

# 2009 Rotary steerable drilling systems directory

Product trade name	Point-the-bit or Push-the-bit?	Length (ft)	O. D. & I. D. (inches)	Hole size (inches)	Max DLS capability (°/100')	Automated closed loop deviation control (yes/no) (+/-degrees)	Build rate increment	Is deviation force continuous?	Max temp (°C /°F)	Max internal pressure (psi)	Other special pressure limitations	Require configuration based on anticipated flow rate?	Sensor distance (ft) Inc/Azm/GR/Res	Control from surface (Downlink)? (Y / N)	If yes, tool control method	Req'd to communicate change in target (minutes)	Minimum kickoff inclination (degrees)	Max RPM / WOB	Min flow rate (gpm)	Max flow rate (gpm)	LCM limits	Power source	Bit requirements	Integrated LWD?
<b>Andergauge Drilling Systems</b> <a href="http://www.ndergauge.com">http://www.ndergauge.com</a>																								
DART475	3-point geometry/ combo	26	OD: 4.75 ID: 1.125	5.875 - 6.75	3.5	No	100.0%	Yes	175/350	25,000	400psi minimum pressure drop at bit	No	Non-instrumented / no electronics	Y	Pipe rotation	2	45	220 rpm 30 kbf	No minimum thru bore	350	None	None	Application specific	No
DART675	3-point geometry/ combo	28	OD: 6.75 ID: 1.75	8.375 - 9.875	3.5	No	100.0%	Yes	175/350	25,000	400psi minimum pressure drop at bit	No	Non-instrumented / no electronics	Y	Pipe rotation	2	45	221 rpm 30 kbf	No minimum thru bore	350	None	None	Application specific	No
<b>Baker Hughes INTEQ</b> <a href="http://www.bakerhughesdirect.com">http://www.bakerhughesdirect.com</a> <a href="http://www.answerswhiledrilling.com/AutoTrak">http://www.answerswhiledrilling.com/AutoTrak</a> e-mail: <a href="mailto:AutoTrakAnswers@INTEQ.com">AutoTrakAnswers@INTEQ.com</a>																								
9.5" AutoTrak G3.0 RCLS	Hybrid of point and push	58 (fully inclusive of steering system & MWD/LWD) Steering head length = 8	OD: 9.5 ID: N/A	12.00 - 28.00	6.5	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Steering system: No MWD system: Yes	3.9 / 32.4 / 24.3 / 25.6	Y	Negative pulse from surface skid unit	While drilling ahead	0	300 RPM 100 kbf	300	1,600	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
8.25" AutoTrak G3.0 RCLS	Hybrid of point and push	57 (fully inclusive of steering system & MWD/LWD) Steering head length = 7	OD: 8.25 ID: N/A	10.625	6.5	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Steering system: No MWD system: Yes	3.1 / 32.4 / 20.3 / 25.6	Y	Negative pulse from surface skid unit	While drilling ahead	0	400 RPM 57 kbf	300	1,290	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
6.75" AutoTrak G3.0 RCLS	Hybrid of point and push	49 (fully inclusive of steering system & MWD/LWD) Steering head length = 7	OD: 6.75 ID: N/A	8.375 - 10.625	6.5	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Steering system: No MWD system: Yes	3.1 / 27.5 / 17.7 / 21.6	Y	Negative pulse from surface skid unit	While drilling ahead	0	400 RPM 57 kbf	200	900	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
4.75" AutoTrak G3.0 RCLS	Hybrid of point and push	47 (fully inclusive of steering system & MWD/LWD) Steering head length =10.5	OD: 4.75 ID: N/A	5.75 - 6.75	10	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Yes	4.3 / 25.9 / 12.9 / 20.0	Y	Negative pulse from surface skid unit	While drilling ahead	0	400 RPM 22.5 kbf	125	350	40 lb/bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
9.5" AutoTrak X-treme (Integrated pre-contoured drilling motor)	Hybrid of point and push	82 (fully inclusive of steering system, motor power section & MWD/LWD) Steering head length = 8	OD: 9.5 ID: N/A	12.25 - 18.25	6.5	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Steering system: No MWD system: Yes	Inc: 3.9 Others BHA dependent	Y	Negative pulse from surface skid unit	While drilling ahead	0	300 RPM 60 kbf	530	1,160	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
6.75" AutoTrak X-treme (Integrated pre-contoured drilling motor)	Hybrid of point and push	70 fully inclusive of steering system, motor power section & MWD/LWD) Steering head length = 7	OD: 6.75 ID: N/A	8.375 - 10.625	6.5	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Steering system: No MWD system: Yes	Inc: 3.1 Others BHA dependent	Y	Negative pulse from surface skid unit	While drilling ahead	0	400 RPM 36 kbf	265	660	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
4.75" AutoTrak X-treme (Integrated pre-contoured drilling motor)	Hybrid of point and push	68 (fully inclusive of steering system, motor power section & MWD/LWD) Steering head length = 10.5	OD: 4.75 ID: N/A	5.875 - 6.75	10	Yes Precise to within 0.125°	1.5%	Yes >7,000 Steering vectors continuously available	150/300 (175/347 on request)	25,000 (30,000 on request)	None	Yes	Inc: 4.3 Others BHA dependent	Y	Negative pulse from surface skid unit	While drilling ahead	0	400 RPM 14.6 kbf	105	315	40 lb/bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	Yes
9.5" AutoTrak eXpress RCLS (Base level RSS service)	Hybrid of point and push	64 (fully inclusive of steering system & MWD) Steering head length = 8	OD: 9.5 ID: N/A	12.00 - 26.00	6.5	Yes Precise to within 0.125°	Programmable from surface via downlink from 0-6.5° /100 ft	Yes Steering vectors continuously available	150/300	20,000	None	Steering system: No MWD system: Yes	3.9 / 40.8 / 37.5 / -	Y	Flow rate change	While drilling ahead	0	300 RPM 100 kbf	300	1,600	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	no
6.75" AutoTrak eXpress RCLS (Base level RSS service)	Hybrid of point and push	54 (fully inclusive of steering system & MWD) Steering head length = 7	OD: 6.75 ID: N/A	8.375 - 10.625	8	Yes Precise to within 0.125°	Programmable from surface via downlink from 0-8° /100 ft	Yes Steering vectors continuously available	150/300	20,000	None	Steering system: No MWD system: Yes	3.1 / 34.6 / 31.3 / -	Y	Flow rate change	While drilling ahead	0	400 RPM 57 kbf	265	900	Steering system: None MWD system: 40 lb/ bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	no
4.75" AutoTrak eXpress RCLS (Base level RSS service)	Hybrid of point and push	57 BHA inclusive of steering system & MWD	OD: 4.75 ID: N/A	5.75 - 6.75	10	Yes Precise to within 0.125°	Programmable from surface via downlink from 0-10° /100 ft	Yes Steering vectors continuously available	150/300	20,000	None	Yes	3.8 / 32.8 / 29.5 / -	Y	Flow rate change	While drilling ahead	0	400 RPM 22.5 kbf	125	350	40 lb/bbl fine nutplug (higher conc. on request)	Turbine generator	Application specific	no
<b>Gyrodatta Western Hemisphere</b> <a href="mailto:Jeff Weimer">Jeff Weimer</a> 713-461-3146 ( <a href="mailto:jeffw@gyrodatta.com">jeffw@gyrodatta.com</a> ) <a href="http://www.gyrodatta.com">www.gyrodatta.com</a>																								
Well-Guide 10-300	Point	31 collar	OD:10.25 ID: 2.813	12.25 - 17.5	3.3	Yes inclination and azimuth to within 0.1°	0 to 100%	Yes	125/257	20,000	None	No	9 Inc/Azm	Y	Rotary	0	0	150 RPM 70 kbf	none (2.813 bore - no restriction)	None	Lithium batteries/ rotation	Best bit for formation	No - Can be operated below any LWD/MWD	
<b>Gyrodatta Eastern Hemisphere</b> <a href="mailto:Sandy Lawson">Sandy Lawson</a> 44-1224-823060 ( <a href="mailto:sandyl@gyrodatta.com">sandyl@gyrodatta.com</a> ) <a href="http://www.gyrodatta.com">www.gyrodatta.com</a>																								
Well-Guide 7-100	Point	24 collar	OD: 7.25 ID: 2.25	8.375 - 9.875	7	Yes inclination and azimuth to within 0.1°	0 to 100%	Yes	150/302	20,000	None	No	7 Inc/Azm/GR	Y	Rotary	0	0	250 RPM 53 kbf	none (2.25 bore - no restriction)	None	Lithium batteries/ rotation	Best bit for formation	No - Can be operated below any LWD/MWD	

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Halliburton Sperry Drilling Guillermo Capacho, Principal Product Champion (guillermo.capacho@halliburton.com) www.halliburton.com																								
Geo-Pilot System 5200 Series	Point	16.2 + 11.5 flex collar	OD: 5.25 ID: 1.125	5.825 - 6.75	10	No	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	20,000	None	No	10/32/32/42	Y	Negative pulse from surface skid unit	0	5	180 RPM 25klb	Recommend 500 psi differential across MWD for telemetry	5,000 lbs/min (e.g., 350 gpm @ 14.3 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 5200 Series	Point	16.2 + 11.5 flex collar	OD: 5.25 ID: 1.125	5.825 - 6.75	10	No	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	20,000	None	No	10/32/32/42	Y	Negative pulse from surface skid unit	0	5	180 RPM 25klb	Recommend 500 psi differential across MWD for telemetry	5,000 lbs/min (e.g., 350 gpm @ 14.3 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot System 7600 Series	Point	20	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	18,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 7600 Series	Point	20	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	18,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 7600 Series Solar	Point	20	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	175 / 347	25,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 7600 Series XHP	Point	20	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	30,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 7600 Series Solar XHP	Point	20	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	175/347	30,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot System 9600 Series	Point	22	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	20,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 100klb	Recommend 500 psi differential across MWD for telemetry	20,000 lbs/min (e.g., 2,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 9600 Series	Point	22	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	20,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 100klb	Recommend 500 psi differential across MWD for telemetry	20,000 lbs/min (e.g., 2,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 9600 Series Solar	Point	22	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	175/347	25,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 100klb	Recommend 500 psi differential across MWD for telemetry	20,000 lbs/min (e.g., 2,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot XL System 9600 Series XHP	Point	22	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	30,000	None	No	3/23/3/40	Y	Negative pulse from surface skid unit	0	0	250 RPM 100klb	Recommend 500 psi differential across MWD for telemetry	20,000 lbs/min (e.g., 2,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot GXT System 7600 Series (Integrated GeoForce even-wall power section)	Point	20 + 27.4 (power section)	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	18,000	None	No	3/23/3/56	Y	Negative pulse from surface skid unit	0	0	400 bit RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot GXT System 7600 Series Solar (Integrated GeoForce even-wall power section)	Point	20 + 27.4 (power section)	OD: 7.625 ID: 1.625	8.375 - 10.625	8	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	175/347	25,000	None	No	3/23/3/56	Y	Negative pulse from surface skid unit	0	0	400 bit RPM 55klb	Recommend 500 psi differential across MWD for telemetry	10,000 lbs/min (e.g., 1,000 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot GXT System 9600 Series (Integrated GeoForce even-wall power section)	Point	22 + 29.7 (power section)	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	140/284	20,000	None	No	3/23/3/58	Y	Negative pulse from surface skid unit	0	0	400 bit RPM 90klb	Recommend 500 psi differential across MWD for telemetry	12,000 lbs/min (e.g., 1,200 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes
Geo-Pilot GXT System 9600 Series Solar (Integrated GeoForce even-wall power section)	Point	22 + 29.7 (power section)	OD: 9.625 ID: 2.375	12.25 - 26	9	Yes within 0.100°	0-100% in 1% increments, and 3° TF increments	Yes >12,000 Steering vectors continuously available	175/347	25,000	None	No	3/23/3/58	Y	Negative pulse from surface skid unit	0	0	400 bit RPM 90klb	Recommend 500 psi differential across MWD for telemetry	12,000 lbs/min (e.g., 1,200 gpm @10 ppg)	None	Lithium batteries	Extended gauge for predictable build rate	Yes

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Product trade name	Point-the-bit or Push-the-bit?	Length (ft)	O. D. & I. D. (inches)	Hole size (inches)	Max DLS capability (°/100')	Automated closed loop deviation control (yes/no) (+/-degrees)	Build rate increment	Is deviation force continuous?	Max temp (°C /°F)	Max internal pressure (psi)	Other special pressure limitations	Require configuration based on anticipated flow rate?	Sensor distance (ft) Inc/Azm/GR/Res	Control from surface (Downlink)? (Y / N)	If yes, tool control method	Req'd to communicate change in target (minutes)	Minimum kickoff inclination (degrees)	Max RPM / WOB	Min flow rate (gpm)	Max flow rate (gpm)	LCM limits	Power source	Bit requirements	Integrated LWD?
EZ-Pilot 1225 System	Point	11.7	OD: 10.63 ID: 2.0	12 - 14.75	5	No	Surface selectable from 0-5° /100 ft	Yes	150/302	18,000	None	No	5.7/28/35	Y	Negative pulse from surface skid unit	0	0	280 RPM 88klb	Recommend 500 psi differential across MWD for telemetry	1,400	None	Lithium batteries	Application specific	No
EZ-Pilot 850 System	Point	13.3	OD: 7.25 ID: 2.0	8.375 - 9.875	5	No	Surface selectable from 0-5° /100 ft	Yes	150/302	20,000	None	No	7.5/28/35	Y	Negative pulse from surface skid unit	0	0	280 RPM 42.5klb	Recommend 500 psi differential across MWD for telemetry	1400	None	Lithium batteries	Application specific	No

Pathfinder Energy Services Steve Jones [steve.jones@pathfinderlwd.com](mailto:steve.jones@pathfinderlwd.com)

PathMaker 8in.	Point & push modes available	22 w/flex collar	OD: 9.5 ID: 2.25	12.25 - 16.5	6	Yes	+/- 0.1°	0-100% in 1% resolution, and 3 deg TF resolution	Yes	150/305	15,000	None	No	Inc: 10 Others BHA dependent	Y	Rotary	While drilling ahead	0	250 RPM 60 klbs	No minimum requirement	1500	None	Lithium batteries	None	Yes
PathMaker 6.75in	Point & push modes available	25 w/flex collar	OD: 6.75 ID: 1.60	8.375 - 8.75	10	Yes	+/- 0.1°	0-100% in 1% resolution, and 3° TF resolution	Yes	150/305	20,000	None	No	Inc: 10 Others BHA dependent	Y	Rotary	While drilling ahead	0	250RPM 50 klbs	No minimum requirement	750	None	Lithium batteries	None	Yes

Schlumberger Emma Bloor, Marketing Communications Manager [ebloor@slb.com](mailto:ebloor@slb.com) 281-285-8425

PowerDrive Xceed 675	Point	25	OD: 6.75 ID: N/A	8.375 - 9.875	8	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	20,000	None	Yes	Inc / Azm 12.8 / 12.8	Y	Flow rate change	While drilling ahead	0	350 RPM 55 klbf	360	800	50 lb/bbl med. nut plug	Turbine generator	Application specific - bi-center compatible	Modular
PowerDrive Xceed 900	Point	28	OD: 9.00 ID: N/A	12.25 - 17.5	6.5	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	20,000	None	Yes	Inc / Azm 16.7 / 16.7	Y	Flow rate change	While drilling ahead	0	350 RPM 75 klbf	450	1,800	50 lb/bbl med. nut plug	Turbine generator	Application specific - bi-center compatible	Modular
PowerDrive X5 1100	Push	15.1	OD: 9.5 ID: N/A	16 - 26	4	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	25,000	Pressure drop at bit consideration required	Yes	Inc / Azm 8.8 / 10.9 GR 8.0	Y	Flow rate change	While drilling ahead	0	220 RPM 65 klbf	480	1,900	50 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive X5 900	Push	16.5	OD: 9.0 ID: N/A	12 - 14.75	5	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	25,000	Pressure drop at bit consideration required	Yes	Inc / Azm 8.4 / 10.5 GR 7.6	Y	Flow rate change	While drilling ahead	0	220 RPM 65 klbf	360	1,900	50 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive X5 825	Push	15.9	OD: 8.25 ID: N/A	10.625	6	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	25,000	Pressure drop at bit consideration required	Yes	Inc / Azm 8.4 / 10.5 GR 7.6	Y	Flow rate change	While drilling ahead	0	220 RPM 65 klbf	360	1,500	50 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive X5 675	Push	13.4	OD: 6.75 ID: N/A	7.875 - 9.875	8	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	25,000	Pressure drop at bit consideration required	Yes	Inc / Azm 7.3 / 9.4 GR 6.4	Y	Flow rate change	While drilling ahead	0	220 RPM 65 klbf	250	800	50 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive X5 650	Push	10	OD: 6.50 ID: N/A	7.875	8	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	20,000	Pressure drop at bit consideration required	Yes	N/A	Y	Flow rate change	While drilling ahead	0	220RPM 65 klbf	240	550	50 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive X5 475	Push	14.6	OD: 4.75 ID: N/A	5.5 - 6.75	8	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/302	25,000	Pressure drop at bit consideration required	Yes	Inc / Azm 6.7 / 8.8 GR 5.9	Y	Flow rate change	While drilling ahead	0	220 RPM 50 klbf	130	400	35 lb/bbl med. nut plug	Turbine generator	Application specific	Modular
PowerDrive Xbow	Push	36.5	3.125	3.75 - 4.5	15	Yes	+/- 0.1°	1% and 1° TF resolution	Adjustable	150/303	20,000	Pressure drop at bit consideration required	Yes	Inc / Azm 16.9 / 16.9	Y	Flow rate change	While drilling ahead	0	400 RPM 5 klbf	80	140	35 lb/bbl med. nut plug	Turbine generator	Application specific	Modular

Weatherford International Steve Bell [steve.bell@weatherford.com](mailto:steve.bell@weatherford.com) [www.weatherford.com](http://www.weatherford.com)

Revolution 825 rotary steerable system	Point	14.5	OD: 8.25 ID: 2.75	17.5 - 10.625	7.5	No	Variable	Yes	165/329 operating	25,000	None	No	14/14/16/39	Y	Drillstring rotation or negative pulse from surface skid unit	Typically < 3	0	250 RPM 90 klb	No minimum requirement	1500	Steering system: None MWD system: 80 lb/bbl fine/med (higher conc. on request)	Lithium batteries	Medium/long passive gauge PDC or roller cone	Yes
Revolution 675 rotary steerable system	Point	12.7	OD: 6.75 ID: 2.0	8.375 - 9.875	10	No	Variable	Yes	165/329 operating	25,000	None	No	12/ 12/14/39	Y	Drillstring rotation or negative pulse from surface skid unit	Typically < 3	0	250 RPM 50 klb	No minimum requirement	750	Steering system: None MWD system: 80 lb/bbl fine/med (higher conc. on request)	Lithium batteries	Medium/long passive gauge PDC or roller cone	Yes
Revolution 475 rotary steerable system	Point	11.2	OD: 4.75 ID: 1.75	6 - 6.75	10	No	Variable	Yes	165/329 operating	25,000	None	No	9/ 9/16/39	Y	Drillstring rotation or negative pulse from surface skid unit	Typically < 3	0	250 RPM 25 klb	No minimum requirement	350	Steering system: None MWD system: 80 lb/bbl fine/med (higher conc. on request)	Lithium batteries	Medium/long passive gauge PDC or roller cone	Yes