

CH 650

Self-Erecting Hydraulic Piling Rig



High Tech Line



COMACCHIO

DRILLING HI-TECH

The **Comacchio** self-erecting rigs are available in **CPD** (Cilynder Pull Down) and **WPD** (Winch Pull Down) versions and both are designed for easy transport as well as the best drilling performance.

- The design of the **CH 650** adapts to a wide range of drilling technologies including:
- **CBP** (Cased Bored Piles) cased bored piles with casing driven directly by rotary head or optionally by casing oscillator powered by the base carrier;
 - **BP** (Bored Piles) deep uncased bored piles stabilized by drilling fluid or dry hole;
 - **CFA** (Continuous Flight Auger) piles by means of long auger string;
 - **DP** (Displacement Piles)
 - **SM** (Soil Mixing)
 - **LDTH** (Large DTH)

The **CH 650** is equipped with the **CCS** (Comacchio Controlling System) on 12” full touch screen for monitoring and control of the rig performances and operating parameters.

Technical Data

Undercarriage	m.s.	i.s.	High Tech Line				
Type	-		Variable gauge				
Removable tracks	-		No		Optional		
Track shoe width	mm	ft-in	800	31" ½	700	27" ½	
Track shoe type	-		Triple grouser				
Overall width (retracted side frames)	mm	ft-in	3.000	9' 10"	2.980	9' 9" ¼	
Overall width (extended side frames)	mm	ft-in	4.300	14' 1" ¼	4.280	14' ½	
Overall length	mm	ft-in	5.860	19' 2" ¾	5.960	19' 6" ¾	
Centre idler to centre sprocket	mm	ft-in	5.000	16' 4" ¾	5.035	16' 6" ¼	
Upperframe							
Width	mm	ft-in	3.000		9' 10"		
Operators' cabin	-		TOPS & FOPS-1 certified, 1040 mm (3' 5") wide				
Control system type	-		CAN-BUS				
User interface	-		12" Touch Screen				
Tail swing radius	mm	ft-in	3.535	11' 7" ¼	3.460	11' 4" ¼	
Diesel Engine			High Tech Line				
Make and model	-		CAT C9		CAT C9.3		
Emission certification	-		EU stage IIIA / US EPA Tier 3		EU stage IV / US EPA Tier 4f		
Aspiration	-		Turbocharged and charge air cooled				
Power rating (1800-1550 rpm)	kW	HP	261	350	240	321	
Displacement	cc	in³	8.800	537	9.300	568	
Fuel consumption rate (100% power, rated speed)	g/kWh	lb/hp-hr	222	0.365	202	0.332	
Average fuel consumption approx.	l/hr	gal/hr	34,5	9.1	31,5	8.3	
Hydraulic System							
Main pumps flow	l/min	gal/min	2 x 280		2 x 74		
Third pump flow	l/min	gal/min	90		24		
Kelly bars							
Outer element diameter (three options available)	mm	ft-in	419 - 406 - 394		16" ½ - 16" - 15" ½		
Max length (self-mounting) CPD - WPD	m	ft-in	14		45' 9"		
Max pull down force	kN	lbs	300 ⁽¹⁾		67,500 ⁽¹⁾		

Technical Data

Main winch					
Type	-		Controlled descent		
1 st layer line pull	kN	lbs	250	56,200	
1 st layer rope speed	m/min	ft/min	76	249	
Rope diameter	mm	ft-in	28	1" 1⁄8	
Rope layers	-		2		
Useful rope length with 1 / 2 / .. full layers	m	ft-in	38 - 84	124' 8" - 275' 7"	
FEM classification	-		M5 - L2 - T5		
Service winch					
Type	-		Controlled descent / Free fall		
1 st layer line pull	kN	lbs	133	29,900	
1 st layer rope speed	m/min	ft/min	64	210'	
Rope diameter	mm	ft-in	20	13⁄16"	
Rope layers	-		3		
Useful rope length with 1 / 2 / 3 full layers	m	ft-in	17 - 39 - 62	56' - 128' - 203'	
FEM classification	-		M5 - L2 - T5		
Bored Piles (BP)					
Drilling radius min - max	mm	ft-in	3.800 - 4.500	12' 5" ½ - 14' 9" ¼	
Max pile diameter, CPD (Cylinder pull down)	mm	ft-in	2.200 - 2.500 ^[2]	7' 3" - 8' 2" ^[2]	
Max pile diameter, WPD (Winch pull down)	mm	ft-in	2.000 - 2.500 ^[3]	6' 7" - 8' 2" ^[3]	
Max pile depth friction kelly CPD - WPD	m	ft-in	69	226' 5"	
Max pile depth locking kelly CPD - WPD	m	ft-in	56,5	185' 4"	
Operating weight w/o tool, CPD	kg	lbs	62.000	136,700	
Operating weight w/o tool, WPD	kg	lbs	64.000	141,100	
CFA (Continuous Flight Auger)			T4		
Max pile diameter	mm	ft-in	1.200	3' 9"	
Max length of augers	m	ft-in	18,5	60' 8"	
Max length of auger extension	m	ft-in	6	19' 8"	
Max pile depth	m	ft-in	18 + 6 = 24	59' 1" + 19' 8" = 78' 9"	
Extraction force	kN	lbs	650	146,000	
Crowd force on auger (option)	kN	lbs	100 ^[4]	22,500 ^[4]	

- Note**
- (1) 406 mm (16”) Kelly bar, locking type
- (2) tool in front of mast - below mast
- (3) with - without bottom mast element
- (4) depth reduced by 1 m (3’ 3” ½)

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Options and Accessories

Standard equipment

Main winch with special grooving
Hoist limit switch on main rope and service rope
Swivel for main rope
Service rope parking point
Mast inclination measurement on X & Y axes (digital and analog display)
Automatic vertical mast alignment
Depth measuring device on main winch
Rpm measuring device on rotary
Crowd pressure setting
Oscillator attachment brackets
Air conditioning system
Emergency mode of operation for engine
Engine diagnostic panel
Diagnostic panel for hydraulic, electrical and electronic functions
Transport securing lugs on crawler unit
On board lighting set
Electric refuelling pump
Front and top cabin protective grate
Radio and music player C/W bluetooth
Phone charger
CCS Comacchio Controlling System
Spinoff and Shaker tool dump systems
Rotary auto speed management & interactive multiple gear

Optional equipment

Removable tracks
Biodegradable oil
Freefall auxiliary winch
Central lubrication system
Swivel for auxiliary rope
Main and aux winch load cell
Videocamera set
Vibrator device
Washing kit

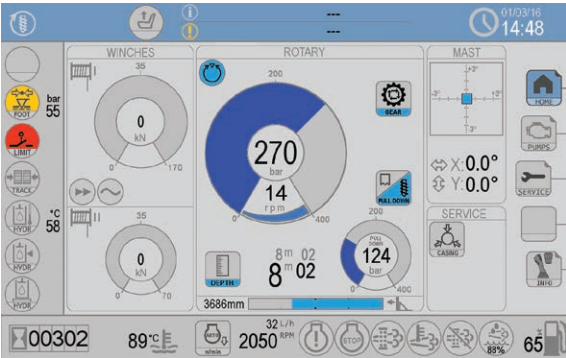
Kelly Bars

Comacchio developed an innovative kelly bar system. Three bar sizes are available with minor changes on the rotary head.

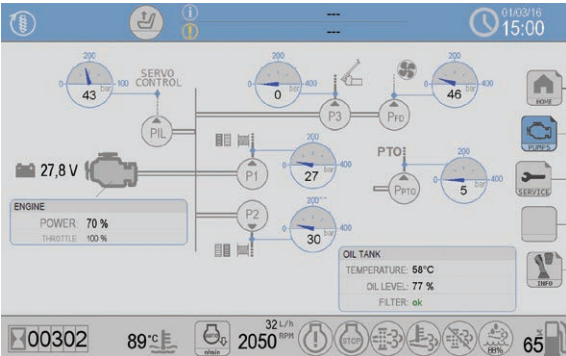


Kelly bar sizes	m.s.	i.s.	Outer diameter	
L (light)	mm	ft	394	15' 1/2"
HD (Heavy Duty)	mm	ft	406	16"
XHD (Extra Heavy Duty)	mm	ft	419	16" 1/2"

CCS Comacchio Controlling System



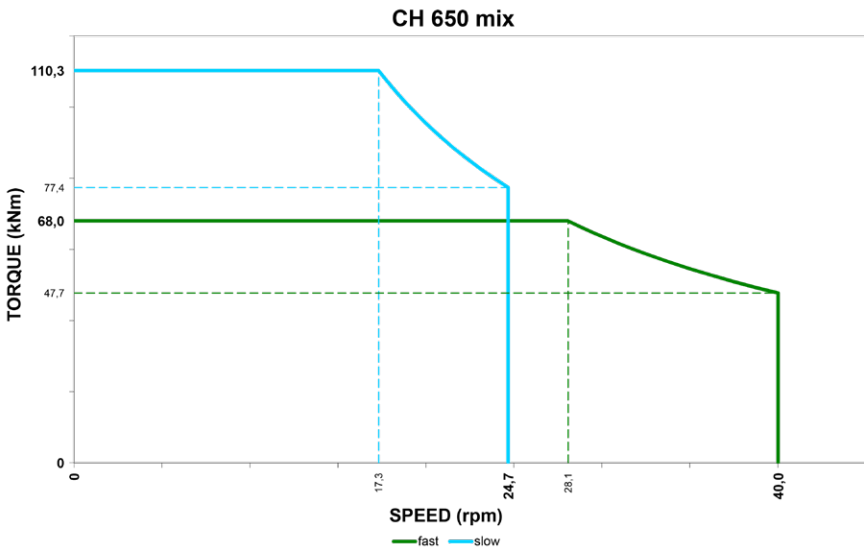
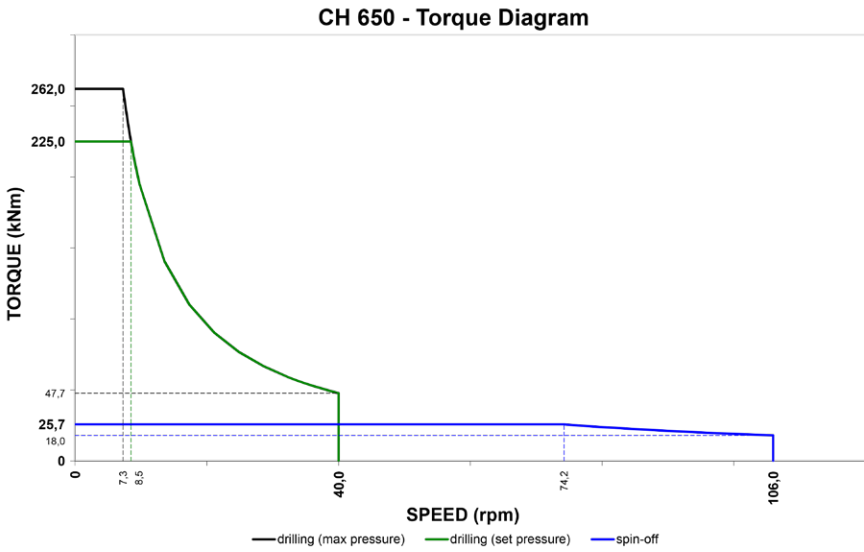
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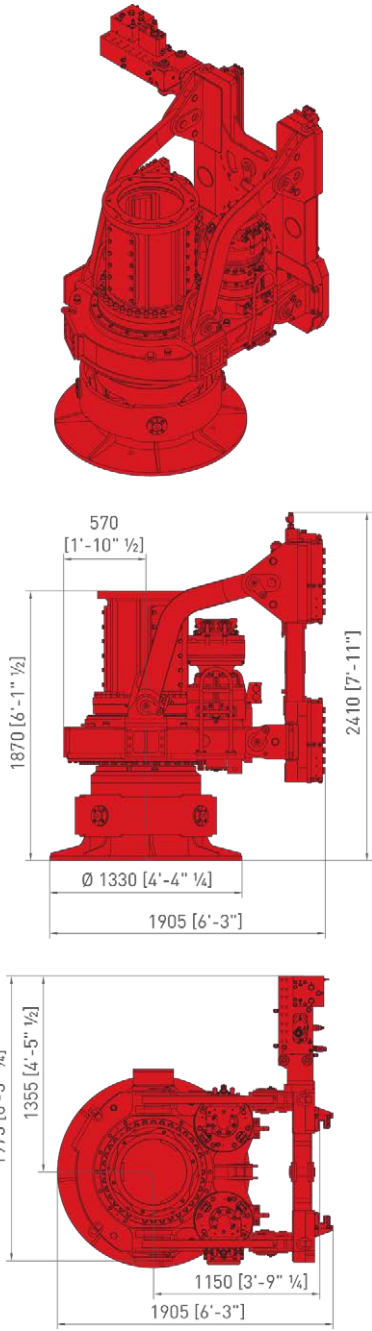
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Rotary Head

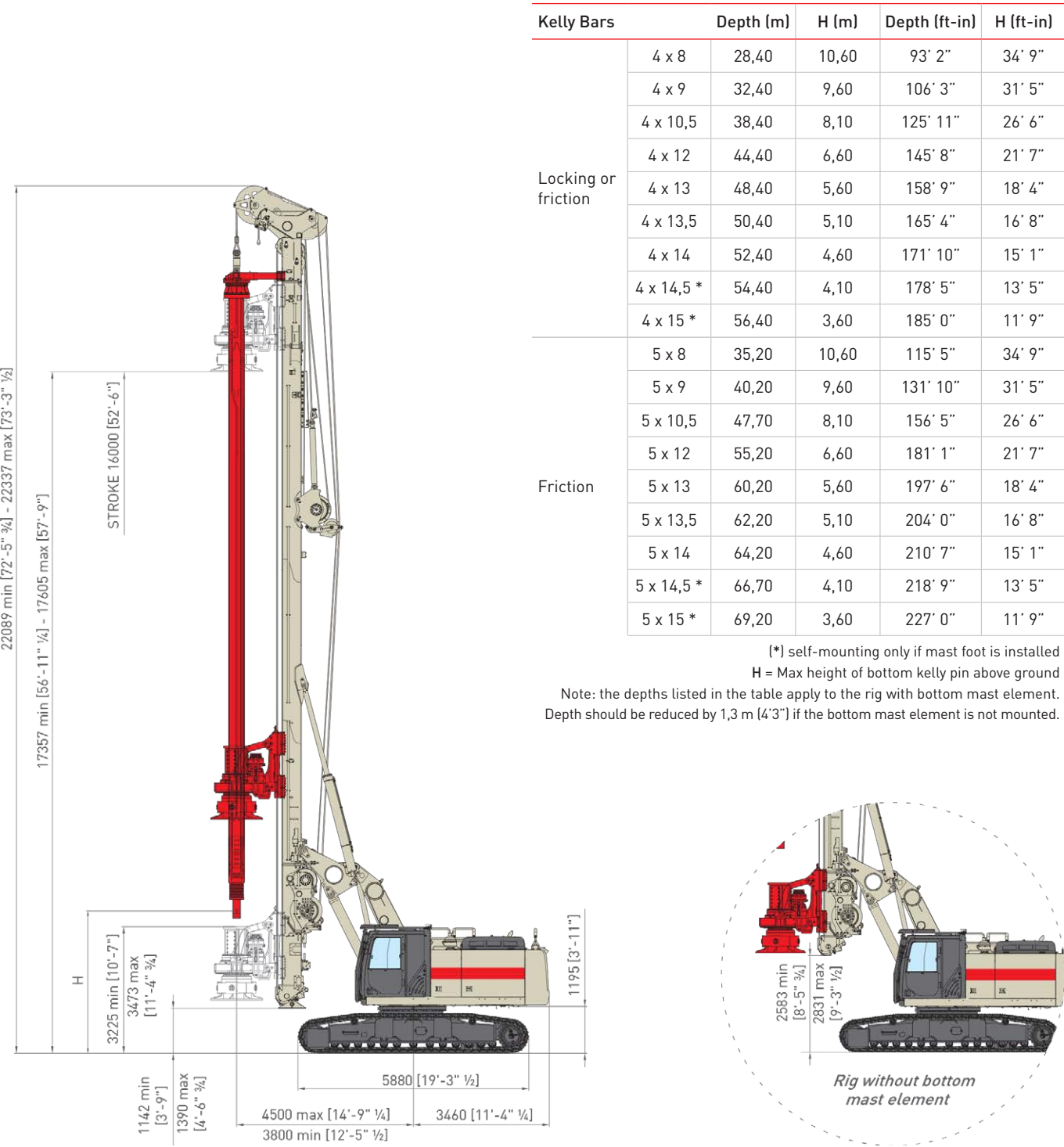


Rotary Head	m.s.	i.s.
Max torque	kNm lbf-ft	225 at 30 MPa 166,000 at 4350 psi
Nominal max torque	kNm lbf-ft	262 at 35 MPa 193,240 at 5080 psi
Max drilling speed	rpm	40
Hydraulic power	kW HP	200 268
Spin-off speed	rpm	106
Replaceable drive sleeve	-	Yes
Replaceable drive keys	-	Yes



CH 650 - BP / WPD

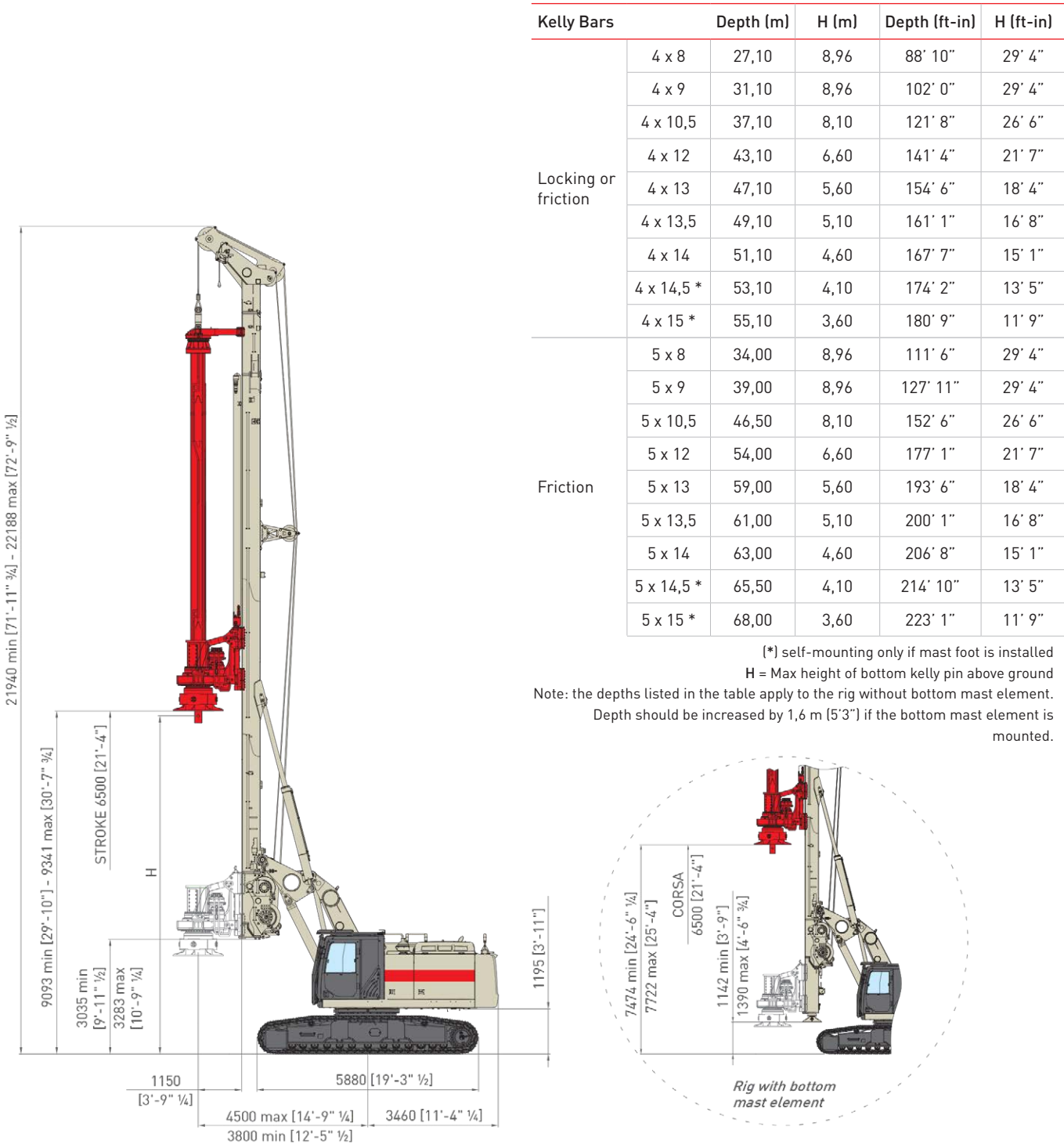
Overall dimensions



WPD (Winch Pull Down)	m.s.	i.s.		
Stroke c/w mast foot	mm	ft-in	16.000	52' 6"
Stroke c/w lower reeving box	mm	ft-in	14.700	48' 3"
Max pull up force	kN	lbs	330	74,200
Max pull down force	kN	lbs	330	74,200
Speed up	m/min	ft/min	44	144
Speed down	m/min	ft/min	44	144

CH 650 - CPD

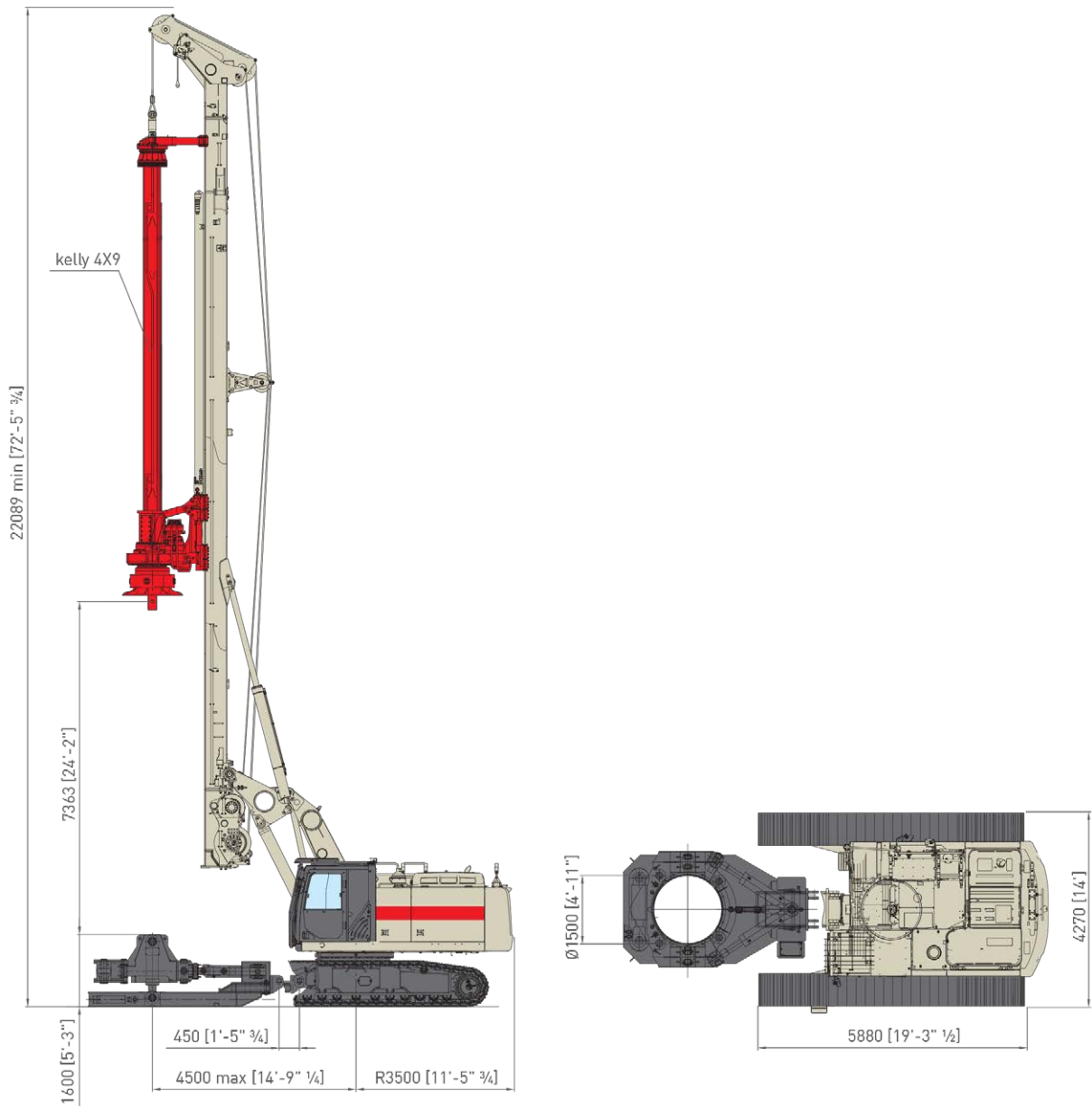
Overall dimensions



CPD (Cylinder Pull Down)	m.s.	i.s.		
Stroke	mm	ft-in	6.500	21' 4"
Max pull up force	kN	lbs	280	63,000
Max pull down force	kN	lbs	232	52,200
Speed up	m/min	ft/min	25	82
Speed down	m/min	ft/min	25	82

CH 650 - CPD

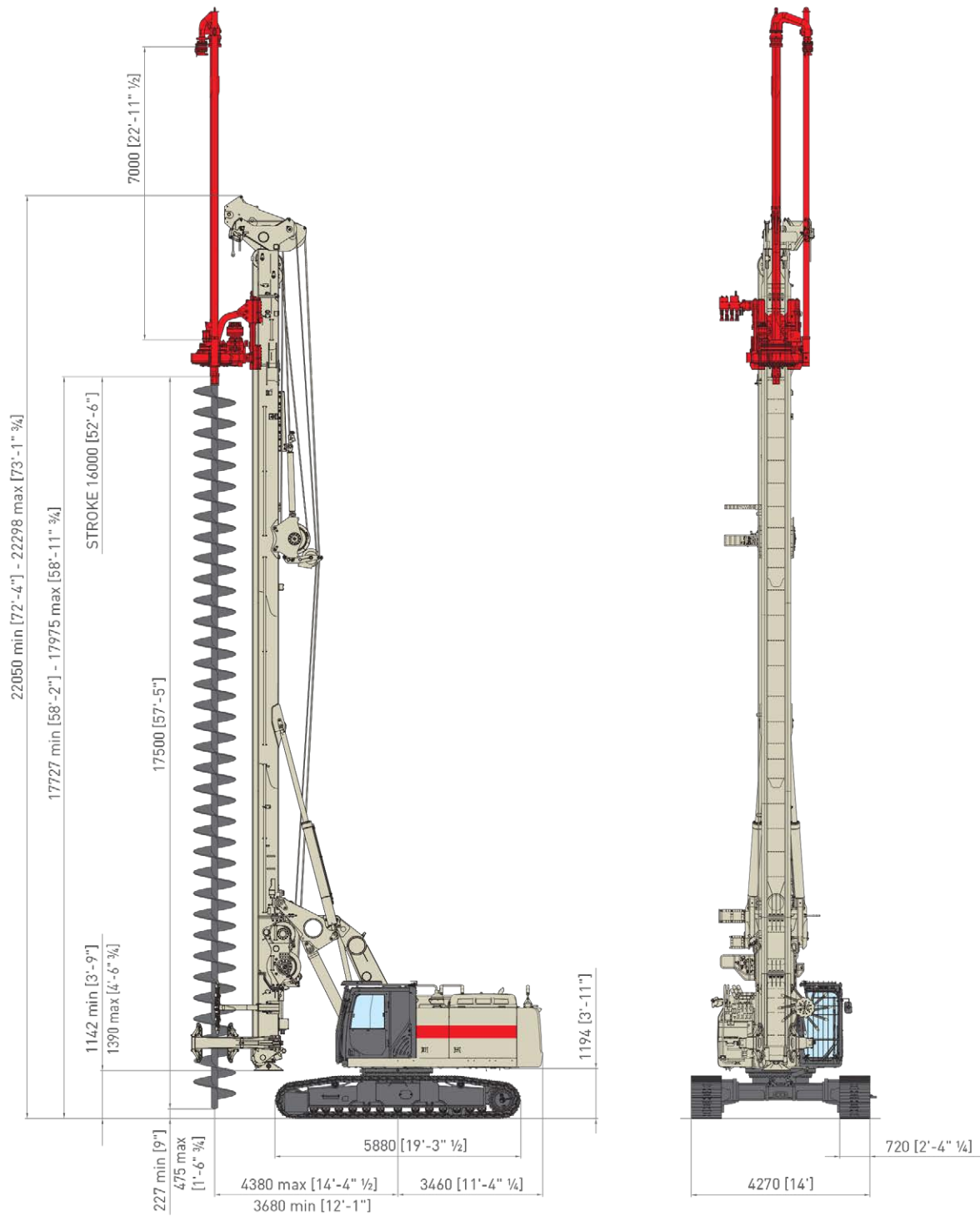
Overall dimensions



CPD (Cylinder Pull Down) with casing oscillator	m.s.	i.s.		
Stroke	mm	ft-in	6.500	21' 4
Max. diameter with casing oscillator	mm	ft-in	1.500	4' 11"
Max pull up force	kN	lbs	280	63,000
Max pull down force	kN	lbs	232	52,200
Speed up	m/min	ft/min	25	82
Speed down	m/min	ft/min	25	82

CH 650 - CFA/WPD

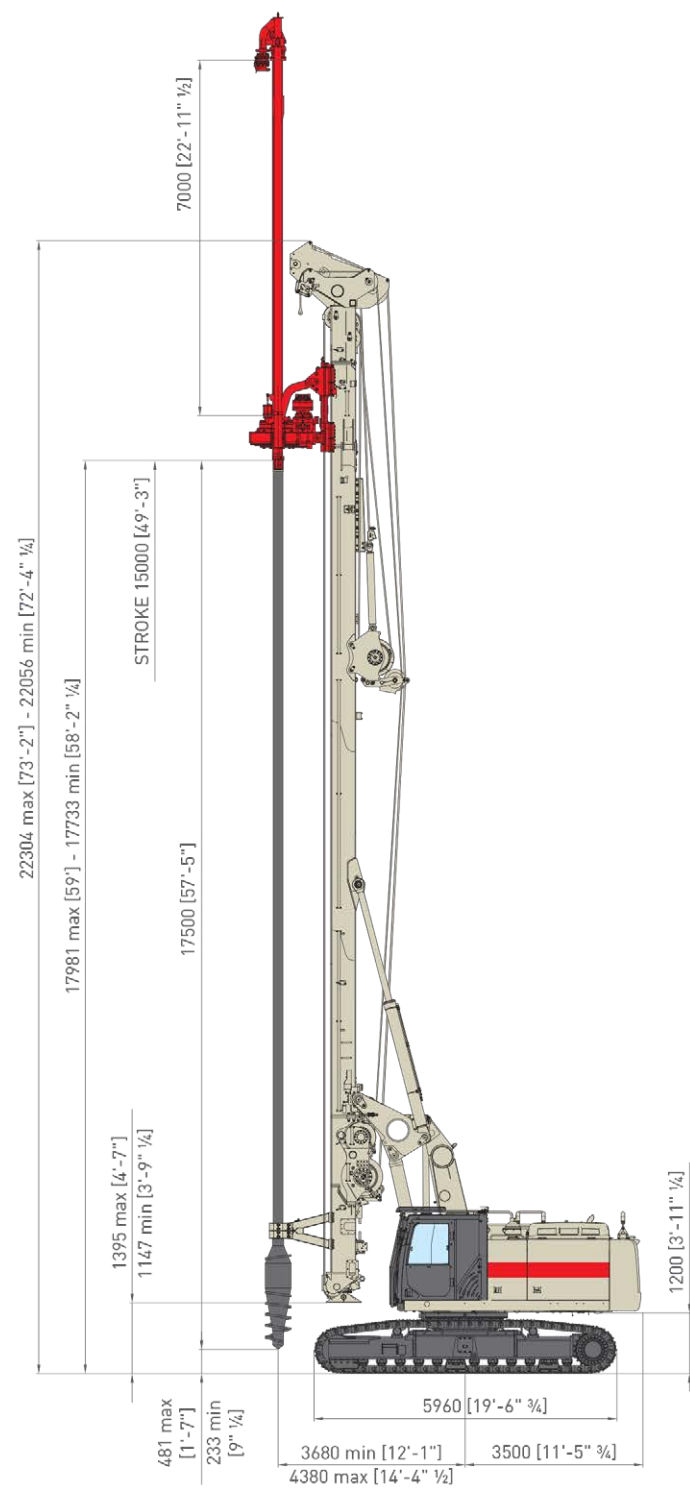
Overall dimensions



CFA/WPD (Quick Conversion CFA)	m.s.	i.s.		
Max pile diameter	mm	ft-in	1.200	3' 9"
Max length of augers	m	ft-in	17,5	57' 5"
Max length of auger extension	m	ft-in	7	23'
Max pile depth	m	ft-in	15,5 + 7 = 22,5	50' 10" + 23' = 73' 10"
Extraction force	kN	lbs	580	130,400
Crowd force on auger	kN	lbs	330	74,200

CH 650 - DP

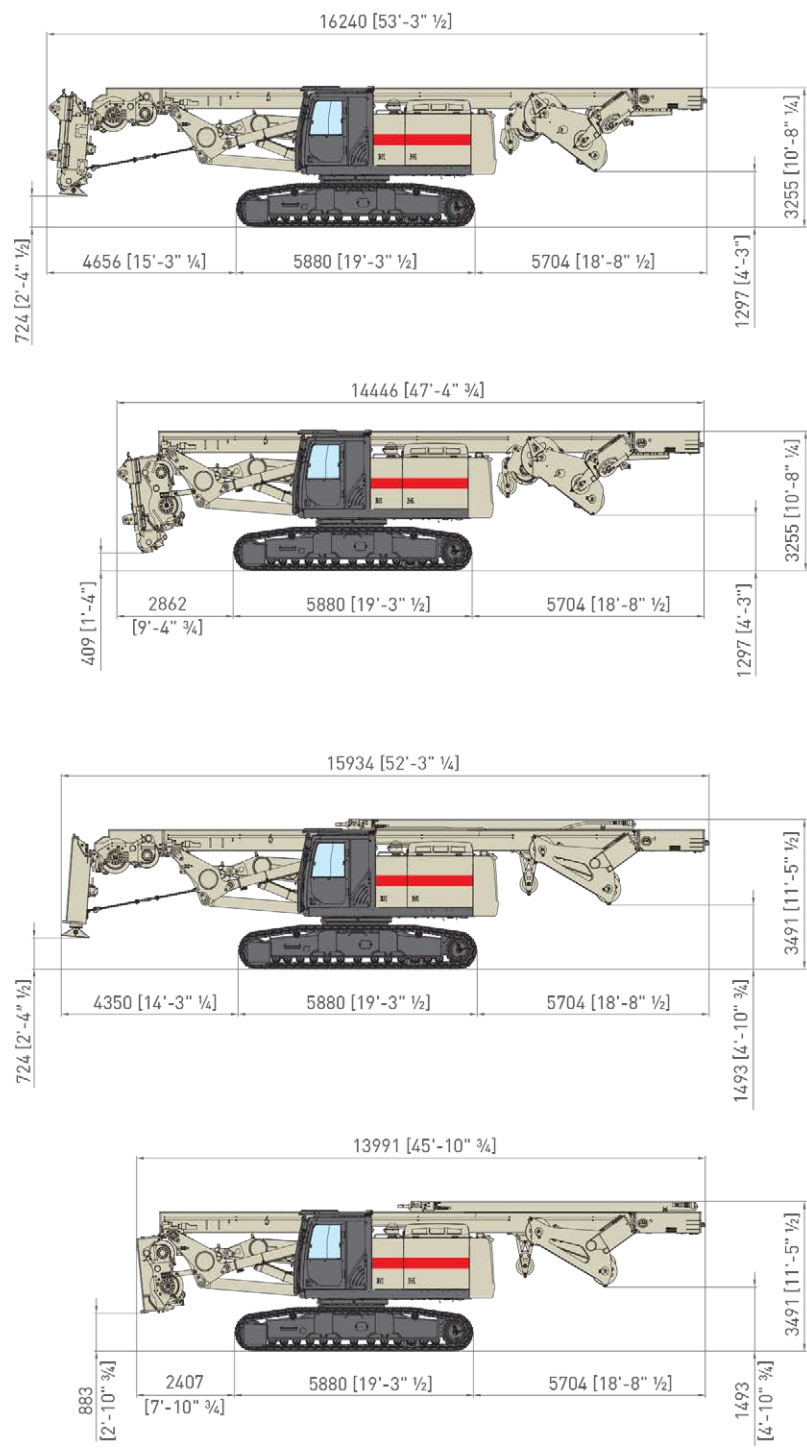
Overall dimensions



DP (Displacement Piles)	m.s.	i.s.		
Max diameter	mm	ft-in	600	24"
Max drill string length	m	ft-in	17,5	57' 5"
Max length of string extension	m	ft-in	7	23'
Max depth	m	ft-in	14,5 + 7 = 21,5	47' 7" + 23' = 70' 6"
Max pull down force	kN	lbs	330	74,200

CH 650

Overall dimensions



	m.s.	i.s.	WPD	
Transport weight	kg	lbs	61.400	135,000

	m.s.	i.s.	WPD w/o mast foot	
Transport weight	kg	lbs	58.100	128,100

	m.s.	i.s.	CPD	
Transport weight	kg	lbs	57.450	126,650

	m.s.	i.s.	CPD w/o mast foot	
Transport weight	kg	lbs	56.100	123,700

Weights and dimensions	m.s.	i.s.		
Transport width	mm	ft-in	3.000	9' 10"
Transport height BP - CPD/WPD	m	ft-in	3.490 - 3.290	11' 5" 1/2 - 10' 9" 1/2
Transport length BP	-	-	See drawings above	
Transport weight BP - CPD/WPD	-	-	See drawings above ⁽¹⁾	

Notes CPD and WPD

(1) weights above include the counterweight. It may be removed thus reducing them by 8.300 kg / 18,300 lbs



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