

RELIABLE ULTRASONIC MEASUREMENT



# CYGNUS PROBES



To compliment our ultrasonic thickness gauges we offer a range of ultrasonic probes. The performance of any ultrasonic thickness gauge relies heavily on the probe and its suitability to the material being measured. Therefore, selecting the right probe is vital.

IDEAL FOR USE IN



OIL AND GAS



OFFSHORE PLATFORMS



THROUGH SPECIAL COATINGS



SHIP SURVEYS



HIGH TEMPERATURE

...plant maintenance, civil engineering, marine structures, ship inspections, oil and gas facilities, offshore platforms, wind farms, rail infrastructure, metals protected by thick/special coatings.



EXPLORE THE PROBE RANGE



# CYGNUS INSTRUMENTS PROBES

To compliment our ultrasonic thickness gauges we offer a range of ultrasonic probes. The performance of any ultrasonic thickness gauge relies heavily on the probe and its suitability to the material being measured. Therefore, selecting the right probe is vital.

All Cygnus' probes are made from stainless steel and have a hard wear face or a wear membrane to protect the probe.



### What does each probe code mean?

T	S	B	-	C	A	W	X	
Probe Type			Probe Specifics					
Type	Frequency	Crystal Size	Crystal Type	Exit	Connector Type	Application		
Single <b>S</b>	0.5 <b>0.5</b>	< 7 <b>A</b>	Monolithic <b>M</b>	Axial <b>A</b>	Wired <b>W</b>	Standard		
Twin <b>T</b>	1.00 <b>1</b>	7-11 <b>B</b>	Composite <b>C</b>	Side <b>S</b>	BNC <b>B</b>	High Temp <b>H</b>		
	2.00 <b>2</b>	12- 15 <b>C</b>				Lemo - 00 <b>L</b>	Deep Water <b>D</b>	
	2.25 <b>2</b>	19 <b>D</b>				uDot <b>U</b>	Boiler Tube <b>B</b>	
	3.00 <b>3</b>	25 <b>E</b>			Sub Vis <b>S</b>	Ex <b>X</b>		
	3.50 <b>3</b>	30 <b>F</b>						
	4.00 <b>4</b>							
	5.00 <b>5</b>							
	7.50 <b>7</b>							
	10.00 <b>10</b>							
15.00 <b>15</b>								
20.00 <b>20</b>								

### Variety of Cygnus INOX Probes

- Stainless steel SINGLE CRYSTAL probes, used in multiple-echo mode, include replaceable membranes for long life, require no zeroing and have a high linear accuracy.
- Stainless steel TWIN CRYSTAL probes, used in echo-echo and single-echo modes, have improved measurability on extreme back wall corrosion and pitting.
- Probes for use with the Cygnus 2, 2+, 4, 4+ and 6+ gauges are fitted with a BNC or Lemo 00 connector.
- Cygnus DIVE gauge probes are fitted with an integral coiled cable with a Fischer connector.
- Probes for use with the Cygnus Underwater, Intrinsically Safe and Heavy Duty gauges are fitted to a nosecone that screws onto the gauge body.

### Guidelines for Probe Frequency Selection

The probe frequency will be determined by the minimum thickness you need to measure. However, the lower the frequency

the more effective the ultrasound will be at penetrating coatings and corrosion. The S2C 2.25 MHz 13 mm (0.5 inch) INOX probe is recommended for the majority of applications as it performs the best on corroded metal and through thick coatings.

### Three Versatile Measuring Modes

Multiple-Echo mode uses three error checked back wall echoes to provide the most reliable and accurate remaining thickness measurements, with no need to remove coatings (up to 20mm/0.8 in thick).

Single-Echo mode is ideal for measuring uncoated metals with heavy front and/or back-wall corrosion. Also effective on a range of cast metals, plastics and composites.

Echo-Echo mode works best for measuring heavily corroded metals through thin coatings of up to 1mm/0.04in thick, ideal for measuring painted metals with heavy back wall corrosion.

**Single crystal probes are particularly suited to read through and ignore coatings.** They are used

with our gauges in Multiple-Echo mode. Constructed from stainless steel, they have a soft face incorporating a replaceable wear membrane. This protects the probe face ensuring years of reliable, accurate service.



## SINGLE CRYSTAL PROBES



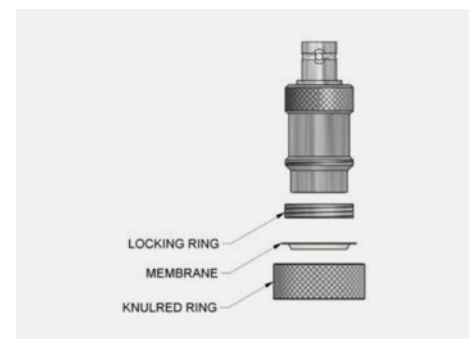
	S5A	S5C	S3C	S2C
	Ideal for: Small diameter pipes and boiler tubes/heat exchangers	Ideal for: Measuring wall thickness down to 1 mm (0.040 inch)	Ideal for: Measuring wall thickness down to 2mm/0.080in with corrosion through coatings	Ideal for: all round measurement of wall thickness with corrosion through coatings
<b>Frequency</b>	5 MHz	5 MHz	3.5 MHz	2.25 MHz
<b>Tip Size</b>	6mm (0.24 in)	13mm (0.5 in)	13mm (0.5 in)	13mm (0.5 in)
<b>Range in Steel</b>	1 - 50mm (0.040 - 2in)	1 - 50mm (0.040 - 2in)	2 - 150mm (0.080 - 6in)	3 - 250mm (0.120 - 10in)
<b>Connectors</b>	Lemo 00	BNC	BNC	BNC
<b>Colour</b>	Black Face	Black Band	Orange Band	Red Band

All probes need to be used with Ultrasonic Couplant when taking measurements (excl. underwater)

### Probe Membranes

Cygnus single crystal probes have a protective membrane fitted in front of the probe face to protect it from damage during use. The membrane also helps the probe face “mould” to surfaces being measured.

The performance of the probe depends on the condition of the membrane and how well it has been fitted. Cygnus recommends membranes are replaced frequently as a precaution or at the first sign of any scoring, tearing or damage.



Part No.	Probe Size	Size of Head inc. Knurled Ring (approx.)	Size of Membrane (approx.)
<b>Standard Polyurethane (max. 75°C) Pack of 20</b>			
001-3702	6mm/0.24in	18mm/0.70in	14mm/0.50in
001-3701	13mm/0.50in	24mm/0.95in	21mm/0.82in
001-3700	19mm/0.75in	30mm/1.18in	28.5mm/1.12in
<b>Teflon (max. 150 °C) Pack of 10</b>			
001-4873	6mm/0.24in	18mm/0.70in	14mm/0.50in
001-4874	13mm/0.50in	24mm/0.95in	21mm/0.82in
001-4875	19mm/0.75in	30mm/1.18in	28.5mm/1.12in

A pack of standard membranes is supplied in each gauge kit. Details above to order spares and Teflon membranes.

Membranes are available in two materials, the standard Polyurethane membrane is suitable for surface temperatures up to 75°C (167°F), the Teflon membrane is suitable for surface temperatures up to 150°C (302°F) with a maximum contact time of 5 seconds.

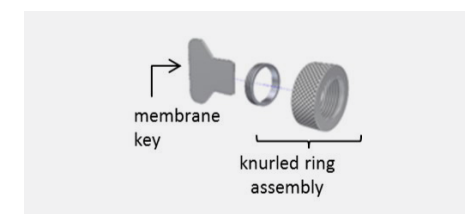
### Membrane Couplant

Membrane couplant needs to be used between the membrane and the probe face. This creates a thin layer of oil that allows the ultrasound to pass through.

A 25 ml bottle of Membrane Couplant is supplied in each gauge kit.

### Knurled Rings And Membrane Locking Ring Keys

Supplied with every single crystal probe, the knurled ring holds the membrane in place. The membrane key is used to unscrew and screw in the locking ring which the membrane is fitted into.



Part Description	Part Number
<b>Knurled Ring Assembly for:</b>	
19mm (0.75 inch) Probes	001-3705
13mm (0.50 inch) INOX Probes	001-3709
13mm (0.50 inch) Probes	001-3704
6mm (0.24 inch) Probes	001-3703
<b>Membrane Keys for:</b>	
19mm (0.75 inch) Probes	001-2610
13mm (0.50 inch) Probes	001-2611
6mm (0.24 inch) Probes	001-2612

# TWIN CRYSTAL PROBES

Twin crystal probes are particularly suited to measuring heavily corroded metals. They are used with our gauges in two measuring modes. In Echo-Echo mode, up to 1 mm (0.040 inch) of surface coating can be read through and ignored. Single-Echo mode should only be used when there are no surface coatings.



Standard probe supplied

	T2C-CSL	T5B-CSL	T5A-CSW	T5B-CSW	T7A-CSWB
	Ideal for: Attenuative materials	Ideal for: General purpose heavy front/back wall corrosion or pitting	Ideal for: General purpose	Ideal for: General purpose, extremely heavy front/back wall pitting or corrosion	Ideal for: Small diameter pipes e.g. boiler tube. Thin, corroded plate
<b>Frequency Crystal Ø</b>	2 MHz 12mm (0.5in)	5 MHz 9.5mm (0.37in)	5 MHz 6.4mm (0.25in)	5 MHz 9.5mm (0.37 in)	7.5 MHz 4.5mm (0.18 in)
<b>Tip Size</b>	17mm (0.67in)	12.7mm (0.5in)	9.5mm (0.37in)	12.7mm (0.5in)	6.5mm (0.26in)
<b>Range in Steel (Single-Echo)</b>	2.5 - 350mm (0.1 - 13.8in)	1.5 - 200mm (0.059 - 7.90in)	1 - 150mm (0.039 - 5.91in)	1.5 - 200mm (0.059 - 7.9in)	0.8 - 50mm (0.031 - 2in)
<b>(Echo-Echo)</b>	5 - 50mm (0.20 - 2in)	4 - 50mm (0.16 - 2in)	3 - 50mm (0.12 - 2in)	4 - 50mm (0.16 - 2in)	3 - 25mm (0.12 - 1in)
<b>Connectors</b>	Twin Lemo 00	Twin Lemo 00	Wired to Lemo 00	Wired to Lemo 00	Wired to Lemo 00
<b>Weight</b>	56g (1.98 oz)	61g (2.15 oz)	81.7g (2.89 oz) Inc. cable	90g (3.2 oz) Inc. cable	68g (2.39 oz) Inc. cable
<b>Temperature Range</b>	-10°C to 70°C (14°F to 158°F)	-10°C to 70°C (14°F to 158°F)	-10°C to 70°C (14°F to 158°F)	-10°C to 70°C (14°F to 158°F)	-10°C to 70°C (14°F to 158°F)

All above probes have composite crystal and need to be used with Ultrasonic Couplant when taking measurements (excl. underwater)

# HIGH TEMPERATURE PROBE

No cooling period required - reducing inspection time and facilitating more effective measurement



T5B-MAUH

Ideal for: hot surfaces up to 300 degrees C

<b>Frequency Crystal Ø</b>	5.0 MHz 8mm (0.31in) Nominal
<b>Tip Size</b>	11mm (0.43in) Nominal
<b>Range in Steel</b>	1.5 - 250mm (0.05 - 9.8in)
<b>Connectors</b>	Twin Lemo 00
<b>Temperature Range</b>	-55°C to 300°C (-67°F to 572°F)

High Temperature Ultrasonic Couplant is required when taking measurements

Twin Element Ultrasonic Probe designed for high-temperature, in-service thickness measurements and corrosion surveys across oil and gas, refining, energy and process sectors. Great wear resistance allows for use on hot surfaces up to 300°C. Measures remaining wall thickness from 1.5mm to 250mm - depending on temperature and material.



Option to use a standard cable or a more robust, braided cable.

Standard Cable



Braided Cable



# HOW TO CHOOSE THE RIGHT PROBE

WHAT ARE YOU TESTING?

**CORRODED METALS**

**THICK PROTECTIVE COATING (UP TO 20MM)**

**SINGLE CRYSTAL PROBES WITH MULTIPLE-ECHO MEASURING MODE (PLUS DEEP COAT FUNCTION)**

**PROTECTIVE COATING (UP TO 3MM)**

**SINGLE CRYSTAL PROBES WITH MULTIPLE-ECHO MEASURING MODE**

**THIN PROTECTIVE COATING (UP TO 1MM)**

**SINGLE CRYSTAL PROBES WITH MULTIPLE-ECHO MEASURING MODE**

OR

**TWIN CRYSTAL PROBES WITH ECHO-ECHO MEASURING MODE**

**NO PROTECTIVE COATING**

**SINGLE CRYSTAL PROBES WITH MULTIPLE-ECHO MEASURING MODE**

OR

**TWIN CRYSTAL PROBES WITH SINGLE-ECHO MEASURING MODE**

**EXTREMELY CORRODED METALS WITH FRONT OR BACK WALL CORROSION OR PITTING**

**THIN PROTECTIVE COATING (UP TO 1MM)**

**TWIN CRYSTAL PROBES WITH ECHO-ECHO MEASURING MODE**

**NO PROTECTIVE COATING**

**TWIN CRYSTAL PROBES WITH SINGLE-ECHO MEASURING MODE**

**PLASTICS, CAST METALS, COMPOSITES, ATTENUATIVE MATERIALS**

**NO PROTECTIVE COATING**

**TWIN CRYSTAL PROBES WITH SINGLE-ECHO MEASURING MODE**

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All information provided is subject to change without prior notice.



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