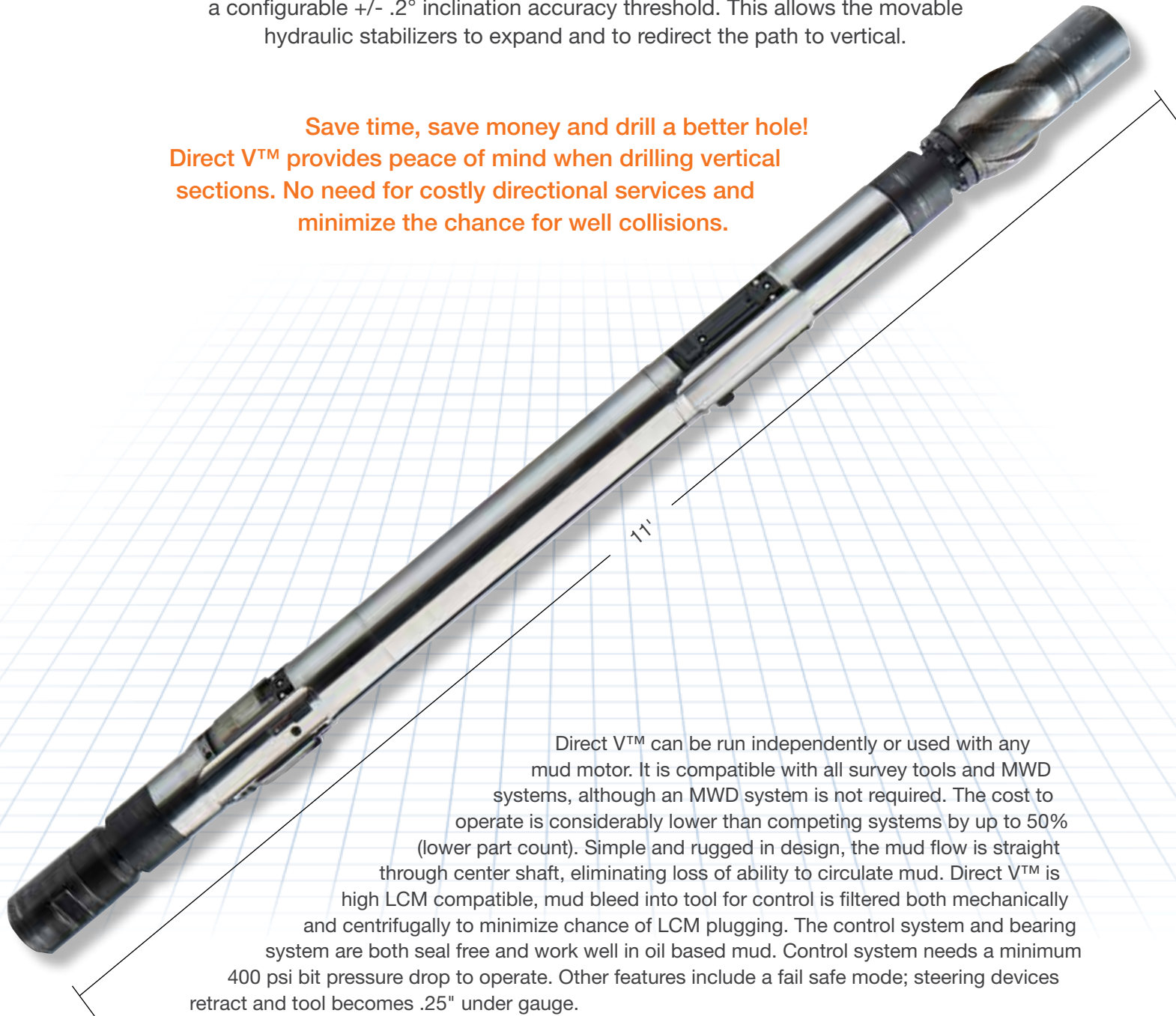


Direct V™ – The Steerable Tool Revolutionize Straight Hole Drilling

Direct V™ is fully automatic, electro mechanical, closed loop system with a configurable +/- .2° inclination accuracy threshold. This allows the movable hydraulic stabilizers to expand and to redirect the path to vertical.

**Save time, save money and drill a better hole!
Direct V™ provides peace of mind when drilling vertical sections. No need for costly directional services and minimize the chance for well collisions.**



Direct V™ can be run independently or used with any mud motor. It is compatible with all survey tools and MWD systems, although an MWD system is not required. The cost to operate is considerably lower than competing systems by up to 50% (lower part count). Simple and rugged in design, the mud flow is straight through center shaft, eliminating loss of ability to circulate mud. Direct V™ is high LCM compatible, mud bleed into tool for control is filtered both mechanically and centrifugally to minimize chance of LCM plugging. The control system and bearing system are both seal free and work well in oil based mud. Control system needs a minimum 400 psi bit pressure drop to operate. Other features include a fail safe mode; steering devices retract and tool becomes .25" under gauge.

VERTEX
DOWNHOLE

Direct V™ Advantages

- Save money; more cost effective than a MWD motor configuration
- Automatically corrects drift
- Steerable hole means less hole friction, less stuck drill strings
- Improved hole cleaning
- 4 battery packs equals 600 hours
- Easier casing runs, due to less tortuous holes
- Stays within extremely tight targets
- Higher ROP — continuous rotation increase ROP over sliding with motor
- Unlimited mud capability; where some chemicals and muds attack motor stators
- More accurate directional control, sensors are close to bit, no motor tool face windup, the DCT can make directional corrections in a timelier manner than a person
- Drills wells faster, with more weight on bit, without need for feathering or correction slides
- No need for expensive mud motor

	Direct V	Scout	Verti trac	Power V	Smart drill/NOV	D-Tech
cost to operate/day	650	1000	2000	2000	5000	2000
length/feet	10.5	20	30	20	16	13
WOB	58,000	32,000	n/a	65,000	44,962	50,000
flow max gpm	650	650	n/a	950	529	675
max pressure drop	1200	700	n/a	750	n/a	570
Min pressure drop	400	400	n/a	n/a	n/a	380
Max overpull	625,000	410,000	n/a	n/a	n/a	n/a
LCM	100lbs/bbl med nut	20lbs/bbl nut plug	n/a	50lbs/bbl med nut	n/a	n/a
RPM	250	n/a	n/a	220	250	180
mechanical / smart	smart	mechanical	smart	smart	smart	smart
dayrate	3500	6500	8000	10000	6500	6500
Temp	150	175	150	150	150	150
Torque	16,600	n/a	n/a	16,000	11,070	16,000
power section	option	built in	built in	option	no	no
Max Pressure	20,000	n/a	n/a	n/a	n/a	15,000
Downlink	yes	no	n/a	yes	n/a	Yes

Sizes & Specifications

6.5" tool, hole sizes are: 7.875", 8.375", 8.5", 8.75"

Pressure rating — 20,000 psi
 Max operating temp — 329° F / 165° C
 Maximum WOB — 58,000 lbs
 Flow rate range — 300-650 gpm
 Max rotary speed — 250 rpm
 Max torque — 16,600 ft-lbs
 Max overpull to failure is 821,000 lbs
 Max overpull to re-run is 625,000 lbs

8.0" tool (available Q2 2020) hole sizes are: 9.875" - 12.25"

Automated closed loop control — Yes
 Integrated electronics — Yes
 Integrated MWD — No
 Tool length — 11
 Configurable build range — 0-4°/100 (formation dependent)
 Bit Pressure Drop limits pressure drop across tool, 400 psi minimum/1,200 psi maximum.

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