RCSL CORROSION MONITORING

Corrosion Monitoring

ER Probes **LP Probes** **MS Instrumentation**

Weight Loss Coupons **Miscellaneous**

Access Fittings **Chemical Injection**

Catalogue

Electrical Resistance Probes and Accessories

RCSL Corrosion Monitoring have a range of ER (Electrical Resistance) Probes available, for more information and specifications please click below:

ER0250
ER0500
ER1000
ER2000
ER2100
ER3000
ER3100
ER3110
ER3200
ER4000
ER4100
ER4200
ER4210
ER6000
ER6100
ER6200
ER7000
ER7100
ER7200
ER7210
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ER7300

ER System Accessories

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LP Probe Menu

Linear Polarisation Resistance Probes and Accessories

RCSL Corrosion Monitoring have a range of ER (Electrical Resistance) Probes available, for more information and specifications please click below:

LP1000
LP1100
LP2000
LP2100
LP3000
LP3010
LP3100
LP4000
LP4100
LP6000
LP6100
LP7000
LP7100
LP7210

Electrodes and Gaskets

LP System Accessories

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MS Instrumentation

RCSL Corrosion Monitoring offer various ER and LPR MS Instrumentation, for more on these product, please click below:

MS0500

MS1000

MS1500E

MS1500L

MS2500E

MS2500L

MS2510

MS2600E

MS2700E

MS2800E

MS3500E

MS3500L

Wireless Radio Option for 2500E/ 2500L

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Weight Loss Coupons

A Number of Weight Loss Coupons along with a number of accessories that accompany them are available below:

RT6000

Test Racks

HC Coupon Probes

RT4000

Coupon Specifications

Two inch system

Water Treatment Industry

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Miscellaneous

SP7000 Sand Probe

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SR2159 Retracting System

Model 600 Access Valve

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Access Fittings

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- Accessories
- Seals and O Rings
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Model IP4000

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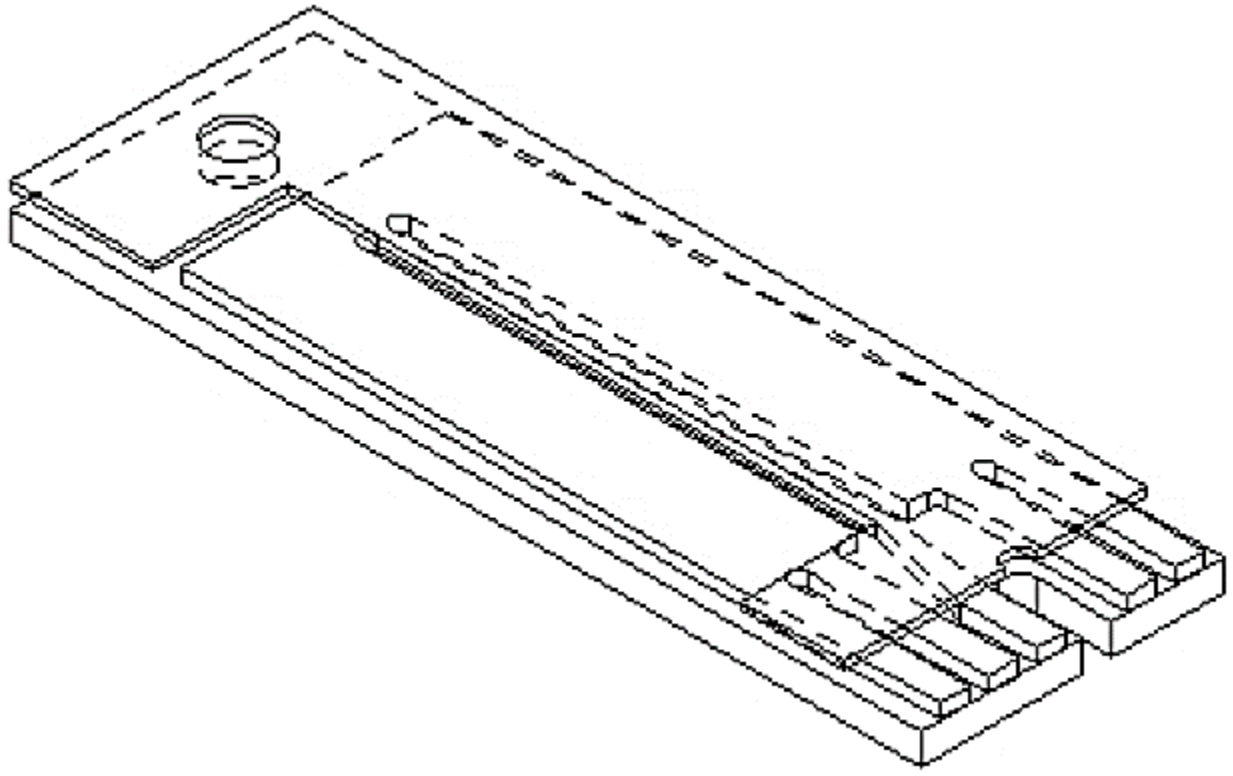
ER0250 Atmospheric Probe
Data Sheet



Picture is for illustrative purposes only, supplied product may differ.

Model ER0250 is a probe used to monitor corrosion in atmospheric environments. The probe consists of an element which is mounted onto an epoxy board. One side of the element is exposed to the corrosive environment while the other side is covered, acting as a reference element. The ER0250 connects to a special cable that allows it to be used with electrical resistance probe instrumentation. Replacement elements may be ordered without cable. The probe comes with a 3/16" hole for easy mounting.

Specifications:	
Probe Body	Epoxy
Temperature Rating	121°C / 250°F
Standard Element sizes	4 or 8 mils (useful range is half of thickness)

ER0250 Ordering Information

Model				
AP21	Atmospheric Probe			
	Element Thickness			
	04	4 mil thickness (2 mil useful probe life)		
	08	8 mil thickness (4 mil useful probe life)		
		Element Alloy		
		XXX	Use Code in Alloy Chart	
			Cable Length	
			00	No Cable
			10	10ft Cable
			20	20ft Cable
AP21	**8**	**375**	**20**	**Example of Probe Ordering#**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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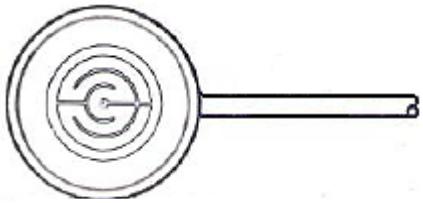
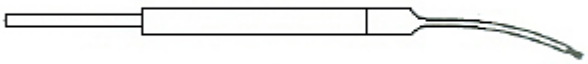
ER0500 – Electrical Resistance Probe
Surface Strip Elements and Cylindrical Element Types



Surface Strip Element



Cylindrical Element

Picture is for illustrative purposes only, supplied product may differ.

Model ER0500 corrosion probes are designed for heavy duty service conditions such as underground and structural monitoring of pipelines, vessels, above and below ground storage tanks and structures - whether cathodically protected or not. The surface strip element assembly is suited to the "construction site" environment. The cylindrical element is economical and durable. Its slim profile is convenient for locations with restricted access such as concrete bridge structures and other infrastructure applications. Both probes provide good sealing of the reference element and the check element provides confidence in the continued performance of the corrosion sensor.

Either probe may or may be connected to a cathodically protected structure. Connection of a ground cable allows the probe to measure the effectiveness of the Cathodic Protection (C.P.) System under all the operating conditions. If unconnected to the structure, the probe monitors the direct corrosivity of the soil or environment. The probes may be ordered with or without a grounding lead for a C.P. System. The lead may be installed at the probe or connector end, whichever is most convenient. In most cases, a lead at the monitoring connector end is preferred, with a separate lead running to the vessel or C.P. System. This enables connection to the C.P. System to be made as required - even after probe installation.

Specifications:

	Surface Strip	Cylindrical (Standard)	Cylindrical (High-Temp)
Probe Body	PVC/ Epoxy	FRP/ Epoxy	Stainless Steel
Cable	High-Density Polyethlene Jacket Rated for Direct Burial		Teflon® FEP
Temperature Rating	176°F (80°C)		392°F (200°C)

ER0500 Ordering Information

Model					
AP	Electrical Resistance Probe				
	Type				
	31	Under ground surface strip without ground strap			
	40	Under ground cylindrical with ground strap			
	61	Under ground surface strip with ground strap			
	70	Under ground cylindrical without ground strap			
		Element Thickness			
		10	10 mil thickness (5 mil useful probe life) - cylindrical or surface strip		
		20	20 mil thickness (10 mil useful probe life) - cylindrical or surface strip		
		40	40 mil thickness (20 mil useful probe life) - surface strip only		
		50	50 mil thickness (25 mil useful probe life) - cylindrical only		
			Element Alloy		
			XXX	Use Code in Alloy Chart	
				Cable Length	
				10	10ft cable
				20	20ft cable
AP	**31**	**40**	**375**	**20**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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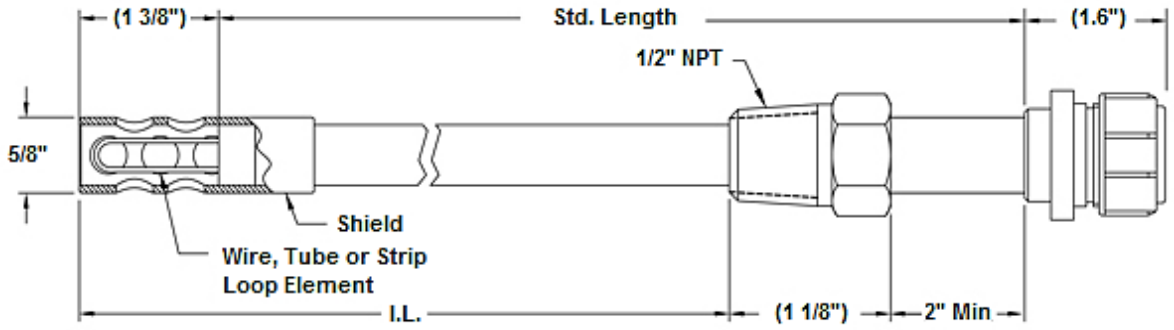
Model ER1000 – Electrical Resistance Probe with Fixed Length ½" NPT Pipe Plug Mount and Loop Element



All Dimensions in Inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER1000 Electrical Resistance Probe is a fixed-insertion-length probe with a ½" NPT pipe plug. The probe process isolation or process shutdown to install and a threaded pipe fitting to mount. With a maximum diameter of ½", the probe is ideal for applications where space is limited. The probe consists of an insertion rod with an element, a hermetically sealed connector, a ½" NPT fitting, and a velocity shield, which are all welded in place. Several standard loop elements and lengths are available to meet your specific needs. (Refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Glass or Teflon®
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi / 204 Bar
Mounting	½" NPT Fitting

Standard. Length	I.L. (max)
5"	2.08"
8"	5.08"
12"	9.08"
18"	15.08"

ER1000 Ordering Information

Model							
EP21	Electrical Resistance 0.5 inch NPT Pipe Plug Probe						
	Probe Body Material						
	22	316					
	44	C276					
		E/R Element Options					
		00	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)				
		10	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)				
		20	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)				
		30	TU08 Tube Loop - 8 mil thickness (4 mil useful probe life)				
			Seal Type				
			1	Glass			
			2	Teflon®			
			3	Epoxy			
				Length			
				05	2.08 inches max. insertion length		
				08	5.08 inches max. insertion length		
				12	9.08 inches max. insertion length		
				18	15.08 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
						03	Shield
EP21	**22**	**10**	**1**	**08**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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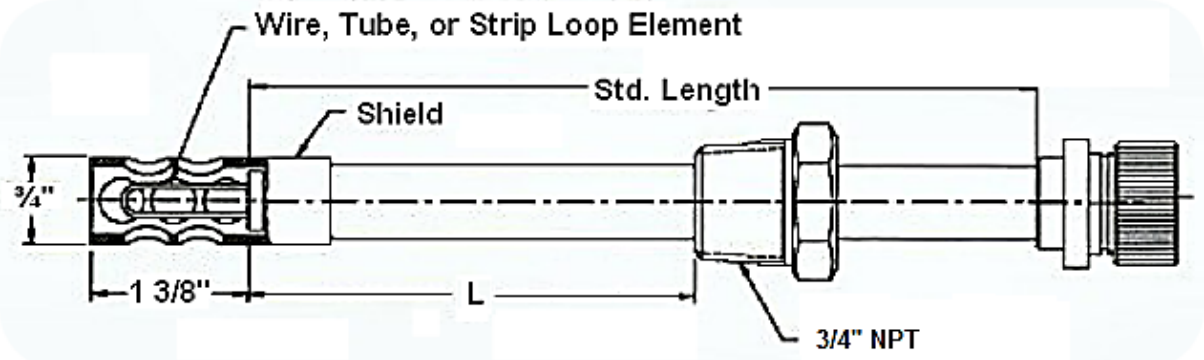
Model ER2000 – Electrical Resistance Probe with Fixed Length NPT Pipe Plug Mount and Loop Element



All Dimensions in inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER2000 Electrical Resistance Probe is a fixed-insertion-length probe with a ¾" NPT pipe plug. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, a ¾" NPT fitting. Which are welded in place. A velocity shield can be provided if required. The insertion length (I.L.) is calculated to the end of the shield and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Several standard loop elements are available to meet your specific needs.

Specifications:	
Element Seal	Glass or Teflon®
Fill Material	Ceramic or Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi / 204 Bar
Mounting	¾” NPT Fitting (please specify size required)
Probe Body	316 Stainless Steel

Standard Length	I.L. (max)
6”	4.13”
8”	6.13”
12”	10.13”
18”	16.13

ER2000 Ordering Information

Model								
ER2	Electrical Resistance Fixed Length Pipe Plug Probe							
	Pipe Plug Size							
	2	0.75 inch NPT Pipe Plug						
	3	1 inch NPT Pipe Plug						
		Probe Body Material						
		22	316					
		44	C276					
			E/R Element Options					
			00	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)				
			10	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)				
			20	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)				
			30	TU08 Tube Loop - 8 mil thickness (4 mil useful probe life)				
			80	SL05 Strip Loop - 5 mil thickness (1.25 mil useful probe life)				
			90	SL10 Strip Loop - 10 mil thickness (2.5 mil useful probe life)				
				Seal Type				
				1	Glass			
				2	Teflon®			
				3	Epoxy			
					Length			
					06	4.13 inches max. insertion length		
					08	6.13 inches max. insertion length		
					12	10.13 inches max. insertion length		
					18	16.13 inches max. insertion length		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	No Shield
							03	Shield
ER2	**2**	**22**	**10**	**1**	**8**	**375**	**3**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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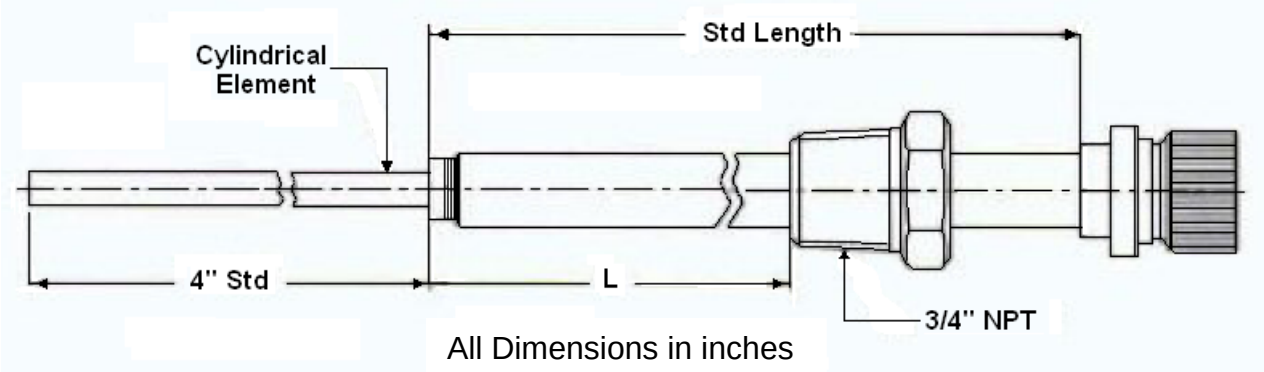
Model ER2100 – Electrical Resistance Probe with fixed Length NPT Pipe Plug Mount and Loop Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER2100 is a fixed-length, electrical resistance probe with a ¾" NPT pipe plug. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The all-welded construction allows the probe to be used in harsh environments. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a ¾" NPT fitting, which are all welded in place. A velocity shield can be provided if required. The insertion length (I.L.) is calculated to the end of the shield or to the end of the element if a shield is not present. Probe length can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Welded
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	3000 psi / 204 Bar
Mounting	¾" NPT Fitting

Standard. Length	I.L. (max)
6"	7.38"
8"	9.38"
12"	13.38"
18"	19.38"

ER2100 Ordering Information

Model							
ER2	Electrical Resistance Fixed Length Pipe Plug Probe						
	Pipe Plug Size						
	2	0.75 inch NPT Pipe Plug					
	3	1 inch NPT Pipe Plug					
		Probe Body Material					
		22	316				
		44	C276				
			E/R Element Options				
			500	CT10 Cylindrical - 10 mil thickness (5 mil useful probe life)			
			600	CT20 Cylindrical - 20 mil thickness (10 mil useful probe life)			
			700	CT50 Cylindrical - 50 mil thickness (25 mil useful probe life)			
				Length			
				06	7.38 inches max. insertion length		
				08	9.38 inches max. insertion length		
				12	13.38 inches max. insertion length		
				18	19.38 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
						03	Shield
ER2	**2**	**22**	**500**	**08**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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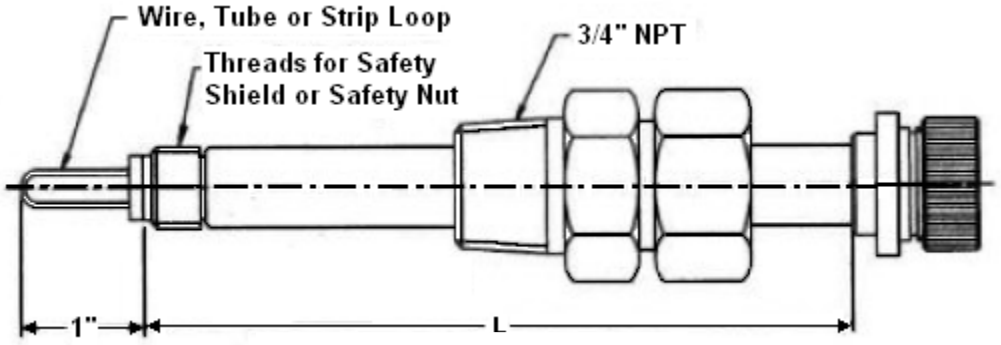
Model ER3000 Electrical Resistance Probe
With Adjustable Length ¾ inch Pipe Plug Mount and Loop Element



All Dimensions in Inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER3000 is an adjustable-length, electrical resistance probe with a 3/4" NPT compression fitting. The compression fitting allows the probe to be inserted into the process to the required length. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe consists of an insertion rod with an element, a hermetically sealed connector, a 3/4" compression fitting, and a safety nut to prevent blow out. A velocity shield can be added to the assembly if required. The insertion length (I.L.) is calculated to the end of the shield or to the end of the element if a shield is not present. Probe length can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Glass or Teflon®
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	¾” NPT Fitting

Standard Length	I.L. (max)
6”	5.33”
8”	7.33”
12”	11.33”
18”	17.33”

ER3000 Ordering Information

Model								
ER3	Electrical Resistance Adjustable Pipe Plug Probe							
	Pipe Plug Size							
	2	0.75 inch NPT Pipe Plug						
	3	1 inch NPT Pipe Plug						
		Probe Body Material						
		22	316					
		44	C276					
			E/R Element Options					
			00	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)				
			10	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)				
			20	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)				
			30	TU08 Tube Loop - 8 mil thickness (4 mil useful probe life)				
			80	SL05 Strip Loop - 5 mil thickness (1.25 mil useful probe life)				
			90	SL10 Tube Loop - 10 mil thickness (2.5 mil useful probe life)				
			A0	FS04 Flush Mount Small - 4 mil thickness (2 mil useful probe life)				
				Seal Type				
				1	Glass			
				2	Teflon®			
				3	Epoxy			
					Length			
					06	5.33 inches max. insertion length		
					08	7.33 inches max. insertion length		
					12	11.33 inches max. insertion length		
					18	17.33 inches max. insertion length		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	No Shield
							03	Shield
ER3	**2**	**22**	**10**	**1**	**08**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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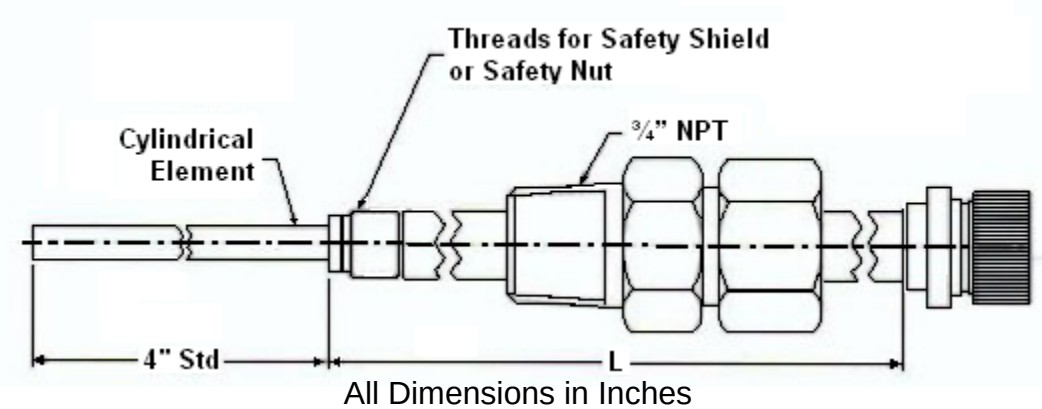
Model ER3100 – Electrical Resistance Probe with Adjustable Length ¾" NPT Pipe Plug Mount and Cylindrical Element



All Dimensions in Inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER3100 is an adjustable-length, electrical resistance probe with a 3/4" NPT compression fitting. The compression fitting allows the probe to be inserted into the process to the required length. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The all-welded construction allows the probe to be used in harsh environments. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector welded in place, a 3/4" compression fitting, and a safety nut to prevent blow out. A velocity shield can be added to the assembly if required. The insertion length (I.L.) is calculated to the end of the shield or to the end of the element if a shield is not present. Probe length can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Welded
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	¾" NPT Fitting

Standard Length	I.L. (max)
6"	8.58"
8"	10.58"
12"	14.58"
18"	20.58"

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ER3100 Ordering Information

Model							
ER3	Electrical Resistance Adjustable Length Pipe Plug Probe						
	Pipe Plug Size						
	2	0.75 inch NPT Pipe Plug					
	3	1 inch NPT Pipe Plug					
		Probe Body Material					
		22	316				
		44	C276				
			E/R Element Options				
			500	CT10 Cylindrical - 10 mil thickness (5 mil useful probe life)			
			600	CT20 Cylindrical - 20 mil thickness (10 mil useful probe life)			
			700	CT50 Cylindrical - 50 mil thickness (25 mil useful probe life)			
				Insertion Length			
				06	8.58 inches max. insertion length		
				08	10.58 inches max. insertion length		
				12	14.58 inches max. insertion length		
				18	20.58 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
						03	Shield
ER3	2	22	500	08	375	03	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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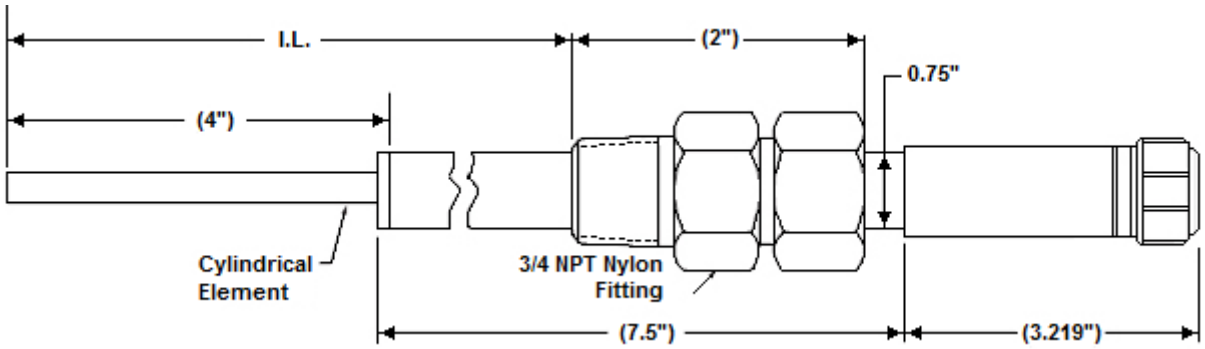
REGISTRATION No. 1394643 ENGLAND · REGISTERED OFFICE: AS ABOVE

Model ER3110 Electrical Resistance Probe Adjustable Length with 3/4" NPT Pipe Plug, Cylindrical Element and Non-Metallic Probe Body



Picture is for illustrative purposes only, supplied product may differ.

Model ER3110 is an adjustable-length, electrical resistance probe with a ¾" NPT compression fitting and a non-metallic probe body. The compression fitting allows the probe to be inserted into the process to the required length. The non-metallic body provides electrical isolation between the probe element and the vessel. This can be useful in systems where galvanic problems and stray currents may cause accelerated corrosion of the probe element, causing an over-estimation of the system's corrosion rate. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe assembly consists of an epoxy-filled insertion rod with an element, a 6-pin connector, and a ¾" compression fitting. The insertion length (I.L.) is calculated to the end of the element. The maximum insertion length (I.L.) is 9.5". Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	Glass Epoxy
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating (w/Nylon compression fitting)	65°C / 150°F
Pressure Rating	100psi / 7 Bar
Mounting	¾" NPT Pipe Plug

ER3110 Ordering Information

Model							
ER3	Electrical Resistance Adjustable Length Pipe Plug Probe						
	Pipe Plug Size						
	2	¾” NPT Pipe Plug					
		Probe Body Material					
		7E	Epoxy				
			ER Element Options				
			503	CT10 Cylindrical – 10 mil thickness (5 mil useful probe life)			
			603	CT20 Cylindrical – 20 mil thickness (10 mil useful probe life)			
			703	CT50 Cylindrical – 50 mil thickness (25 mil useful probe life)			
				Length			
				11	9.5” max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						ER Probe Options	
						00	None
ER3	**2**	**7E**	**503**	**11**	**375**	**00**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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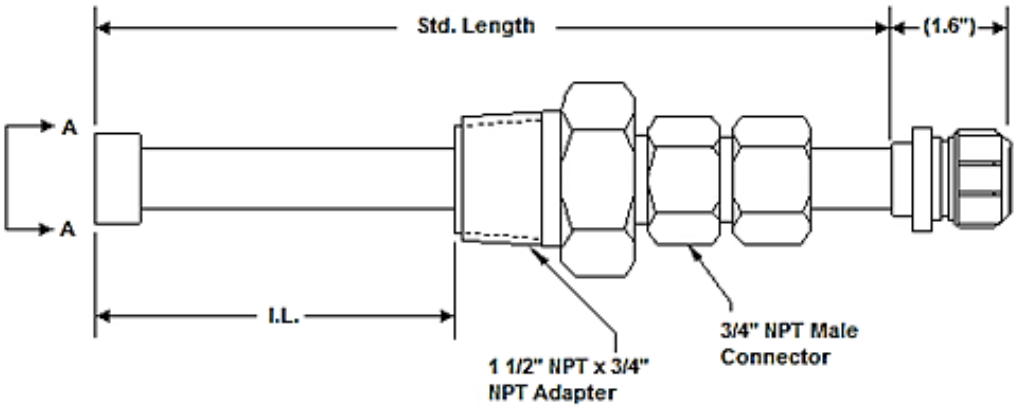
Model ER3200 Electrical Resistance Probe
Adjustable Length with 1 1/2" NPT Pipe Plug and Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER3200 is an adjustable-length, electrical resistance probe with a 3/4" NPT compression fitting combined with a 3/4" to 1 1/2" adapter. The compression fitting allows the probe to be inserted into the process to the required length. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector welded in place, a 3/4" compression fitting, and a 3/4" to 1 1/2" adapter. The adapter cannot be removed from the compression fitting. The insertion length (I.L.) is calculated to the end of the element. Probe length can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	1 ½” NPT Fitting

Standard Length	I.L. (max)
6”	3”
8”	5”
12”	9”
18”	15”

ER3200 Ordering Information

Model							
ER3	Electrical Resistance Adjustable Length Pipe Plug Probe						
	Pipe Plug Size						
	7	1 ½" NPT Pipe Plug					
		Probe Body Material					
		22	316				
		44	C276				
			ER Element Options				
			C03	FL05 Flush Mount – 5 mil thickness (2.5 mil useful probe life)			
			D03	FL10 Flush Mount – 10 mil thickness (5 mil useful probe life)			
			E03	FL20 Flush Mount – 20 mil thickness (10 mil useful probe life)			
			F03	FL40 Flush Mount – 40 mil thickness (20 mil useful probe life)			
				Length			
				06	3 inches max. insertion length		
				08	5 inches max. insertion length		
				12	9 inches max. insertion length		
				18	15 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						ER Probe Options	
						00	No Shield
ER3	**7**	**22**	**C03**	**08**	**375**	**00**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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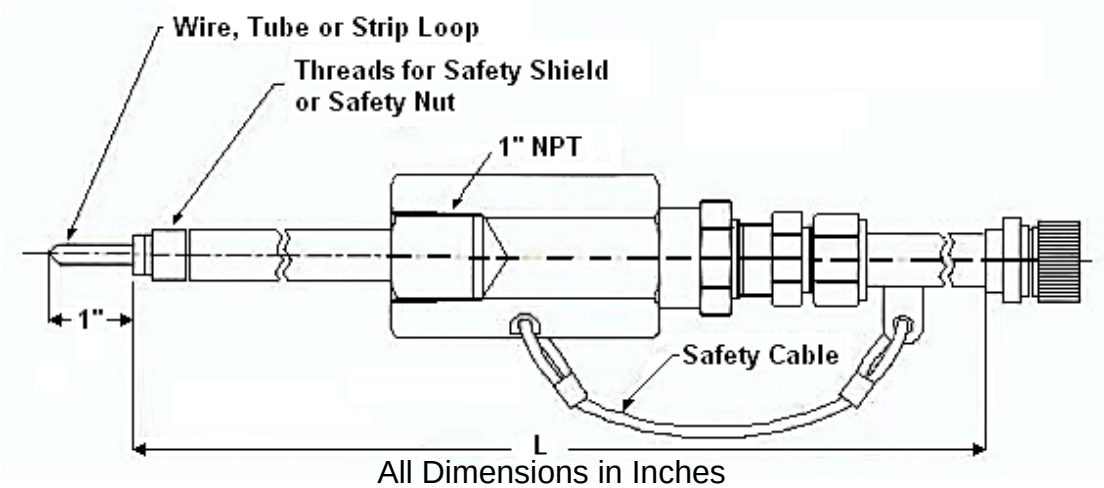
Model ER4000 – Electrical Resistance Probe With Packing Gland and Loop Element



All Dimensions in Inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER4000 is a retractable, electrical resistance probe commonly used in field and plant applications. A specially designed packing gland is used with the probe for insertion into or retraction from a pressurised system without a process shutdown. The probe is designed to mount onto a 1" piping system, but can easily be adapted to fit your specific requirements. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector welded in place, and a packing gland. A safety cable and safety nut are also provided to prevent blowout. A velocity shield can be added to the assembly if required. Standard packing material in the packing gland is Teflon®, however, Grafoil® packing can be provided for high temperature applications. Several standard elements and lengths are available to meet your specific needs. (Please refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Glass or Teflon®
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	1 inch Full Port Valve (Min)

Standard length	I.L. (max)
24”	17.6”
30”	23.6”
36”	29.6”
42”	35.6”

The Model SR2159 Easy Tool Retracting system is required for probe insertion or retraction in systems with pressure over 150 pounds.

ER4000 Ordering Information

Model								
ER45	Electrical Resistance 1 inch Female NPT Probe, Packing Gland with Teflon®							
ER75	Electrical Resistance 1 inch Female NPT Probe, Packing Gland with Grafoil®							
ER00	Electrical Resistance Replacement Insertion Rod							
	Probe Body Material							
	2	316						
	4	C276						
		Packing Gland Material						
		0	N/A (replacement insertion rod)					
		2	316					
		4	C276					
			E/R Element Options					
			00	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)				
			10	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)				
			20	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)				
			30	TU08 Tube Loop - 8 mil thickness (4 mil useful probe life)				
			40	TU16 Tube Loop - 16 mil thickness (8 mil useful probe life)				
			80	SL05 Strip Loop - 5 mil thickness (1.25 mil useful probe life)				
			90	SL10 Strip Loop - 10 mil thickness (2.5 mil useful probe life)				
				Seal Type				
				1	Glass			
				2	Teflon®			
				3	Epoxy			
					Length			
					24	17.60 inches max. insertion length		
					30	23.60 inches max. insertion length		
					36	29.60 inches max. insertion length		
					42	35.60 inches max. insertion length		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	No Shield
							01	Shield, Coupon adapter (118), hardware
							02	Shield, Coupon adapter (220), hardware
							03	Shield
ER45	**2**	**2**	**10**	**1**	**36**	**375**	**02**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Safety clamp must be ordered separately.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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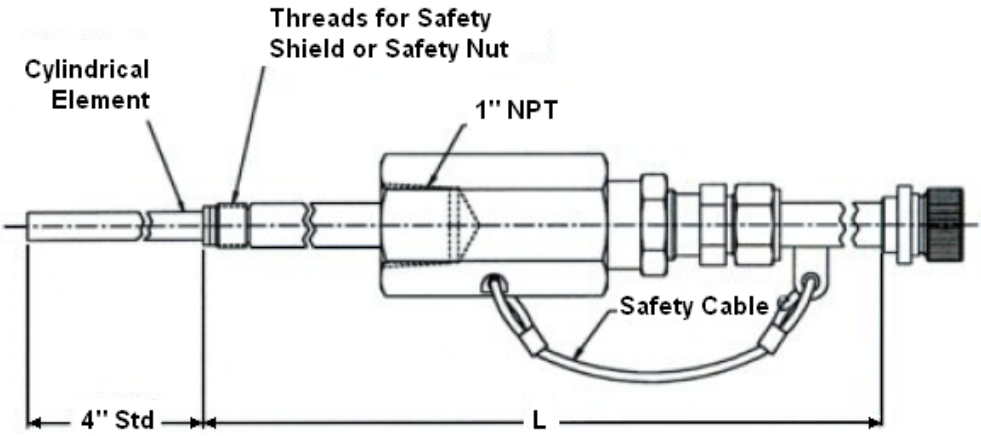
Model ER4100 Electrical Resistance Probe with Packing gland and Cylindrical Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER4100 Electrical Resistance Probes are retractable and commonly used in field and plant applications. The all-welded design allows the probe to be used in harsh environments. A specially designed packing gland is used with the probe for insertion into or retraction from a pressurised system without a process shutdown. The probe is designed to mount onto a 1" piping system, but can easily be adapted to fit your specific requirements. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector welded in place, and a packing gland. A safety cable and safety nut are also provided to prevent blowout. A velocity shield can be added to the assembly if required. Standard packing material in the packing gland is Teflon®, however Grafoil® packing can be provided for high temperature applications. Several standard elements and lengths are available to meet your specific needs. (Refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Welded
Fill Material	Ceramic
Temperature Rating	Teflon® - 260°C/ 500°F Grafoil® - 454°C/ 850°F*
Pressure Rating	1000psi / Bar
Mounting	1 inch Full Port Valve

*Applications above 260°C / 500°F require the use of a high-temperature element. Contact our sales department for further details.

Standard length	I.L. (max)
24”	20.85”
30”	26.85”
36”	32.85”
42”	38.85”

RCSL Corrosion Monitoring is recommended for probe insertion or retraction in systems with pressure over 150 pounds.

ER4100 Ordering Information

Model							
ER45	Electrical Resistance 1 inch Female NPT Probe, Packing Gland with Teflon®						
ER75	Electrical Resistance 1 inch NPT Probe, Packing Gland with Grafoil®, High Temperature						
ER00	Electrical Resistance Replacement Insertion Rod						
ER05	Electrical Resistance Replacement Insertion Rod, High Temperature						
	Probe Body Material						
	2	316					
	4	C276					
		Packing Gland Material					
		0	N/A (replacement insertion rod)				
		2	316				
		4	C276				
			E/R Element Options				
			500	CT10 Cylindrical - 10 mil thickness (5 mil useful probe life)			
			600	CT20 Cylindrical - 20 mil thickness (10 mil useful probe life)			
			700	CT50 Cylindrical - 50 mil thickness (25 mil useful probe life)			
				Length			
				24	20.85 inches max. insertion length		
				30	26.85 inches max. insertion length		
				36	32.85 inches max. insertion length		
				42	38.85 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
						01	Shield, Coupon adapter (118), hardware
						02	Shield, Coupon adapter (220), hardware
						03	Shield
ER3	**2**	**2**	**700**	**36**	**375**	**O2**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Safety clamp must be ordered separately.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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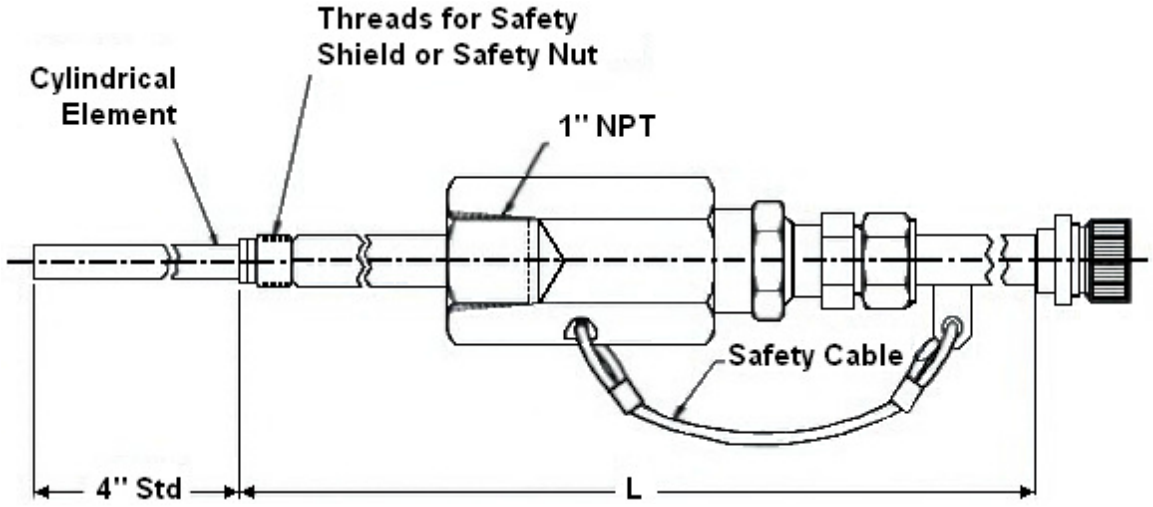
Model ER4200 - Electrical Resistance Probe with Packing Gland and Small Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER4200 is a retractable, flush-mount, electrical resistance probe ideally suited for applications where the probe element needs to be flush with the wall of the pipe. A specially designed packing gland is used with the probe for insertion to or retraction from a pressurised system without a process shutdown. Standard packing material in the packing gland is Teflon®, however, Grafoil® packing can be provided for high temperature applications if requested. The probe is designed to mount into a 1" piping system, but can easily be adapted to fit your specific requirements. The probe consists of an insertion rod with an element, a hermetically sealed connector welded in place and a packing gland. The insertion length (I.L.) is calculated to the end of the element. Probe length can be specified by the customer. For standard probes, the maximum length is given in the chart below. Several standard elements are available to meet your specific needs. (Refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	1 inch Full Port Valve (Min)

Standard length	I.L (max)
24”	16.22”
30”	22.22”
36”	28.22”
42”	34.22”

ER4200 Ordering Information

Model							
ER45	Electrical Resistance 1 inch Female NPT Probe, Packing Gland with Teflon®						
ER75	Electrical Resistance 1 inch Female NPT Probe, Packing Gland with Grafoil®						
	Probe Body Material						
	22	316					
	44	C276					
		E/R Element Options					
		A0	FS04 Flush Mount - 4 mil thickness (2 mil useful probe life)				
		B0	FS08 Flush Mount - 8 mil thickness (4 mil useful probe life)				
		H0	FS20 Flush Mount - 20 mil thickness (10 mil useful probe life)				
			Seal Type				
			1	Glass			
				Length			
				24	16.22 inches max. insertion length		
				30	22.22 inches max. insertion length		
				36	28.22 inches max. insertion length		
				42	34.22 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	N/A
ER45	**22**	**A0**	**1**	**36**	**375**	**00**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Safety clamp must be ordered separately.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels.

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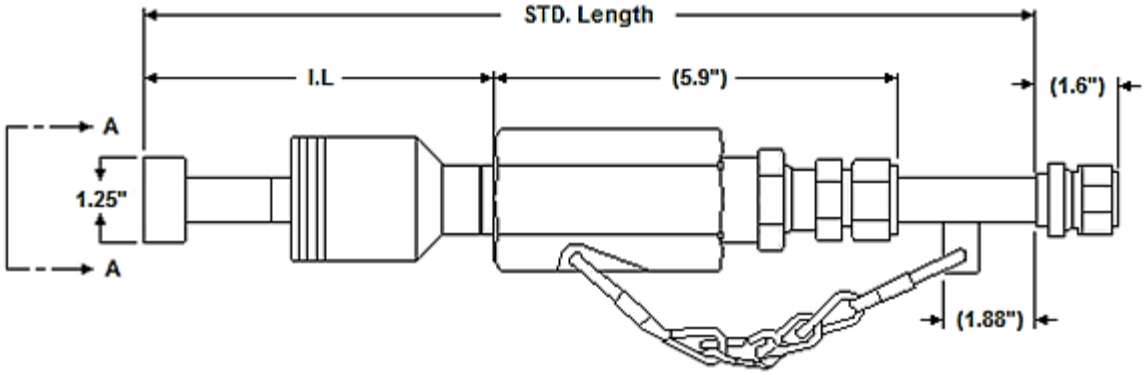
ER4210 Electrical Resistance Probe
Retractable with Packing Gland and Large Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER4210 is a retractable, flush-mount, electrical resistance probe ideally suited for applications where the probe element needs to be flush with the wall of the pipe. A specially designed packing gland is used with the probe for insertion to or retraction from a pressurised system without a process shutdown. Standard packing material in the packing gland is Teflon®, however, Grafoil® packing can be provided for high temperature applications. The probe is designed to mount into a 1 1/2" piping system, but can easily be adapted to fit larger requirements. The probe consists of an insertion rod with an element, a hermetically sealed connector welded in place, and a packing gland with a 1" to 1 1/2" swage nipple (2” also available). The insertion length (I.L.) is calculated to the end of the element. Probe length can be specified by the customer. For standard probes, the maximum length is given in the chart below. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	1500 PSI/ 102 Bar
Mounting	1 ½” Full Port Valve

Standard length	I.L (max)
24”	11.22”
30”	17.22”
36”	23.22”
42”	29.22”

ER4210 Ordering Information

Model							
ERB	Electrical Resistance Pipe Plug Probe with Packing Gland and Swage Nipple						
	Pipe Plug Size						
	6	2” NPT Pipe Plug					
	7	1 ½” NPT Pipe Plug					
		Probe Body Material					
		22	316				
		44	C276				
			ER Element Options				
			C03	FL05 – 5 mil thickness (2.5 mil useful probe life)			
			D03	FL10 Flush Mount – 10 mil thickness (5 mil useful probe life)			
			E03	FL20 Flush Mount – 20 mil thickness (10 useful probe life)			
			F03	FL40 Flush Mount – 40 mil thickness (20 mil useful probe life)			
				Length			
				24	11.22 inches max. insertion length		
				30	17.22 inches max. insertion length		
				36	23.22 inches max. insertion length		
				42	29.22 inches max. insertion length		
					Element Alloy		
					XXX	Use Code in Alloy chart	
						ER Probe Options	
						00	N/A
ERB	**6**	**22**	**C03**	**24**	**375**	**00**	**Example of Probe Ordering**

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Safety clamp must be ordered separately.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S.	S31603
538	5Cr 1/2mo	K42544	A12	C276	N10276
541	9Cr 1mo	K90941	602	Alloy 625	N06625
186	410 S.S.	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grain carbon steels.

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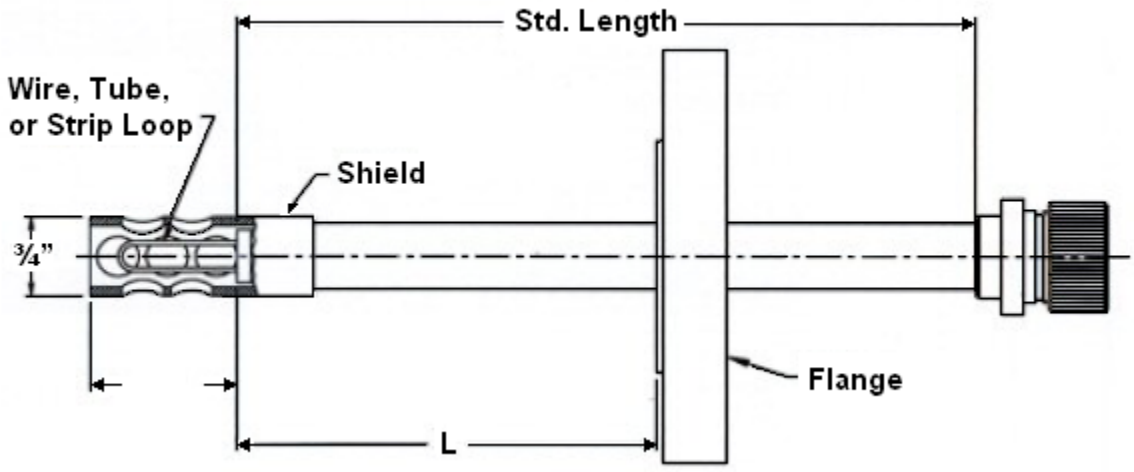
Model ER 6000 - Electrical Resistance Probe with Fixed Length Flange and Loop Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER6000 is a fixed-insertion-length, flange-mounted, electrical resistance probe. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required for installation and inspection. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector and a flange (as specified by customer), which are all welded in place. A velocity shield can be added to the assembly if required. A mechanical seal can be added for additional safety. Several standard elements, lengths and different flange sizes are available to meet your specific needs. (Refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Glass or Teflon®
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard length	I.L (max)
8”	6.125”
12”	10.125”
18”	16.125”
24”	22.125”

ER6000 Ordering Information

Model									
ER6	Electrical Resistance Fixed Length Probe with Flange								
	Flange Size								
	1	1 inch Flange							
	2	1.5 inch Flange							
	3	2 inch Flange							
	4	3 inch Flange							
	5	4 inch Flange							
	7	6 inch Flange							
		Probe Body Material							
		22	316						
		44	C276						
			E/R Element Options						
			0	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)					
			1	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)					
			2	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)					
			3	TU08 Tube Loop - 8 mil thickness (4 mil useful probe life)					
			8	SL05 Strip Loop - 5 mil thickness (1.25 mil useful probe life)					
			9	SL10 Strip Loop - 10 mil thickness (2.5 mil useful probe life)					
				Flange Pressure Rating					
				1	150 lb.				
				2	300 lb.				
				3	600 lb.				
				4	1200 lb.				
				5	1500 lb.				
				6	900 lb.				
					Seal Type				
					1	Glass			
					2	Teflon®			
					3	Epoxy			
						Insertion Length			
						08	6.125 inches max. insertion length		
						12	10.125 inches max. insertion length		
						18	16.125 inches max. insertion length		
						24	22.125 inches max. insertion length		
							Element Alloy		
							XXX	Use Code in Alloy Chart	
								E/R Probe Options	
								00	No Shield
								01	Shield, coupon adapter (118), hardware
								02	Shield, coupon adapter (220), hardware
								03	Shield
ER6	**2**	**22**	**4**	**1**	**2**	**08**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

ER6000 Ordering Information Continued

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels.

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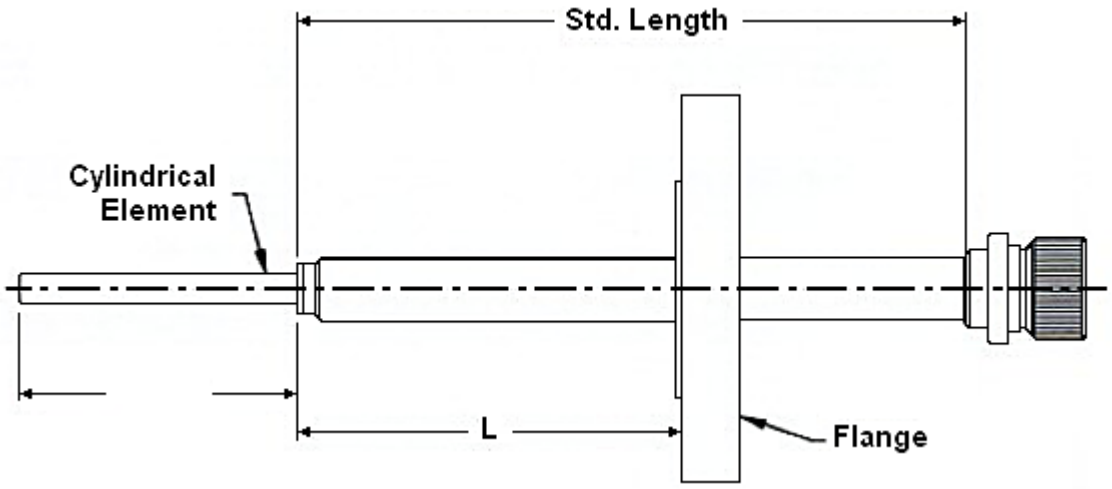
REGISTRATION No. 1394643 ENGLAND · REGISTERED OFFICE: AS ABOVE

Model ER 6100 - Electrical Resistance Probe with Fixed Length Flange and Cylindrical Element



All Dimension in inches

Picture is for illustrative purposes only, supplied product may differ.

Model ER6100 is a fixed-insertion-length, flange-mounted, electrical resistance probe. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required to install and inspect. The all-welded construction allows the probe to be used in harsh environments. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a flange (as specified by customer), which are all welded in place. A mechanical seal and a velocity shield can be added for additional safety. Several standard elements, lengths, and different flange sizes are available to meet your specific needs. (Refer to the Element and Alloy Selection Chart for more information.)

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Welded
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard length	I.L (max)
8”	9”
12”	13”
18”	19”
24”	25”

ER6100 Ordering Information

Model								
ER6	Electrical Resistance Fixed Length Probe with Flange							
	Flange Size							
	1	1 inch Flange						
	2	1.5 inch Flange						
	3	2 inch Flange						
	4	3 inch Flange						
	5	4 inch Flange						
	7	6 inch Flange						
		Probe Body Material						
		22	316					
		44	C276					
			E/R Element Options					
			5	CT10 Cylindrical - 10 mil thickness (5 mil useful probe life)				
			6	CT20 Cylindrical - 20 mil thickness (10 mil useful probe life)				
			7	CT50 Cylindrical - 50 mil thickness (25 mil useful probe life)				
				Flange Pressure Rating				
				10	150 lb.			
				20	300 lb.			
				30	600 lb.			
				40	1200 lb.			
				50	1500 lb.			
				60	900 lb.			
					Insertion Length			
					08	9 inches max. insertion length		
					12	13 inches max. insertion length		
					18	19 inches max. insertion length		
					24	25 inches max. insertion length		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	No Shield
							01	Shield, coupon adapter (118), hardware
							02	Shield, coupon adapter (220), hardware
							03	Shield
ER6	**2**	**22**	**7**	**20**	**08**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels

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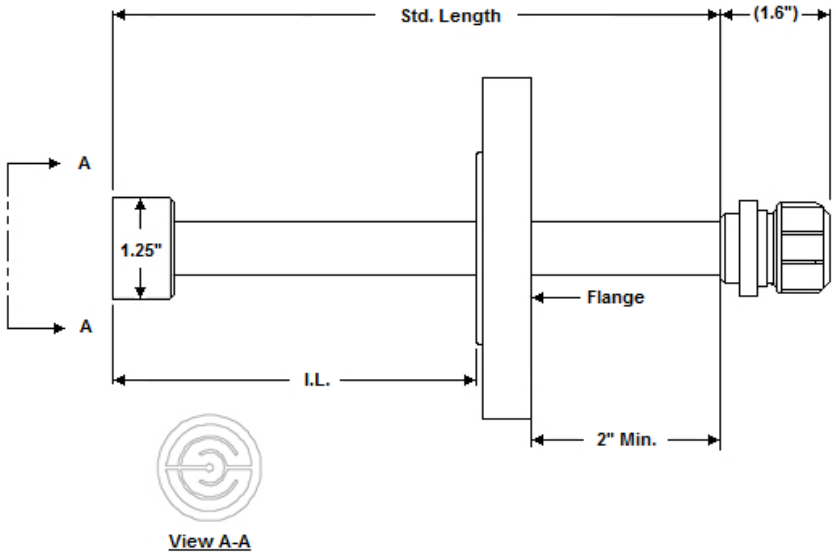
Model ER6200 Electrical Resistance Probe Fixed Length with Flange and Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER6200 is a fixed-length, flange-mounted, electrical resistance probe. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required to install and inspect. The all-welded construction allows the probe to be used in harsh environments. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a flange (as specified by customer), which are all welded in place. A mechanical seal can be added if required. The insertion length (I.L.) is calculated to the end of the element. Probe length can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below and, in this case, is based on a 1" total flange thickness. Several standard elements are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard length	I.L. (max)
8”	5”
12”	9”
18”	15”

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24”	21”

ER6200 Ordering Information

Model								
ER6	Electrical Resistance Fixed Length Probe with Flange							
	Flange Size							
	2	1 ½ inch Flange						
	3	2 inch Flange						
	4	3” Flange						
	5	4” Flange						
	7	6” Flange						
		Probe Body Material						
		22	316					
		44	C276					
			E/R Element Options					
			C	FL05 Flush Mount – 5 mil thickness (2.5 mil useful probe life)				
			D	FL10 Flush Mount – 10 mil thickness (5 mil useful probe life)				
			E	FL20 Flush Mount – 20 mil thickness (10 mil useful probe life)				
			F	FL40 Flush Mount – 40 mil thickness (20 mil useful probe life)				
				Flange Pressure Rating				
				13	150 lb.			
				23	300 lb.			
				33	600 lb.			
				43	1200 lb.			
				53	1500 lb.			
				63	900 lb.			
					Insertion Length			
					08	5 inches max. insertion length		
					12	9 inches max. insertion length		
					18	15 inches max. insertion length		
					24	21 inches max. insertion length		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	N/A
ER6	**2**	**22**	**C**	**13**	**08**	**375**	**00**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels

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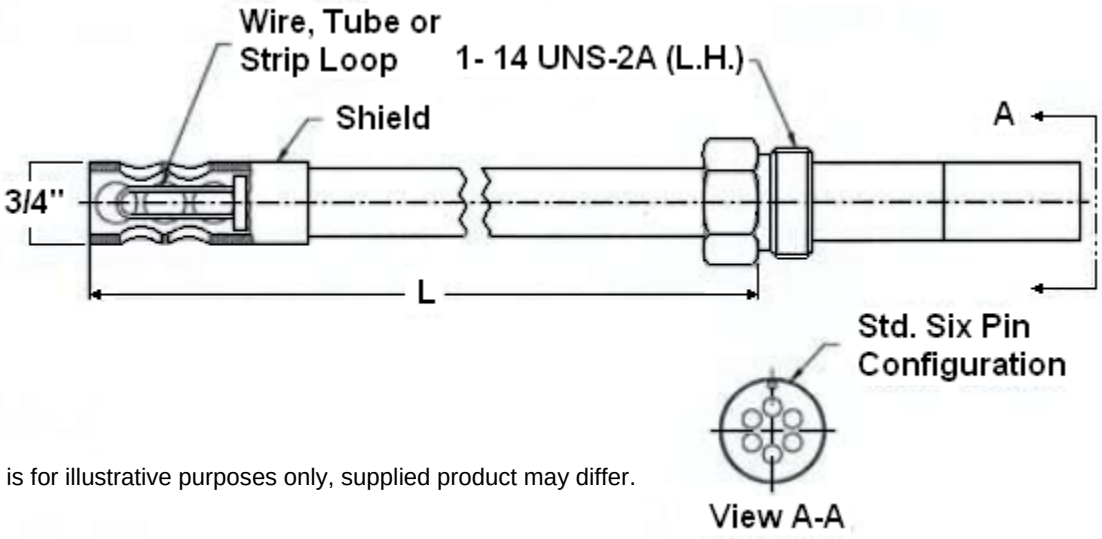
Model ER7000 - Electrical Resistance Probe for the 2 inch Access System with Loop Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER7000 Electrical Resistance Probe is a fixed-length probe for use with the 2" access fitting systems at high pressures and temperatures. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector and a hollow plug nut which are all welded in place. A velocity shield can be added to the assembly if required. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. Several standard element and probe lengths are available to meet your specific needs. Probe adaptors are available and must be ordered separately. (Refer to the Element and Alloy Selection Chart for more information.)

The insertion length (I.L.) can range from 2.875" up to any length specified by the customer in 1/8" increments. Insertion length is calculated by the formula:

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)

Note: Formula valid for access fitting heights of 5.25” and 5.5”.

Several standard elements are available to meet your specific needs. Probe adaptors are available and must be ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Glass
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	3600 PSI/245 Bar
Mounting	2 inch Access System with Hollow Plug

ER7000 Ordering Information

Model								
HR	Electrical Resistance Probe for 2 inch Access Systems							
	Mounting Material							
	2	316						
	3	C276						
		Connector Type						
		1	Small Connector					
		2	Standard Connector					
			E/R Element Options					
			0	WR40 Wire Loop - 40 mil thickness (10 mil useful probe life)				
			1	WR80 Wire Loop - 80 mil thickness (20 mil useful probe life)				
			2	TU04 Tube Loop - 4 mil thickness (2 mil useful probe life)				
			3	TU08 Tube Loop - 8 mil thickness (8 mil useful probe life)				
				Seal Type				
				1	Glass			
				2	Teflon®			
				3	Epoxy			
					Length (round calculated length down to the nearest 1/8”)			
					XXXX	Length in inches, stated in 2 decimal place format (Ex:7.25 inches=0725)		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							00	No Shield
							01	Standard Shield
							02	Hi-velocity Shield
							03	Coupon Holding Shield
HR	2	2	3	1	0612	375	03	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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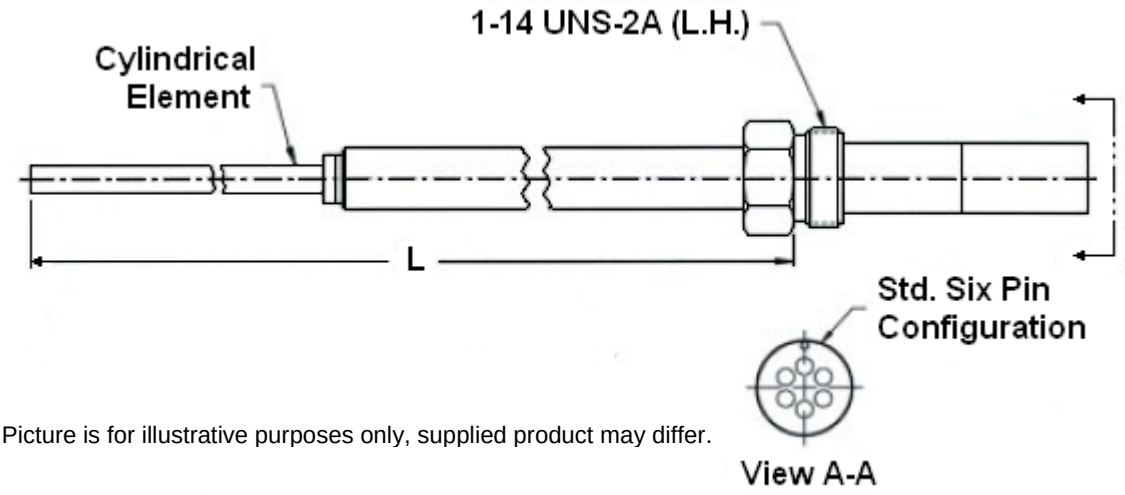
Model ER7100 - Electrical Resistance Probe for the 2 inch Access Fitting System with Cylindrical Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER7100 Electrical Resistance Probe is a fixed-length, retrievable probe for use with the 2" access system in high pressure and high temperature applications. The all-welded construction of the element makes it ideal for harsh environments. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a hollow plug nut, which are all welded in place. A velocity shield can be added to the assembly if required. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown.

The minimum insertion length (I.L.) for J0 element is 3”, 5" for other element types, up to any length specified by the customer in 1/8" increments. Insertion length is calculated by the formula:

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)

Note: Formula valid for access fitting heights of 5.25/ 5.5".

Several standard elements are available to meet your specific needs. Probe adaptors are available and must be ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Welded
Fill Material	Ceramic
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi/245 Bar
Mounting	2 inch Access System

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ER7100 Ordering Information

Model							
HR	Electrical Resistance Probe for 2” Access Fitting Systems						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		1	Small Connector				
		2	Standard Connector				
			E/R Element Options				
			50	CT10 Cylindrical – 10 mil thickness (5 mil useful probe life)			
			J0	CT10 Cylindrical (2”) – 10 mil thickness (5 mil useful probe life)			
			60	CT20 Cylindrical – 20 mil thickness (10 mil useful probe life)			
			70	CT50 Cylindrical – 50 mil thickness (25 mil useful probe life)			
				Length			
				XXXX	Length in inches, stated in 2 decimal place format (E.G 6.25 inches = 0625)		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
						01	Standard Shield
						02	Hi-velocity Shield
						03	Coupon Holding Shield
HR	**2**	**2**	**60**	**0625**	**375**	**03**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½ Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels.

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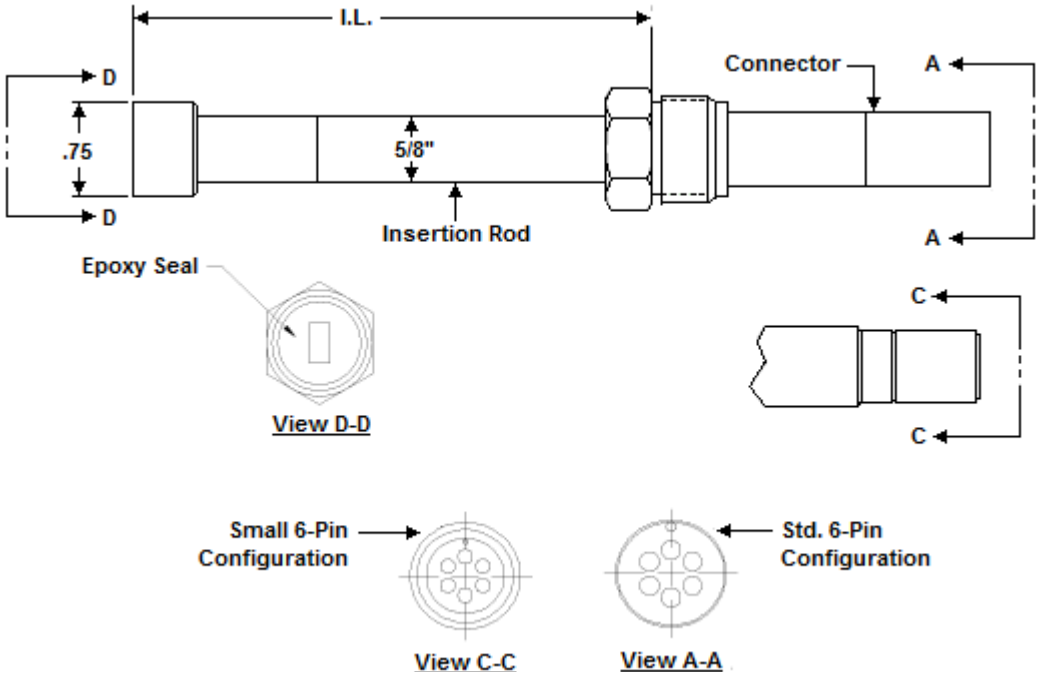
Model ER7200 – Electrical Resistance Probe for the 2 inch Access System with Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER7200 Flush-Mount, Electrical Resistance Probe is a fixed-length probe for use with the 2" access system in high pressure and high temperature applications. These probes are ideally suited for applications where the probe element needs to be flush with the wall of the pipe. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a hollow plug nut, which are all welded in place. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. Insertion lengths range from a minimum of 1.25" up to any length specified by the customer in 1/16" increments, using the formula:
The insertion length (I.L.) can range from a minimum of 1.75" up to any length specified by the customer in 1/8" increments, using the formula:

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)
For top-of-the-line, flush-mount monitoring, PD = 0.

Note: Formula valid for access fitting heights of 5.25”/ 5.5"

Several standard elements are available to meet your specific needs. Probe adaptors are available and must be ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi / 245 Bar

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Mounting	2 inch Access System

ER7200 Ordering Information

Model								
HR	Electrical Resistance Probe for 2 inch Access Systems							
	Mounting Material							
	2	316						
	3	C276						
		Connector Type						
		1	Small Connector					
		2	Standard Connector					
			E/R Element Options					
			A	S4 Flush Mount - 4 mil thickness (2 mil useful probe life)				
			B	S8 Flush Mount - 8 mil thickness (4 mil useful probe life)				
			H	S20 Flush Mount - 20 mil thickness (10 mil useful probe life)				
				Seal Type				
				3	Epoxy			
					Length			
					XXXX	Length in inches, stated in 2 decimal place format (Ex:7.25 inches = 0725)		
						Element Alloy		
						XXX	Use Code in Alloy Chart	
							E/R Probe Options	
							0	No Shield
HR	2	2	B	3	0725	375	00	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

* Chemically equivalent to standard pipe-grade carbon steels.

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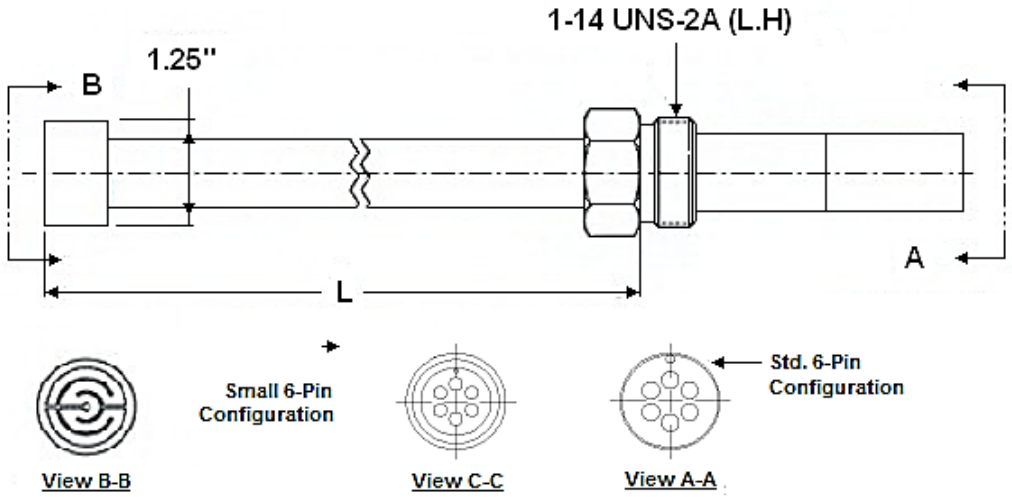
Model ER 7210 - Electrical Resistance Probe for the 2 inch Access System With Large Flush Element



Picture is for illustrative purposes only, supplied product may differ.

Model ER7210 is a fixed-length Flush-Mount, retrievable, electrical resistance probe for use with the 2" access system in high pressure and high temperature applications. These probes are ideally suited for applications where the probe element needs to be flush with the wall of the pipe. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector, and a hollow plug nut, which are all welded in place. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. The insertion length (I.L.) can range from a minimum of 1.75” up to any length specified by the customer in 1/8” increments, using the formula:

The insertion length (I.L.) can range from a minimum of 1.75" up to any length specified by the customer in 1/8" increments, using the formula:

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)
For top-of-the-line, flush-mount monitoring, PD = 0.

Note: Formula valid for access fitting heights of 5.25"/ 5.5".

Several standard elements are available to meet your specific needs. Probe adaptors are available and must be ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi/245 Bar
Mounting	2 inch Access System

Model ER7210 Ordering Information

Model							
HR	Electrical Resistance Probe for use with 2 inch Access Systems						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		1	Small Connector				
		2	Standard Connector				
			E/R Element Options				
			C3	FL05 Flush Mount - 5 mil thickness (2.5 mil useful probe life)			
			D3	FL10 Flush Mount - 10 mil thickness (5 mil useful probe life)			
			E3	FL20 Flush Mount - 20 mil thickness (10 mil useful probe life)			
			F3	FL40 Flush Mount - 40 mil thickness (20 mil useful probe life)			
				Length (round calculated to the nearest 1/8”)			
				XXXX	Length in inches, stated in 2 decimal place format (Ex:7.25 inches=0725)		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						0	No Shield
HR	2	2	C3	0725	375	00	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr 1/2Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe grade carbon steels.

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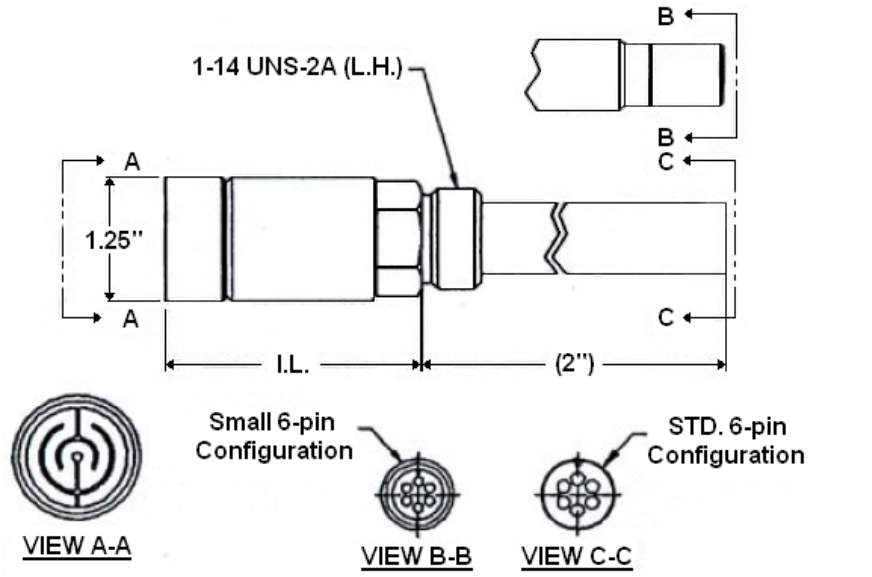
REGISTRATION No. 1394643 ENGLAND · REGISTERED OFFICE: AS ABOVE

Model ER7220 - Electrical Resistance Probe Retrievable with Large Adjustable Flush Element for 2 inch Access Systems



Picture is for illustrative purposes only, supplied product may differ.

Model ER7220 is an adjustable-length, flush mount, retrievable, electrical resistance probe for use with the 2" access system in high pressure and high temperature applications. These probes are ideally suited for applications where the probe element needs to be flush with the wall of the pipe to prevent any obstructions. The probe assembly consists of an insertion rod with an element, a hermetically sealed connector and a hollow plug nut, which are all welded in place. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. The insertion length (I.L.) can range from a minimum of 1.75" up to any length in 1" increments (specify lengths over 1.75" as 2", 3", 4", etc.) specified by the customer using the formula below. The adjustable flush element allows for a total adjustment of 1".

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)
For top-of-the-line, flush-mount monitoring, PD = 0.

Note: Formula valid for access fitting heights of 5.25"/ 5.5".

Several standard elements are available to meet your specific needs. Probe adaptors are available and must be ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
O-Ring Material	Viton (other materials available)
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi/ 245 Bar

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Mounting	2 inch Access System

ER7220 Ordering Information

Model							
HR	Electrical Resistance Probe for 2 inch Access Systems						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		1	Small Connector				
		2	Standard Connector				
			E/R Element Options				
			C3	FL05 Flush Mount - 5 mil thickness (2.5 mil useful probe life)			
			D3	FL10 Flush Mount - 10 mil thickness (5 mil useful probe life)			
			E3	FL20 Flush Mount - 20 mil thickness (10 mil useful probe life)			
			F3	FL40 Flush Mount - 40 mil thickness (20 mil useful probe life)			
				Length (round calculated length down to the nearest inch)			
				XXXX	Length in inches, stated in 2 decimal place format (Ex: 7 inches=0700)		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						AD	No Shield, Adjustable
HR	2	2	C3	0700	375	AD	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	Description	UNS#	Code	Description	UNS#
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade types and seals.

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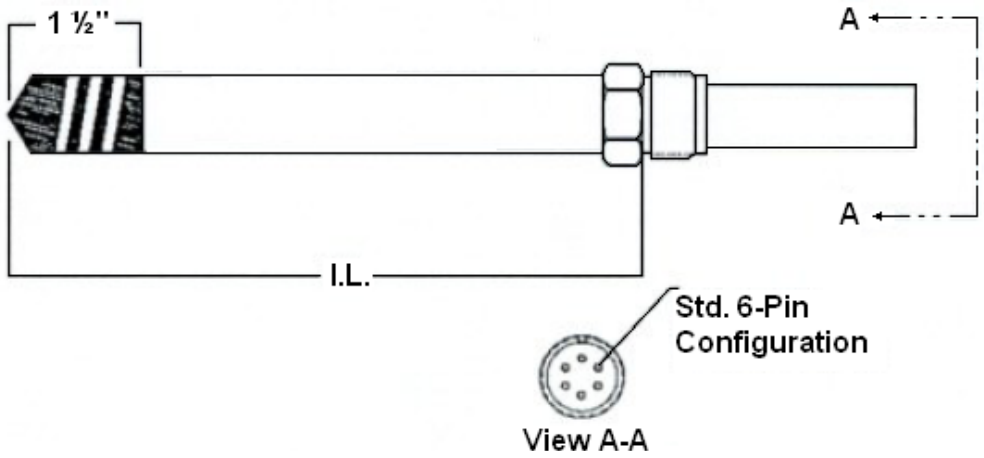
Model ER 7300 - Electrical Resistance Probe, Retrievable Spiral Loop for Two Inch High Pressure Access Systems



Picture is for illustrative purposes only, supplied product may differ.

Model ER7300 spiral loop probe is retrievable, electrical resistance probe designed for use with 2 inch high pressure access systems. The element is a spiral wound strip encased in epoxy. This approach to element construction offers several advantages over other element geometries:

- High intrinsic resistance – provides highly stable readings with low susceptibility to noise.
- High element strength – allows use in very high flow rate regimes such as a gas transmission.
- Wide spacing of element loops – minimises the risk of iron sulphide scaling and bridging.

While the spiral loop is ideally suited to fast flowing, sour systems, its high stability makes it a suitable choice for oil and gas systems.

Insertion length (I.L.) can range from a minimum of 3.75” up to any length (in 1/8” increments) specified by the customer, using the formula:

I.L. = PD + WT = 1.75” (where PD = penetration depth, WT = wall thickness)
Note: Formula valid for access fitting heights of 5.25”/ 5.5”.

Specifications:	
Probe Body	316L Stainless Steel
Element Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi/ 245 Bar
Mounting	2 inch Access System with Hollow Plug

ER7300 Ordering Information

Model							
HR	Electrical Resistance Probe for 2 inch Access Systems						
	Mounting Material and Connector Type						
	22	316 stainless steel with standard connector					
		E/R Element Options					
		K	SP10 Spiral Loop - 10 mil thickness (5 mil useful probe life)				
		L	SP20 Spiral Loop - 20 mil thickness (10 mil useful probe life)				
			Seal Type				
			3	Epoxy			
				Length (round calculated length down to the nearest 1/8”)			
				XXXX	Length in inches, stated in 2 decimal place format (Ex:7.25 inches=0725)		
					Element Alloy		
					XXX	Use Code in Alloy Chart	
						E/R Probe Options	
						00	No Shield
HR	**22**	**K**	**3**	**0725**	**375**	**00**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Alloy Chart					
Code	**Description**	**UNS#**	**Code**	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100	159	316L S.S	S31603
538	5Cr ½Mo	K42544	A12	C276	N10276
541	9Cr 1Mo	K90941	602	Alloy 625	N06625
186	410 S.S	S41000	419	CDA110	C11000
141	304 S.S	S30400	434	CDA443	C44300

Note: Not all alloys are available with all element types and seals.

*Chemically equivalent to standard pipe-grade carbon steels.

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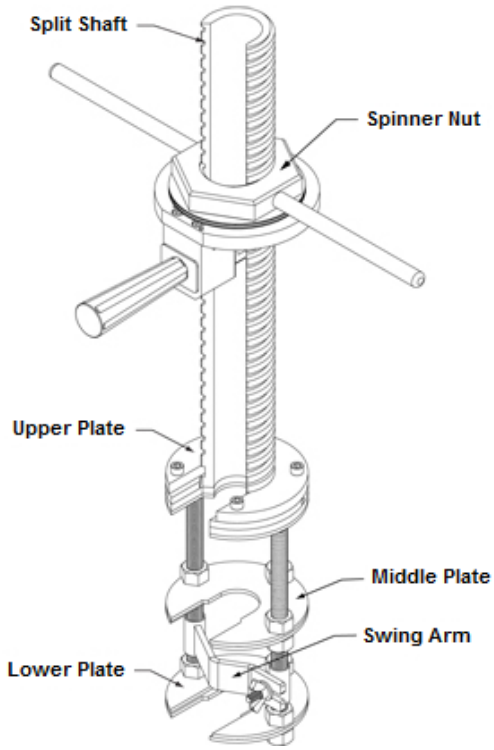
Model SR2159 Easy Tool Retracting System



Picture is for illustrative purposes only, supplied product may differ.

The Easy Tool Retracting System is designed for the safe insertion or retraction of series 4000 systems, including electrical resistance probes (ER), linear polarisation probes (LP), coupon insertion systems (RT), and chemical injection systems (IP). RCSL Corrosion Monitoring Systems requires that an Easy Tool be used when working on systems with pressures over 150 psi.

The Easy Tool can insert/retract standard electrical resistance probes and coupon insertion systems up to 42".

With a weight of under 15 pounds and an overall length of 44", the Easy Tool is one of the lightest and shortest retracting tools available on the market.

The Easy Tool can be used with most standard packing glands.

Ordering Part Number	
SR2159ER24	Insertion length of 24"
SR2159ER36	Insertion length of 36" (standard size)

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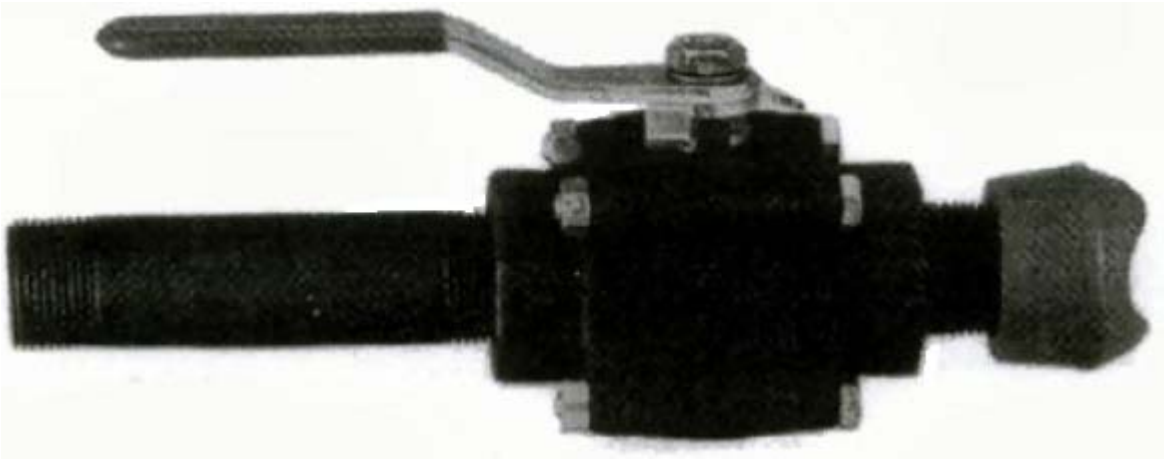
Model 600 Access Valve



Picture is for illustrative purposes only, supplied product may differ.

The Model 600 Access Valve Assemblies are designed to allow access to pressurised areas without process shutdown.

The assembly consists of a Threadolet, all thread nipple, ball valve and a 5" Packing Gland interjoint nipple. NOTE: The 5" nipple is used as standard, and is suitable for all probe elements except coupon holding shields which require a 9" nipple. The full port valve is provided in either carbon steel or 316 Stainless Steel body, with Polyfill seats and Viton body seals. All items comply with NACE standard MR0175, for materials resistant to sulphide stress cracking. Flanged Outlets to connect with a pipeline or vessel mating flange are available.

The Model 600 Access Valve Assembly accommodates all RCSL Corrosion Monitoring retractable probes. This includes Electrical Resistance, Linear Polarisation Resistance, Coupon Holder, Injection Tubes and Nozzles, Hydrogen, Sand and Galvanic Probes.

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ER System Accessories

Cables

Factory Assembled: For Portable Instrument Series P.N 700716 + Length
For Transmitter and Data Collection Systems P.N. 700726 + Length

Cable - Heavy Duty: P.N 700331
Two wire for transmitter P.N. 700431

Connectors: Low Pressure Probe Type A P.N. 700521 2" System High Pressure Type B P.N. 700343

Probe to Cable Adaptor for 2" High Pressure System

Portable with Standard 6 pin Connector P.N. 700319
Portable with Small 6 pin Connector Fixed P.N. 700033
Fixed Adapter with Standard 6 pin Connector P.N. 700640
Fixed Adaptor with Small 6 pin Connector P.N. 700077

Shield Options

Standard Shield - Wire Loop Probe - P.N. 700608
High Velocity Shield - Wire Loop Probe - P.N. 700609
Standard Shield - Cylindrical Probe - P.N. 700610
High Velocity Shield - Cylindrical Probe - P.N. 700611

Coupon Holder Shield - Wire Loop Probe - P.N. 700612
Coupon Holder Shield - Cylindrical Probe - P.N. 700613

Safety Clamps

For 18" and 24" Probe lengths P.N. 700700
For 30", 36" and 42" Probe lengths P.N. 700701

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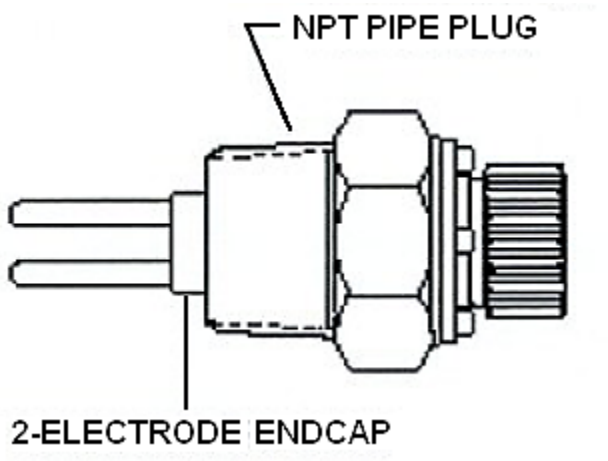
Model LP1000 – Linear Polarisation Resistance Probe with NPT Pipe Plug And 2-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP1000 is a Linear Polarisation Resistance Probe commonly used in Laboratory, bypass-loop, and field applications. The assembly consists of an NPT pipe plug (1 inch, or 1.5 inch or 2 inch), a two-electrode endcap and a six-pin military connector mounted in place. Electrodes are ordered separately. Several standard electrodes are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi/ 204 Bar
Mounting	1 inch, 1.5 inch, or 2 inch NPT Pipe Plug

LP1000 Ordering Information

Model				
LP13	Linear Polarisation 1 inch NPT Pipe Plug Probe			
LP16	Linear Polarisation 2 inch NPT Pipe Plug Probe			
LP17	Linear Polarisation 1.5 inch NPT Pipe Plug Probe			
	Probe Body Material			
	02	316		
	03	C.S.		
	04	C276		
		LP Electrode Options		
		20100	Two-electrode integral type with glass seal	
			Options	
			000	None
LP13	**02**	**20100**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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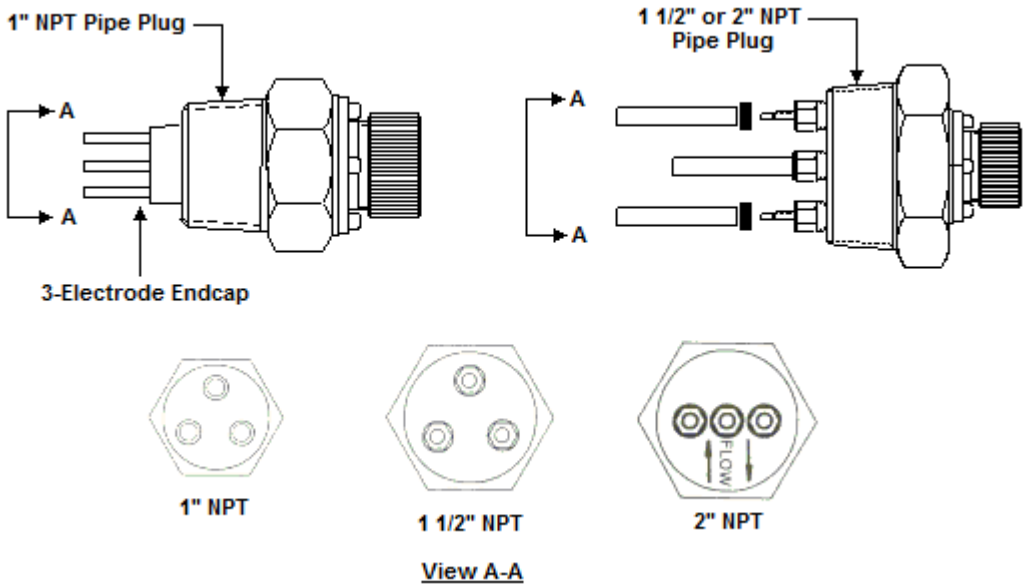
Model LP1100 – Linear Polarisation Resistance Probe with 1 inch NPT Pipe Plug and 3-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP1100 is a linear polarisation resistance probe commonly used in laboratory, bypass-loop, and field applications. The assembly consists of a 1 inch, 1 ½ inch, or 2 inch NPT pipe plug and a five-pin military connector mounted in place. Replaceable mounting studs can be ordered with 1 1/2" and 2" pipe plugs. Electrodes are ordered separately. Several standard electrodes are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi / 204 Bar
Mounting	1 inch, 1 ½ inch, or 2 inch NPT Pipe Plug

LP1100 Ordering Information

Model					
LP13	Linear Polarisation 1 inch NPT Pipe Plug Probe (LP13 cannot be used with replaceable mounting studs)				
LP16	Linear Polarisation 2 inch NPT Pipe Plug Probe				
LP17	Linear Polarisation 1.5 inch NPT Pipe Plug Probe				
	Probe Body Material				
	02	316			
	03	C.S.			
	04	C276			
		LP Electrode Options			
		10	Three-electrode plug type (replaceable mounting studs)		
		30	Three-electrode integral type (non-replacement mounting studs)		
			Seal Type		
			100	Glass	
				Options	
				000	None
LP13	**02**	**30**	**100**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, contact our sales department.

Note: Not all alloys are available with all element types and seals.

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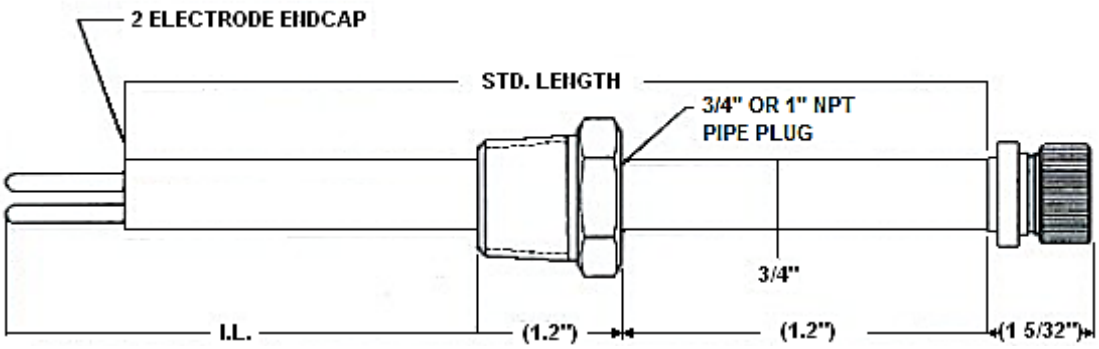
Model LP2000 – Linear Polarisation Resistance Probe Fixed Length With 0.75 inch NPT Pipe Plug and 2-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP2000 is a fixed-length, linear polarisation resistance probe with a ¾" or 1" NPT pipe plug. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe assembly consists of an insertion rod with a two-electrode endcap, a hermetically sealed connector and an NPT pipe plug which are all welded in place. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Electrodes are ordered separately. Several standard electrodes are available to meet your specific needs.

Specifications	
Probe Body	316 Stainless Steel or C276
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi / 204 Bar
Mounting	0.75 inch or 1 inch NPT Pipe Plug

Standard length
6"
8"
12"
18"

I.L. (max)
4.05"
6.05"
10.05"
16.05"

LP2000 Ordering Information

Model							
LP2	Linear Polarisation Fixed Length Pipe Plug Probe						
	Pipe Plug Size						
	2	0.75 inch NPT					
	3	1 inch NPT					
		Probe Body Material					
		22	316				
		44	C276				
			LP Electrode Options				
			20	Two-electrode integral type			
				Seal Type			
				1	Glass		
					Length		
					06	4.05 inch max. insertion length	
					08	6.05 inch max. insertion length	
					12	10.05 inch max. insertion length	
					18	16.05 inch max. insertion length	
						Options	
						000	None
LP2	**02**	**22**	**20**	**1**	**08**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately. (See Electrodes)

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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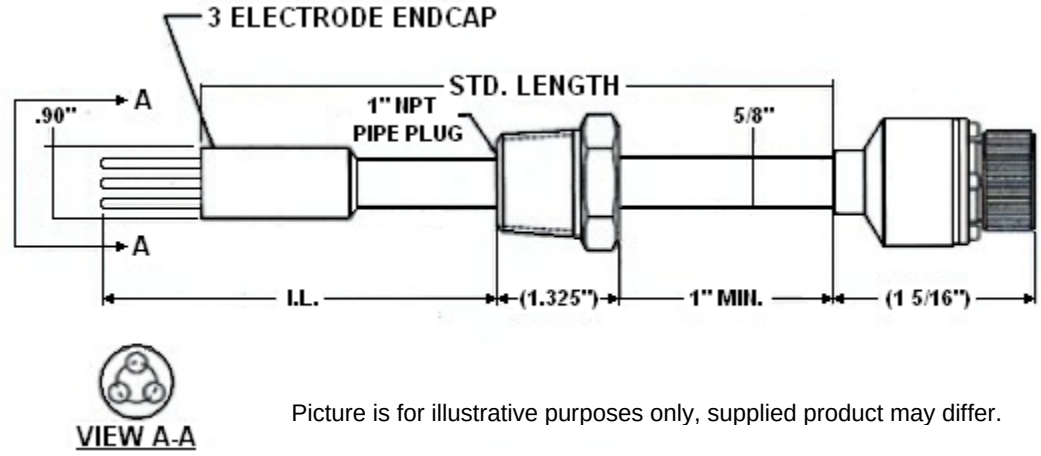
Model LP2100 – Linear Polarisation Resistance Probe Fixed Length with 1 inch NPT Pipe Plug and 3-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP2100 is a fixed-length, linear polarisation resistance probe with a 1" NPT pipe plug. The probe requires process isolation or process shutdown to install and a threaded pipe fitting to mount. The probe assembly consists of an insertion rod with a three-electrode endcap, a 1" NPT pipe plug and a five-pin military connector mounted in place. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. This maximum I.L. is based on the length of a carbon steel electrode. **Electrode lengths may vary depending on the alloy.** Electrodes are ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3000psi / 204 Bar
Mounting	1 inch NPT Pipe Plug

Standard length
8”
12”
18”

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I.L (max)
5.92”
9.92”
15.92”

LP2100 Ordering Information

Model							
LP2	Linear Polarisation Fixed Length Pipe Plug Probe						
	Pipe Plug Size						
	3	1 inch NPT					
		Probe Body Material					
		22	316				
			LP Electrode Options				
			10	Three-electrode plug type			
			30	Three-electrode integral type			
				Seal Type			
				1	Glass		
					Length		
					08	5.92 inch max. insertion length	
					12	9.92 inch max. insertion length	
					18	15.92 inch max. insertion length	
						Options	
						000	None
LP2	3	22	30	1	08	000	Example of Probe Ordering #

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
377	C1018 Carbon Steel*	G10180
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.

Note: Not all alloys are available with all element types and seals.

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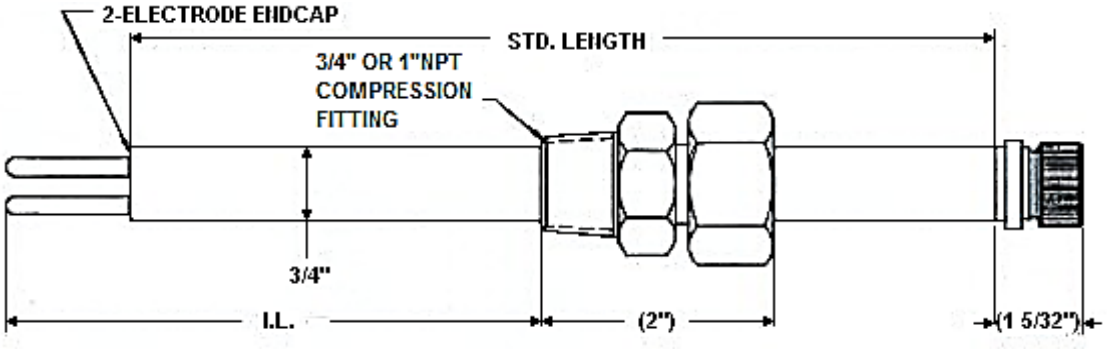
Model LP3000 – Linear Polarisation Resistance Probe Adjustable Length with 0.75 inch NPT Fitting and 2-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP3000 is a linear polarisation resistance probe commonly used in laboratory, bypass-loop, and field applications. The assembly consists of a 3/4" NPT compression fitting, an insertion rod with a hermetically sealed two-electrode endcap, and a six-pin connector welded in place. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. Electrodes are ordered separately. Several standard electrodes are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	0.75 inch NPT

Standard length	I.L. (max)
6”	5.25”
8”	7.25”
12”	11.25”
18”	17.25”

Model LP3000 Ordering Information

Model							
LP3	Linear Polarisation Adjustable Length Pipe Plug Probe						
	Pipe Plug Size						
	2	0.75 inch NPT					
	3	1 inch NPT					
		Probe Body Material					
		22	316				
			LP Electrode Options				
			20	Two-electrode integral type			
				Seal Type			
				1	Glass		
					Length		
					06	5.25 inch max. insertion length	
					08	7.25 inch max. insertion length	
					12	11.25 inch max. insertion length	
					18	17.25 inch max. insertion length	
						Options	
						000	None
LP3	**2**	**22**	**20**	**1**	**08**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately. (See electrodes.)

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
419	CDA110	C11000
434	CDA443	C44300
159	316L S.S.	S31603

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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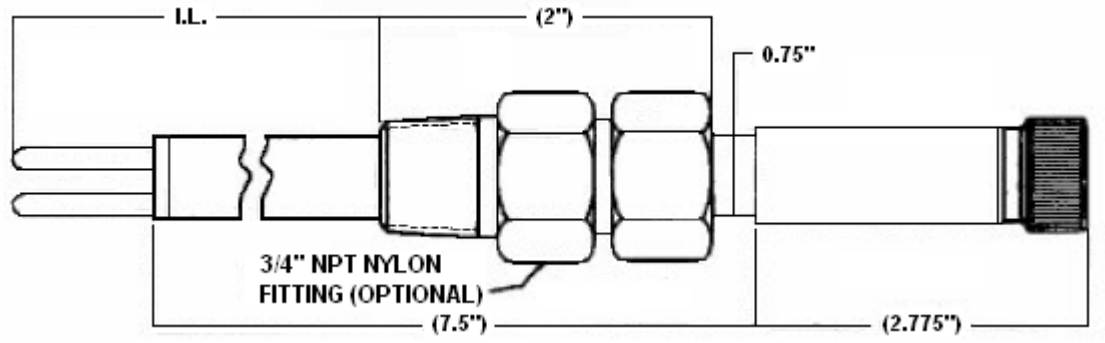
Model LP3010 – Epoxy Probe



Picture is for illustrative purposes only, supplied product may differ.

Model LP3010 is a linear polarisation resistance probe commonly used in laboratory, bypass-loop, and field applications. The probe (with additional instrumentation) can be used to monitor corrosion rates, evaluate materials, and screen corrosion inhibitors. The assembly consists of a glass epoxy probe with an optional 3/4" NPT nylon compression fitting for insertion into the system. The studs for mounting the electrodes and the six-pin connector are held in place by the epoxy fill material. The maximum insertion length (I.L.) is 6.75" when the compression fitting is used and 8.75" when the fitting is not used. Electrodes are ordered separately.

Specifications:	
Probe Body	Glass Epoxy
Endcap Seal	Epoxy
Fill Material	Epoxy
Temperature Rating (with Nylon compression fitting) (without Nylon compression fitting)	 65°C / 150°F 150°C/ 300°F
Pressure Rating	100psi / 7 Bar
Mounting	0.75 inch Pipe Plug

LP3010 Ordering Information

Model								
LP3	Linear Polarisation Adjustable Length Pipe Plug Probe							
LP0	Linear Polarisation Insertion Rod							
	Pipe Plug Size							
	0	N/A (when ordering only Insertion Rod – LP0)						
	2	0.75 inch NPT						
		Probe Body Material						
		7	Epoxy					
			Mount (Pipe Plug) Material					
			0	N/A (when ordering only Insertion Rod – LP0)				
			E	Nylon				
				LP Electrode Options				
				20	Two-electrode integral type			
					Seal Type			
					3	Epoxy		
						Length		
						11	11 inch	
							Options	
							000	None
LP3	**2**	**7**	**E**	**20**	**3**	**11**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
419	CDA110	C11000
434	CDA443	C44300
159	316L S.S.	S31603

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals. (See Electrodes.)

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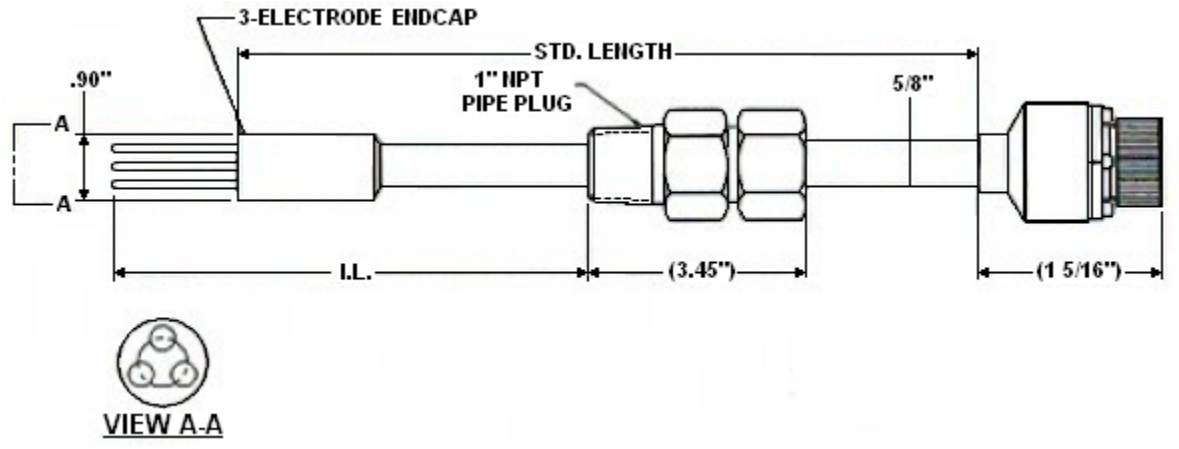
Model LP3100 – Linear Polarisation Resistance Probe Adjustable Length with 1 inch NPT Fitting and 3-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP3100 is a linear polarisation resistance probe commonly used in laboratory, bypass-loop, and field applications. The assembly consists of a 1" NPT compression fitting, an insertion rod with a hermetically sealed three-electrode endcap, and a five-pin military connector mounted in place. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. This maximum I.L. is based on the length of a carbon steel electrode. Electrode lengths may vary depending on the alloy**.** Electrodes are ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	1500psi / 102 Bar
Mounting	1 inch NPT

Standard length	I.L. (max)
8”	5.8”
12”	9.8”
18”	15.8”

LP 3100 Ordering Information

Model							
LP3	Linear Polarisation Adjustable Length Pipe Plug Probe						
	Pipe Plug Size						
	3	1 inch NPT					
		Probe Body Material					
		22	316				
			LP Electrode Options				
			10	Three-electrode plug type			
			30	Three-electrode integral type			
				Seal Type			
				1	Glass		
					Length		
					08	5.8 inch max. insertion length	
					12	9.8 inch max. insertion length	
					18	15.8 inch max. insertion length	
						Options	
						000	None
LP3	**3**	**22**	**30**	**1**	**08**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
377	C1018 Carbon Steel	G10180
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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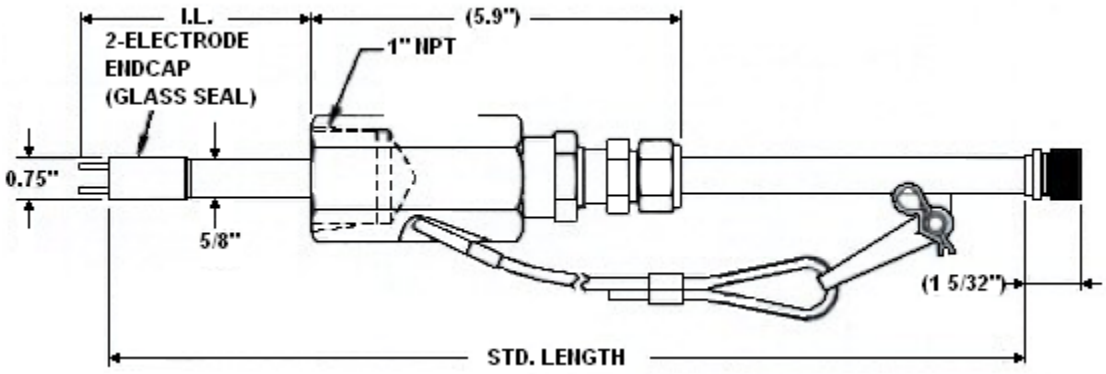
Model LP4000 – Linear Polarisation Resistance Probe with 2-Electrode Endcap and Packing Gland



Picture is for illustrative purposes only, supplied product may differ.

Model LP4000 is a retractable, linear polarisation resistance probe commonly used in field and plant applications. A specially designed packing gland is used with the probe for insertion into or retraction from a pressurised system without a process shutdown. The packing gland is designed to mount easily on a 1" piping system, but it can be modified for your specific mounting requirements. The probe assembly consists of a packing gland, an insertion rod with a hermetically sealed two-electrode endcap, and a six-pin connector welded in place. A safety chain is also provided to prevent blowout. Standard packing material in the packing gland is Teflon®, however Grafoil® packing can be provided for high temperature applications. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes the maximum insertion length is given in the chart below. Electrodes for the probe can be ordered separately. Several standard electrodes and probe lengths are available to meet your specific needs.

Specifications:	
Probe Body	316 Stainless Steel or C276
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F – Teflon® 454°C / 850°F – Grafoil®
Pressure Rating	1500psi / 102 Bar
Mounting	1 inch Full Port Valve (Min)

Standard length	I.L. (max)
24”	17.53”
30”	23.53”
36”	29.53”
42”	35.53”

RCSL Corrosion Monitoring Easy Tool is recommended for probe insertion or retraction in systems with pressure over 150 pounds.

LP4000 Ordering Information

Model						
LP45	Linear Polarisation 1 inch Female NPT Probe, Packing Gland with Teflon®					
LP75	Linear Polarisation 1 inch Female NPT Probe, Packing Gland with Grafoil®					
	Probe Body Material					
	22	316				
	44	C276				
		LP Electrode Options				
		20	Two-electrode integral type			
			Seal Type			
			1	Glass		
				Length		
				24	17.53 inch max. insertion length	
				30	23.53 inch max. insertion length	
				36	29.53 inch max. insertion length	
				42	35.53 inch max. insertion length	
					Options	
					000	None
LP45	**22**	**20**	**1**	**24**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
419	CDA110	C11000
434	CDA443	C44300
159	316L S.S.	S31603

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department
Note: Not all alloys are available with all element types and seals.

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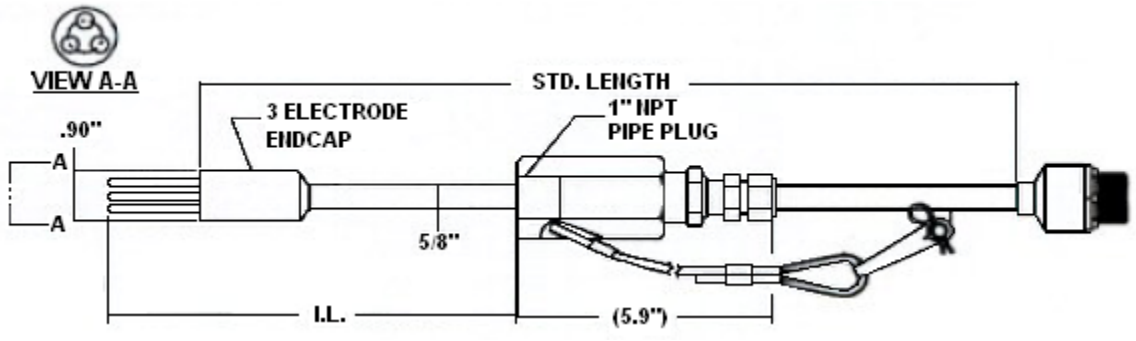
Model LP4100 – Linear Polarisation Resistance Probe with 3-Electrode Endcap and Packing Gland



Picture is for illustrative purposes only, supplied product may differ.

Model LP4100 is a retractable, linear polarisation resistance probe commonly used in field and plant applications. A specially designed packing gland is used with the probe for insertion into or retraction from a pressurised system without a process shutdown. The packing gland is designed to mount easily on a 1" piping system, but it can be modified for your specific mounting requirements. The probe assembly consists of a packing gland, an insertion rod with a hermetically sealed three-electrode endcap, and a five-pin military connector mounted in place. A safety chain is also provided to prevent blowout. Standard packing material in the packing gland is Teflon®, however, Grafoil® packing can be provided for high temperature applications. The insertion length (I.L.) is calculated to the end of the electrode and can be specified by the customer. For standard probes, the maximum insertion length is given in the chart below. This maximum I.L. is based on the length of a carbon steel electrode. Electrode lengths may vary depending on the alloy. Electrodes are ordered separately.

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F. – Teflon® 454°C / 850°F. – Grafoil®
Pressure Rating	1500psi / 102 Bar
Mounting	1 inch Full Port Valve (Min)

Standard length	I.L. (max)
24”	17.53”
30”	23.53”
36”	29.53”
42”	35.53”

RCSL Corrosion Monitoring Easy Tool is recommended for probe insertion or retraction in systems with pressure over 150 pounds.

LP4100 Ordering Information

Model						
LP45	Linear Polarisation 1 inch Female NPT Probe, Packing Gland w/ Teflon® (for integral type)					
LP75	Linear Polarisation 1 inch Female NPT Probe, Packing Gland w/ Grafoil® (for integral type)					
LPB7	Linear Polarisation 1 inch Female NPT Probe, Packing Gland w/ Teflon® (for plug type)					
LPC7	Linear Polarisation 1 inch Female NPT Probe, Packing Gland w/ Grafoil® (for plug type)					
	Probe Body Material					
	22	316				
	44	C276				
		LP Electrode Options				
		10	Three-electrode plug type with 1½ inch swage nipple			
		30	Three-electrode integral type			
			Seal Type			
			1	Glass		
				Length		
				24	17.53 inch max. insertion length	
				30	23.53 inch max. insertion length	
				36	29.53 inch max. insertion length	
				42	35.53 inch max. insertion length	
					Options	
					000	None
LP45	**22**	**30**	**1**	**24**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately. (See Electrodes.)

Alloy Chart		
Code	**Description**	**UNS#**
377	C1018 Carbon Steel	G10180
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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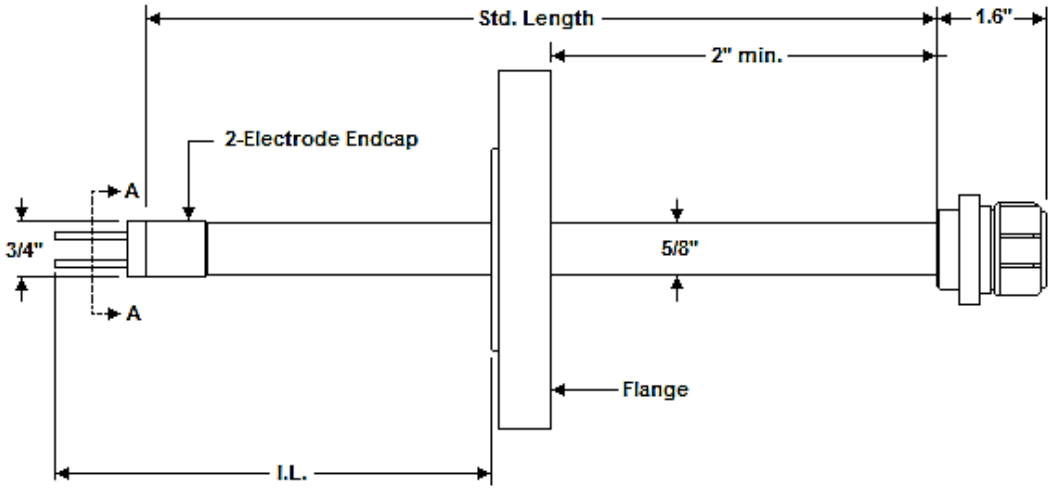
Model LP6000 Linear Polarisation Resistance Probe
Fixed Length with Flange & 2-Electrode Endcap



View A-A

Picture is for illustrative purposes only, supplied product may differ.

Model LP6000 is a fixed-length, flange-mounted, linear polarisation resistance probe. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required for installation and inspection. The probe assembly consists of an insertion rod with a two-electrode endcap, a hermetically sealed connector, and a flange (as specified by customer), which are all welded in place. Insertion length (I.L.) is calculated to the end of the electrodes and, in this case, is based on a 1" total flange thickness. Customers can specify any length required. For standard probes, the maximum insertion length is given in the chart below. Electrodes are ordered separately. Several standard electrodes are available to meet your specific needs.

Specifications	
Probe Body	316 Stainless Steel or C276
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard Length	I.L. (max)
12”	10.12”
18”	16.12”

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24”	22.12”

LP6000 Ordering Information

Model								
LP6	Linear Polarisation Fixed Length Pipe Probe with Flange							
	Flange Size							
	1	1 inch Flange						
	2	1 ½” inch Flange						
	3	2 inch Flange						
	4	3 inch Flange						
	5	4 inch Flange						
	7	6 inch Flange						
	8	2 ½” inch Flange						
	9	¾” inch Flange						
		Probe Body Material						
		22	316					
		44	C276					
			LP Electrode Options					
			2	Two-electrode integral type				
				Flange Pressure Rating				
				1	150 lb.			
				2	300 lb.			
				3	600 lb.			
				4	1200 lb.			
				5	1500 lb.			
				6	900 lb.			
					Seal Type			
					1	Glass		
						Length		
						12	10.12” inches max. insertion length	
						18	16.12” inches max. insertion length	
						24	22.12” inches max. insertion length	
							Options	
							000	None
LP6	**2**	**22**	**2**	**1**	**1**	**12**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
419	CDA110	C11000
434	CDA443	C44300
159	316 S.S	S31603

For alloys, sizes, or other special requirements not listed, please contact our sales department. Not all alloys are available with all electrode types and seals.

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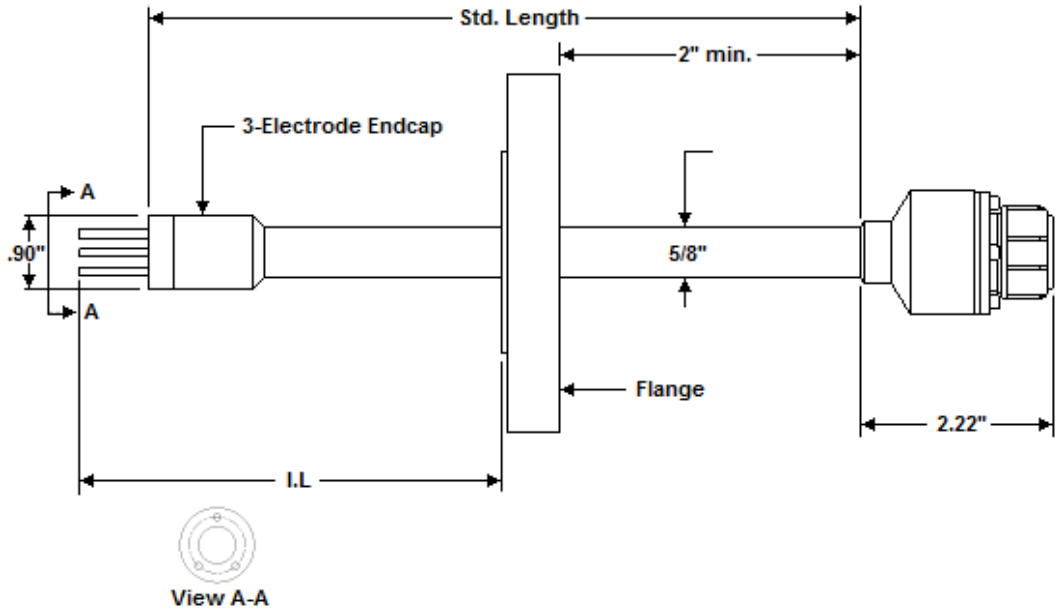
Model 6100 Linear Polarization Resistance Probe
Fixed Length with Flange and 3-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP6100 is a fixed-length, flange-mounted, linear polarisation resistance probe. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required for installation and inspection. The probe assembly consists of an insertion rod with a three-electrode endcap, a hermetically sealed connector, and a flange (as specified by customer), which are all welded in place. Insertion length (I.L.) is calculated to the end of the electrodes and, in this case, is based on a 1" total flange thickness. Customers can specify any length required. For standard probes, the maximum insertion length is given in the chart below. Several standard electrodes are available to meet your specific needs. Electrodes are ordered separately.

Specifications	
Probe Body	316 Stainless Steel
Fill Material	Glass
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard Length	I.L. (max)
12”	10.25”
18”	16.25”

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24”	22.25”

LP6100 Ordering Information

Model								
LP6	Linear Polarisation Fixed Length Probe with Flange							
	Flange Size							
	1	1 inch Flange						
	2	1 ½ inch Flange						
	3	2 inch Flange						
	4	3 inch Flange						
	5	4 inch Flange						
	7	6 inch Flange						
	8	2 ½ inch Flange						
		Probe Body Material						
		22	316					
			LP Electrode Options					
			10	Three-electrode plug type				
			30	Three-electrode integral type				
				Flange Pressure Rating				
				1	150 lb.			
				2	300 lb.			
				3	600 lb.			
				4	1200 lb.			
				5	1500 lb.			
				6	900 lb.			
					Seal Type			
					1	Glass		
						Length		
						12	10.25 inches max. insertion length	
						18	16.25 inches max. insertion length	
						24	22.25 inches max. insertion length	
							Options	
							000	None
LP6	**2**	**22**	**30**	**1**	**1**	**18**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX - use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
377	C1018 Carbon Steel	G10180
159	316 S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department. Not all alloys are available with all electrode types and seals.

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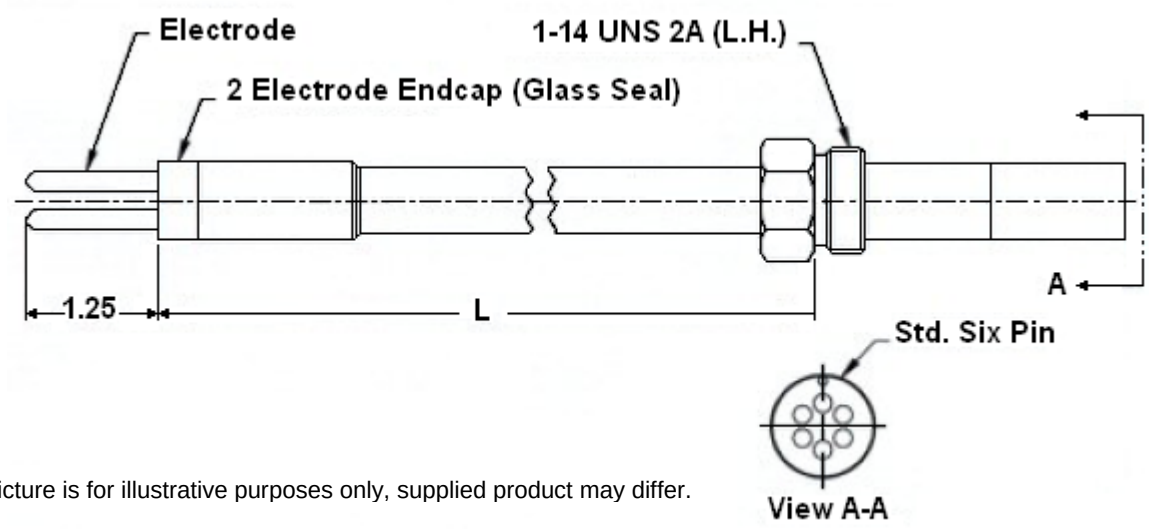
Model LP7000 - Linear Polarisation Resistance Probe (2 Electrodes) for the 2 inch Access System



Picture is for illustrative purposes only, supplied product may differ.

Model LP7000 is a fixed-length, linear polarisation resistance probe for use with 2 inch access systems. The probe assembly consists of an insertion rod with a hermetically sealed two-electrode endcap, a hollow plug nut, and a standard six-pin connector, which are all welded in place. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. The insertion length (I.L.) can range from 3" up to any length specified by the customer in 1/8" increments, using the formula below. (This includes 1.25" for the length of the electrode.)

I.L. = PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)

Note: Formula valid for an access fitting height of 5.25"

Several standard electrodes are available to meet your specific needs. Probe adaptors are also available and must be ordered separately

Specifications	
Probe Body	316 Stainless Steel or C276
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi / 245 Bar
Mounting	2” Access System with Hollow Plug

LP7000 Ordering Information

Model							
HL	Linear Polarisation Two-Electrode Probe for 2 inch Access System						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		1	Small Connector				
		2	Standard Connector				
			LP Electrode Options				
			0	Two-electrode integral type			
				Seal Type			
				0	Glass		
				1	Epoxy		
					Length		
					XXXX	Length in inches, stated in 2 decimal place format (Example: 6 1/8” = 0612)	
						Options	
						000	None
HL	2	2	0	0	0612	000	Example of Probe Ordering #

Electrode Part Number - EL400XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
375	C1010 Carbon Steel*	G10100
419	CDA110	C11000
434	CDA443	C44300
159	316L S.S.	S31603

*Chemically equivalent to standard pipe-grade carbon steels.

For alloys, sizes, or other special requirements not listed, please contact our sales department.
Note: Not all alloys are available with all element types and seals.

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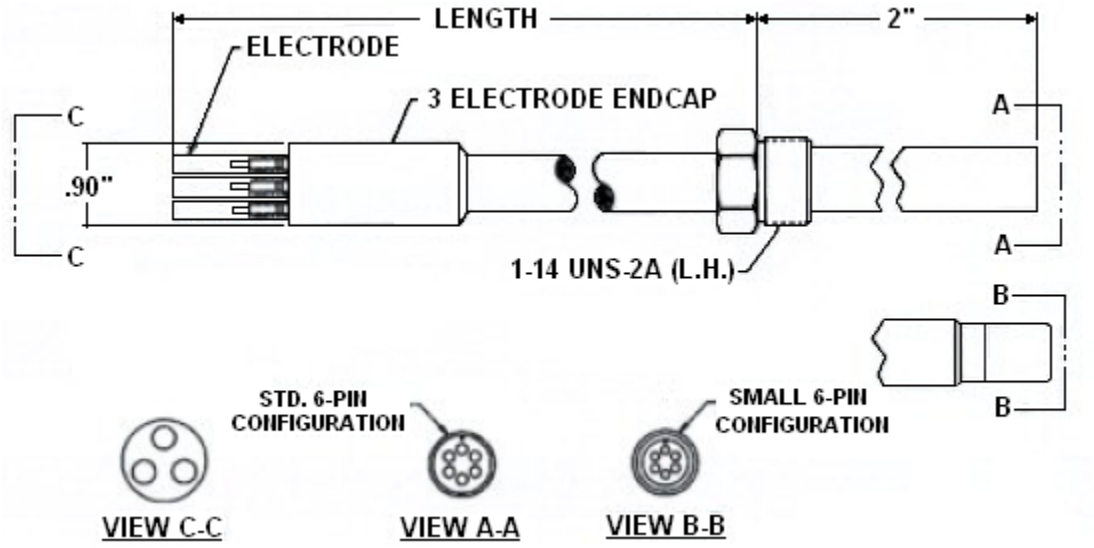
Model LP7100 - Linear Polarisation Resistance Probe with 3-Electrode Endcap



Picture is for illustrative purposes only, supplied product may differ.

Model LP7100 is a fixed-length, linear polarisation resistance probe for use with 2 inch access systems. The probe assembly consists of an insertion rod with a hermetically sealed three-electrode endcap, a hollow plug nut, and a standard six-pin connector, which are all welded in place. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. Several standard electrodes are available to meet your specific needs. Probe adaptors are also available and must be ordered separately. The insertion length (I.L.) can range from 2" up to any length specified by the customer in 1/8" increments, using one of the following formulas.

Top-of-the-line monitoring: **I.L. = WT + 1.75**
Middle-of-the-line monitoring: **I.L. = PD + WT + 1.75 - 1/2EL**
Bottom-of-the-line monitoring: **I.L. = PD + WT + 1.75 - EL**
(where PD = penetration depth, WT = wall thickness, EL = electrode length - see Alloy Chart below)
Note: Formula valid for access fitting heights of 5.25"/ 5.5".

Specifications:	
Probe Body	316 Stainless Steel or C276
Endcap Seal	Glass
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi / 245 Bar
Mounting	2 inch Access System with Hollow Plug

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LP7100 Ordering Information

Model							
HL	Linear Polarisation Three-Electrode Probe for 2 inch Access System						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		1	Small Connector				
		2	Standard Connector				
			LP Electrode Options				
			1	Three-electrode integral type			
				Seal Type			
				0	Glass		
					Length (round calculated length down to the nearest 1/8”)		
					XXXX	Length in inches, stated in 2 decimal place format (Ex: 6 1/8” = 0612)	
						Options	
						000	None
HL	**2**	**2**	**1**	**0**	**0612**	**000**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart			
Code	**Description**	**UNS#**	**Electrode Length (EL)**
377	C1018 Carbon Steel	G10180	1.72 inches
159	316L S.S.	S31603	1.62 inches
419	CDA110	C11000	3.50 inches
434	CDA443	C44300	3.17 inches

For alloys, sizes, or other special requirements not listed, please contact our sales department
Note: Not all alloys are available with all element types and seals.

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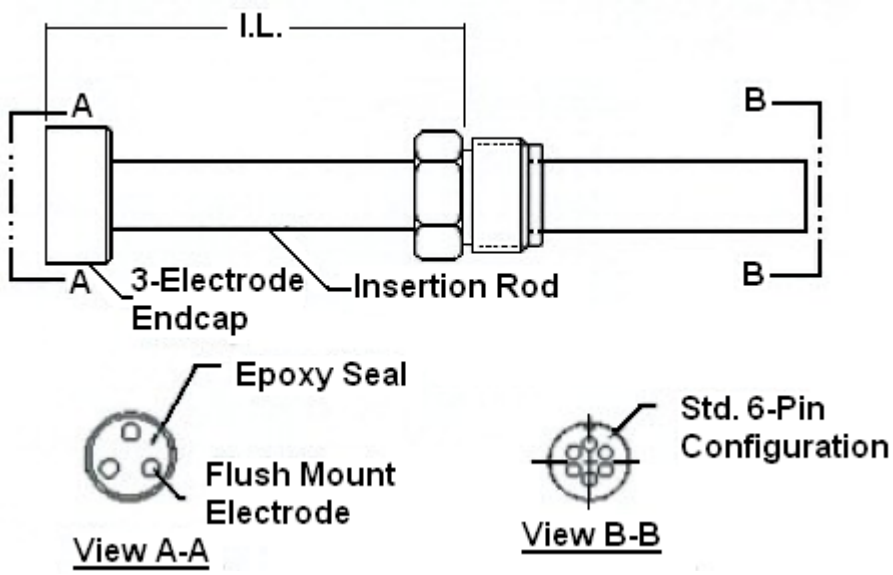
Model LP7210 – Linear Polarisation Resistance Probe Retrievable with Flush-Mount 3-Electrode Endcap for 2 inch high Pressure Access Systems



Picture is for illustrative purposes only, supplied product may differ.

Model LP7210 is a fixed-length, flush-mount, three electrode, retrievable, linear polarisation resistance probe for use with 2 inch access systems. These probes are ideally suited for applications where the probe electrodes need to be flush with the wall of the pipe. The probe assembly consists of an insertion rod, a flush mount, three-electrode endcap and a six-pin military connector. The hollow plug nut on the probe screws into the hollow plug of the access system. This allows the probe to be installed in the process, using a retriever tool and service valve, without process shutdown. The probe's three-electrode endcap is filled with an epoxy seal. Electrodes are not replaceable. The insertion length (I.L.) can range from a minimum of 1.75 inches up to any length specified by the customer in $^{1}/_{8}$" increments, using the formula:

I.L. = PD + WT + 1.75"
(Where PD = penetration depth, WT = wall thickness)
For top-of-the-line, flush-mount monitoring, PD=0

Note: Formula valid for access fitting heights of 5.25".

Specifications:	
Probe Body	316 Stainless Steel
Endcap Seal	Epoxy
Fill Material	Epoxy
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi/ 245 Bar
Mounting	2 inch Access System

LP7210 Ordering Information

Model							
HL	Linear Polarisation Three-Electrode Probe for 2 inch Access System						
	Mounting Material						
	2	316					
	3	C276					
		Connector Type					
		2	Standard Connector				
			LP Electrode Options				
			4	Three-electrode integral flush type			
			6	Three-electrode integral flush adjustable type			
				Seal Type			
				1	Epoxy		
					Length (round calculated length down to the nearest 1/8”)		
					XXXX	Length in inches, stated in 2 decimal place format (Ex: 6 1/8” = 0612)	
						Electrode Alloy	
						XXX	Use Code in Alloy Chart
HL	**2**	**2**	**4**	**1**	**0612**	**XXX**	**Example of Probe Ordering #**

Electrode Part Number - EL412XXX2800000 (XXX-use Code in Alloy Chart)
LPR probe electrodes are replaceable and sold separately.

Alloy Chart		
Code	**Description**	**UNS#**
377	C1018	G10180
159	316L S.S.	S31603
419	CDA110	C11000
434	CDA443	C44300

For alloys, sizes, or other special requirements not listed, contact our sales department.
Note: Not all alloys are available with all element types and seals.

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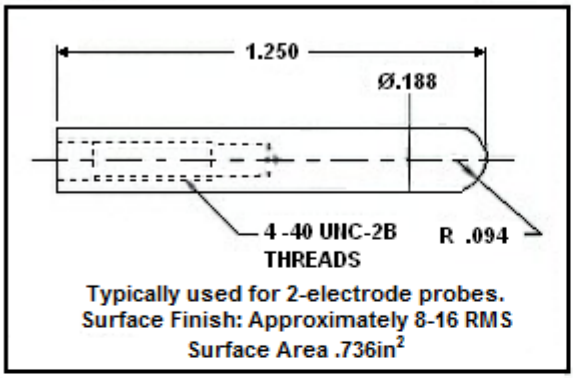
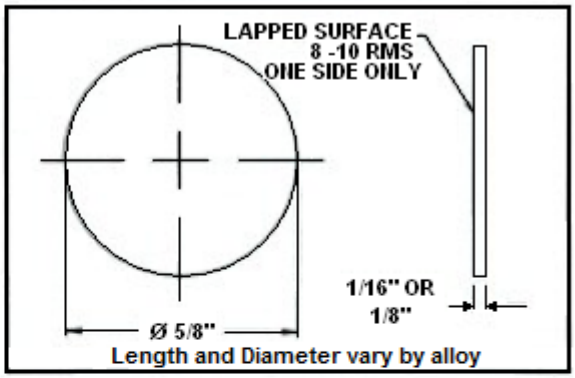
Electrodes for Electro-Chemistry

P/N EL400



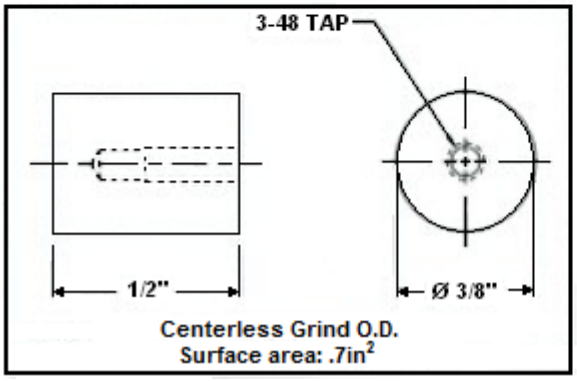
Typically used for 2-electrode probes.
Surface Finish: Approximately 8-16 RMS
Surface Area .736in^2

P/N EL405



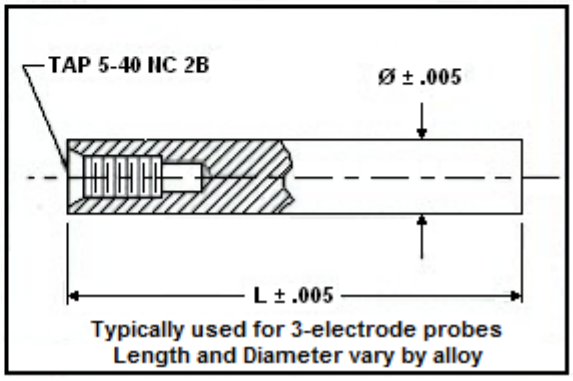
Length and Diameter vary by alloy

P/N EL410



Centerless Grind O.D.
Surface area: .7in^2

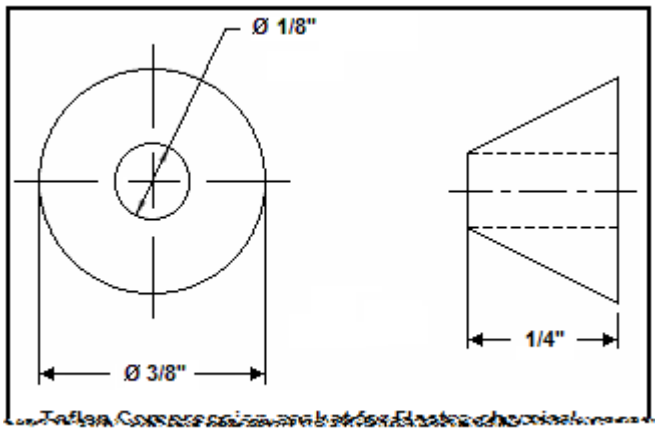
P/N EL412



Typically used for 3-electrode probes
Length and Diameter vary by alloy

Gaskets commonly used with Electro-chemical Apparatus

P/N MI2605



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LP System Accessories

Cables

- Factory Assembled: For Portable Instrument Series P.N 700716 + Length
  For Transmitter and Data Collection Systems P.N. 700726 + Length
- Cable - Heavy Duty: P.N 700331
  Two wire for transmitter P.N. 700431
- Connectors: Low Pressure Probe Type A P.N. 700521
  System High Pressure Type B P.N. 700343
  Probe to Cable Adaptor for 2" High Pressure System
- Portable with Standard 6 pin Connector P.N. 700319
- Portable with Small 6 pin Connector Fixed P.N. 700033
- Fixed Adapter with Standard 6 pin Connector P.N. 700640
- Fixed Adaptor with Small 6 pin Connector P.N. 700077

Shield Options

- Standard Shield - Wire Loop Probe - P.N. 700608
- High Velocity Shield - Wire Loop Probe - P.N. 700609
- Standard Shield - Cylindrical Probe - P.N. 700610
- High Velocity Shield - Cylindrical Probe - P.N. 700611
- Coupon Holder Shield - Wire Loop Probe - P.N. 700612
- Coupon Holder Shield - Cylindrical Probe - P.N. 700613

Safety Clamps

- For 18" and 24" Probe lengths P.N. 700700
- For 30", 36" and 42" Probe lengths P.N. 700701

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MS0500 ER Corrosion Meter

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(Probe shown in photograph not included with corrosion meter)

The MS0500 is a battery-powered, portable corrosion meter capable of interpreting all electrical resistance type corrosion probes. Combining a light weight of only 4 pounds with ease of operation, the MS0500 enables the operator to take readings from several different probe locations.

Corrosion rate measurements are made using the electrical resistance method. Essentially, the instrument measures the resistance of the probe element which changes over time as metal loss occurs. The rate of change is directly proportional to the corrosion rate. This method finds a wide variety of applications since it can be used in conductive and nonconductive environments, such as petroleum, chemical, water, soil, or even atmosphere.

The MS0500 has a permanently attached cable assembly which mates directly to any standard ER probe. A switch is provided on the front panel of the instrument for selecting the probe type to be measured (wire loop, tube loop, cylindrical, etc.). Readings are taken using the dial and analog meter on the front panel.

The MS0500 also offers a built-in battery test function, and comes in a convenient carrying case.

MS0500 Technical Specifications

Model	
MS0500 – ER Corrosion Meter (Ordering # IN0500)	
Physical Data	
Instrument Weight:	1.08 kg (2.38 lb)
Total Weight w/ Carrying Case & Accessories:	1.63 kg (3.6 lb)
Instrument Dimensions:	7.62cm H x 12.7cm W x 17.15cm D (3" H x 5" W x 6.75")
Carrying Case Dimensions:	15.24cm H x 15.24cm W x 22.23cm D (6.0" x 6.0" x 8.75")
Operating Temperature:	0° to 50°C (32° to 122°F)
Storage Temperature:	0° to 50°C (32° to 122°F)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (wire loop, tube loop, cylindrical, flush, strip, etc.) w/ check reading.
Range:	0-1000 digits representing 0-100% of probe life
Resolution:	1 digit
Electrical Data	
Power Requirements:	Two 9V Batteries
Maximum Probe Cable Distance:	30.48m (100ft) *

Special Features
- Simple user interface
- Built-in battery check
- Portable

Accessory Items
Carrying Case, 6” Probe Cable (attached), Meter Prover, Operation Manual

*May vary with element type.

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MS1000 Corrosion Meter

The MS1000 is a hand-held, battery-powered corrosion meter. This versatile instrument measures the instantaneous corrosion rate and electrochemical current between the electrodes of any standard 2-electrode linear polarisation resistance (LPR) probe.

Corrosion rate measurements are made using the LPR technique. The instrument measures the current required to polarise the electrodes of a probe to a known potential. From the polarisation potential and the measured current, polarisation resistance can be calculated. Then, using Faraday's law, instantaneous corrosion rate is calculated from polarisation resistance.

The MS1000 is designed to calculate the corrosion rate in mils per year (mpy) for carbon steel. Multiplication factors for several common alloys have been included on the front panel of the instrument for quick reference. Multiplication factors for other alloys can be easily calculated using the formulas supplied in the operation manual.

The MS1000 also offers a high precision zero resistance ammeter (ZRA) for measuring the electrochemical current between electrodes. This function may be used to measure the galvanic current between electrodes of dissimilar alloys.

The MS1000 has a simple function key interface, using a 4-key keypad and a 4-line LCD display. The instrument also offers low-battery detection and an auto-shutoff feature to conserve battery life.

MS1000 Technical Specifications

Model	
MS1000 – LPR Corrosion Meter (Ordering # IN1000)	
Physical Data	
Instrument Weight:	0.38Kg (0.84 lb.)
Total Weight w/ Carrying Case and Accessories:	2.36Kg (5.20 lb.)
Instrument Dimensions:	19.38cm (H) x 10.54cm (W) x 3.30cm (D) (7.36" x 4.15" x 1.3")
Carrying Case Dimensions:	25.40cm (H) x 29.85cm (W) x 13.72cm (D) 10" x 11.75" x 5.4"
Operating Temperature:	0° to 50°C (32° to 122°F)
Storage Temperature:	-20° to 70°C (-4° to 158°F)
Performance Data	
Measurement Type:	2-Electrode LPR Galvanic
Range:	2-Electrode: 0-40 mpy Galvanic 0-80 µA
Resolution:	2-Electrode: 0.02 mpy Galvanic 0.04 µA
Cycle Time:	Corrosion Rate: 60 sec ZRA: 30 sec
Electrical Data	
Power Requirements:	One 9V Li-Ion Rechargeable Battery (see below)
Maximum Probe Cable Distance:	609.6m (2000 ft)
Special Features	
• Microprocessor-based electronics • Function key interfacing using 4-key keypad and 4-line LCD display • Low-battery detection • Portable	
Accessory Items	
Carrying case, 10" Probe cable, Battery charger, Lightweight protective case, Meter prover, Operation Manual	
New Li-Ion Rechargeable Battery	
Li-Ion battery charges faster and has a longer life than previous NiCad battery (400mAH as opposed to 120mAH.) Li-Ion charger Features: • Multi-voltage input for domestic & international use (100-240 VAC 50/60Hz) • Automatic cut-off when battery is charged (to prevent over-charging) • Red/Green LED's to indicate when battery is charging/ full	

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MS1500E Handheld Corrosion Data Logger

The MS1500E is a hand-held, battery-powered, corrosion meter capable of measuring and storing data from all types of electrical resistance (ER) corrosion probes. The instrument is light weight, microprocessor-based, and features a simple, menu-driven interface using a 12-key keypad and a 4-line LCD display.

Corrosion rate measurements are made using the electrical resistance method. Essentially, the instrument measures the resistance of the probe element which changes over time, as metal loss occurs. The rate of change is directly proportional to corrosion rate. This method finds a wide variety of applications since it can be used in conductive and nonconductive environments such as petroleum, chemical, water, soil, or even atmosphere.

After taking a reading, the instrument displays metal loss in mils and corrosion rate in mils per year (mpy). The reading can then be stored to memory or discarded. All stored readings are automatically time and date stamped, and are protected by a lithium back-up battery. The instrument can store a maximum of 3,100 readings on up to 150 different probes.

Stored data can be uploaded to any IBM compatible PC as a comma-delimited ASCII text file. Because the data is in ASCII text format, it can be imported into any standard data analysis program such as Microsoft Excel, Lotus 123, or Corel Quattro Pro. Data can also be reviewed on the instrument's LCD display for quick reference.

The MS1500E may also be used as a data transfer unit (DTU) for the MS3500E Remote Data Logger. Data may be transferred from multiple MS3500E field-based units to the MS1500E, then later transferred to a PC for analysis.

An ETL certified model for intrinsic safety in hazardous areas is available upon request.

MS1500E Technical Specifications

Model		
MS1500E – Handheld ER Corrosion Data Logger (Ordering #IN1500)		
Physical Data		
Instrument Weight:	0.64 kg (1.4 lb)	
Total Weight w/ Carrying Case & Accessories:	2.39 kg (5.26 lb)	
Instrument Dimensions:	19.38cm H x 10.54cm W x 5.08cm D (7.63” x 4.15” x 2”)	
Carrying Case Dimensions:	25.40cm H x 29.85cm W x 13.72cm D (10” x 11.75” 5.4”)	
Operating Temperature:	0° to 50°C (32° to 122°F)	
Storage Temperature:	-20° to 70°C (-4° to 158°F)	
Performance Data		
Measurement Type:	ER measurement using any standard ER probe type (wire loop, tube loop, cylindrical, flush, strip, etc.)	
Range:	0-10 digits representing 0-100% of probe life	
Resolution:	1 digit	
Electrical Data		
Power Requirements:	Three 1.5V AA Batteries	
Maximum Probe Cable Distance:	1.83m (6ft)	
Output Specifications:	RS-232 Output in Comma-Delimited ASCII Text Format	
Optional:		
Intrinsic Safety:	ETL LISTED 9900750	Class I, Division 1 Groups A, B, C and D Temperature Code T3C Class I, Zone 0 Group IIC, T3C Conforms to ANSI/UL Std. 913 **Intrinsic safety option must be specified when ordering.**
Special Features:		
- Microprocessor-based electronics		
- Data storage capacity of 3,100 readings on 150 different probes, with battery backup		
- Menu-driven interface using a 12-key keypad and a 4-line LCD display		
- Low-battery detection		
- Portable		
Accessory Items		
Carrying Case, 6” Probe Cable (attached,) Meter Prover, Communications Cable and Connector, Operation Manual, Corrosion Data Management Software.		

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MS1500L Handheld LPT Corrosion Data Logger

The MS1500L is a hand-held, battery-powered, intrinsically safe corrosion meter capable of measuring and storing data from all types of 2- or 3-electrode linear polarisation resistance (LPR) corrosion probes. The instrument is light weight, microprocessor-based, and features a simple, menu-driven interface using a 12-key keypad and a 4-line LCD display.

Corrosion rate measurements are made using the linear polarisation resistance technique. The instrument measures the current required to polarise the electrodes of a probe to a known potential. From the polarisation potential and the measured current, polarisation resistance can be calculated. Then, using Faraday's law, the instantaneous corrosion rate can be calculated from polarisation resistance.

The MS1500L incorporates a high-precision zero-resistance ammeter (ZRA) for measuring galvanic current between electrodes. It also offers a high-precision voltmeter for measuring the open-circuit potential between electrodes.

After performing a measurement, the instrument displays the corrosion rate, current, or potential, depending on the mode selected. The reading can then be stored to memory or discarded. All stored readings are automatically time and date stamped, and are protected by a lithium back-up battery. The instrument can store a maximum of 3,000 readings on up to 100 different probes.

Stored data can be uploaded to any IBM compatible PC as a comma-delimited ASCII text file. Because the data is in ASCII text format, it can be imported into any standard data analysis program such as Microsoft Excel, Lotus 123, or Corel Quattro Pro. Data can also be reviewed on the instrument's LCD display for quick reference.

The MS1500L may also be used as a data transfer unit (DTU) for the MS3500L Remote Data Logger. Data may be transferred from multiple MS3500L field-based units to the MS1500L, then later transferred to a PC for analysis.

MS1500L Technical Specifications

Model		
MS1500L – Handheld ER Corrosion Data Logger (Ordering #IN1500)		
Physical Data		
Instrument Weight:	0.64 kg (1.4 lb)	
Total Weight w/ Carrying Case & Accessories:	2.39 kg (5.26 lb)	
Instrument Dimensions:	19.38cm H x 10.54cm W x 5.08cm D (7.63” x 4.15” x 2”)	
Carrying Case Dimensions:	25.40cm H x 29.85cm W x 13.72cm D (10” x 11.75” 5.4”)	
Operating Temperature:	0° to 50°C (32° to 122°F)	
Storage Temperature:	-20° to 70°C (-4° to 158°F)	
Performance Data		
Measurement Type	**Range**	**Resolution**
2-Electrode	0 to 200 mpy	0.01 mpy
3-Electrode	0-150 mpy	0.01 mpy
Galvanic	± 999µA	1 µA
Potential	± 999mV	1mV
Electrical Data		
Power Requirements	One 9V Battery	
Maximum Probe Cable Distance:	1.83m (6ft)	
Output Specifications:	RS-232 Output in Comma-Delimited ASCII Text Format	
Intrinsic Safety:	ETL LISTED ® 9900750	Class I, Division 1 Groups A, B, C and D Temperature Code T2D Class I, Zone 0 Group IIC, T2D Conforms to ANSI/UL Std. 913
Special Features:		
- Microprocessor-based electronics		
- Data storage capacity of 3,000 readings on 100 different probes, with battery backup		
- Menu-driven interface using a 12-key keypad and a 4-line LCD display		
- Low-battery detection		
- Portable		
Accessory Items		
Carrying Case, 6” Probe Cable (attached), Meter Prover, 6 to 5-pin Adapter, Galvanic Adapter, Communications Cable and Connector, Operation Manual, Corrosion Data Management Software.		

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MS2500E Transmitter

Standard Version


Direct Mount Version

The MS2500E is an intrinsically safe, microprocessor-based corrosion transmitter capable of measuring and transmitting data from all types of electrical resistance (ER) corrosion probes.

Corrosion rate measurements are made using the electrical resistance method. Essentially, the instrument measures the resistance of the probe element which changes over time, as metal loss occurs. The rate of change is directly proportional to corrosion rate. This method finds a wide variety of applications since it can be used in conductive and nonconductive environments such as petroleum, chemical, water, soil, or even atmosphere.

Measurements are transmitted via 4-20mA current loop. Since current loop signals are not as sensitive to line loss as other types of data signals, the MS2500E may be located up to ten miles away from the data receiver under proper conditions.

The MS2500E is completely loop-powered, so installation is simple. A two-wire connection is all that is required for both instrument power and data transmission. Setup is also simple, using a set of switches to select the probe type to be measured (wire loop, tube loop, cylindrical, etc.).

The MS2500E is housed in a NEMA 4X rated explosion-proof and weather-proof enclosure, and the probe cable is connected through a water-tight, explosion-proof cable gland. This makes the MS2500E suitable for use in almost any indoor or outdoor environment.

MS2500E Technical Specifications

Model	
MS2500E – Loop-Powered ER Transmitter (Ordering # IN2500) Wireless Radio option also available (more info included on Wireless Radio Option page)	
Physical Data	
Instrument Weight:	2.28 Kg (5.02 lb)
Total Weight w/ Accessories:	3.21 Kg (7.08 lb)
Instrument Dimensions:	14.76cm H x 11.43cm W x 12.22cm D (5.81” x 4.5” x 4.81”)
Case Specifications:	Explosion Proof (FM, CSA, CENELEC, UL) Class I, Groups B, C, D, Class II, Groups E, F, G, Class III, CENELEC: Eexd IIC NEMA 4X, 7BCD, 9EFG
Mounting Specifications:	1.85cm x 4.46cm (0.728” x 1.756”) Bolt Pattern with 1/4-20 Tapped Mounting Holes, or may be mounted on a 1.27cm to 5.08cm (½” tp 2”) pipe using supplied hardware
Operating Temperature:	-18° to 60°C (0° to 140°F)
Storage Temperature:	-40° to 80°C (-40° to 176°F)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (wire loop, tube loop, cylindrical, flush, strip, etc.)
Range:	0-100% of probe life
Resolution:	0.4% of Full Scale
Cycle Time:	1 Minute
Electrical Data	
Power Requirements:	10 to 35 VDC
Maximum Probe Cable Distance:	1.52m (5ft)
Output Specifications:	4-20 mA Current Loop Output
Intrinsic Safety:	Certified to CAN/CSA STD E79-0-95 & E79-11-95 Class I, Division 1, Groups C and D, T4
Special Features	
- Switch selectable probe type (wire loop, tube loop, cylindrical, etc.) - Loop powered	
Accessory Items	
5” Probe Cable (attached,) Meter Prover, Mounting Hardware, Operation Manual.	

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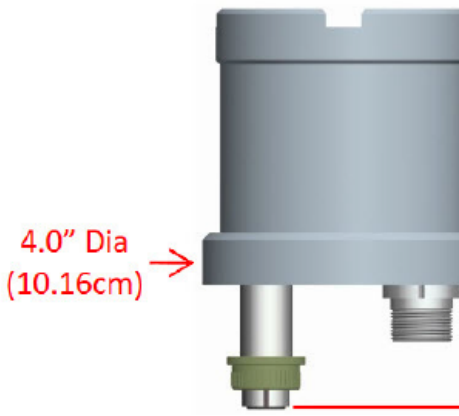
REGISTRATION No. 1394643 ENGLAND · REGISTERED OFFICE: AS ABOVE

MS2600E High Resolution ER Transmitter
4-20 mA Analog Output

Compact MS2600E ER Transmitter (ERT), measures all types of electrical resistance (ER) corrosion probes. The new high-resolution, 16-bit measurement provides faster response, obtaining corrosion rates in hours instead of days. The transmitter can be remote or direct-mounted (shown).

The transmitter is available in a weather-proof stainless steel enclosure designed for applications which do not permit aluminium enclosures (such as offshore environments or Zone 0 hazardous areas). Alternatively, a weather-proof (NEMA-4X) and explosion proof cast aluminium enclosure is also available.

The MS2600E is completely loop-powered, so installation is simple. A two-wire connection is all that is required for both instrument power and data transmission. Setup is also simple, using a set of switches to select the probe type to be measured.



MS2600E direct mounted to a retrievable probe

MS2600E Technical Specifications

Model	
MS2600E – High Resolution ER 4-20mA Transmitter	
Physical Data	
Instrument Weight:	1.68Kg (3.7 lb.)
Total Weight w/ Accessories:	2.61Kg (5.76lb.)
Instrument Dimensions:	15.25cm Height x 10.16cm Diameter (6.0” Height x 4” Diameter)
Operating Temperature:	-20°C to 70°C (-4°F to 158°F)
Storage Temperature:	-40°C to 80°C (-40°F to 176°F)
Enclosure Material:	316 Stainless Steel
Mounting Specifications:	Direct probe mount (standard) May be pole mounted using optional hardware (Up to a 6.35cm (2.5”) Diameter pole)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (Wire Loop, Tube Loop, Cylindrical, Flush, Strip, etc.)
Range:	0-100% of probe life
Resolution:	0.0015% of probe life (16-bit)
Cycle Time:	1 Minute
Electrical Data	
Power Requirements:	10 to 28 VDC
Maximum Probe Cable Distance:	30ft (9.1m)
Output Specifications:	4-20mA Current Loop Output
Hazardous Location Certifications – Intrinsic Safety	
USA/ Canada	Conforms to ANSI/UL Std. 60079-0, 60079-11, 61010-1 CAN/CSA Std. E66079-0, E60079-11 & CAN/CSA C22.2 No. 61010-1 Class I, Zone0, AEx ia IIC T4 Ga Zone 20, AEx ia IIIC T130° C Da -20° C ≤ Ta ≤ +70° C
Europe and Worldwide (ATEX and IECEx) X. Probe dielectric rating <500V r.m.s. Do not exceed	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia III T130°C Da - 20°C ≤ Ta ≤ + 70°C ATEX Certificate No: ITS14ATEX27981X IECEx Certificate No: IECEx ITS 14.0010X
Included Accessories	
1M Current Loop Harness, Meter Prover, Operations Manual	
Optional Accessories	
Probe Extension Cable, Remote Mounting Hardware	

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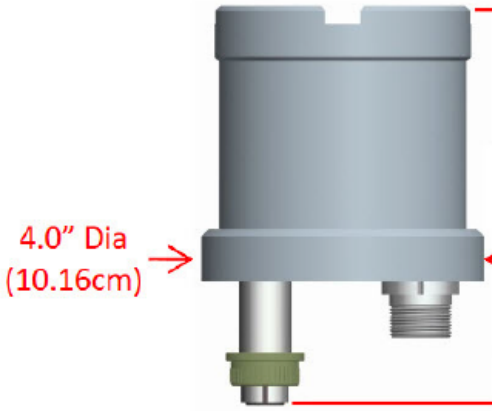
MS2700E High Resolution ER Transmitter
RS-485 Modbus Output

The Compact MS2700E ER Transmitter measures all types of electrical resistance (ER) corrosion probes. The new high-resolution, 16-bit measurement provides faster response, obtaining corrosion rates in hours instead of days. The transmitter can be remote or direct-mounted (shown).

The transmitter is available in a weather-proof stainless steel enclosure designed for applications which do not permit aluminium enclosures (such as offshore environments or Zone 0 hazardous areas). Alternatively, a weather-proof (NEMA-4X) and explosion proof cast aluminum enclosure is also available.

The MS2700E transmitter offers simple installation and robust RS-485 Modbus communication, allowing up to 32 units to be connected in series (daisy-chained) on a single line. Setup is also simple, using a set of switches to select the probe type to be measured, address and other options.



MS2600E direct mounted to a retrievable probe

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MS2700E Technical Specifications

Model	
MS2700E – High Resolution ER RS-485 Modbus Transmitter	
Physical Data	
Instrument Weight:	1.68Kg (3.7 lb.)
Total Weight w/ Accessories:	2.61Kg (5.76lb.)
Instrument Dimensions:	15.25cm Height x 10.16cm Diameter (6.0” Height x 4” Diameter)
Operating Temperature:	-20°C to 70°C (-4°F to 158°F)
Storage Temperature:	-40°C to 80°C (-40°F to 176°F)
Enclosure Material:	316 Stainless Steel
Mounting Specifications:	Direct probe mount (standard) May be pole mounted using optional hardware (Up to a 6.35cm (2.5”) Diameter pole)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (Wire Loop, Tube Loop, Cylindrical, Flush, Strip, etc.)
Range:	0-100% of probe life
Resolution:	0.0015% of probe life (16-bit)
Cycle Time:	75 Seconds
Electrical Data	
Power Requirements:	10 to 28 VDC
Maximum Probe Cable Distance:	9.1m (30ft)
Output Specifications:	RS-485 Modbus, RTU or ASCII Protocol (Switch Selectable) 2400/ 4800/ 9600/ 19.2K Selectable Baud 32 Maximum Units (Addresses 1 to 32)
Hazardous Location Certifications – Intrinsic Safety	
USA/ Canada	Conforms to ANSI/UL Std. 60079-0, 60079-11, 61010-1 CAN/CSA Std. E66079-0, E60079-11 & CAN/CSA C22.2 No. 61010-1 Class I, Zone0, AEx ia IIC T4 Ga Zone 20, AEx ia IIIC T130°C Da -20° C ≤ Ta ≤ +70°C
Europe and Worldwide (ATEX and IECEx) X. Probe dielectric rating <500V r.m.s. Do not exceed	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia III T130°C Da - 20°C ≤ Ta ≤ + 70°C ATEX Certificate No: ITS14ATEX28092X IECEx Certificate No: IECEx ITS 14.0052X
Included Accessories	
1M Current Loop Harness, Meter Prover, Operations Manual	
Optional Accessories	
Probe Extension Cable, Remote Mounting Hardware	

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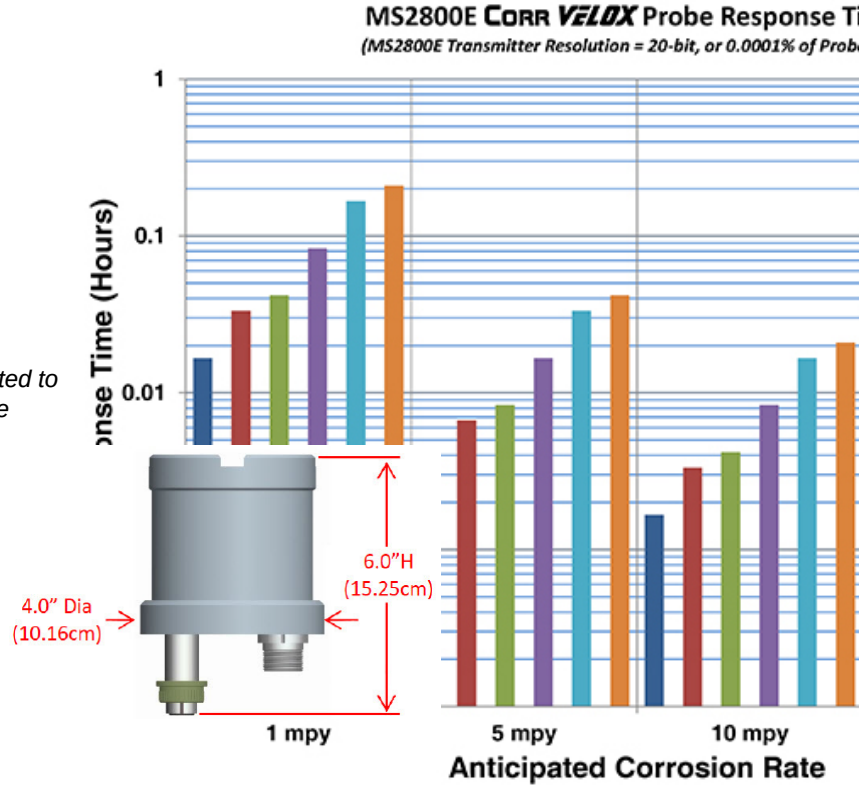
MS2800E Ultra Resolution ER Transmitter
RS-485 Modbus Output

The new compact MS2800E **Corr Velox** ER Transmitter measures all types of electrical resistance (ER) corrosion probes. The ultra high-resolution, 20-bit measurement provides faster response, obtaining corrosion rates in hours instead of days. The transmitter can be remote or direct-mounted (shown).

The transmitter is available in a weather-proof stainless steel enclosure designed for applications which do not permit aluminium enclosures (such as offshore environments or Zone 0 hazardous areas). Alternatively, a weather-proof (NEMA-4X) and explosion proof cast aluminum enclosure is also available.

MS2800E direct mounted to a retrievable probe

The **Corr Velox** transmitter offers simple installation and robust RS-485 Modbus communication, allowing up to 32 units to be connected in series (daisy-chained) on a single line. Setup is also simple, using a set of switches to select the probe type to be measured, address and other options.



MS2800E Technical Specifications

Model	
MS2800E – High Resolution ER RS-485 Modbus Transmitter	
Physical Data	
Instrument Weight:	1.68Kg (3.7 lb.)
Total Weight w/ Accessories:	2.61Kg (5.76lb.)
Instrument Dimensions:	15.25cm Height x 10.16cm Diameter (6.0” Height x 4” Diameter)
Operating Temperature:	-20°C to 70°C (-4°F to 158°F)
Storage Temperature:	-40°C to 80°C (-40°F to 176°F)
Enclosure Material:	316 Stainless Steel
Mounting Specifications:	Direct probe mount (standard) May be pole mounted using optional hardware (Up to a 6.35cm (2.5”) Diameter pole)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (Wire Loop, Tube Loop, Cylindrical, Flush, Strip, etc.)
Range:	0-100% of probe life
Resolution:	0.0001% of probe life (20-bit)
Cycle Time:	75 Seconds
Electrical Data	
Power Requirements:	10 to 28 VDC
Maximum Probe Cable Distance:	9.1m (30ft)
Output Specifications:	RS-485 Modbus, RTU or ASCII Protocol (Switch Selectable) 2400/4800/9600/19.2K Selectable Baud 32 Maximum Units (Addresses 1 to 32)
Hazardous Location Certifications – Intrinsic Safety	
USA/ Canada	Conforms to ANSI/UL Std. 60079-0, 60079-11, 61010-1 CAN/CSA Std. E66079-0, E60079-11 & CAN/CSA C22.2 No. 61010-1 Class I, Zone0, AEx ia IIC T4 Ga Zone 20, AEx ia IIIC T130°C Da -20°C ≤ Ta ≤ +70°C
Europe and Worldwide (ATEX and IECEx) X. Probe dielectric rating <500V r.m.s. Do not exceed	II 1 G Ex ia IIC T4 Ga II 1 D Ex ia III T130°C Da - 20°C ≤ Ta ≤ + 70°C ATEX Certificate No: ITS14ATEX28092X IECEx Certificate No: IECEx ITS 14.0052X
Included Accessories	
1M Current Loop Harness, Meter Prover, Operations Manual	
Optional Accessories	
Probe Extension Cable, Remote Mounting Hardware	

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MS2500L Loop-Powered LPR Transmitter

The MS2500L is a corrosion transmitter capable of measuring and transmitting data from all types of 3-electrode linear polarisation resistance (LPR) corrosion probes.

Corrosion rate measurements are made using the linear polarisation resistance technique. The instrument measures the current required to polarise the electrodes of a probe to a known potential. From the polarisation potential and the measured current, polarisation resistance can be calculated. Then, using Faraday's law, instantaneous corrosion rate is calculated from polarisation resistance.

Another feature of the MS2500L is its high-precision voltmeter. This is used to measure the open-circuit potential between electrodes.

Measurements are transmitted via 4-20mA current loop. Since current loop signals are not as sensitive to line loss as other types of data signals, the MS2500L may be located up to ten miles away from the data receiver under proper conditions.

The MS2500L is completely loop-powered, so installation is simple. A two-wire connection is all that is required for both instrument power and data transmission. Setup is also simple, using a set of switches to select the measurement function (corrosion rate or electrode potential.)

The MS2500L is housed in a NEMA 4X rated explosion-proof and weather-proof enclosure, and the probe cable is connected through a water-tight, explosion-proof cable gland. This makes the MS2500L suitable for use in almost any indoor or outdoor environment.

MS2500L Technical Specifications

Model	
MS2500L – Loop-Powered LPR Transmitter (Ordering # IN2500L) Wireless Radio option also available (more info included on Wireless Radio Option page)	
Physical Data	
Instrument Weight:	2.28 Kg (5.02 lb.)
Total Weight w/ Accessories:	3.21 Kg (7.08 lb.)
Instrument Dimensions:	14.76cm H x 11.43cm W x 12.22cm D (5.81” x 4.5” x 4.81”)
Case Specifications:	Explosion Proof (FM, CSA, CENELEC, UL) Class I, Groups B, C, D, Class II, Groups E, F, G, Class III, CENELEC: Eexd IIC NEMA 4X, 7BCD, 9EFG
Mounting Specifications:	1.85cm H x 4.46cm W (0.728” x 1.756”) Bolt Pattern with 1/4-20 Tapped Mounting Holes, or may be mounted on a ½” to 2” (1.27cm to 5.08cm) pipe using supplied hardware
Operating Temperature:	0° to 70°C (32° to 158°F)
Storage Temperature:	0° to 70°C (32° to 158°F)
Performance Data	
Measurement Type:	3-electrode LPR, Potential
Range:	3-electrode: 0-100 mpy Potential ± 1V
Cycle Time:	0.1 to 99.9 minutes
Electrical Data	
Power Requirements:	11 to 35 VDC
Maximum Probe Cable Distance:	3.05m (10 ft.)
Output Specifications:	4-20 mA Current Loop Output
Special Features	
- Switch selectable measurement type and cycle time - Loop powered	
Accessory Items	
10’ Probe Cable (attached,) Meter Prover, Mounting Hardware, Operation Manual	

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Wireless Radio Option for MS2500E/ MS2500L

The integrated wireless radio and I/O module eliminates cable and conduit used by the standard 4-20 mA current loop version of the MS2500E/ MS2500L, making it better equipped for harsh industrials environments. The wireless radio utilises 900-928 MHz ISM band spread spectrum, frequency-hopping technology to guarantee a license free, interference free link between remote devices and the control room.

Costly cable and conduit runs on new projects, or retrofitting of existing systems, are eliminated and replaced with a maintenance free, reliable and versatile wireless solution.

The set consists of an outdoor transmitter, receiver and two antennas.

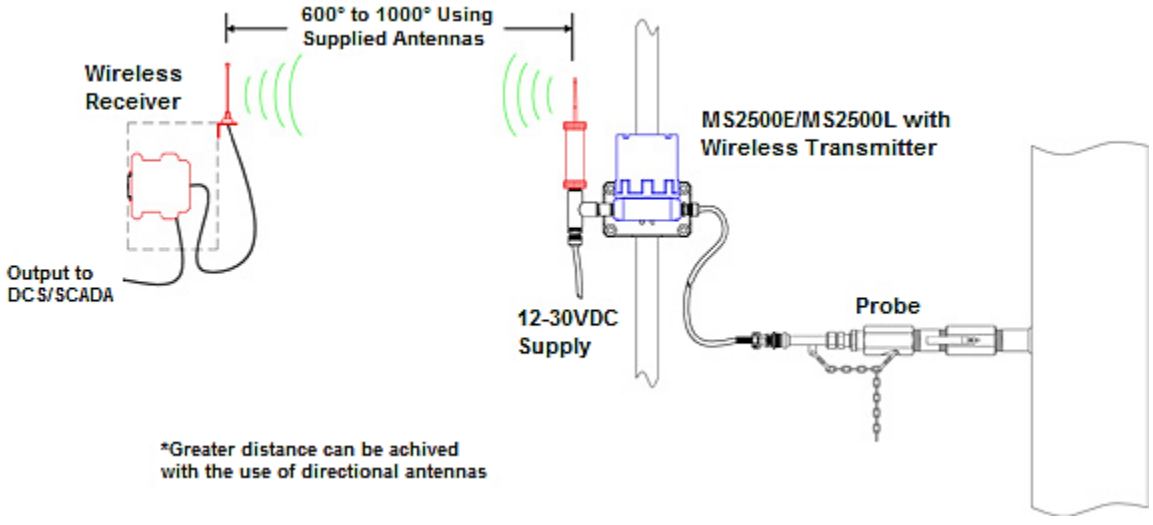
Features of the Wireless Radio

- Interference free, frequency-hopping, spread spectrum technology
- License free 900-928 MHz band
- Easy to use, wire in/ wire out, no setup or programming
- 180-300m (600 to 1000 ft.) range in plant without line of sight with included antennas
- Range with optimal omni-directional antenna – receiver and transmitter = 6-8 km (4-5 miles)

Electrical Data

Power Requirements: 12 to 35 VDC

Intrinsic Safety: Class I, Division 2 approved for hazardous area



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MS2510 Receiver

The MS2510 receiver is designed to be used with MS2500 transmitters to provide a single channel stand-alone system. The MS2500 transmitter is mounted close to a corrosion monitoring probe. Only a single twisted pair cable is required to connect the transmitter to the MS2510 receiver.

The colour touch screen of the MS2510 receiver provides a local display of the corrosion monitoring data received from the transmitter. The transmitter/ receiver system is especially useful where a process monitoring computer is not readily accessible.

Transmitter-to-receiver distances up to 10,000 feet with safety barriers are possible.

The MS2510 receiver is powered by 100-240 VAC and provides the 24 VDC supply for powering the MS2500 transmitter's 4-20 mA loop. The receiver processes the 4-20 mA signal to provide a digital readout of the cumulative metal loss and the probe corrosion rate based on the monitoring period set by the user (48 hours, 7 days, 15 days or 30 days.)

The MS2510 also offers an integrated web server. This feature allows users to access the MS2510 from any PC on the network using a standard web browser. Through this interface users can view data and make setup changes to the MS2510.

MS2510 Technical Specifications

Model	
MS2510 Receiver	
Receiver and Transmitter	
Input:	One probe
Maximum transmitter to receiver distance:	3000 metres (10,000 feet)
Output:	Colour touch screen; Metal loss (mils) or Corrosion Rate (mpy)
Resolution:	+/- 0.1 mpy or 0.01 mil
Mounting:	Panel or Rack Mount
Power Supply	
Voltage:	100 – 240 V AC, 1 phase, 50/60 Hz
Current:	< 2 Amps
Signal	
Input:	4 – 20 mA current loop
Voltage:	24V DC
Input Impedance:	250 Ohms

MS2510 Receiver	
Operating Temperature:	0° to 50°C (32° to 122°F)
Weight:	1.9 Kg (4.0 lbs.)
Size:	20.95cm x 25.40cm x 15.24cm (8.25” x 10” x 6”)
Panel Cutout:	20.95cm x 25.40cm (8.25” x 10”)

Network
Use a Crossover cable to connect the instrument directly to a PC. Use a Straight cable to connect the instrument to a network switch or router.

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MS3500E Remote ER Data Logger

The MS3500E is a battery-powered, intrinsically safe, remote data-logger capable of measuring and storing data from all types of electrical resistance (ER) corrosion probes. The instrument is microprocessor-based and features a simple, menu-driven interface using a 2-key keypad and a 2-line LCD display.

Corrosion rate measurements are made using the electrical resistance method. Essentially, the instrument measures the resistance of the probe element which changes over time, as metal loss occurs. The rate of change is directly proportional to corrosion rate. This method finds a wide variety of applications since it can be used in conductive and nonconductive environments such as petroleum, chemical, water, soil, or even atmosphere.

The MS3500E takes probe readings on a user-programmable logging interval. Readings are time and date stamped as they are taken, then stored to memory. Between readings, the instrument remains in a "sleep" mode to conserve main battery power. The instrument's memory is capable of storing 3,100 readings, and is protected by a lithium back-up battery.

Stored data can be uploaded to any IBM compatible PC as a comma-delimited ASCII text file. Because the data is in ASCII text format, it can be imported into any standard data analysis program such as Microsoft Excel, Lotus 123, or Corel Quattro Pro. Data can also be reviewed on the instrument's LCD display for quick reference.

Stored data can also be uploaded to a RCSL model MS1500E Handheld ER Data Logger for transfer to a PC. This handy feature eliminates the need to remove the MS3500E from its site, or to bring a laptop PC to the site. This can be particularly useful when collecting data from multiple MS3500E Data Loggers. And since both the MS3500E and the MS1500E are intrinsically safe, data can be uploaded from the MS3500E to the MS1500E even in hazardous locations.

The MS3500E also offers an optional 4-20mA current loop output (model MS3510E). This feature allows data from the instrument to be fed directly to any industrial process computer that accepts analog inputs.

The instrument is housed in a NEMA-4 enclosure, and all external connections are weather-proof. This makes the MS3500E suitable for use in almost any indoor or outdoor environment.

MS3500E Technical Specifications

Model	
MS3500E – Remote ER Data Logger (Ordering # IN3500)	
MS3510E – Remote ER Data Logger w/ 4-20mA Current Loop Output (Ordering # IN3510)	
Physical Data	
Instrument Weight:	5.42 Kg (11.94 lb.)
Total Weight w/ Accessories:	6.19 Kg (13.64 lb.)
Instrument Dimensions:	29.21cm H x 22.71cm W x 10.16cm D (11.50” x 8.94 “ x 4”)
Case Specifications:	NEMA-4
Mounting Specifications:	27.31cm H x 15.24cm W (10.75” x 6”) Bolt Pattern 0.76cm (0.3”) Diameter Bolt Holes
Operating Temperature:	0° to 50°C (32° to 122°F)
Storage Temperature:	-20° to 70°C (-4° to 158°F)
Performance Data	
Measurement Type:	ER measurement using any standard ER probe type (wire loop, tube loop, cylindrical, flush, strip, etc.)
Range:	0-1000 digits representing 0-100% of probe life
Resolution:	1 digit Cycle Time: 1 Hour to 99 Days
Electrical Data	
Power Requirements:	Six 1.5V AA Batteries
Maximum Probe Cable Distance:	3.05m (10 ft.)
Output Specifications:	RS-232 Output in Comma-Delimited ASCII Text Format
Intrinsic Safety	Class I, Division 1 Groups A, B, C and D Temperature Code T3C Class I, Zone 0 Group IIC, T3C Conforms to ANSI/UL Std. 913
Special Features:	
- Microprocessor-based electronics	
- Data storage capacity of 3,100 readings on 150 different probes, with battery backup	
- Menu-driven interface using a 2-key keypad and a 2-line LCD display	
- Low-battery detection	
Accessory Items	
10’ Probe Cable, Meter Prover, Communications Cable and Connector, Current Loop Connector (MS3510 only,) Operation Manual, Corrosion Data Management Software.	

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MS3500L Remote LPR Data Logger

The MS3500L Remote Data Logger is designed to provide a continuous record of corrosion activity in remote locations that are infrequently visited, such as cross country pipelines and unmanned production platforms. However, this unit finds equal application in locations that are inconvenient or difficult to access on a regular basis.

The MS3500L is completely self-contained with the onboard battery system supplying the total power requirement for operation. The unit is extremely versatile, having a variety of menu selectable measurement modes:

- Corrosion rate for 2-electrode LP probe
- Corrosion rate for 3-electrode LP probe
- "Pitting Index" for 2-electrode probe
- Galvanic current - Zero Resistance Ammetry
- Electrode Potential

Once in place, this unit will automatically read the probe at customer-selected intervals and store the resulting data in the unit's onboard memory. The onboard memory will collect up to 3000 data points before data download is required. The data collection interval is programmable in hour intervals.

At a data collection interval of 1 hour, data downloading need only be performed every ninety days. With longer data collection intervals (8-12 hours), the unit may be unattended for as long as 6-8 months between downloading operation.

An optical, infrared, RS232 communication link is provided for data download to either a laptop (IBM compatible) PC, or to the MS1500L portable data logger. The infrared communication link is an integral part of the intrinsically safe design on the unit. Optical, instead of electrical, this unique feature permits data downloading without removing the instrument or "memory module" from the hazardous area.

Downloaded data may be analysed, reviewed, or reported by conventional spreadsheet, database, or mathematical software packages.

Another unique feature of the MS3500L is the high level of onboard intelligence. The two-line, 20-character LCD screen allows visual review of all historical data in memory and reads directly as corrosion rate, millivolts or microamps. The LCD screen, together with the 2-key membrane key pad provides a user-friendly, interactive, prompting system that is used for both system setup and data review. This makes the MS3500L the most advanced unit of its type on the market.

An optional feature of the unit is the addition of a 4-20mA continuous output transmitter. This allows transmission of data, via a 4-20mA loop, to a plant computer or central data logger for integration with other real-time process parameters. This data transmission can be accomplished without disruption of the unit's basic logging and data storage operations. The 4-20mA loop extends the capabilities of the unit to include conventional, in-plant, real-time data communication.

The unit uses a NEMA 4 enclosure, making it suitable for use in the most extreme of outdoor conditions.
The inclusion of the potential and galvanic current as measurement model makes the unit a complete diagnostic tool for studying electrochemical corrosion. Not only can general corrosion rates be measured but, in addition, such phenomena as active passive transitions, onset of pitting and crevice corrosion, bimetallic attack, and oxygen ingress can be monitored.

MS3500L Technical Specifications

Model			
MS3500L – Remote LPR Data Logger (Ordering # IN3500L)			
MS3510L – Remote LPR Data Logger w/ 4-20mA Current Loop Output (Ordering # IN3510L)			
Physical Data			
Instrument Weight:	5.42 Kg (11.94 lb.)		
Total Weight w/ Accessories:	6.19 Kg (13.64 lb.)		
Instrument Dimensions:	29.21cm H x 22.71cm W x 10.16cm D (11.5" x 8.94" x 4")		
Case Specifications:	NEMA-4		
Mounting Specifications:	27.31cm H x 15.24cm W (10.75" x 6") Bolt Pattern 0.76 cm (0.3") Diameter Bolt Holes		
Operating Temperature:	0° to 50°C (32° to 122°F)		
Storage Temperature:	-20° to 70°C (-4° to 158°F)		
Performance Data			
Measurement Type	**Range**	**Resolution**	**Cycle Time**
2-Electrode	0-200 mpy	0.01 mpy	1 minute to 99 hours
3-Electrode	0 to 150 mpy	0.01 mpy	1 minute to 99 hours
Galvanic	± 999 µA	1µA	1 minute to 99 hours
Potential	± 999 µA	1 mV	1 minute to 99 hours
Electrical Data			
Power Requirements:	Six 1.5V AA Batteries		
Maximum Probe Cable Distance:	3.05m (10 ft.)		
Output Specifications:	RS-232 Output in Comma-Delimited ASCII Text Format		
Intrinsic Safety	ETL LISTED 9900750	Class I, Division 1 Groups A, B, C and D Temperature Code T3C	
		Class I, Zone 0 Group IIC, T3C Conforms to ANSI/UL Std. 913	
Special Features:			
- Microprocessor-based electronics			
- Data storage capacity of 3,000 readings, with battery backup			
- Menu-driven interface using a 2-key keypad and a 2-line LCD display			
- Low-battery detection			
Accessory Items			
10' Probe Cable, Meter Prover, 6 to 5-Pin Adapter, Galvanic Adapter, Communications Cable and Connector, Current Loop Connector (MS3510L only,) Operation Manual, Corrosion Data Management Software.			

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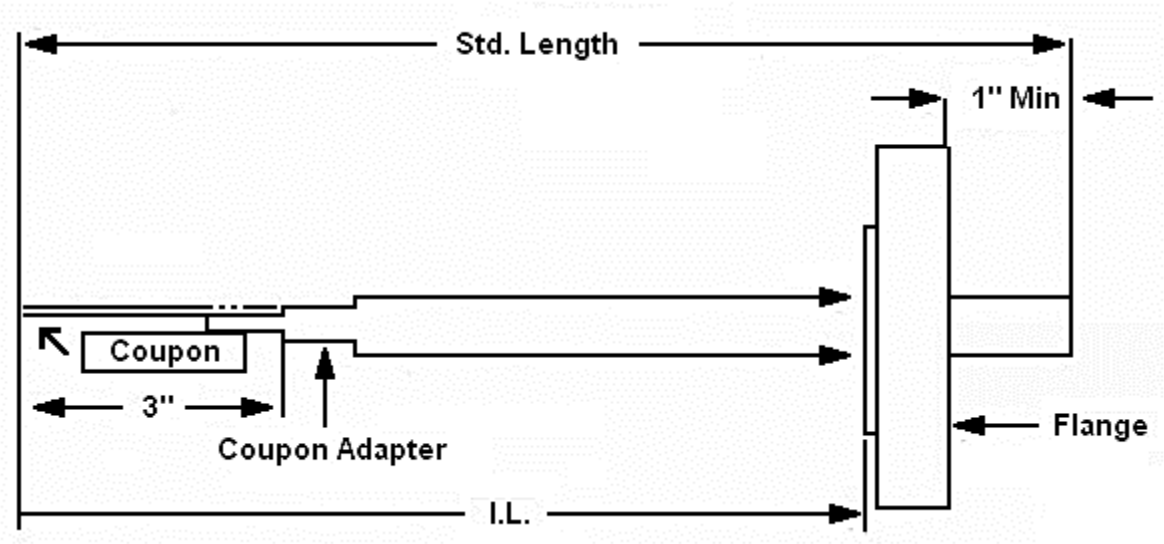
REGISTRATION No. 1394643 ENGLAND · REGISTERED OFFICE: AS ABOVE

Model RT6000 - Coupon Insertion System
Fixed Length with Flange



Picture is for illustrative purposes only, supplied product may differ.

Model RT 6000 is a fixed-length, flange-mounted, coupon insertion system. The probe is ideally suited for use in high pressure and/or hazardous applications where threaded fittings are not available or not recommended. Process shutdown or process isolation is required for installation and inspection. The probe assembly consists of an insertion rod with an element and a flange (as specified by customer) which are all welded in place.

Insertion length (I.L.) is calculated to the end of the coupon in this case, is based on a 1 inch total flange thickness. Customers can specify any length required. For standard probes, the maximum insertion length is given in the chart below.

Specification:	
Probe Body	316 Stainless Steel
Temperature Rating	260°C / 500°F
Pressure Rating	According to Flange Rating
Mounting	Mating Flange

Standard Length	I.L. (Max)
8”	6”
12”	10”
18”	16”
24”	22”

RT6000 Ordering Information

Model						
RT6	Coupon Insertion System with Flange					
	Flange Size					
	1	1 inch Flange				
	2	1.5 inch Flange				
	3	2 inch Flange				
	4	3 inch Flange				
	5	4 inch Flange				
	6	0.5 inch Flange				
	7	6 inch Flange				
		Probe Body Material				
		22	C316			
		44	C276			
			Coupon Options			
			010	Fits P/N C0100		
			030	Fits P/N C0118		
			050	Fits P/N C0111		
			060	Fits P/N C0220		
				Flange Pressure Rating		
				1	150 lb	
				2	300 lb	
				3	600 lb APPEND A FOR RF FLANGES	
				4	1200 lb APPEND B FOR RTJ FLANGES	
				5	1500 lb	
				6	900 lb	
					Length	
					08	06.00 inch max. insertion length
					12	10.00 inch max. insertion length
					18	16.00 inch max. insertion length
					24	22.00 inch max. insertion length
					36	34.00 inch max. insertion length
						FOR LENGTHS OTHER THAN STANDARD INSERT THE ACTUAL LENGTH IN INCHES
RT6	**2**	**22**	**50**	**1A**	**12**	**Example of Probe Ordering #**

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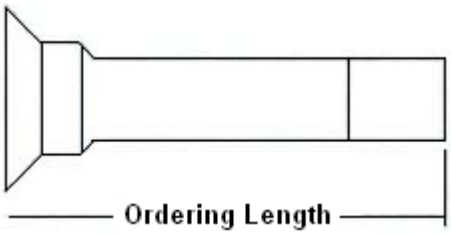
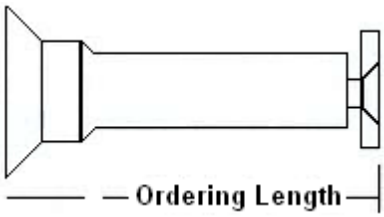
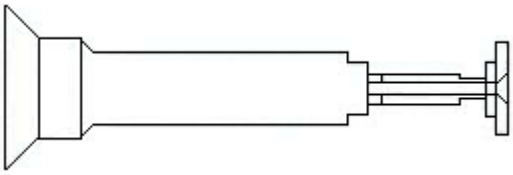
Two-inch System
HC Series Coupon Probes



Strip Coupon Holder



Disc/Flush Disc Coupon Holder



Adjustable Disc/Flush Coupon Holder

HC Series Probes are used in conjunction with the High Pressure Access Fitting Assembly.

The Coupon Probe is attached to the Solid Plug Assembly by means of an O.D. left handed thread connection and also retains the primary packing. Disc Coupon Probes are primarily intended for use in areas where pigging operations prohibit the use of projecting style probes. Additional advantages are the lack of requirement to orient the coupon relative to the flow direction and a greater exposed surface area at the pipe wall. Coupon Probes are manufactured in 316 SS and are available in lengths from 2.50 inches to 36 inches.

To calculate the correct ordering length, use the following formula.

ORDERING LENGTH =P + W + 2.50 inches
where P = Penetration required in pipe
W = Wall thickness of pipe

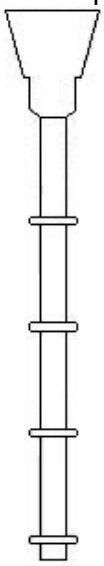
Note: Formula is based upon a standard access fitting height of 5.25 inches and 0.0625 weld gap per ANSI B31.1.1973.

Corrosion Coupons can be supplied in most alloys and are complete with Coupon.

Pictures are for illustrative purposes only, supplied product may differ.

Accessories for Disc Coupon Probe	Accessories for Strip Coupon Probe
Mounting Kit - P/N 700620 Screw 0.25 - 20.1.00 - St. St. Coupon Insulation Washer Teflon® Washer	Mounting Kit - P/N 700567

Multiple Disc Coupon Holder



Multiple Disc Coupon monitoring is suitable for pipes with I.D. greater than 6.00 inches. Multiple Disc Monitoring permits coupons to be placed at a specific level in multi phase or stratified flow. The coupons are insulated from the probe rod by Nitrile O rings. Delrin or Nylon Spacers are used to provide insulation between coupons. Materials of construction satisfy the requirements of NACE MR-01-75

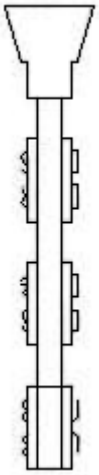
Probe Sizing (Flare-weld Access Fitting - 5.25” Height)
Calculate the Probe length as follows:

L = K + D - W -2.75”
L = Probe Holder Length
K = 5.31” (Constant)
D = Pipe O.D.
W = Pipe Wall Thickness

Round down to the nearest 0.125 inches
Rod Length R = L - 1.9375”
Coupon Position
Top of Line Coupon C1 = K + W - 3.8125”
Middle of Line Coupon C2 = K + D/2 - C1 - 4.125”
Bottom of Line Coupon C3 = R - C1 - C2 0.375”
C1 + C2 + C3 + 0.375” must equal R (Rod length)

To Order:
Determine Rod Length. Order using format detailed in Ordering Chart.

Ladder Strip Coupon Monitoring



- Determine the length and quantity of coupon to coupon insulation spacers.
- Determine the number of Coupon-Rod Bushings required.

Ladder Strip Coupon Monitoring is suitable for pipes 8 inch O.D. and greater. The probe body is a single blade containing holes spaced along its length for mounting the coupons. A minimum probe length of 26 cm (10.25") is required to mount three pairs of coupons.

Probe Sizing

Calculate the probe length required as follows:

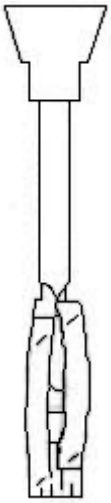
L = (5.31” + D) - (2.50” + W)
L = Probe Length
D = Pipe O.D.
W = Pipe Wall Thickness

This formula should only be used for Access Fitting Bodies with 5.25” height. For Flanged Access Fitting Body installations, please call the sales office.

To Order:

Accessories for Multi Disc Coupon Probe	Accessories for Ladder Strip Coupon Probe
Bushing - O Ring Insulation Spacers Available in 0.0625” increments from 1 inch to 2 inches	Mounting Kit - Coupon

Multi Stressed Holder



Applied Stress Coupons are 152mm (6 inches) long, 22.3mm (0.875 inches) wide, 3.18mm (0.125 inches) thick. An insulated adjusting screw located on the coupon mid-point applies stress to the coupon.
Note: Applied stress coupons have been stamped on the end because this is the lowest stress area and cracking is not expected to be initiated by the identification mark.

Applied stress is determined from the number of adjusting screw turns or bending deflection. The coupons are first stressed and then installed in the line. The time required for cracks to develop is determined by pulling coupons at regular intervals, usually 24 hours to 30 days. Test duration will vary with the stress level applied to the coupon. The time to crack may then be used as a measure of stress corrosion resistance.

Test start time begins when stress is applied and the stressed coupon is exposed to the corrosive environment, whichever occurs later. The coupon is considered to have failed when cracks appear. The cracks may be detected by optical, mechanical or electrical means.
Cracking time is the elapsed time from test start until the appearance of cracks.
Formula for Applied Stress Coupons:
$S = 6Ety/H$
Where:
S = maximum tensile stress
E = modulus of elasticity
t = thickness of coupon
y = maximum deflection

The formula is for longitudinal stress in the outer fibers of the coupon, below the elastic limit of the material. At stress above the elastic limit, but below the yield strength at 0.2% error results. The formula must not be used above the yield strength of the material.
NOTE: The formula is based on small deflections i.e. y/H is less than 0.1.

High Pressure Coupon Holder Ordering Information Chart

HC	X	X	X	X
	Coupon Type	**Probe Type**	**Probe Alloy**	**Probe Length**
	1 – Strip coupon	1 – Welded	1 -316 SS	2” to 40” in 1/8 increments. For Flush Disc Adjustable put “VA.RY.”
	2 – Ladder strip	2 – Non welded	2 – Hastelloy C276	
	3 – Flush Disc Fixed			
	4 – Flush Disc Adj.			
	5 – Multi Disc			
	6 – Single Pre-stressed			
	7 – Multi Pre-stressed			

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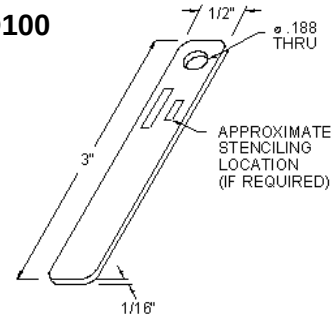
Standard Coupon Specifications

Accurate monitoring of corrosion rates in any environment is critical when viewed in terms of the maintenance and repair costs associated with corrosion and material failure. Test coupons can provide an inexpensive means of effectively monitoring corrosion levels in a system. By observing the mils-per-year corrosion rate of an exposed coupon, valuable information can be provided regarding the material's life expectancy. RCSL can supply coupons in any size, shape, or material you need. Coupons can be stenciled with alloy and sequence numbers for proper identification. Mill test reports, identifying element compositions of materials used, are provided on all orders.

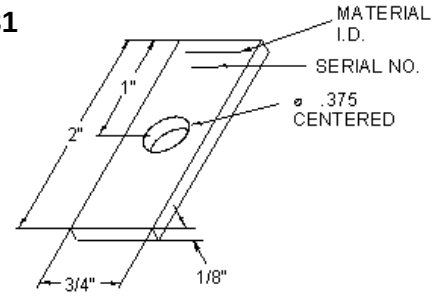
P/N CO100



1/16" THICK COUPON

Shape:	Rectangular
Finish:	Double disc or glass bead
Identification:	Stencilled-alloy, heat no sequence
Surface Area:	3.38in^2

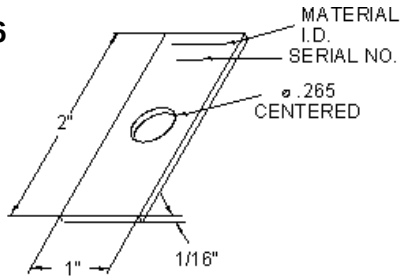
P/N CO131



1/8" THICK COUPON

Shape:	Rectangular
Finish:	120 grit, glass bead or mill
Identification:	Stencilled-alloy, heat no sequence
Surface Area:	3.47in^2

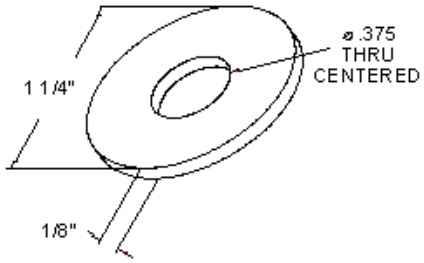
P/N CO146



1/16" THICK COUPON

Shape:	Rectangular
Finish:	Glass bead or mill
Identification:	Stencilled-alloy, heat no sequence
Surface Area:	4.26in^2

P/N CO220



1/8" THICK COUPON

Shape:	Circular
Finish:	120 grit, glass bead or mill
Identification:	Stencilled-alloy, heat no sequence
Surface Area:	2.72in^2

Coupons can be furnished with a variety of finishes depending on your particular application. Some of the typical finishes are defined below:

- **Mill** – finish as produced from mill.
- **Glass Bead** – blasted with fine glass beads to remove mill scale.
- **120 Grit** – fine finish using a 120 grit belt and commonly used in corrosion tests, such as pitting studies, where smooth surface finish is desired. Finishes up to 800 grit (extremely fine) can be provided by using belt sanders.
- **Double Disc Ground** – extra fine finish using an abrasive disc that leaves minimal residual grit. Excellent for studies where surface finish is critical. Capable of producing 16-32 RMS finishes on common steels and 8 RMS on carbide steels.

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Corrosion Test Supplies for the Water Treating Industry

RCSL Corrosion Monitoring provides the water treatment industry with a wide assortment of corrosion test supplies. We specialise in expeditious order processing of test coupons made according to your needs for material, size, shape and finish. Coupons can be stencilled with alloy and sequence numbers for proper identification, and the pre-weighed and measured to help assure the integrity of your test data.

Standard Water Treating Coupons*

P/N	SIZE	HOLE	HOLE LOCATION	AREA IN SQ.IN
CO100**	½" x 3" x 1/16"	3/16"	¼" fr.end	3.38
CO101	1" x 2" x 1/16"	3/16"	¼" fr.end	4.32
CO102	½" x 3" x 1/16"	9/64"	1/8" fr.end	3.41
CO103	½" x 3" x 1/16"	¼"	¼" fr.end	3.34
CO104	½" x 3" X 1/16	(2) ¼"	½" fr.end	3.24
CO105	½" x 3" x 1/16"	3/16"	½" fr.end	3.38
CO106	½" x 3" x 1/16"	¼"	½" fr.end	3.34
CO115***	½" x 3" x 1/16"	¼"	¼" fr.end	
CO117	3/8" x 3"x 1/16"	9/64"	1/8" fr.end	2.64
CO118	½" x 3" x 1/16"	(2) ¼"	¼" and ¾" end	3.24
CO120	3/8" x 3" x 1/16"	(2) ¼"	¼" and ¾" end	2.48

*Table refers to standard water treating coupons made from C1010 material.
**Standard P/N CO100 comes with rounded corners

Standard Pipe Plug Assemblies

P/N	CARBON STEEL OR PVC PLUG	3" (std) STEM	MATCH WITH COUPON NUMBER
2077NA	¾" NPT	Nylon	CO102, CO117
2079NA	1" NPT	Nylon	CO102, CO117
2077TA	¾" NPT	Teflon®	CO102, CO117
2079TA	1" NPT	Teflon®	CO102, CO117
2078NA	¾" NPT	Nylon	CO100, C0103, CO115
2081NA	1" NPT	Nylon	CO100, CO103, CO115
2078TA	¾" NPT	Teflon®	CO100, CO103, CO115
2081TA	1" NPT	Teflon®	CO100, CO103, CO115
2087NA	¾" NPT	Nylon	CO118, CO120
2088NA	1" NPT	Nylon	CO118, CO120
2087TA	¾" NPT	Teflon®	CO118, CO120
2088TA	1" NPT	Teflon®	CO118, CO120
2084NA	¾" NPT	Nylon	CO105, CO106
2075NA	1" NPT	Nylon	CO105, CO106
2084TA	¾" NPT	Teflon®	CO105, CO106
2075TA	1" NPT	Teflon®	CO105, CO106
2092NA	½" NPT	Nylon	CO100, CO103, CO115

A variety of plug sizes and stem lengths are available.

Continued on next page

Cylindrical Coupons (C1018 STD)

P/N	SIZE	THREAD	SLOT
ES200	¼" x 2.5"	¼"-20 x 3/8"	1/16"
ES201 ¼" x 2"	¼" x 2"	¼"-20 x 3/8"	1/16"
ES202	¼" x 3"	¼"-20 x 3/8"	1/16"
ES204	¼" x 1 ½"	¼"-20 x 3/8"	1/16"

For a full range of Alloys available, please contact RCSL Corrosion Monitoring.

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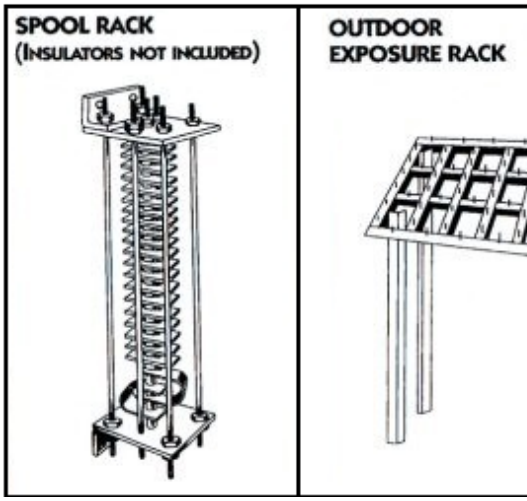
Test Racks

Specimen Exposure racks are used to mount test samples and secure them directly to operating equipment within the industrial environment. The usage helps eliminate coupon loss which might occur if samples were individually placed in the process flow. Rack usage also allows samples of differing alloys and materials to be studied in the same test.

Guidelines for Supporting Specimens

Corrosive behaviour of materials subjected to immersion, partial immersion, or vapour phase can have great variance. For this reason, specimens to be tested should be property positioned. There are several important points to be considered when supporting specimens for exposure:

- The specimen's location should be identified by sketch and recorded.
- The corrosive media should have access to the coupons.
- The supports should have adequate corrosion resistance to endure the test.
- The specimen's should be electrically insulated from other metals unless galvanic effects are being studied.
- The specimens should be located in easily accessible areas.



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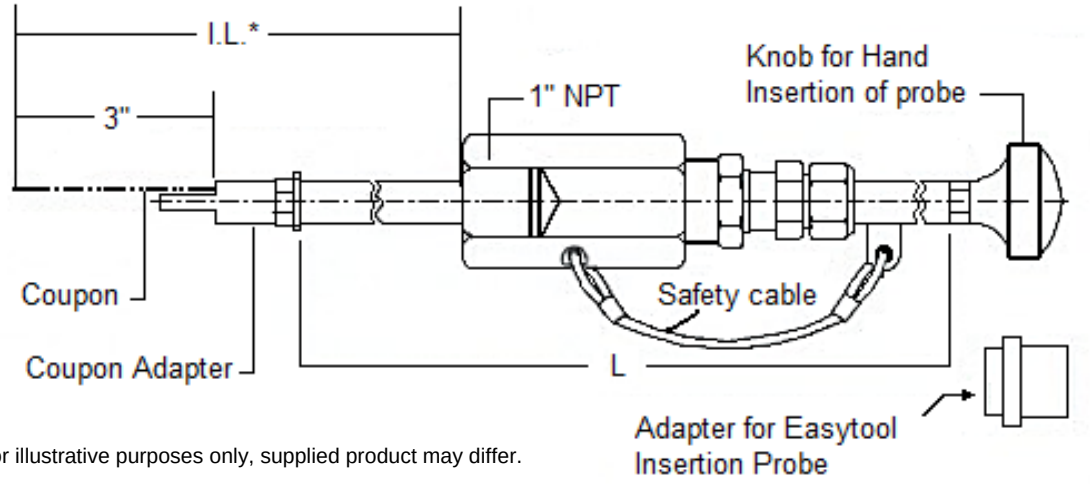
Model RT4000 - Coupon Insertion System
Retractable with Packing Gland



Picture is for illustrative purposes only, supplied product may differ.

All dimensions in inches

Model RT4000 coupon insertion system is a retractable unit commonly used in field and plant applications. A specially designed packing gland is used to insert or retract a coupon from a pressurized system without a process shutdown. The insertion system is designed to mount onto a 1" piping system, but can easily be adapted to fit your specific requirements. The system consists of an insertion rod with a coupon adapter, and a packing gland. A safety chain and safety nut are also provided to prevent blowout. Standard packing material in the packing gland is Teflon®, however, Grafoil® packing can be provided for high temperature applications. Several coupon holders and lengths are available. *The insertion length (I.L.) shown here is based on a standard Metal Samples Corrosion Monitoring Systems part #CO118 coupon and may vary for other coupons depending on the coupon length and hole location.

Specifications:	
Probe Body	316 Stainless Steel
Temperature Rating	260°C / 500°F Teflon®
Temperature Rating	454°C / 850°F Grafoil®
Pressure Rating	1500 PSI / 102 Bar
Mounting	1 inch Full Port Valve (min.)

Standard Length	I.L. (max)
24”	18.54”
30”	24.54”
36”	30.54”
42”	36.54”

RCSL Corrosion Monitoring Easy Tool is recommended for probe insertion
Or retraction in systems with pressure over 150 pounds

RT4000 Ordering Information

Model					
RT45	Retractable Coupon Insertion System 1 inch Female NPT, Packing Gland with Teflon®				
RT75	Retractable Coupon Insertion System 1 inch Female NPT, Packing Gland with Grafoil®				
RT00	Retractable Coupon Insertion System Replacement Insertion Rod				
	Insertion Rod and Mounting Material				
	20	316 (when ordering only Insertion Rod – SR00)			
	22	316			
	40	C276 (when ordering only Insertion Rod – RT00)			
	44	C276			
		Coupon Options			
		010	Fits P/N C0100		
		030	Fits P/N C0118		
		040	Fits P/N ES200 (Cylindrical Coupons)		
		050	Fits P/N C0111		
		060	Fits P/N C0220		
			Length		
			24	18.54 inch max. insertion length	
			30	24.54 inch max. insertion length	
			36	30.54 inch max. insertion length	
			42	36.54 inch max. insertion length	
				Coupon Adapter and Insulators	
				1	Coupon adapter same material as rod, Teflon® insulators.
				2	Teflon® coupon adaptor, Teflon® insulators.
				3	Coupon adapter same material as rod, ceramic insulators.
				4	Coupon adapter same material as rod, nylon insulators.
				5	Nylon coupon adaptor, nylon insulators.
				6	Coupon adapter same material as rod, no insulators.
RT450	**22**	**030**	**18**	**1**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department.

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Two-inch System

Standard Coupons	Special Corrosion Coupons
6 Inch Strip Coupons: This coupon is used when a larger exposed area is required. The exposed surface area is 73.5cm^2 (11.4in^2). Dimensions 152 x 22 x 3.2mm (6 inch x 0.875 inch x 0.125 inch.) The coupon has two mounting holes.	**Pre-stressed Coupons:** are used where sulphide stress corrosion cracking is a factor. Pre-stressed coupons come in two sizes: 6 inch for single coupon and 4 inch for the multiple type.
3 Inch Strip Coupons: 76.3 x 22 x 3.2mm (2.875inch x 0.875inch x 0.125inch) with two mounting holes and have an exposed surface area of 35.35cm^2 (5.47in^2.)	**Ladder Strip Coupons:** are designed for simultaneous corrosion monitoring at top, middle and bottom positions in a pipeline. Dimensions 51 x 22 x 32mm (2inch x 0.875inch x 0.125 inch) with two mounting holes. The exposed surface area is 21cm^2 (8.27in^2.)
Flush Disc Coupons: dia. 31.8 x 3.2mm (dia. 1.25 inch x 0.125 inch) are utilised where the coupons should not extend into the pipe or interfere with the media flow or pig passage. The exposed area is about 17cm^2 (2.6 in^2.)	**Scale Coupons:** are of the same size as the 3inch strip coupon, but have a series of holes of different size range. Scale usually forms on cavities therefore it is likely to form on small sized holes.
Disc Coupons: Are utilised for stacked multiple phase monitoring when the line diameter is 6 inches or more. For pipelines less than 6 inches it is recommended to use single disc. Dimensions dia. 31.8 x 3.2mm (dia. 1.25 inch x 0.125 inch). The exposed surface area is about 17cm^2 (2.6 inch^2.)	**Residual Stress Coupons:** are rectangular coupons similar to the 3 inch strip coupons, but are deformed to create residual stress. This type of coupon stimulates any corrosion effect due to the residual stress present in combination with an embrittling environment.
Rod Coupons: This is a rod protruding into the product flow. Standard rods are available in a size of 101.6 x dia. 6.35mm. (4 inch x 0.25 inch dia.). One end of the rod is threaded with 0.25inch UNC to screw the rod into the holder. The exposed area is about 21.09cm^2 (3.27in^2.)	**Crevice Corrosion Coupons:** are made from the standard Disc Coupon, dimensions 31.8 dia. x 3.2mm (1.25 inch dia. x 0.125 inch) with a nylon disc on each side held in position by a stainless steel screw.

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Weight Loss Coupons Menu

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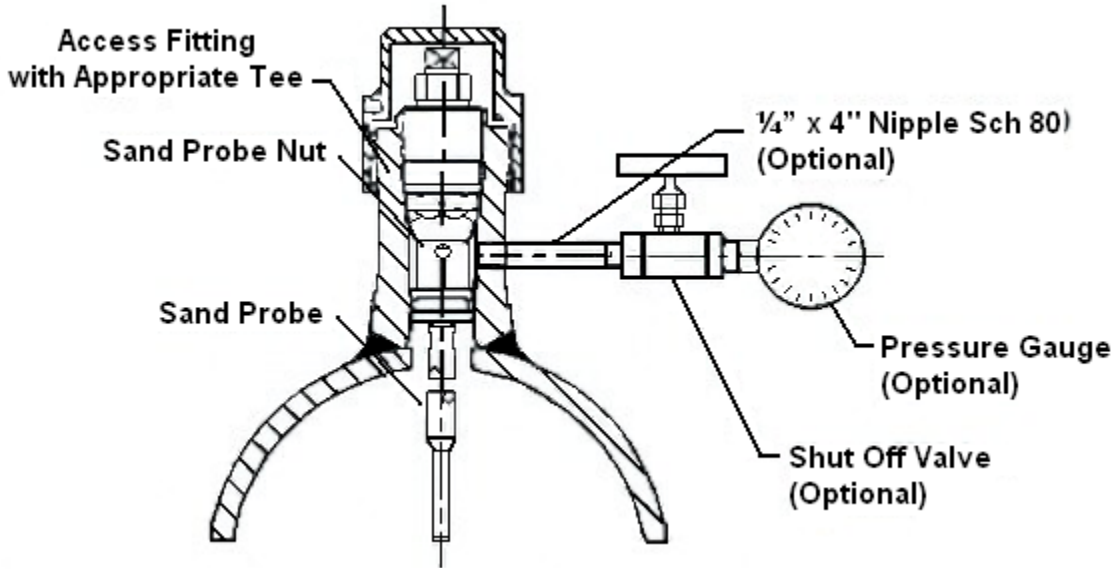
Model SP7000 - Sand Probe for 2 inch Access Systems



Picture is for illustrative purposes only, supplied product may differ.

Model SP7000 sand probes are used to detect erosion in flow lines caused by abrasive particles such as sand. One end of the probe is attached to a tee-type, high pressure access fitting with a solid plug by means of a sand probe nut. The other end is sealed, thin walled tube placed within the process stream to be exposed to particulate flowing through the system. (To minimise the effects of corrosion and thus more accurately detect erosion with the stream, the exposed element is made of stainless steel). As particulate impinges on the surface of the sensing element, a hole is eventually eroded through the element. Once penetration has occurred, the system pressure then travels up the tube, into the access fitting body, and through a nipple and valve to a pressure gauge assembly. The pressure gauge detects that the element has been breached. If required, electronic pressure sensors can be connected to alarm systems to signal the exact moment when failure occurs.

Specifications:	
Probe Body	Stainless Steel
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi / 245 Bar
Mounting	2 inch Access System with Solid Plug

Sand Probe Parts		
MH Part #	**HP Part #**	**Description**
See chart below		Nipple and Valve
HA700603	HA700603	Pressure Gauge

SP7000 Ordering Information

Model					
SP	Sand Probe for 2 inch Access Systems				
	Mounting Material				
	2	316			
	4	C276			
	U	Duplex 2205			
		Tube Material			
		2	316		
		4	C276		
		U	Duplex 2205		
			Tube Wall Thickness		
			1	0.016 inches	
			2	0.028 inches	
			3	0.035 inches	
				Length (Round calculated down to the nearest ¼ inch)	
				XXXX	Length in inches, stated in 2 decimal places format (Ex:6.25inches = 0625)
SP	2	2	1	0625	Example of Probe Ordering #

For alloys, sizes, or other special requirements not listed, contact our sales department.

Sizing Formulas:
Shortest length available is 3.75 ".

Non-Flanged Access Fitting
(FH +PD/2)-(2.04 +N)=L

Flanged Access Fitting
(FH +PD/2 +MF)-(2.04 +N)=L

Where:
FH = Access Fitting Height
N = Injection Nut Length
L = Injection Tube Length
MF = Mating Flange Height
PD = Pipe Outer Diameter

Nipple and Valve Chart

Access Fitting Tee Size	Valve 316 SS	Nipple, 4 in (100mm) 316 SS Sch. 80
	Part No.	Part No.
¼”	HA700022158	HA700018158
½”	HA700023158	HA700019158
¾”	HA700027158	HA700020158
1”	HA700029158	HA700021158

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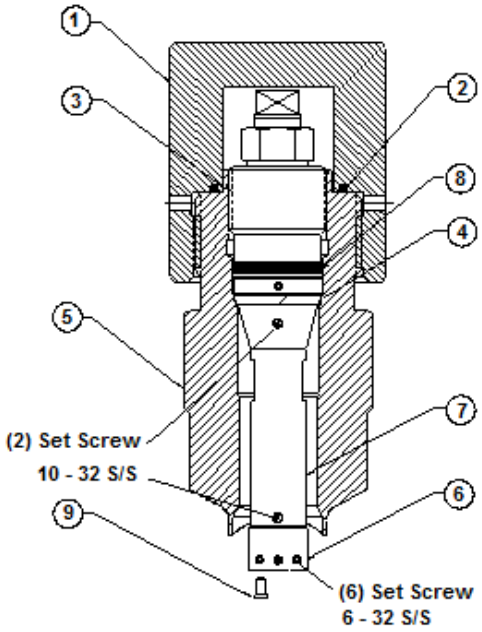
Model HC6200 Bio-probe

Model HC6200 bio-probe is used to collect samples of bacteria in gas and oil producing systems. The bacterial population on a systems metal surfaces more relevant to corrosion than the bacteria population in the system's fluids. This is because only surface or sessile bacteria cause corrosion. Thus a corrosion control program is ineffective unless it kills those bacteria which have formed attached biomasses. The same bacteria which cause problems in gas pipelines, tanks, vessels, oil wells and water handling systems attach to the bio-probes sample element. Since the bio-probe is designed for high pressure access systems, common throughout the oil field, it becomes a convenient and economical way for sampling corrosion-causing biological activity.



Picture is for illustrative purposes only, supplied product may differ.

Part #	Description
HC62158XXXX	Bio-Probe Assembly with Delrin Holder (XXXX = insertion length in inches, stated in 2 decimal place format)
EL438	Biological Sample Elements, C.S.
HA700120	Solid Plug, High Pressure Access System

Item #	Description	Material
1	Heavy duty cover	Carbon Steel
2	O-ring	Viton®
3	Solid Plug	316
4	Primary Packing (primary seal)	25% G.F. Teflon®
5	Access Fitting	Carbon Steel
6	Bacterial sample holder	Delrin
7	Bacterial fixture	316
8	O-ring	Viton®
9	Sample element “Bullet”	Mild steel or brass

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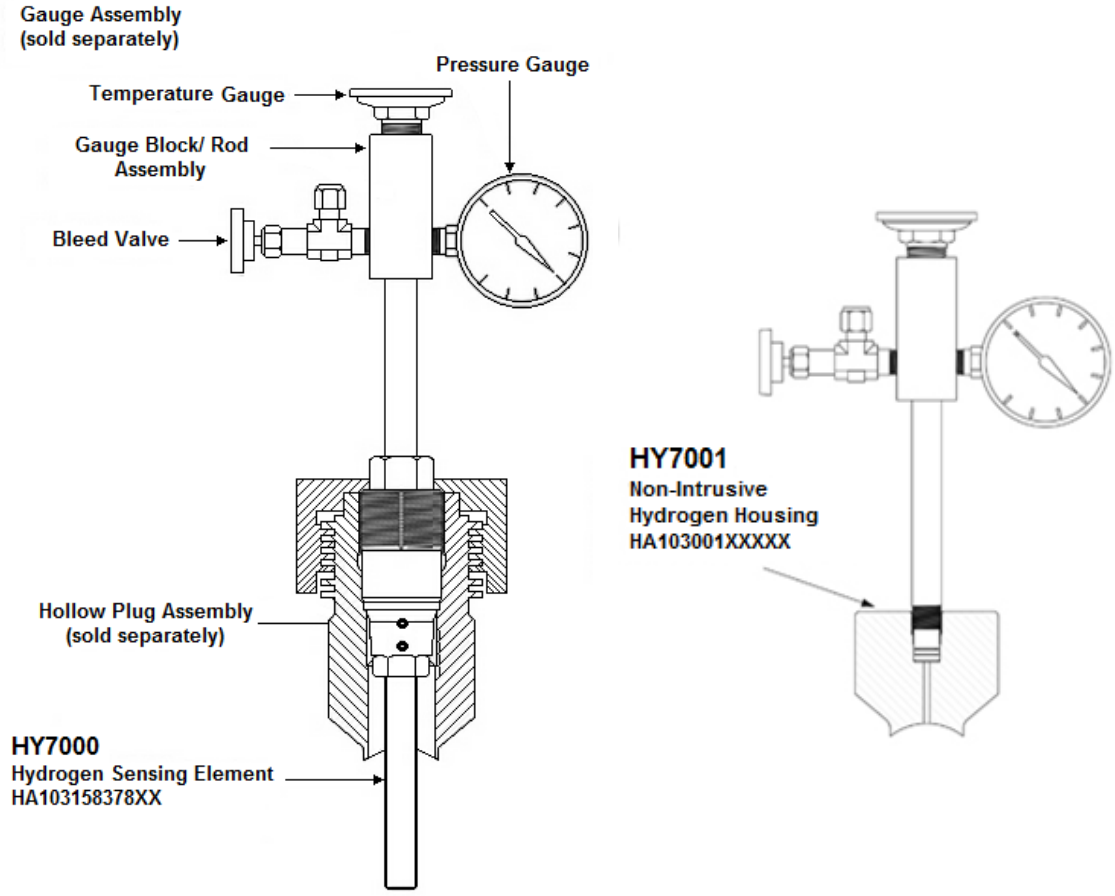
Model HY7000/ HY7001 - Hydrogen Probes for High Pressure Access Systems or Direct Mount



Picture is for illustrative purposes only, supplied product may differ.

Model HY7000 and HY7001 are high pressure hydrogen probe configurations which can be used for pressures up to 3600 psi. Hydrogen probes are commonly used for monitoring hydrogen permeation in steels, which could lead to embrittlement, blistering, and decarburisation resulting in the failure of the material.

The intrusive hydrogen probe assembly consists of three subassemblies (sold separately): the gauge assembly, the hollow plug assembly, and the HY7000 sensing element assembly. The gauge assembly consists of a gauge body, a pressure gauge (0-40 psi), a temperature gauge, and a bleed valve. The sensing element on the HY7000 probe is about 3 inches long and consists of a thin-walled tube which is sealed from the process and allows nascent hydrogen to permeate. The minimum insertion length (I.L.) of the probe is 6 inches and can be ordered in 1 inch increments.

The HY7001 housing can be machined to fit the flat surfaces of tanks or radiused to fit pipe diameters. The HY7001 consists of two subassemblies: the gauge assembly and the non-intrusive housing that can be welded directly to the exterior of the pipe wall or vessel.

Model HY7000/ HY7001 Ordering Information

Specifications	
Probe Body	316 Stainless Steel
Temperature Rating	260°C / 500°F
Pressure Rating	3600psi / 245 Bar
Mounting	- High Pressure Access system with Hollow Plug (HY7000) - Direct Mount (HY7001)

Gauge Assembly Parts*	
Part No.	Description
PS5509	Gauge Assembly (complete) Contains all part listed below
PR6441158	Pressure Gauge
PR6032	Temperature Gauge
PR6034	Bleed Valve
PS5603158	Gauge Block/ Rod Assembly
PR6158158	Gauge Body

*Gauge assembly sold separately, not included with probe

Model		
HA103158378	High Pressure Hydrogen Probe Sensing Element	
	Length	
	XX	Length in inches (Ex: 6” = 06). Available in 1” increments starting at 6”
HA103158378	**XX**	**Example of Probe Ordering #**

Length formula:
I.L. + PD + WT + 1.75"
(where PD = penetration depth, WT = wall thickness)

Note: Formula valid for access fitting heights of 5.25”.

Model				
HA103001	Non-Intrusive Hydrogen Housing			
	Alloy			
	158	316		
		Pipeline Size		
		1	2”	
		2	3”	
		3	4”	
		4	6”	
		5	8-10”	
		6	12-18”	
		7	20-26”	
		8	Flat	
			Gauge Block/ Rod Assembly	
			0	Not included
			1	Included
HA103001	**158**	**1**	**0**	**Example of Housing Ordering #**

Please contact RCSL for pricing and availability.

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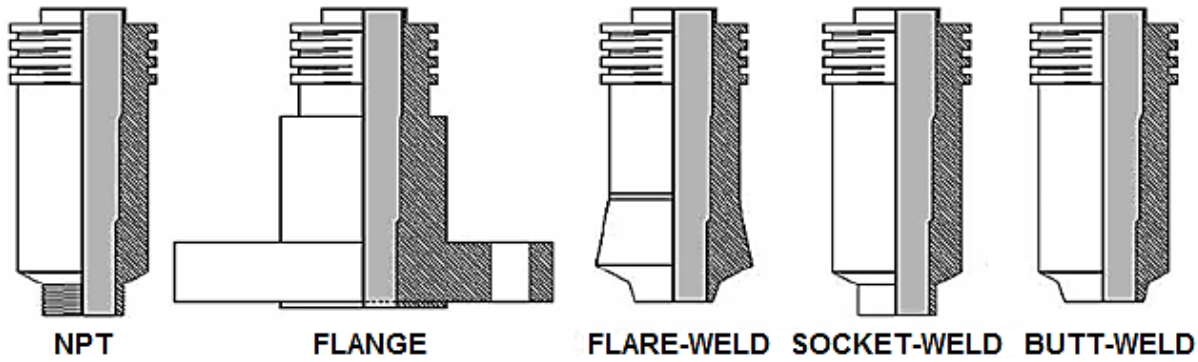
2 Inch System Access Fitting Assemblies Data Sheet



The TRISEAL* Two Inch System makes it possible to insert and retrieve a complete range of corrosion monitoring, erosion monitoring, biomonitoring, hydrogen monitoring, chemical injection and sampling system probes, quills and nozzles whilst the operating system, vessel or pipeline remains operational and at full operational pressure. A comprehensive range of access fitting assemblies are available in a wide range of styles and materials.

Two Inch System Access Fitting Assemblies consist of:

1. The Access Fitting Body.
2. A Solid or Hollow Plug, and
3. A Thread Protector, (Optional)

The Design of the Access Fitting Bodies:

Standard and Codes:

- ASME B31.3
- API RP 14E
- ASME/ANSI B16.5
- NACE MR-01-75

All components of the TRISEAL* System Two Inch System are interchangeable with existing 2 inch high pressure access systems.

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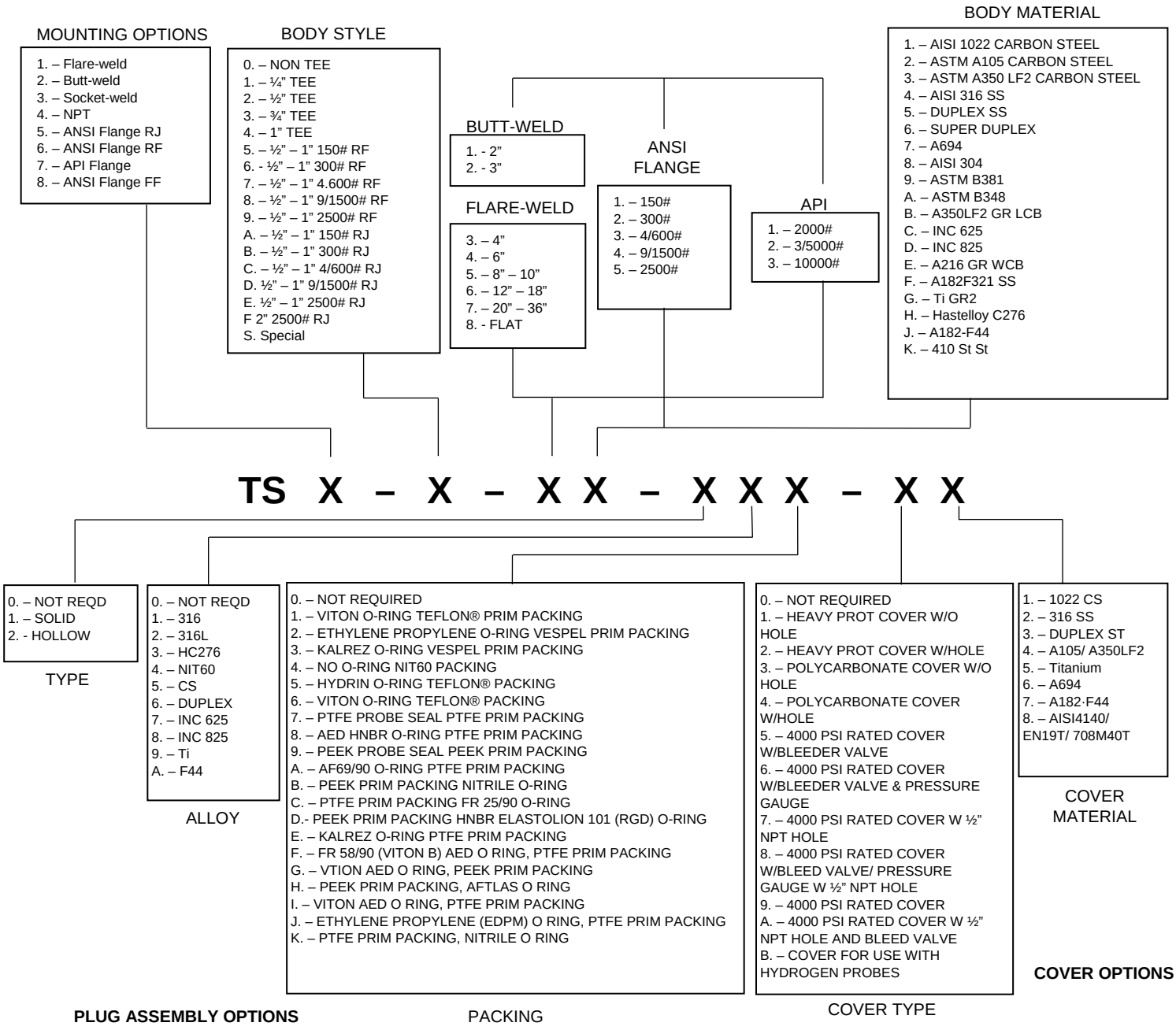
*TRISEAL is a Registered Trade Mark of RCSL Corrosion Monitoring

Ordering Information Chart



1. To order an Access Fitting Body only, use the first eight characters on the chart. Example: If a 0.25 inch tee 4/600# ANSI Flange RJ fitting made of Duplex SS is required, use part TS51350000.
2. To order a Body with a Plug Assembly, use the first eight characters on the chart. Example: If a Flare-weld mount with a 0.75 Tee body style and pipeline size of 4 inch, made with a body material of ASTM A105 Carbon Steel is needed, with a Solid CS Plug, a Hydrin O-Ring Teflon® packing, use part # TS13321550.
3. To order a body with a Plug Assembly and a Cover, use all nine characters on the chart. Example: #TS133215511

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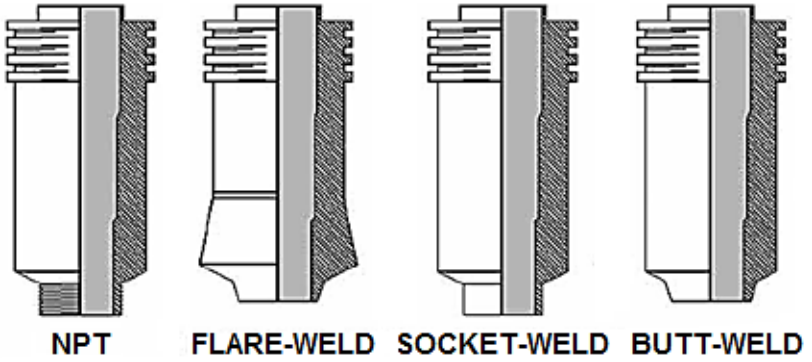
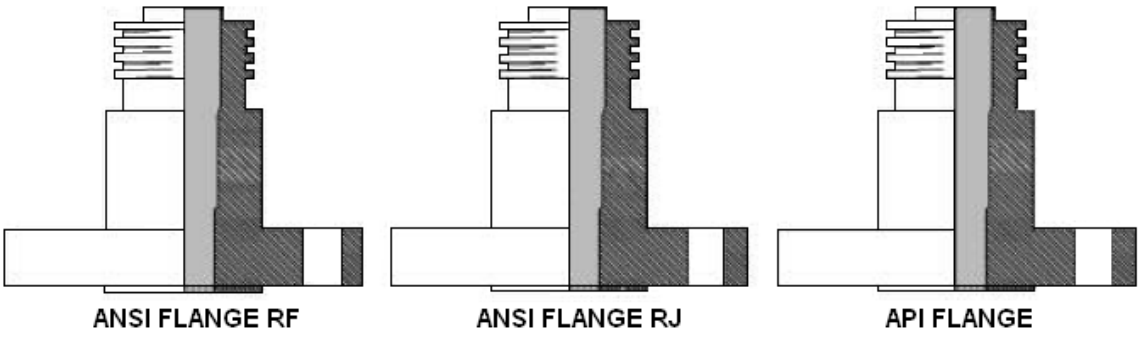
Non Tee Type Triseal® Access Fittings

Flange Size	Height	Weight
150	13.335cm (5.25”)	4.76 Kg (10.5 lb.)
300	13.335cm (5.25”)	5.22 Kg (11.5 lb.)
4/600	15.875cm (6.25”)	6.92 Kg (15.25 lb.)
9/1500	15.875cm (6.25”)	13.95 Kg (30.75 lb.)
2.500	15.875cm (6.25”)	18.15 Kg (40 lb.)



Model	Height	Weight
Flare-weld	13.335cm (5.25”)	2.5 Kg (5.5 lb.)
Butt-weld	13.335cm (5.25”)	2.5 Kg (5.5 lb.)
Socket-weld	15.875cm (6.25”)	2.05 Kg (4.5 lb.)
NPT	15.875cm (6.25”)	2.05 Kg (4.5 lb.)



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Temperature Rating: -28.9°C (-20°F) to +176°C (+350°F.)
Pressure Rating: 6000psi (410 bar) or as Flange Size

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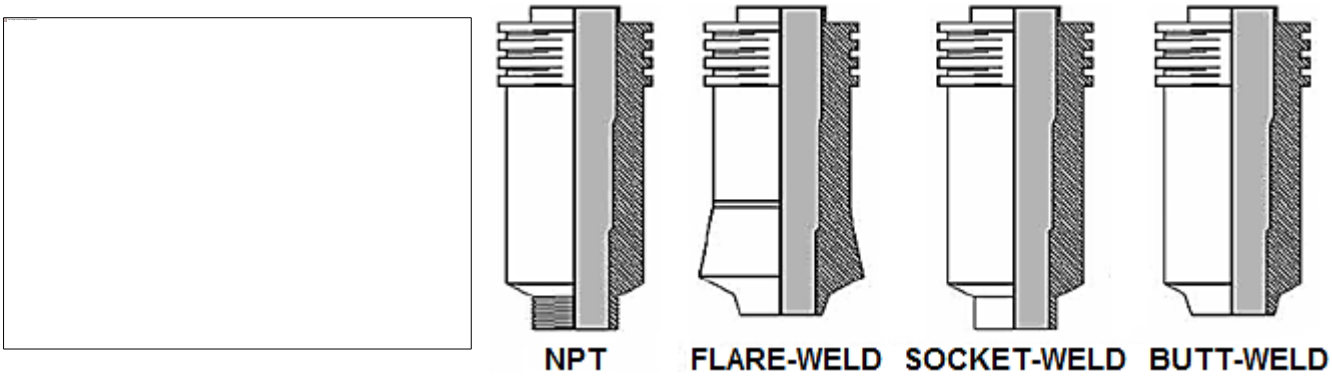
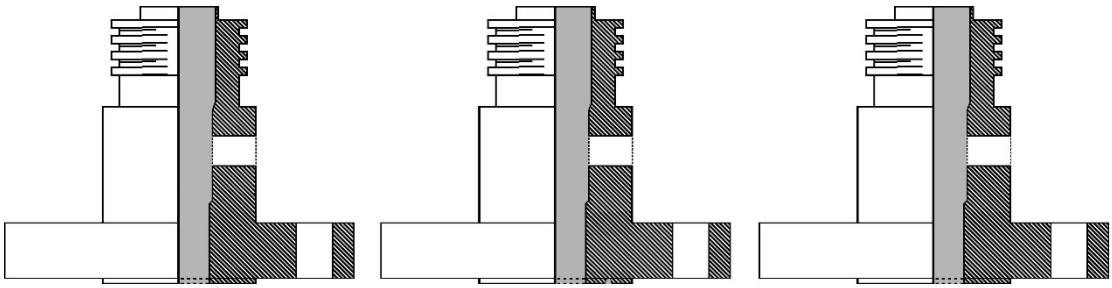
Tee Type Triseal® Access Fittings



0.25 inch T		0.5 inch T		0.75 inch T		1 inch T	
Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)
5.25	4.5	6.25	5.75	6.25	6.5	7.25	7



		0.25 inch T		0.5 inch T		0.75 inch T		1 inch T	
Model	Flange Size	Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)	Height (ins)	Weight (lbs)
ANSI Flange RF	150	5.25	9.75	7.25	10.00	7.25	10.00	7.25	10.50
	300	5.25	11.50	7.25	11.75	7.25	12.00	7.25	12.00
	4/600	6.25	12.75	7.25	13.00	7.25	13.00	7.25	13.00
	9/1500	6.25	25.75	8.25	26.00	8.25	26.25	8.25	26.50
	2500	6.25	40.20	8.25	40.50	8.25	40.40	8.25	40.75
ANSI Flange RJ	150	5.25	9.75	7.25	9.75	7.25	13.00	7.25	13.00
	300	5.25	11.50	7.25	10.00	7.25	17.00	7.25	17.00
	4/600	6.25	12.75	7.25	11.75	7.25	18.00	7.25	18.00
	9/1500	6.25	25.75	8.25	25.75	8.25	38.00	8.25	38.00
	2500	6.25	40.10	8.25	40.10	8.25	45.50	8.25	45.50
API Flange	2000#	6.25	15.75	7.25	18.00	7.25	18.00	7.25	18.00
	3/5000#	6.25	31.00	8.25	38.00	8.25	38.00	8.25	38.00
	10000#	6.25	40.50	8.25	45.50	8.25	45.50	8.25	45.50

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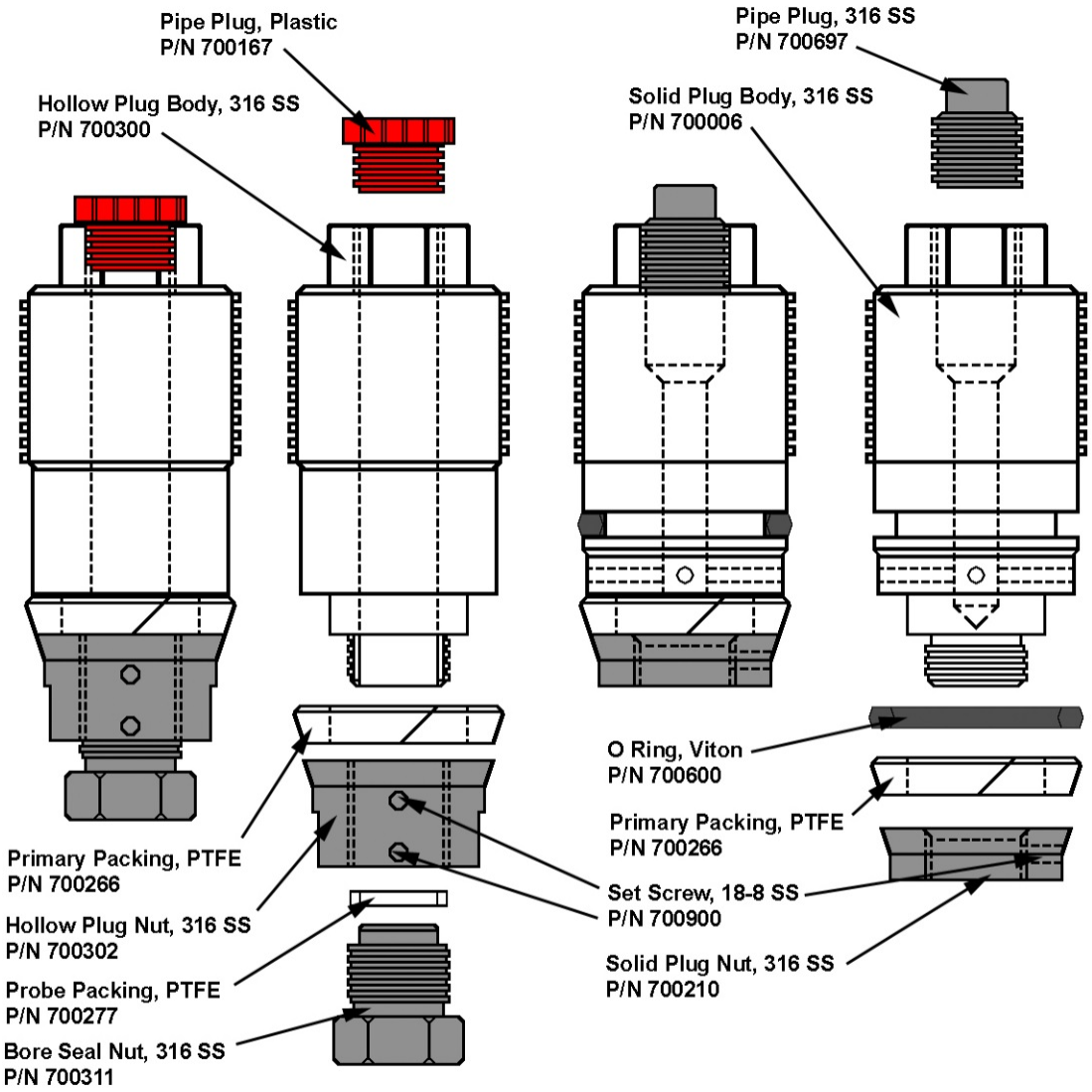
Two Inch System Accessories



Hollow Plug Assembly, 316 SS
P/N 700952

Solid Plug Assembly, 316 SS
P/N 700120

Accessories Continue on the Next Page

Protective Covers

Application	Description	Part no.	Material
Continuous Monitoring with pressure retaining seal and 0.5 inch NPT hole for permanent probe adapter	Cover with 0.5 inch NPT Hole	700731	1022 C.S.
Continuous Monitoring	Cover with Hole	700732	1022 C.S.
Intermittent Monitoring – Chemical Injection	Cover without Hole	700734	1022 C.S.
Continuous Monitoring	Cover with Hole	700435	Polycarbonate
Intermittent Monitoring	Cover without Hole	700436	Polycarbonate
Provides a secondary seal in case of leaks	Cove and Bleed Valve	700480	1022 C.S.
Similar to P.N 700480	Cover, Bleed Valve and Pressure Gauge	700481	C.S. 316 SS
Provides a secondary seal whilst permitting continuous monitoring – not for use above 4000 PSI	Cover, Bleed Valve Pressure Gauge and 0.5 inch NPT Hole	700482	CS/ 316 SS

Service Equipment

Application	Description	Part no.	Material
Maintenance of threads in the Access Fitting Body	Thread Tap Assembly	700111	M2 Steel
Maintenance of threads on the Solid and Hollow Plug Bodies	Thread Die Assembly	700112	M2 Steel
Removal of rust, scale etc. from the plug seat in the Access Fitting Body	Seat Reamer	700113	-
For the removal of debris from the Access Fitting Body threads	Thread Brush	700114	-
Maintenance of the 3 inch ACME thread on the Access Fitting Body	3 inch Acme Thread Cleaner	700115	-
Multi-purpose Grease	Lithium Grease	700116	-
For use in light hydrocarbon liquids	Silicone Grease	700117	-
For cleaning sand and debris from the Access Fitting Body Threads before installation of Solid and Hollow Plugs under pressure	Cleaning Tube Assembly	700118	-

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Seals and "O" Rings

Temperature Range	Material	Part Number
+45° to +176°C -50° to +350°F	"O" Ring, Viton	700600
	Primary Packing	700266
Steam to: + 250°C 450°F	"O" Ring, Ethylene Propylene	700139
	Primary Packing, Vespel	700773
+176 to +260°C +350° to +500°F	"O" Ring, Kalrez or Chemraz	700680
	Silicone	700601
	Primary Packing, Vespel	700733
In Excess of 287°C 500°F	Primary Packing, Nitronic 60 Do not use "O" rings at these temperature.	700284

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Two-Inch System
Retriever and Service Valve Kits

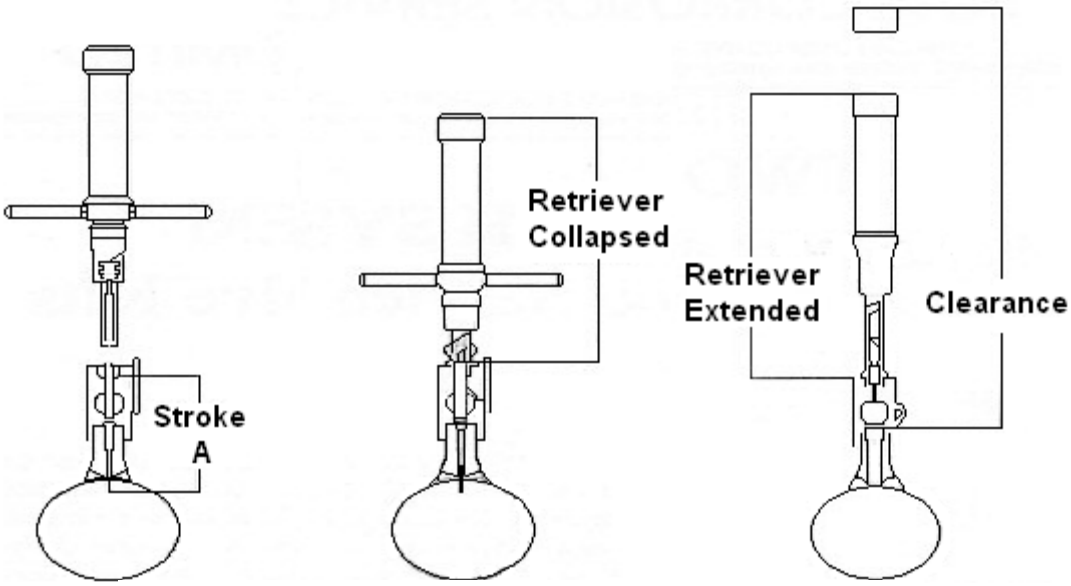
The Retriever and Service Valve permit safe and simple removal of a range of monitoring probes and chemical injection devices whilst the pipeline or vessel is under operating pressure. The retrieval tool has been designed to operate on the principal of balancing the pressure acting on the internal surfaces of the tool so that no resultant force is applied to the retriever moving parts whilst the equipment is being operated. Retriever tools are sized to accommodate different pipeline pressures and probe/device lengths. All the materials of construction comply with the requirements of NACE standard MR-01-75 (92).

Service Valves are lightweight, portable 2 inch ball valve type which, interface the retriever to the Two Inch System Access Fitting. The valve also contains the line pressure whilst the Retriever and Access Fitting Plug Assembly are removed from the system. Service Valves are supplied with two bleed valves. One valve bleeds to atmosphere, allowing pressure within the retriever/valve system to be released. The second valve bleeds pressure from the outlet (line) to the inlet (retriever) side of the valve. This makes operation of the valve quite easy, as the valve seats are not under load.

Retriever and Service Valve Kits include a heavy duty carrying case, maintenance tools and spare seals. A comprehensive Operation and Maintenance Manual is also included. Seal and Repair Kits are available separately at a moderate cost.

Operator training is minimal and is easily achieved once the basic principles of operation are understood. Training courses are available both on-site and off-site as required.

Pictures are for illustrative purposes only, supplied product may differ.



Picture is for illustrative purposes only, supplied product may differ.

Stroke mm	Max Probe Length mm	Total Length		Clearance	Pressure Rating/ Part Numbers		
		Collapsed	Extended		100 Bars	250 Bars	400 Bars
450	200	648	1,108	1,362	700501	700601	700801
630	406	826	1.463	1.713	700502	700602	700802
830	612	1.004	1,818	2,073	700503	700603	700803
940	711	1.130	2.073	2.323	700504	700604	700804
1.224	1.016	1.435	2.683	2.957	700505	700605	700805
1.530	1.320	1.740	3.292	3.546	700506	700606	700806

These maximum probe dimensions are only valid with 5.25 inch Flare-weld and Butt-weld Access Fittings. For maximum probe length with other Access Fitting configurations contact our sales office.

How to Order

1. Retrievers are selected by the length of stroke required. The stroke is the distance the Plug Assembly and Probe must travel from within the Access Fitting body, through the Service Valve allowing the valve to be closed.

2. From figure A determine the Retriever stroke length required to retrieve the maximum length probe.

Spare Parts		Options	
Part Number	Description	Part Number	Description
700084	Retriever Seal Kit	700674	Diverter Hose Assembly – 3M
700085	Retriever Repair Kit	700676	Diverter Hose Assembly – 8M
700047	Safety Hammer	700677	Diverter Hose Assembly – 15M
700066	Head Bar	700678	Surge Tube Assembly
700060	Retainer Clamp	700752	Field Operators Tool Kit

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Two-Inch System
Service Valve Kits

Pictures are for illustrative purposes only, supplied product may differ

Service valves are required to connect the retriever tool to the Access Fitting to be serviced; its primary function is to contain the line pressure whilst the monitoring probe/injection device is replaced or removed. Designed for ease of use in connection with a Retriever Tool, Service Valves are ball type valves with full opening port and feature two Bleed Valves which permit easier operation at high pressures. One valve allows pressure equalisation on both sides of the valve, thus allowing the valve to be opened without torque problems. The second valve allows pressure or product to be bled to atmosphere or for product sampling.

Service Valves are available rated for 250 bar (3600psi) and 400 bar (5700psi).
Service Valves rated 250 bar are extremely compact with a total weight of 23 kilos.

All service valves comply with NACE MR-01-75 (92 Rev) requirements for materials suitable for use in sour service conditions.

How to order:

- Service Valve Kit – 250 Bar – Part No 700187
- Service Valve Kit – 400 Bar – Part No 700191

Spare Parts		
Description		**Material**
Service Valve Repair Kit	250 Bar (3600 psi)	700051
Service Valve Seal Kit	250 Bar (3600psi)	700052
Service Valve Repair Kit	400 Bar (5700psi)	700053
Service Valve Seal Kit	400 Bar (5700psi)	700054

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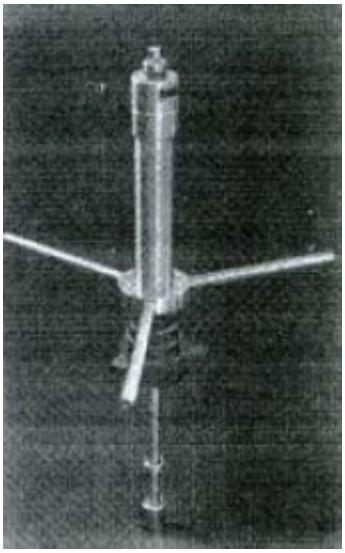

Hot Tap Tool

The Hot Tap Tool provides a safe and reliable method of hot tapping high pressure access fittings on presented pipelines or vessels.

Operation

A Special cutter assembly is installed in the access fitting previously welded onto the pipe. To tap a hole through the pipe wall, a service valve is installed on to the fitting. This allows the cutter fitting to be isolated if necessary. The hot tap tool is mounted onto the service valve and mated to the cutter. The drive screw on the hot tap tool puts pressure onto the cutter as the tool shaft is rotated to cut through the pipe wall. After the hole is cut through the pipe wall, the tool is removed from the valve and the retrieval tool is then used to pull the cutter assembly and pipe plug from the fitting. Shavings and cuttings are removed using swabs or brushes.

The hot tap procedure may be expedited by the use of an air operated drill motor to turn the cutter shaft.

Safety is enhanced because the cutter is isolated from the atmosphere by a service valve. At any time in the procedure the cutter drive shaft may be retracted and the fitting and its contents isolated from the atmosphere by closing the service valve.

The hot tap tool is compatible with other major manufacturer's access fitting assemblies.

Part HA102102 Components	
Description	**Part Number**
Bore Reamer Assembly	102004
HP Thread Chaser with Adaptor	8002
Seat Reaming Assembly	7282A
Weld and Seal Test Fixture	8004
Cutter Assembly - HP 5.25 Nipple	7305G
HP Cutter Test for CT Cutter Test Assembly	7306A
Bushing Insertion Tool	7241A
Hot Tap and Extraction Tool Test Assembly	7307A
Hot Tap Turning Handle	7308A

Over shot for Cutter	7244A
Adaptor for Tools	102001158
Magnetic Swab Assembly	102003
3/16" Allen Wrench	PR6352
Spanner Wrench	PR6356
1⅜" Hex Socket	PR6433
Snap Ring Pliers	PR2283
Seal Insertion Ring	7249A
Brass Hammer	PR6358
3/32" Allen Wrench	PR2291
Snap Ring Pliers	PR2297
Quick Coupling (female)	PR1294
½" Drive, socket "T" Handle	PR6357
Case	PR2399
Seal Repair Kit	7213A

The above tools are furnished as standard equipment with each complete Hot Tap Tool Kit. In addition common tools such as 3/16” Punch, large Crescent Wrench, large screw driver may be necessary.

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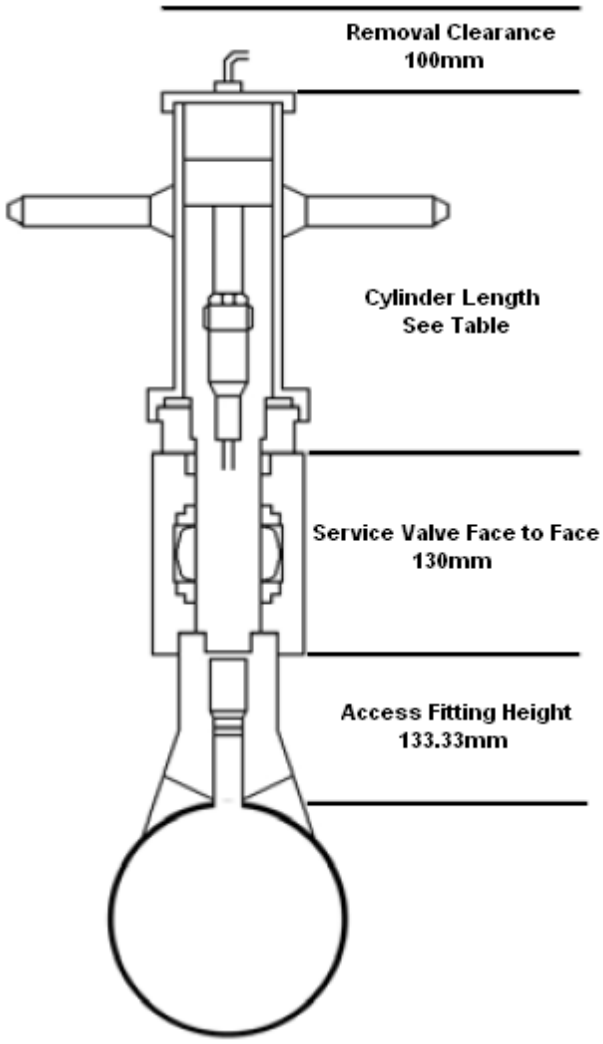
Hydraulic Retriever and Service Valve Kit
Model HPH

The Model HPH Hydraulic Retriever Tool is a single cylinder retriever of fixed length which is equilibrated at the same pressure as the pipeline or vessel to be serviced. An internal piston may be moved up or down by changing the pressure in the upper barrel of the retriever. Pressure differential of a few PSI is sufficient to move the piston. Downward movement is obtained by pumping oil into the upper part of the retriever using a small portable pump; upward motion is achieved by returning oil to the oil tank. Internal safety devices are provided to prevent excessive pressure differentials from being developed across the piston.

A Socket Adaptor Assembly is attached to the Internal piston. A Pilot on this Adaptor mates the assembly to the standard Triseal® 2" System Solid or Hollow plug.

When the piston is moved to the lower part of the retriever it may be connected to the retriever barrel which is then turned to screw or unscrew the Plug Assembly from the Triseal® access fitting body.

Minimum clearance requirements, minimum weight and full compatibility with all generic access fittings are major features of the HPH Retriever tool.



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Triseal ® is the Registered Trade name of RCSL Corrosion Monitoring

HPH Retriever Ordering Information

250 Bar Maximum Working Pressure

Retriever Kit Part Number	700834	700835	700836	700837	700838	700839	700840	700841	700842
Maximum Probe Length	130mm 5.11”	200mm 7.87”	300mm 11.81”	400mm 15.74”	500mm 19.68”	600mm 23.62”	700mm 27.55”	800mm 31.50”	900mm 35.43”
Removal Clearance	840mm	945mm	1096mm	1245mm	1395mm	1545mm	1695mm	1845mm	1995mm
Retrieval Cylinder Length	510mm	615mm	765mm	915mm	1065mm	1215mm	1365mm	1515mm	1665mm
Retriever Weight	15.75kg	17.20kg	18.70kg	20.50kg	22.01kg	23.70kg	25.60kg	27.70kg	29.85kg
Retriever Kit Weight	46.50kg	48.00kg	49.50kg	51.50kg	53.50kg	55.50kg	58.00kg	60.50kg	64.00kg

450 Bar Maximum Working Pressure

Retriever Kit Part Number	701100	701101	701102	701103	701104	701105	701106	701107	701108
Maximum Probe Length	130mm 5.11”	200mm 7.87”	300mm 11.81”	400mm 15.74”	500mm 19.68”	600mm 23.62”	700mm 27.55”	800mm 31.50”	900mm 35.43”
Removal Clearance	840mm	945mm	1096mm	1245mm	1395mm	1545mm	1695mm	1845mm	1995mm
Retrieval Cylinder Length	510mm	615mm	765mm	915mm	1065mm	1215mm	1365mm	1515mm	1665mm
Retriever Weight	20.75kg	22.20kg	23.70kg	25.50kg	27.01kg	28.70kg	31.60kg	32.70kg	39.85kg
Retriever Kit Weight	54.50kg	56.00kg	57.50kg	59.50kg	61.50kg	63.50kg	64.00kg	68.50kg	72.00kg

How to Order:

1. Retriever size is determined by the length of piston movement required within the retriever cylinder. This is the distance of a plug assembly and probe must travel from within the access fitting body and through the service valve allowing the valve to be closed.
2. Determine the maximum working pressure required
3. Determine the maximum probe length required to be retrieved
4. From the above table select the most suitable kit Part Number. Order by Kit Part Number

Spare Parts

250 Bar	
Description	**Part Number**
Retriever Seal Kit	**700868**
Service Valve Seal Kit	**700877**
Hydraulic Pump	**700842**
Three Way Valve	**700844**

450 Bar	
Description	**Part Number**
Retriever Seal Kit	**701109**
Service Valve Seal Kit	**701110**
Hydraulic Pump	**701111**
Three Way Valve	**701112**

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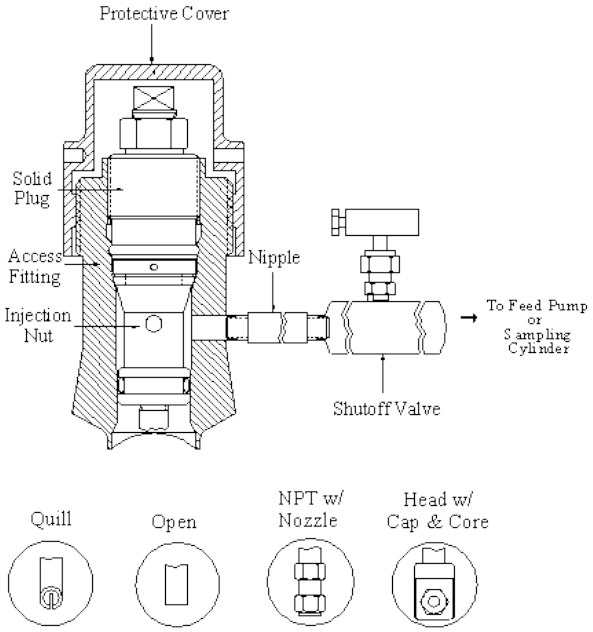
Two-Inch System Injection and Sampling System



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Injection and sampling systems are fundamental to corrosion control and process control programs. They are applicable to a large variety of processes in the petroleum, chemical and water treatment industries. Injection systems may be used for the injection into the system of a wide range of chemicals such as biocides, demulsifiers, corrosion inhibitors, oxygen scavenger, glycol and mono-ethylene glycol, dewaxers, methanol, odorisers and a wide range of product activities.

Injection systems may be as simple as using an open-ended tube that allows for even distribution of the injected chemical or as complex as using a head with a cap and core to obtain precise atomisation of the chemical.

Sampling systems, as the name implies are used to take samples of the process fluid medium. Such samples are the analysed in the laboratory for inhibitor concentration levels, the presence of metal ions, oxygen levels, scale forming compounds and a wide range of process parameters.

Injection Systems

The art of chemical injection is a complex technology. Irrespective of the type of injection or injected fluid, several factors relative to the process system and the injection system must be considered. Principle factors are:

Pressure Differential

This is the difference between the injection pump pressure and the process line or vessel pressure. Ideally the pressure differential should be 8 Bar (100psi.) However, varied injection rates can be achieved by changing the pressure differential.

Temperature

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Temperature directly affects viscosity. Ideally the temperature of both the injected chemical and the line product should be about 21°C (70°F.)

Viscosity
This is the measure of fluids resistance to flow. The more viscous the fluid the smaller the spray angle.

Spray Angle
Spray angle is affected by viscosity, spray distance and pressure differential.

Spray Coverage
This is calculated theoretical area coverage.

Specific Gravity
The specific gravity of a liquid is the density ratio of the liquid to water. The flow rate of a liquid is affected by its specific gravity.

Injection Rate
This is the amount of chemical to be injected within a specified period and is defined as Litres Per Day (LPD) Gallons Per Hour (GPH) etc. Injection systems are available for injection rates varying from 0.38 litres/hour (0.1 GPH) to 250 litres/hour (65.7GPH).

Injection may be via a simple open ended tube or a quill that relies upon a natural turbulence within the pipeline to disperse the injected chemical and to accomplish even distribution. There is no restricting orifice and such systems tend to be clog proof even when using unscreened chemicals a disadvantage of such systems is that at low flow rates there tends to be a concentration of the injected chemical at the pipe wall surface below the injection point.

Injection Point

The maximum fluid velocity is usually at the centre of the line hence the most effective position for injection is generally at the centre of the pipe in the direction of the product flow. If the line is to be pigged, the injection point may be flush with the pipe wall. This eliminates the need to remove the injection probe before pigging operations begin. On pipelines this means that injection is perpendicular to the product flow. Top of the line may be used if the injection is required to be oblique or horizontal to the product flow.

A more comprehensive discussion of the factors to be considered in the design of chemical injection systems is contained in the RCSL Injection Primer.

A typical Two Inch System Injection Assembly is shown above. A sampling system uses the same components. The various components of the assembly are:

1. An Access Fitting Body with a side Tee through which the fluid transfer takes place. The Tee may be threaded or welded. Welded Tees are either flanged or butt-weld nipple. Threaded Tees are based on an NPT tapped hole in the fitting body. The Tee size is rated according to the injection rate and injection and viscosity of the injection chemical.

2. A Solid plug Assembly inside the fitting body is used to carry an injection nut which has the injection tube/nozzle assembly screwed to its base.

3. An Injection/Sampling Nut. This is a multiple use nut that replaces the nut of the Solid Plug. It is used to direct the injected product to the injection tube or atomisation device. An Injection Nut sizing chart is shown in Table 1.

4. The Injection or Sampling Tube or Nozzle. The various forms offered are:

a. X Open. This is an open tube. The natural turbulence within the pipeline is used to ensure even distribution. The pressure differential is experienced at the orifices so it is necessary to control the injection rate at the injection pump or the shut off valve.

b. X Quill. This has a scarf and quill inserted at the open end. It utilises the turbulence created by its unique design to achieve distribution of the injected chemical into the product flow. Injection Tube x Quill are clog proof and give extremely good dispersion of the inhibitor provided that the product flow is 4.6 metres per second or greater. As with the Open Tube, injection rate must be controlled at the Injection Pump or Shut Off Valve.

c. X NPT. Again similar to the Open Tube but is threaded at the dispersion end, thus allowing attachment of female nozzle assemblies. Injection may be perpendicular with the use of a straight nozzle or parallel with a right angle nozzle.

d. X Head. This is the usual style used for parallel injection at the centre of the line. The head is integral with the Injection Tube and is designed to accept the Cap and Core from a standard nozzle assembly.

5. Nipples. Nipples are used with threaded Tee Access Fitting Bodies and are the means of connecting the shut off valve to the Access Fitting Body.

6. Shut Off Valves. These are required to cut-off the injection flow and maintain pressure integrity through the Tee when the solid plug assembly is being removed or replaced. They are also used to control the injection flow rate. A nipple and Shut Off Valve sizing chart is given in table 3.

7. Check Valve. These are optional items which may be fitted within the Injection Tube in the inlet line to the Access Fitting Body Tee.

8. Atomisation Nozzles and Cap and Cores. These are the various devices which, attached to the dispersion end of the Injection Tube, permit atomisation of the fluid as it is injected into the product line or vessel.

Nozzle assemblies are complete units which contain caps, cores, and strainers. They are available with both female and male NPT threads to match the thread on the Injection Tube X NPT. Caps, cores and strainers are component parts of the Nozzle Assemblies. They have male UNF threads which engage with the UNF threads in the dispersion body of the Injection Tube X Head.

The correct Nozzle size may be determined from Table 4.

9. The Injection or Feed Pump. The injection pump must be capable of generating sufficient injection line pressure to overcome the line operating pressure and thus create the required pressure differential across the atomising nozzle or injection tube.

Materials of Construction.
All components are manufactured from 316 Stainless Steel as standard with the exception of seals and packing. These materials comply with the requirements of NACE Standard MR 01-75. Recommended materials for sulphide stress cracking environments.

Injection Tube Sizing

Flush - Non Flange Access Fitting
X Open: (FH + PW)-(2.04 + N) = L
X NPT: (FH + PW)-(3.353 + N) = L

Flush - Flange Access Fitting
X Open: (FH + PW + MF)-(2.04 + N) = L

Top of Line - Non Flange Fitting
X Open (FH + PW + IL)-(2.04 + N) = L
X NPT: (FH + PW + IL)-(2.04 + N) = L
X Quill: (FH + PW + IL)-(2.04 + N) = L

Top of Line - Flange Fitting
X Open (FH + PW + IL + MF)-(2.04 + N) = L
X NPT: (FH + PW + IL + MF)-(3.363 + N) = L
X Quill: (FH + PW + IL + MF)-(2.04 + N) = L

Centre of Line - Non Flange Fitting
X Quill: (FH + PD/2)-(2.04 + N) = L
X Head: (FH + PD/2)-(2.04 + N) = L

Centre of Line - Flange Fitting
X Quill: (FH + PD/2 + MF)-(2.04 + N) = L

Bottom of Line - Non Flange Fitting
X Open: (FH + PD)-(2.04 + N + PW)=L

Bottom of Line - Flange Fitting
X Open: (FH + PD + MF)-(2.04 + N + PW) = L

FH = Access Fitting Height
PW = Pipe Wall Thickness
N = Injection Nut Length
L = Injection Tube Length
MF = Mating Flange Height
IL = Insertion Length into Pipe or Vessel
PD = Pipe Outside Diameter

How to Order

A) The Access Fitting Body style and Tee size may be determined from the Access Fitting product literature.

B) The Injection Nut size may be determined from Table 1.

Table 1

Nut thread Size	Nut Length				
	1.75”	3”	3.5”	3.75”	5.50”
	Part Number	Part Number	Part Number	Part Number	Part Number
1/8” (3.2mm)	700219	700220	700227	700231	700235
¼” (6.4mm)	700221	700222	700228	700232	700236
½” (12.7mm	700223	700224	700229	700233	700237
¾” (19mm)	700225	700226	700230	700234	700238

Use 1.75 inch Nut Length for Access Fitting Body Height 5.25 inch, use 3.00 inch or 3.50 inch Nut length for 6.25 inch Access Fitting Body Height, use 3.75 inch for 7.25 inch Access Fitting Body Height and use 5.50 inch for 8.25 inch Access Fitting Body Height.

C) Determine the Injection Tube type required. Determine the injection point. Calculate the Injection Tube length using the sizing formulas. Use this information to determine the Injection Tube Part Number from Table 2.

Table 2

Model	Injection Tube Type	Material	NPT Thread Sizes	Injection Tube Length
IQ Required	- xx -	xx	xx	- xx.xx. = Part. No.
	1 – X Open	01 – 316 S.S	01 – 1/8”	Open/ Quill/ NPT Available from 3.2cm to 76.2cm X Head Available from 5.7cm to 76.2cm
	2 – X Quill	02 – Other (Specify)	02 – ¼”	
	3 – X NPT		03 – ½”	
	4 – X Head		04 – ¾”	

D) A Nipple and Shut Off Valve to match the Tee of the Access Fitting Body may be selected from Table 3

Table 3

Access Fitting Tee Size	Valve 316 S.S	Nipple 100mm 316 S.S Sch 80
	Part Number	Part Number
¼”	700322	700018
½”	700323	700019
¾”	700324	700020
1”	700325	700021

E) If applicable select a suitable Nozzle Assembly/ Cap and Core from Table 4

Table 4

Part Number	Orifice Diameter/ Nozzle Type	GPH Capacity & Pressure Differential			
		40 PSI	60 PSI	80 PSI	100 PSI
700030	0.30 – ¼” NPT Fem.N	0.3	0.36	0.42	0.48
700031	0.40 – ¼” NPT Fem.N	0.4	0.48	0.56	0.64
700032	0.60 – ¼” NPT Fem.N	0.6	0.72	0.84	0.96
700034	0.30 – ¼” NPT Flush	0.3	0.36	0.42	0.48
700035	0.40 – ¼” NPT Flush	0.4	0.48	0.56	0.64
700036	0.60 – ¼” NPT Flush	0.6	0.72	0.84	0.96
700038	0.30 –Cap/core 9/16”	0.3	0.36	0.42	0.48
700039	0.40 – Cap/ Core 9/16”	0.4	0.48	0.56	0.64
700040	0.60 – Cap/Core 9/16”	0.6	0.72	0.84	0.96

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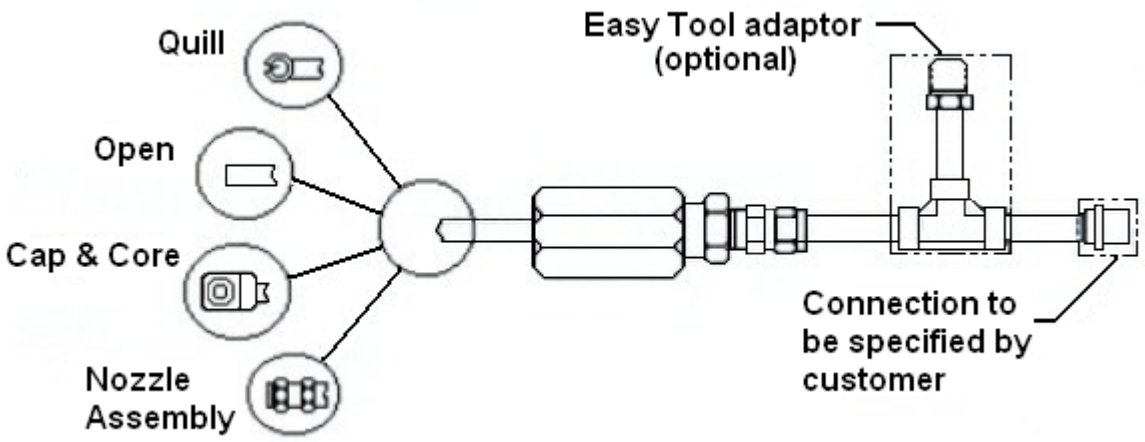
Model IP4000 – Injection and Sampling System Retractable with Packing Gland



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Model IP4000 Injection and Sampling System is a retractable unit commonly used in field and plant applications. A Specially designed packing gland is used with the unit for insertion into or retraction from a pressurised system without a process shutdown. The unit is designed to mount onto a 1 inch piping system, but can easily be adapted to fit your specific requirements.

The unit assembly consists of a packing gland and an insertion rod with an injection/ sampling fitting. The fitting, which is threaded or welded to the end of the rod, can be either a quill, open, cap and core or nozzle assembly type. A safety cable is also provided to prevent blowout.

In systems with pressure over 150psi, an adaptor for the Easy Tool may be added to the unit. Standard packing material in the packing gland is Teflon® however, Grafoil® packing can be provided for high temperature applications. Model IP4000 units are available in different lengths and materials.

Specifications:	
Body	316 Stainless Steel
Temperature Rating	260°C / 500°F – Teflon® 649°C / 1200°F – Grafoil®
Pressure Rating	1500psi / 102 Bar
Mounting	1” Full Port Valve (Min.)

Standard Length	I.L. (Max)
24”	16”
30”	22”
36”	38”

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42”	34”

IP4000 Ordering Information

Model						
IP45	Injection and Sampling System 1” NPT Female Thread, Packing Gland with Teflon®					
IP75	Injection and Sampling System 1”NPT Female Thread, Packing Gland with Grafoil®					
IPB7	Injection and Sampling System 1 ½” NPT Male Swage Nipple (used with head, cap, core)					
IP00	Injection & Sampling System Replacement Insertion Rod					
	Mounting Material (Packing Gland and Rod)					
	22	316				
	44	C276				
		Injection Tip Option				
		000	N/A			
		010	Quill (straight)			
		020	Quill (raised)			
		030	Open			
		040	¼” NPT (female) with nozzle*			
		050	Head with cap and core ($^{9}/_{16}$”) – Must use Swage Nipple			
		060	¼” NPT (male) with nozzle*			
		070	$^{3}/_{8}$” NPT (male) with nozzle*			
		090	½” NPT (female) with nozzle*			
			Tube Size			
			1	$^{3}/_{8}$”		
			2	½”		
			3	$^{5}/_{8}$”		
				Length		
				24	16 inches max. insertion length	
				30	22 inches max. insertion length	
				36	28 inches max. insertion length	
				42	34 inches max. insertion length	
					Dry End Mount Options	
					01	Blanked off
					02	½” NPT
					03	¾” NPT
IP45	**22**	**010**	**2**	**24**	**02**	**Example of Probe Ordering #**

For alloys, sizes, or other special requirements not listed, please contact our sales department. Not all alloys are available with all electrode types and seals.

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