

CH 320

Self-Erecting Hydraulic Piling Rig



COMACCHIO

DRILLING HI-TECH

CH 320

MULTIPURPOSE PILING RIG

The winning solution for job sites of short duration that require frequent operations of transport, setting up and dismantling.

Truly self-erecting. The machine is entirely autonomous and self-erecting, and can be transported in one piece/fully assembled with the rotary head and kelly bar installed. Once on site, the machine is easily off loaded from the truck and set up without the need for crane service.

Wide range of drilling technologies. The CH 320 allows for the use of the following drilling technologies:

BP (Bored Piles) uncased bored piles excavated by dry method or stabilized by fluid overpressure;

CBP (Cased Bored Piles) bored piles with casing installation by rotary drive;

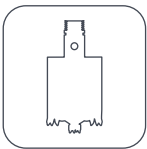
CFA (Continuous Flight Auger) piles that are drilled uncased by the use of a continuous hollow auger stem;

DP (Displacement Piles) piles installed without soil removal by advancing a special tool into the ground that causes the soil to be displaced radially and vertically;

SM (Soil Mixing) piles constructed by mixing and partly replacing the existing soils with grout using a soil mixing tool;

MP (Micropiles) installed using conventional air-flush rotary drilling.

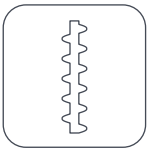
Performance



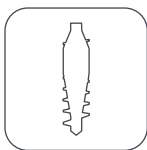
	m.s.	i.s.	BP (Bored Piles)		CBP (Cased Bored Piles)	
Max. pile diameter	mm	ft-in	1.180 / 1.500 ⁽¹⁾	3' 10" / 4' 11" ⁽¹⁾	880	2' 11"
Max. pile depth	m	ft-in	47,5 ⁽²⁾	155' 10" ⁽²⁾	-	-

(1) tool below mast.

(2) using self mounting 5-elements kelly bar.



	m.s.	i.s.	CFA (Continuous Flight Auger)			
Max. pile diameter	mm	ft-in	800	2' 7"		
Max. pile depth	m	ft-in	11 + 7 = 18	36' 1" + 23' = 59' 1"		



	m.s.	i.s.	DP (Displacement Piles)			
Pile diameter	mm	in	450	18"		
Max. pile depth	m	ft-in	10,5 + 7 = 17,5	34' 5" + 23' = 57' 5"		



	m.s.	i.s.	SM (Soil Mixing)			
Pile diameter ⁽³⁾	mm	ft-in	400 - 1100/2000 ⁽⁴⁾	16" - 3' 7"/6' 7" ⁽⁴⁾		
Max. pile depth	m	ft-in	10,5 + 7 = 17,5	34' 5" + 23' = 57' 5"		

(3) according to the soil conditions

(4) tool below mast



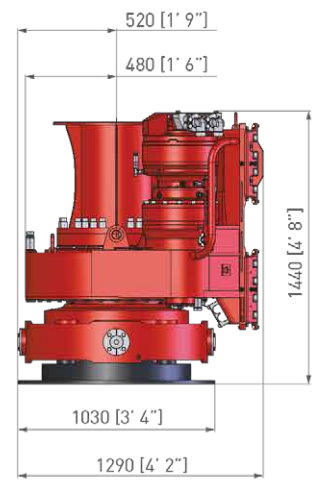
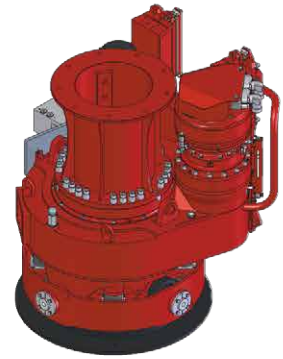
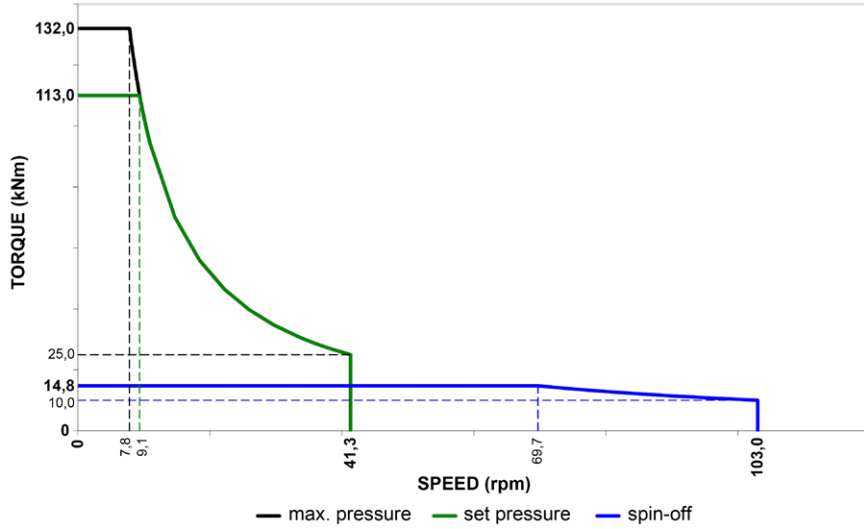
	m.s.	i.s.	MP (Micropiles)			
Max. pile diameter	mm	in	610	24"		
Stroke of rotary head	mm	ft-in	10.500	34' 7"		

Undercarriage		m.s.	i.s.		
Type		-	Variable gauge, telescoping side frames		
Track shoe width	mm	ft-in	600	1' 11" 5/8	
Track shoe type		-	Triple grouser		
Overall width (retracted side frames)	mm	ft-in	2.550	8' 4" 1/2	
Overall width (extended side frames)	mm	ft-in	3.750	12' 3" 1/2	
Overall length	mm	ft-in	4.295	14' 1"	
Centre idler to centre sprocket	mm	ft-in	3.560	11' 8"	
Upperframe					
Width	mm	ft-in	2.550	8' 4" 1/2	
Operators' cabin		-	TOPS & FOPS-1 certified, 960 mm [3' 2"] wide		
Control system type		-	CAN-BUS		
User interface		-	7" Touch Screen		
Tail swing radius	mm	ft-in	3.100	10' 2"	
Diesel Engine		High Tech Line			
Make and model		-	Cummins B4.5	Cummins QSB4.5	
Emission certification		-	EU stage V / US EPA Tier 4f	EU stage IIIA / US EPA Tier 3	
Aspiration		-	Turbocharged and charge air cooled		
Power rating (2000 rpm)	kW	HP	142	190	123 165
Displacement	cc	in ³	4.500		275
Fuel consumption rate (100% power, rated speed)	g/kWh	lb/hp-hr	203	0.334	227 0.373
Fuel tank	l	gal	300	80	
Hydraulic System					
Main pumps flow	l/min	gal/min	2 x 160		2 x 42.3
Hydraulic oil tank capacity	l	gal	400	105	
Main Winch					
Type		-	Controlled descent		
1 st layer line pull	kN	lbs	120	26,980	
1 st layer depth	m	ft	43	142'	
1 st layer rope speed	m/min	ft/min	86	282'	
Rope diameter	mm	in	21	13/16"	
Rope layers		-	2		
FEM classification		-	M5-L2-T5		
Service Winch					
Type		-	Controlled descent		
1 st layer line pull	kN	lbs	61	13,700	
1 st layer rope speed	m/min	ft/min	58	190' 3"	
Rope diameter	mm	in	15	9/16"	
Rope layers		-	4		
FEM classification		-	M5-L2-T5		

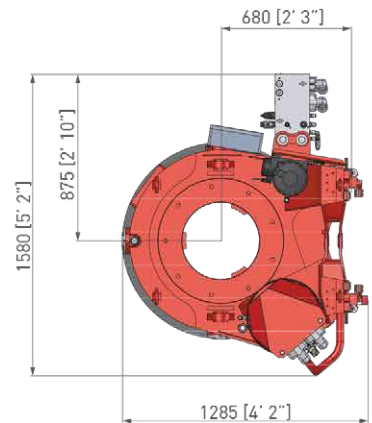
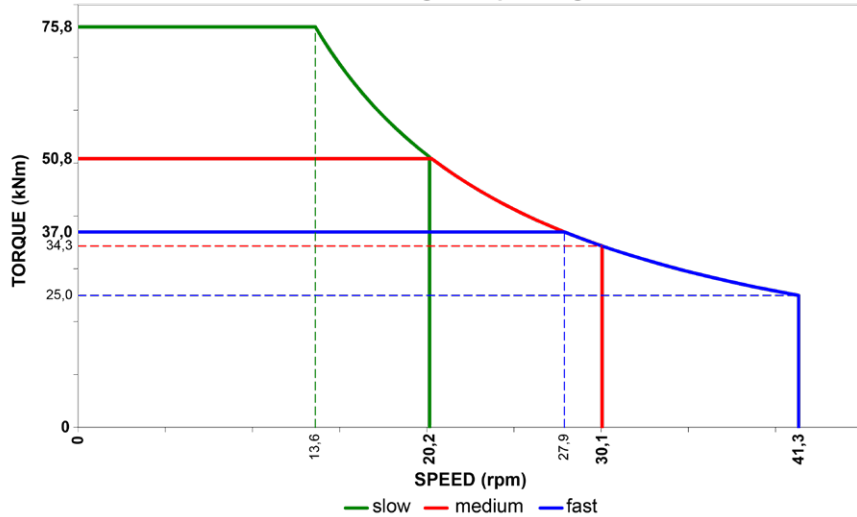
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Rotary Head

Torque Diagram



Soil Mixing - Torque Diagram



Rotary Head

m.s. i.s.

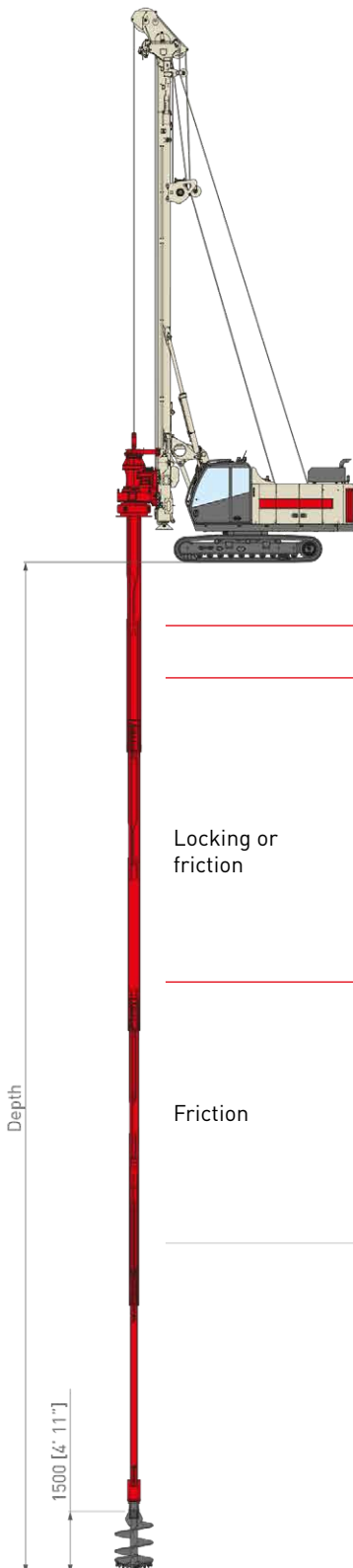
CR 13

Nominal max torque	kNm	lbf-ft		132 at 35 MPa	97,300 at 5,076 psi
Max. torque	kNm	lbf-ft		113 at 30 MPa	83,300 at 4,350 psi
Max. drilling speed	rpm			41	
Hydraulic power	kW	HP	CUMMINS stage V	108	145
	kW	HP	CUMMINS stage IIIA	94	126
Spin-off speed	rpm			103	
Replaceable drive sleeve			-	Yes	
Replaceable drive keys			-	Yes (optional)	

Comacchio Innovative Kelly bar system

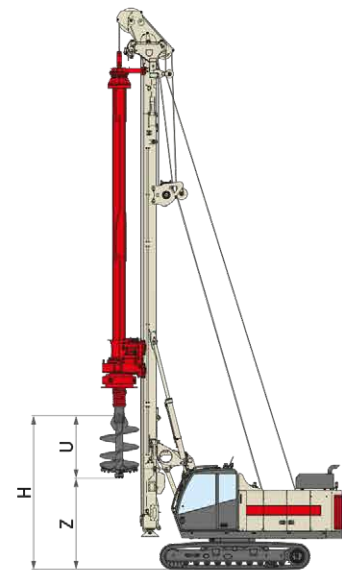
Kelly bar sizes	m.s. i.s.		Outer diameter	
	mm	in	355	14"
L (standard)				

Note
Different sizes upon request.



$$U \text{ (approx.)} \quad \text{mm} \quad \text{ft-in} \quad 1.500 \quad 4' 11''$$

$$Z = H - U$$



	Kelly bar				WPD				
	N.	Length		Weight		Depth		H ⁽¹⁾	
		(m)	(ft-in)	(kg)	(lbs)	(m)	(ft-in)	(m)	(ft-in)
Locking or friction	4	6	19' 8"	2.830	6,240	20,50	67' 3"	7,50	24' 7"
	4	7	23'	3.190	7,030	24,50	80' 5"	6,50	21' 4"
	4	8	26' 3"	3.540	7,800	28,50	93' 6"	5,50	18' 1"
	4	9	29' 6"	3.900	8,600	32,50	106' 8"	4,50	14' 9"
	4	10,5	34' 5"	4.440	9,790	38,50	126' 4"	3,00	9' 10"
Friction	5	6	19' 8"	3.230	7,120	25,50	83' 8"	7,50	24' 7"
	5	7	23'	3.660	8,070	30,50	100' 1"	6,50	21' 4"
	5	8	26' 3"	4.080	8,990	35,50	116' 6"	5,50	18' 1"
	5	9	29' 6"	4.500	9,920	40,50	132' 10"	4,50	14' 9"
	5	10,5	34' 5"	5.130	11,310	48,00	157' 6"	3,00	9' 10"

(1) Max height of bottom kelly pin above ground, with 130 x 130 mm (5" 1/8 x 5" 1/8) square joint.
Using 200 x 200 mm (7" 7/8 x 7" 7/8) square joint the height decreases by approx. 0,20 m (7" 7/8).

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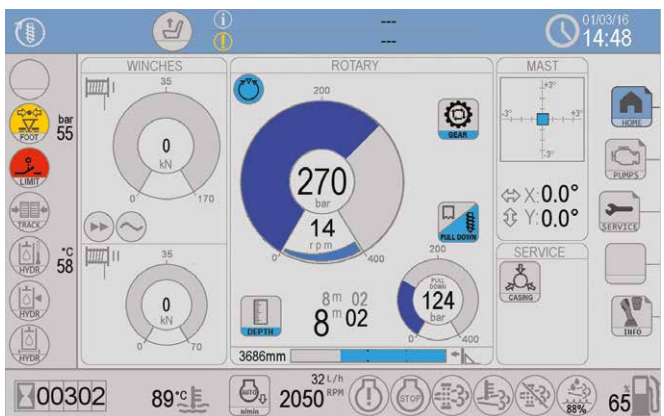
Options and Accessories

Standard equipment

Main winch with special grooving	Transport securing lugs on crawler unit
Hoist and lowering limit switches on main and service ropes	Work lights
Swivel for main rope	Electric refuelling pump and hydraulic oil refilling
Service rope parking point	Diagnostic panel for hydraulic, electrical and electronic functions
Mast inclination measurement on X & Y axes (digital and analog display)	Front and top cabin protective grate (FOPS-1 certified)
Automatic vertical mast alignment	Bluetooth radio device
Depth measuring device on main winch	Phone charger
Rpm measuring device on rotary	CCS Comacchio Controlling System - 7" Touch Screen
Crowd pressure setting	Spinoff tool dump system
Heating & air conditioning system	Adaptive shaker tool dump system
Engine diagnostic panel	Rotary auto speed management & interactive multiple gear
Fire extinguisher in the cabin	Tool box



APPROVED NEW ERGONOMIC RIDESIGNED CABIN



CCS: Home page

Optional equipment

Biodegradable oil	Washing kit
Main and aux winch load cells	Air compressor kit
Swivel for auxiliary rope	Videocamera set
Central lubrication system	Vibratory equipment for steel cage
Automatic lubrication kit for rotary sliding guides	Hydraulic PTO
CFA cleaner (star or hydraulic type)	Tools shelf on cabin
Flange for bucket opening	Customized casing twisters
Cardan joint	Auger extension transportation kit (CFA version)
Kelly bar quill with replaceable drive keys	ComNect system
Flange for casing driving	Data logger
Welding equipment & generator	

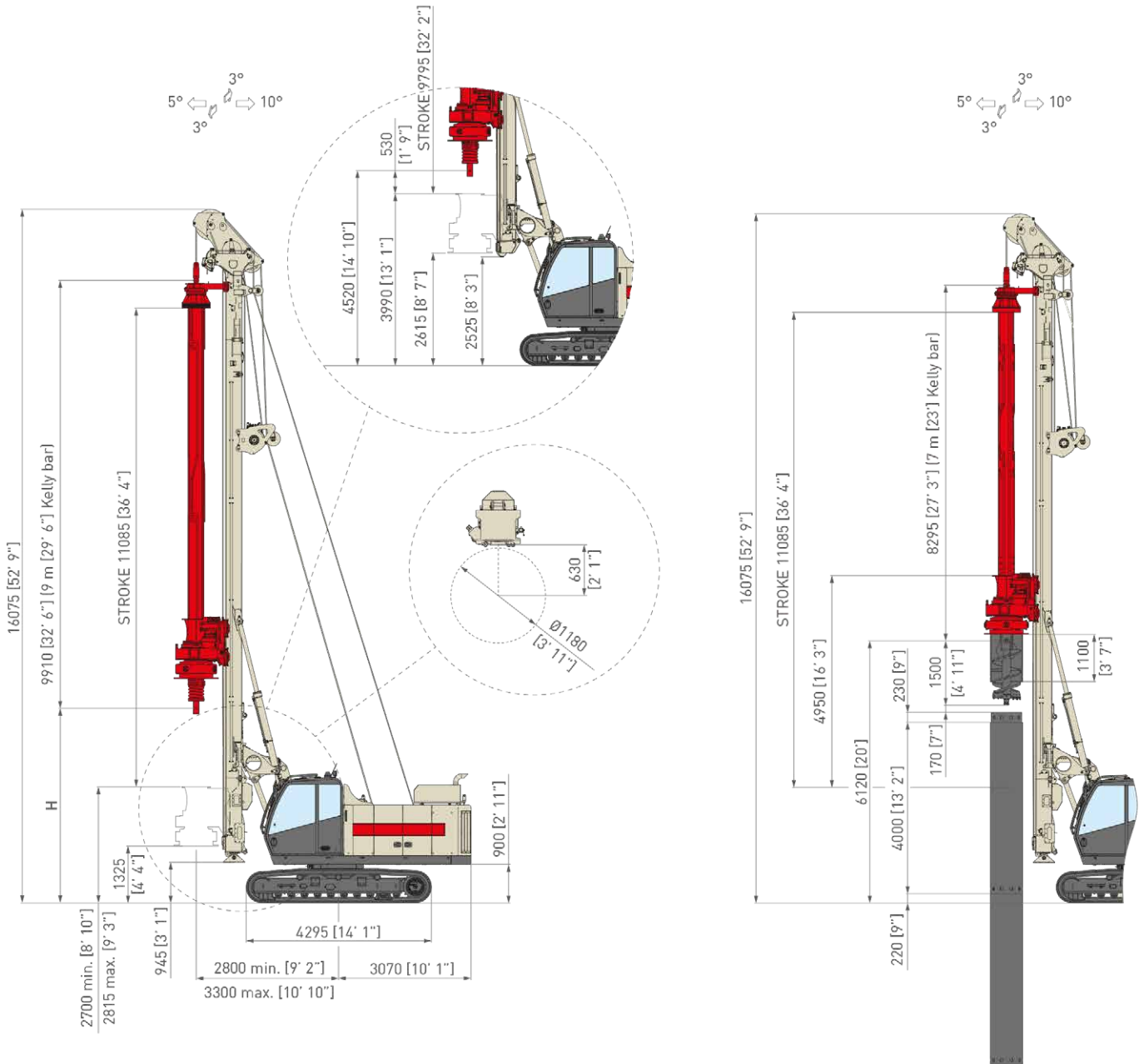
CE conformity kit

Machine travel remote radio control	Video cameras set
Main and aux winch load cells	CFA cleaner
Side walkways w/handrails	Rubber strip on auger guide



CH 320 - WPD

Overall dimensions



WPD (Winch Pull Down)

	m.s.	i.s.		
Stroke	mm	ft-in	11.300	37' 1"
Max. pull up force	kN	lbs	160	36,000
Max. pull down force	kN	lbs	160	36,000
Crowd speed (hoist-lowering)	m/min	ft/min	36 - 36	118 - 118
Max. pile diameter	mm	ft-in	1.180 ⁽¹⁾ - 1.500 ⁽²⁾	3' 10" ⁽¹⁾ - 4' 11" ⁽²⁾
Operating weight w/o tool	kg	lbs	31.600 ⁽³⁾	70,000 ⁽³⁾

Notes

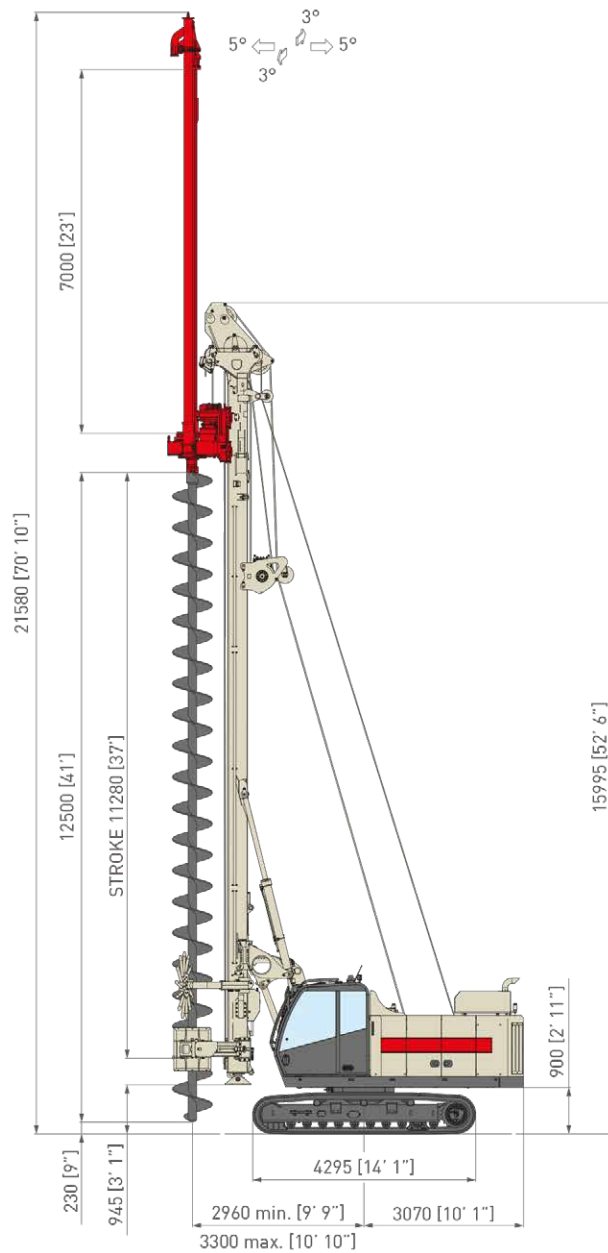
(1) tool in front of mast.

(2) tool below mast.

(3) c/w 4 x 9 m [4 x 29' 6"] long 355 mm [14"] dia. Kelly bar; rotary c/w bucket opening flange.

CH 320 - CFA/WPD

Overall dimensions



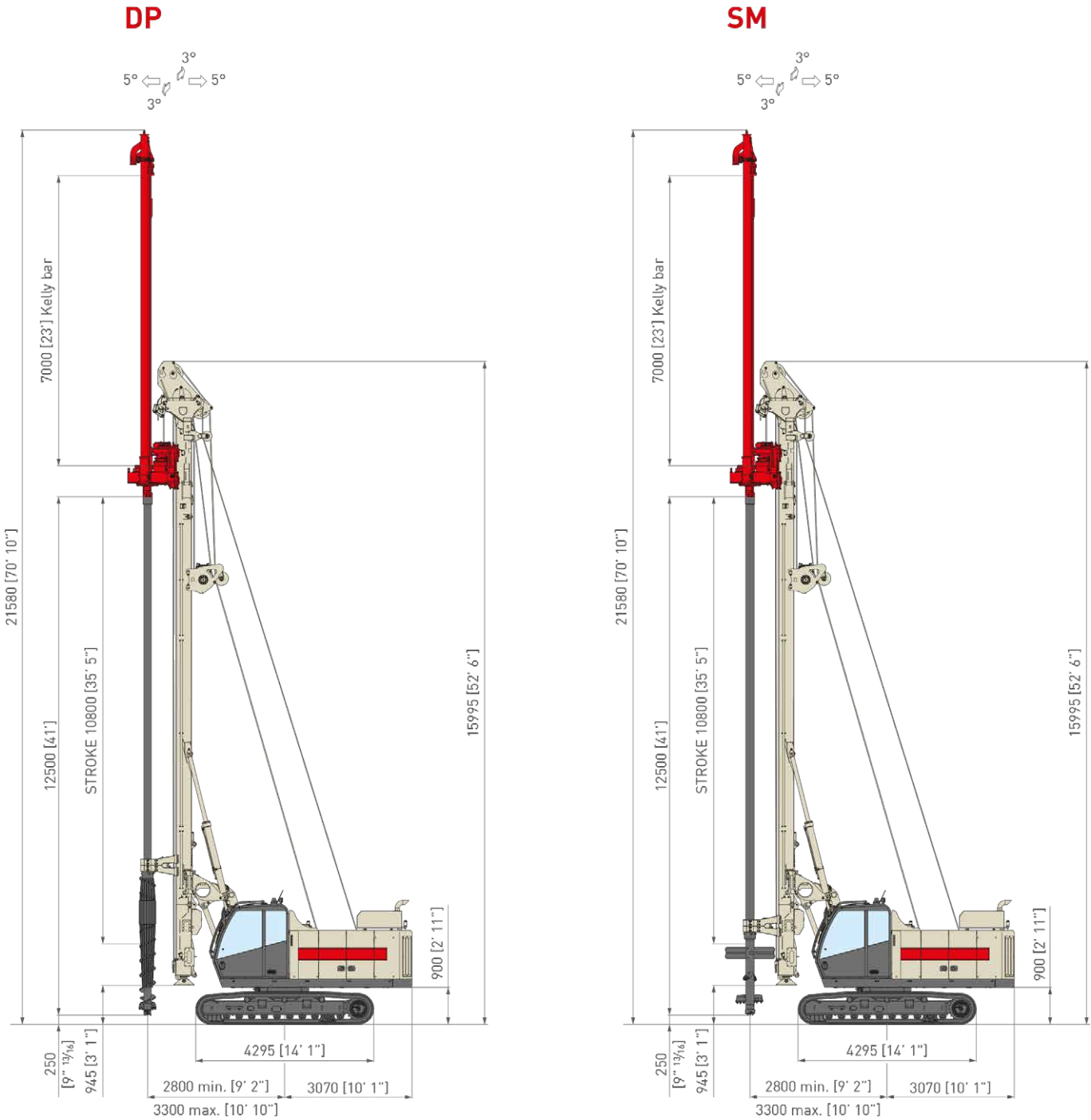
CFA	m.s.		i.s.		CFA/WPD (Quick Conversion CFA)	
	mm	ft-in	m	ft-in		
Max. pile diameter					800	2' 7"
Max. length of augers					12,5	41'
Max. length of auger extension					7	23'
Max. pile depth					11 + 7 = 18	36' 1" + 23' = 59' 1"
Extraction force	kN	lbs			250	56,200
Crowd force on auger (optional)	kN	lbs			100	22,500
Operating weight w/o tool	kg	lbs			27.200 ⁽¹⁾	60,000 ⁽¹⁾
Max. drill string weight	kg	lbs			4.300	9,500

Note

(1) with 7 m [23'] auger extension & star cleaner; without pull down winch on rotary.

CH 320 - DP/SM

Overall dimensions



WPD (Winch Pull Down) / DP-SM	m.s.	i.s.	DP (Displacement Piles)		SM (Soil Mixing)	
Max. pile diameter	mm	in	450	18"	400-1.100/2000 ⁽¹⁾	16" - 3' 7"/6' 7" ⁽¹⁾
Max. drill string length	m	ft-in	12,5	41'		
Max. length of drill string extension	m	ft-in	7	23'		
Max. pile depth	m	ft-in	10,5 + 7 = 17,5	34' 5" + 23' = 57' 5"		
Extraction force	kN	lbs	250	56,200		
Max. pull down force	kN	lbs	160	36,000		
Operating weight w/o tool	kg	lbs	27.000	59,500		

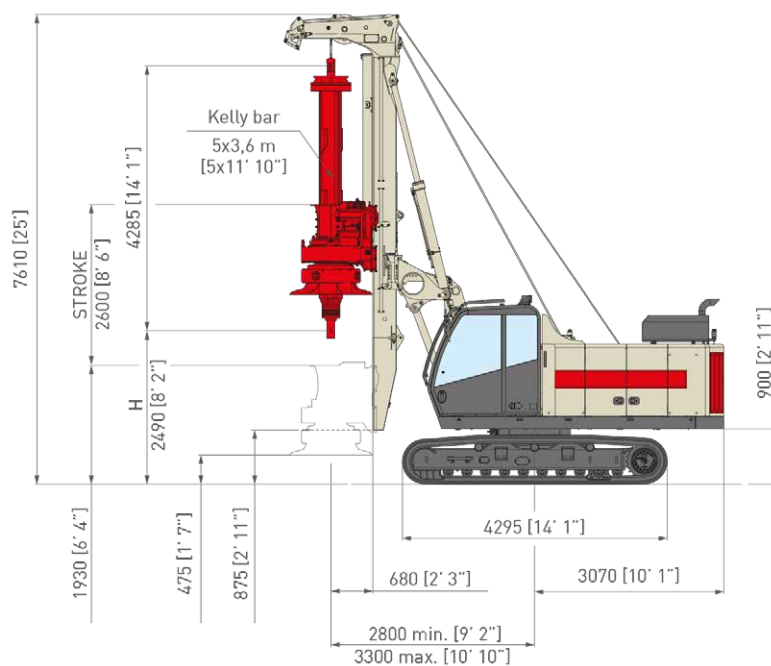
Note

(1) tool below mast.

CH 320 - LHR

Overall dimensions

7,6 m / 25'



LHR (Low Head Room)	m.s.	i.s.	LHR 7,6 m / 25'	
Min. height	mm	ft-in	7.610	25'
Max kelly bar length	m	ft-in	3,9	12' 10"
Stroke of pull down cylinder (with / without mast foot)	m	ft-in	2,6 - 1,1	8' 6" - 3' 7"
Max. pile diameter (in front of mast / below mast)	mm	ft-in	1300 - 1500	4' 3" / 4' 11"
Max. pile depth with 4-element kelly bar	m	ft-in	12,50	41'
Max. pile depth with 5-element kelly bar	m	ft-in	15,30	50' 2"
Operating weight w/o tool	kg	lbs	27.300 ⁽¹⁾	60,200 ⁽¹⁾

Note

(1) c/w 5 x 3,6 m (5 x 11' 10") 343 mm (13" ½) dia. kelly bar; rotary c/w bucket opening flange.

