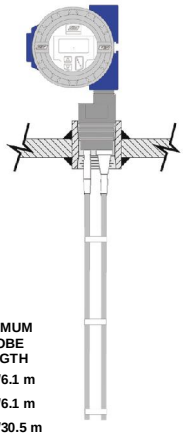
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.6	20 ft./6.1 m
3	30 ft./9.1 m
10	50 ft./15.2 m
35	50 ft/15.2 m

Removable Stilling Well



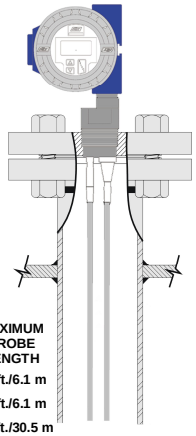
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.6	20 ft./6.1 m
3	30 ft./9.1 m
10	50 ft./15.2 m
35	50 ft/15.2 m

Dual Rod Flat Plate or Coupling



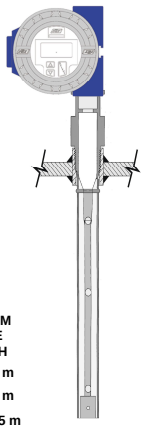
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
2.5	20 ft./6.1 m
4	20 ft./6.1 m
10	100 ft./30.5 m

Dual Rod Nozzle & Flange



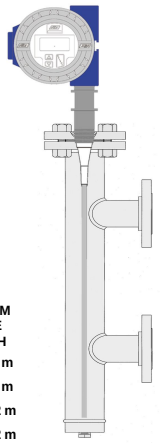
MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
2.5	20 ft./6.1 m
4	20 ft./6.1 m
10	100 ft./30.5 m

Coaxial Probe



MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.4	20 ft./6.1 m
4	20 ft./6.1 m
10	100 ft./30.5 m

External Chamber



MINIMUM DIELECTRIC CONSTANT	MAXIMUM PROBE LENGTH
1.6	20 ft./6.1 m
3	30 ft./9.1 m
10	50 ft./15.2 m
35	50 ft./15.2 m

1. **Accuracy subject to changes in dielectric constant. Ultra-Low Dielectric (ULD) measurement method supports dielectric constants from 1.3 to a maximum of 2.5.**

Quotation Request

Material & Connections:

Process Connection: ☐ MNPT ☐ RF Flange ☐ Tri-Clamp ☐ Other

Process Connection Description: _____

Probe Material: ☐ 316L SS ☐ Hast C276 ☐ Hast B3 ☐ Monel ☐ Titanium ☐ Inconel 625

Probe Type: ☐ Solid Rod ☐ Cable (316SS & Monel Only)

☐ Sanitary Rod Specify Finish ☐ 180 Grit ☐ 240 Grit ☐ 240 Grit & EP

(Refer to chart for part numbers)

Centering Disk (Solid Rod): ☐ Yes ☐ No P/N: _____ If blank, ABB will choose.

Centering Weight (Cables): ☐ Yes ☐ No P/N: _____ If blank, ABB will choose.

Housing & Electronics Options:

☐ Aluminum Dual Compartment Housing **(standard)** ☐ 316L SS Dual Compartment Housing ☐ Window Cover

☐ HART ☐ MODBUS ☐ Foundation Fieldbus

Vessel / Application Details: **specify by circling**

Total Insertion Length (Bottom of process fitting to end of probe): _____ **in / ft / cm / m Other:** _____

Standard Lengths for field modification to final length: _____

Custom Lengths for final length by ABB _____

Mounting:

☐ Directly on roof of tank ☐ Mounted on Nozzle: nozzle height: _____ diameter: _____

☐ In existing stilling well - describe: _____

☐ In new stilling well - describe: _____

☐ In external chamber - describe: _____

☐ Stilling well or external chamber to be supplied with transmitter: Yes ☐ No ☐

Approval Required:

☐ **FM Factory Mutual**

XP-IS / I / 1 / ABCD / T6 Ta = 77ºC
DIP / II, III / 1 / EFG / T6 Ta = 77ºC
IS / I / 1 / ABCD / T4 Ta = 77ºC - ELE1034
NI / I / 2 / ABCD / T4 Ta = 77ºC
S / II,III / 2 / FG / T4 Ta = 77ºC
ANI / I / 2 / ABCD / T4 - ELE1034
Type 4X

☐ **Canadian Standards Association**

XP CL 1, DIV 1, GP ABCD; CL 2, DIV 1, GP EFG; CL 3 - T6
CL 1, DIV 2, GP ABCD; CL 2, DIV 2, GP EFG - T5
IS CL 1, DIV 1, GP CD; CL 2, DIV 1, GP EFG - T4
- when installed per ELE1034
Type 4X

☐ **GOST Russian**

1Exd[ia]IICT6, 0ExiaIIBT6, IP67

☐ **UKRSEPRO**

1ExdiaIICT6, 0ExiaIIBT4

☐ **IEC International Electromechanical Commission**

IECEx ITS 08.0036X
II 1/2 G/D
Ex ia IIB T4 (-40°C ≤ TAMB ≤ 66°C)
Ex iaD 20/21 IP6X T80°C (-40°C ≤ 66°C)
IECx ITS 08.0037X
Ex ia d IIC T4
Ex iaD tD 20/A21 IP6X T80°C

☐ **ATEX**

ITS 08ATEX25865X
Ex ia IIB T4 (-40°C ≤ Tamb ≤ 66°C)
Ex iaD 20/21 IP6X T80°C (-40°C Tamb ≤ 66°C)
ITS08 ATEX15870X
II 1/2 G/D Ex ia d IIC T6
Ex tD 20/A21 IP6X T80°C

Completed by ABB:

Quotation # _____ By: _____ Date: _____

Qty: _____ Part #: _____ Price: $ _____

Options: _____

Note: All prices USD, EX-Works packed for shipping, FOB Factory, standard shipping 5 weeks ARO.

Additional notes or comments:

Contact us

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USA
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Fax: +1 225 637 2525

www.abb.com/level

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