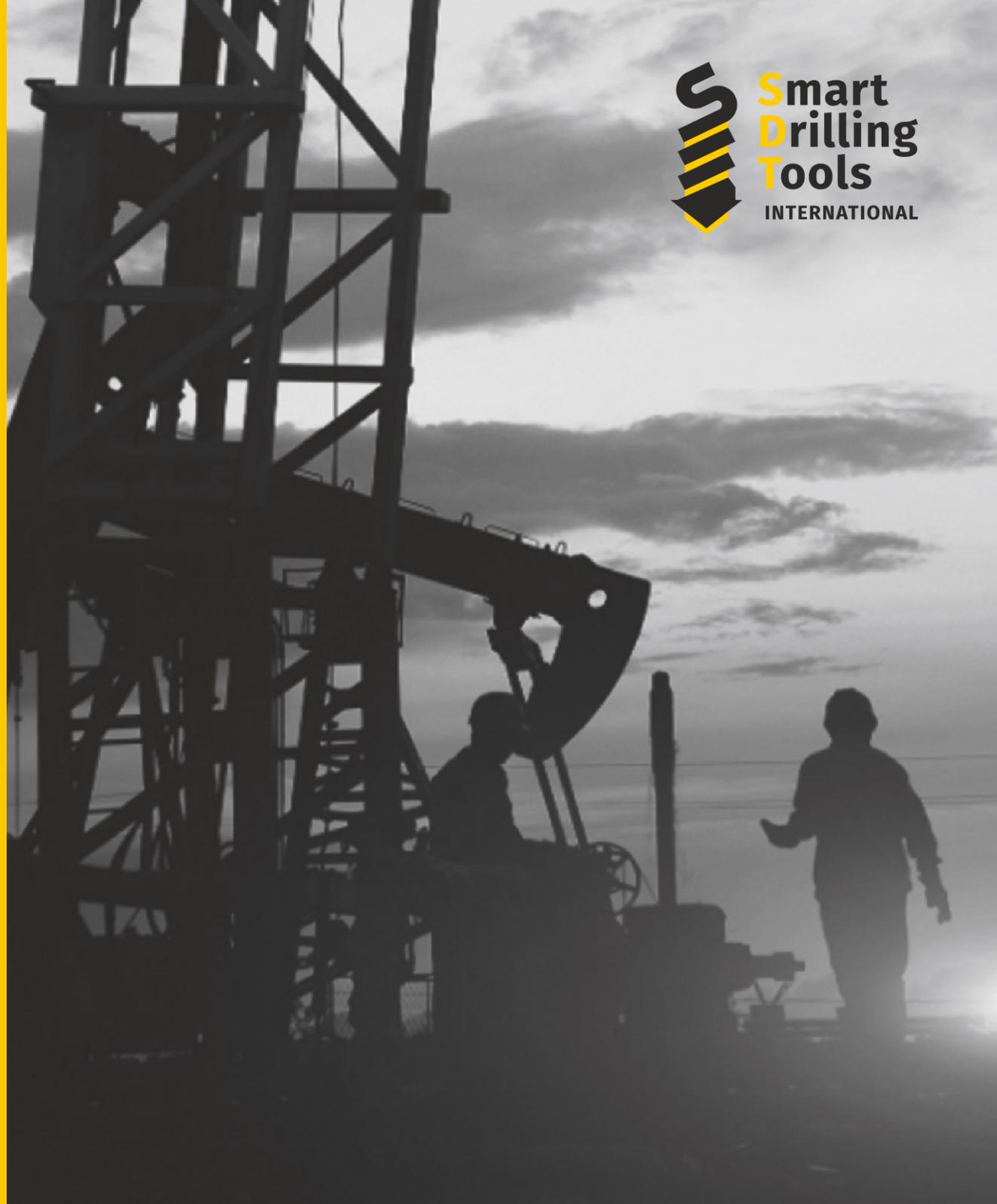


Profile - 2024/2025  
SDT International – FZCO

- ▶ New Technologies
- ▶ Innovative Design
- ▶ In-house Manufacturing
- ▶ Service & Support



## About Us

SDT Group is now one of the leading players in the market of innovative well drilling and completions technologies in Russia and CIS regions.

SDT Group designs, develops, manufactures, sales and rents its equipment to all the major clients in Russia/CIS, including International majors.

SDT Group is comprised of 4 manufacturing companies with 5 manufacturing sites and currently investing in building 1 more manufacturing site.

SDT Group has 3 service companies focused on, job modelling and engineering support, equipment running, rentals and after sales equipment support.

Total group head count is ~1200 employees.



In 2022 SDT Group founded UAE based company (SDT International FZCO) to facilitate its expansion to GCC and MENA markets. SDT Group already has successful track record and experience of supplying its equipment to Oman (PDO) and Kuwait (KOC).

SDT Group has strong appetite for expanding and growing its business in MENA region and actively looking for strong local partners willing to co-invest and cooperate.

## Circulation Sub



### ▶ Description

The Circulating subs is used for diverting the mud flow inside the drill string to the annulus whenever required and combat common drilling problems, such as lost circulation and limited circulation rates.

The sub operation mode is adjusted from the surface by balls dropping without need for tripping. It is always recommended to include the circulation sub into BHA in following cases:

- ▶ Acid, chemical and bridging agents (LCM) treatments, which can be harmful for below located BHA components;
- ▶ Reaming during loss of circulation, full loss of circulation; Wellbore cleanout required for acceleration of the flow in annular space by increase of mud flow;
- ▶ Filling and emptying the inner tube space of the drill pipe during pulling and running operations (bypass valve function);
- ▶ Cut-off of the underlying assembly from the ingress of the scale and hardener drilling mud during extension of the drill string

The sub has several configurations, which differ by number of operation cycles and activation/deactivation pressures without need of pulling out of hole. There is no need for presence of specific operational engineer at the rig.



## Circulation Sub

- ▶ Benefits
- ▶ Significantly increases economical efficiency by reducing time per operation
- ▶ Restore circulation, bottom hole chemical treatments are possible without BHA additional tripping Up to 10 activations at one BHA trip (4/5 activations is standard)
- ▶ In case of circulation stop, the sub blocks the ports automatically to prevent cross flow of mud between annular space and the drill string
- ▶ Simple visual control of pressure drop
- ▶ No limitations for LCM type of materials to deal with loss of circulation
- ▶ Operation over a wide range of specific weight of fluids and wells TVD by adjusting the deactivating pressure (2100psi, 3000psi, 4500psi)
- ▶ The «dump sub» function can be activated after pulling out of hole
- ▶ Sub can operate in the harshest environments including CO<sub>2</sub> and H<sub>2</sub>S



# Circulation Sub

## ► Specification



Imperial	SDT-CS415	SDT-CS475	SDT-CS500	SDT-CS600	SDT-CS675	SDT-CS825	SDT-CS900	SDT-CS950
Basic Parameters and Dimensions								
Tool size (in)	4 ¼	4 ¾	5	6 ⅛	6 ¾	8 ¼	9	9 ½
Length (C) (in)	75.0	95.0	84.3	128.9	105.3	115.9	124.5	119.9
Weight (lb)	196	315	331	710	794	1124	1488	1477
Number of ports	2	2	2	2	2	2	2	2
Port size (in)	0.57	1.02	1.02	1.02	1.02	1.24	1.24	1.24
Number of activation balls	1	1	1	1	1	1	1	1
Number of deactivation balls	2	2	2	2	2	2	2	2
Tool connections (Top&Bottom)	3 ½ FH (NC-31)	3 ⅞ FH (NC-38)	3 ⅞ FH (NC-38)	4 ½ FH (NC-46)	4 ½ FH (NC-46)	6 ⅝ Reg	7 ⅞ FH	7 ⅝ Reg
Tool mid connection	3 ½ FH (NC-31)	3 ⅞ FH (NC-38)	3 ⅞ FH (NC-38)	4 ½ FH (NC-46)	4 ½ FH (NC-46)	6 ⅝ Reg	7 ⅞ FH	7 ⅝ Reg
Operating Parameters								
Maximum flow rate (gpm)	238	396	396	713	713	1014	1014	1014
Pressure drop with direct circulation (with empty basket) (psi)	116	61	61	116	116	73	73	73
Pressure drop (circulation through side ports) (psi)	174	54	54	218	218	174	174	174
Number of cycles (std / ext)	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*
Activation pressure (psi)	58	87	87	87	87	58	58	58
Deactivation pressure (psi)	2100	2100	2100	2100	2100	2100	2100	2100
Blocking ball push-through pressure (psi)	1088	1088	1088	1088	1088	1088	1088	1088
Maximum tensile load (lb)	512500	737250	860000	778700	1344300	2135500	2337500	2810000
Torsional strength main body (ft-lb)	15860	18880	27430	37615	55900	106200	125400	147500

# Circulation Sub

## ► Specification



Metric	SDT-CS415	SDT-CS475	SDT-CS500	SDT-CS600	SDT-CS675	SDT-CS825	SDT-CS900	SDT-CS950
Basic Parameters and Dimensions								
Tool size	106 mm	120 mm	127 mm	155 mm	172 mm	210 mm	229 mm	240 mm
Length (C)	1906 mm	2412 mm	2140 mm	3275 mm	2674 mm	2945 mm	3162 mm	3045 mm
Weight	89 kg	143 kg	150 kg	322 kg	360 kg	510 kg	675 kg	670 kg
Number of ports	2	2	2	2	2	2	2	2
Port size	14.5 mm	25.8 mm	25.8 mm	25.8 mm	25.8 mm	31.5 mm	31.5 mm	31.5 mm
Number of activation balls	1	1	1	1	1	1	1	1
Number of deactivation balls	2	2	2	2	2	2	2	2
Tool connections (Top&Bottom)	3 ½ FH (NC-31)	3 ¾ FH (NC-38)	3 ¾ FH (NC-38)	4 ½ FH (NC-46)	4 ½ FH (NC-46)	6 ⅝ Reg	7 ⅝ FH	7 ⅝ Reg
Tool mid connection	3 ½ FH (NC-31)	3 ¾ FH (NC-38)	3 ¾ FH (NC-38)	4 ½ FH (NC-46)	4 ½ FH (NC-46)	6 ⅝ Reg	7 ⅝ FH	7 ⅝ Reg
Operating Parameters								
Maximum flow rate	900 l/min	1500 l/min	1500 l/min	2700 l/min	2700 l/min	3840 l/min	3840 l/min	3840 l/min
Pressure drop with direct circulation (with empty basket)	0.8 MPa	0.42 MPa	0.42 MPa	0.8 MPa	0.8 MPa	0.5 MPa	0.5 MPa	0.5 MPa
Pressure drop (circulation through side ports)	1.2 MPa	0.37 MPa	0.37 MPa	1.5 MPa	1.5 MPa	1.2 MPa	1.2 MPa	1.2 MPa
Number of cycles (std / ext)	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*	5/10*
Activation pressure	0.4 MPa	0.6 MPa	0.6 MPa	0.6 MPa	0.6 MPa	0.4 MPa	0.4 MPa	0.4 MPa
Deactivation pressure	14.5 MPa	14.5 MPa	14.5 MPa	14.5 MPa				
Blocking ball push-through pressure	7.5 MPa	7.5 MPa	7.5 MPa	7.5 MPa				
Maximum tensile load	2280 kN	3280 kN	3825 kN	3464 kN	5980 kN	9500 kN	10400 kN	12500 kN
Torsional strength main body	21.5 kN·m	25.6 kN·m	37.2 kN·m	51 kN·m	75.8 kN·m	144 kN·m	170 kN·m	200 kN·m

## Shock Tools



- ▶ Description
- ▶ The SDT-ST shock tools are designed to reduce the impact of vibrations on the elements of the bottom of the drill string and to absorb shocks and vibrations, acting on the string in the process of drilling oil and gas wells.
- ▶ By isolating vibration from the bottom hole assembly, caused by the drilling operations, the shock tool reduces the probability of the drill string or/and electronic components failure due to fatigue destruction.
- ▶ SDT-ST shock tool design ensures efficient operation under various combinations of drilling parameters and reduces fluctuation/spikes in mud flow rates and pressure.
- ▶ Downhole shock tool SDT-ST can be installed in the BHA directly above the bottom hole drive or above it.



## Shock Tools

- ▶ Description
- ▶ Reduces the likelihood of accidents associated with drill string failures/ partitions
- ▶ Increase the bit life and BHA elements
- ▶ Improved ROP
- ▶ Protect top drive systems from drill string pulsations
- ▶ Protect electronics used in BHA MWD/LWD tools
- ▶ Isolates bit/formation induced vibrations from the drill string elements
- ▶ Fully oil-sealed and lubricated for extended service life
- ▶ Does not use temperature-sensitive elastomers for shock absorption, therefore is suitable for use at temperatures up to 250oF(120oC),with optional seals available for temperatures up to 320°F (160°C)
- ▶ Reduces wear and tear on rig equipment, and fatigue failures on drill collars and drill pipes
- ▶ Automatically compensates for flow rate/ pump created hydraulic forces in the drill string



# Shock Tools

## ► Specification



	SDT-ST475		SDT-ST675		SDT-ST800		SDT-ST950		SDT-ST1100	
Specification	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Tool Size, in/mm	4.75	121	6.75	171	8	203	9.5	241	11	279
Tool Designation	SDT-ST475	SDT-ST475	SDT-ST675	SDT-ST675	SDT-ST800	SDT-ST800	SDT-ST950	SDT-ST950	SDT-ST1100	SDT-ST1100
Max. Outer Diameter, in/mm	4.80	122	6.89	175	8	203	9.5	241	11	279
Length, ft/mm	10.17	3 100	12.80	3 900	13.88	4 230	13.16	4 010	14.34	4 370
Min. Bore Diameter, in/mm	2.0	50	2.76	70	2.76	70	3.0	76	3.0	76
Max. Allowable Tensile Load, lb/kgf	341 700	152 000	719 400	320 000	820 700	365 000	1 209 000	537 800	1 628 000	724 300
Max. Applied Torque, ft-lb/kgf-m	16 960	2 300	36 140	4 900	61 960	8 400	130 530	17 700	201 350	27 300
Connection Threads (API)	NC38	NC38	NC50	NC50	6 $\frac{5}{8}$ " Reg	6 $\frac{5}{8}$ " Reg	7 $\frac{7}{8}$ " Reg			

## Drill String Oscillator



- ▶ Description
  - ▶ The SDT-VS oscillator reduces friction and improves weight transfer by gently oscillating the drill string.
  - ▶ SDT-VS oscillator is installed in the drill string assembly and is designed to reduce the BHA friction against the borehole walls.
  - ▶ Since the oscillations are low magnitude and only affect the longitudinal axis of your drill string, SDT-VS does not cause the harmful lateral vibrations that can damage downhole tools.
  - ▶ The Oscillator system is compatible with all MWD systems.
  - ▶ Total pressure drop of 300-400 psi on the Oscillator Tools allows to maintain higher flow rates on rigs, with limited pump pressure capacity.



## Drill String Oscillator

- ▶ Benefits
  - ▶ Reduced friction between the BHA and the borehole walls
  - ▶ Improved weight on bit delivery results in higher ROP and extended bit life
  - ▶ Better tool face control while sliding
  - ▶ Stick-slip reduction
  - ▶ Very helpful technology for fishing operations
  - ▶ Reduced lateral and torsional BHA vibration
  - ▶ Compatible with all MWD systems
  - ▶ Improved ERD capabilities



# Drill String Oscillator

## ► Specification



Imperial	SDT-VS415	SDT-VS475LF	SDT-VS475HF	SDT-VS525LF	SDT-VS525HF	SDT-VS675LF	SDT-VS675HF
Basic Parameters and Dimensions							
Housing OD max (in)	4.17	4.88	4.88	5.24	5.24	7.00	7.00
Total length (in)	300	288	288	289	289	307	307
Weight (lb)	737	1 025	1 025	1 058	1 058	2 205	2 205
Connection thread	NC31	NC38	NC38	NC40	NC40	NC50	NC50
Make-up torque (ft-lb)	6 600-7 375	9 600-11 060	9 600-11 060	11 100-12 540	11 100-12 540	32 450-38 350	32 450-38 350
Operating Parameters							
Flow rate (gpm)	95-190	158-270	237-333	158-285	237-333	396-600	600-900
Mud density max (ppg)	16.7	16.7	16.7	16.7	16.7	16.7	16.7
Sand content	2%	2%	2%	2%	2%	2%	2%
LCM size max (in)	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Max temperature (°F)	230	230	230	230	230	230	230
Pressure drop (psi)	435	435	435	435	435	435	435
Operating frequency (gpm)	14-15 Hz @ 142	18-19 Hz @ 248	16-17 Hz @ 248	18-19 Hz @ 237	16-17 Hz @ 237	16-17 Hz @ 500	13-19 Hz @ 600-900
Oscillation amplitude (in)	0.04-0.16	0.04-0.12	0.04-0.12	0.04-0.12	0.04-0.12	0.04-0.16	0.04-0.16
Pulsation coefficient (Hz/gal)	0.43	0.33	0.29	0.33	0.29	0.11	0.11
Strength Specifications							
Maximum tensile load (lb)	281 000	341 700	341 700	480 000	480 000	719 400	719 400
Maximum compression load (lb)	56 202	89 900	89 900	101 160	101 160	101 160	101 160
Maximum torque (ft-lb)	8 850	17 000	17 000	20 650	20 650	36 140	36 140
Pump opening area (in <sup>2</sup> )	8.29	11.03	11.03	11.79	11.79	19.62	19.62

# Drill String Oscillator

## ► Specification



Metric	SDT-VS475LF	SDT-VS475HF	SDT-VS525LF	SDT-VS525HF	SDT-VS675LF	SDT-VS675HF
Basic Parameters and Dimensions						
Housing OD max (mm)	124	124	133	133	178	178
Total length (mm)	7 310	7 310	7 344	7 344	7 800	7 800
Weight (kg)	465	465	480	480	1 000	1 000
Connection thread	NC38	NC38	NC40	NC40	NC50	NC50
Make-up torque (kN·m)	13-15	13-15	15-17	15-17	44-52	44-52
Operating Parameters						
Flow rate (kN·m)	10-17	15-21	10-18	15-21	25-38	38-58
Mud density max (kg/m <sup>3</sup> )	2 000	2 000	2 000	2 000	2 000	2 000
Sand content	2%	2%	2%	2%	2%	2%
LCM size max (mm)	9	9	9	9	9	9
Max temperature (°C)	110	110	110	110	110	110
Pressure drop (Mpa)	3	3	3	3	3	3
Operating frequency (l/s)	18-19 Hz @ 15.7	16-17 Hz @ 15.7	18-19 Hz @ 15	16-17 Hz @ 15	16-17 Hz @ 31.5	13-19 Hz @ 37.8-58
Oscillation amplitude (mm)	1-3	1-3	1-3	1-3	1-4	1-4
Pulsation coefficient (l/s)	1.23	1.10	1.23	1.10	0.43	0.42
Strength Specifications						
Maximum tensile load (kN)	1 520	1 520	2 136	2 136	3 200	3 200
Maximum compression load (kN)	400	400	450	450	450	450
Maximum torque (kN·m) <sup>0</sup>	23	23	28	28	49	49
Pump opening area (mm <sup>2</sup> )	7 121	7 121	7 605	7 605	12 661	12 661

## Hydraulic Drilling Jars

### ► Description

- The drilling jars are designed and used to help solving drill string stuck incidents by applying push-pull loads on the selected part of BHA.
- Hydraulic jar (HJ) is a bi-directional drilling jar incorporating hydraulic delay without a latch mechanism. This type of jar allows operator to apply variable impact in both the up and down directions. The HJ is intended for use in highly deviated or high friction wells where conditions may prevent applying sufficient force to release a mechanical latch.

The HJ is a purely hydraulic bidirectional drilling jar that allows the operator to apply variable impact on both the up and down directions - unaffected by torque.

### ► Benefits

- The HJ is hydraulically controlled and jars in both directions with impact force controlled by the operator.
- Impact force is controlled by a metering device that ensures consistent delay times over the full range of operating temperatures.
- The HJ operates via a simple up and down motion and is unaffected by torque.



# Hydraulic Drilling Jars

## ► Specification



Specification	SDT-HJ475		SDT-HJ650		SDT-HJ800		SDT-HJ950	
	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Nominal OD (A), in/mm	4.88	124	6.61	168	8.15	207	9.48	241
Thru Bore (B), in/mm	2.2	56	2.76	70	2.76	70	3	76
Length in open position, ft/mm	18	5 500	18.4	5 600	22.3	6 800	22.3	6 800
Length in closed position (C), ft/mm	16	4 900	16.4	5 000	20.3	6 190	20.3	6 200
Free stroke after hydraulic delay during extension, in/mm	7.28	185	7.48	190	7.87	190	7.87	200
Free stroke after hydraulic delay during compression, in/mm	7.28	185	7.48	190	7.87	190	7.87	200
Hydraulic delay time*, sec	30 – 150	30 – 150	30 – 150	30 – 150	30 – 150	30 – 150	30 – 150	30 – 150
Pump Open Area, in.sq./sm.sq.	11,78	76	23.7	153	30.7	198	41.2	266
Maximum tensile (compressive) load during hydraulic delay, lbs/kgf	77 150	35 000	176 370	80 000	242 500	110 000	242 500	110 000
Maximum tensile load during pulling out of hole, lbs/kgf	286 600	130 000	617 290	280 000	804 700	365 000	1 197 100	543 000
Maximum torque, ft-lbs/kgf*m	13 000	1 800	22 120	3 000	60 700	8 390	122 960	17 000
Connecting threads	NC38	NC38	NC50	NC50	6 5/8 Reg	6 5/8 Reg	7 5/8 Reg	7 5/8 Reg
Make up torque, ft-lbs/kgf*m	8 680– 10 120	1 200 – 1 400	18 400 – 19 900	2 500 – 2 700	47 000 – 50 600	6 500 – 7 000	57 850 – 65 100	8 000– 9 000
Maximum operating temperature***, °F/°C	248	120	248	120	248	120	248	120
Weight, lb/kg	705.5	320	1 313	596	2 425	1 100	3 307	1 500
Overhaul period, hours below the rotary table**, hours	500	500	750	750	750	750	750	750

\* Actual values are supplied in tool test report

\*\* Tool should be sent for maintenance every 250 hours when used in environment with chloride content higher than 50,000 mg/l

\*\*\* As per special request tool can be equipped with seals of up to 175 deg C (350 deg F)

## Hydraulic Mechanical Drilling Jars

- ▶ Description
  - ▶ Hydraulic mechanical Jar (HMJ) is a double acting jar, designed to deliver hydraulic delay when jarring in the up direction, and mechanical release when jarring in the down direction.
  - ▶ The HMJ incorporates a latch mechanism to keep the jar locked in the neutral position and eliminate unexpected jarring while tripping or racking on the derrick.
  - ▶ The built-in mechanical latch keeps the jar locked in a neutral position, which prevents stroking of the jar downhole and unintentional firing of the jar while drilling or tripping. When latched, the mandrel and housing act integrally, eliminating seal and inner-tool wear. The latch eliminates the need for a safety collar and special handling/precautions on the rig floor.
  - ▶ The hydraulic valve provides delay when jarring up, allowing drillers to vary overpull and control impact force. The valve resides in its own oil seal chamber for increased reliability, and a robust metering device controls delay times across operating temperatures.
  - ▶ Down strokes use the mechanical part of the jar, while upward strokes use the hydraulic part with hydraulic delay. The mechanical latch actuation force can be adjusted and set during the jar assembly upon customer request.



## Hydraulic Mechanical Drilling Jars

### ▶ Benefits

- ▶ Can be used for both drilling and fishing operations
- ▶ Ability to create shock loads/forces in two directions (up-down)
- ▶ Stability of hydraulic delay time over the entire operating temperature range
- ▶ Increased ID of the inner hole for the passage of probes of MWD systems
- ▶ Cost effective and highly robust design
- ▶ Simply to service and maintain
- ▶ In-house visco jets designed and developed for maximum efficiency and cost control
- ▶ The HMJ is normally operated in the latched position to reduce unexpected jarring while drilling and eliminate movement between jar components, increasing service life
- ▶ The spline drive and latch mechanism are enclosed in a single, sealed oil chamber without ports to the annulus
- ▶ Such ports on other jars may fill with cuttings and restrict the down jar stroke
- ▶ With the latch mechanism in the latched position, the inner mandrel and outer housing act integrally, virtually eliminating seal and inner tool wear during normal drilling conditions. There is no need to extend or open the jar before running in the hole
- ▶ The HMJ can be run in tension or in compression within the preset latch setting

# Hydraulic Mechanical Drilling Jars

## ► Specification



Specification	SDT-HMJ475		SDT-HMJ675		SDT-HMJ800		SDT-HMJ950	
	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Nominal OD (A), in/mm	4.88	124	6.73	175	8	203	9.5	241
Thru Bore (B), in/mm	2.16	55	2.75	70	2.75	70	3	76
Free stroke Up, in/mm	9	230	9	230	9	230	9	230
Free stroke Down, in/mm	5.9	150	5.9	150	5.9	150	5.9	150
Length in fixed position (C), ft/mm	22.14	6 750	22.15	6 750	22.97	7 000	22.97	7 000
Hydraulic delay time, sec	30 - 150	30 - 150	30 - 150	30 - 150	30 - 150	30 - 150	30 - 150	30 - 150
Nominal Up latch setting, lbs/kgf	55 000	25 000	130 000	59 000	154 300	70 000	165 000	75 000
Nominal Down latch setting, lbs/kgf	35 900	16 300	70 500	32 000	99 200	45 000	108 000	49 000
Pump Open Area, in.sq./sm.sq.	11.78	76	23.7	153	30.69	198	41.2	266
Maximum pull during hydraulic delay, lbs/kgf	76 200	34 600	189 600	86 000	242 500	110 000	242 500	110 000
Tensile yield, lbs/kgf	391 000	177 350	705 500	320 000	804 500	365 000	1 197 000	543 000
Torsional limit, ft-lbs/Nm	13 276	18 000	36 100	49 000	61 900	84 000	125 400	170 000
Connecting threads	NC38	NC38	NC50	NC50	6 5/8 Reg	6 5/8 Reg	7 5/8 Reg	7 5/8 Reg
Make up torque, ft-lbs/kgf*m	8 851 - 10 325	1 200 - 1 400	28 750 - 33 200	3 900 - 4 500	47 900 - 51 500	6 500 - 7 000	59 000 - 66 400	8 000 - 9 000
Maximum operating temperature, °F/°C	302 °F	150 °C	302	150	302	150	302	150
Weight, lb/kg	749	340	1 926	874	2 866	1 300	4 079	1 850

\* Actual values are supplied in tool test report

\*\* Tool should be sent for maintenance every 250 hours when used in environment with chloride content higher than 50,000 mg/l

\*\*\* As per special request tool can be equipped with seals of up to 175 deg C (350 deg F)

## Hydraulic Drilling Jars with mechanical latch

### ▶ Description

- ▶ Hydraulic jar with mechanical latch (HJML) is a double acting jar. Designed to deliver hydraulic delay when jarring up or down equipped with mechanical lock in each direction.
- ▶ The HJML incorporates a latch mechanism to keep the jar locked in the neutral position and eliminate unexpected jarring while tripping or racking back on the derrick.

### ▶ Benefits

- ▶ The HJML is hydraulically controlled and jars in both directions with impact force controlled by the operator.
- ▶ Impact force is controlled by a metering device that ensures consistent delay times over the full range of operating temperatures.
- ▶ The HJML operates via a simple up and down motion and is unaffected by torque.



# Hydraulic Drilling Jars with mechanical latch



## ► Specification

Specification	SDT-HJML475		SDT-HJML650		SDT-HJML800		SDT-HJML950	
	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Nominal OD (A), in/mm	4.88	124	6.61	168	8.15	207	9.49	241
Thru Bore (B), in/mm	2.2	56	2.76	70	2.76	70	3	76
Length in fixed position, ft/mm	23.13	7 050	24.1	7 350	24.93	7 600	25.26	7 700
Free stroke after hydraulic delay during extension, in/mm	7.28	185	7.48	190	7.87	200	7.87	200
Free stroke after hydraulic delay during compression, in/mm	7.28	185	7.48	190	7.87	200	7.87	200
Hydraulic delay time*, sec	30 – 150	30 – 150			30 – 150 sec	30 – 150 sec	30 – 150 sec	30 – 150 sec
Nominal Up latch setting, lbs/kgf	55 000	25 000	130 000	59 000	154 300	70 000	165 000	75 000
Nominal Down latch setting, lbs/kgf	35 900	16 300	70 500	32 000	99 200	45 000	108 000	49 000
Pump open area, in.sq./sm.sq.	11.78	76	24.8	153	30.7	198	41.2	266
Maximum tensile (compressive) load during hydraulic delay, lbs/kgf	77 150	35 000	176 370	80 000	242 500	110 000	242 500	110 000
Tensile yield, lbs/kgf	286 600	130 000	617 290	280 000	804 700	365 000	1 197 100	543 000
Maximum torque, ft-lbs/kgf*m	13 000	1 800	22 120	3 000	60 700	8 400	122 960	17 000
Thread connections	NC38	NC38	NC50	NC50	6 5/8 Reg	6 5/8 Reg	7 5/8 Reg	7 5/8 Reg
Make up torque, ft-lbs/kgf*m	8 680 – 10 120	1 200 – 1 400	18 400 – 19 900	2 500 – 2 700	47 000 – 50 600	6 500 – 7 000	57 850 – 65 100	8 000 – 9 000
Maximum operating temperature ***, °F/°C	248	120	248	120	248	120	248	120
Weight, lb/kg	930	422	1 800	820	3 140	1 425	4 300	1 950
Time between service, hours below rotary table**, hours	500	500	750	750	750	750	750	750

\* Actual values are supplied in tool test report

\*\* Tool should be sent for maintenance every 250 hours when used in environment with chloride content higher than 50,000 mg/l

\*\*\* As per special request tool can be equipped with seals of up to 175 deg C (350 deg F)

## Reamer Shoe

- ▶ Description
- ▶ Motorized shoe reamer helps reach Target Depth with casing or liner and provides extra insurance when high torque is required downhole.
- ▶ As with all our tools, it eliminates the need for casing string rotation. A positive displacement motor-powered reamer, it has the benefit of low to mid speed and high torque.
- ▶ The disposable motor enables the final string to be landed at Target Depth, and also delivers the ability to drill new formation at Target Depth.
- ▶ Our motorized shoe reamer is the best tool when high torque tough reaming is required through the most challenging hole intervals. It offers exceptional performance with more robust strings.



## Reamer Shoe

- ▶ Benefits
  - ▶ Low-cost Target Depth insurance
  - ▶ Quick completion of trouble-zones and challenging intervals
  - ▶ Minimized well-construction risks and HSE exposure
  - ▶ Disposable motor with high torque capability
  - ▶ Cement job done through MSR and/or Safety sub
  - ▶ Reduced wiper and reaming trips
  - ▶ Minimized probability of casing/liner pull out operations
  - ▶ Range of Reamer Shoes available
  - ▶ 150 C (302 F) rated power section
  - ▶ Maximizes ROI



# Reamer Shoe

## ► Specification



Non-drillable Shoe	FS475ND		FS550ND	
	Imperial	Metric	Imperial	Metric
Housing OD (B), in/mm*	4,75	120	5,5	139,7
Stabilizer OD (C), in/mm*	4,9	124,5	5,65	143,7
Reamer bit OD (D), in/mm*	5,5	139,7	6,75	171,4
Total length (F), ft/mm	19,25	5 870	19,25	5 870
Weight, lb / kg	827	375	827	435
Top connection	*	*	*	*
Bottom connection	3 ½ Reg (box)			
WOB, Lbf/ kg	22 046	10 000	22 046	10 000
Operational information				
Flow rate, Gpm / LPM	95 – 320	360 – 1 200	95 – 320	360 – 1 200
Pressure drop, Psi / Bar	264 – 435	18 – 30 Bar	264 – 435	18 – 30 Bar
No-load, rpm	60 – 200	60 – 200	60 – 200	60 – 200
Rev/Unit volume, rev/gal / rev/l	0,63	0,167	0,63	0,167
Max. allowable differential pressure, Psi / Bar	580	40 atm	1 044	40 atm
RPM at max. power, RPM	50 – 160	50 – 160	50 – 160	50 – 160
Max. torque at max. power, ft-lbf / N·m	5 160	7 000	5 160	7 000
Overpull to Yield, lbf / kg	330 000	150 000	330 000	150 000
Max. working temperature, °F / °C	302	150	302	150
Assigned run time, hours	150	150 hours	150	150 hours
Compatibility with OBM & WBM	Yes	Yes	Yes	Yes
Material type	Alloy steel 4340 or analogue			
<b>SAFETY SUB</b>	<b>SS475ND</b>		<b>SS550ND</b>	
Housing OD (A), in / mm*	5,2	132MM	6,3	160MM
Total length (E), ft / mm	2,42	740MM	2,42	740MM
Activation pressure, Psi /Bar	2170 – 3620	150 – 250	2170 – 3620	150 – 250
Pass through ID TFA, in.sq. / mm sq.	4,38	2 826	4,38	2 826
Total Flow Area, TFA, in.sq. / mm sq.	3,18	2 056	3,18	2 056
Connection thread	*	*	*	*

\* according to customer requirements

# Reamer Shoe

## ► Specification



Specification	FS700		FS962		FS1075		FS1337	
	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Housing OD (B), in/mm*	7,32	186	10,63	270	11,75	298,5	14,26	362,1
Stabilizer OD (C), in/mm*	8,12	206,2	11,1	282	12,05	306	14,6	371
Max. diameter of the drill-through bit, in/mm*	6,13	155,6	8,69	220,7	9,875	250,8	12,25	311,15
Reamer bit OD (D), in/mm*	8,27	209,55	11,4	290	12,25	311,15	15	381
Reamer bit TFA, sq.in/sq.mm	4,8	3 100	7,6	4 900	9,7	6 300	14,26	9 200
Total length (F), ft/mm*	9,74	2 970	9,84	3000	11,31	3450	12,3	3750
Weight, lb/kg	562	255	1 104	501	1653	750	2491	1130
Top connection	*	*	*	*	*	*	*	*
WOB, lbf/kg	33 069	15 000	33 069	15 000	33 069	15 000	33 069	15 000
Operational information								
Flow rate, gpm/lpm	396-555	1 500 – 2 100	475 – 792	1 800 – 3 000	475 – 792	1 800 – 3 000	475 – 792	1 800 – 3 000
Pressure drop, psi/bar	174 – 261	12 – 18	174 – 362	12 – 25	174 – 362	12 – 25	174 – 362	12 – 25
No-load, rpm	114 – 150	114 – 150	90 – 150	90 – 150	60 – 100	60 – 100	30 – 50	30 – 50
Rev/Unit volume, rev/gal/rev/l	0,29	0,076	0,19	0,046	0,13	0,03	0,06	0,016
Max. allowable differential pressure, psi/bar	290	20	290	20	290	20	290	20
RPM at max. power, rpm	90 – 114	90 – 114	66 – 114	66 – 114	44 – 76	44 – 76	22 – 38	22 – 38
Max. torque at max. power, ft-lbf/N·m	5 160	7 000	4 425	6 000	5 160	7 000	5 900	8 000
Overpull to Yield, lbf/kg	308 646	140 000	308 646	140 000	308 646	140 000	308 646	140 000
Max. working temperature, °F/°C	302	150	302	150	302	150	302	150
Assigned run time, hours	150	150	150	150	150	150	150	150
Compatibility with OBM & WBM	Yes							
Outer housing material grade	P110							
Drillable material type	Rubber / duralumin							
<b>SAFETY SUB</b>	<b>SS700</b>	<b>SS700</b>	<b>SS962</b>	<b>SS962</b>	<b>SS1075</b>	<b>SS1075</b>	<b>SS1337</b>	<b>SS1337</b>
Housing OD (A), in/mm*	7,8	198	10,63	270	11,75	298,5	14,26	362,1
Total length (E), ft/mm	4,41	1345	3,92	1195	3,94	1200	3,67	1120
Activation pressure, psi/bar	1 740 – 2320	120 – 160	1 740 – 2320	120 – 160	1 740 – 2320	120 – 160	1 740 – 2320	120 – 160
Pass through ID, in/mm*	6,27	159,4	8,83	224,4	6,13	316	12,25	311,15
Pass through ID TFA, in.sq./mm.sq.	30,91	19 945,50	61,27	39 528,90	30,91	19 945,50	30,91	19 945,50
Ports Total Flow Area, TFA, in.sq./mm.sq.	8,1	5 224	8,1	5 224	8,1	5 224	8,1	5 224
Connection thread	*	*	*	*	*	*	*	*

\* according to customer requirements

## Turbo Reamer Shoe

- ▶ Description
- ▶ SDT-TRS tool provides for rotation of nose part of the shoe with pumps on irrespective of rotation or reciprocation of casing string, when difficult well bore conditions are encountered.
- ▶ Rotation of SDT-TRS nose part is beneficial to help passing through well bore ledges and tight spots without pulling out of hole and casing rotation. Rotation of SDT-TRS nose allows to ream most complicated well bore intervals.
- ▶ SDT-TRS breaks and moves cuttings up hole allowing casing to reach planned TD. With the RPM of more than 1500, SDT-TRS – is an ideal tool for casing and liner cementing operations as fluid flow distribution ensures better mud preparation and minimizes its contamination during cementing job. The casing is cemented in the normal manner.
- ▶ The SDT-TRS is designed for very rapid drill out. Drill out time of the SDT-TRS is under 15 minutes and a dedicated drill out trip is not required.



## Turbo Reamer Shoe

- ▶ Benefits
  - ▶ Reaming head turbine powered rotation with circulation only
  - ▶ Ensures casing reaches TD from first attempt
  - ▶ Eliminates need of wiper trip to condition the hole or reduces number of wiper trips
  - ▶ Better preparation of the well bore and mud before cementing job
  - ▶ Higher quality cementing in deviated and horizontal wells
  - ▶ SDT-TRS is drilled out within several minutes with next section PDC bit and full bore pass through
  - ▶ Reaming blades and nose can be armed with PDC cutters
  - ▶ Can ream through obstructions other tools can not
  - ▶ Well construction risks reduction
  - ▶ Reduces completion running cost by up to 70%
  - ▶ 75% faster than conventional technology



# Turbo Reamer Shoe

## ► Specification



Imperial	SDT-TRS-450	SDT-TRS-500	SDT-TRS-550	SDT-TRS-575	SDT-TRS-662
Casing size, in	4.50	5	5.5	5.75	6.6
Body size, in	5.50	5.5	7.28	8.03	18.03
Min. wellbore diameter*, in	6.00	6	8.07	8.25	8.25
Connection threads	Client specific				
Tool length, in	38.98	38.98	38.98	38.98	38.98
Drill-Thru Diameter, in	3.92	4.28	4.89	5.08	6.05
Tool TFA, sq.in	3.41	3.41	7.21	8.34	8.34
Maximum weight on bit (WOB), lbs	39 683	39 683	48 502	66 139	66 139
Operating temperature**, °F	Up to 302 F				
Flow rate, gpm	79-237	79-237	79-380	79-380	79-380
Tool weight, lb	176	187	198	198	198
Operating time (circulating hours)	150	150	150	150	150
Pressure drop across the tool, psi	44-293	44-293	44-293	44-293	44-293
Imperial	SDT-TRS-700	SDT-TRS-962	SDT-TRS-1075	SDT-TRS-1275	SDT-TRS-1337
Casingsize, in	7	9.62	10.75	12.75	13.37
Bodysize, in	8.03	11.26	14.17	14.17	14.17
Min. wellbore diameter*	8.25	11.5	14.96	14.96	14.96
Connection threads	Client specific				
Tool length, in	38.98	43.31	51.18	51.18	51.18
Drill-Thru Diameter, in	6.26	8.92	9.16	12	12
Tool TFA, sq.in	8.34	13.52	16.06	16.06	16.06
Maximum weight on bit (WOB), lbs	66 139	99 208	110 231	110 231	110 231
Operating temperature**, °F	Up to 302 F				
Flow rate, gpm	79-475	126-951	126-951	126-951	126-951
Tool weight, lb	265	507	551	661	772
Operating time (circulating hours)	150	150	150	150	150
Pressure drop across the tool, psi	44-293	44-293	44-293	44-293	44-293

\* Reamer size and arming can be modified as per customer requirements

\*\* Higher temperature grades available upon request.

\*\*\* Performance charts are provided separately as they are dependent on the fluid weight being used on casing/completion run.

# Turbo Reamer Shoe

## ► Specification



Metric	SDT-TRS-450	SDT-TRS-500	SDT-TRS-550	SDT-TRS-575	SDT-TRS-662
Casingsize, mm	114	127	140	146	168
Bodysize, mm	139	139	185	204	204
Reamerhead size*, mm	149.4	149.4	205	210	210
Connection threads	Client specific				
Toollength, mm	990	990	990	990	990
Drill-Thru Diameter, mm	99.6	108.6	124,3	129.1	153.6
ToolTFA, mm*	2 198	2 198	4 652	5 381	5 381
Maximum weight on bit (WOB), MT	18	18	22	30	30
Operating temperature**, °C	Up to 150				
Flow rate, l/s	5-15	5-15	5-24	5-24	5-24
Tool weight, kg	80	85	90	90	90
Operating time (circulating hours)	150	150	150	150	150
Pressure drop across the tool, atm	3-20	3-20	3-20	3-20	3-20
Metric	SDT-TRS-700	SDT-TRS-962	SDT-TRS-1075	SDT-TRS-1275	SDT-TRS-1337
Casing size, mm	178	245	273	324	340
Bodysize, mm	204	286	360	360	360
Reamerhead size*, mm	210	292	380	380	380
Connection threads	Client specific				
Tool length, mm	990	1 100	1 300	1 300	1 300
Drill-Thru Diameter, mm	159	226.6	232.6	304.9	304.9
Tool TFA, mm*	5 381.00	8 725	10 360	10 360	10 360
Maximum weight on bit (WOB), MT	30	45	50	50	50
Operating temperature**, °C	Up to 150				
Flow rate, l/s	5-30	8-60	8-60	8-60	8-60
Tool weight, kg	120	230	250	300	350
Operating time (circulating hours)	150	150	150	150	150
Pressure drop across the tool, atm	3-20	3-20	3-20	3-20	3-20

\* Reamer size and arming can be modified as per customer requirements

\*\* Higher temperature grades available upon request.

\*\*\* Performance charts are provided separately as they are dependent on the fluid weight being used on casing/completion run.

## Positive displacement motors

- ▶ Description
  - ▶ Positive displacement motor (downhole drilling motor) is designed for driving the bit downhole adding more RPM and torque to be able to cut formations more efficiently and faster.
  - ▶ Motors can also be used for workover and well cleaning operations, as well as coil tubing and through tubing applications.
  - ▶ SDT company is capable to manufacture all the motor sizes, however our initial focus is to design and develop most robust and efficient slim size motors ranging from 2 7/8" to 5" size including RSS assist applications.



## Positive displacement motors

- ▶ Benefits
  - ▶ Most robust, reliable and time proven design
  - ▶ High-quality materials for the manufacture of all parts and components
  - ▶ Reinforced axial multi-row bearings
  - ▶ Heavy duty drive shaft of in-house design
  - ▶ Proprietary in-house developed rubber compounds from leading manufacturers with highest properties
  - ▶ Use of high quality adhesives
  - ▶ Most cost effective motors available on the market



# Positive displacement motors

## ► Specification



	SDT-SDM300.4544		SDT-SDM475.7838		SDT-SDM500.7833		SDT-SDM675.7864	
	Imperial	Metric	Imperial	Metric	Imperial	Metric	Imperial	Metric
Tool size, in/mm	3	76	4,75	120	5	127	6 3/4	172
Max Housing OD, in/mm	3	76	5.0	128	5	127	8.0	178
Length to Stabilizer (C), in/mm	-	-	20.9	531	-	-	19 1/2	487
Length to bend (B), in/mm	-	-	59.6	1 514	-	-	70.6	1 794
Overall length (A), in/mm	182.4	4630	290.1	7 369	325.4	8 267	375.6	9 540
Power Section Length, in/mm	78.7	2000	187.0	4 750	236.2	6 000	246.2	6 253
Weight, lbs/kg	238	108	1 126	512	3 090	1 402	3 090	1 402
Spindle type	Mud lubricated		Mud lubricated		Mud lubricated		Mud lubricated	
Bent angles			0°, 0.38°, 0.78°, 1.15°, 1.50°, 1.83°, 2.12°, 2.38°, 2.60°, 2.77°, 2.90°, 2.97°, 3.00°				0°, 0.38°, 0.78°, 1.15°, 1.50°, 1.83°, 2.12°, 2.38°, 2.60°, 2.77°, 2.90°, 2.97°, 3.00°	
Bit sizes range, in/mm	3 1/4 - 3 7/8	83 - 98,4	5 7/8 - 7 7/8	149.2 - 200.0	5 1/2 - 7	139.7 - 177.8	8 3/8 - 9 7/8	212.7 - 250.8
Connecting threads:								
Bit box	2 3/8 Reg		3 1/2 Reg		NC38 (pin)		4 1/2 Reg	
Top sub	2 3/8 Reg		NC38		NC38 (box)		NC50	
Recommended make-up torque:								
to bit: 2 3/8 Reg ft-lbs/kN-m	1 844 - 3 467	2.5 - 4.7	10 178 - 10 915	13,8-14,8	6 600 - 9 600	9-13	11 800 - 16 250	16-22
to pipe: 2 3/8 Reg ft-lbs/kN-m	1 770 - 3 170	2.4 - 4.3	6 600 - 9 600	9-13	6 600 - 9 600	9-13	33 190 - 35 400	45-48
Adjustable bent housing, ft-lbs/kN-m	-	-	8 850 - 9 600	12 - 13	-	-	23 340 - 29 500	33 - 40
Lobes	4/5		7/8		7/8		7/8	
Stages	4.4		3.8		3.3		6.4	
Flow rate, gpm/lpm	48-79	180-300	159-301	600-1 140	100 - 400	378 - 1 515	396-571	1 500-2 160
Speed Ratio, rev/gal / rev/l	5	1.33	0.511	0.135	0.280	0.074	0.280	0.074
No-load RPM	240-396		81-155		32 - 126		111-160	
Differential pressure on full load mode, psi/Mpa	667	4.6	667	4.6	870	6.00	1 117	7.7
Torque Ratio, ft-lbs/psi / kN-m/Mpa	0.53	0.11	4.81	0.943	7.82	1.54	8.76	1.72
Torque at full load mode, ft-lbs/kN-m	310	0.42	3 205	4.342	6 800	9.22	9 780	13.252
Torque at max. power mode, ft-lbs/kN-m	465	0.63	4 807	6.513	10 200	13.83	14 670	19.878
Power on full load mode, hp/kW	22	16	94	70	148	109	298	222
Power at max. power mode, hp/kW	27	20	141	105	192	141	447	333
WOB, max, lbs/kN	5 600	25	13 200	60	31 500	140	39 600	180
Max Body Overpull, lbs/kN	69 700	310	189 200	860	225 000	1 000	497 200	2 260
Max Bit Overpull, lbs/kN	42 700	190	110 000	500	123 650	550	308 000	1 400

# Positive displacement motors

## ► Specification



	SDT-SDM962.5650		SDT-SDM962.7850	
	Imperial	Metric	Imperial	Metric
Tool size, in/mm	9 5/8	244	9 5/8	244
Max Housing OD, in/mm	9 5/8	244	9 5/8	244
Length to Stabilizer (C), in/mm	32.8	834	32 1/2	835
Length to bend (B), in/mm	95.2	2 419	95.2	2 419
Overall length (A), in/mm	385.9	9 801	34.1	10 401
Power Section Length, in/mm	220.5	5 600	244.1	6 200
Weight, lbs/kg	6 178	2 808	5 690	2 581
Spindle type	Mud lubricated		Mud lubricated	
Bent angles	0°, 0.38°, 0.78°, 1.15°, 1.50°, 1.83°, 2.12°, 2.38°, 2.60°, 2.77°, 2.90°, 2.97°, 3.00°		0°, 0.38°, 0.78°, 1.15°, 1.50°, 1.83°, 2.12°, 2.38°, 2.60°, 2.77°, 2.90°, 2.97°, 3.00°	
Bit sizes range, in/mm	12 1/4-17 1/2	311.1-444.5	12 1/4-17 1/2	311.1-444.5
Connecting threads:				
Bit box	6 5/8Reg / 7 5/8Reg		6 5/8Reg / 7 5/8Reg	
Top sub	6 5/8Reg / 7 5/8Reg		6 5/8Reg / 7 5/8Reg	
Recommended makeup torque:				
to bit:				
6 5/8Reg	28 000 - 32 450	38-44	58 229-62 362	78.9-84.5
7 5/8Reg	33 900 - 39 800	46-54.0	59 005-62 693	80.0-85.0
ft-lbs/kN-m				
to pipe:				
6 5/8Reg	51 600 - 54 600	70-74	51 808-55 498	70.2-75.2
7 5/8Reg	86 300 - 89 250	117-121	59 005-62 693	80.0-85.0
ft-lbs/kN-m				
Adjustable bent housing, ft-lbs/kN-m	47 940 - 57 530	65-78	47 970-57 565	65-78
Lobes	5/6		7/8	
Stages	5.0		5.0	
Flow rate, gpm/lpm	634-951	2 400-3 600	555-1 189	2 100-4 500
Speed Ratio, rev/gal/rev/l	0.147	0.04	0.134	0.03
No-load RPM	95-140		72-154	
No-load Pressure, min, psi/Mpa	230	1.4	870	6
Differential pressure on full load mode, psi/Mpa	870	6	18.9	3.72
Torque Ratio, ftlbs/psi/kNm/Mpa	16.6	3.267	16 445	22.296
Torque at full load mode, ft-lbs/kN-m	14 456	19.6	24 667	33.44
Torque at max. power mode, ft-lbs/kN-m	21 684	29.4	482	360
Power at max. power mode, hp/kW	578	431	722	539
WOB, max, lbs/kN	88 185	400	88 185	400
Max Body Overpull, lbs/kN	1056K	4 800	1058K	4 800
Max Bit Overpull, lbs/kN	558 800	2 540	558 800	2 540



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