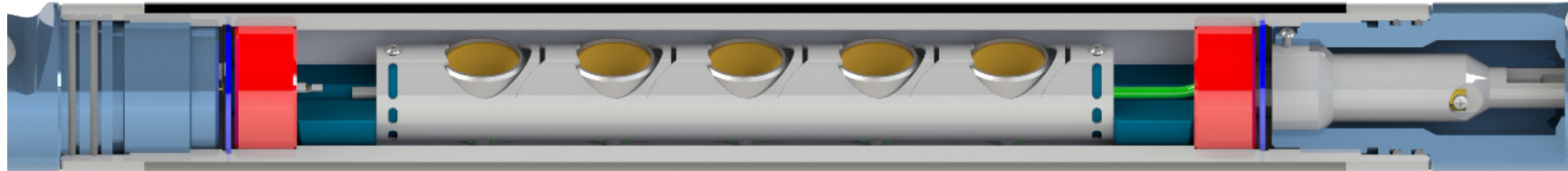


TECHNICAL INFORMATION:

3.125" Pressure Select Fire Switches



The Owen Oil Tools ZERO180 gun system provides the latest technology in oriented perforating. Designed for horizontal wells, the ZERO180 system lowers completion costs and increases production results. The new generation wireline version of the ZERO180 offers a patented electrical contact design which allows the system to rotate freely without wearing or damaging electrical connections. The shaped charges are oriented with an eccentrically weighted charge tube assembly. This patented weight system provides high torque to ensure accuracy of rotation and shot placement. This ZERO180 system is compatible with Wireline select fire pressure switch systems.

CASE STUDY: The Owen Oil Tools, LP ZERO180 Oriented Perforating Gun System was successfully used to Plug and Perf a horizontal shale well in western Canada. This well utilized fiber optic located on the outside of the casing for real time monitoring. The ZERO180 perforating guns were oriented to avoid perforating the fiber optic line. The toe of the well was perforated with Coiled Tubing deployed ZERO180 perforating guns configured with the HTD-BLAST time delay system. The wireline pump down Plug and Perf operation was completed with ZERO180 guns configured with addressable select fire switches. A total of 140 ZERO180 perforating guns successfully perforated the 20 stage well while avoiding perforating the fiber optic line.

ADVANTAGES:

- Orientation accuracy +/- 8°
- Uniform hole size & accurate shot placement
- Reduces break-down and treating pressures
- Simple and quick gun assembly
- Electrical contacts reduce connections and ensure free rotation
- Charge tube rotates within gun carrier - not affected by well bore debris
- No additional downhole equipment
- Quick adjustable orientation
- US Patent 9,903,185

SPECIFICATIONS:

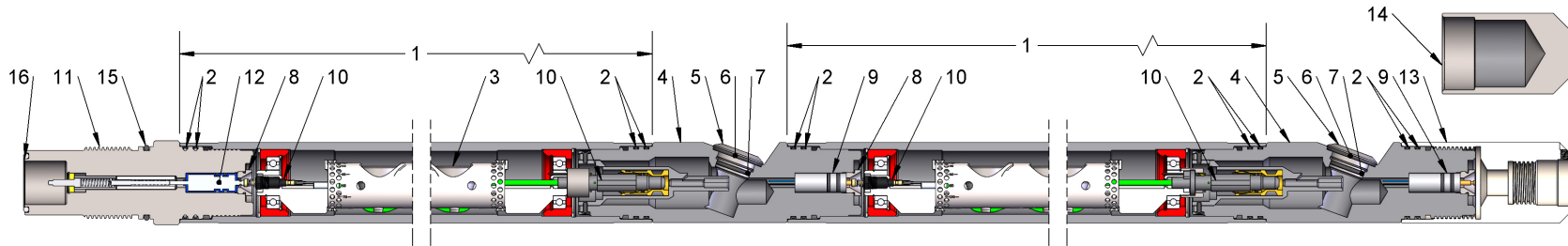
O.D.	79.375 MM	3.125"
PRESSURE RATING	144.8 Mpa	21,000 psi
TEMPERATURE	UP TO 175°C	UP TO 350°F
TENSILE STENGTH	80 070 daN	180,000 lbs
CARRIER THREAD	2.755" - 6 ACME - 3G	
TORSIONAL YIELD	4 475 N*m	3,300 lb-ft

NOTES:

- The maximum string length lifted from horizontal with the ZERO180 system should be limited to 65' (19.8m) when run with the angled side port sub (TAG-3125-281SBZ). Exceeding this string length could result in permanent deformation from string bending while lifting from horizontal.

TECHNICAL INFORMATION:

3.125" Pressure Select Fire Switches



GUN SYSTEMS:

ITEM	PART NUMBER	DESCRIPTION
1	S31-0548-O019ZA	Orienting Gun, 3.125IN, 0°, 4 Holes, 1.90FT (0.36M)
	S31-0548-O023ZA	Orienting Gun, 3.125IN, 0°, 6 Holes, 2.28FT (0.69M)
	S31-0548-O035ZA	Orienting Gun, 3.125IN, 0°, 12 Holes, 3.5FT (1.07M)
	S31-0548-R019ZA	Orienting Gun, 3.125IN, 0°/180°, 4 Holes, 1.90FT (0.36M)
	S31-0548-R023ZA	Orienting Gun, 3.125IN, 0°/180°, 6 Holes, 2.28FT (0.69M)
	S31-0548-R035ZA	Orienting Gun, 3.125IN, 0°/180°, 12 Holes, 3.5FT (1.07M)

COMPONENTS:

ITEM	PART NUMBER	DESCRIPTION
2	OOO-N569-230	O-Ring, #230, 90 Duro Nitrile
	OOO-V569-230	O-Ring, #230, 90 Duro Viton
3	ZRO-3119-330	Zero180 Charge, 19 Gram, RDX
--	DET-3050-429	Bi-Directional Booster
--	--	Detonating Cord, 80 gr., RD, RDX LS, HMX LS
--	DET-3050-300	300 Detonator
4	TAG-3125-281SBZ	Angled Port Tandem Select Fire Switch Sub
5	WT-401-0007-000	Side Port Plug with Dual O-ring Seal
6	OOO-N569-224	O-Ring, #224, 90 Duro Nitrile
	OOO-V569-224	O-Ring, #224, 90 Duro Viton
7	OOO-N569-216	O-Ring, #216, 90 Duro Nitrile
	OOO-V569-216	O-Ring, #216, 90 Duro Viton
8	SFS-BVRN-038	Bevel Switch Retaining Nut, 3/8" Bore
9	--	Select Fire Switch Negative
	--	Select Fire Switch Positive
10	ZRO-3125-000	Electrical Contact Kit for 3.125" Zero180 Wireline*
11	ZRO-3125-040S	Zero180 3.125" Short Top Contact Sub
--	ZRO-3125-040SK	Short Top Contact Sub Redress Kit
12	S-M1-11	NEXUS Solid Feethru Bulkhead, 2" Lg
13	TAG-3125-073	Plug & Shoot Adapter, QC Style
14	ZRO-3125-162	Zero180 3.125" Box Bull Plug
15	OOO-N569-332	O-Ring, #332, 90 Duro Nitrile
	OOO-V569-332	O-Ring, #332, 90 Duro Viton
16	OOO-N569-328	O-Ring, #328, 90 Duro Nitrile
	OOO-V569-328	O-Ring, #328, 90 Duro Viton
--	ZRO-3125-791	Gun Thread & Contact Tube Protector