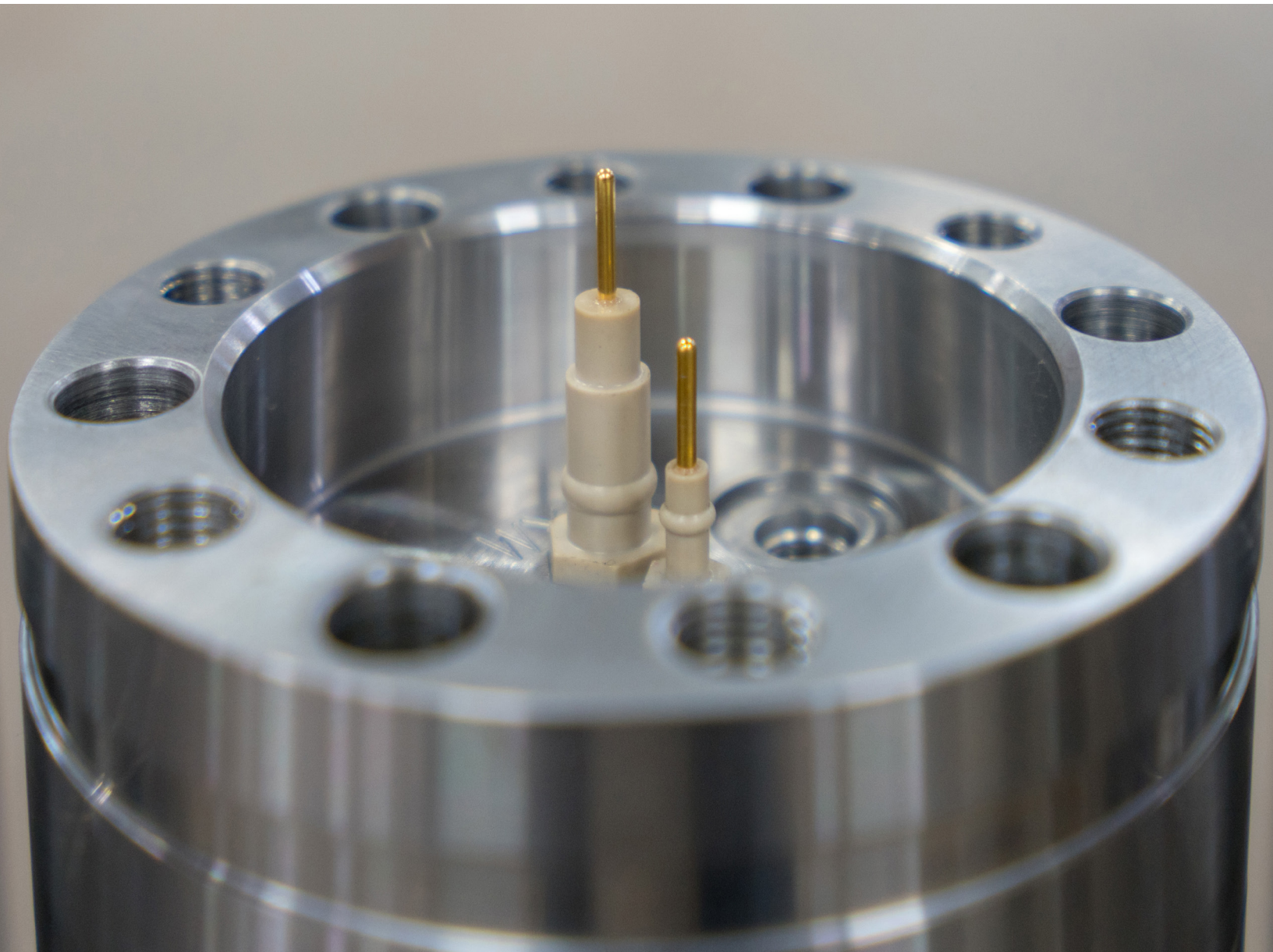




# Triton<sup>®</sup> gauges

Downhole gauge provides superior  
asset surveillance and data acquisition



# Triton® gauges

## The next generation of downhole gauges

Summit ESP® – A Halliburton Service proudly presents the next generation of downhole gauges with leading-edge technology that provides superior asset surveillance capability, protection, and data acquisition. Triton® 7 channel (T7-125 or T7-150) or Triton 8 channel (T8-150) downhole gauges can be used with a variety of electric submersible pump (ESP) motors using specially-designed, bolt-on adapters.

Triton downhole gauges are easy to install, easy to operate, and use a waterproof wye-point connection. Telemetry to the surface is accomplished by superimposing DC signals on a traditional 5 KV ESP power cable. At the surface, these signals are translated into usable data values by the Triton Surface Interface (TSI) and are displayed on the advanced technology Summit ESP ACS®-15 variable speed drive (VSD) operator interface.

FEATURES	BENEFITS
Sealed electronics	Gauge communication maintained if well fluid penetrates ESP motor / seal assembly
Industry leading transducer accuracy	Increases reliability of gauge operation, reducing chance of damage
Downhole data displayed directly on VSD interface	Better data reliability and accessibility
Remote access via SCADA and Summit ESP® Monitoring Service	Improved decision-making capability based upon current information
Adaptability for RS-485, Ethernet, AO, DI, competitive Modbus Maps	Configurability for special applications
Custom alarming and notification configured directly on VSD	Optimization of well production
24 x 7 asset monitoring	Improved production and equipment run life – continuous asset health knowledge
Easy integration into Summit ESP VSDs and switchboards	Reduced time and cost for start up
Compatible with all ESP OEM providers	Lower installation cost
Slim hole compatible – 3-3/4" (9.5 cm) O.D.	Easily installed with 375 / 338 series ESP equipment
Stainless steel metallurgy (optional)	Improved corrosion resistance
Industry leading 20,000 pound connection weight	Allows adding more accessory equipment to string

No need to operate “blind” when critical “real-time” data can be acquired using Triton downhole gauges. The acquired data can then be transmitted via Modbus protocol or SCADA to a surveillance center through Summit ESPs well surveillance and remote control service. Analysis can then be performed by our team of petroleum engineers to ensure continuous operation and optimized production, which helps increase run-life and reduce OPEX.

Reservoir life cycles can be improved by using Triton downhole gauges, in conjunction with proactive data evaluation philosophies, to prevent or to reduce formation damage caused by over-production. Triton gauges can provide data to identify water or gas break-through by monitoring intake fluid temperature and pressure.



Acquired data from the Triton® gauge is transmitted via modbus protocol or SCADA to a surveillance center through summit ESPs well surveillance and remote control service.

Performance parameters

PARAMETER	BENEFITS
Intake Pressure	<ul style="list-style-type: none"><li>Monitor well draw down rate</li><li>Static or dynamic fluid levels</li><li>Production problem forewarning e.g. gas fraction increase, gas lock</li><li>Pump off</li><li>Reservoir formation changes or damage</li><li>Perf plugging</li><li>Annulus inflow conditions</li></ul>
Discharge Pressure	<ul style="list-style-type: none"><li>Production problem e.g. gas fraction increase, gas lock</li><li>Tubing or casing leaks</li><li>Pump scaling, asphaltine build up, other</li><li>Pump wear</li><li>Broken pump shaft</li><li>Fluid density changes</li></ul>
Intake Temperature	<ul style="list-style-type: none"><li>Detect changes in fluid temperature</li><li>Reservoir formation changes</li><li>Water break through</li></ul>
Motor Temperature	<ul style="list-style-type: none"><li>Forewarns of impending motor damage</li><li>Change in motor operation – mechanical and electrical</li><li>Excessive loading of thrust bearing</li><li>Sustained overload conditions</li><li>Pump performance</li><li>Change in fluid flow past motor</li><li>Pump off – gas lock</li></ul>

Prognostic parameters

PARAMETER	BENEFITS
Gauge Input Voltage Monitoring	<ul style="list-style-type: none"><li>Ensures proper voltage for telemetry and gauge diagnostic assistance</li><li>Cable diagnostics, e.g. fluid intrusion, grounded cable</li></ul>
Current Leakage	<ul style="list-style-type: none"><li>Monitoring of motor cable insulation health</li><li>Data points for trend analysis of ESP health</li></ul>
Vibration	<ul style="list-style-type: none"><li>ESP string mechanical damage</li><li>High fluid solids content</li><li>Debris ingestion by pump</li><li>Gas fraction increase</li><li>Data points for trend analysis of ESP health</li></ul>

Technical specifications

	T7 125°C (257°F)	T7 150°C (302°F)	T8 150°C (302°F)	OPERATING RANGE	ACCURACY	RESOLUTION
Intake Pressure	x	x	x	Up to 5,800 psi Up to 400 bar)	0.17% FS	0.1 psi
Discharge Pressure			x	Up to 5,800 psi (Up to 400 bar)	0.17% FS	0.1 psi
Intake Temperature	x	x	x	150°C (302°F)	1% FS	0.1°C
Motor Temperature	x	x	x	250°C (482°F)	1% FS	0.1°C
Gauge Input Voltage	x	x	x	55 – 130 VDC	0.020000	0.1 VDC
Current Leakage	x	x	x	0 – 25 mA	±0.1 mA	0.1 mA
Vibration X	x	x	x	±6 g P-P	1% FS	0.1 g
Vibration Y	x	x	x	±6 g P-P	1% FS	0.1 g
Metallurgy	Carbon Steel	Stainless Steel or Carbon Steel	Stainless Steel			

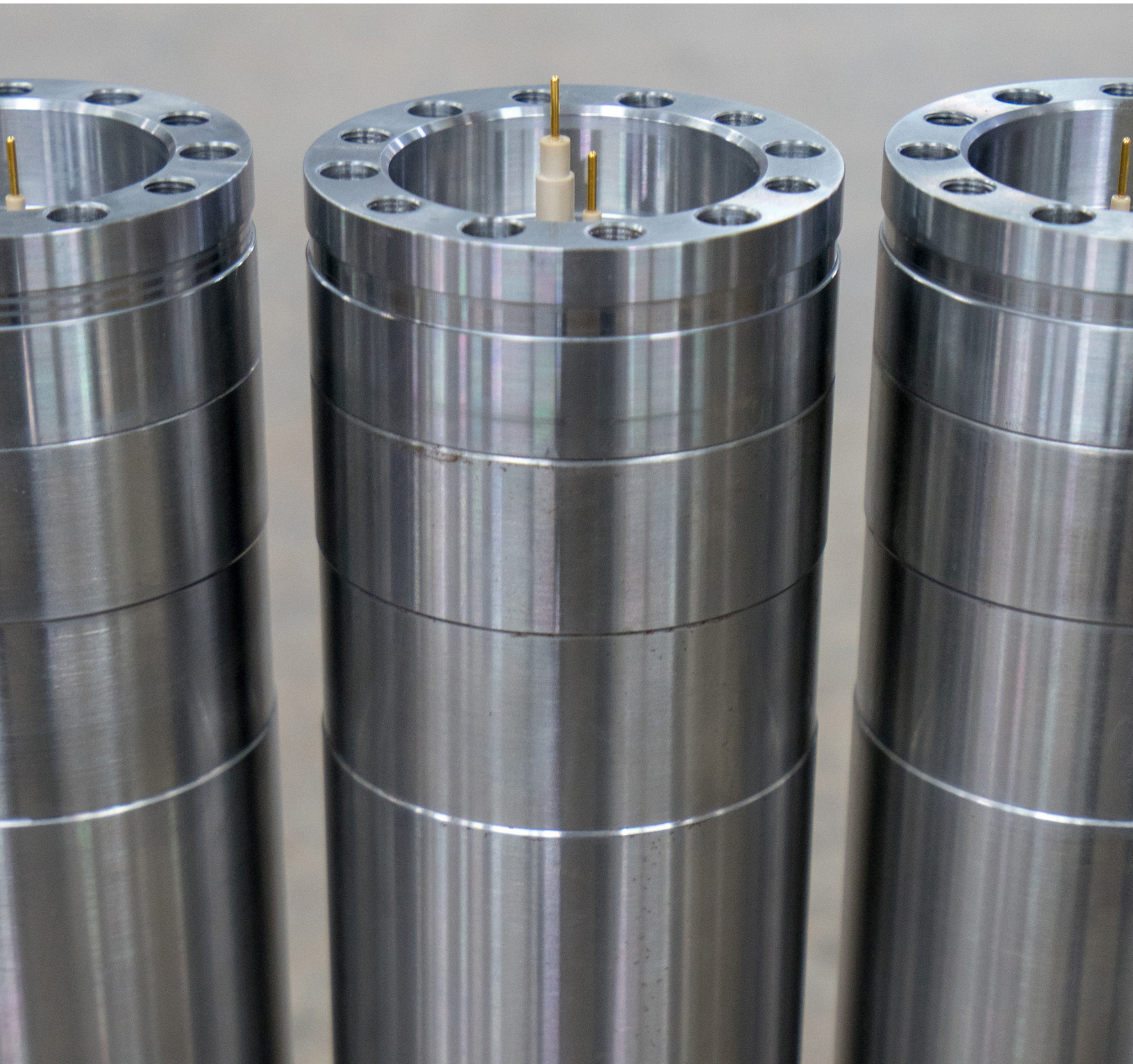
Mechanical characteristics

LENGTH	O.D.	WEIGHT	CONNECTION WEIGHT	CONNECTION THREAD
20-1/2" (52 cm)*	3-3/4" (9.5 cm)	<30 lbs. (13.6 kg)	20,000 lbs (9,702 kg)	2-3/8" (6 cm) 8 Rd EUE

\*Length without motor adapter

Discharge kits

MOTOR EQUIPMENT	PRODUCTION TUBING
375 Series	2-3/8" (6 cm) 8 rd EUE
456 Series	2-7/8" (7.3 cm) 8 rd EUE
562 Series	2-7/8" (7.3 cm) 8 rd EUE
562 Series	3-1/2" (8.9 cm) 8 rd EUE





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**For more information, contact your local Halliburton representative or visit us on the web at [www.halliburton.com](http://www.halliburton.com)**

Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

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