

CH 450

Self-Erecting Hydraulic Piling Rig



High Tech Line



COMACCHIO

DRILLING HI-TECH

CH 450

MULTIPURPOSE PILING RIG

CH 450

Performance

The CH 450 is the winning solution for job sites of short duration that require frequent operations of transport, setting up and dismantling.

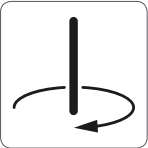
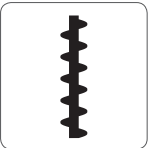
Truly self-erecting. The machine is entirely autonomous and self-erecting, and can be transported in one piece/fully assembled with the rotary head and kelly bar installed. Once on site, the machine is easily off loaded from the truck and set up without the need for crane service.

Wide range of drilling technologies. The CH 450 can be offered in CPD (cylinder pulldown) and WPD (winch pulldown) configuration. The innovative rotary head design adopted by Comacchio allows for the use of Kelly bars of various diameters, including HD (heavy duty) bars and XHD (extra heavy duty) bars, up to a maximum length of 14 m, with minor changes on the rotary head.

The unique design of the CH 450 adapts to a **wide range of drilling technologies** that include:

- 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 or optionally by hydraulic casing oscillator;
- CFA (Continuos 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;
- LDTH (Large DTH)** piles installed with DTH method using bits of a larger diameter than standard bits;
- MP (Micropiles)** installed using conventional air-flush rotary drilling.

The CH 450 can be offered in two different **LHR** (low head room) configurations, designed for the construction of bored piles in challenging access sites.



	m.s.	i.s.	BP (Bored Piles)	CBP (Cased Bored Piles)
Max pile diameter CPD	mm	ft-in	2.000 ⁽¹⁾ 6' 7" ⁽¹⁾	1.500 4' 11"
Max pile diameter WPD	mm	ft-in	2.000 ⁽¹⁾ 6' 7" ⁽¹⁾	1.300 4' 3"
Max pile depth CPD	mm	ft-in	56,60 ⁽²⁾ 185' 8" ⁽²⁾	56,60 ⁽³⁾ 185' 8" ⁽³⁾
Max pile depth WPD	m	ft-in	62,90 ⁽²⁾ 206' 4" ⁽²⁾	62,90 ⁽²⁾ 206' 4" ⁽²⁾
Pile diam with casing oscillator min-max	mm	ft-in	-	600 - 1.200 1' 97" - 3' 9"

(1) tool below mast
(2) using self mounting kelly bar
(3) only kelly bar

	m.s.	i.s.	CFA (Continuos Flight Auger)
Max pile diameter	mm	ft-in	1.000 3' 3"
Max pile depth [CFA/WPD]	m	ft-in	14 + 7 = 21 46' + 23' = 69'
Max pile depth [CFA T4]	m	ft-in	16,5 + 6 = 22,5 54' 2" + 19' 8" = 73' 10"
Max pile depth [CFA T4XL]	m	ft-in	18 + 6 = 24 59' 1" + 19' 8" = 78' 9"

	m.s.	i.s.	DP (Displacement Piles)
Max pile diameter	mm	ft-in	450 18"
Max pile depth	m	ft-in	13,5 + 8,5 = 22 44' 3" + 27' 11" = 72' 2"

	m.s.	i.s.	SM (Soil Mixing)
Pile diameter	mm	ft-in	400 - 2000 ⁽⁴⁾ 16" - 6' 7" ⁽⁴⁾
Max pile depth	m	ft-in	13,5 + 8,5 = 22 44' 3" + 27' 11" = 72' 2"

(4) according to the soil conditions

	m.s.	i.s.	LDTH (Large DTH)
Pile diameter	mm	ft-in	1.000 3' 3"
Pile depth	m	ft-in	Approx. 50 - 60 ⁽⁵⁾ 164' - 196' ⁽⁵⁾

(5) max depth is upon drill string weight

	m.s.	i.s.	MP (Micropiles)
Max pile diameter	mm	ft-in	610 24"
Stroke of rotary head	mm	ft-in	13.750 45' 1" ¼



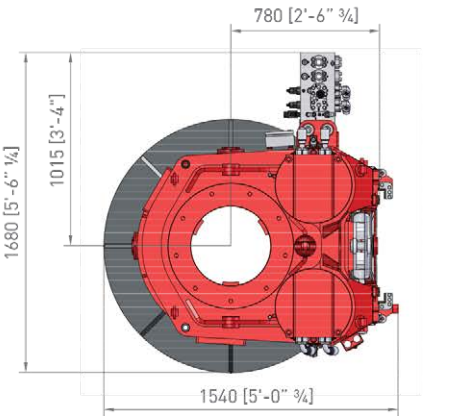
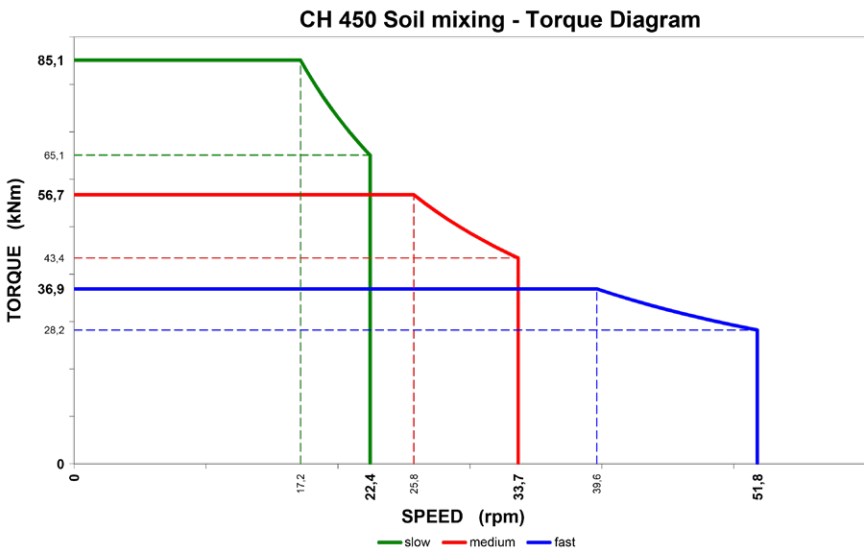
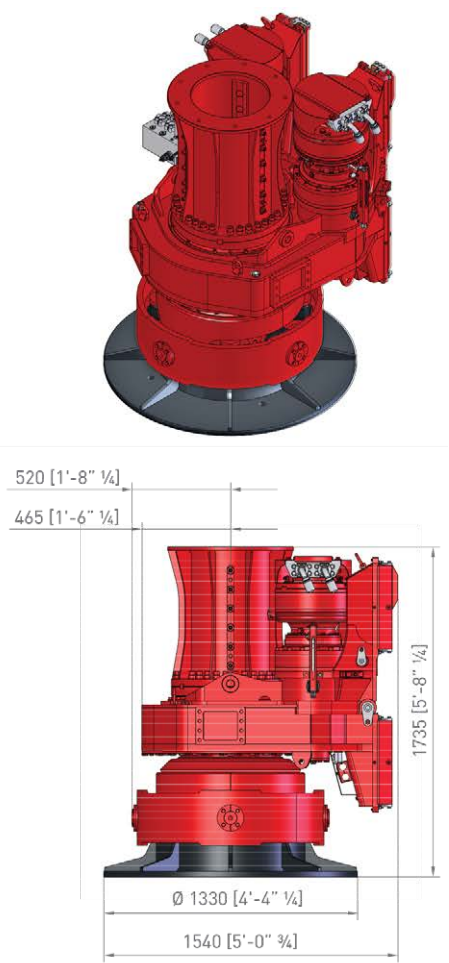
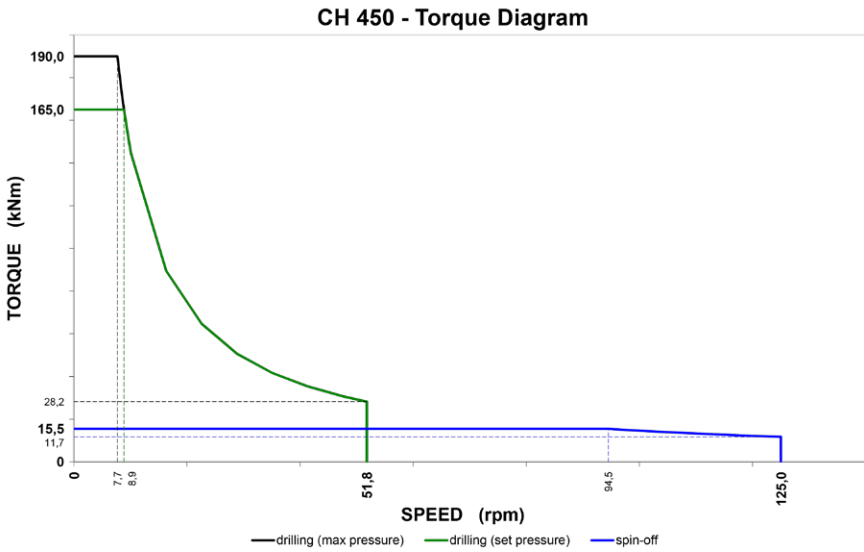
CH 450

Technical Data

Undercarriage		m.s.	i.s.			
Type			-	Variable gauge, telescoping side frames		
Removable tracks			-	No		
Track shoe width	mm	ft-in	600	23" 5⁄8	800	31" ½
Track shoe type			-	Triple grouser		
Overall width (retracted side frames)	mm	ft-in	2.550	8' 4" ½	2.950	9' 8" ¼
Overall width (extended side frames)	mm	ft-in	4.000	13' 1" ½	4.200	13' 9" ¼
Overall length	mm	ft-in	4.925		16' 2"	
Centre idler to centre sprocket	mm	ft-in	4.100		13' 5" ½	
Upperframe						
Width	mm	ft-in	2.550		8' 4" ½	
Operators' cabin			-	TOPS & FOPS-1 certified, 980 mm (3' 3") wide		
Control system type			-	CAN-BUS		
User interface			-	12" Touch Screen		
Tail swing radius	mm	ft-in	3.865		12' 8"	
Diesel Engine						
High Tech Line						
Make and model			-	Cummins QSB6.7		
Emission certification			-	EU stage IV / US EPA Tier 4f		EU stage IIIA / US EPA Tier 3
Aspiration			-	Turbocharged and charge air cooled		
Power rating (2000 rpm)	kW	HP	201		270	
Displacement	cc	in³	6.700		408	
Fuel consumption rate (100% power, rated speed)	g/kWh	lb/hp-hr	202	0.332	222	0.365
Average fuel consumption approx.	l/hr	gal/hr	31,5	8.3	34,5	9.1
Fuel tank	l	gal	500		135	
Sound pressure level in cabin (EN 16228-1, Annex B)			-	LP _A 82 dB (A)		
Sound Power level (2000/14/EC - EN 16228-1, Annex B)			-	LW _A 108 dB (A)		
Hydraulic System						
Main pumps flow	l/min	gal/min	2 x 214		2 x 56.5	
Third pump flow	l/min	gal/min	160		42.3	
Hydraulic oil tank capacity	l/min	gal/min	600		158	
Main Winch						
Type			-	Controlled descent		
1 st layer line pull	kN	lbs	160		35,970	
1 st layer rope speed	m/min	ft/min	75		246	
Rope diameter	mm	ft-in	24		15⁄16"	
Rope layers			-	2		
FEM classification			-	M6-L3-T5		
Service Winch						
Type			-	Controlled descent		Free fall
1 st layer line pull	kN	lbs	72		16,200	
1 st layer rope speed	m/min	ft/min	55	180' 5"	49	161
Rope diameter	mm	ft-in	18		11⁄16"	
Rope layers			-	3		4
FEM classification			-	M5-L2-T5		M6-L3-T5

CH 450

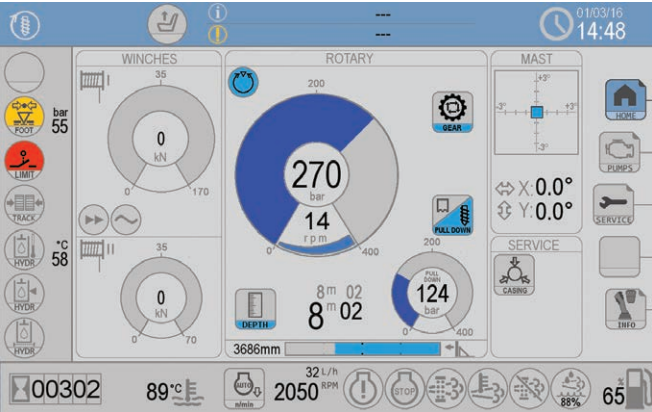
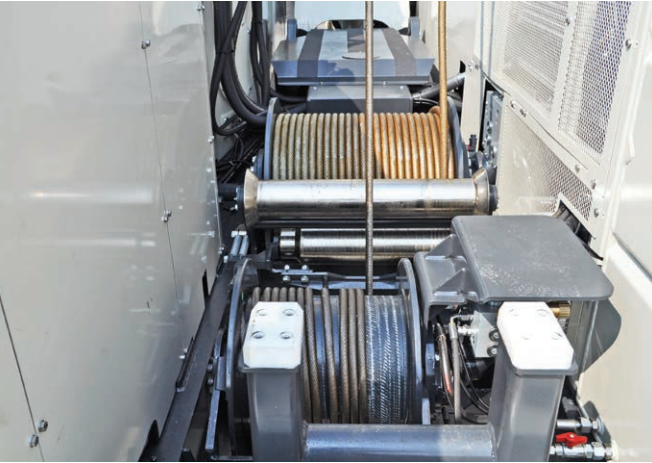
Rotary Head



Rotary Head	m.s.	i.s.		CR 19	
Nominal max torque	kNm	lbf-ft	190 at 33 MPa	140,000 at 4,800 psi	
Max torque	kNm	lbf-ft	165 at 28,5 MPa	121,700 at 4,130 psi	
Max drilling speed	rpm		51,8		
Hydraulic power	kW	HP	155	208	
Spin-off speed	rpm		125		
Replaceable drive sleeve	-		Yes		
Replaceable drive keys	-		Yes		

Standard equipment

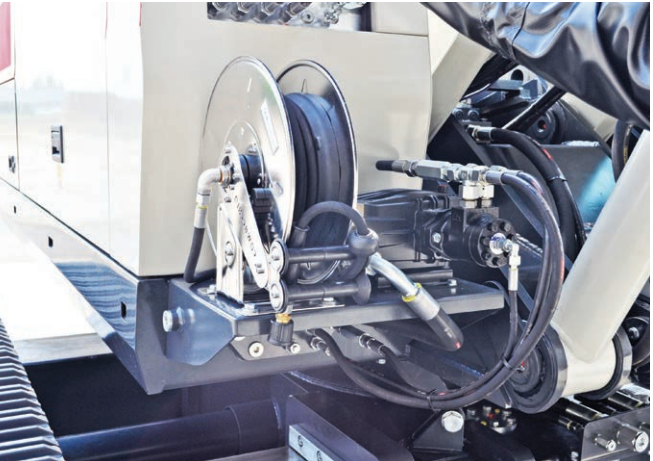
Main winch with special grooving	Engine diagnostic panel
Hoist limit switch on main rope and service rope	Transport securing lugs on crawler unit
Swivel for main rope	Work lights
Service rope parking point	Electric refuelling pump and hydraulic oil refilling
Mast inclination measurement on X & Y axes (digital and analog display)	Diagnostic panel for hydraulic, electrical and electronic functions
Automatic vertical mast alignment	Front and top cabin protective grate (FOPS-1 certified)
Depth measuring device on main winch	Radio and music player c/w bluetooth
Rpm measuring device on rotary	Phone charger
Crowd pressure setting	CCS Comacchio Controlling System
Oscillator attachment brackets	Spinoff and Shaker tool dump systems
Air conditioning system	Rotary auto speed managemment & interactive multiple gear
Emergency mode of operation for engine	Tool box



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Optional equipment

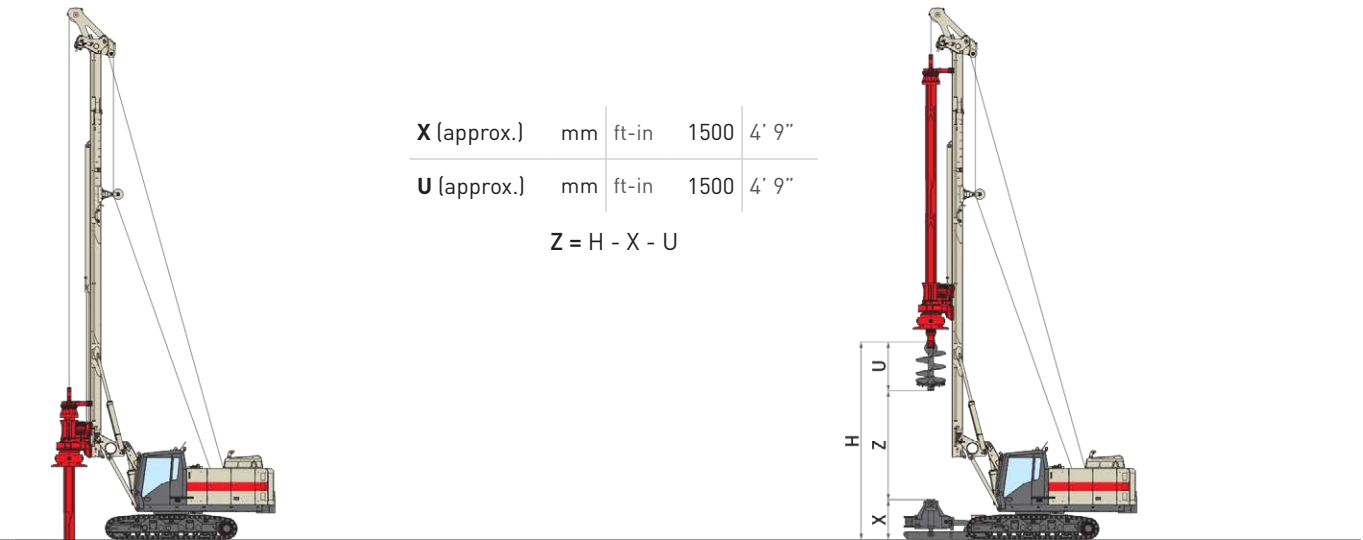
Biodegradable oil	Flange for casing driving
Freefall auxiliary winch	Welding equipment & generator
Main and aux winch load cell	Air compressor
Swivel for auxiliary rope	Washing kit
Central lubrication system	Videocamera set
Automatic lubrication kit for rotary sliding guides	Prearrangement for casing oscillator
Auger cleaner (star or hydraulic type)	Casing oscillator
Flange for bucket opening	Vibratory equipment for steel cage
Cardan joint	CE conformity kit
	ComNect system



Comacchio Innovative
Kelly bar system

Three bar sizes are available with minor changes on the rotary head.

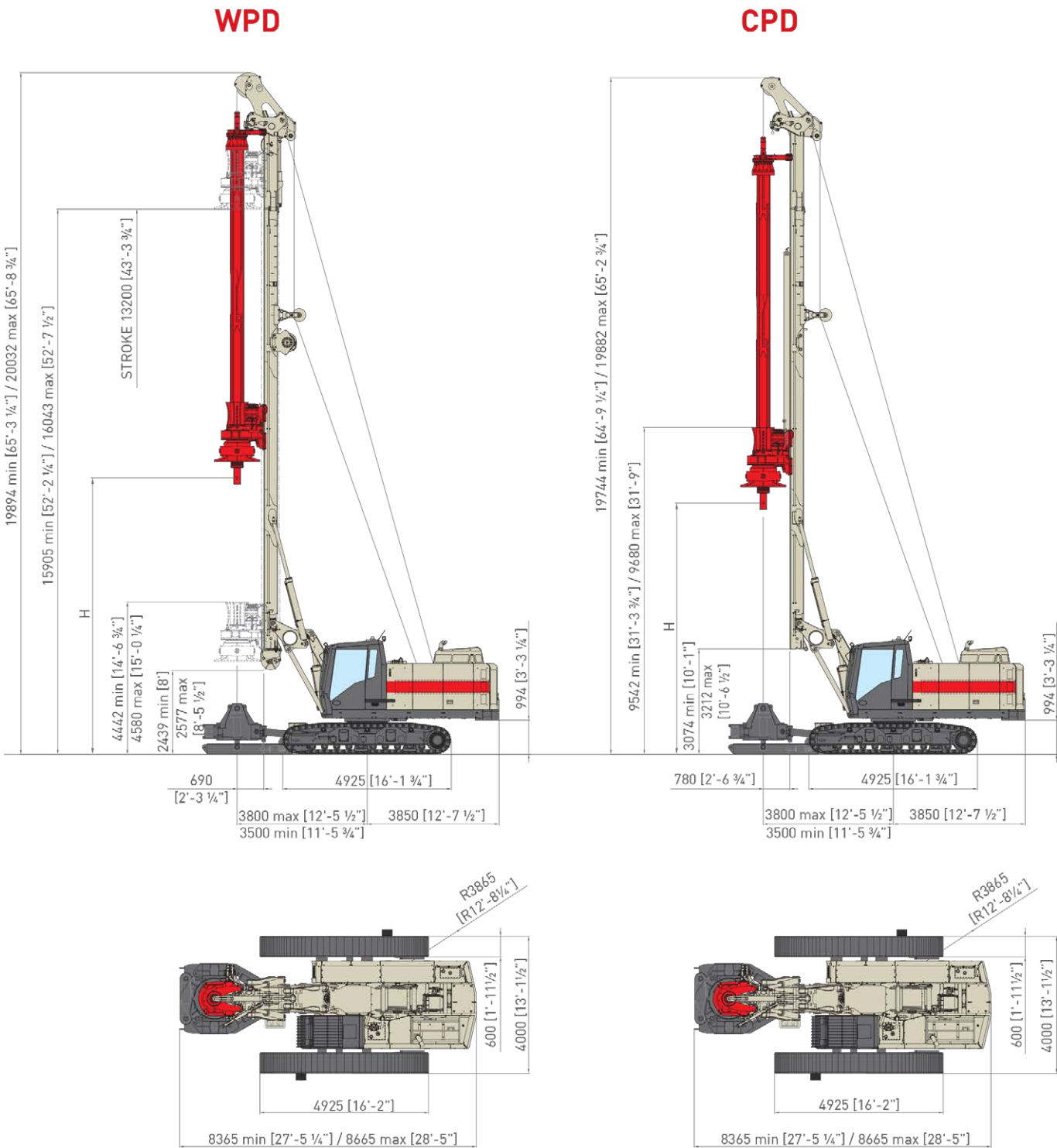
Kelly bar sizes	m.s.	i.s.	Outer diameter	
L (light)	mm	ft-in	355	14"
HD (Heavy Duty)	mm	ft-in	368	14 1/2"
XHD (Extra Heavy Duty)	mm	ft-in	394	15 1/2"



X (approx.)	mm	ft-in	1500	4' 9"
U (approx.)	mm	ft-in	1500	4' 9"
Z = H - X - U				

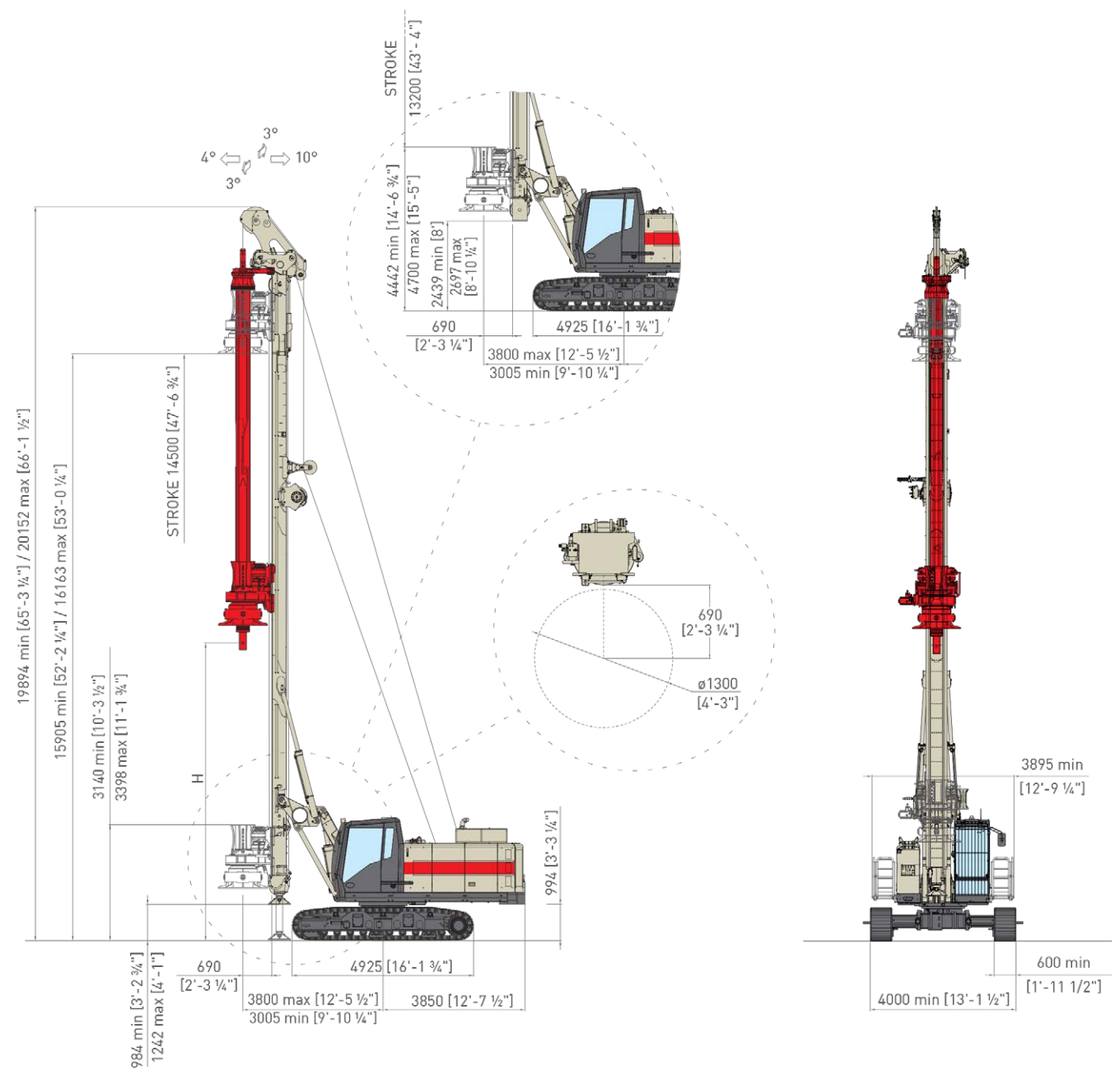
						WPD				CPD				
Depth	Kelly Bars	N.	Length		Weight ⁽¹⁾		Depth		H ⁽⁴⁾		Depth		H ⁽⁴⁾	
			(m)	(ft-in)	(kg)	(lbs)	(m)	(ft-in)	(m)	(ft-in)	(m)	(ft-in)	(m)	(ft-in)
Locking or friction		4	8	26' 2"	4.400	9,700	28,40	93' 2"	9,05	29' 8"	27,10	88' 10"	7,30	23' 11"
		4	9	29' 5"	4.800	10,600	32,40	106' 3"	8,05	26' 4"	31,10	102' 0"	7,30	23' 11"
		4	10,5	34' 4"	5.500	12,100	38,40	125' 11"	6,55	21' 5"	37,10	121' 8"	6,55	21' 5"
		4	12	39' 4"	6.100	13,400	44,40	145' 8"	5,05	16' 6"	43,10	141' 4"	5,05	16' 6"
		4	12,5	41'	6.300	13,900	46,40	152' 2"	4,55	14' 11"	45,10	147' 11"	4,55	14' 11"
		4	13 ⁽²⁾	42' 6" ⁽²⁾	6.500	14,300	48,40	158' 9"	4,05	13' 3"	47,10	154' 6"	4,05	13' 3"
		4	13,5 ⁽²⁾	44' 3" ⁽²⁾	6.700	14,800	50,40	165' 4"	3,55	11' 7"	49,10	161' 1"	3,55	11' 7"
		4	14 ^{(2)/(3)}	46' ^{(2)/(3)}	6.900	15,200	52,40	171' 10"	3,05	10' 0"	51,10	167' 7"	3,05	10' 0"
Friction		5	8	26' 2"	5.000	11,000	35,40	116' 1"	9,05	29' 8"	34,10	111' 10"	7,30	23' 11"
		5	9	29' 5"	5.500	12,000	40,40	132' 6"	8,05	26' 4"	39,10	128' 3"	7,30	23' 11"
		5	10,5	34' 4"	6.100	13,500	47,90	157' 1"	6,55	21' 5"	46,60	152' 10"	6,55	21' 5"
		5	12	39' 4"	6.800	15,000	55,40	181' 9"	5,05	16' 6"	54,10	177' 5"	5,05	16' 6"
		5	12,5	41'	7.100	15,600	57,90	189' 11"	4,55	14' 11"	56,60	185' 8"	4,55	14' 11"
		5	13 *	42' 6" ⁽²⁾	7.300	16,000	60,40	198' 1"	4,05	13' 3"	59,10	193' 10"	4,05	13' 3"
		5	13,5 *	44' 3" ⁽²⁾	7.500	16,500	62,90	206' 4"	3,55	11' 7"	61,60	202' 1"	3,55	11' 7"
		5	14 ^{(2)/(3)}	46' ^{(2)/(3)}	7.700	16,900	65,40	214' 6"	3,05	10' 0"	64,10	210' 3"	3,05	10' 0"

(1) Weight refers to Ø 368,3 mm [14' 1/2" ft-in] HD version (2) Non self-mounting in CPD version (3) Non self-mounting in WPD Version
(4) Max height of bottom kelly pin above ground



CH 450 - WPD

Overall dimensions



WPD (Winch Pull Down)	m.s.	i.s.		
Stroke c/w mast foot	mm	ft-in	14.500	47' 7"
Stroke c/w lower reeving box	mm	ft-in	13.200	43' 4"
Max pull up force	kN	lbs	240	53,950
Max pull down force	kN	lbs	240	53,950
Crowd Speed	m/min	ft/min	36	118
Max pile diameter	mm	ft-in	1.300 - 2.000 ⁽¹⁾	4' 3" - 6' 7" ⁽¹⁾
Operating weight w/o tool	kg	lbs	44.800 ⁽²⁾	98,800 ⁽²⁾

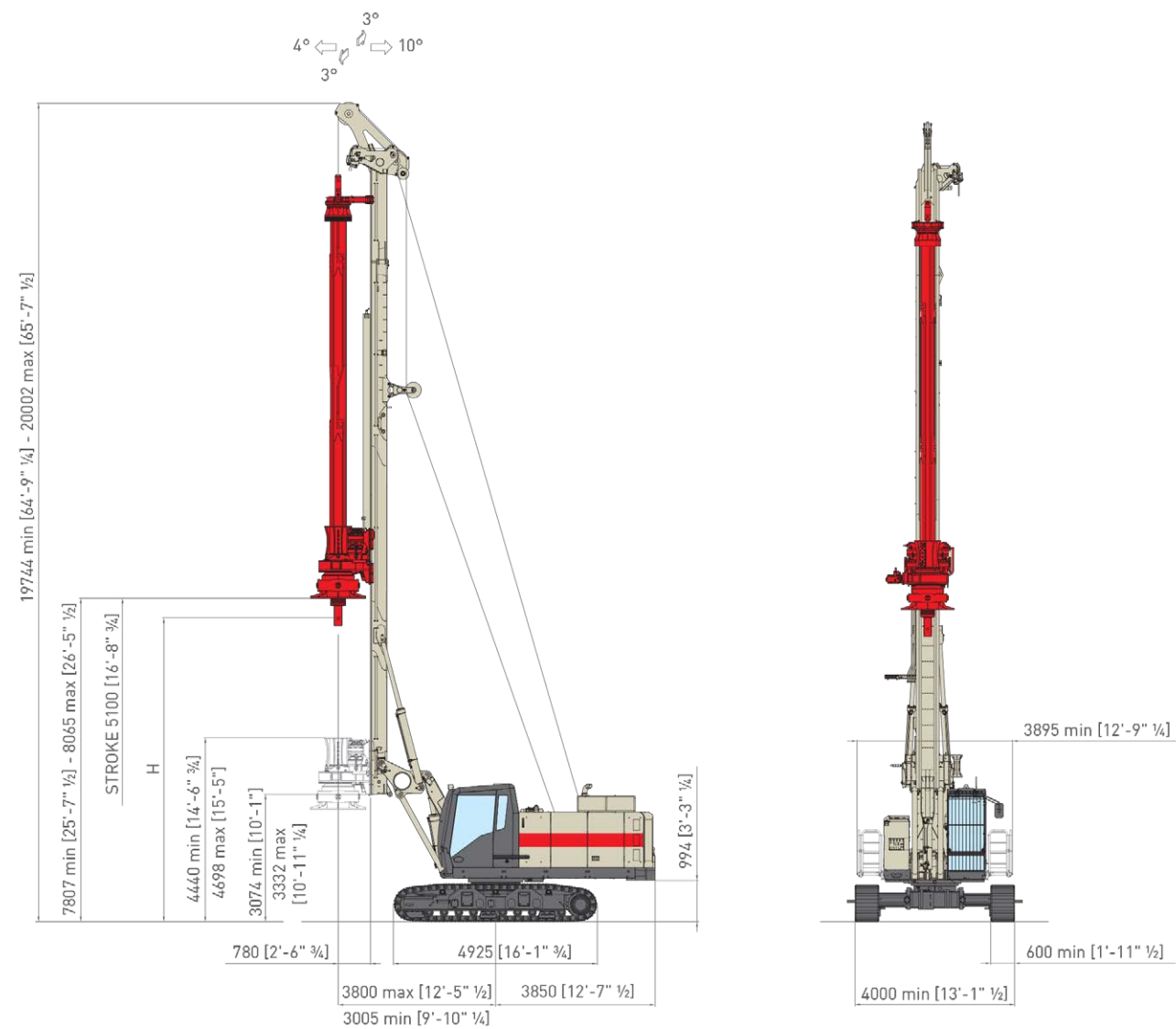
Notes

- (1) with - without bottom mast element
- (2) c/w 4 x 9 m (4 x 29' 6") long 368 mm (14" 1/2) dia. Kelly bar; rotary c/w bucket opening flange



CH 450 - CPD

Overall dimensions



CPD (Cylinder Pull Down)	m.s.	i.s.		
Stroke	mm	ft-in	5.100	16' 9"
Max pull up force	kN	lbs	226	50,800
Max pull down force	kN	lbs	204	45,860
Crowd speed	m/min	ft/min	20 - 21	65' 7" - 68' 11"
Max pile diameter	mm	ft	1.500 ⁽¹⁾ / 1.800 ⁽²⁾ - 2.000 ⁽³⁾	4' 11" ⁽¹⁾ / 5' 11" ⁽²⁾ - 6' 7" ⁽³⁾
Operating weight w/o tool	kg	lbs	43.100 ⁽⁴⁾	95,000 ⁽⁴⁾

Notes

(1) tool in front of mast, standard CPD version

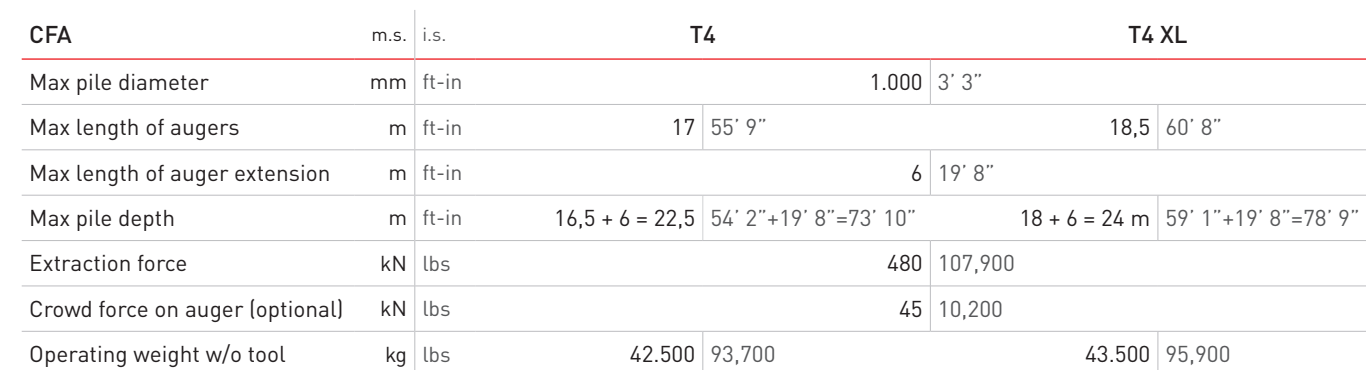
(2) tool in front of mast, LHR CPD version

(3) tool below mast, standard CPD version

(4) c/w 4 x 9 m [4 x 29' 6"] long 368 mm [14" 1/2] dia. Kelly bar; rotary c/w bucket opening flange

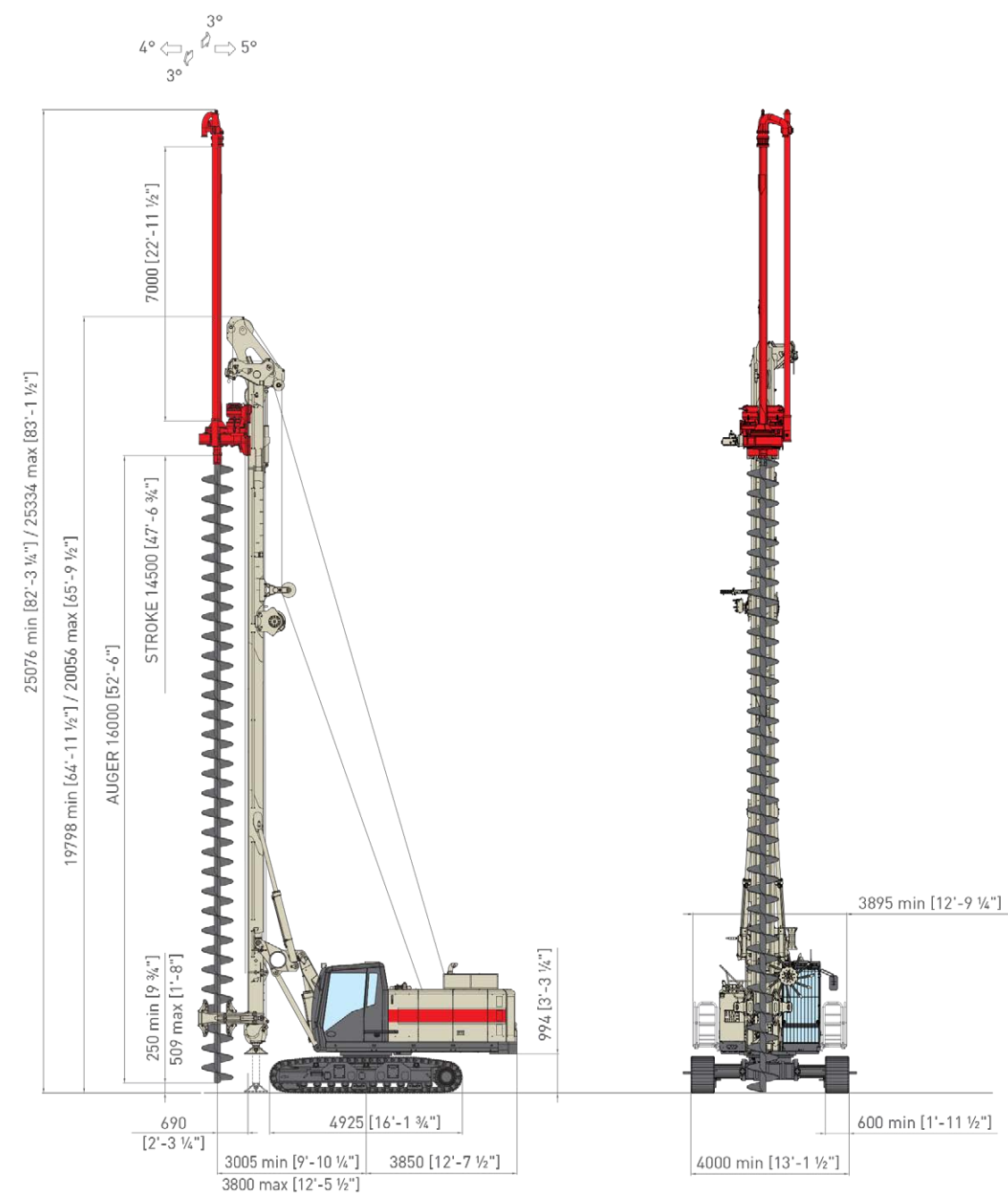


Overall dimensions



CH 450 - CFA/WPD

Overall dimensions

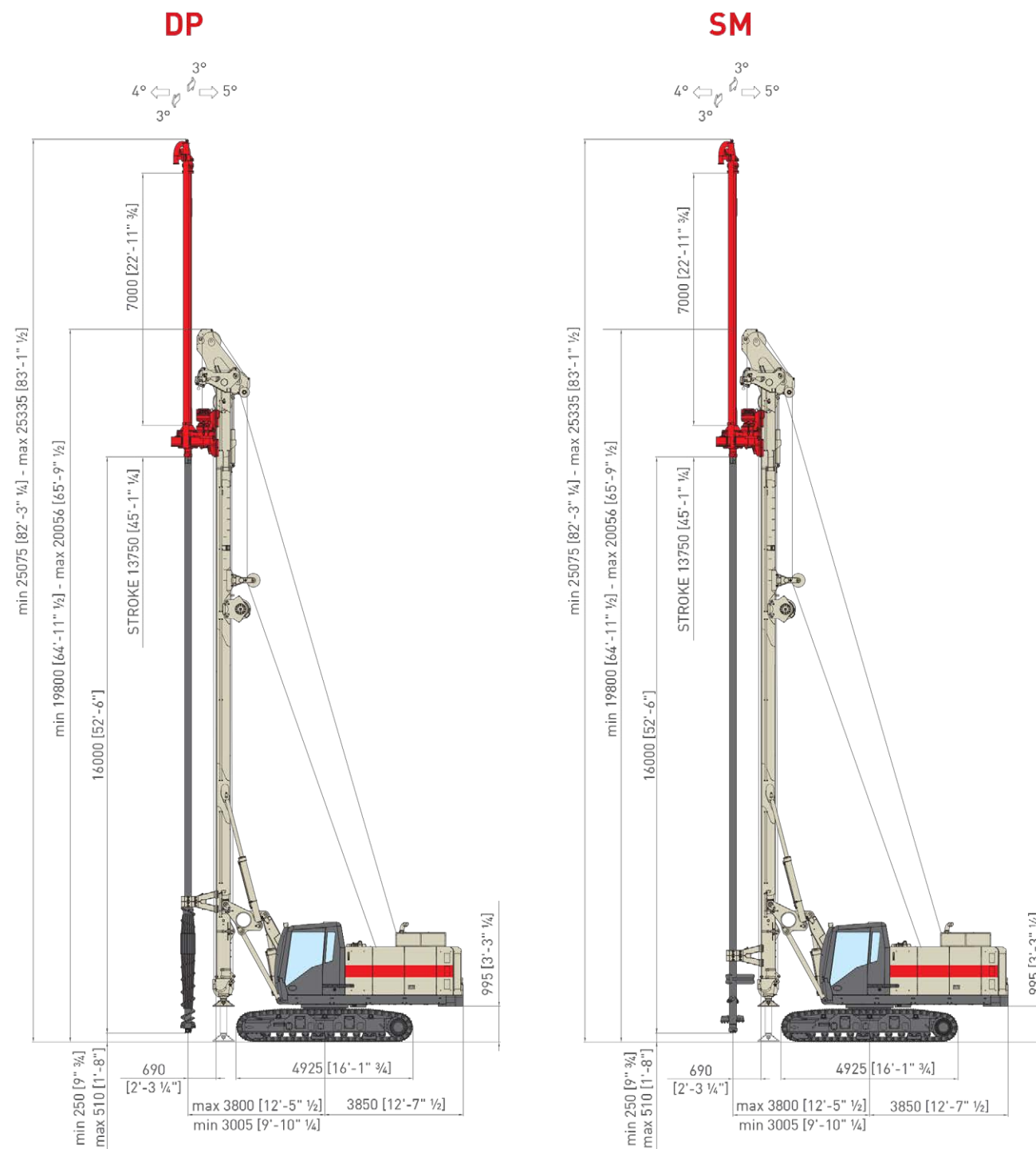


CFA	m.s.	i.s.	CFA/WPD (Quick Conversion CFA)	
Max pile diameter	mm	ft-in	1.000	3' 3"
Max length of augers	m	ft-in	16	52' 6"
Max length of auger extension	m	ft-in	7	23'
Max pile depth	m	ft-in	14 + 7 = 21 m	46' + 23' = 69'
Extraction force	kN	lbs	330	74,200
Crowd force on auger	kN	lbs	140	31,470
Operating weight w/o tool	kg	lbs	41.500	91,500



CH 450 - 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	400	16"	400 - 2000 ⁽¹⁾	16" - 6' 7" ⁽¹⁾
Max drill string length	m	ft-in		16	52' 6"	
Max length of string extension	m	ft-in		8,5	27' 11"	
Max pile depth	m	ft-in		13,5 + 8,5 = 22	44' 3" + 27' 11" = 72' 2"	
Extraction force	kn	lbs		330	74,200	
Max pull down force	kN	lbs		240	53,954	
Operating weight w/o tool	kg	lbs		41.500	91,500	

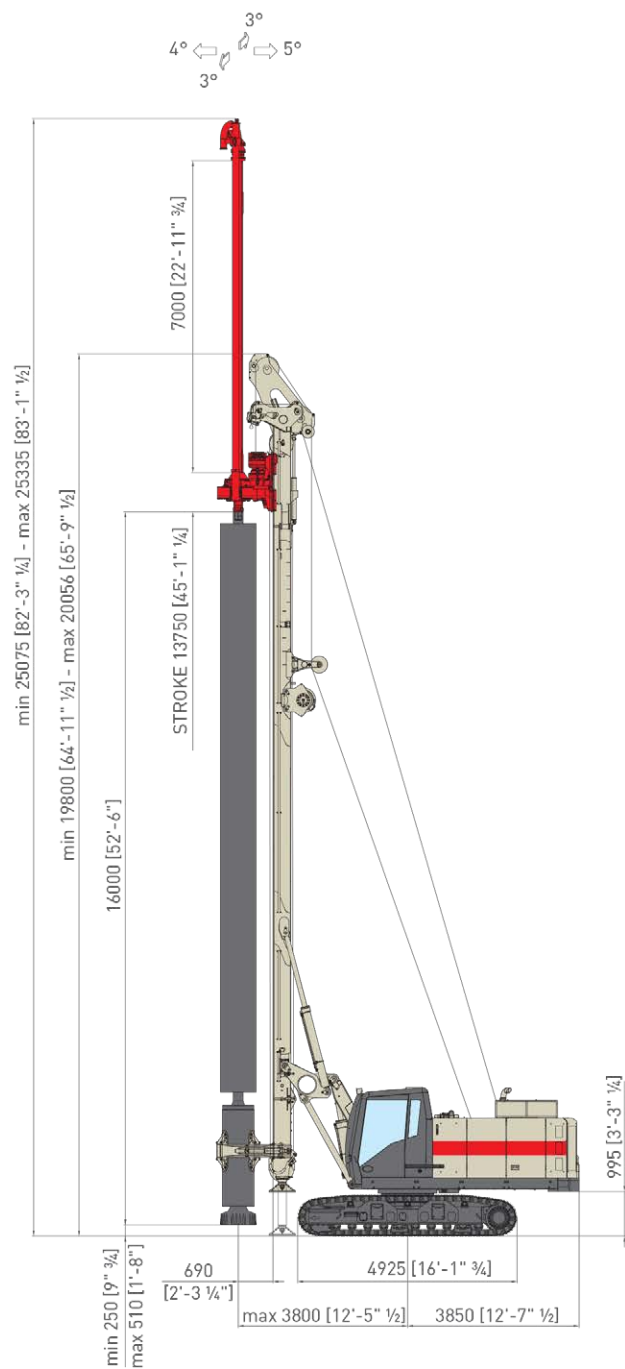
Notes

(1) according to the soil conditions



CH 450 - LDTH

Overall dimensions



LDTH (Large Down the Hole Hammer)	m.s.	i.s.		
Max pile diameter	mm	ft-in	1.000	3' 3"
Stroke c/w mast foot	m	ft-in	14,5	47' 7"
Max pile depth	m	ft-in	Approx. 50 - 60 ⁽¹⁾	Approx. 164' - 196' ⁽¹⁾
Extraction force	kN	lbs	330	74,200
Operating weight w/o tool	kg	lbs	41.500	91,500

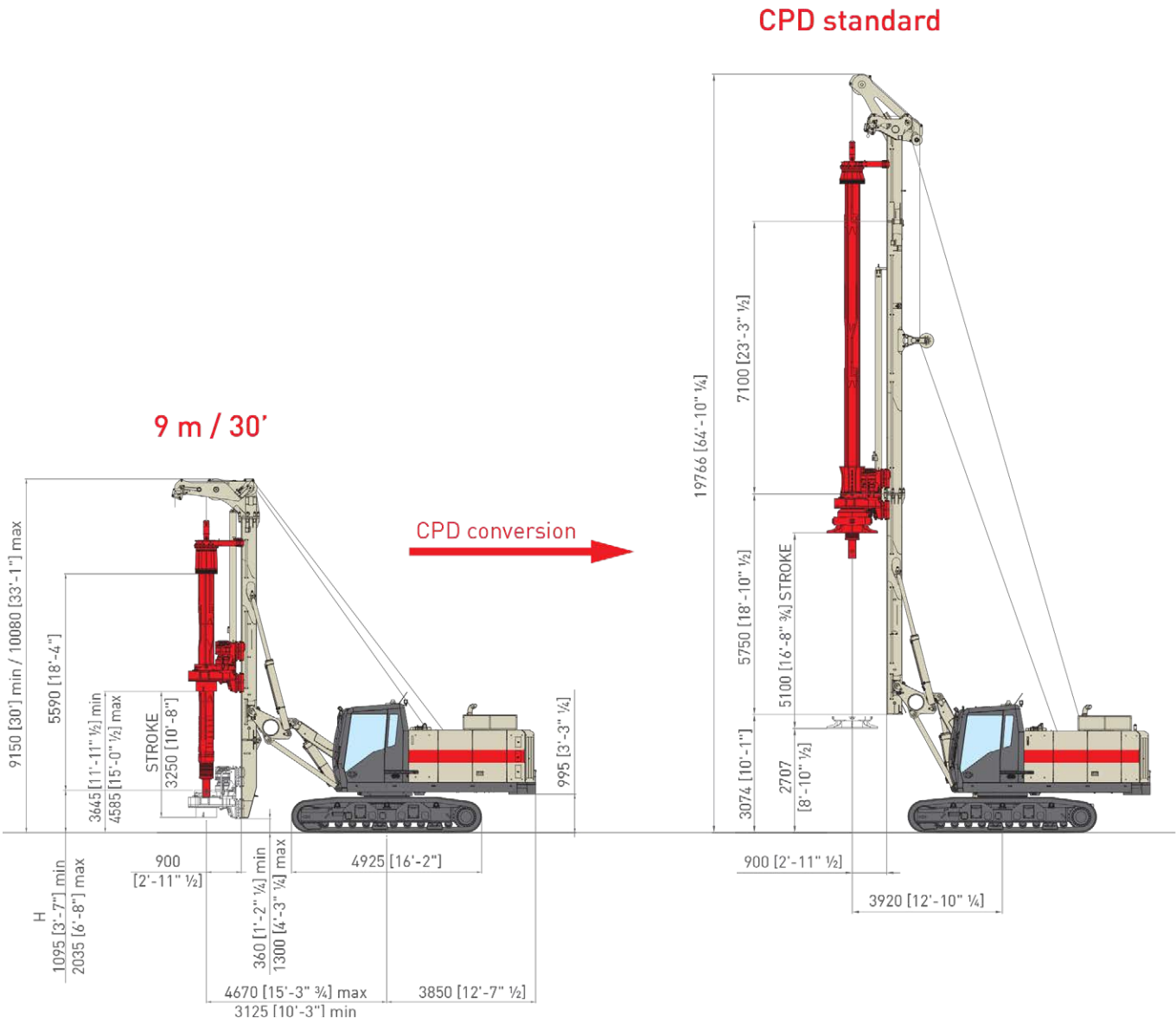
Notes

(1) max depth is upon drill string weight



CH 450 - LHR

Overall dimensions



LHR (Low Head Room)	m.s.	i.s.	9 m / 30'		CPD standard	
Min. height	mm	ft-in	9.150	30'	19.766	64' 8"
Max kelly bar length	m	ft-in	5,5	18'	12,5	41'
Pull down cylinder stroke	m	ft-in	3,250	10' 8"	5,100	16' 7"
Max pile diameter	mm	ft-in		1.800	5' 11"	
Max pile depth c/w 4-element kelly bar	m	ft-in	{4x5,5} 18,80	{4x18'} 61' 8"	{4x12,5} 45,10	{4x41'} 147' 11"
Max pile depth c/w 5-element kelly bar	m	ft-in	{5x5,5} 23,15	{5x18'} 75' 11"	-	-
Operating weight w/o tool	kg	lbs	40.100 ⁽¹⁾	88,400 ⁽¹⁾	43.400 ⁽²⁾	95,700 ⁽²⁾

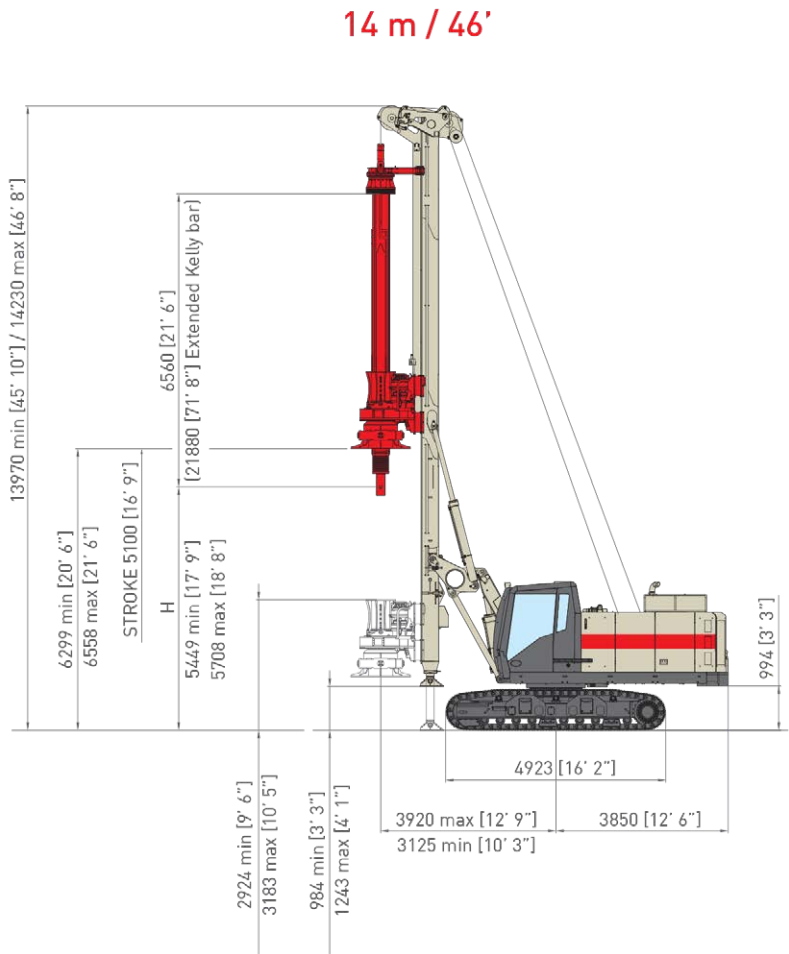
Notes

(1) c/w 4 x 5,5 m {4 x 18' 1"} long 368 mm {14" 1/2} dia. kelly bar

(2) c/w 4 x 9 m {4 x 29' 6"} long 368 mm {14" 1/2} dia. kelly bar; rotary c/w bucket opening flange

CH 450 - LHR

Overall dimensions



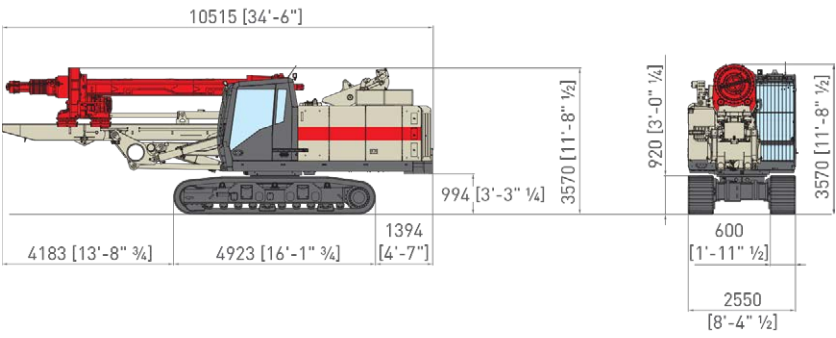
LHR (Low Head Room)	m.s.	i.s.	LHR 14 m / 46'	
Min. height	mm	ft-in	13.970	45' 10"
Max kelly bar length	m	ft-in	8,0	26' 3"
Pull down cylinder stroke	m	ft-in	5,10	16' 9"
Max pile diameter	mm	ft-in	1.800	5' 11"
Max pile depth c/w 4-element kelly bar	m	ft-in	{4x8} 28,80	{4x26' 3"} 94' 6"
Max pile depth c/w 5-element kelly bar	m	ft-in	{5x8} 35, 80	{5x26' 3"} 117' 5"
Operating weight w/o tool	kg	lbs	42.400 ⁽¹⁾	93,500 ⁽¹⁾

Notes

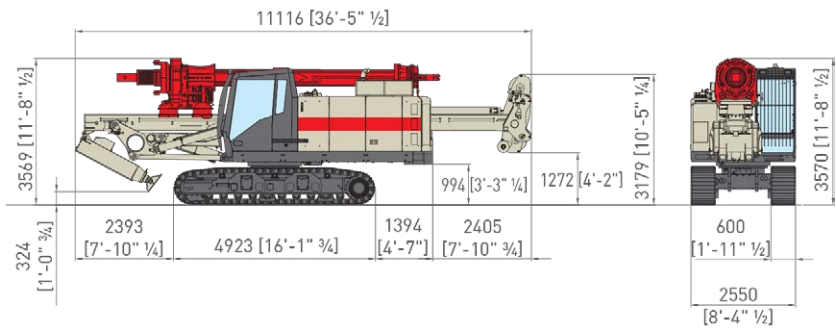
(1) c/w 4 x 6 m {4 x 19' 8"} long 368 mm {14" 1/2} dia. kelly bar; rotary c/w 1000 mm {40"} diam. casing twister

CH 450 - LHR

Overall dimensions



	m.s.	i.s.	LHR 9 m	
Transport weight	kg	lbs	40.100	88,400

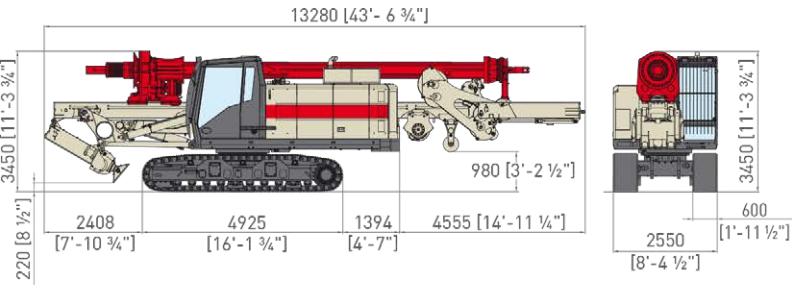


	m.s.	i.s.	LHR 14 m	
Transport weight	kg	lbs	42.000	92,600

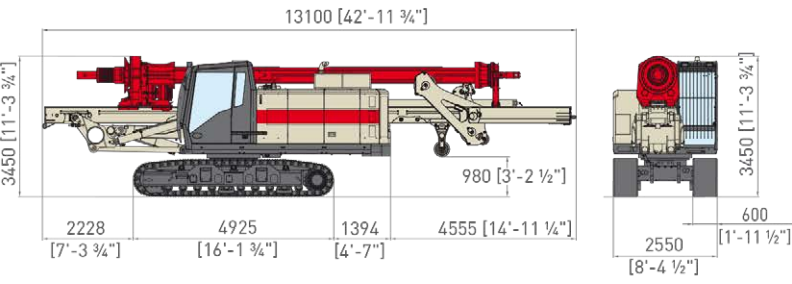


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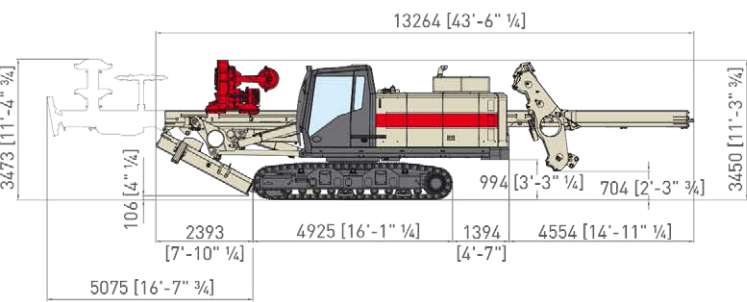
Overall dimensions



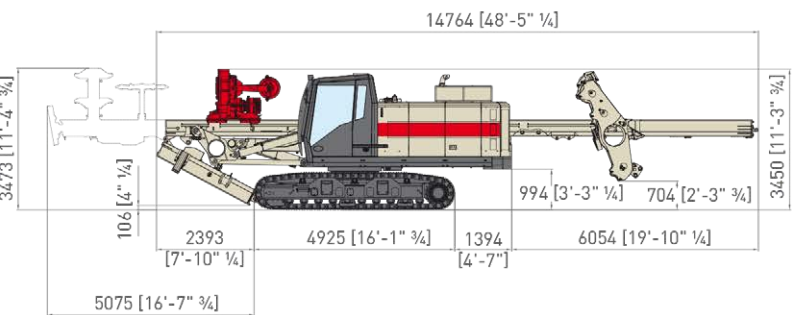
	m.s.	i.s.	WPD	
Transport weight	kg	lbs	44.800	98,800



	m.s.	i.s.	CPD	
Transport weight	kg	lbs	43.100	95,000



	m.s.	i.s.	CFA T4	
Transport weight	kg	lbs	40.500	89,300



	m.s.	i.s.	CFA T4 XL	
Transport weight	kg	lbs	41.500	91,500



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