

DESCRIPTION

The Horizon® 704 is a loop-powered, 24 V DC liquid-level transmitter based on the revolutionary Guided Wave Radar (GWR) technology. The electronics of the Horizon® 704 is integral mount on the GWR probe and allows local configuration via a 3 pushbutton keypad / LCD screen. The Horizon® 704 electronics are compatible with different types of GWR probes each encompassing different application challenges (coaxial, single rod or twin rod types). The aluminium or Valox® housing can be removed for service under process conditions.

FEATURES

- * "REAL LEVEL", measurement not affected by changing media variables eg. dielectrics, pressure, density, pH, viscosity, ...
- * Easy bench configuration - no need for level simulation.
- * 2-line x 8-character LCD / 3-pushbutton keypad or blind transmitter.
- * Two-wire, intrinsically safe loop powered level transmitter.
- * Housing can be easily removed without depressurizing the vessel.
- * HART®/AMS® digital communication.
- * Max process temperature: 200 °C (400 °F).
- * Max process pressure: 70 bar (1000 psig).
- * 4-20 mA output (meets NAMUR NE 43).
- * Integral mount electronics.

APPLICATIONS

MEDIA: Liquids or slurries; hydrocarbons to water-based media (dielectric 1,7 - 100).

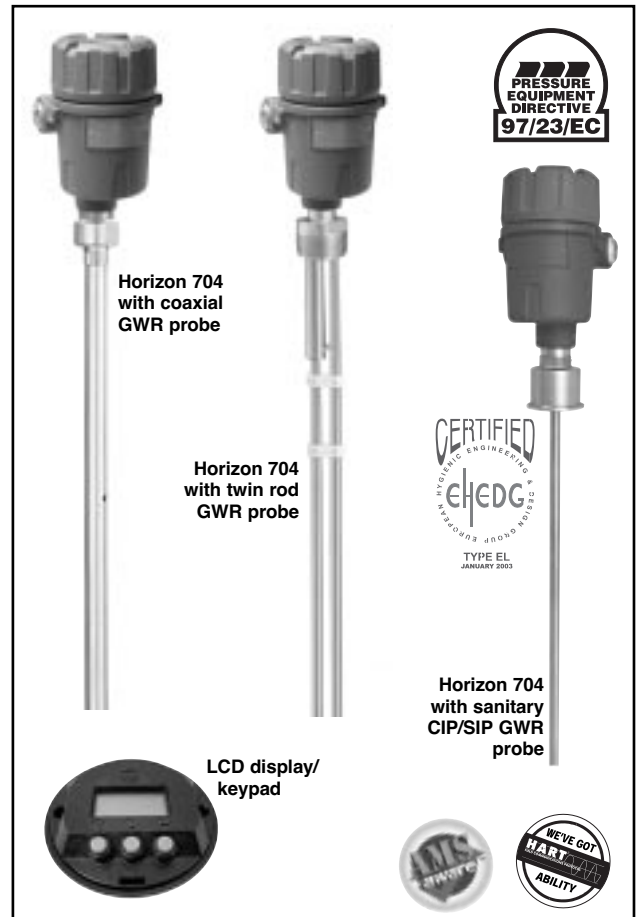
VESSELS: Most process or storage vessels up to rated probe temperature and pressure.

CONDITIONS: All level measurement and control applications including process conditions exhibiting visible vapors, foam, coating / build up, surface agitation, turbulence and varying dielectric media or specific gravity.

TECHNOLOGY

Horizon Guided Wave Radar is based upon the technology of TDR (Time Domain Reflectometry). TDR utilizes pulses of electromagnetic energy, which are transmitted down a probe. When a pulse reaches a liquid surface that has a higher dielectric than the air/vapor in which it is travelling, the pulse is reflected. An ultra high-speed timing circuit precisely measures the transit time and provides an accurate measure of the liquid level.

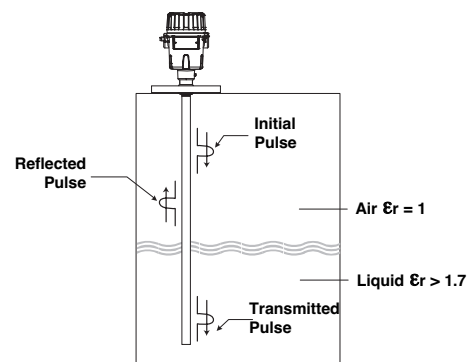
Measures «REAL LEVEL»



AGENCY APPROVALS

Agency	Approvals
ATEX	ATEX II 1 G EEx ia IIC T4, intrinsically safe
FM/CSA®	Non Incendive / Intrinsically safe / Explosion proof

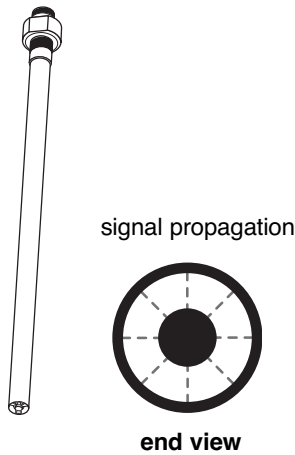
① Consult factory for proper partnumbers



PROBE OVERVIEW

Choosing the proper Guided Wave Radar (GWR) probe is the most important decision in the application process. The probe configuration establishes fundamental performance characteristics. Coaxial, twin rod and single rod are the 3 basic configurations used today; each with specific strengths and weaknesses.

COAXIAL TYPE GWR PROBE



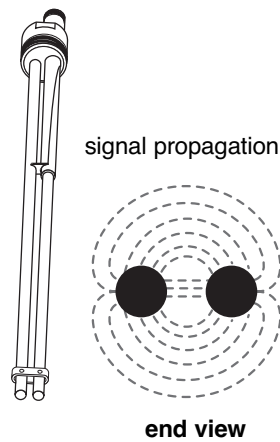
Ideally suited for:

- media $\geq 1,7$
- mounting in by-pass cages
- most efficient GWR probe

Beware of:

- clogging / build up inside coaxial tube (max 500 cP)

TWIN ROD TYPE GWR PROBE



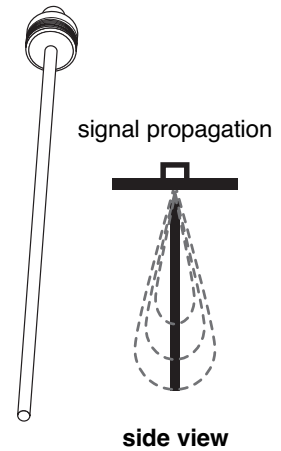
Ideally suited for:

- media $\geq 2,5$
- allows moderate build up (viscosity up to 1500 cP)

Beware of:

- bridging build up between the two rods

SINGLE ROD TYPE GWR PROBE



Ideally suited for:

- media ≥ 10
- handles very viscous media (viscosity up to 10.000 cP)

Beware of:

- mounting considerations, see page 6.

AMPLIFIER OVERVIEW

Eclipse® and Horizon® products offer today, the most comprehensive range of solutions in Guided Wave Radar for liquid level measurement. Below table helps you defining the most cost effective solution by considering the challenges of your application.

Concept	Set up	Max temp. ①	Max press. ①	Min ϵ_r ①	Housing type	GWR probe compatibility ②	Amplifier
cost effective	needs calibration	+150 °C (+300 °F)	70 bar (1000 psig)	> 1.7	single Valox® or aluminium	7MA, 7MB, 7MF, 7MF-E	Horizon® 703
mid range	only configuration	+200 °C (+400 °F)	70 bar (1000 psig)	> 1.7	single Valox® or aluminium	7MR, 7MA, 7MF 7MB, 7MF-4/E/F	Horizon® 704
full featured	only configuration	+400 °C (+750 °F) +320 °C (+605 °F) for steam	345 bar (5000 psig)	> 1.4	dual compartment aluminium or Stainless steel	7MR, 7MA, 7MB, 7MS, 7MP, 7MD	Eclipse® 705
liquid-liquid interface	only configuration	+200 °C (+400 °F)	70 bar (1000 psig)	> 1.4	dual compartment aluminium or Stainless steel	7MT	Eclipse® 707
high viscous media	only configuration	+200 °C (+400 °F)	70 bar (1000 psig)	> 10	dual compartment aluminium or Stainless steel	7MF, 7MF-4/E/F, 7M1, 7M7	Eclipse® 708
full featured with visual indication	only configuration	+400 °C (+750 °F) +320 °C (+605 °F) for steam	345 bar (5000 psig)	> 1.4	dual compartment aluminium or Stainless steel	7MR, 7MS, 7MD	Eclipse® Aurora

① performance is GWR dependant
 ② 7MA: general purpose coaxial type GWR probe
 7MB: twin rod type GWR probe
 7MD: high temp / high pressure GWR probe
 7MF: single bare GWR rod
 7MF-E: CIP/SIP sanitary GWR probe
 7MF-F: single rod corrosion resistant GWR probe

7MF-4: single rod PFA coated GWR probe
 7MP: high pressure GWR probe
 7MR: overflow safe GWR probe
 7MS: steam GWR probe
 7M1: single flexible GWR probe
 7M7: twin flexible GWR probe

EXPEDITE SHIP PLAN (ESP)

Several Horizon® Guided Wave Radar Transmitters are available for quick shipment, within max. 3 weeks after factory receipt of purchase order, through the Expedite Ship Plan (ESP).

Models covered by ESP service are conveniently colour coded in the selection data charts.

To take advantage of ESP, simply match the colour coded model number codes (standard dimensions apply).

ESP service may not apply to orders of ten units or more. Contact your local representative for lead times on larger volume orders, as well as other products and options.

SELECTION DATA

A complete measuring system consists of:

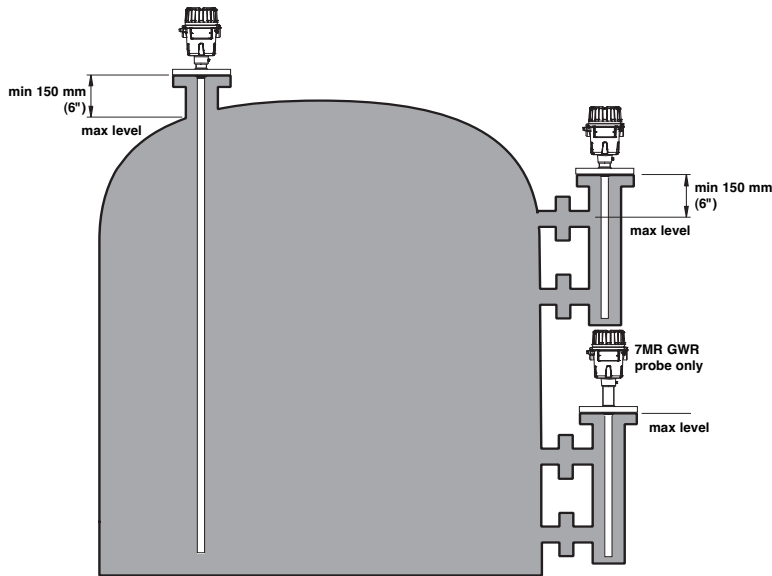
1. Horizon® 704 transmitter head/electronics
2. Horizon® 704 GWR probe
3. OPTIONAL spacer for 7MF-A/B/C/4: P/N 089-9114-001
4. OPTION: HART® communicator
Magnetrol P/N **089-5213-012** (EURO plug)/**089-5213-013** (UK plug)

1. Order code for HORIZON 704 transmitter head/electronics

BASIC MODEL NUMBER

7	0	4	Horizon 704 guided wave radar transmitter									
POWER												
5	24 V DC, two wire											
SIGNAL OUTPUT												
1	4-20 mA with HART® communication											
0	4-20 mA only (requires local display and keypad - Accessories code A)											
MENU LANGUAGE (Hart® communication is only available in English language)												
1	English											
2	Spanish											
3	French											
4	German											
ACCESSORIES												
A	Plug in digital display and keypad											
0	Blind transmitter (no display/keypad) – only available for units with HART® communication											
MOUNTING/CLASSIFICATION (Consult factory for FM/CSA approvals) - IP 67												
1	Integral, General Purpose (& I.S. FM/CSA)											
A	Integral, ATEX II 1 G EEx ia IIC T4											
MATERIAL OF CONSTRUCTION												
3	Valox® single compartment housing											
4	Cast aluminium single compartment housing											
CABLE ENTRY												
1	M20 x 1.5 (2 entries - one plugged)											
0	3/4" NPT (2 entries - one plugged)											
7	0	4	5								complete order code for HORIZON 704 transmitter head/electronics	

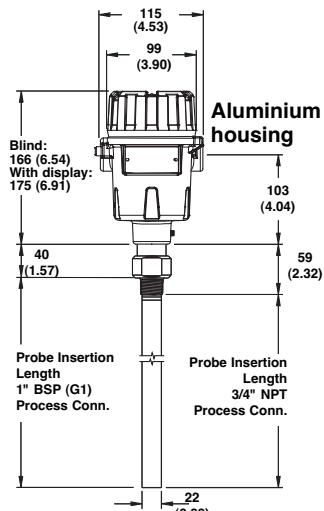
MOUNTING 7MA/7MR/7MB



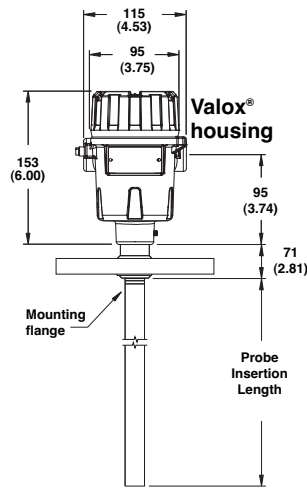
High level shutdown / Overfill protection

Special consideration is necessary in any application where guided wave radar is to be used for high level shutdown / overfill protection. To ensure proper measurement, the guided wave radar probe should be installed so the maximum overfill level is a minimum of 150 mm (6") (300 mm (12") for 7MB) below the process connection. This may include utilizing a nozzle or spool piece to raise the probe. No special precautions are required for the 7MR probe.

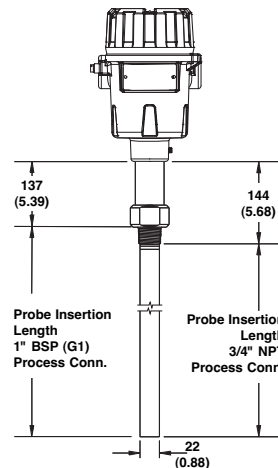
DIMENSIONS in mm (inches)



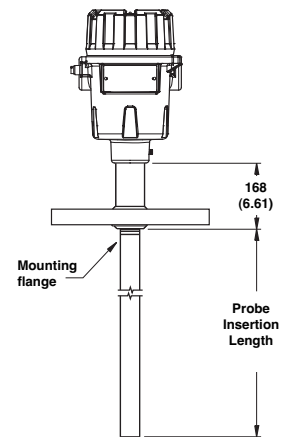
Horizon 7MA
with threaded connection



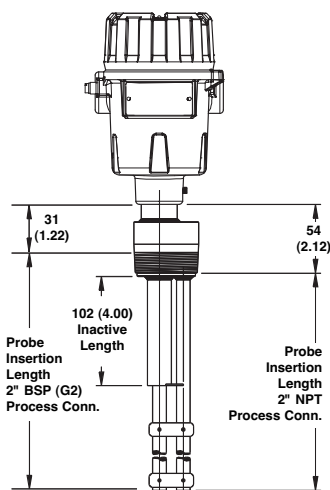
Horizon 7MA
with flanged connection



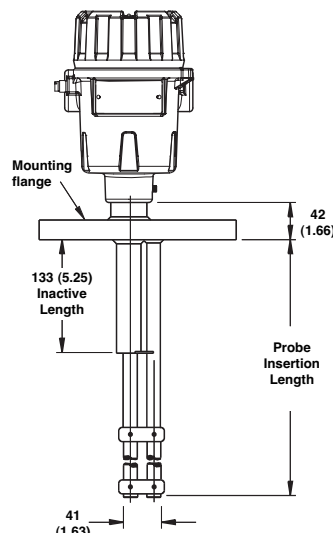
Horizon 7MR
with threaded connection



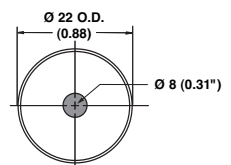
Horizon 7MR
with flanged connection



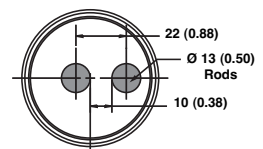
Horizon 7MB
with threaded connection



Horizon 7MB
with flanged connection



**Coaxial GWR Probe,
End View**



**Twin Rod GWR Probe,
End View**

2. Order code for HORIZON 704 Coaxial or Twin rod GWR probe

BASIC MODEL NUMBER

7 M A	Coaxial GWR probe	(dielectric range: ≥ 1,7)
7 M R	Overfill safe coaxial GWR probe	(dielectric range: ≥ 1,7)
7 M B	Twin rod GWR probe	(dielectric range: ≥ 2,5)

MATERIAL OF CONSTRUCTION - wetted parts (including process connection flange when applicable)

A	316/316L (1.4401/1.4404) stainless steel
B	Hastelloy C (2.4819)
C	Monel (2.4360)

PROCESS CONNECTION - SIZE/TYPE (consult factory for other process connections)

7MA/7MR – Threaded

1 1	3/4" NPT thread
2 2	1" BSP (G1) thread

7MB – Threaded

4 1	2" NPT thread
4 2	2" BSP (G2) thread

7MA/7MR – ANSI flanges

2 3	1"	150 lbs. ANSI RF
2 4	1"	300 lbs. ANSI RF
3 3	1 1/2"	150 lbs. ANSI RF
3 4	1 1/2"	300 lbs. ANSI RF
3 5	1 1/2"	600 lbs. ANSI RF
4 3	2"	150 lbs. ANSI RF
4 4	2"	300 lbs. ANSI RF
4 5	2"	600 lbs. ANSI RF

7MA/7MR/7MB – ANSI flanges

5 3	3"	150 lbs. ANSI RF
5 4	3"	300 lbs. ANSI RF
5 5	3"	600 lbs. ANSI RF
6 3	4"	150 lbs. ANSI RF
6 4	4"	300 lbs. ANSI RF
6 5	4"	600 lbs. ANSI RF

7MA/7MR – DIN flanges

B A	DN 25, PN 16	DIN 2527 form B
B B	DN 25, PN 25/40	DIN 2527 form B
B C	DN 25, PN 64/100	DIN 2527 form E
C A	DN 40, PN 16	DIN 2527 form B
C B	DN 40, PN 25/40	DIN 2527 form B
C C	DN 40, PN 64/100	DIN 2527 form E
D A	DN 50, PN 16	DIN 2527 form B
D B	DN 50, PN 25/40	DIN 2527 form B
D D	DN 50, PN 64	DIN 2527 form E
D E	DN 50, PN 100	DIN 2527 form E

7MA/7MR/7MB – DIN flanges

E A	DN 80, PN 16	DIN 2527 form B
E B	DN 80, PN 25/40	DIN 2527 form B
E D	DN 80, PN 64	DIN 2527 form E
E E	DN 80, PN 100	DIN 2527 form E
F A	DN 100, PN 16	DIN 2527 form B
F B	DN 100, PN 25/40	DIN 2527 form B
F D	DN 100, PN 64	DIN 2527 form E
F E	DN 100, PN 100	DIN 2527 form E

PROCESS SEAL - MATERIAL ^①

0	Viton GFLT seal - for universal use / steam applications	Min. -40 °C (-40 °F)
1	EPDM (Ethylene Propylene) - for e.g. ammonia / caustic soda applications	Min. -50 °C (-60 °F)
8	Aegis PF 128 - for aggressive media	Min. -20 °C (-4 °F)

^① Viton GFLT and Aegis are rated to a max. process temperature of +200 °C (+400 °F) / EPDM is rated to +125 °C (+250 °F). Consult factory for alternative seal materials

INSERTION LENGTH – specify per 1 cm (0.39") increments

0 6 0	min 60 cm (24") insertion length
4 9 0	max 490 cm (192") insertion length

7	M								
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complete code for HORIZON 704 Coaxial or Twin Rod GWR probe

MOUNTING 7MF

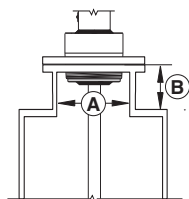
MOUNTING CONSIDERATIONS FOR 7MF PROBES

1. Turbulence

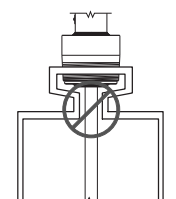
The bottom of the probe should be stabilized if turbulence will cause a deflection of more than 75 mm at 3 m of length. The probe should not make contact with a metal tank. A TFE bottom spacer (P/N 089-9114-001) for metal single rod GWR probes is optional.

2. Nozzles: do not restrict performance by ensuring the following:

- Nozzle must be 50 mm (2") or larger diameter.
- Nozzle inside diameter (A) should be \geq to nozzle height (B). If this is not the case, it is recommended to adjust DEAD BAND and/or SENSITIVITY settings.



Correct installation



Pipe reducers should not be used

High level shutdown / Overfill protection

Use the 7MF GWR probes only for in-tank mounting. Special consideration is necessary in any application where guided wave radar is to be used for high level shutdown / overfill protection. To ensure proper measurement, the guided wave radar probe should be installed so the maximum overfill level is a minimum of 300 mm (12") below the process connection. This may include utilizing a nozzle or spool piece to raise the probe. Consult factory for further information.

3. Metallic (conductive) obstructions in tank.

Distance to probe	Acceptable objects
< 150 mm (6")	Continuous, smooth, parallel, conductive surface (e.g. metal tank wall); probe should not touch tank wall
> 150 mm (6")	< 1"/DN25 diameter pipe and beams, ladder rungs
> 300 mm (12")	< 3"/DN80 diameter pipe and beams, concrete walls
> 450 mm (18")	All remaining objects

4. Non-metallic vessels:

- Flange (metal) mounting is recommended for optimum performance.
- Mount probe more than 450 mm (18") from vessel wall.

2. Order code for HORIZON 704 - PFA insulated / faced flange single rod GWR probe - for aggressive media

BASIC MODEL NUMBER

7	M	F	-	F	Single rod PFA insulated 316/316L (1.4401/1.4404) GWR probe	(dielectric range: ≥ 10)
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PROCESS CONNECTION - SIZE/TYPE ANSI flanged

5	3	3"	150 lbs.	ANSI RF flange
5	4	3"	300 lbs.	ANSI RF flange
5	5	3"	600 lbs.	ANSI RF flange
6	3	4"	150 lbs.	ANSI RF flange
6	4	4"	300 lbs.	ANSI RF flange
6	5	4"	600 lbs.	ANSI RF flange

DIN flanges

E	A	DN 80, PN 16	DIN 2527 form B
E	B	DN 80, PN 25/40	DIN 2527 form B
E	D	DN 80, PN 64	DIN 2527 form E
F	A	DN 100, PN 16	DIN 2527 form B
F	B	DN 100, PN 25/40	DIN 2527 form B
F	D	DN 100, PN 64	DIN 2527 form E

INSERTION LENGTH – Specify insertion length per cm (0.39") increments

0	6	0	minimum 60 cm (24") insertion length
4	9	0	maximum 490 cm (192") insertion length

7	M	F	-	F		N		
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complete order code for HORIZON 704 - PFA insulated / faced flange single rod GWR probe

2. Order code for HORIZON 704 single rod GWR probe

- 316/316L (1.4401/1.4404) material for standard applications
- Hastelloy C (2.4819) or Monel (2.4360) for extreme aggressive media
- PFA insulated for applications with excessive coating / build up.

BASIC MODEL NUMBER

7	M	F	Single rod GWR probe	(dielectric range: ≥ 10)
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MATERIAL OF CONSTRUCTION

A	316/316L (1.4401/1.4404) stainless steel
B	Hastelloy C (2.4819)
C	Monel (2.4360)
4	PFA insulated 316/316L (1.4401/1.4404) SST
P	316/316L (1.4401/1.4404) stainless steel – paint kitchen applications only

PROCESS CONNECTION - SIZE/TYPE

Threaded

4	1	2" NPT thread
4	2	2" BSP (G2) thread

ANSI flanged

5	3	3" 150 lbs. ANSI RF flange
5	4	3" 300 lbs. ANSI RF flange
5	5	3" 600 lbs. ANSI RF flange
6	3	4" 150 lbs. ANSI RF flange
6	4	4" 300 lbs. ANSI RF flange
6	5	4" 600 lbs. ANSI RF flange

DIN flanged

E	A	DN 80, PN 16	DIN 2527 form B
E	B	DN 80, PN 25/40	DIN 2527 form B
E	D	DN 80, PN 64	DIN 2527 form E
F	A	DN 100, PN 16	DIN 2527 form B
F	B	DN 100, PN 25/40	DIN 2527 form B
F	D	DN 100, PN 64	DIN 2527 form E

PROCESS SEAL - MATERIAL

0	Viton GFLT seal - for universal use / steam applications	Min. -40 °C (-40 °F)
1	EPDM (Ethylene Propylene) - for e.g. ammonia / caustic soda applications	Min. -50 °C (-60 °F)
8	Aegis PF 128 - for aggressive media	Min. -20 °C (-4 °F)
N	None (7MF-P only)	

① Viton GFLT and Aegis are rated to a max. process temperature of 200 °C (400 °F) / EPDM is rated to 125 °C (250 °F). Consult factory for alternative seal materials

INSERTION LENGTH – Specify insertion length per cm (0.39") increments

0	6	0	minimum 60 cm (24") insertion length
4	9	0	maximum 490 cm (192") insertion length

7	M	F					
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complete order code for HORIZON 704 single rod GWR probe

2. Order code for HORIZON 704 - sanitary CIP/SIP GWR probe (finished to 0,5 µm - RA 20)

BASIC MODEL NUMBER

7	M	F	-	E	sanitary CIP/SIP GWR probe in 316/316L (1.4401/1.4404) stainless steel	(dielectric range: ≥ 10)
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PROCESS CONNECTION - SIZE/TYPE

4	P	2" - 3A Tri-clover compatible 16 AMP fitting
5	P	3" - 3A Tri-clover compatible 16 AMP fitting
6	P	4" - 3A Tri-clover compatible 16 AMP fitting

Note: EHEDG tested with a Hyjoin® peek/steel ring

INSERTION LENGTH – Specify insertion length per cm (0.39") increments

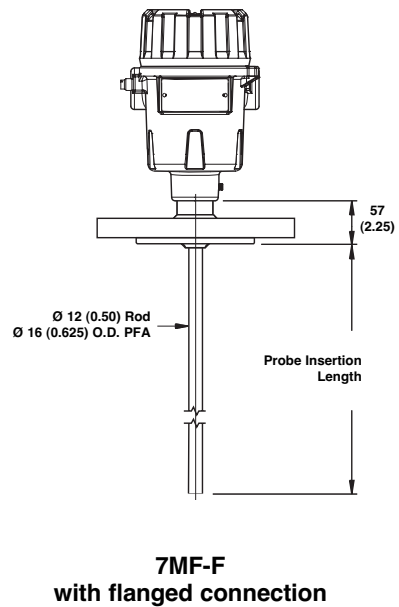
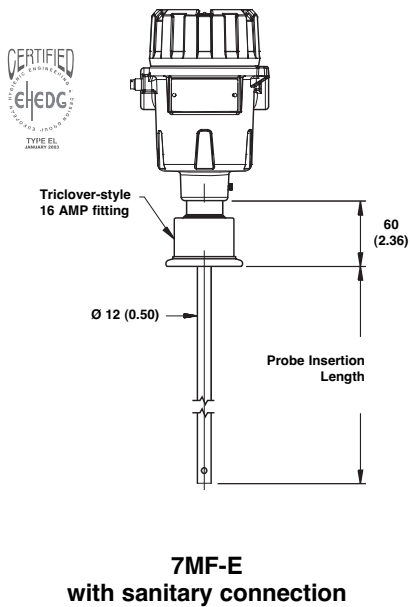
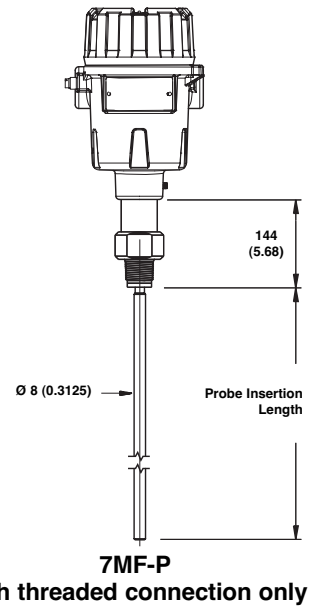
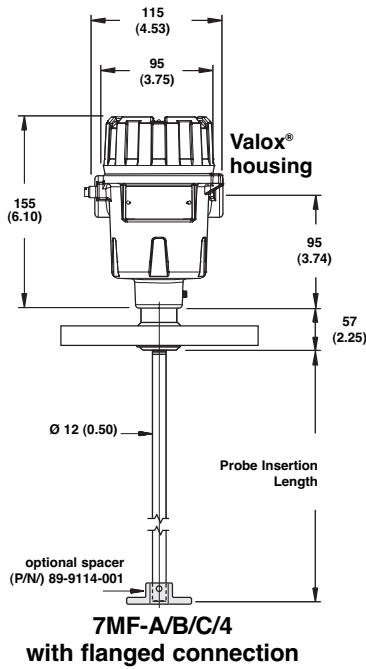
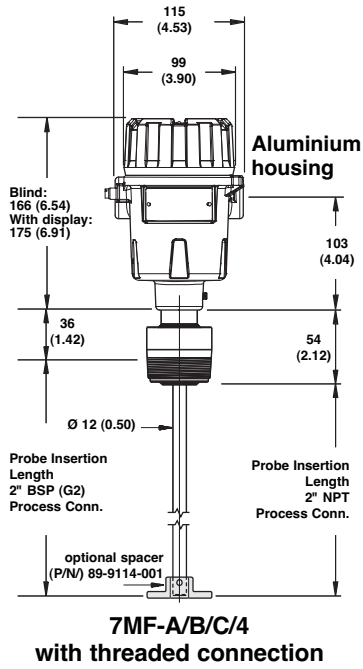
0	6	0	minimum 60 cm (24") insertion length
4	9	0	maximum 490 cm (192") insertion length

7	M	F	-	E			N		
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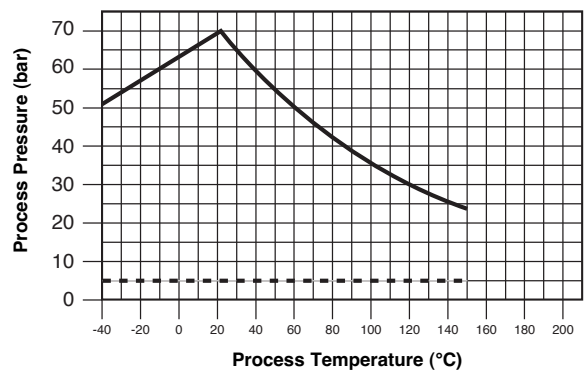
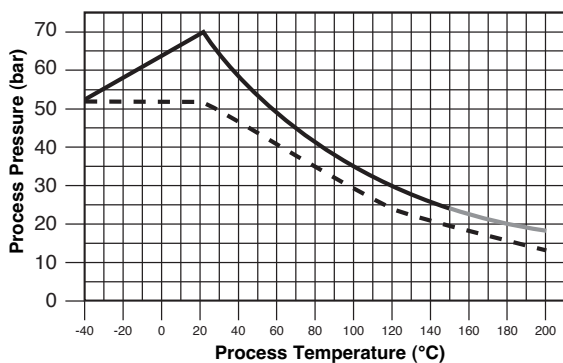
complete order code for HORIZON 704 sanitary CIP/SIP - GWR probe



DIMENSIONS in mm (inches)



TEMPERATURE-PRESSURE RATING



- 7MA: coaxial GWR probe
- - - 7MB: standard twin rod GWR probe
- · - 7MR: overfill prevention GWR probe

- 7MF: single rigid rod GWR probe
- - - 7MF-E: sanitary CIP/SIP GWR probe

PROBE SPECIFICATIONS

Description		7MA/7MR: coaxial GWR probe	7MB: twin rod GWR probe
Materials	Probe	316/316L (1.4401/1.4404), Hastelloy C [®] (2.4819) or Monel [®] (2.4360)	
	Process seal	TFE with Viton GFLT, EPDM or Kalrez 4079 (Consult factory for alternatives)	
Probe diameter		Inside rod: 8 mm (0.3125") – Outer tube: 22 mm (0.875")	Two 13 mm (0.5") Ø rods – 22 mm (0.875") $\overline{\phi}$ to $\overline{\phi}$
Mounting		In-tank mounting only – 7MA External cage and/or in-tank mounting – 7MR	Twin rod probe must be used in metallic vessel or stillwell > 25 mm (1") from any surface or obstruction.
Process Connection		Threaded: 3/4" NPT or 1" BSP (G1) Flanged: Various ANSI or DIN flanges	Threaded: 2" NPT or 2" BSP (G2) Flanged: Various ANSI or DIN flanges
Probe length		From 600 mm to 4900 mm (24 to 193"), selectable per 10 mm	
Transition Zone ^①	Top	ϵ_r : 2,0 = 25 mm (1") / ϵ_r : 80 = 150 mm (6") – 7MA 0 mm (0") – 7MR	$\epsilon_r > 10 = 50$ mm (2") / $\epsilon_r < 10 = 200$ mm (8") + 102 mm (4") inactive length
	Bottom	ϵ_r : 2,0 = 150 mm (6")/ ϵ_r : 80 = 25 mm (1")	ϵ_r : 2,0 = 150 mm (6")/ ϵ_r : 80 = 25 mm (1")
Max Process Temp.		7MA: +150 °C @ 27 bar (+250 °F @ 400 psi) 7MR: +200 °C @ 20 bar (+400 °F @ 270 psi)	+150 °C @ 20 bar (+250 °F @ 300 psi) / +200 °C (+400 °F) with max ambient temp. of +30 °C (+86 °F) @ 13 bar (200 psi)
Min Process Temp.		-40 °C @ 50 bar (-40 °F @ 750 psi)	
Max Process Pressure		70 bar @ +20 °C (1000 psi @ +70 °F) – see table at page 11	50 bar @ +20 °C (750 psi @ +70 °F) – see table at page 11
Max Viscosity		500 cP	1500 cP
Dielectric Range		1,7 to 100	2,5 to 100
Vacuum service		Negative pressure but not full vacuum	
Media coating		Not recommended in case of media coating	Film: 3% error of coated length, bridging not recommended ^②

Description		7MF: single rod GWR probe	7MF-P: automotive paint kitchen probe
Materials	Probe	316/316L (1.4401/1.4404), Monel [®] (2.4360), Hastelloy C [®] (2.4819) or PFA insulated	316/316L (1.4401/1.4404)
	Process seal	TFE with Viton GFLT, EPDM or Aegis PF 128 (Consult factory for alternatives)	
Probe diameter		Bare: 13 mm (0.50") - PFA coated: 16 mm (0.625")	6 mm (0.31")
Mounting		See mounting considerations on page 4	
Process Connection		Threaded: 2" NPT or 2" BSP (G2) – Flanged: Various ANSI, DIN or sanitary	Threaded: 3/4" NPT or 1" BSP (G1)
Probe length		From 600 mm to 4900 mm (24" to 193")	From 600 mm to 1800 mm (24" to 72")
Dead Zone (top)		min 300 mm (adjustable)	
Transition Zone ^① (bottom)		$\epsilon_r \geq 10$: 25 mm (1")	
Max Process Temp.		+150 °C @ 27 bar (+300 °F @ 400 psi)	+70 °C (+160 °F) @ atmospheric
Min Process Temp.		-40 °C @ 50 bar (-40 °F @ 750 psi)	
Max Process Pressure		70 bar @ +20 °C (1000 psi @ +70 °F) – All except sanitary GWR probe (7MF - E)	Atmospheric
		5 bar @ +150 °C (73 psi @ +300 °F) – Sanitary GWR probe only (7MF - E)	
Max Viscosity		10.000 cP – consult factory in case of agitation/turbulence	2000 cP
Dielectric Range		ϵ_r 10-100 (depending installation conditions down to $\epsilon_r \geq 3,0$)	
Side load		< 75 mm (3") deflection at end of 305 cm (120") probe	
Media coating		Max error of 10 % of coated length ^③	

^① Transition Zone (zone with reduced accuracy) is dielectric dependent; ϵ_r = dielectric permittivity. It is recommended to set 4-20 mA signal outside the transition zone / dead zone.

^② Bridging is defined as continuous accumulation of material between the probe elements.

^③ % error is related to dielectric of medium, thickness of coating and coated probe length above level.

TRANSMITTER SPECIFICATIONS

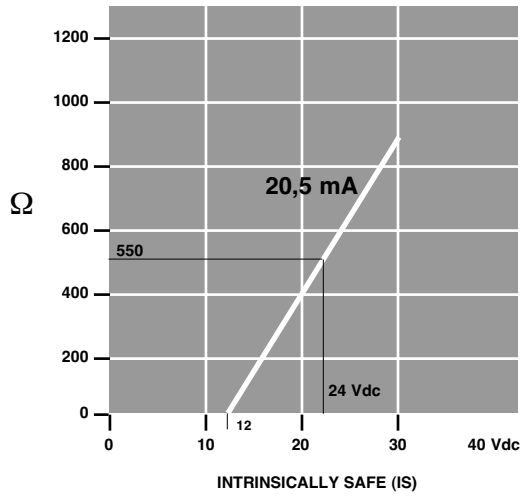
FUNCTIONAL/PHYSICAL

Description	Specification
Power (at terminals)	General Purpose / ATEX Intrinsically Safe: 12 to 28,6 V DC
Signal Output	4-20 mA or 4-20 mA with HART® 3,8 to 20,5 mA useable (meets NAMUR NE 43)
Span	150 to 4900 mm (6 to 193")
Resolution	Analog: 0,01 mA Display: 0,1 cm (inch)
Loop Resistance (see tables at page 12)	550 Ω @ 24 V DC (20,5 mA)
Damping	Adjustable 0-10 s
Diagnostic Alarm	Adjustable 3,6 mA, 22 mA, HOLD (3,6 mA is not valid if unit includes both digital display and HART®)
User Interface	3-button keypad and/or HART® communicator
Display	2-line x 8-character LCD
Menu Language	English/Spanish/French/German
Housing Material	IP 67/Valox®, UL94 - V0 rating IP 67/Aluminium A356T6 (< 0.20 % copper)
Approvals	ATEX II 1G EEx ia II C T4 FM - CSA: Non Incendive / Intrinsically safe / Explosion proof
Electrical Data	Ui = 28,4 V, Ii = 94 mA, Pi = 0,67 W
Equivalent Data	Ci = 16 nF, Li = 400 μH
Shock/Vibration Class	ANSI/ISA-571.03 SA1 (Shock), ANSI/ISA-571.03 VC2 (Vibration)
Net and Gross Weight	1,59 kg net; 2,10 kg gross (with Aluminium housing) 0,68 kg net; 1,18 kg gross (with Valox® housing)
Overall Dimensions	Aluminium (blind): H 166 mm (6.54") x W 99 mm (3.90") x Ø 115 mm (4.53") Aluminium (with display): H 175 mm (6.91") x W 99 mm (3.90") x Ø 115 mm (4.53") Valox®: H 155 mm (6.10") x W 95 mm (3.75") x Ø 115 mm (4.53")

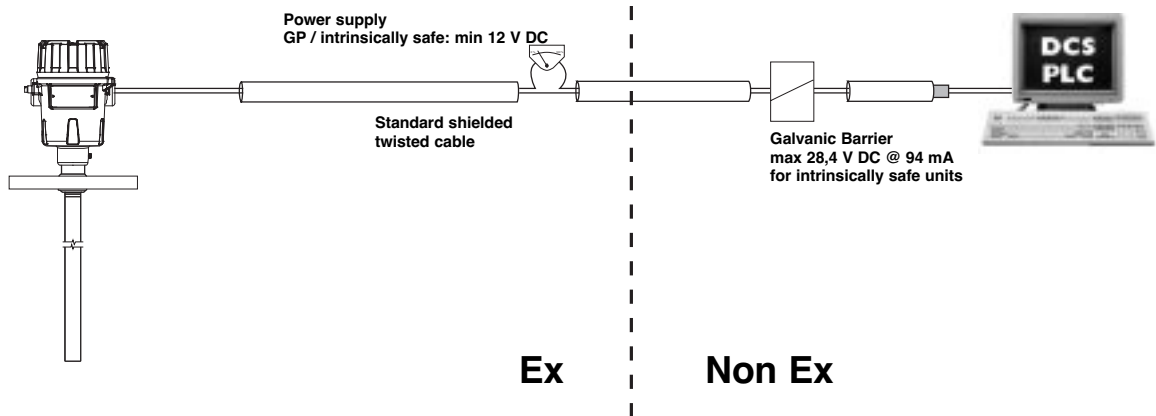
PERFORMANCE

Description	Specification
Reference Conditions with a 1,8 m (72") coaxial type GWR probe	Reflection from water at +20 °C (70 °F) with 185 mm (72") coaxial GWR probe
Linearity	7MA/7MR GWR probe: ± 6,3 mm (0,25") 7MB GWR probe: ± 12,7 mm (0,50") 7MF GWR probe: ± 19 mm (0,75")
Resolution	± 4 mm (0.15")
Repeatability	< 4 mm (0.15")
Hysteresis	< 4 mm (0.15")
Response Time	< 1 second
Warm-up Time	< 5 seconds
Ambient Temp.	blind transmitters -40 °C to +80 °C (-40 °F to +175 °F) – Aluminium housing -40 °C to +70 °C (-40 °F to +160 °F) – Valox® housing transmitters with LCD -20 °C to +70 °C (-5 °F to +160 °F)
Process Dielectric Effect	< 13 mm (0.5") within selected range
Operating Temp. Effect	Approx. ±0,03 % of probe length/°C for probes ≥ 2,5 m (8')
Humidity	0-99 %, non-condensing
Electromagnetic Compatibility	Meets CE requirements (EN-61000-6-4, EN 61000-6-2) (single and twin-rod probe must be used in metallic vessel or stillwell)

LOOP RESISTANCE



ELECTRICAL WIRING





QUALITY ASSURANCE - ISO 9001

THE QUALITY ASSURANCE SYSTEM IN PLACE AT MAGNETROL GUARANTEES THE HIGHEST LEVEL OF QUALITY DURING THE DESIGN, THE CONSTRUCTION AND THE SERVICE OF CONTROLS. OUR QUALITY ASSURANCE SYSTEM IS APPROVED AND CERTIFIED TO **ISO 9001** AND OUR TOTAL COMPANY IS COMMITTED TO PROVIDING FULL CUSTOMER SATISFACTION BOTH IN QUALITY PRODUCTS AND QUALITY SERVICE.

PRODUCT WARRANTY

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SUPERSEDES:

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UNDER RESERVE OF MODIFICATIONS

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