

CH 18

SELF-ERECTING
HYDRAULIC PILING RIG



THE MULTIPURPOSE PILING RIG

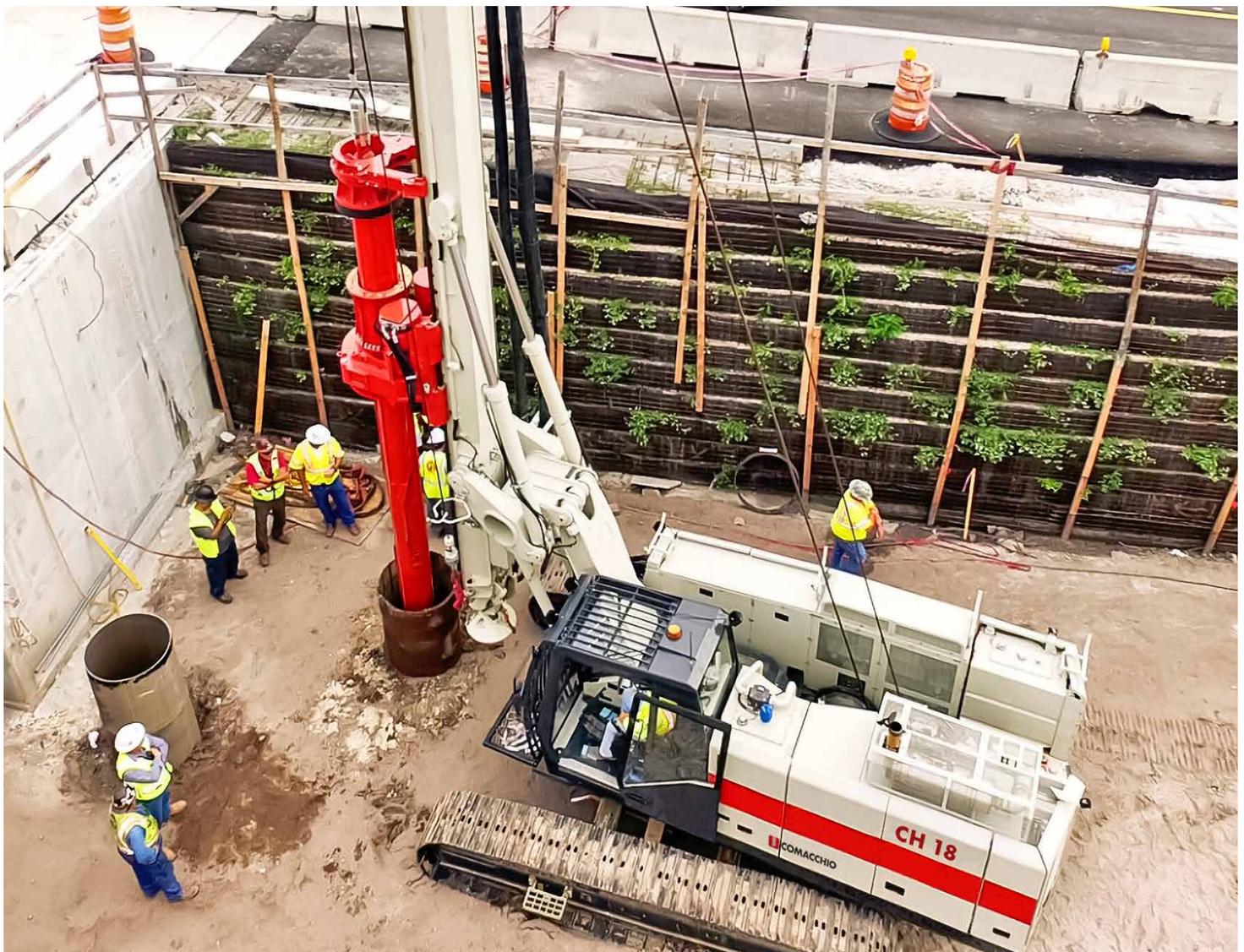


The **CH 18** is the **winning solution for job sites of short duration** that require frequent operations of transport, setting up and dismantling.

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 18** can be offered in **CS** (Cylinder System) and **WS** (Winch System) configuration. The **innovative CR 19 rotary head** design adopted by Comacchio allows for the use of **Kelly bars** of various diameters, up to a **maximum length of 14 m**, with minor changes on the rotary head.

The **CH 18** is available in **different LHR** (low head room) configurations, **designed for the construction of bored piles in challenging access sites.**



TECHNOLOGIES



The **unique design** of the **CH 18** adapts to a wide range of drilling technologies that include:

	BP (Bored Piles) CBP (Cased Bored Piles)	BP - Uncased Kelly Piles excavated by dry method or stabilized by fluid overpressure CBP - Kelly Piles with Casing installation by rotary drive or optionally by hydraulic casing oscillator				
			m.s.	i.s.	BP	CBP
		Max. pile diameter CS	mm	ft-in	2.000 ¹ 6' 7" ¹	1.500 ^{3/4} 4' 11" ^{3/4}
		Max. pile diameter WS	mm	ft-in	2.000 ¹ 6' 7" ¹	1.300 ^{3/4} 4' 3" ^{3/4}
		Max. pile depth CS	mm	ft-in	61.400 ² 201' 5" ²	61.400 ^{2/5} 201' 5" ^{2/5}
		Max. pile depth WS	mm	ft-in	62.800 ² 206' ²	62.800 ^{2/5} 206' ^{2/5}
		NOTES	1 - Tool below mast		2 - Using a non-self-mounting 5-elements kelly bar	
	3 - Depending on the twister		4 - Standard drilling axis	5 - Open hole (uncased) depth		
	CFA (Continuous Flight Auger)	CFA - Piles that are drilled uncased by the use of a continuous hollow auger stem				
			m.s.	i.s.	CFA	
		Max. pile diameter	mm	ft-in	1.000	3' 3"
		Max. pile depth (CFA/WS)	mm	ft-in	14.000 + 7.000 = 21.000	45' 11" + 22' 11" = 68' 10"
		Max. pile depth (CFA T4)	mm	ft-in	16.500 + 6.000 = 22.500	54' 2" + 19' 8" = 73' 10"
		Max. pile depth (CFA T4 XL)	mm	ft-in	18.000 + 6.000 = 24.000	59' 1" + 19' 8" = 78' 9"
Max. pile depth (CFA T4 XXL)	mm	ft-in	19.000 + 6.000 = 25.000	62' 4" + 19' 8" = 81' 12"		
	DP (Displacement Piles)	DP - Piles installed without soil removal by advancing a special tool into the ground that causes the soil to be displaced radially and vertically				
			m.s.	i.s.	DP	
		Max. pile diameter	mm	ft-in	450	1' 5"
		Max. pile depth	mm	ft-in	13.500 + 8.500 = 22.000	44' 3" + 27' 11" = 72' 2"
	SM (Soil Mixing)	SM - Piles constructed by mixing and partly replacing the existing soils with grout using a soil mixing tool				
			m.s.	i.s.	SM	
		Pile diameter	mm	ft-in	400 - 2.000 ⁶	1' 4" - 6' 7" ⁶
		Max. pile depth	mm	ft-in	13.500 + 8.500 = 22.000	44' 3" + 27' 11" = 72' 2"
NOTES	6 - According to the soil conditions					
	SC (Stone Columns)	SC - Piles made of crushed gravel placed with a vibrating tool into the soil				
			m.s.	i.s.	SC	
		Max. pile depth	mm	ft-in	12.600	41' 4"
	LDTH (Large DTH)	LDTH - Piles installed with DTH method using bits of a larger diameter than standard bits				
			m.s.	i.s.	LDTH	
		Max. pile diameter	mm	ft-in	1.000	3' 3"
		Max. pile depth	mm	ft-in	Approx. 50.000 - 60.000 ⁷	164' - 196' ⁷
NOTES	7 - Max. depth is upon drill string weight					
	MP (Micropiles)	MP - Installed using conventional air-flush rotary drilling				
			m.s.	i.s.	MP	
		Max. pile diameter	mm	ft-in	610	24'
		Stroke of rotary head	mm	ft-in	14.500	47' 6"

TECHNICAL DATA



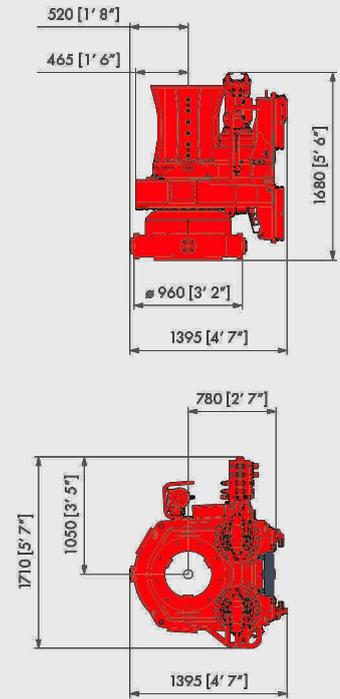
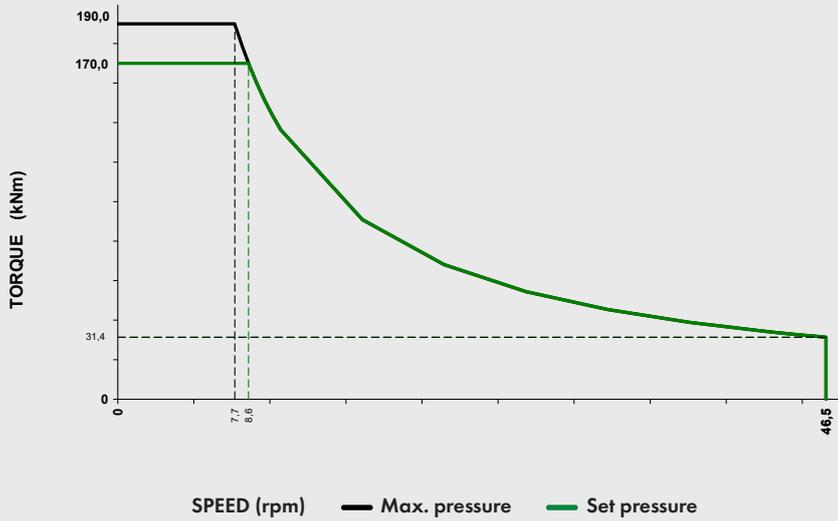
UNDERCARRIAGE		m.s.	i.s.			
Type	-	-	Variable gauge, telescoping side frames			
Track shoe width	mm	ft-in	600	1' 11"	800	2' 8"
Track shoe type	-	-	Triple grouser			
Overall width (retracted side frames)	mm	ft-in	2.550	8' 4"	2.950	9' 8"
Overall width (extended side frames)	mm	ft-in	4.000	13' 2"	4.200	13' 9"
Overall length	mm	ft-in	4.925		16' 1"	
Centre idler to centre sprocket	mm	ft-in	4.100		13' 5"	
UPPERFRAME		m.s.	i.s.			
Width	mm	ft-in	2.550	8' 4"		
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		m.s.	i.s.			
			High Tech Line			
Make and model	-	-	Cummins B6.7		Cummins QSB6.7	
Emission certification	-	-	EU stage V / US EPA Tier 4f		EU stage IIIA / US EPA Tier 3	
Aspiration	-	-	Turbocharged and charge air cooled			
Power rating (2.000 rpm)	kW	hp	209	284	201	274
Displacement	cc	in ³	6.700		408	
Fuel tank	l	gal	500		135	
Sound pressure level in cabin (EN 16228-1, Annex B)	-	-	LPA 82 dB (A)			
Sound Power level (2000/14/EC - EN 16228-1, Annex B)	-	-	LWA 108 dB (A)			
HYDRAULIC SYSTEM		m.s.	i.s.			
Main pumps flow	l/min	gal/min	2 x 214		2 x 56,5	
Service pump flow	l/min	gal/min	160		42,3	
Hydraulic oil tank capacity	l	gal	600		158	
MAIN WINCH		m.s.	i.s.			
Type	-	-	Controlled descent			
1 st layer line pull	kN	lbs	160		35,970	
1 st layer rope speed	mm/min	ft/min	75.000		246'	
Rope diameter	mm	in	24		15/16"	
Rope layers	-	-	2			
FEM classification	-	-	M6-L3-T5			
SERVICE WINCH		m.s.	i.s.			
Type	-	-	Controlled descent		Free fall	
1 st layer line pull	kN	lbs	72		16,200	
1 st layer rope speed	mm/min	ft/min	55.000	180'	49.000	161'
Rope diameter	mm	in	18		11/16"	
Rope layers	-	-	3		4	
FEM classification	-	-	M5-L2-T5		M6-L3-T5	

ROTARY HEAD



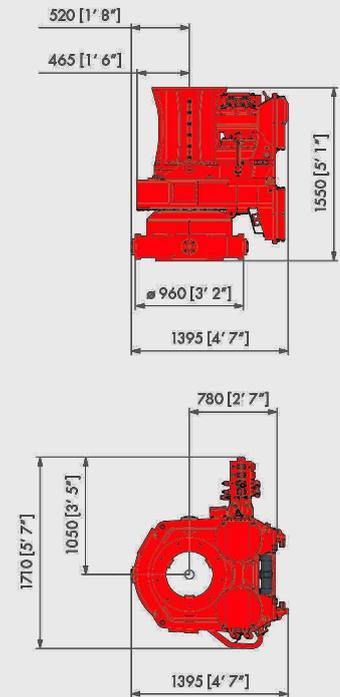
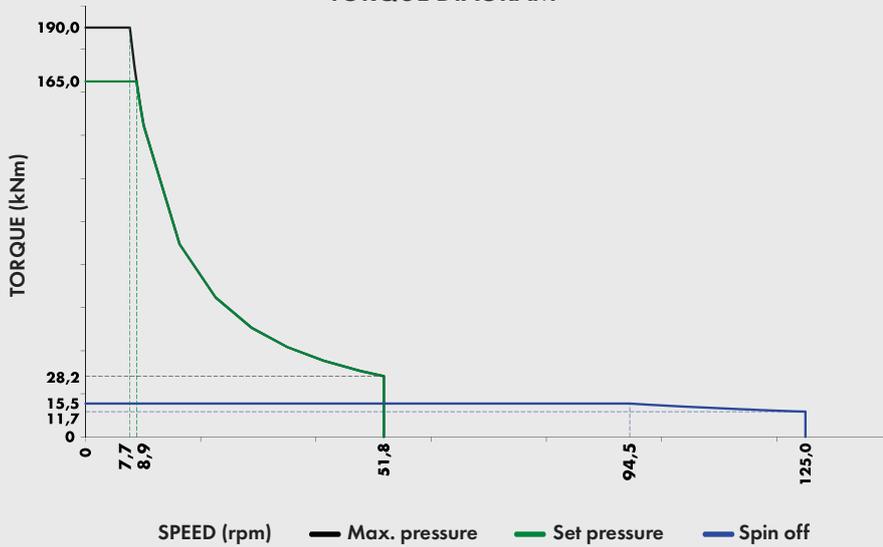
CR 19

TORQUE DIAGRAM



CR 19 HS

TORQUE DIAGRAM



ROTARY HEADS	m.s.	i.s.	CR 19		CR 19 HS	
Nominal max. torque	kNm	lbf-ft	190 at 35 MPa	140,000 at 5,100 psi	190 at 33 MPa	140,000 at 4,800 psi
Max. torque	kNm	lbf-ft	170 at 31 MPa	125,400 at 4,500 psi	165 at 28,5 MPa	121,700 at 4,130 psi
Max. drilling speed	rpm		46,5		51,8	
Hydraulic power	kW	hp	155	208	155	208
Spin-off speed	rpm		-		125	
Replaceable drive sleeve	-	-	Yes		Yes	
Replaceable drive keys	-	-	Yes		Yes	
Weight (as shown)	kg	lbs	3.480	7,672	3.600	7,937

OPTIONS AND ACCESSORIES



STANDARD EQUIPMENT

Main winch with special grooving	Automatic lubrication kit for rotary sliding guides
Hoist and lowering limit switches on main and service winches	Transport securing lugs on crawler unit
Swivel for main and service winch rope	Work lights
Service rope parking point	Electric refuelling pump and hydraulic oil refilling system
Mast inclination measurement on X & Y axes (digital and analog display)	Diagnostic panel for hydraulic, engine, electrical and electronic functions
Automatic vertical mast alignment	Front and top cabin protective grate (FOPS-1 certified)
Depth measuring device on main winch	Radio with bluetooth
Rpm measuring device on rotary	Phone charger
Crowd pressure setting	CCS Comacchio Controlling System - Touch screen 12"
Oscillator attachment brackets	Adjustable spin-off and shaker tool discharge systems
Heating & air conditioning system	Rotary auto speed management & interactive multiple gear system
Rotary quill with interchangeable Kelly ribs	Tool box
Video cameras set	Tool tray in front of cabin
Automatic stop of the main winch at the end of the hole	Diesel engine diagnostics system



OPTIONAL EQUIPMENT

Biodegradable oil	Air compressor kit
Freefall auxiliary winch	Washing kit
Main and service winch load cells	Flange for casing driving
Central lubrication system	Hydraulic provision for casing oscillator
Custom painting	Casing oscillator
CFA cleaner (star, roller or brush type)	Vibrator for steel reinforcement cage
Flange for bucket opening	Data logger
Cardan joint	ComNect system
Welding equipment & generator	



CE CONFORMITY KIT

Remote radio control for machine travel	CFA cleaner
Main and aux winch load cells	Rubber strip on auger guide
Side walkways with handrails	

Inspired by the automotive-style fit and finish, the new **Comacchio cab** stands out for its ergonomic design and safety features, offering high level of comfort for the operator and ensuring smooth and easy operation.



INNOVATIVE KELLY BAR SYSTEM

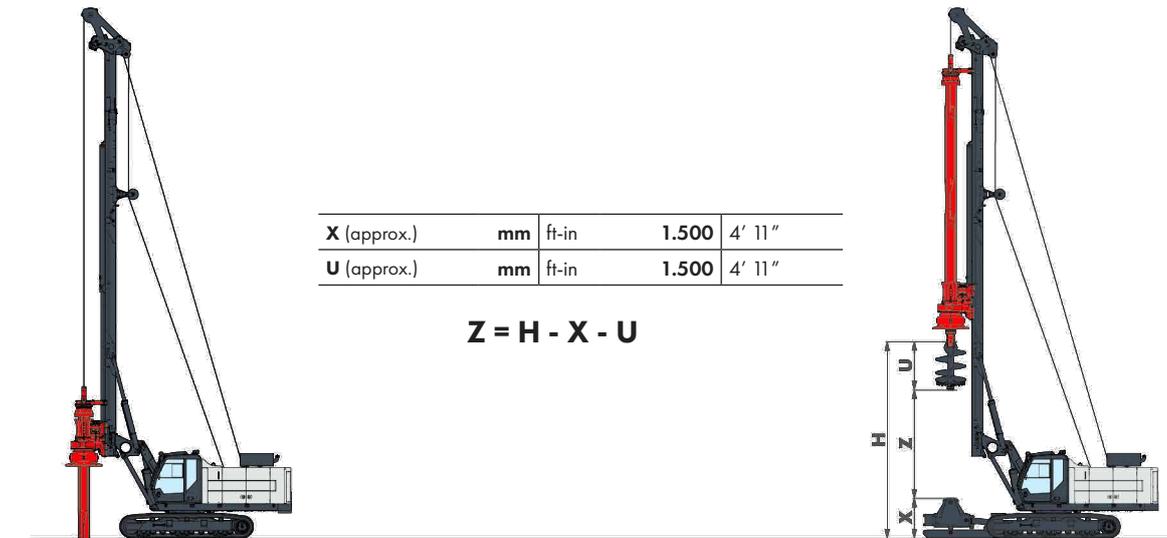


Two bar sizes are **available with minor changes** on the rotary head.

KELLY BAR SIZES	m.s.	i.s.	Outer diameter	
Standard	mm	in	368	14" 1/2
Optional	mm	in	355	14"

X (approx.)	mm	ft-in	1.500	4' 11"
U (approx.)	mm	ft-in	1.500	4' 11"

$$Z = H - X - U$$



N.	KELLY BARS			WS (Winch System)				CS (Cylinder System)				
	Length	Weight ¹	Depth ⁵	H ⁴		Depth		H ⁴				
				mm	ft-in	mm	ft-in	mm	ft-in			
Locking or friction	4	8.000	26' 2"	4,4	27.700	90' 11"	9.050	29' 8"	26.300	88' 10"	7.300	23' 11"
	4	9.000	29' 5"	4,8	31.700	104'	8.050	26' 4"	30.300	99' 5"	7.300	23' 11"
	4	10.500	34' 4"	5,5	37.600	123' 4"	6.550	21' 5"	36.300	119' 1"	6.550	21' 5"
	4	12.000	39' 4"	6,1	43.000	142'	5.050	16' 6"	41.700	136' 9"	5.050	16' 6"
	4	12.500	41'	6,3	44.900	147' 4"	4.550	14' 11"	43.600	143'	4.550	14' 11"
	4	13.000 ²	42' 6"	6,5	46.700	153' 3"	4.050	13' 3"	45.400	148' 11"	4.050	13' 3"
	4	13.500 ²	44' 3" ²	6,7	48.600	159' 5"	3.550	11' 7"	47.300	155' 2"	3.550	11' 7"
	4	14.000 ^{2/3}	46' 2" ³	6,9	50.400	165' 4"	3.050	10'	49.100	161' 1"	3.050	10'
Friction	5	8.000	26' 2"	5	34.400	112' 10"	9.050	29' 8"	33.000	108' 3"	7.300	23' 11"
	5	9.000	29' 5"	5,5	39.400	129' 3"	8.050	26' 4"	38.000	124' 8"	7.300	23' 11"
	5	10.500	34' 4"	6,1	46.800	153' 7"	6.550	21' 5"	45.500	149' 3"	6.550	21' 5"
	5	12.000	39' 4"	6,8	53.600	175' 10"	5.050	16' 6"	52.200	171' 3"	5.050	16' 6"
	5	12.500	41'	7,1	55.900	183' 5"	4.550	14' 11"	54.500	178' 9"	4.550	14' 11"
	5	13.000 ²	42' 6" ²	7,3	58.200	190' 11"	4.050	13' 3"	56.800	186' 4"	4.050	13' 3"
	5	13.500 ²	44' 3" ²	7,5	60.500	198' 6"	3.550	11' 7"	59.100	193' 10"	3.550	11' 7"
	5	14.000 ^{2/3}	46' 2" ³	7,7	62.800	206'	3.050	10'	61.400	201' 5"	3.050	10' 0"

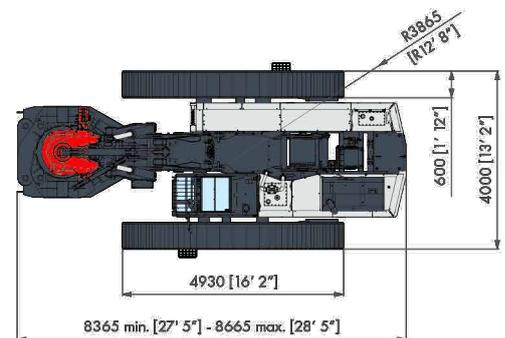
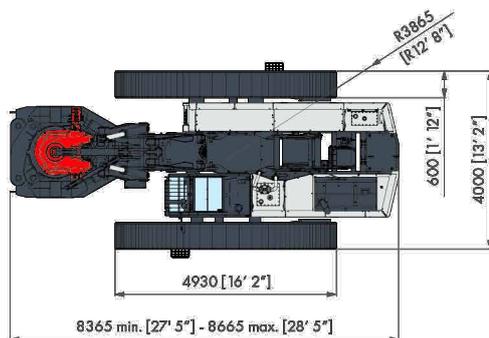
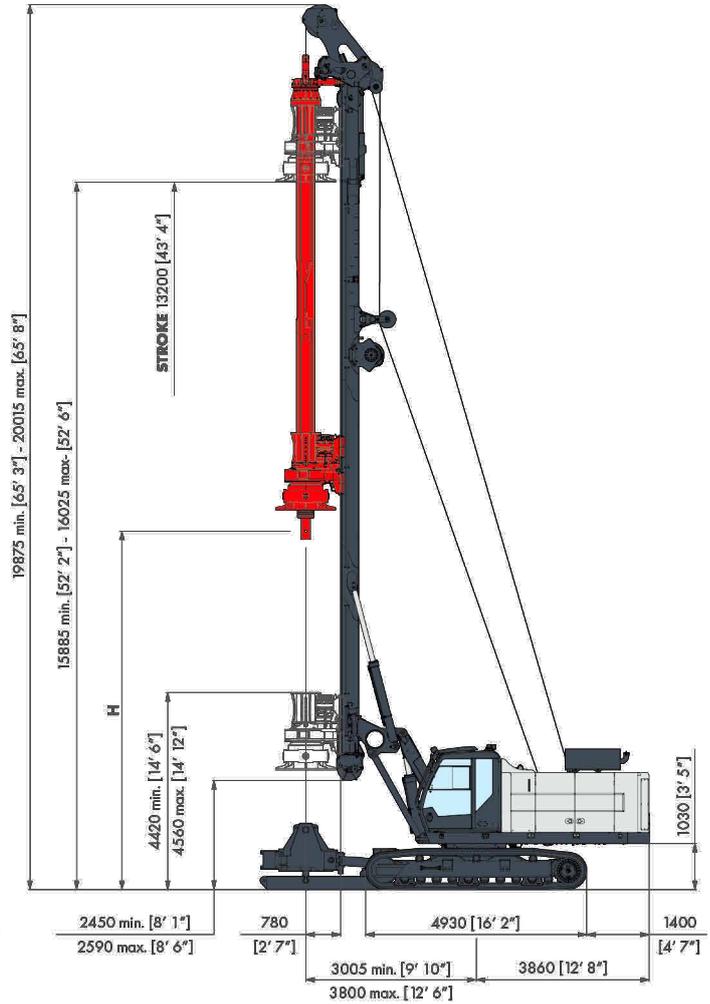
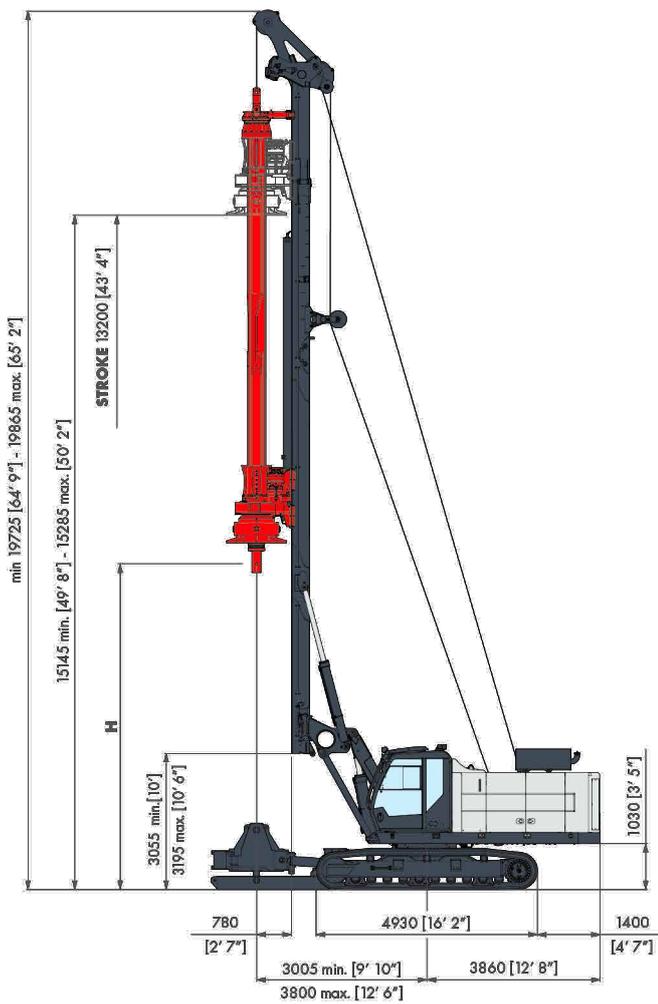
NOTES	1 - Weight refers to Ø 368 mm (14" 1/2)	2 - Non self-mounting in CS version
	3 - Non self-mounting in WS version	4 - Max. height of bottom kelly pin above ground
	5 - Depth to be reduced by 1.300 mm (4' 3") in case mast foot is not installed	

CASING OSCILLATOR ARRANGEMENT



CS

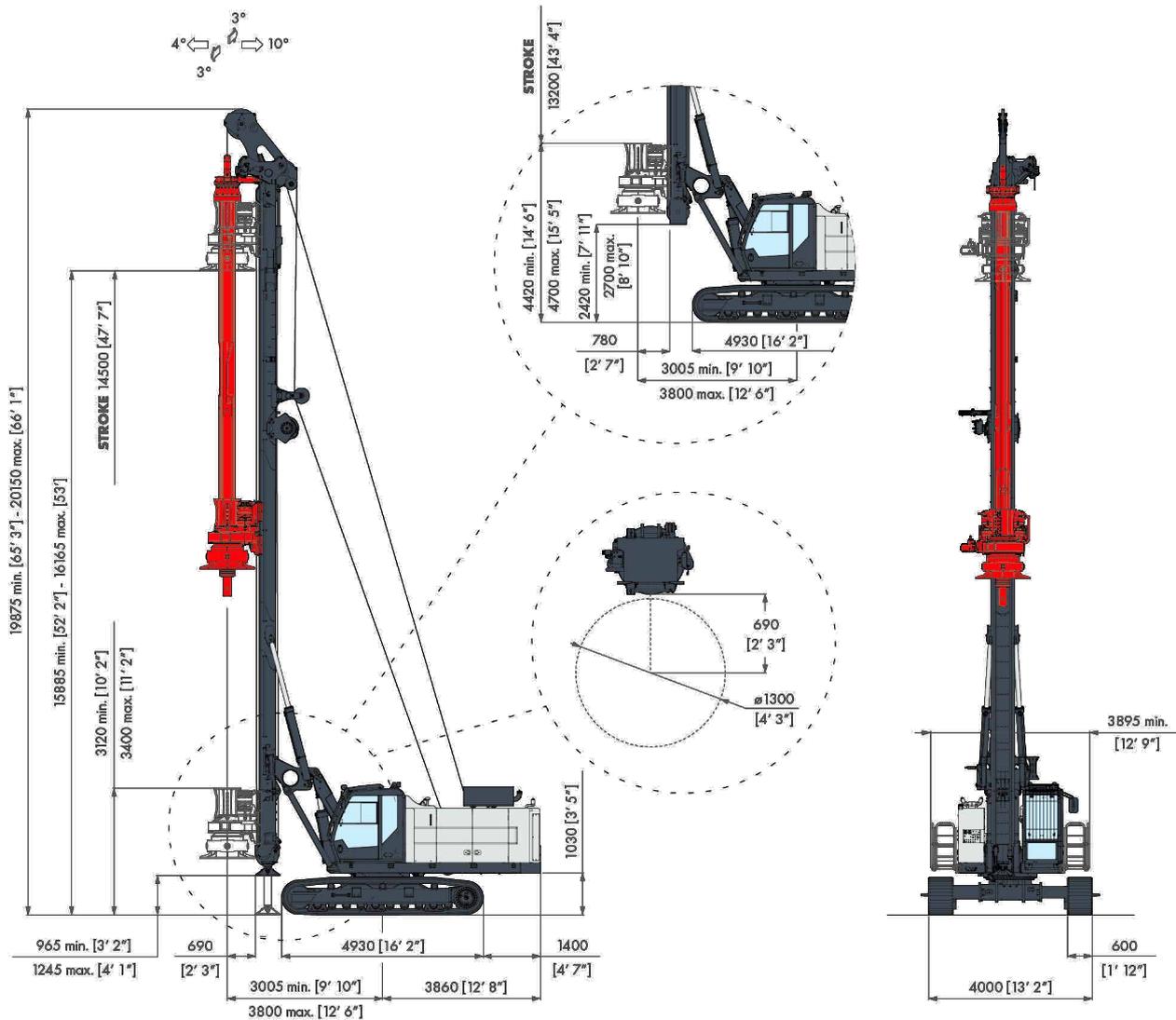
WS



BORED PILES



CH 18 - WS



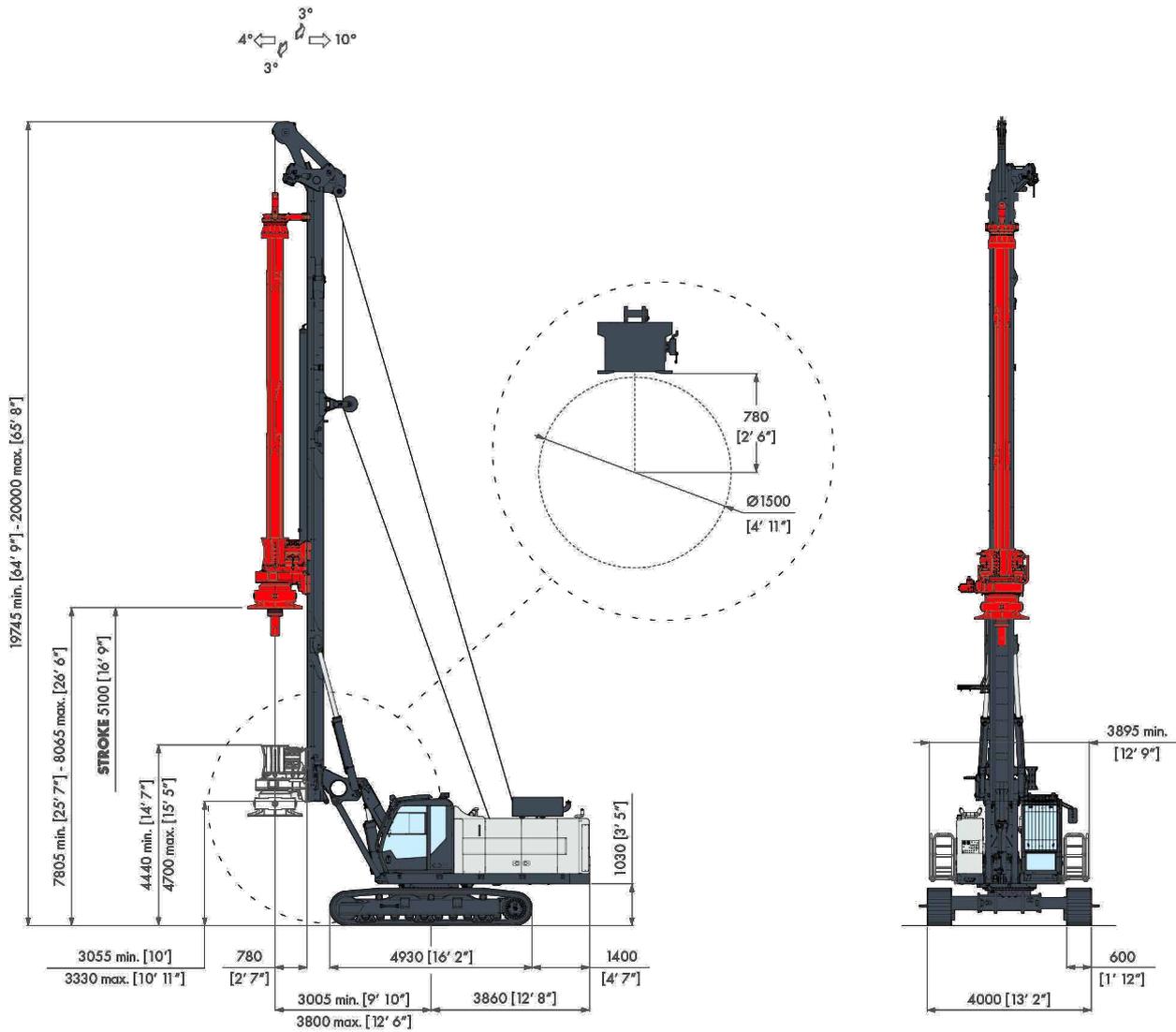
WS (Winch System)	m.s.	i.s.		
Stroke c/w mast foot	mm	ft-in	14.500	47' 7"
Stroke c/w lower reeving box	mm	ft-in	13.200	43' 4"
Max. pull up force	kN	lbs	240	53,950
Max. pull down force	kN	lbs	240	53,950
Speed down	mm/min	ft/min	36.000	118'
Max. pile diameter	mm	ft-in	1.300 - 2.000 ¹	4' 3" + 6' 7" ¹
Operating weight w/o tool	ton		44,8 ²	

NOTES	
1 - With - without bottom mast element	
2 - c/w 4 x 9.000 mm (4 x 29'6") long 368 mm (14" 1/2) dia. Kelly bar; rotary c/w bucket opening flange	

BORED PILES



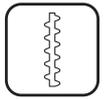
CH 18 - CS



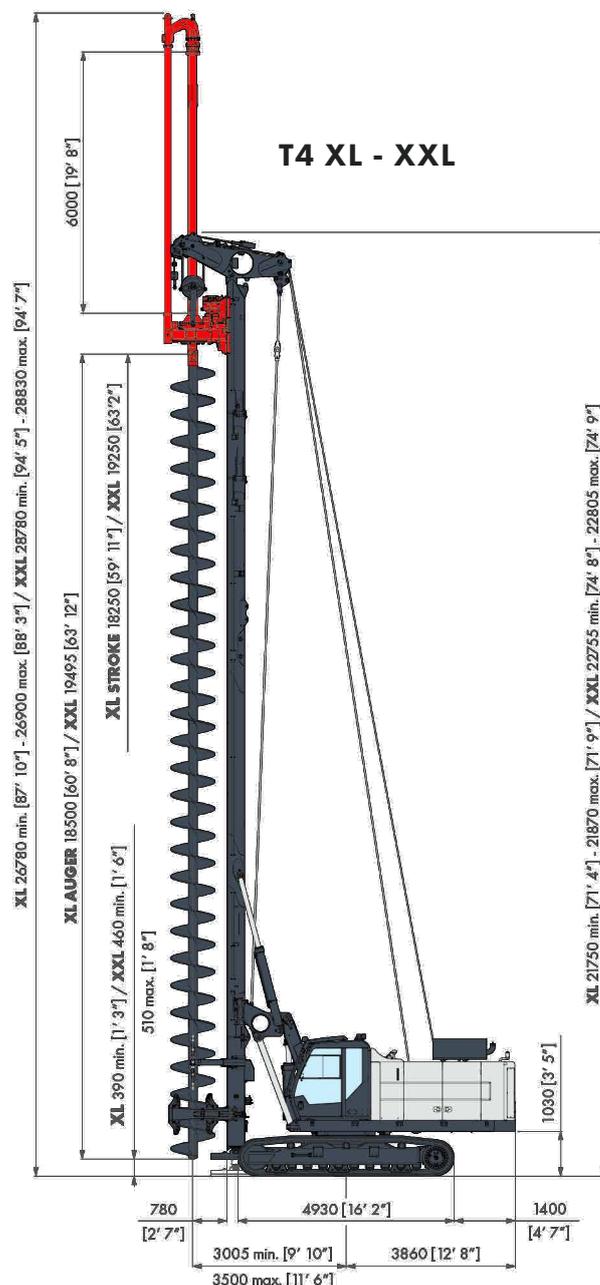
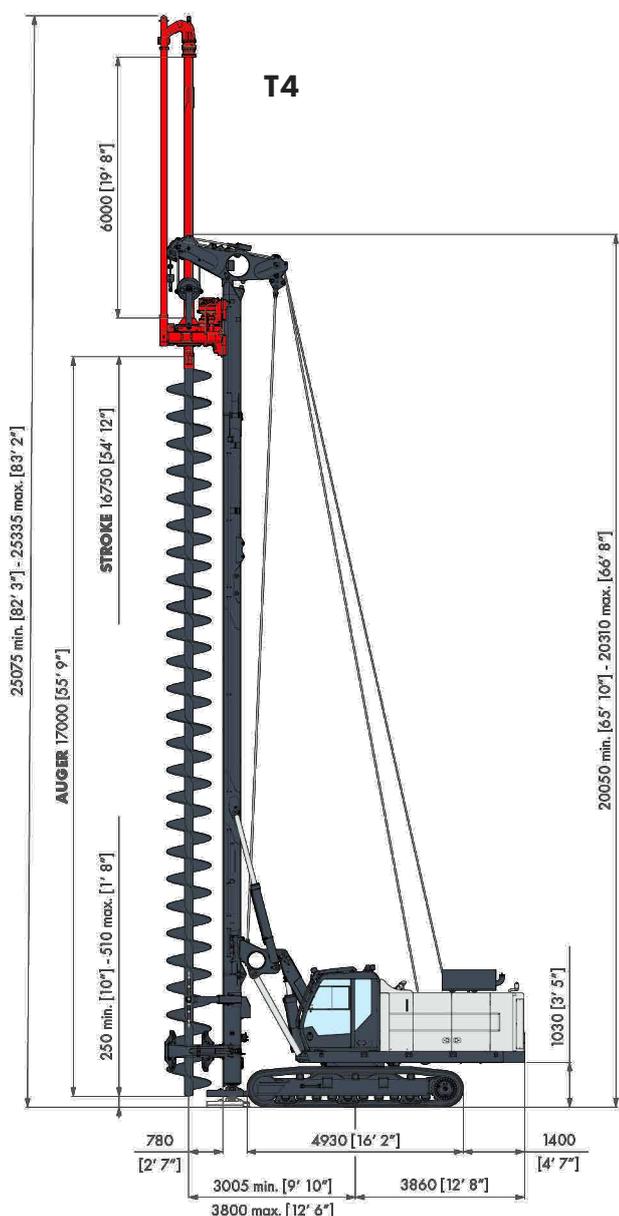
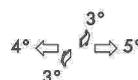
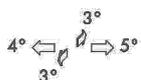
CS (Cylinder System)	m.s.	i.s.		
Stroke	mm	ft-in	5.100	16' 9"
Max. pull up force	kN	lbs	226	50,800
Max. pull down force	kN	lbs	204	45,860
Speed down	mm/min	ft/min	20.000 - 21.000	65' 7" - 68' 11"
Max. pile diameter	mm	ft-in	1.500 ¹ - 2.000 ²	4' 11" ¹ - 6' 7" ²
Operating weight w/o tool	ton		43,1 ³	

NOTES	1 - Tool in front of mast	2 - Tool below mast
	3 - c/w 4 x 9.000 mm (4 x 29'6") long, 368 mm (14" 1/2) dia. Kelly bar; rotary c/w bucket opening flange	

CFA



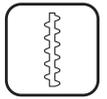
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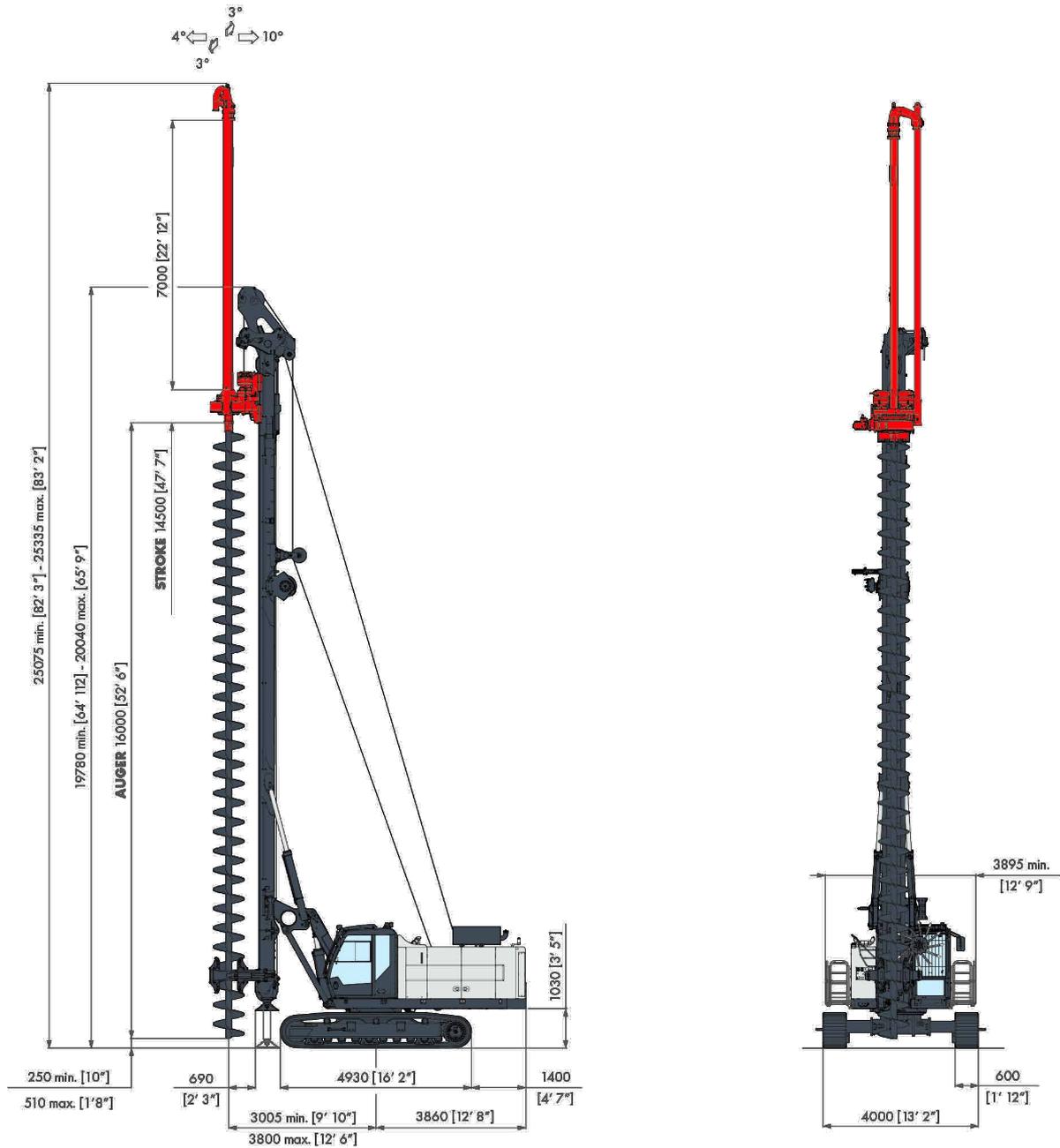
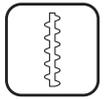
CFA (Continuous Flight Auger)	m.s.	i.s.	T4		T4 XL		T4 XXL	
Max. pile diameter	mm	ft-in	1.000	3' 3"	1.000	3' 3"	1.000	3' 3"
Max. length of augers	mm	ft-in	17.000	55' 9"	18.500	60' 8"	19.500	63' 11"
Max. length of auger extension	mm	ft-in	6.000	19' 8"	6.000	19' 8"	6.000	19' 8"
Max. pile depth	mm	ft-in	16.500 + 6.000 = 22.500	54' 2" + 19' 8" = 73' 10"	18.000 + 6.000 = 24.000	59' 1" + 19' 8" = 78' 9"	19.000 + 6.000 = 25.000	62' 4" + 19' 8" = 81' 12"
Extraction force	kN	lbs	480	107,900	480	107,900	480	107,900
Crowd force on auger	kN	lbs	45 ¹	10,200 ¹	45 ¹	10,200 ¹	45 ¹	10,200 ¹
Operating weight w/o auger	ton		42,5 ²		43,5 ²		43,7 ²	

NOTES | 1 - Optional 100 kN (22,480 lbs) | 2 - c/w auger extension, auger cleaner, swivel and swan neck

CFA/WS



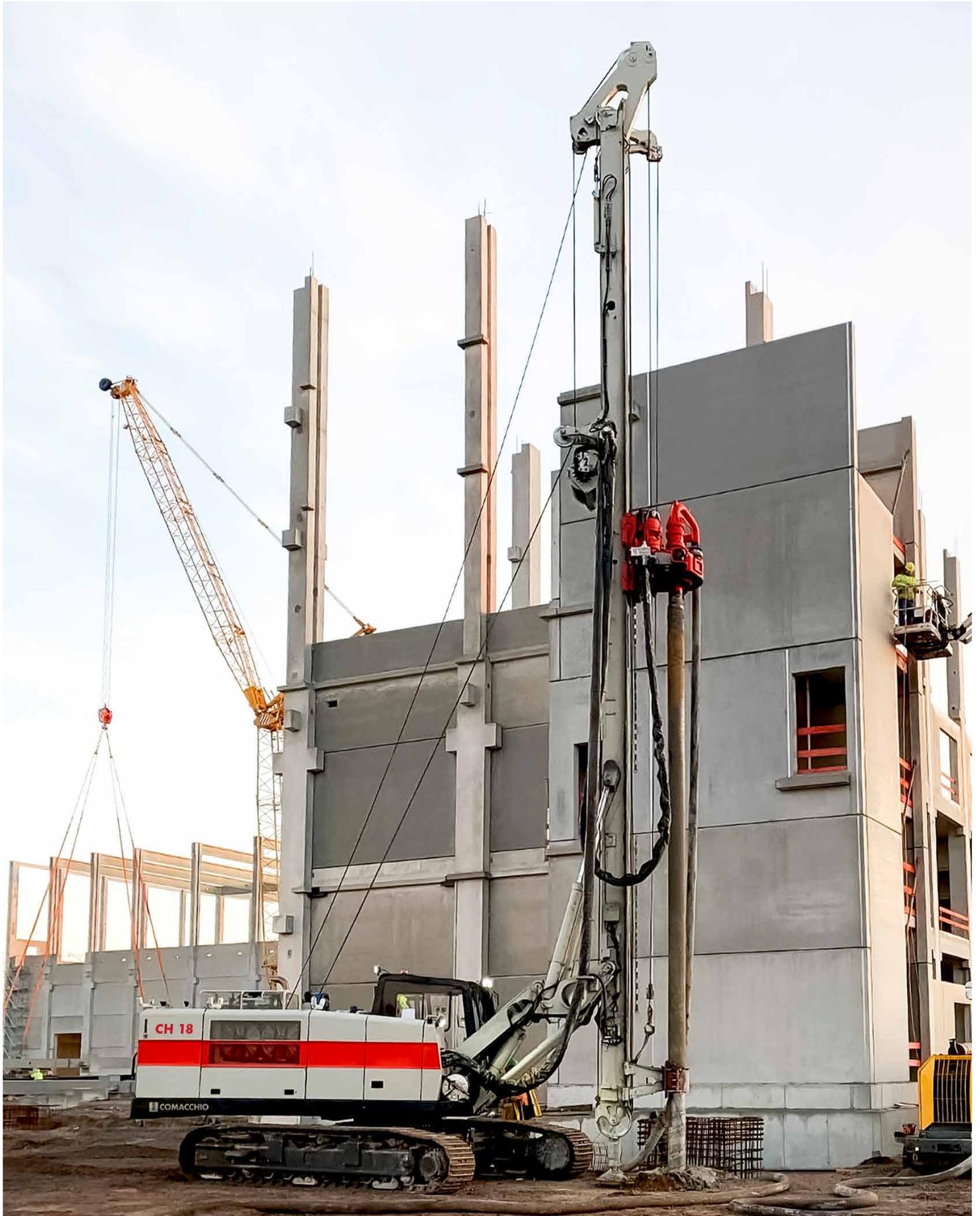
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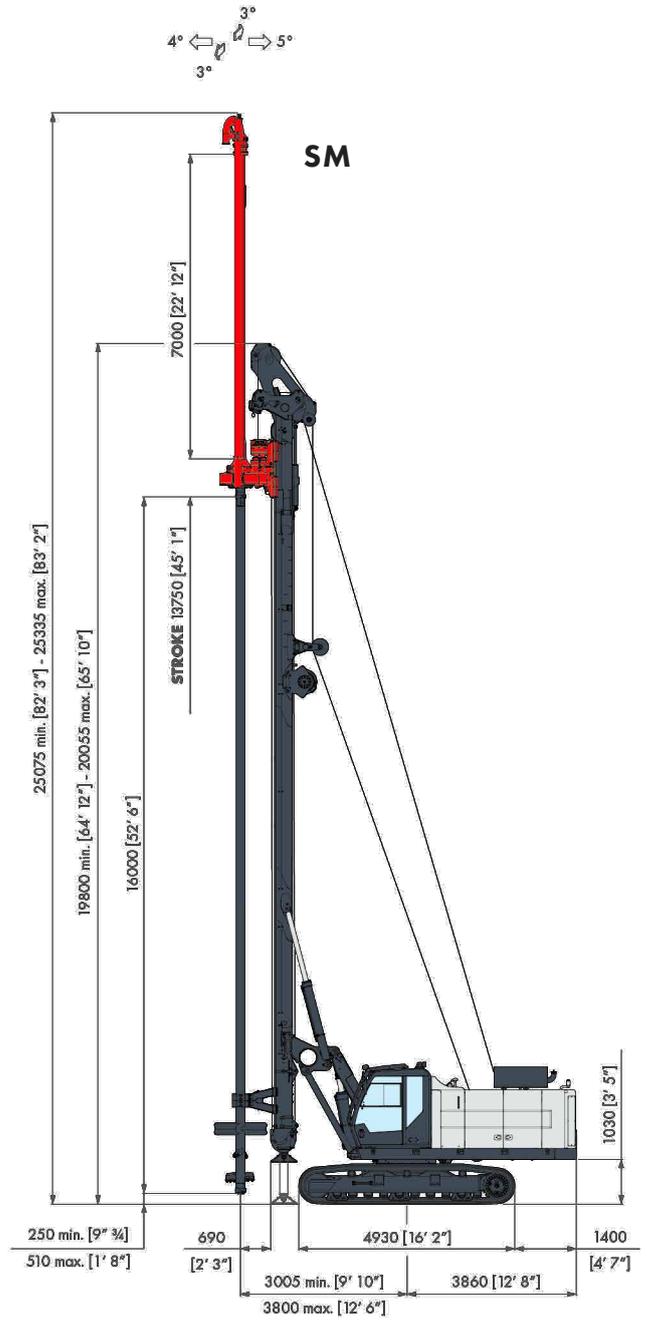
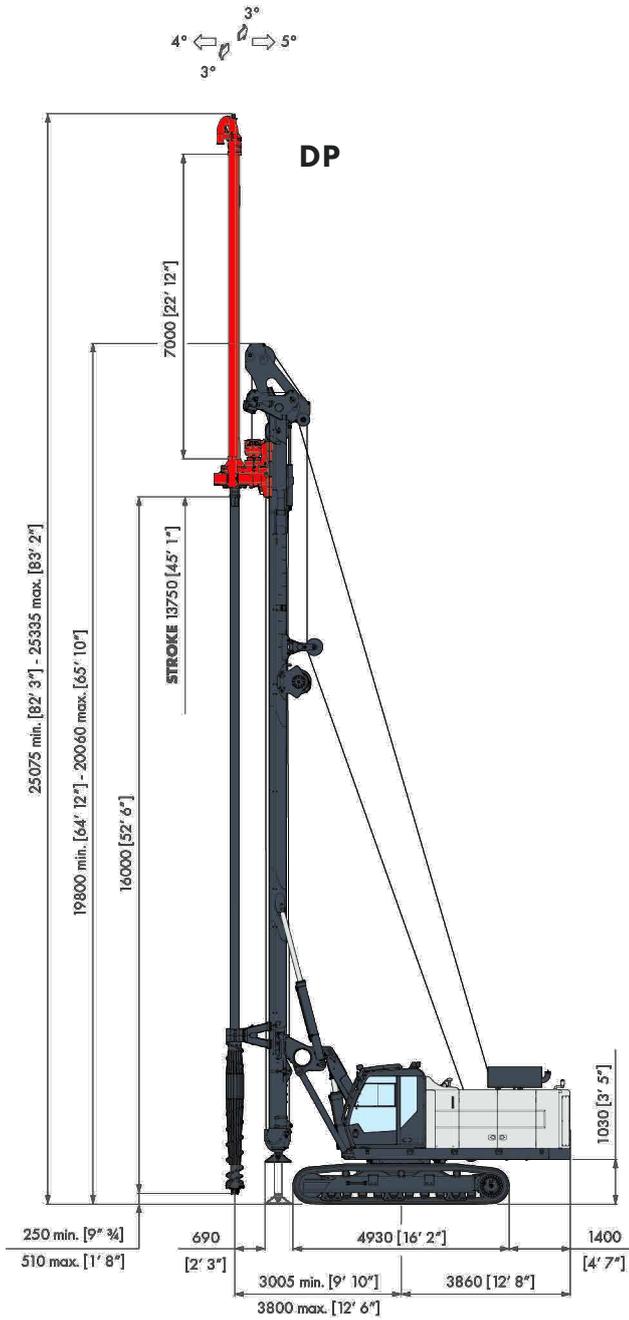
CFA (Continuous Flight Auger)	m.s.	i.s.	CFA/WS (Quick Conversion CFA)	
Max. pile diameter	mm	ft-in	1.000	3' 3"
Max. length of augers	mm	ft-in	16.000	52' 6"
Max. length of auger extension	mm	ft-in	7.000	23'
Max. pile depth	mm	ft-in	14.000 + 7.000 = 21.000	46' + 23' = 69'
Extraction force	kN	lbs	330	74,200
Crowd force on auger	kN	lbs	140	31,470
Operating weight w/o tool	ton		41,5 ¹	

NOTE 1 - c/w auger extension, auger cleaner, swivel and swan neck

DP/SM



CH 18



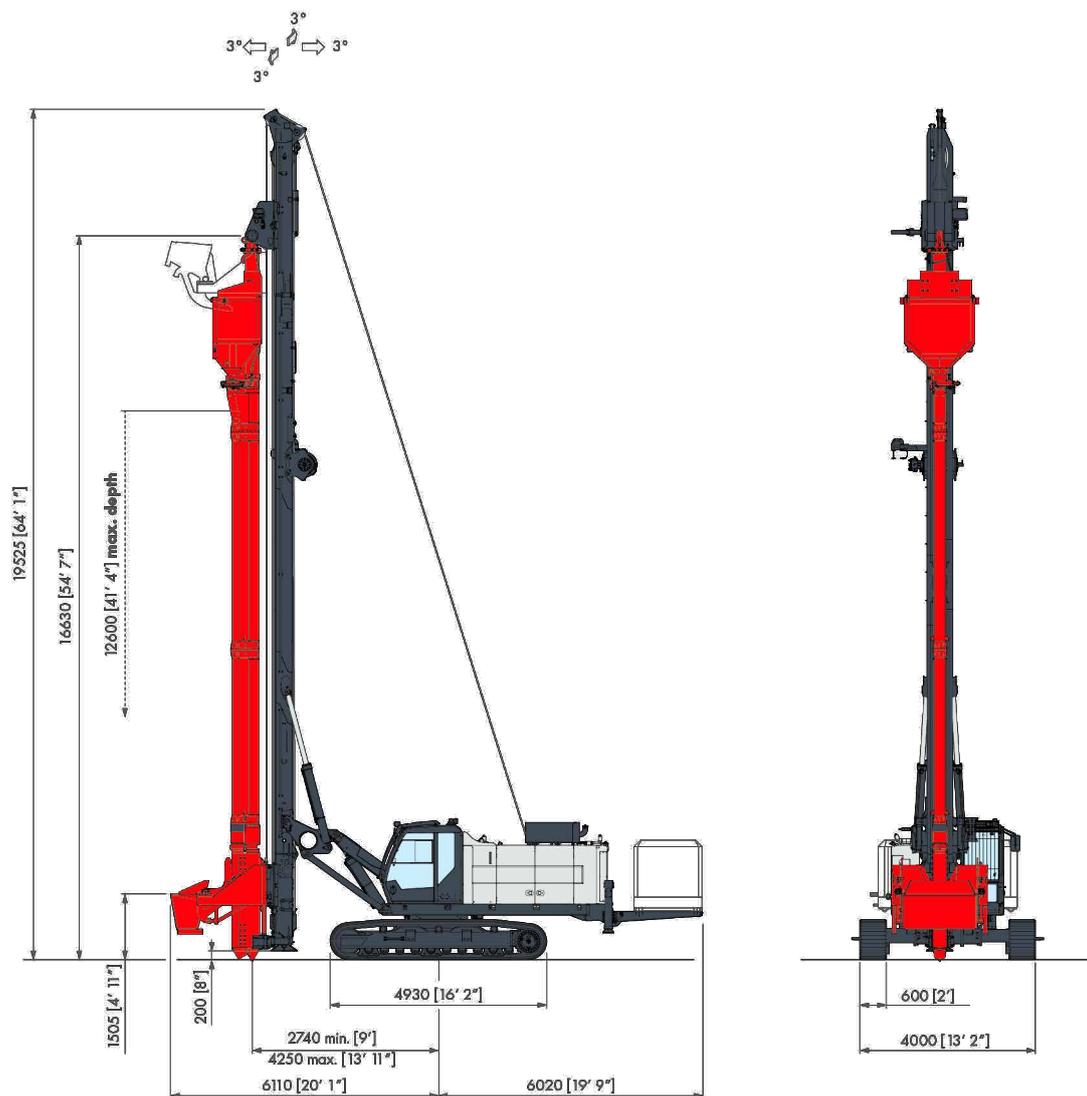
WS (Winch System) / DP-SM	m.s.	i.s.	DP (Displacement Piles)		SM (Soil Mixing)	
			400	16"	400 - 2.000 ¹	16" - 6' 7" ¹
Max. pile diameter	mm	in	400	16"	400 - 2.000 ¹	16" - 6' 7" ¹
Max. drill string length	mm	ft-in	16.000	52' 6"		
Max. length of drill string extension	mm	ft-in	8.500	27' 11"		
Max. pile depth	mm	ft-in	13.500 + 8.500 = 22.000	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	ton		41,5 ²			

NOTES | 1 - According to the soil conditions | 2 - c/w auger extension, swivel and swan neck

STONE COLUMNS



CH 18



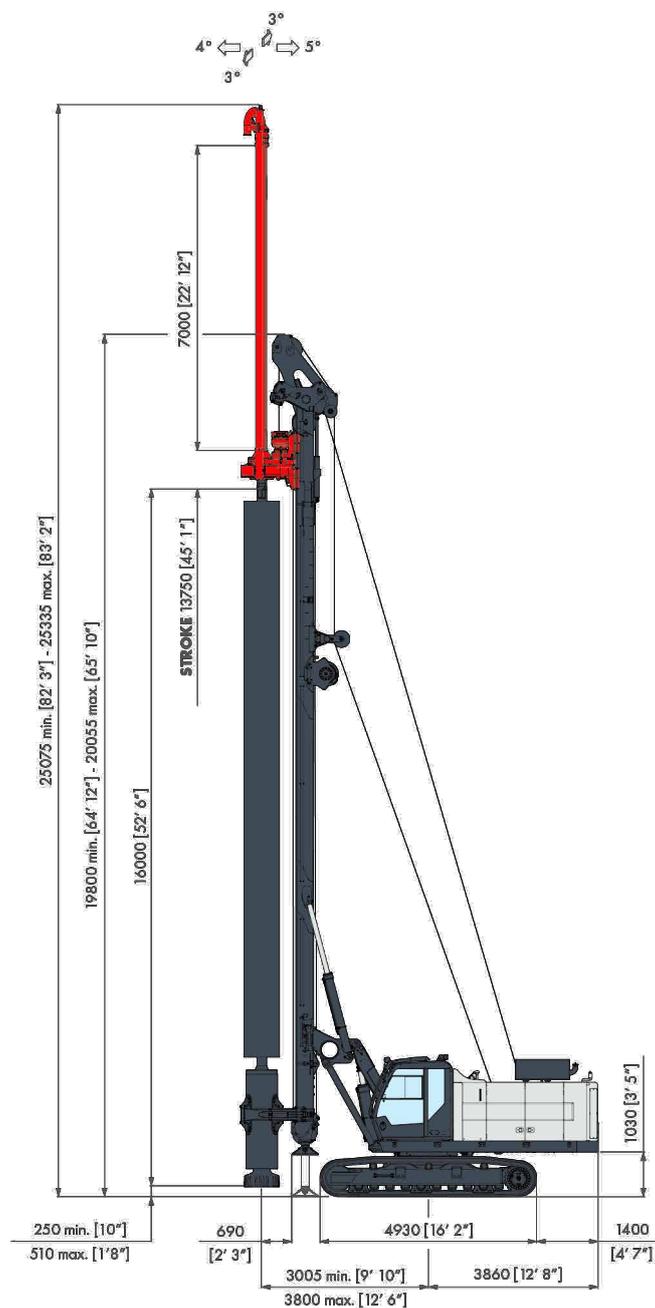
WS (Winch System)	m.s.	i.s.	SC (Stone Columns)	
Vibroflotation unit length	mm	ft-in	16.630	54' 7"
Max. pile depth	mm	ft-in	12.600	41' 4"
Vibration frequency	Hz		50	
Extraction force	kN	lbs	240	54,000
Pull down force	kN	lbs	240	54,000
Operating weight w/o tool	ton		44,2 ¹	

NOTE | 1 - c/w 2.2 ton compressor unit; w/o weight of gravel

LDTH



CH 18

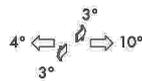
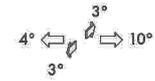


LDTH (Large DTH)	m.s.	i.s.		
Max. pile diameter	mm	ft-in	1.000	3' 3"
Stroke c/w mast foot	mm	ft-in	14.500	47' 7"
Max. pile depth	mm	ft-in	Approx. 50.000 - 60.000 ¹	Approx. 164' - 196' ¹
Extraction force	kN	lbs	330	74,200
Operating weight w/o tool	ton		41,5 ²	

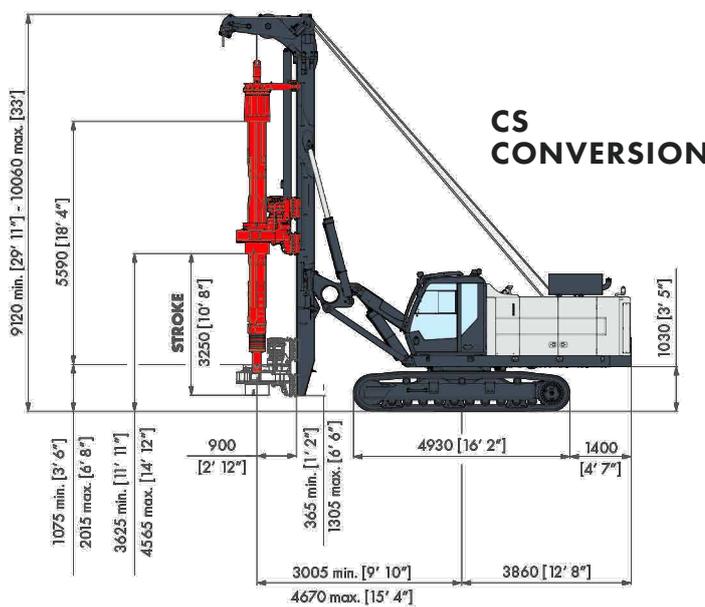
NOTES | 1 - Max. depth is upon drill string weight

2 - c/w auger extension, swivel and swan neck

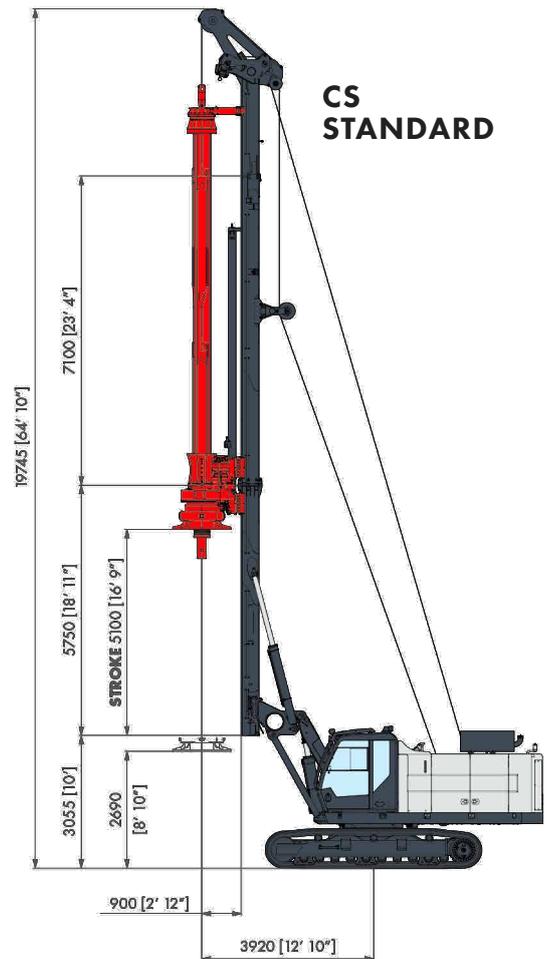
LHR



9 m / 30'



CS
CONVERSION

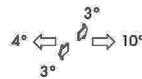


CS
STANDARD

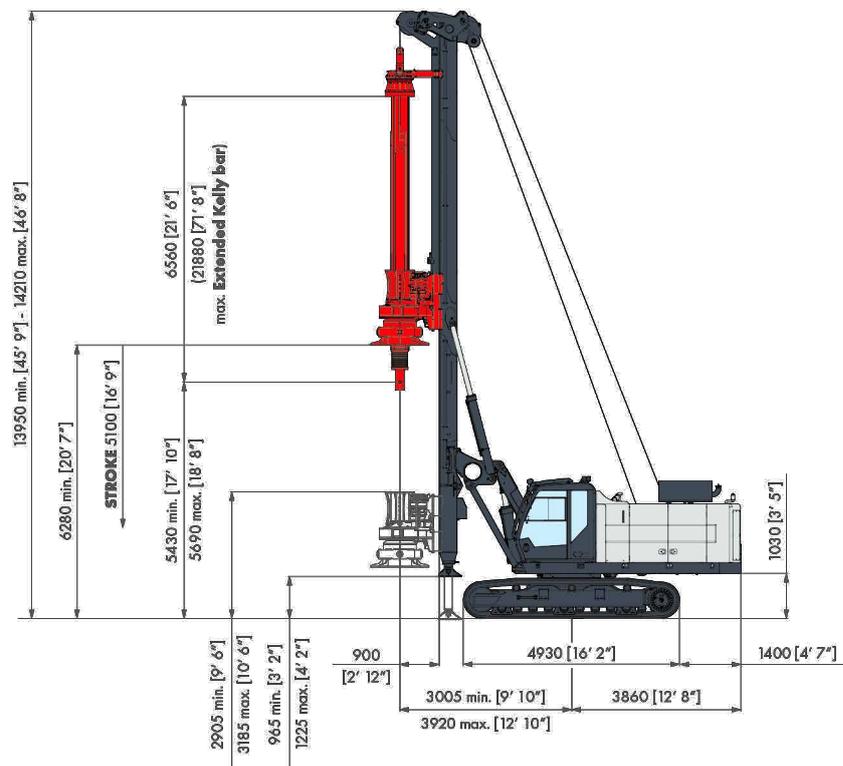
LHR (Low Head Room)	m.s.	i.s.	9 m / 30'		CS standard	
Min. height	mm	ft-in	9.120	29' 11"	19.745	64' 9"
Max. kelly bar length	mm	ft-in	5.500	18'	12.500	41'
Stroke of pull down cylinder	mm	ft-in	3.250	10' 8"	5.100	16' 7"
Max. pile diameter	mm	ft-in	1.800		5' 11"	
Max. pile depth with 4-element kelly bar	mm	ft-in	(4 x 5.500) 18.800	(4 x 18') 61' 8"	(4 x 12.500) 43.600	(4 x 41') 143' 1"
Max. pile depth with 5-element kelly bar	mm	ft-in	(5 x 5.500) 23.150	(5 x 18') 75' 11"	(5 x 12.500) 54.500	(5 x 41') 178' 10"
Operating weight w/o tool	ton		40,1 ¹		43,4 ²	

NOTES	
1	- c/w 4 x 5.500 mm (4 x 18' 1") long 368 mm (14" ½) dia. Kelly bar
2	- c/w 4 x 9.000 mm (4 x 29' 6") long 368 mm (14" ½) dia. Kelly bar; rotary c/w bucket opening flange

LHR



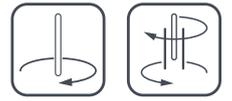
14 m / 46'



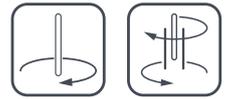
LHR (Low Head Room)	m.s.	i.s.	LHR 14 m / 46'	
Min. height	mm	ft-in	13.970	45' 10"
Max. kelly bar length	mm	ft-in	8.000	26' 3"
Stroke of pull down cylinder	mm	ft-in	5.100	16' 9"
Max. pile diameter	mm	ft-in	1.800	5' 11"
Max. pile depth with 4-element kelly bar	mm	ft-in	(4 x 8.000) 28.800	(4 x 26' 3") 94' 6"
Max. pile depth with 5-element kelly bar	mm	ft-in	(5 x 8.000) 35.800	(5 x 26' 3") 117' 5"
Operating weight w/o tool	ton		42,4 ¹	

NOTE 1 - c/w 4 x 6.000 mm (4 x 19' 8") long 368 mm (14" ½) dia. Kelly bar; rotary c/w 1000 mm (40") diam. cardan joint

MP

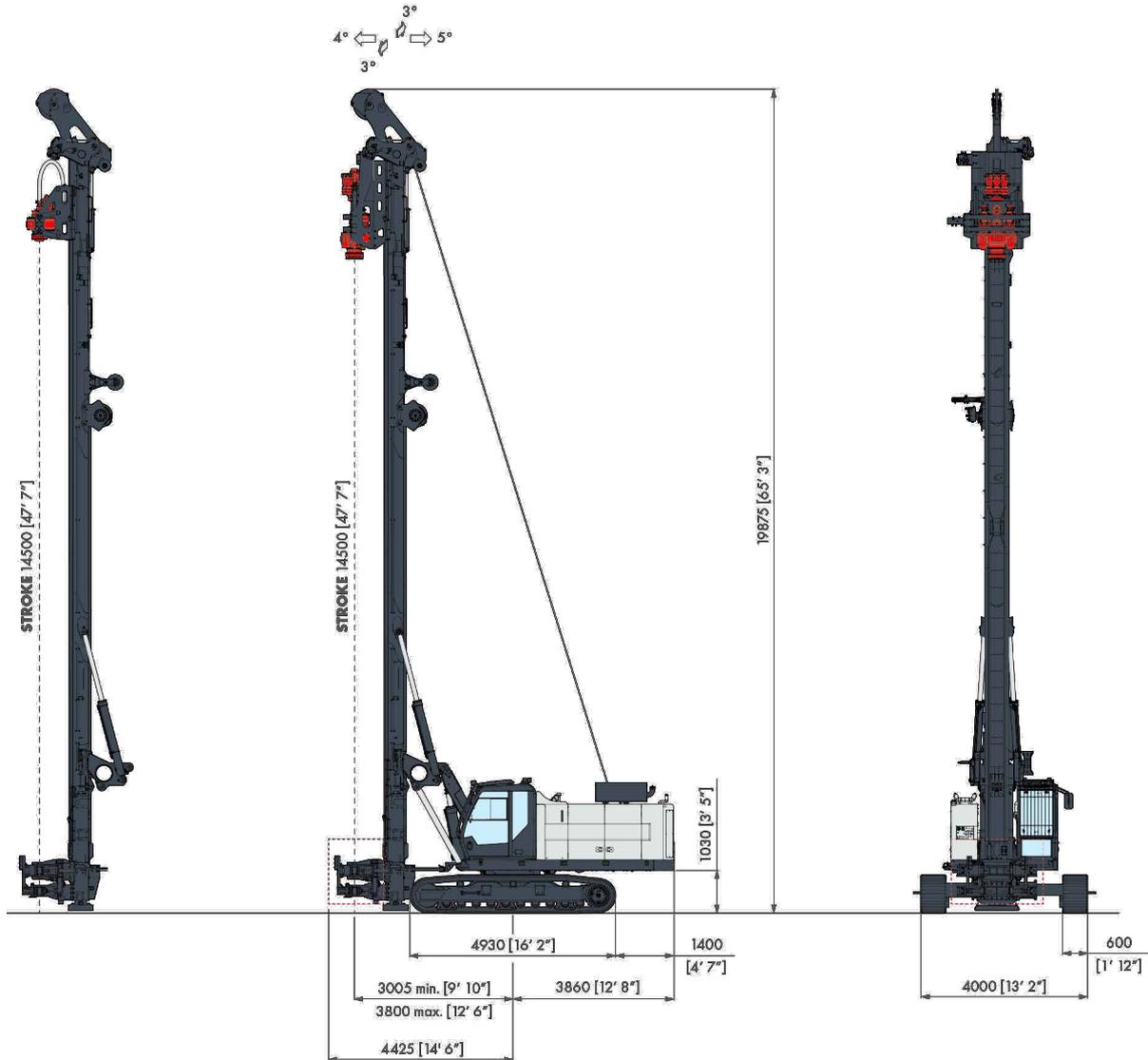


CH 18



SINGLE HEAD

DOUBLE HEAD

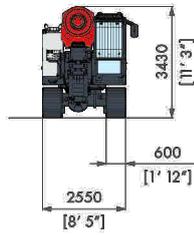
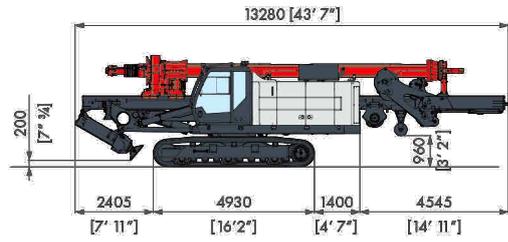


MP (Micropiles)	m.s.	i.s.	DOUBLE HEAD		SINGLE HEAD	
			kN	lbs	kN	lbs
Max. feed force	kN	lbs	93	20,900	240	53,900
Max. retract force	kN	lbs	204	45,800	240	53,900
MAST						
Feed Stroke	mm	ft-in	14.500	47' 6"	14.500	47' 6"
DOUBLE CLAMP WITH CASING EXTRACTOR						
Clamping range	mm	in	120 - 620	4 3/4" - 24"	120 - 620	4 3/4" - 24"
ROTARY HEAD						
			UPPER HEAD		LOWER HEAD	
Model	-	-	R 24005		R 10000	
Gears	-	-	3		4	
Max. torque	kNm	lbs-ft	24.7	18,200	106.2	78,300
Max. speed	rpm	rpm	97		36	
OPERATING WEIGHT W/O TOOL						
	ton		43,7		43,4	

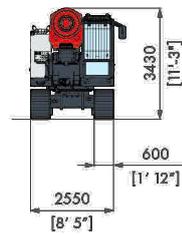
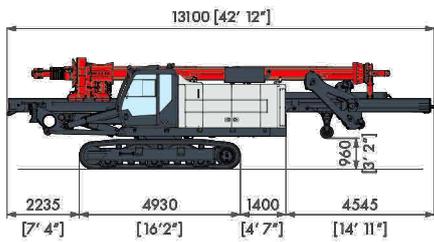
TRANSPORT DIMENSIONS



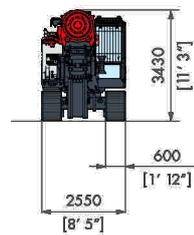
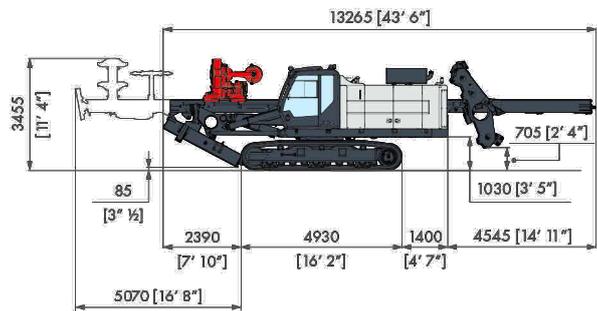
CH 18



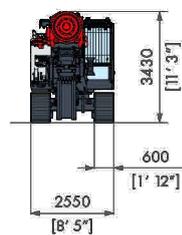
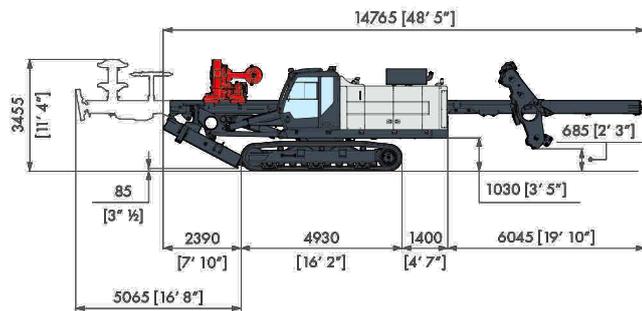
	m.s.	BP - WS
Transport weight	ton	44,8
NOTE	c/w 4 x 9.000 mm (4 x 26' 6") long 368 mm (14" 1/2) dia. Kelly bar	



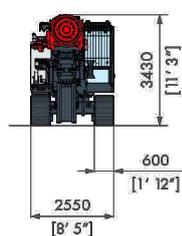
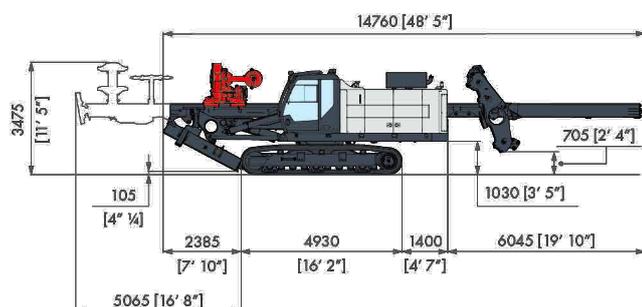
	m.s.	BP - CS
Transport weight	ton	43,1
NOTE	c/w 4 x 9.000 mm (4 x 26' 6") long 368 mm (14" 1/2) dia. Kelly bar	



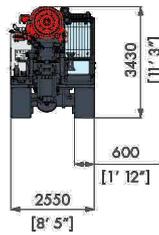
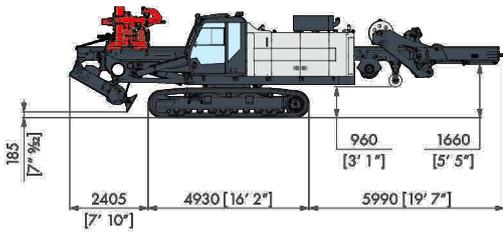
	m.s.	CFA T4
Transport weight	ton	40,5



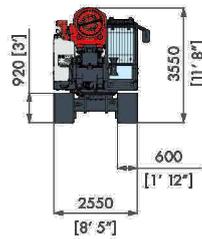
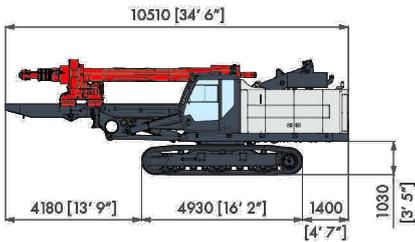
	m.s.	CFA T4 XL
Transport weight	ton	41,5



	m.s.	CFA T4 XXL
Transport weight	ton	43,7

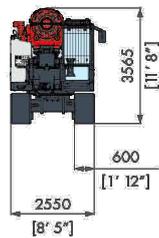
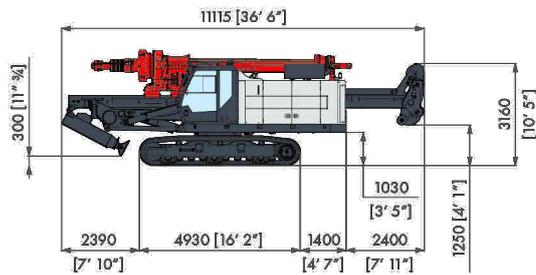


	m.s.	CFA/WS
Transport weight	ton	41



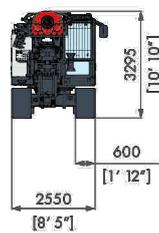
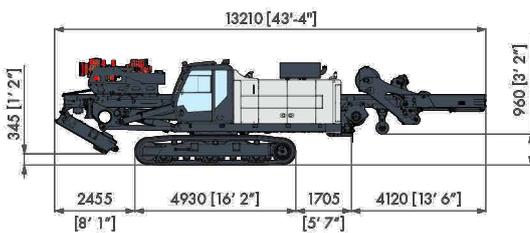
	m.s.	LHR 9 m
Transport weight	ton	40,1

NOTE	c/w 4 x 5.500 mm (4 x 18' 1") long 368 mm (14" 1/2) dia. Kelly bar
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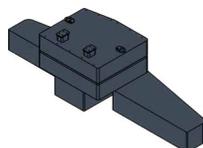
	m.s.	LHR 14 m
Transport weight	ton	42

NOTE	c/w 4 x 6.000 mm (4 x 19' 8") long 368 mm (14" 1/2) dia. Kelly bar
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	m.s.	MP (Double Head)
Transport weight	ton	40,7

	m.s.	MP (Single Head)
Transport weight	ton	40,5



Counterweight	m.s.	
Weight	ton	3,85



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