

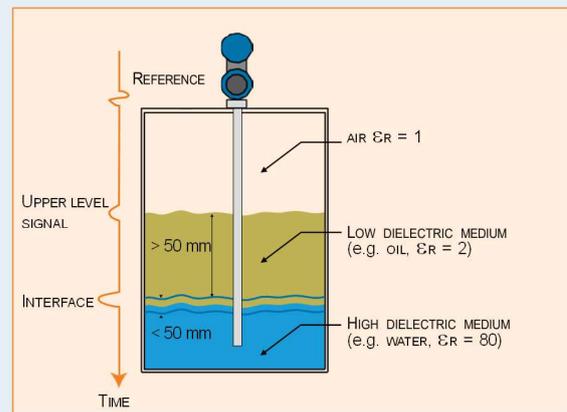
## DESCRIPTION ECLIPSE® 706 Guide wave radar level transmitter



Guided Wave Radar is based upon the principle of Time Domain Reflectometry (TDR). TDR utilises 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/vapour in which it is traveling, the pulse is reflected.

An ultra high-speed timing circuit precisely measures the transit time and provides an accurate measurement of the liquid level or the liquid-liquid interface.

Many of these devices are overfill safe due to the fact that the reference signal is generated above the process seal.



**ECLIPSE® 706**  
Guided wave radar  
level transmitter

**DESCRIPTION**

Eclipse® Model 706 is an advanced two wire loop powered, 24 V DC guided wave radar trans-mitter with a superior signal strength to take on a broad range of challenging high pressure high temperature applications. An extensive line of dedicated coaxial, caged coaxial, single and twin rod probes delivers accurate and reliable level control.

The innovative dual compartment enclosure positions wiring and electronics in the same plane, and angled to maximise ease of wiring, configuration, set-up and data display.

**Feature**

"Real Level", measurement not affected by media variables eg. dielectrics, pressure, density, pH, viscosity, ...

Easy bench configuration - no need for level movement.

2-wire loop powered intrinsically safe level transmitter.

360° rotatable housing can be dismantled without depressurising the vessel via "Quick connect/disconnect" probe coupling.

Probe designs: up to +450 °C / 430 bar (+850 °F / 6250 psi).

Saturated steam applications up to 155 bar @ +345 °C (2250 psi @ +650 °F).

Cryogenic applications down to -196 °C (-320 °F).

Integral or remote mount electronics.

SIL 2 / SIL 3 capable certified.

Unique overfill feature.

Higher pulse amplitude and superior signal-to-noise ratio (SNR).

4-button user interface and graphical LCD display provide enhanced depth of data, indicating on-screen waveforms and troubleshooting tips.

Can be programmed to automatically capture waveform data by time or by event occurrence.

Contains pro-active build-up diagnostics.

Potted electronics.

**Application**

**MEDIA:** Liquids or slurries hydrocarbons to water-based media (dielectric 1.4 - 100) and solids (dielectric 1.9 - 100). Open channel flow flumes and weirs.

**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 vapours, foam, surface agitation, bubbling or boiling, high fill/empty rates, low level and varying dielectric media or specific gravity.

**AGENCY APPROVALS**

	Ex d	Ex ia	Ex n	Ex t	XP	IS	NI	Other
ATEX	•	•	•	•				
CCOE	•	•						
CSA					•	•	•	
FM					•	•	•	
EAC (GOST)	•	•	•	•				Metrology
IEC	•	•	•	•				
Inmetro	•	•	•	•				
SIL	SIL 2 (1001)							
Marine	Lloyd's Register of Shipping (LRS)							
TÜV	WHG § 63, overfill prevention							
Other approvals are available, consult factory for more details								



## ECLIPSE® 706 PROBE SELECTION

### Coaxial GWR probes - liquides

Application/Type	7yT		7yP		7yD		7yS	
Function	Level - Interface Standard temp		Level High - Interface pressure		Level - Interface HTHP		Saturated steam Steam probe	
Overfill safe	Yes		Yes		Yes		No	
Temperature								
-40 / +65 °C (-40 / +150 °F)	Yes		Yes		Yes		Yes	
-40 / +200 °C (-40 / +400 °F)	Yes		Yes		Yes		Yes	
-196 / +200 °C (-320 / +400 °F)	No		Yes		Yes		No	
-196 / +450 °C (-320 / +850 °F)	No		No		Yes		No	
-50 / +345 °C (-58 / +650 °F)	No		No		Yes		Yes	
saturated steam	No <sup>(2)</sup>		No		No		Yes	
Max pressure								
70 bar (1000 psi)	Yes		Yes		Yes		Yes	
88 bar (1275 psi)	No		Yes		Yes		Yes	
431 bar (6250 psi)	No		Yes		Yes		No	
Dielectrics <sup>(1)</sup>								
≥ 1.4	Yes		Yes		Yes		No	
≥ 1.7	Yes		Yes		Yes		No	
≥ 4	Yes		Yes		Yes		No	
≥ 10	Yes		Yes		Yes		Yes	
Available probe length								
Standard	0,3 to 6,1 m (12 to 240")		0,3 to 6,1 m (12 to 240")		0,3 to 6,1 m (12 to 240")		0,6 to 6,1 m (24 to 240")	
Enlarged	9 m (30')		9 m (30')		9 m (30')		N/A	
Material of construction								
316/316L (1.4401/1.4404)	Yes		Yes		Yes		Yes	
Hastelloy® C (2.4819)	Yes		Yes		Yes		Yes	
Monel® (2.4360)	Yes		Yes		Yes		No	
PFA insulated 316/316L rod	No		No		No		No	
Process seal type	Teflon® TFE with Viton® o-rings <sup>(3) (5)</sup>		Hermetic glass ceramic, Inconel		Hermetic glass ceramic, Inconel		Hermetic glass ceramic, PEEK HT, Inconel	
Vacuum service	Negative pressure, but no hermetic seal		Full vacuum		Full vacuum		Full vacuum	
Viscosity cP (mPa.s)	500/2000		500/2000		500/2000		500	
Liquid	small	enlarged	small	enlarged	small	enlarged		
Clean	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Film coating	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Moderate build-up	No	Yes	No	Yes	No	Yes	No	
Strong build-up	No	No	No	No	No	No	No	
Min req. process conn.								
Small	3/4"		3/4"		2"		2"	
Enlarged	3" <sup>(4)</sup>		3" <sup>(4)</sup>		3" <sup>(4)</sup>		N/A	

<sup>(1)</sup> 1.2 min dielectric when end of probe analysis can be enabled.

<sup>(2)</sup> Acceptable up to 150 °C (300 °F) max with aegis o-rings.

<sup>(3)</sup> Other o-ring materials available (Kalrez®, Aegis,...).

<sup>(4)</sup> Outer probe ø 45 mm (1.75") (SST) or 49 mm (1.90") (exotic material) or 64 mm (2.50") (segmented).

<sup>(5)</sup> Special HF acid probe available upon request.

## ECLIPSE® 706 PROBE SELECTION

### Caged GWR probes - liquides

Application/Type	7yG	7yL	7yJ
Function	Level - Interface Standard temp	Level - Interface High pressure	Level - Interface HTHP
Overfill safe	Yes	Yes	Yes
Temperature			
-40 / +65 °C (-40 / +150 °F)	Yes	Yes	Yes
-40 / +200 °C (-40 / +400 °F)	Yes	Yes	Yes
-196 / +200 °C (-320 / +400 °F)	No	Yes	Yes
-196 / +450 °C (-320 / +850 °F)	No	No	Yes
-50 / +300 °C (-58 / +575 °F)	No	No	Yes
saturated steam	No	No	No
Max pressure			
70 bar (1000 psi)	Yes	Yes	Yes
88 bar (1275 psi)	No	Yes	Yes
431 bar (6250 psi)	No	Yes	Yes
Dielectrics <sup>(1)</sup>			
≥ 1.4	Yes <sup>(2)</sup>	Yes <sup>(2)</sup>	Yes <sup>(2)</sup>
≥ 1.7	Yes	Yes	Yes
≥ 4	Yes	Yes	Yes
≥ 10	Yes	Yes	Yes
Available probe length	0,3 to 6,1 m (12 to 240")	0,3 to 6,1 m (12 to 240")	0,3 to 6,1 m (12 to 240")
Material of construction			
316/316L (1.4401/1.4404)	Yes	Yes	Yes
Hastelloy® C (2.4819)	Yes	Yes	Yes
Monel® (2.4360)	Yes	Yes	Yes
PFA insulated 316/316L rod	No	No	No
Process seal type	Teflon® TFE with Viton® o-rings <sup>(3) (4)</sup>	Hermetic glass ceramic, Inconel	Hermetic glass ceramic, Inconel
Vacuum service	Negative pressure, but no hermetic seal	Full vacuum	Full vacuum
Viscosity cP (mPa.s)	10000	10000	10000
Liquid			
Clean	Yes	Yes	Yes
Film coating	Yes	Yes	Yes
Moderate build-up	Yes	Yes	Yes
Strong build-up	Yes	Yes	Yes
Min req. process conn.	2"	2"	2"

<sup>(1)</sup> 1.2 min dielectric when end of probe analysis can be enabled.

<sup>(2)</sup> When installed in the proper chamber/cage/stilling well.

<sup>(3)</sup> Other o-ring materials available (Kalrez®, Aegis,...).

<sup>(4)</sup> Special HF acid probe available upon request.

## ECLIPSE® 706 PROBE SELECTION

### Single rod rigid GWR probes - liquides

Application/Type	7yF	7yM	7yN
Function	Level Standard temp	Level High pressure	Level HTHP
Overfill safe	No <sup>(2)</sup>	No <sup>(2)</sup>	No <sup>(2)</sup>
Temperature			
-40 / +65 °C (-40 / +150 °F)	Yes	Yes	Yes
-40 / +200 °C (-40 / +400 °F)	Yes	Yes	Yes
-196 / +200 °C (-320 / +400 °F)	No	Yes	Yes
-196 / +450 °C (-320 / +850 °F)	No	No	Yes
-50 / +300 °C (-58 / +575 °F)	No	No	Yes
saturated steam	No	No	No
Max pressure			
70 bar (1000 psi)	Yes	Yes	Yes
88 bar (1275 psi)	No	Yes	Yes
431 bar (6250 psi)	No	Yes	Yes
Dielectrics <sup>(1)</sup>			
≥ 1.4	No	No	No
≥ 1.7	Yes	Yes	Yes
≥ 4	Yes	Yes	Yes
≥ 10	Yes	Yes	Yes
Available probe length	0,6 to 7,32 m (24 to 288")	0,6 to 7,32 m (24 to 288")	0,6 to 7,32 m (24 to 288")
Material of construction			
316/316L (1.4401/1.4404)	Yes	Yes	Yes
Hastelloy® C (2.4819)	Yes	Yes	Yes
Monel® (2.4360)	Yes	Yes	Yes
PFA insulated 316/316L rod	Yes	No	No
Process seal type	Teflon® TFE with Viton® o-rings <sup>(3)</sup>	Hermetic glass ceramic, Inconel	Hermetic glass ceramic, Inconel
Vacuum service	Negative pressure, but no hermetic seal	Full vacuum	Full vacuum
Viscosity cP (mPa.s)	10000	10000	10000
Liquid			
Clean	Yes	Yes	Yes
Film coating	Yes	Yes	Yes
Moderate build-up	Yes	Yes	Yes
Strong build-up	Yes	Yes	Yes
Min req. process conn.	2" <sup>(4)</sup>	2" <sup>(4)</sup>	2"

<sup>(1)</sup> 1.2 min dielectric when end of probe analysis can be enabled.

<sup>(2)</sup> Overfill capability can be achieved via software.

<sup>(3)</sup> Other o-ring materials available (Kalrez®, Aegis,...).

<sup>(4)</sup> 1" threaded connection available.

## ECLIPSE® 706 PROBE SELECTION

### Flexible GWR probes - liquides

Application/Type	7y1	7y3	7y6	7y7
Function	Level Single flexible Standard temp	Level Single flexible HP	Level - Interface Single flexible HTHP	Level - Interface Twin flexible Standard temp
Overfill safe	No <sup>(2)</sup>	No <sup>(2)</sup>	No <sup>(2)</sup>	No <sup>(2)</sup>
Temperature				
-40 / +65 °C (-40 / +150 °F)	Yes	Yes	Yes	Yes
-40 / +200 °C (-40 / +400 °F)	Yes	Yes	Yes	Yes
-196 / +200 °C (-320 / +400 °F)	No	Yes	Yes	No
-196 / +450 °C (-320 / +850 °F)	No	Yes	Yes	No
-50 / +300 °C (-58 / +575 °F)	No	Yes	Yes	No
saturated steam	No	No	No	No
Max pressure				
70 bar (1000 psi)	Yes	Yes	Yes	Yes
88 bar (1275 psi)	No	Yes	Yes	No
431 bar (6250 psi)	No	Yes	Yes	No
Dielectrics <sup>(1)</sup>				
≥ 1.4	No	No	Yes <sup>(3)</sup>	No
≥ 1.7	Yes <sup>(4)</sup>	Yes <sup>(4)</sup>	Yes	Yes <sup>(4)</sup>
≥ 4	Yes	Yes	Yes	Yes
≥ 10	Yes	Yes	Yes	Yes
Available probe length	1 to 30 m (3 to 100')	1 to 30 m (3 to 100')	1 to 30 m (3 to 100')	1 to 30 m (3 to 100')
Material of construction				
316/316L (1.4401/1.4404)	Yes	Yes	Yes	Yes
Hastelloy® C (2.4819)	No	No	No	No
Monel® (2.4360)	No	No	No	No
PFA insulated 316/316L cable	Yes	No	No	No
Process seal type	Teflon® TFE with Viton® o-rings <sup>(5)</sup>	Hermetic glass ceramic	Hermetic glass ceramic	Teflon® TFE with Viton® o-rings <sup>(5)</sup>
Vacuum service	Negative pressure, but no hermetic seal	Full vacuum	Full vacuum	Negative pressure, but no hermetic seal
Viscosity cP (mPa.s)	10000	10000	10000	1500
Liquid				
Clean	Yes	Yes	Yes	Yes
Film coating	Yes	Yes	Yes	Yes
Moderate build-up	Yes	Yes	Yes	No
Strong build-up	Yes	Yes	Yes	No
Min req. process conn.	2"	2"	2"	2"

<sup>(1)</sup> 1.2 min dielectric when end of probe analysis can be enabled.

<sup>(2)</sup> Overfill capability can be achieved via software.

<sup>(3)</sup> When installed in the proper chamber/cage/stilling well.

<sup>(4)</sup> May increase with probe length >10 m (30').

<sup>(5)</sup> Other o-ring materials available (Kalrez®, Aegis,...).

## ECLIPSE® 706 PROBE SELECTION

Flexible GWR probes - solids

Application/Type	7y2	7y5
Function	Level Single flexible Standard temp	Level Twin flexible Standard temp
Overfill safe	No <sup>(2)</sup>	No <sup>(2)</sup>
Temperature		
-40 / +65 °C (-40 / +150 °F)	Yes	Yes
-40 / +200 °C (-40 / +400 °F)	No	No
-196 / +200 °C (-320 / +400 °F)	No	No
-196 / +450 °C (-320 / +850 °F)	No	No
-50 / +300 °C (-58 / +575 °F)	No	No
saturated steam	No	No
Max pressure	Atmos	Atmos
Dielectrics <sup>(1)</sup>		
≥ 1.4	No	No
≥ 1.7	No	Yes <sup>(3)</sup>
≥ 4	Yes	Yes
≥ 10	Yes	Yes
Available probe length	1 to 30 m (3 to 100')	1 to 30 m (3 to 100')
Material of construction		
316/316L (1.4401/1.4404)	Yes	Yes
Hastelloy® C (2.4819)	No	No
Monel® (2.4360)	No	No
PFA insulated 316/316L rod	No	No
Process seal type	Teflon® / PEI <sup>(4)</sup>	Teflon® / PEI <sup>(4)</sup>
Vacuum service	Negative pressure, but no hermetic seal	Negative pressure, but no hermetic seal
Viscosity cP (mPa.s)	10000	1500
Liquid		
Clean	Yes	Yes
Film coating	Yes	Yes
Moderate build-up	Yes	No
Strong build-up	Yes	No
Min req. process conn.	2" min	2" min

<sup>(1)</sup> 1.2 min dielectric when end of probe analysis can be enabled.

<sup>(2)</sup> Overfill capability can be achieved via software.

<sup>(4)</sup> PEI = Ultem™ 1000.