

Roxar™ Hydraulic Access Fitting System



Flanged Hydraulic Access Fitting system (left) and Flare-welded Hydraulic Access Fitting System (right)

Emerson offers a complete range of access fitting assemblies for installation of corrosion probes and weight loss coupons. The product range comprises both the traditional 2-inch Roxar Mechanical Access Fitting System as well as the 2-inch Roxar Hydraulic Access Fitting System. For more information on the mechanical system, refer to the *Roxar Mechanical Access Fittings - Product Data Sheet*.

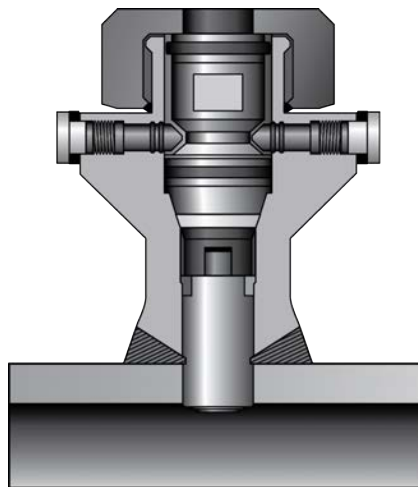
The Roxar Hydraulic Access and Retrieval System is a complete system for installing and retrieving probes and coupon holders from high pressure piping, pipelines and vessels under full operational pressure. The maximum operating temperature is 400 °F (204 °C). The system allows for live retrieval tool operations for pressures up to 10,000 psi (690 bar).

Roxar Hydraulic Access and Retrieval System components

The Roxar Hydraulic Access and Retrieval system consists of the following components:

- High pressure hydraulic access fitting (or hydraulic adaptors for converting mechanical access fittings to hydraulic system)
- Hollow or solid hydraulic plugs
- Heavy duty protective covers for hydraulic system (including pressure proof alternatives)
- Locking pins
- Hydraulic retrieval tool (refer to the *Roxar Hydraulic Retrieval Tool and Service Valve - Product Data Sheet*)

Figure 1: Flareweld Hydraulic Access Fitting System



The Roxar Hydraulic Access System is also available for injection and sampling applications, refer to the *Roxar High Pressure Injection and Sampling System - Product Data Sheet*.

An existing 2-inch mechanical system can easily be retrofitted (even during operation) to the safer and more reliable hydraulic retrieval system by means of a hydraulic adapter.

Roxar Hydraulic Access fittings

The hydraulic access fitting has a threaded outlet to mate with the service valve of the Roxar Hydraulic Retrieval Tool system. The hydraulic access fitting has no internal threads, thereby eliminating the danger of a seized plug. Four locking pins hold the internal plug in position for the 6,000 psi (420 bar) hydraulic fitting, while six locking pins hold the plug in position for the 10,000 psi (690 bar) hydraulic fitting. A heavy duty cover holds the plug in position during permanent operation and keeps the pressure inside the system. The locking pins hold the plug in position when cover is removed, until the plug is controlled by the pressure in the hydraulic retrieval tool.

The hydraulic access fitting is available in flareweld and flanged versions as standard. Other versions (for example, a clamp type of connection) are available upon request. Hydraulic access fittings are available in a wide variety of materials from different types of carbon steel up to more noble materials, such as nickel alloys. Hydraulic access fittings meet NACE MR0175 requirements. The NORSOK specification is available upon request.

Figure 2: Hydraulic Flareweld Access Fitting



Figure 3: Hydraulic Flanged Access Fitting



For more information, refer to the *Roxar High Pressure Access Fittings - Product Data Sheet*.

Roxar hydraulic plugs

The hollow or solid plug provides the pressure seal in the access fitting, and is the carrier for the corrosion monitoring device (whether a probe or a coupon).

Figure 4: Hydraulic solid plug (left) and hollow plug (right)



- The Roxar Hydraulic Hollow Plug is used for electric probes like Electrical Resistance (ER) and Linear Polarization Resistance (LPR) Probes.
- The Hydraulic Solid Plug is used for passive monitoring devices like weight loss coupons, bio coupons, sacrificial probes and either injection or sampling equipment.

For both types of plugs, the primary packing is made from PTFE (25% glass filled). Both plugs are available in these standard options: 316 stainless steel, duplex, super duplex, nickel alloys UNS N06625 and UNS N08825 (other materials are available upon request).

A common challenge for high velocity applications is the strength of the device (coupon or probe) with respect to static and dynamic stress in relation to operating conditions (flow velocity, density and viscosity). Emerson offers a unique reinforced plug design with increased performance for high velocity applications, available for hydraulic access fittings.

For more information, refer to the *Roxar High Pressure Plugs - Product Data Sheet*.

Roxar Hydraulic Access Fitting Adaptor

Hydraulic Access Fitting Adaptors are available for conversion of mechanical access fittings to a hydraulic system. This conversion can be done on pressurized pipes. Contact Emerson for more details.

Figure 5: Hydraulic Access Fitting Adaptor



Note

When a hydraulic access fitting adaptor is installed, a specially-designed plug (hollow or solid) is required.

Roxar Hydraulic Access fitting covers

Hydraulic Access Fitting Covers are available in 2 design options: Heavy-Duty and Pressure-Proof, with pressure ratings up to 10,000 psi (690 bar).

Hydraulic covers have three main functions:

1. To hold the plug in position in the access fitting during the permanent installation.
2. To protect the external threads used for service valve connection.
3. To keep the pressure inside the access fitting system.

Figure 6: Hydraulic Access Fitting Cover



The Heavy-Duty design is available in two different configurations:

- With hole - used with corrosion and erosion probes that requires a top entry for a probe adapter
- Without hole - used with coupons, sacrificial probes, and an injection quill or injection quills

The pressure-proof design has the advantage of serving as a secondary pressure-retaining part and it is provided with a pressure gauge and a bleed plug. This design is also available in two different configurations:

- With threaded hole - used with corrosion probes that requires a top entry for pressure-proof probe adapter
- Without hole - used with coupons, sacrificial probes, and an injection quill or injection quills

For more information, refer to the *Roxar High Pressure Covers - Product Data Sheet*.

Roxar probes and coupons

The Roxar Retrievable Electrical Resistance (ER) Probe determines the corrosion rates by measuring the electrical resistance at preset intervals⁽¹⁾. The increase in electrical resistance is proportional to the accumulated corrosion of the probe element during the exposure period.

The Roxar Retrievable Linear Polarization Resistance (LPR) probe is designed to be used in water systems. The internal corrosion monitoring is based on measuring the current response to a small polarization (10 - 20 mV) to a steel electrode's corrosion potential. Electrochemical theory (Stern-Geary's equations) shows that corrosion rates can be calculated directly from the current response to such a small, known polarization, and thus, LPR measurements give an immediate corrosion rate value.

Figure 7: ER and LPR Probes



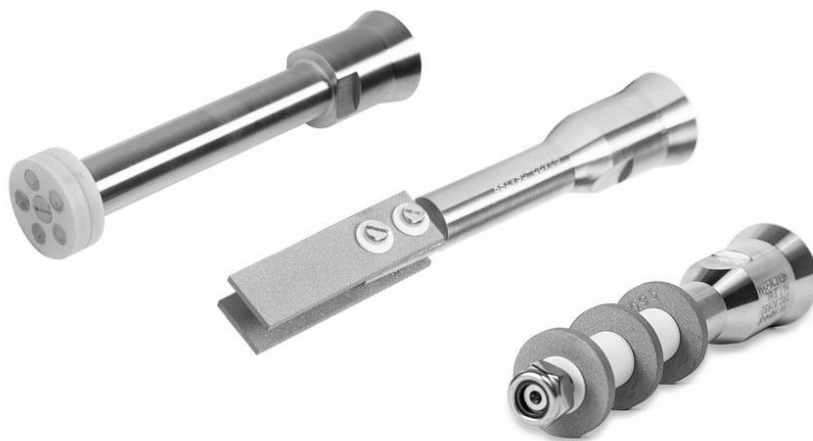
The Roxar Retrievable Weight Loss Coupons and Holders are used to correlate the corrosion rates on pipe walls by measuring the weight of elements exposed to corrosion over a given period. If required, effects of pitting, scaling, deposits or bacteria can also be analyzed.

The Roxar Sand Probe calculates sand erosion rates by exposing the probe elements to sand particles in the flow. The probe's metal loss is calculated based on the resistance in the measurement element due to sand erosion.

Figure 8: Roxar Sand Erosion Probe



(1) The readings can be set at different intervals depending on customers requirements.

Figure 9: Various Coupons and Holders

Coupons are used to evaluate the corrosiveness of the system, to monitor the effectiveness of corrosion-mitigation programs, and to tune process conditions. Therefore, coupons results are linked to the corrosiveness of a system and not to the absolute metal loss on the pipe itself.

For more information, contact your Emerson representative.

Roxar Hydraulic Retrieval Tool and Service Valves

The Roxar Hydraulic Retrieval Tool and Service Valve is a high-quality tool for installing and retrieving probes and coupons under full operational pressure. This tool is compatible with most 2-inch access systems provided by common corrosion monitoring vendors on the market and is available for both 6,000 psi pressure rate and 10,000 psi pressure rate applications. Emerson is the only vendor to provide a 10,000 psi pressure rating tool to retrieve probes and coupons.

Figure 10: Hydraulic Retrieval Tool and Service Valve



For more information, refer to the *Roxar Hydraulic Retrieval Tool and Service Valve - Product Data Sheet*.

Model code numbering - Hydraulic Access Fitting System

Model code selector for high pressure access fittings

High pressure access fitting product description

Code	Product description
TAF	High pressure access fitting

Design type for high pressure access fittings

Code	Design type for high pressure access fittings
H	Hydraulic

Pressure rating options for high pressure access fittings

Code	Pressure rating options for high pressure access fittings
1	Max 6,000 psi (413.69 bar) design pressure; Limited by the process connection rating
2 (1)(2)	Max 10,000 psi (689.48 bar) design pressure

(1) Available only with process connections options 00.

(2) Not available with material options 316B, 316F.

Process connections for high pressure access fittings

Code	Process connections for high pressure access fittings
00	2 in Flareweld for 2 in pipe; ASME B31.3
20	2 in Flanged 150 lbs raised face; ASME B16.5
21	2 in Flanged 300 lbs raised face; ASME B16.5
22	2 in Flanged 400 lbs / 600 lbs raised face; ASME B16.5
23	2 in Flanged 900 lbs / 1500 lbs raised face; ASME B16.5
24	2 in Flanged 2500 lbs raised face; ASME B16.5
30	2 in Flanged 150 lbs ring type joint; ASME B16.5
31	2 in Flanged 300 lbs ring type joint; ASME B16.5
32	2 in Flanged 400 lbs / 600 lbs ring type joint; ASME B16.5
33	2 in Flanged 900 lbs / 1500 lbs ring type joint; ASME B16.5
34	2 in Flanged 2500 lbs ring type joint; ASME B16.5

Material for high pressure access fittings

Code	Material for high pressure access fittings
105B ⁽¹⁾⁽²⁾	Carbon steel ASTM A105, bar; NACE MR0175
350B ⁽¹⁾⁽²⁾	Carbon steel ASTM A350 Gr. LF2 Cl. 1, bar; NACE MR0175
605B ⁽¹⁾⁽²⁾	Carbon steel ASTM A694 F60/ F65, bar; NACE MR0175
316B ⁽¹⁾⁽²⁾	Stainless steel ASTM A479 UNS S31603 (316L), bar; NACE MR0175
318B ⁽¹⁾⁽²⁾	Duplex ASTM A479 UNS S31803, bar; NACE MR0175
760B ⁽¹⁾⁽²⁾	Super duplex ASTM A479 UNS S32760, bar; NACE MR0175
625B ⁽¹⁾⁽²⁾	Nickel alloy ASTM B446 UNS N06625, bar; NACE MR0175
825B ⁽¹⁾⁽²⁾	Nickel alloy ASTM B425 UNS N08825, bar; NACE MR0175
105F ⁽²⁾⁽³⁾	Carbon steel ASTM A105, forging; NACE MR0175
350F ⁽²⁾⁽³⁾	Carbon steel ASTM A350 Gr. LF2 Cl. 1, forging; NACE MR0175
605F ⁽²⁾⁽³⁾	Carbon steel ASTM A694 F60/ F65, forging; NACE MR0175
316F ⁽²⁾⁽³⁾	Stainless steel ASTM A182 UNS S31603 (316L), forging; NACE MR0175
318F ⁽²⁾⁽³⁾	Duplex ASTM A182 F51 (UNS S31803), forging; NACE MR0175
760F ⁽²⁾⁽³⁾	Super duplex ASTM A182 F55 (UNS S32760), forging; NACE MR0175
625F ⁽²⁾⁽³⁾	Nickel alloy ASTM B564 UNS N06625, forging; NACE MR0175
825F ⁽²⁾⁽³⁾	Nickel alloy ASTM B564 UNS N08825, forging; NACE MR0175

(1) Available only with process connections option 00, Flareweld.

(2) Requires special tests and certificates options MC or MT.

(3) Not available with process connections option 00, Flareweld.

Operating mode and conditions for high pressure access fittings

Code	Operating mode and conditions
Pressure Rating Code 1 (Maximum 6,000 psi design pressure)	
00 ⁽¹⁾	Not applicable
01 ⁽²⁾	Standard, Viton o-rings, (-4 °F (-20.0 °C) to 392 °F (200.0 °C)), ASTM A193 B7 locking pins
02 ⁽²⁾	Rapid gas decompression, FR25/90 o-rings, (-41.8 F (-41.0 °C) to 392 F (200 °C)), ASTM A193 B7 locking pins
03 ⁽²⁾	Rapid gas decompression and /or 100 % methanol, Elast-O-Lion 101 o-rings, (-20.2 °F (-29.0 °C)) to 320 °F (160.0 °C)), ASTM A193 B7 locking pins
04 ⁽²⁾	Standard, generic FKM 75 o-rings, -4 °F (-20 °C) to 392 °F (200 °C), ASTM A193 B7 locking pins
05 ⁽²⁾	Rapid gas decompression, generic FKM 90 o-rings, (5 °F (-15.0 °C) to 392 °F (200.0 °C)), ASTM A193 B7 locking pins
06 ⁽²⁾	Rapid gas decompression and / or 100% methanol generic HNBR 90 o-rings, (-13 °F (-25.0 °C) to 284 °F (140.0 °C)), ASTM A193 B7 locking pins
Pressure Rating Code 2 (Maximum 10,000 psi design pressure)	
00 ⁽¹⁾	Not applicable
01 ⁽²⁾	Standard, Viton o-rings, (-4 °F (-20.0 °C) to 392 °F (200.0 °C)), ASTM A193 B7 locking pins
02 ⁽²⁾	Rapid gas decompression, FR25/90 o-rings, (-41.8 F (-41.0 °C) to 392 F (200 °C)), ASTM A193 B7 locking pins
03 ⁽²⁾	Rapid gas decompression and /or 100 % methanol, Elast-O-Lion 101 o-rings, (-20.2 °F (-29.0 °C)) to 320 °F (160.0 °C)), ASTM A193 B7 locking pins
04 ⁽²⁾	Standard, generic FKM 75 o-rings, -4 °F (-20 °C) to 392 °F (200 °C), ASTM A193 B7 locking pins
05 ⁽²⁾	Rapid gas decompression, generic FKM 90 o-rings, (5 °F (-15.0 °C) to 392 °F (200.0 °C)), ASTM A193 B7 locking pins
06 ⁽²⁾	Rapid gas decompression and / or 100% methanol generic HNBR 90 o-rings, (-13 °F (-25.0 °C) to 284 °F (140.0 °C)), ASTM A193 B7 locking pins

- (1) Not available with design type option H, Hydraulic.
- (2) Not available with design type option M, Mechanical.

Coating options for high pressure access fittings

Code	Coating options for high pressure access fittings
C0	No coating
C1 ⁽¹⁾⁽²⁾	Roxar standard coating for CS with operating temperature below 248 °F (120.0 °C), RAL 7035
C2 ⁽¹⁾⁽²⁾	Roxar standard coating for CS with operating temperature above 248 °F (120.0 °C), RAL 9006
C6 ⁽¹⁾⁽³⁾	Roxar standard coating for stainless steel, RAL 7035
C7 ⁽¹⁾⁽⁴⁾	Roxar standard coating for nickel alloys, RAL 7035

- (1) Not available with Process Connections option 00, Flareweld.
- (2) Not available with material options 105B, 350B, 605B, 316B, 318B, 760B, 625B, 825B, 316F, 318F, 760F, 625F, 825F.
- (3) Not available with material options 105B, 350B, 605B, 316B, 318B, 760B, 625B, 825B, 105F, 350F, 605F, 625F, 825F.
- (4) Not available with material options 105B, 350B, 605B, 316B, 318B, 760B, 625B, 825B, 105F, 350F, 605F, 316F, 318F, 760F.

Tag Plates for high pressure access fittings

Code	Tag Plates for high pressure access fittings
ZZ	No tag plates
TG	Standard Tag plates for fittings, SS316 with ss bands, Dim 89 x 19mm

Factory options for high pressure access fittings

Code	Factory Options for high pressure access fittings
Z	Standard product

Certificate, tests, calibrations and services for high pressure access fittings

Code	Certificate, tests, calibrations and services (optional) for high pressure access fittings
D1 ⁽¹⁾	Dye penetrant test for access fitting body
PM ⁽¹⁾	Positive material identification for access fitting body (without C content)
PC ⁽¹⁾⁽²⁾	Positive material identification for access fitting body (with C content)
HT	Roxar standard pressure test
PD ⁽³⁾	PED statement of conformity
MG ⁽⁴⁾	Magnetic particle inspection for access fitting body
MC	Material Inspection Certificate 3.1 (supplier lot traceability per EN 10204)
MT	Material Inspection Certificate 3.2 (supplier lot traceability per EN 10204)
MN ⁽⁵⁾	Material requirements according to NORSOK M-630
MN2 ⁽⁶⁾⁽⁷⁾	Material specification type 2

(1) Not available with material options 105B, 350B, 605B, 105F, 350F, 605F.

(2) Not available with material options 625B, 825B, 625F, 825F.

(3) Requires special tests and certificates option HT.

(4) Available only with material options 105B, 350B, 605B, 105F, 350F, 605F.

(5) Not available with material options 605B, 605F, 825B, 825F.

(6) Not available with special tests and certificates options MT, MN.

(7) Not available with material options 605B, 605F.

Model code selector for hydraulic plugs

Product description for plugs

Code	Product description option
TPLUG	Plug

Design type plugs

Code	Design type plug options
H	Hydraulic

Plug type

Code	Plug type
10	Solid plug (suitable for hydrotest); Nut in plastic
11	Solid plug (suitable for hydrotest); Metallic nut – same material as plug body
20	Hollow plug (not suitable for hydrotest); Sealing plug in plastic
21	Hollow plug (suitable for hydrotest); Metallic sealing plug – same material as plug body
30	Reinforced plug (not suitable for hydrotest); Sealing plug in plastic
31	Reinforced plug (suitable for hydrotest); Metallic sealing plug – same material as the plug body

Material plug body

Code	Material plug body
316B ⁽¹⁾	Stainless steel ASTM A479 UNS S31603 (316L), bar, NACE MR0175
318B ⁽¹⁾	Duplex ASTM A479 UNS S31803, bar, NACE MR0175
625B ⁽¹⁾	Inconel ASTM B446 UNS N06625, bar, NACE MR0175
760B ⁽¹⁾	Super duplex ASTM A479 UNS S32760, bar, NACE MR0175
825B ⁽¹⁾	Incoloy ASTM B425 UNS N08825, bar, NACE MR0175

(1) Requires special tests and certificates options MC or MT.

Operating mode and condition for plugs

Code	Operating mode and conditions
00	O-ring not applicable; PTFE primary packing

Product specific options for plugs

Code	Product specific options for plugs
C0	No coating

Factory option for plugs

Code	Factory options
Z	Standard product

Certificates, tests, calibrations, and services for plugs

Code	Certificates, tests, calibrations and services (optional)
D1	Dye penetrant test for plug body
PM	Positive material identification for plug body (without C content)
PC ⁽¹⁾	Positive material identification for plug body (with C content)
PD ⁽²⁾	PED statement of conformity
MC	Material inspection certificate 3.1 (supplier lot traceability per EN 10204)
MT	Material inspection certificate 3.2 (supplier lot traceability per EN 10204)
MN ⁽³⁾	Material requirements according to NORSOK M-630
MR ⁽⁴⁾	Material specification type 2

(1) Not available with Material Plug Body options 625B, 825B.

(2) Not available with plug type option 11, and operating mode and conditions option 00.

(3) Not available with material plug body option 825B.

(4) Not available with special tests and certificate options MT, MN.

Model code selector for covers

Product description

Model	Product description
TCOV	Cover

Design type

Code	Design type
H	Hydraulic

Pressure rating

Code	Pressure rating
1	Maximum 6,000 psi (413.69 bar) design pressure
2 ⁽¹⁾	Maximum 10,000 psi (689.48 bar) design pressure

(1) Not available with material option 316B.

Cover design

Code	Cover design
Pressure rating Code 1 (Maximum 6,000 psi design pressure)	
00	Heavy duty without hole
01	Heavy duty with hole
02	Pressure proof for solid plug
03	Pressure proof for hollow plug
Pressure rating Code 2 (Maximum 10,000 psi design pressure)	
00	Heavy duty without hole
01	Heavy duty with hole
02	Pressure proof for solid plug
03	Pressure proof for hollow plug

Material

Code	Material
105B ⁽¹⁾	Carbon steel ASTM A105, bar, NACE MR0175
316B ⁽¹⁾	Stainless steel ASTM A479 UNS S31603 (316L) bar, NACE MR0175
318B ⁽¹⁾	Duplex ASTM A479 UNS S31803, bar NACE MR0175
350B ⁽¹⁾	Carbon steel ASTM A350 Gr. LF2 Cl. 1, bar, NACE MR0175
605B ⁽¹⁾	Carbon steel ASTM A694 F60/ F65, bar, NACE MR0175
625B ⁽¹⁾	Inconel ASTM B446 UNS N06625, bar, NACE MR0175
760B ⁽¹⁾	Super duplex ASTM A479 UNS S32760, bar, NACE MR0175
825B ⁽¹⁾	Incoloy ASTM B425 UNS N08825, bar, NACE MR0175

(1) Requires special tests and certificates option MC or MT.

Operating mode and conditions

Code	Operating mode and conditions
Pressure Rating Code 1 (Maximum 6,000 psi design pressure)	
00 ⁽¹⁾	Not applicable
01 ⁽²⁾	Standard; Viton o-ring (-4 °F (-20 °C) to 392 °F (200 °C))
02 ⁽²⁾	Rapid gas decompression; FR 25/90 o-ring (-42 °F (-41 °C) to 392 °F (200 °C))
03 ⁽²⁾	Rapid gas decompression and/or 100% methanol Elast-O-Lion 101 o-ring (-21 °F (-29 °C) to 320 °F (160 °C))
04 ⁽²⁾	Standard; generic FKM 75 o-ring (-4 °F (-20 °C) to 392 °F (200 °C))
05 ⁽²⁾	Rapid gas decompression Generic FKM 90 o-ring (5 °F (-15 °C) to 392 °F (200 °C))
06 ⁽²⁾	Rapid gas decompression or 100% methanol; generic HNBR 90 o-ring (-13 °F (-25 °C) to 284 °F (140 °C))
Pressure Rating Code 2 (Maximum 10,000 psi design pressure)	
00 ⁽¹⁾	Not applicable
01 ⁽²⁾	Standard Viton o-rings (-4 °F (-20 °C) to 392 °F (200 °C))
02 ⁽²⁾	Rapid gas decompression FR 25/90 o-rings (-42 °F (-41 °C) to 392 °F (200 °C))
03 ⁽²⁾	Rapid gas decompression and/or 100% methanol Elast-O-Lion 101 o-rings (-21 °F (-29 °C) to 320 °F (160 °C))
04 ⁽²⁾	Standard; generic FKM 75 o-rings (-4 °F (-20 °C) to 392 °F (200 °C))
05 ⁽²⁾	Rapid gas decompression; generic FKM 90 o-rings, (5 °F (-15 °C) to 392 °F (200 °C))
06 ⁽²⁾	Rapid gas decompression or 100% methanol; generic HNBR 90 o-rings (-13 °F (-25 °C) to 284 °F (140 °C))

(1) Not available with cover design options 02, 03.

(2) Not available with cover design options 00, 01.

Product specific options

Code	Product specific options
C0	No coating
C1 ⁽¹⁾	Roxar standard coating for carbon steel with operating temperature below 248 °F (120 °C), RAL 7035
C2 ⁽¹⁾	Roxar standard coating for carbon steel with operating temperature above 248 °F (120 °C), RAL 9006
C6 ⁽²⁾	Roxar standard coating for stainless steel, RAL 7035
C7 ⁽³⁾	Roxar standard painting for nickel alloys, RAL 7035

(1) Not available with material options 316B, 318B, 760B, 625B, 825B.

(2) Not available with material options 105B, 350B, 605B.

(3) Available only with material options 625B, 825B.

Probe adapter

Code	Probe adapter
Z	No probe adapter
A ⁽¹⁾	Standard probe adapter for pressure-proof cover

(1) Not available with cover design options 00, 01, 02.

Factory options

Code	Factory options
Z	Standard product

Certificates, tests, calibrations, and services (optional)

Code	Certificates, tests, calibrations and services (optional)
D1 ⁽¹⁾	Dye penetrant test for cover body
PM ⁽¹⁾⁽²⁾	Positive material identification for cover body (without C content)
PC ⁽¹⁾⁽³⁾	Positive material identification for cover body (with C content)
PD ⁽⁴⁾	PED statement of conformity
MG ⁽⁵⁾	Magnetic particle inspection for cover body
MC	Material inspection certificate 3.1 (supplier lot traceability per EN 10204)
MT	Material inspection certificate 3.2 (supplier lot traceability per EN 10204)
MN ⁽⁶⁾	Material requirements according to NORSOK M-630
MR ⁽⁷⁾⁽⁸⁾	Material specification type 2

(1) Not available with material options 105B, 350B, 605B.

(2) Not available with Special Tests and Certificates option PC.

(3) Not available with material options 625B, 825B.

(4) Not available with cover design options 00,01.

(5) Not available with material options 316B, 318B, 760B, 625B, 825B.

(6) Not available with material options 605B, 825B.

(7) Not available with special tests and certificates options MT, MN.

(8) Not available with material option 605B.

Model code selector for probes

Product description

Code	Product description
THCMPR	Corrosion monitoring probe

Measuring methods for probes

Code	Measuring methods for probes
1	Electrical resistance
2	Linear polarization resistance
3	Galvanic monitoring

Probe body type

Code	Probe body type
01	Standard design fixed length
05	Reinforced design, fixed length (no support ring)

Probe body material

Code	Probe body material
316B ⁽¹⁾	Stainless steel ASTM A479 UNS S31603 (316L), bar; NACE MR0175
318B ⁽¹⁾	Duplex ASTM A479 UNS S31803, bar; NACE MR0175
760B ⁽¹⁾	Super duplex ASTM A479 UNS S32760, bar; NACE MR0175
625B ⁽¹⁾	Inconel ASTM B446 UNS N06625, bar; NACE MR0175
825B ⁽¹⁾	Incoloy ASTM B425 UNS N08825, bar; NACE MR0175

(1) Requires Special Tests and Certificates options MC or MT.

Element type

Code	Element type
00 ⁽¹⁾	Flush, Repto D 1.0 mm
01 ⁽¹⁾	Flush, Repto D 2.0 mm
02 ⁽¹⁾	Flush, Repto D 4.0 mm
03 ⁽¹⁾	Flush, Repto E 0.25 mm
04 ⁽¹⁾	Flush, Repto E 0.50 mm
05 ⁽¹⁾	Flush, Repto F (HS) 0.10 mm
10 ⁽¹⁾	Tubular, T10, (0.25 mm)
11 ⁽¹⁾	Tubular, T20, (0.50 mm)
20 ⁽²⁾	Flush, double B
30 ⁽²⁾	Projected, double C
21 ⁽²⁾	Flush, triple B
31 ⁽²⁾	Projected, triple C
40 ⁽³⁾	Flush, Galvopro B
50 ⁽³⁾	Projected, Galvopro C

(1) Available only with Measuring Method option 1, Electrical Resistance.

(2) Available only with Measuring Method option 2, Linear Polarization Resistance.

(3) Available only with Measuring Method option 3, Galvanic Monitoring.

Element material

Code	Element material
Any element type	
S	Standard carbon steel S355J2 (EN10025), for general application
Element type 04	
A	For carbon steel pipes of A106 Gr. B, A333 Gr. 6, API 5L Gr. B, API 5L Gr. X42
B	For carbon steel pipes of API 5L Gr. X52, API 5L Gr. X60, API 5L Gr. X65
C	For stainless steel pipes 316L (UNS S31603)
D	For duplex stainless steel pipes 22Cr (UNS S31803)
Element types 30, and 31	
A	For carbon steel pipes of A106 Gr. B, A333 Gr. 6, API 5L Gr. B, API 5L Gr. X42
B	For carbon steel pipes of API 5L Gr. X52, API 5L Gr. X60, API 5L Gr. X65
C	For stainless steel pipes 316L (UNS S31603)
D	For duplex stainless steel pipes 22Cr (UNS S31803)

Probe length

Code	Probe length
000	Length must be defined before an order can be accepted For flush design measurements, the minimum length is 055 mm and the maximum length is 534 mm. For projected design measurements, the minimum length is 78 mm and the maximum length is 643 mm.

Factory options

Code	Factory options
Z	Standard product

Certificates, tests, calibrations, and services (optional)

Code	Certificates, tests, calibrations, and services (optional)
Dye penetrant examination (select any from this group)	
D1	Dye penetrant test for probe housing
Positive material testing (select only one from this group)	
PM ⁽¹⁾	Positive material identification for probe housing (without C content)
PC ⁽²⁾	Positive material identification for probe housing (with C content)
Pressure testing (select any from this group)	
PT	10000 psi (690 bar) test certificate
Additional raw material testing	
MC	Material inspection certificate 3.1 (supplier lot traceability per EN 10204)
MT	Material inspection certificate 3.2 (supplier lot traceability per EN 10204)
MN ⁽³⁾	Material requirements according to NORSOK M-630
MR ⁽⁴⁾	Material specification type 2

- (1) Not available with Special Tests and Certificates option PC.
- (2) Not available with Probe Body Material options 625B, 825B.
- (3) Not available with Probe Body Material option 825B.
- (4) Not available with Special Tests and Certificates options MT, MN.

Sand probe

Product description

Model	Product description
THSMPR	Sand/Erosion Monitoring Probe

Pipe size

Code	Pipe Size
1	3 in pipe, 2 elements
2	4 in pipe, 2 elements
3	5-6 in pipe, 3 elements
4	6 in pipe, 4 elements
5	8-10 in pipe, 4 elements
6	12 in pipe, 4 elements

Probe body type

Code	Probe body type
01	Standard design
02	Reinforced design, fixed length for access fitting Flareweld
03	Reinforced design, fixed length for access fitting flanged MECH \leq 300#, HYD \leq 1500#
04	Reinforced design, fixed length for access fitting flanged MECH \geq 4/600#, HYD 2500#

Probe body material

Code	Probe body material
2C6A	Stainless steel A 479 Gr. 316L, bar EN 10204 3.1 NACE MR0175
2D6A	Duplex A 276 / A 479 UNS S31803, bar EN 10204 3.1 NACE MR0175
2C6C	Stainless steel A 479 Gr. 316L, bar EN 10204 3.1 NACE MR0175 NORSOK M630 MDS S01
2D6C	Duplex A 276 / A 479 UNS S31803, bar EN 10204 3.1 NACE MR0175 NORSOK M630 MDS D47

Element thickness and material

Code	Element thickness and material
3M	300 micron, Monel 400
5M	500 micron, Monel 400
2D	300 micron, duplex
3D	500 micron, duplex

Probe length

Code	Probe length
L124 ⁽¹⁾⁽²⁾	Standard length for Flareweld fittings, standard design
L146 ⁽²⁾⁽³⁾	Standard length for Flareweld fittings, standard design
L173 ⁽²⁾⁽⁴⁾	Standard length for Flareweld fittings, standard design
L193 ⁽²⁾⁽⁵⁾	Standard length for Flareweld fittings, standard design
L244 ⁽²⁾⁽⁶⁾	Standard length for Flareweld fittings, standard design
L336 ⁽²⁾⁽⁷⁾	Standard length for Flareweld fittings, standard design
L138 ⁽¹⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design
L160 ⁽³⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design
L187 ⁽⁴⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design
L207 ⁽⁵⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design
L258 ⁽⁶⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design
L350 ⁽⁷⁾⁽⁸⁾	Standard length for Flareweld fittings, reinforced design

- (1) Available only with pipe size option 1, 3 in pipe, 2 elements.
- (2) Available only with probe body type options 01, standard design.
- (3) Available only with pipe size option 2, 4 in pipe, 2 elements.
- (4) Available only with pipe size option 3, 5 - 6 in pipe, 3 elements.
- (5) Available only with pipe size option 4, 6 in pipe, 4 elements.
- (6) Available only with pipe size option 5, 8 - 10 in pipe, 4 elements.
- (7) Available only with pipe size option 6, 12 in pipe, 4 elements.
- (8) Available only with probe body type option 02, reinforced design, fixed length for access fitting Flareweld.

Factory options for the Hydraulic Retrieval Tool

Code	Factory options for the Hydraulic Retrieval Tool
Z	Standard product

Factory option

Code	Factory options
Z	Standard product

Certificate, tests, calibrations and services (optional)

Code	Certificates, tests, calibrations, and services (optional)
D1	Dye penetrant test
PM	Positive material identification
PT	10000 psi (690 bar) test certificate

Model selector for corrosion coupons

Product description

Code	Product description
THCOUP	High pressure corrosion coupon assembly

Coupon type

Code	Coupon type
0	Strip
1	Scale
2	Disc
3	Bio

Coupon material

Code	Coupon material
N0	Not applicable; coupon and insulation not included
C1	Carbon steel S355J2 (EN10025); Insulation included
C2 ⁽¹⁾	Carbon steel AISI 1018; Insulation included
C3 ⁽¹⁾	Carbon steel ASTM A106 Gr, B; Insulation included
C4 ⁽¹⁾	Carbon steel ASTM A333 Gr, B; Insulation included
C5 ⁽¹⁾	Carbon steel API 5L Gr, B; Insulation included
C6 ⁽¹⁾	Carbon steel API 5L Gr, X52; Insulation included
C7 ⁽¹⁾	Carbon steel API 5L Gr, X60; Insulation included
C8 ⁽¹⁾	Carbon steel API 5L Gr, X65; Insulation included
S1	Stainless steel 316L UNS S31603; Insulation included
S2	Duplex stainless steel UNS S31803; Insulation included

(1) Not available with Coupon Type option 3.

Coupon holder design

Code	Coupon holder design
01	Standard design, fixed length
05	Reinforced design, fixed length (no support ring)

Coupon holder material

Code	Coupon holder material
316B ⁽¹⁾	Stainless steel ASTM A479 UNS S31603 (316L), bar NACE MR0175
318B ⁽¹⁾	Duplex ASTM A479 UNS S31803, bar NACE MR0175
760B ⁽¹⁾	Super duplex ASTM A479 UNS S32760, bar; NACE MR0175
625B ⁽¹⁾	Inconel ASTM B446 UNS N06625, bar; NACE MR0175
825B ⁽¹⁾	Incoloy ASTM B425 UNS N08825, bar; NACE MR0175

(1) Requires Special Tests and Certificates options MC or MT.

Coupon holder length

Code	Coupon holder length
000	Length has to be defined before order can be accepted
060-149 ⁽¹⁾	Coupon holder length, mm
150-700	Coupon holder length, mm

(1) Not available with Coupon Holder Design, option 05.

Pipe insertion length

Code	Pipe insertion length
NNN	Not applicable

Coupon holder option

Code	Coupon holder options
Z	Standard

Factory options

Code	Factory options
Z	Standard product

Certificates, tests, calibrations, and services (optional)

Code	Certificates, tests, calibrations, and services (optional)
Dye penetrant examination (select any from this group)	
D1	Dye penetrant test for coupon holder
Positive material testing (select only one from this group)	
PM ⁽¹⁾	Positive material identification for coupon holder (without C content)
PC ⁽²⁾	Positive material identification for coupon holder (with C content)
Additional raw material testing	
MC	Material inspection certificate 3.1 (supplier lot traceability per EN 10204)
MT	Material inspection certificate 3.2 (supplier lot traceability per EN 10204)
MN ⁽³⁾	Material requirements according to Norsok M-630
MR ⁽⁴⁾	Material specification type 2

- (1) Not available with Special Tests and Certificates option PC.
- (2) Not available with Coupon Holder Material options 625B, 825B.
- (3) Not available with Coupon Holder Material option 825B.
- (4) Not available with Special Tests and Certificates options MT, MN.

Model code selector for the Hydraulic Retrieval Tool

Product description for Hydraulic Retrieval Tool

Code	Product description for Hydraulic Retrieval Tool
HRT	Hydraulic retrieval tool

Pressure rating for the Hydraulic Retrieval Tool

Code	Pressure rating for the Hydraulic Retrieval Tool
1	Maximum 6,000 psi design pressure
2 ⁽¹⁾⁽²⁾	Maximum 10,000 psi design pressure

(1) Available only with valve design option B, Double Isolation Valve.

(2) Only available with tool length options L03, L05, and L07.

Valve design for the Hydraulic Retrieval Tool

Code	Valve design for the Hydraulic Retrieval Tool
A	Single isolation service valve
B	Double isolation service valve

Tool length for the Hydraulic Retrieval Tool

Code	Tool length for the Hydraulic Retrieval Tool
L01 ⁽¹⁾	Maximum device length: 5 in (130 mm)
L02 ⁽¹⁾	Maximum device length: 8 in (200 mm)
L03 ⁽²⁾	Maximum device length: 9 in (230 mm)
L05	Maximum device length: 16 in (400 mm)
L07	Maximum device length: 24 in (600 mm)
L09	Maximum device length: 31 in (800 mm)
L11	Maximum device length: 39 in (1,000 mm)

(1) Available only with valve design option A, Single Isolation Valve.

(2) Available only with valve design option B, Double Isolation Valve.

Tool material for the Hydraulic Retrieval Tool

Code	Tool material (main components) for the Hydraulic Retrieval Tool
2G6A	Alloy 17-4PH (UNS S17400) cylinder EN 10204 3.1 NACE MR0175

Operating mode and conditions for Hydraulic Retrieval Tool

Code	Pressure rating code 1 (Maximum 6,000 psi design pressure) and Pressure rating code 2 (Maximum 10,000 psi design pressure)
01	Standard, Viton o-rings, -4 °F (-20.0 °C) to 392 °F (200.0 °C)
02	Rapid gas decompression, FR25/90 o-rings, -41.8 °F (-41.00 °C) to 392 °F (200.0 °C)
03	Rapid gas decompression and/or 100 % methanol, Elast-O-Lion 101 o-rings, -20.2 °F (-29.00 °C) to 320 °F (160.0 °C)

Approvals for the Hydraulic Retrieval Tool

Code	Approvals for the Hydraulic Retrieval Tool
M	ROXAR standard (no third party approval)
N ⁽¹⁾	PED compliant tool

(1) Only available with tool material (main components), option 2G6A.

Tag plates for the Hydraulic Retrieval Tool

Code	Tag plates for the Hydraulic Retrieval Tool
ZZ	No tag plates
TG	Standard tag plates

Factory options for the Hydraulic Retrieval Tool

Code	Factory options for the Hydraulic Retrieval Tool
Z	Standard product

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