

Casing Running Tool with External Grip (CRTe™)

Volant's CRTe is designed for casing drilling or running with top drive equipped rigs to makeup, breakout, reciprocate, rotate, fill, circulate, and cement casing and liner strings, reducing non-productive time and associated costs. This tool is mechanically activated in tension and both rotational directions solely by top drive control using TAWG™ (Torque Activated Wedge Grip) technology.

This patented architecture puts control in the hands of the driller, reducing the need for third party support to run casing. Simple intuitive operating steps for pipe engagement and release closely emulate the familiar make and break steps used to run drill pipe – stab, rotate to the right to engage and reverse to disengage. Similarly, rig-in and rig-out steps are simple, intuitive and efficient.

Starting from the base bell diameter, selectable sizes of jaws/dies are used to configure the CRTe to support gripping casing of decreasing external diameter.

Tool Model: CRTe-1.0 Specification Summary

Drive Module 1

			Float	Non-Float
Rated Load Capacity	Hoist ^{1,2}	ton (tonne)	500 (454)	
	Torque ^{2,3}	ft.lbs (N.m)	40,000 (54,233)	
Typical Circulation Pressure Limit ^{4,5}		psi (MPa)	5,000 (34)	
Maximum Pressure End Load ⁵		ton (tonne)	150 (136)	
Maximum Pressure End Load with Retractable Stinger ⁵		ton (tonne)	50 (45)	
Set-Down Load Capacity ⁶		ton (tonne)	200 (181)	
Float Length		in (mm)	6.0 (152.4)	— (—)
Through Hole		in (mm)	1.25 (31.8)	
Tool Joint				NC50
Turns to Stroke Out				1.75

CRTe-1.0 with Grip Module 5.5"



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Casing Running Tools (CRTe-1.0)

Tool Model: CRTe-1.0 Specification Summary

Grip Module 5.5"

		Float	Non-Float
Base Tool Length	in (mm)	83.0 (2,108)	71.0 (1,803)
Overall Tool Length with Keeper ⁷	in (mm)	83.3 (2,115)	71.3 (1,811)
Overall Tool Length with Retractable Stinger ⁷	in (mm)	87.6 (2,225)	75.6 (1,920)
Overall Tool Length with Fixed Mandrel Extension ⁷	in (mm)	95.5 (2,425)	83.5 (2,121)
Maximum Tool Diameter	in (mm)	13.7 (348)	
Approximate Tool Weight	lbs (kg)	1,900 (862)	1,750 (794)
Diametrical Stroke	in (mm)	1.37 (34.7)	
4.5" Casing ⁸			
Die P/N		82155	
Nominal Pipe Size	in (mm)	4.5 (114.3)	
Maximum Coupling Diameter	in (mm)	5.64 (143.3)	
Maximum Coupling Length	in (mm)	12.95 (328.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.03467 (4.581)	
Die Curvature Diameter	in (mm)	4.51 (114.6)	
Die Length	in (mm)	16.3 (414.0)	
5.0" Casing ⁸			
Die P/N		82408	
Nominal Pipe Size	in (mm)	5.0 (127.0)	
Maximum Coupling Diameter	in (mm)	6.16 (156.5)	
Maximum Coupling Length	in (mm)	12.95 (328.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.03081 (4.071)	
Die Curvature Diameter	in (mm)	5.01 (127.3)	
Die Length	in (mm)	16.3 (414.0)	
5.5" Casing ⁸			
Die P/N		81813	
Nominal Pipe Size	in (mm)	5.5 (139.7)	
Maximum Coupling Diameter	in (mm)	6.6 (167.6)	
Maximum Coupling Length	in (mm)	12.95 (328.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.02812 (3.716)	
Die Curvature Diameter	in (mm)	5.51 (140.0)	
Die Length	in (mm)	16.3 (414.0)	

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Tool Model: CRTe-1.0 Specification Summary

Grip Module 7.75"

		Float	Non-Float
Base Tool Length	in (mm)	89.2 (2,266)	77.2 (1,961)
Overall Tool Length with Keeper ⁷	in (mm)	89.6 (2,276)	77.6 (1,971)
Overall Tool Length with Retractable Stinger ⁷	in (mm)	95.5 (2,426)	83.5 (2,120)
Overall Tool Length with Fixed Mandrel Extension ⁷	in (mm)	103.4 (2,625)	91.4 (2,320)
Maximum Tool Diameter	in (mm)	16.3 (414)	
Approximate Tool Weight	lbs (kg)	2,400 (1,089)	
Diametrical Stroke	in (mm)	1.4 (35.6)	
4.5" Casing ^a			
Die P/N		82155	
Nominal Pipe Size	in (mm)	4.5 (114.3)	
Maximum Coupling Diameter	in (mm)	5.93 (150.6)	
Maximum Coupling Length	in (mm)	15.9 (403.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.03467 (4.581)	
Die Curvature Diameter	in (mm)	4.51 (114.6)	
Die Length	in (mm)	16.3 (414.0)	
5.0" Casing ^a			
Die P/N		82408	
Nominal Pipe Size	in (mm)	5.0 (127.0)	
Maximum Coupling Diameter	in (mm)	6.42 (163.1)	
Maximum Coupling Length	in (mm)	15.9 (403.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.03081 (4.071)	
Die Curvature Diameter	in (mm)	5.01 (127.3)	
Die Length	in (mm)	16.3 (414.0)	
5.5" Casing ^a			
Die P/N		81813	
Nominal Pipe Size	in (mm)	5.5 (139.7)	
Maximum Coupling Diameter	in (mm)	6.92 (175.8)	
Maximum Coupling Length	in (mm)	15.9 (403.9)	
Slip to Pipe Body Load Efficiency		80%	
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.02812 (3.716)	
Die Curvature Diameter	in (mm)	5.51 (140.0)	
Die Length	in (mm)	16.3 (414.0)	

CRTe-1.0 with Grip Module 7.75"



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Tool Model: CRTe-1.0 Specification Summary

Grip Module 7.75" (continued)

	Float	Non-Float
7.0" Casing ⁸		
Die P/N		82854
Nominal Pipe Size	in (mm)	7.0 (177.8)
Maximum Coupling Diameter	in (mm)	8.4 (213.4)
Maximum Coupling Length	in (mm)	15.4 (391.2)
Slip to Pipe Body Load Efficiency		80%
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.02577 (3.405)
Die Curvature Diameter	in (mm)	7.0 (177.8)
Die Length	in (mm)	18.3 (464.8)
7.63" Casing ⁸		
Die P/N		81839
Nominal Pipe Size	in (mm)	7.63 (193.7)
Maximum Coupling Diameter	in (mm)	9.01 (228.9)
Maximum Coupling Length	in (mm)	15.4 (391.2)
Slip to Pipe Body Load Efficiency		80%
Torque Factor	ft.lbs/psi/ppf (N.m/Mpa/(kg/m))	0.02371 (3.133)
Die Curvature Diameter	in (mm)	7.64 (194.1)
Die Length	in (mm)	18.3 (464.8)

- 1 Tool hoist rating is based on API Specification 8C.; however, load capacity is further constrained by local interaction of the slip dies with the casing which must not exceed the efficiency indicated for individual slip die sizes to avoid excess deformation. The slip to casing interaction hoist limit is calculated by multiplying the slip to pipe body load efficiency number by the casing hoist limit found in API Specification 5C2. For example, from 5C2 the pipe body yield for 5.5 in x 20.0 ppf L80 (139.7 mm x 29.76 kg/m L80) casing is 466,000 lbs (211.3 tonne). The slip efficiency for die 81813 used to run this casing is 80%. Therefore, the casing hoist limit is 80% x 466,000 lbs = 372,800 lbs (186.4 tons) or 80% x 211.3 tonne = 169.0 tonne.
- 2 Capacity ratings provided represent design intent. These values may change pending outcome of design verification testing.
- 3 Torque capacity may be limited by slip die/casing interaction. Multiply torque factor by the desired casing weight in ppf (kg/m) then multiply the result by the casing yield strength to determine the slip die/casing interaction torque limit. For example, for die 81813 to run 5.5 in x 20.0 ppf L80 (139.7 mm x 29.76 kg/m L80) casing, the die torque limit is: 0.02812 ft.lbs/psi/ppf x 80,000 psi x 20.0 ppf = 44,992 ft.lbs or 3.716 N.m/MPa/(kg/m) x 551.6 MPa x 29.76 kg/m = 61,000 N.m.
- 4 CRTe circulation pressure capacity is generally governed by packer cup pressure capacity. Pressure capacity may be less than indicated if alternative seal arrangements are used.
- 5 CRTe maximum pressure end load depends on the type of casing seal arrangement and mandrel attachments. CRTe hoist capacity must be reduced by the pressure end load during circulation.
- 6 Maximum allowable set-down load applied to the tool. Some set-down load may be reacted through the coupling. This rating does not take into account bearing load limitations of the coupling.
- 7 Overall tool length depends on the casing seal arrangement and mandrel attachments.
- 8 Values given are valid for all pipe weights specified in API 5CT.

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