

METAL to METAL MOTORS GUIDE

SRT METAL to METAL DOWHOLE MOTORS Thru-Tubing Performance Motor Sizes 1-11/16" – 3-1/8"

SR'I

2024

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SRT METAL to METAL DOWNHOLE MOTOR

Thru-Tubing Performance Motor Sizes 1-11/16" - 3-1/8"

The SRT Downhole Thru-Tubing Metal to Metal Motor incorporates our Patented Short Radius Technology that features a Metal to Metal Rotor & Stator with a wide range of torque, speed, and flow rates to convert hydraulic fluid energy, created by flow and pressure, into mechanical energy and improves operational performance from previous configurations. The Metal to Metal SRT was designed to handle extreme hot holes, corrosion resistance to acids, nitrogen, solvents and high chloride fluids. The Metal to Metal SRT eliminates any elastomer rubber throughout the motor preventing swelling, rubber chunking and debonding. This positive displacement motor produces optimum power output with maximum efficiency for today's extreme Thru-Tubing Drilling demands.

DESIGN ADVANTAGES & BENEFITS

- The SRT Metal to Metal Motor incorporates a metal-metal power section that allows temperatures to 500°F, eliminates nitrogen swelling of elastomer as there is no rubber in the motor and can be run with adverse fluids. This unique patented design that utilizes thrust bearings in an on-bottom and off-bottom operation and improves the load bearing capability.
- NO spacers or shims are needed to make-up slack in the thrust bearings during assembly as typically associated with today's angular contact bearings. Instead a compression tension system is utilized that eliminates any special spacing requirements. This greatly improves ease of assembly and maintenance turn around time.
- ➤ The new generation SRTTM-MM improves radial stabilization at the bit box and throughout the length of the bearing assembly to significantly reduce side loading in deviated wells.
- We have designed into the SRT[™]-MM increases in internal and external cross-sectional wall thicknesses to enables the SRT[™]-MM to provide strength improvements unmatched by competing downhole motors.
- ➤ Through value added engineering, the SRT[™]-MM is truly the next generation of downhole motors. This latest generation allows a greater number of plugs to be drilled in longer laterals wells while reducing cost per job. It is simply the easiest to assemble and most reliable motor on the market today.

TRANSMISSION

The bearing assembly incorporates a single-piece flex shaft and flow diverter into one component that exceed the torque capability of the power section and is the simplest transmission for standard applications in a small-diameter motor.

BEARING ASSEMBLY

The **SRT[™]-MM** Downhole Motor's jarrable bearing assembly improves weight on bit, side loading, and over pulls capabilities. It utilizes thrust bearings split internally for weight on bit in drilling mode and for off-bottom operation. It does not use a two piece (Inner/Outer) bearing assembly associated with today's current drilling motors, but rather a single unison dual bearing assembly. This bearing assembly is designed for a mud lubrication bearing system typically utilized in Thru-Tubing operations. The thrust bearings serve to efficiently operate with static and dynamic loads in drilling operations and improvements were implemented in this latest generation. The radial bearings provide perpendicular side loading strength to maintain optimal rotational support. The **SRT[™]-MM** also improves the internal catch system in case of drive shaft failure that keeps the lower end intact when pulling out of hole and a top sub catch system if stator connection was to fail to keep rotor & lower end together and allow for evacuation of motor assembly from hole.





1.50" 11/12 Lobe, 6.2 Stage

Revision: A 07/18/2023

SRT THRU TUBING DRILL MOTOR SPECIFICATION								
Physical Data	Metric	Imperial						
Flow range	57-151 LPM	15-40 GPM						
Max operating temperature	500 °C 932 °F							
Revolutions per unit volume	3,99 RPL	15,1 RPG						
No load speed	226-604	RPM						
Maximum differential pressure	69 Bar	1000 PSI						
Maximum torque	305 Nm	225 ft-lb						
Motor Power	16 Kw	22 HP						

Note: Performance data is for reference only and is subject to change.

ROTOR SPECIFICATIONS							
Physical Data	Metric	Imperial					
Total length	1494 mm	58,8 in					
Profile length	1344 mm	52 <i>,</i> 9 in					
Head length	150 mm	5,9 in					
Rotor eccentricity	1,2 mm	0,05 in					
Major diameter	28,6 mm	1,13 in					
Minor diameter	23,8 mm	0,94 in					
Head diameter	27,0 mm	1,06 in					
Material	34CrAINi7-10 (1.8550)						
Weight	T.B.D	T.B.D					

STATOR SPECIFICATIONS								
Physical Data	Metric	Imperial						
Total length	1750 mm	68,9 in						
Profile length	1344 mm	52,9 in						
Stator outer diameter	38,1 mm	1,50 in						
Major diameter	31,0 mm	1,22 in						
Minor diameter	26,2 mm	1,03 in						
Material	34CrAINi7-10 (1.8550)							
Weight	T.B.D	T.B.D						

**Custom lengths and materials are available upon request.





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Revision: A 5/31/2022

SRT THRU TUBING DRILL MOTOR SPECIFICATION								
Physical Data	Inches	MM	MM Axial Bearing Load Ratings					
Motor Overall Length	105.75	2,686	lbs Kg					
Motor Weight	55	25	Dynamic Compression/Tension 1,600 726					
Bearing Assy MU Length	20.75	527	Static Compression/Tension 6,000 2,722					
Top Connection	1.00" AMMT	1.00" AMMT	Max Overpull to Re-Run 6,000 2,722					
Bit Connection	1.00" AMMT	1.00" AMMT	Max Bit Overpull (80%) 55,000 24,948					
Bit Size	1-7/8-2-3/4	42.67-69.85	Max Body Overpull (80%) 60,972 27,657					

Note: Load ratings can vary with different bit styles based on aggressive to no-aggressive.

POWER SECTION SPECIFICATIONS									
Rotor	Inches	MM		Stator	Inches	MM			
Overall Length	71.6	1,819		Overall Length	79	1,994			
Contour Length	68	1,727		Tube O.D.	1.6875	43			
Major Diameter	1.145	29.08		Tube I.D.	0.984	25			
Minor Diameter	0.916	23		Rubber Cutback-Top	3.25	83			
Eccentricity	0.115	2.92		Rubber Cutback-Bottom	7.75	197			
Head O.D.	1.25	32		Stages	9.1	9			
Weight-Ibs (kg)	16	7		Weight-lbs (kg)	25.5	12			
Thread Form	T1 o	r T2		Thread Form	Contac	t CTRT			

PERFORMANCE SUMMARY								
Flow Range gpm (lpm) 20-50 76-189 Max Diff Pressure-psi (kPa) 2,000 13,790								
Bit Speed Range (rpm)	205-512	205-512		Stall Diff Pressusre-psi (kPa)	3,000	20,684		
Torque Slope ft-lbs/psi (nm/kPa)	0.10	0.02		Max Torque ft-lbs (nm)	200	271		
Rotation Rev/Gal (Rev/liter)	10.24	2.71		Stall Torque ft-lbs (nm)	300	407		
Off Bottom Pressure-psi (kPa)	100	689		Max HP (kW)	58	44		





Revision: A 5/31/202

SRT THRU TUBING DRILL MOTOR SPECIFICATION								
Physical Data	Inches	MM	Axial Bearing Load Ratings					
Motor Overall Length	114.25	2,902	lbs Kg					
Motor Weight	90	41	Dynamic Compression/Tension 7,000 3,175					
Bearing Assy MU Length	25.375	645	Static Compression/Tension 11,000 4,990					
Top Connection	1.50" AMMT	1.50" AMMT	Max Overpull to Re-Run 11,000 4,990					
Bit Connection	1.50" AMMT	1.50" AMMT	Max Bit Overpull (80%) 83,000 37,649					
Bit Size	2.18-3.25	55.5-82.5	Max Body Overpull (80%) 83,000 37,649					

Note: Load ratings can vary with different bit styles based on aggressive to no-aggressive.

POWER SECTION SPECIFICATIONS									
Rotor	Inches	MM		Stator	Inches	MM			
Overall Length	73	1,854		Overall Length	82	2,070			
Contour Length	69	1,753		Tube O.D.	2.12	54			
Major Diameter	1.51	38.35		Tube I.D.	1.25	32			
Minor Diameter	1.13	29		Rubber Cutback-Top	4.5	114			
Eccentricity	0.19	4.83		Rubber Cutback-Bottom	8.75	222			
Head O.D.	1.57	40		Stages	5.7	145			
Weight-lbs (kg)	26	12		Weight-Ibs (kg)	38.5	17			
Thread Form	T1 o	r T2		Thread Form	Contac	t CTRT			

PERFORMANCE SUMMARY								
Flow Range gpm (lpm) 40-106 151-401 Max Diff Pressure-psi (kPa) 725 4,999								
Bit Speed Range (rpm)	216-575	216-575		Stall Diff Pressusre-psi (kPa)	1,088	7,501		
Torque Slope ft-lbs/psi (nm/kPa)	0.90	0.18		Max Torque ft-lbs (nm)	650	881		
Rotation Rev/Gal (Rev/liter)	5.42	1.43		Stall Torque ft-lbs (nm)	975	1,322		
Off Bottom Pressure-psi (kPa)	100	689		Max HP (kW)	45	33		



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SRT THRU TUBING DRILL MOTOR SPECIFICATION Physical Data Inches MM Axial Bearing Load Ratings							
Motor Overall Length	143.50	3,645	lbs Kg				
Motor Weight	160	73	Dynamic Compression/Tension 10,000 4,536				
Bearing Assy MU Length	61	1,549	Static Compression/Tension 14,000 6,350				
Top Connection	2-3/8" PAC	2-3/8" PAC	Max Overpull to Re-Run 14,000 6,350				
Bit Connection	2-3/8" PAC	2-3/8" PAC	Max Bit Overpull (80%) 156,000 70,762				
Bit Size	3.25-4.50	82.55-114.30	Max Body Overpull (80%) 158,824 72,043				

Note: Load ratings can vary with different bit styles based on aggressive to non-aggressive

POWER SECTION SPECIFICATIONS									
Rotor	Inches	MM		Stator	Inches	MM			
Overall Length	78.75	2,000		Overall Length	83	2,096			
Contour Length	72.5	1,842		Tube O.D.	2.87	73			
Major Diameter	2.1	53.34		Tube I.D.	2.31	59			
Minor Diameter	1.68	43		Rubber Cutback-Top	4.38	111			
Eccentricity	0.212	5.38		Rubber Cutback-Bottom	8.25	210			
Head O.D.	2.13	54		Stages	6.8	173			
Weight-lbs (kg)	60	27		Weight-Ibs (kg)	75	34			
Thread Form	T1 o	r T2		Thread Form	Contac	ct CTRT			

PERFORMANCE SUMMARY								
Flow Range gpm (lpm)	42-147	159-556		Max Diff Pressure-psi (kPa)	1,333	9,191		
Bit Speed Range (rpm)	147-516	147-516		Stall Diff Pressusre-psi (kPa)	2,000	13,790		
Torque Slope ft-lbs/psi (nm/kPa)	0.90	0.18		Max Torque ft-lbs (nm)	1,200	1,627		
Rotation Rev/Gal (Rev/liter)	3.51	0.93		Stall Torque ft-lbs (nm)	1,800	2,440		
Off Bottom Pressure-psi (kPa)	100	689		Max HP (kW)	114	85		





Revision: A

SRT THRU TUBING DRILL MOTOR SPECIFICATION			
Physical Data	Metric	Imperial	
Flow range	190-567 LPM	50-150 GPM	
Max operating temperature	500 °C	932 °F	
Revolutions per unit volume	0,59 RPL	2,22 RPG	
No load speed	111-333 RPM		
Maximum differential pressure	172 Bar	2500 PSI	
Maximum torque	2440 Nm	1800 ft-lb	
Motor Power	54 Kw	73 HP	

Note: Performance data is for reference only and is subject to change.

ROTOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	1922 mm	75,6 in
Profile length	1810 mm	71,3 in
Head length	100 mm	3,9 in
Rotor eccentricity	5,3 mm	0,21 in
Major diameter	53 <i>,</i> 3 mm	2,10 in
Minor diameter	42,7 mm	1,68 in
Head diameter	53 <i>,</i> 3 mm	2,10 in
Material	34CrAINi7-10 (1.8550)	
Weight	26,4 Kg	58,3 lbs

STATOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	2100 mm	82,7 in
Profile length	1810 mm	73,7 in
Stator outer diameter	73,6 mm	2,90 in
Major diameter	58,7 mm	2,31 in
Minor diameter	48,0 mm	1,89 in
Material	34CrAINi7-10 (1.8550)	
Weight	35,7 Kg	78,6 lbs

**Custom lengths and materials are available upon request.





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Revision: A

SRT THRU TUBING DRILL MOTOR SPECIFICATION		
Physical Data	Metric	Imperial
Flow range	190-795 LPM	50-210 GPM
Max operating temperature	500 °C	932 °F
Revolutions per unit volume	0,4 RPL	1,5 RPG
No load speed	75-315 RPM	
Maximum differential pressure	172 Bar	2500 PSI
Maximum torque	2305 Nm	1700 ft-lb
Motor Power	52 Kw	70 HP

Note: Performance data is for reference only and is subject to change.

ROTOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	784 mm	30,9 in
Profile length	682 mm	26 <i>,</i> 9 in
Head length	102 mm	4,0 in
Rotor eccentricity	4,7 mm	0,19 in
Major diameter	52,6 mm	2,07 in
Minor diameter	43,1 mm	1,70 in
Head diameter	43,1 mm	1,70 in
Material	42CrMo4 (1.7225)	
Weight	10,9 Kg	24,0 lbs

STATOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	936 mm	36,9 in
Profile length	682 mm	26,9 in
Stator outer diameter	73,6 mm	2,90 in
Major diameter	57,3 mm	2,26 in
Minor diameter	47,8 mm	1,88 in
Material	34CrAINi7-10 (1.8550)	
Weight	15,9 Kg	35,1 lbs

**Custom lengths and materials are available upon request.







Revision: A

SRT THRU TUBING DRILL MOTOR SPECIFICATION			
Physical Data	Metric	Imperial	
Flow range	190-795 LPM	50-210 GPM	
Max operating temperature	500 °C	932 °F	
Revolutions per unit volume	0,58 RPL	2,2 RPG	
No load speed	110-462 RPM		
Maximum differential pressure	172 Bar	2500 PSI	
Maximum torque	2847 Nm	2100 ft-lb	
Motor Power	102 Kw	137 HP	

Note: Performance data is for reference only and is subject to change.

ROTOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	1936 mm	76,2 in
Profile length	1795 mm	70,7 in
Head length	125 mm	4,9 in
Rotor eccentricity	5,8 mm	0,23 in
Major diameter	58,3 mm	2,29 in
Minor diameter	46,6 mm	1,84 in
Head diameter	59,0 mm	2,32 in
Material	34CrAINi7-10 (1.8550)	
Weight	31,9 Kg	70,4 lbs

STATOR SPECIFICATIONS		
Physical Data	Metric	Imperial
Total length	2100 mm	82,7 in
Profile length	1794 mm	70,6 in
Stator outer diameter	79,4 mm	3,13 in
Major diameter	64,1 mm	2,52 in
Minor diameter	52,5 mm	2,06 in
Material	42CrMo4 (1.7225)	
Weight	40,8 Kg	90,0 lbs

**Custom lengths and materials are available upon request.





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