



CASING ROTATOR

SUPERTOP



ISO 9001
Certified

JQA-1232



ISO 14001
Certified

JQA-EM4858



NIPPON SHARYO

SUPERTOP Foundation technique

ULTRADEEP BORING

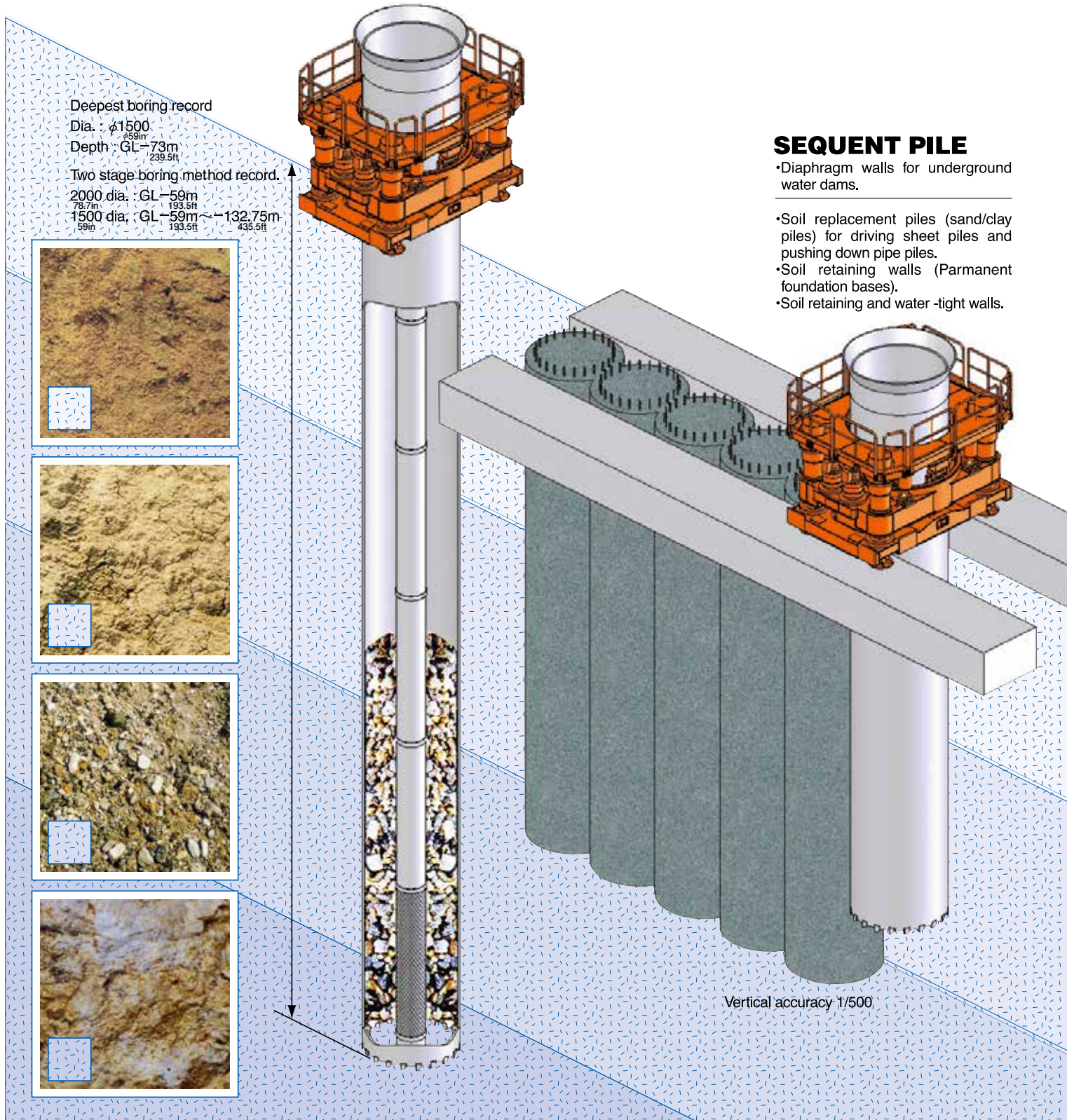
- Deep cast-in-place concrete piles and long steel piles pushing down into deep soil stabilized layers at Tokyo Bay.

- Deep wells for underground water dams in tropical islands.
- Industrial deep wells.
- Vertical boring in dam sites and ventilation holes of tunnels.

SEQUENT PILE

- Diaphragm walls for underground water dams.

- Soil replacement piles (sand/clay piles) for driving sheet piles and pushing down pipe piles.
- Soil retaining walls (Permanent foundation bases).
- Soil retaining and water-tight walls.

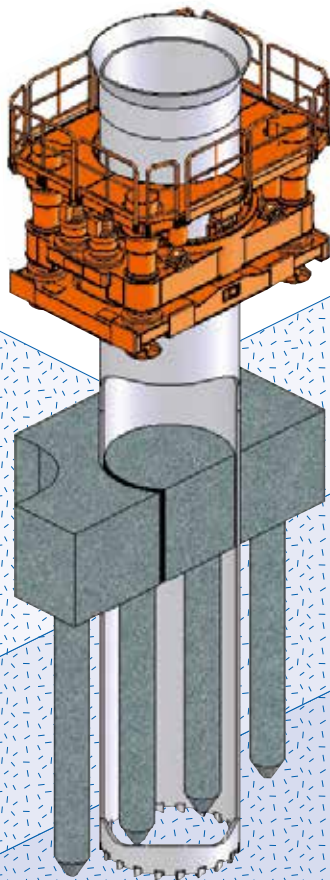


DREAM OF CIVIL ENGINEERS REALIZED

SUPERTOP foundation technique was developed to construct cast-in-place concrete pile, soil replacement pile, sequent pile and deep well with high efficiency and high vertical accuracy in the ground that was previously understood impossible to execute those works by the former oscillator, such as the stratum containing large boulders, reinforced concrete structures and steel piles.

BORING THROUGH UNDERGROUND OBSTACLES

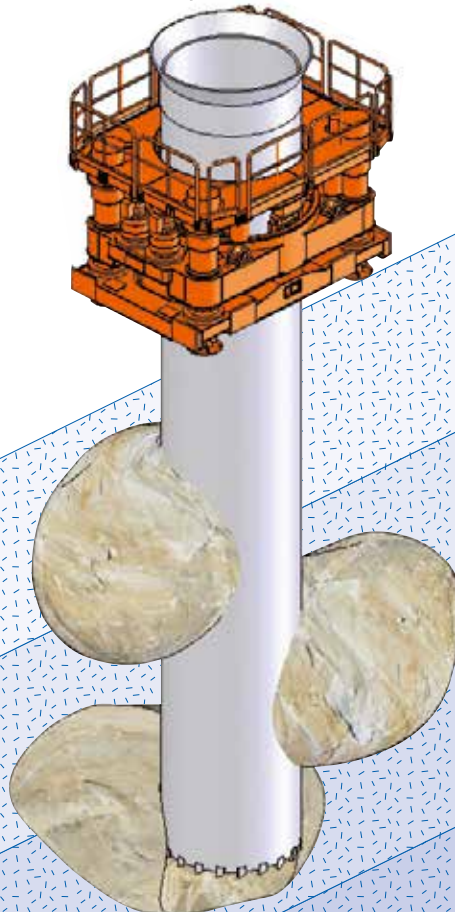
- Cutting reinforced concrete structures and steel piles of old buildings in urban development projects.
- For renewal of electric towers and bridges, cutting old concrete foundations.



BORING THROUGH BOULDERS

- Cast-in-place concrete piles and retaining walls at the ground with boulders in the mountainous area.

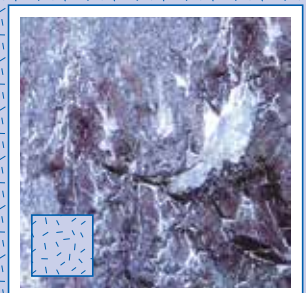
- Soil replacement piles in the stratum with large boulders and concrete tetrapods along sea shore.



Boulders of 137~206MPa uniaxial compression strength and B-class bed rock.

BORING THROUGH BED ROCK

- Insertion of pile end into bed rock.
- Vertical boring in bed rock.



CUTTING RECORD OF HARD BED ROCK AND BOULDERS

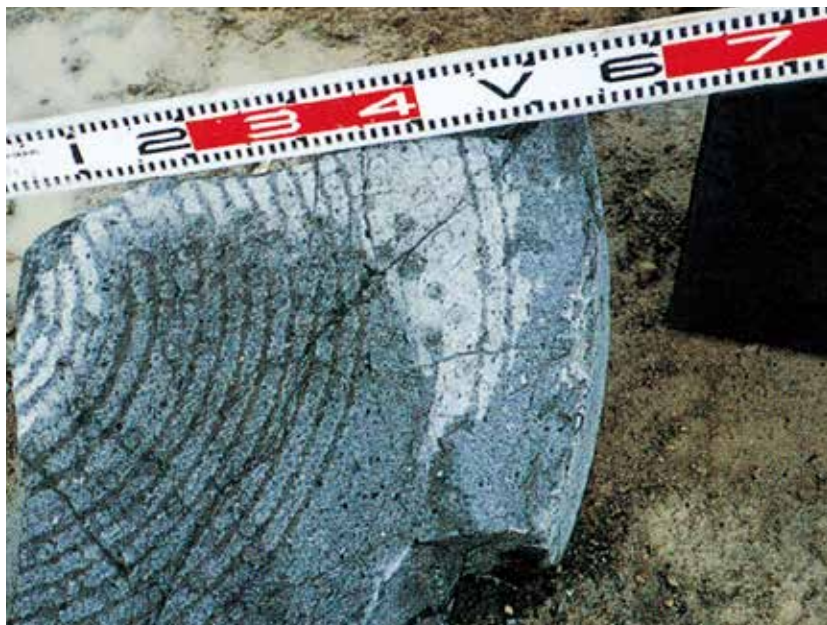
ULTRA DEEP RECORD 132.75m

435.5ft

The SUPERTOP has a 132.75m ultra deep boring record under B / C grade rock by 2000mm dia. & 1500mm dia. 2 stage casing method. That means the SUPERTOP can keep an excellent vertical accuracy of the casing with high power. Refer to right Geological Column Data. Especially a B / C_H grade rock was drilled by the DOWN THE HOLE HAMMER to through a casing.

■ Geological column data

DEPTH (m)	MARK	DESCRIPTION	CLASS	CASING DIAMETER
15 49ft	△ △ △ △ △ △	Talus Cone Hard Wethered Sand Stone	D	
30 98ft		Hard Wethered Sand Stone	C _L	
40 131ft		Wethered Sand Stone	C _L C _M	
50 164ft		Wethered Sand Stone	C _L C _M	
55 180ft		Fresh Sand Stone With no Crack	B C _H	φ2000 #78.7in
66 216ft		With Same Cracks	B C _H	
85 278ft				
100 328ft		Sand Stone	C _H C _M	
132.75m 435.5ft				φ1500 #59in



The points in hard rock boring are ;

- to maintain the high boring efficiency.
- to minimize the consumption of cutting bits.

Upon the most appropriate bed rock boring condition, the number and arrangement of cutting bits should be well studied to design the smooth cleaning of the chips.

■ Geological column data of bed rock cutting

Depth (Ground level)		pile
0m	Old concrete foundation with $\phi 32$ iron reinforcement bars. 1.2in	
-2m 6ft	Porous basalt lava bed RQD 50%~70% GL -6m and deeper : hard bed rock with no joints (cracks) Uniaxial compression strength 129~142MPa	
-8m 26ft	Boulder with gravels (Mainly basalt lava) GL -16m and deeper : Large boulder of $\phi 1000$ and larger	
-18m 59ft	Lava with quartz.	
-20m 65ft		

Boring into rock bed (140MPa uni-axial compression strength)

8 pieces of cast-in-place concrete piles (20m long $\times$ $\phi 1500$) were constructed through the bed rock as shown in the pictures below in this jobsite.

The stratum of the ground was basalt lava, 8 meters thick from the ground level and sandy gravels contained boulders from 8 meters to 20 meters deep.

Basalt lava and boulders



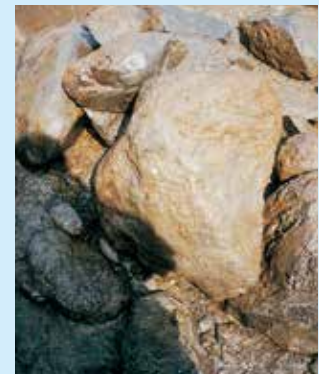
▲ GL-5m
16ft



▲ GL-10-15m
32-49ft



▲ Basalt lava



▲ Boulders



AUTOMATIC LOAD & ROTATION TORQUE CONTROLLER (B-CON) SYSTEM.

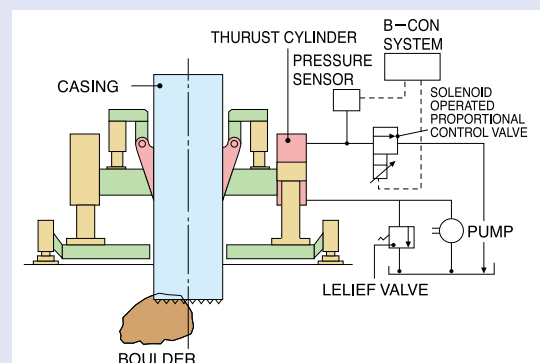
Boulders cutting

For boulders cutting, sometimes even without applying the pushing down force to the casing, the self weight of the casing rotator and the casing itself gives an over loading on the cutting bits, and sometimes which caused to destroy the cutting bits. The automatic bit control mechanism helps to protect the over loading and the sequent damage to the cutting bits. NIPPON SHARYO has been accumulating the knowledge and the experience deeply through diverse jobsites.



B-CON SYSTEM

In case of deep drilling, the total weight of a casing, upper frame, and thrust cylinder will charge the bottom cutter bits. Sometimes, the cutter bits are broken due to such heavy load. More than that, such eccentric load would become a cause of the broken cutter bits. The B-CON is very adequate to control a hydraulic pressure by computer to adjust the suitable condition for the continuous use of cutter bits. (RT-200AⅢ, 200H, 260H, 300Ⅲ)



CUTTING OF UNDERGROUND OBSTACLES



Urban development project and renewal of bridges and electric towers frequently face to bore the ground that remains old reinforced concrete foundation, concrete piles and steel piles.

SUPERTOP foundation technique gives assurance to cut and dig out these underground obstacles with certainty.



H-shaped steel pile ▲▶



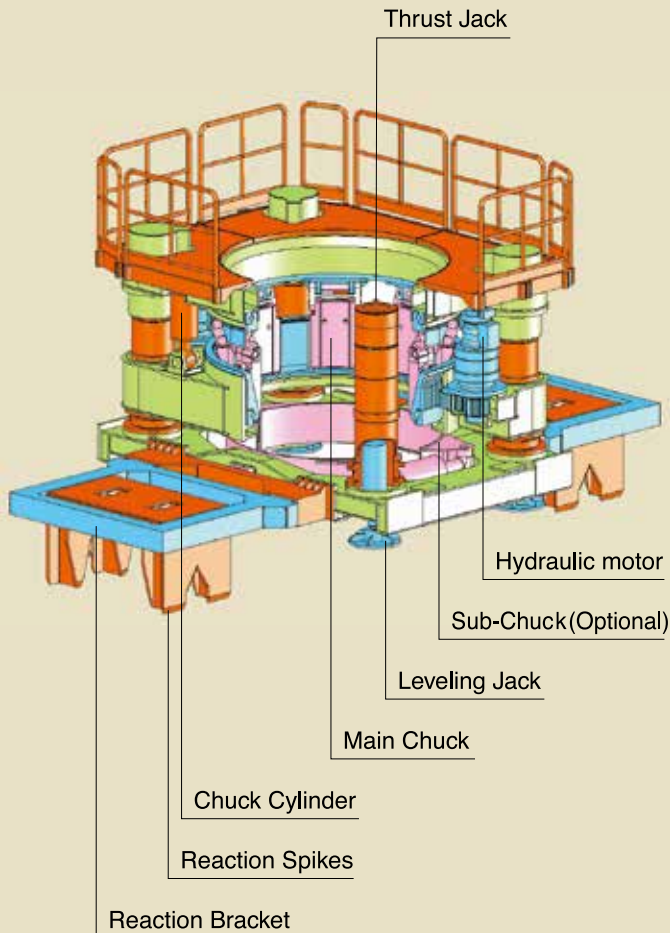
▼ Steel pipe pile.



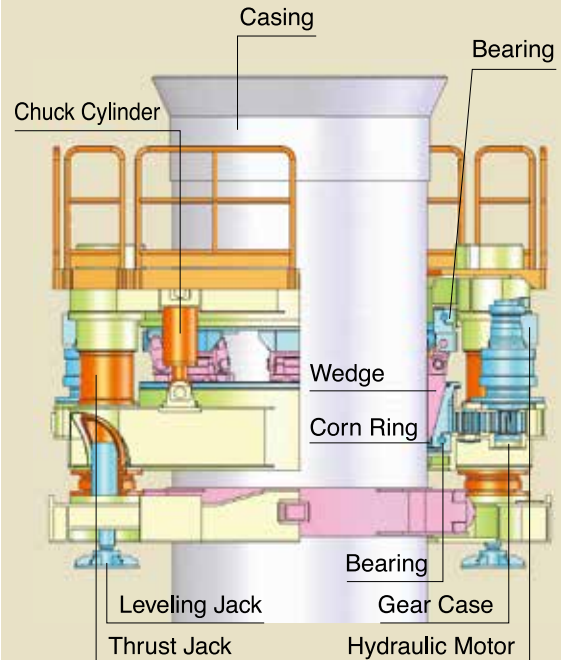
▲ Reinforced concrete foundation.



STRUCTURE OF CASING ROTATOR



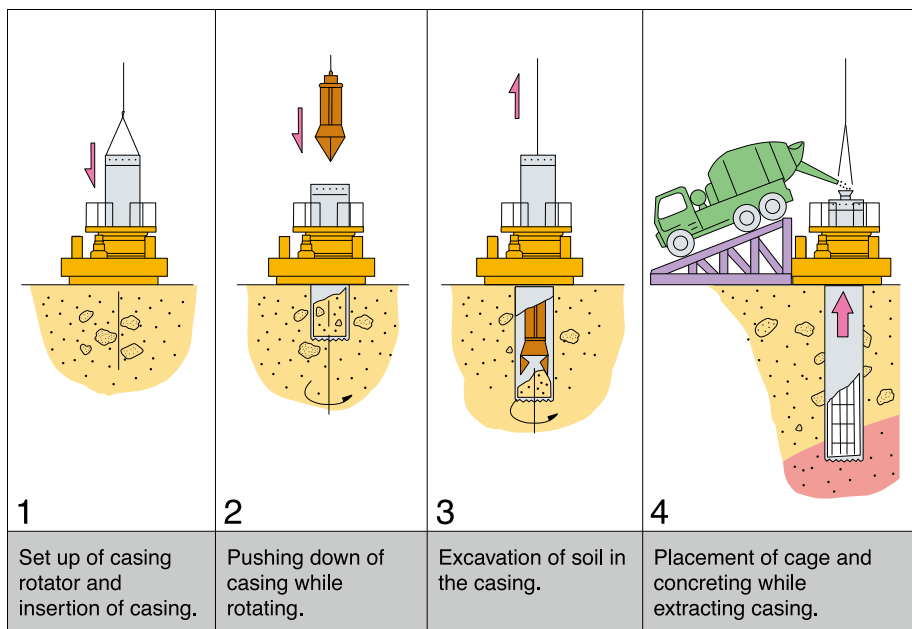
STRUCTURE OF WEDGE TYPE CHUCK SYSTEM



ABOVE SECTION DRAWING SHOWS ADVANTAGE OF WEDGE-SHAPED CHUCK SYSTEM

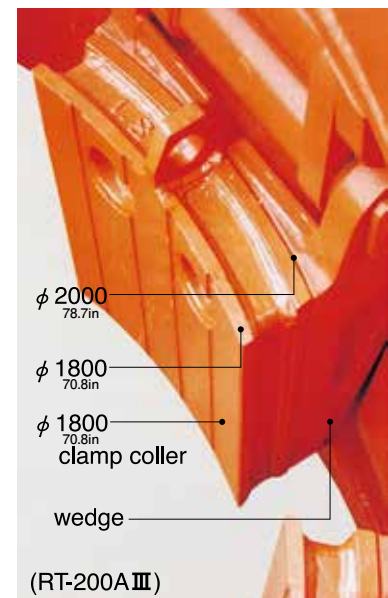
The wedge chuck can clamp the casing any position without disconnect & connect hydraulic line arbitrarily. Vertical accuracy & Clamping force under extracting motion also get an advantage.

PROCESS FLOW OF CAST-IN-PLACE CONCRETE PILE

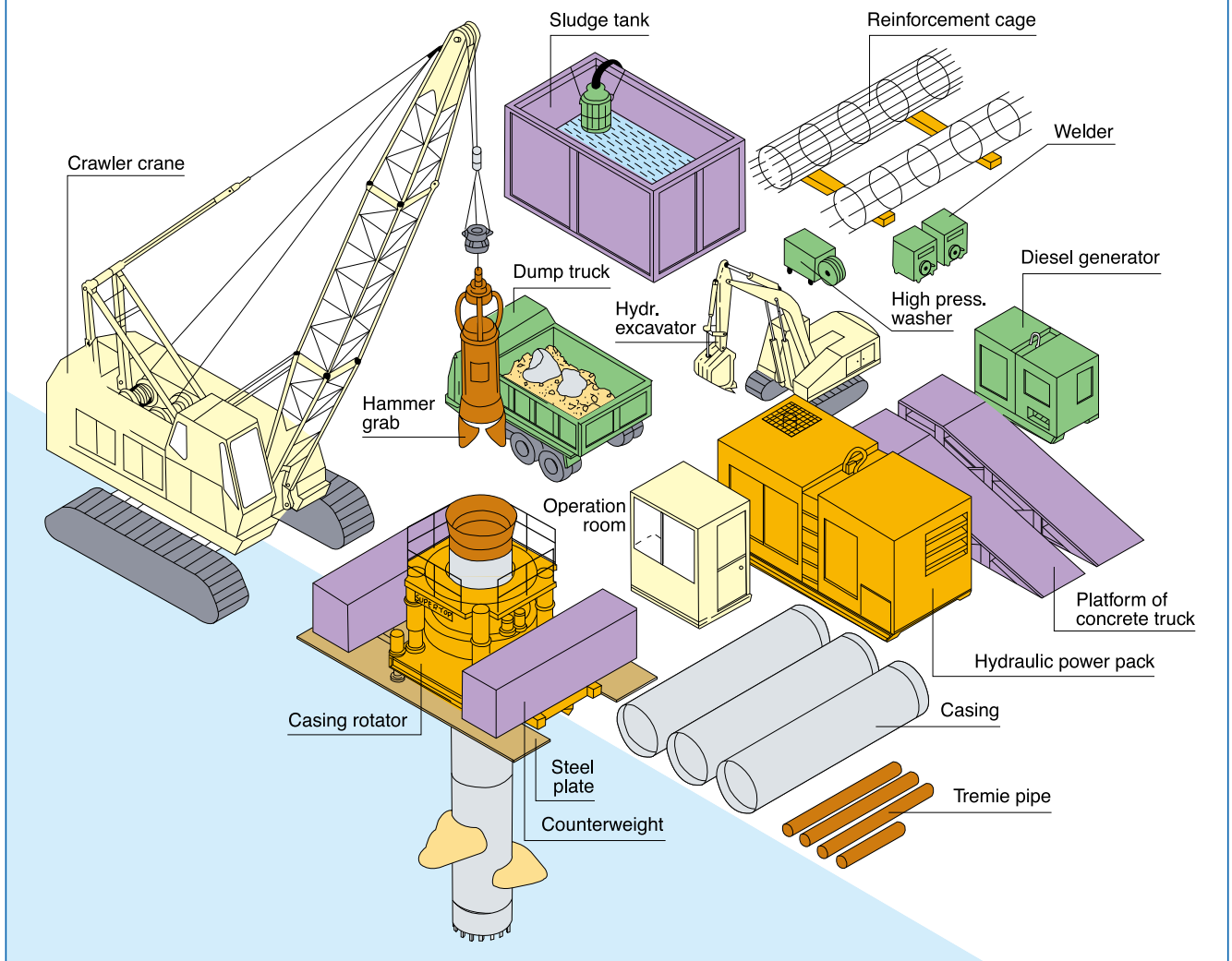


CHUCK REDUCER

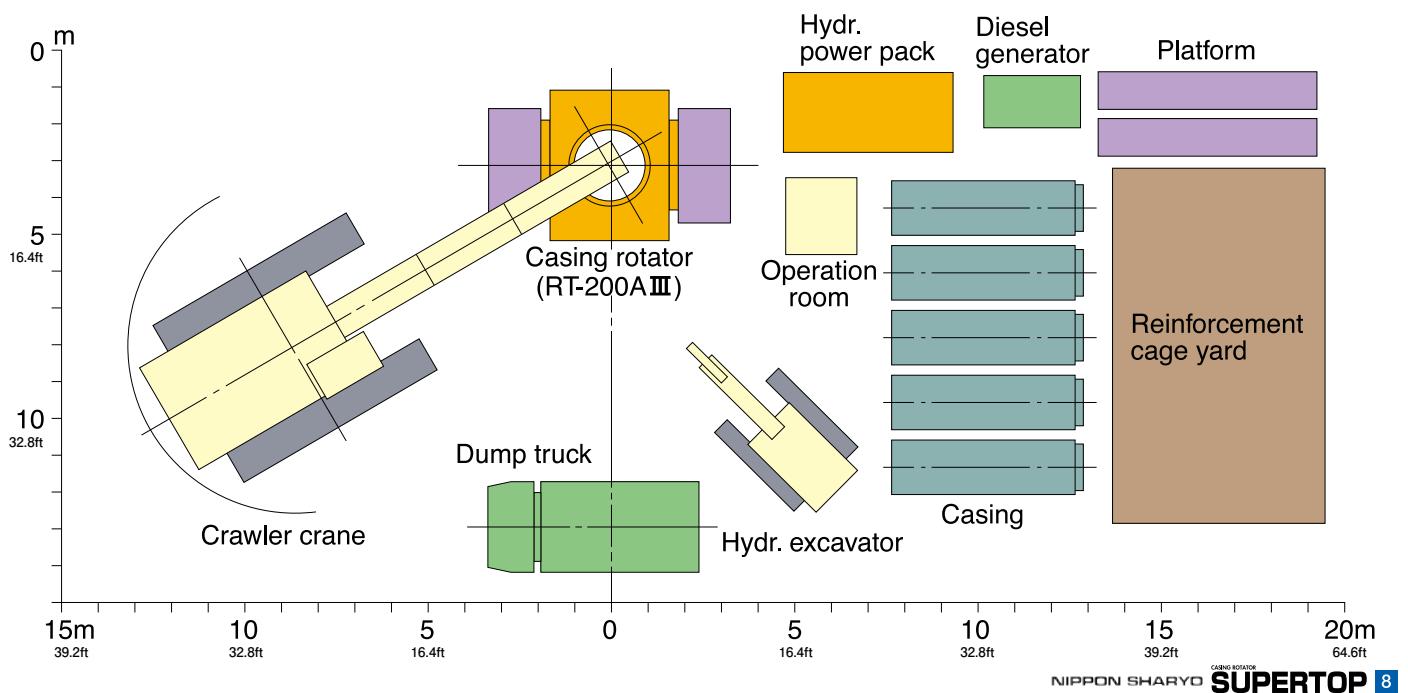
The chuck reducer assists under small casing operation. *(Optional)



SUPERTOP FOUNDATION TECHNIQUE, SYSTEM LAYOUT



TYPICAL JOBSITE LAYOUT

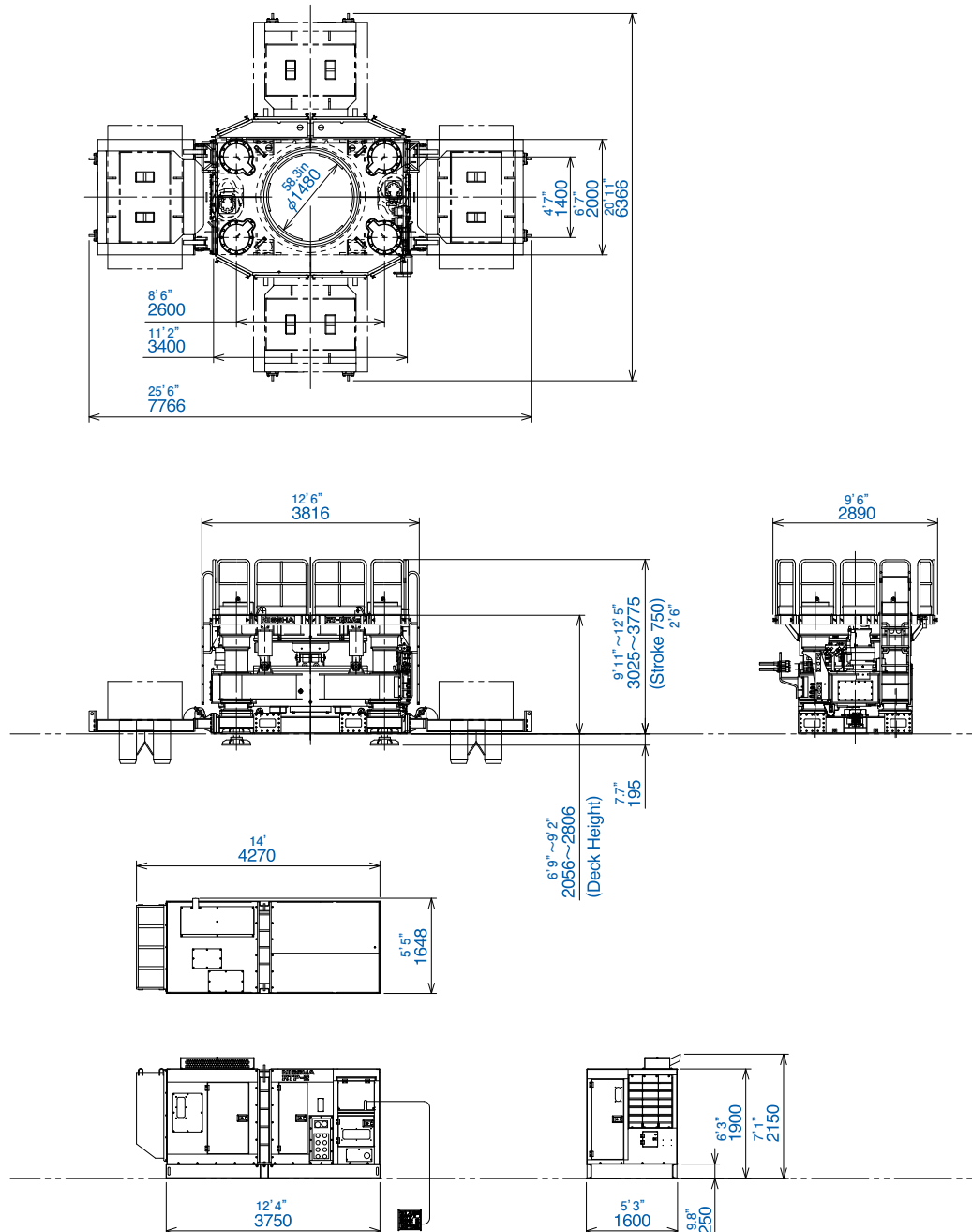


Specification

STANDAD type

RT-150AII

CASING ROTATOR RT-150AII		
Borehole dia.	800mm-1500mm	31.4in~59.0in
Extracting force	2050kN (209tf)	460,858lbf
Pushing down force (Hydraulic+Deadweight)	360kN (37tf)+200kN (20tf)	80,931lbf+44,961lbf
Thrust jack stroke	750mm	2.4ft
Torque	1400/480kN-m (143/49tf-m)	1,032,587/354,029lbf-ft
Rotation speed	1.3/3.7min ⁻¹	
Weight	26.1ton	57,540lb
HYDRAULIC POWER PACK RTP-2		
Engine	HINO J08E-TM	
Output	159kW (216PS)/2000min ⁻¹	
Weight	5.5ton	12,125lb
Dimension (L×W×H)	4270mm×1600mm×2150mm	14.0ft×5.4ft×7.0ft



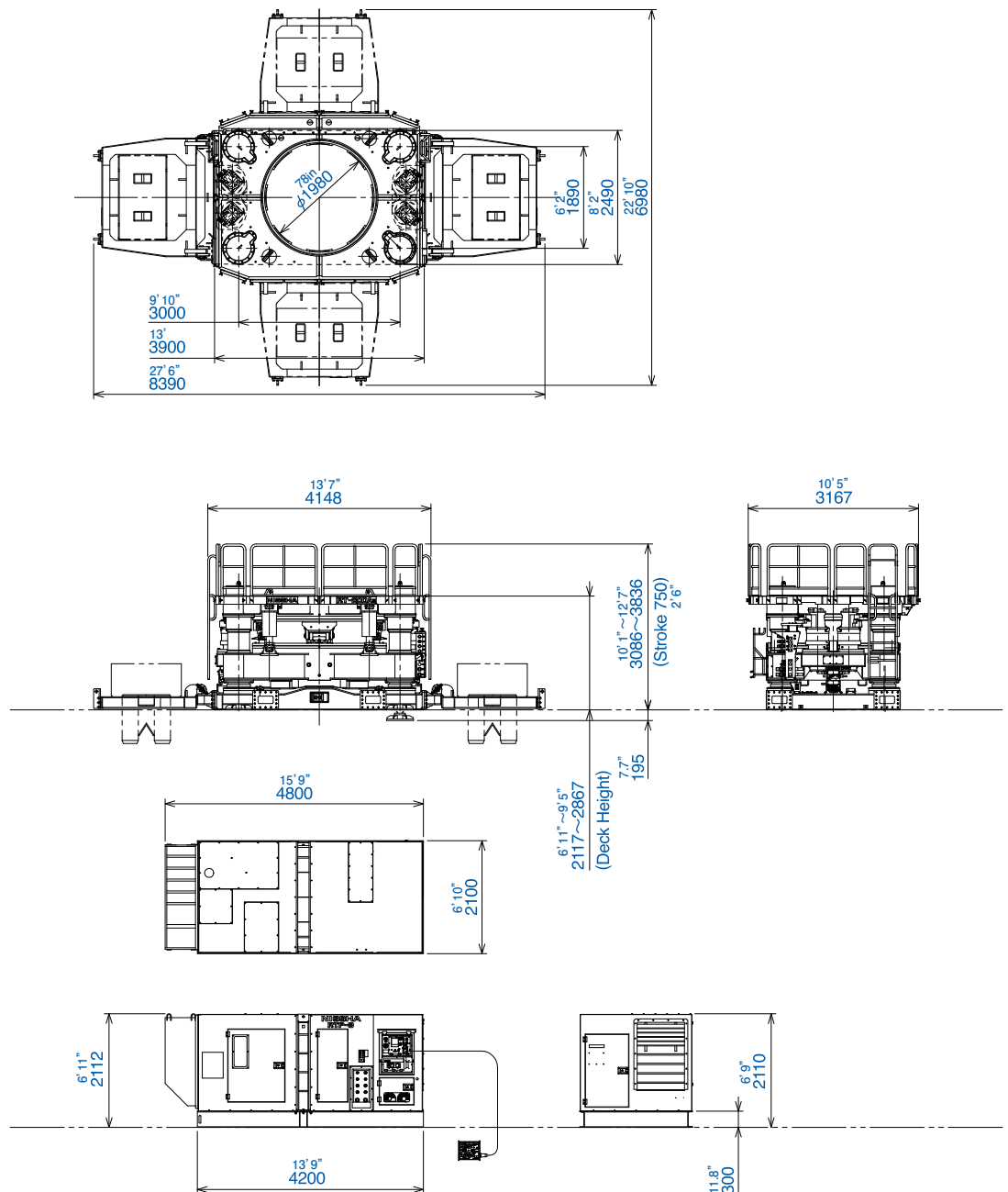
SUPERTOP

STANDAD type

RT-200AⅢ

CASING ROTATOR RT-200AⅢ	
Borehole dia.	1000mm-2000mm 39.4in~78.7in
Extracting force (Normal/Emergency)	2600kN(265tf)/2990kN(305tf) 584,503lbf/672,178lbf
Pushing down force (Hydraulic+Deadweight)	470kN(48tf)+220kN(22tf) 105,660lbf+51,706lbf
Thrust jack stroke	750mm 2.4ft
Torque (Normal/*Emergency)	2170/1270/740kN-m(221/130/75tf-m)*2530kN(258tf-m) 1,600,509/936,703/545,795lbf-ft 1,866,032lbf-ft
Rotation speed	1.1/1.8/3.1min ⁻¹
Weight	30.0 ≪31.3≫ton 66,139lb (69,005lb)
HYDRAULIC POWER PACK RTP-3	
Engine	HINO P11C-UP
Output	257kW(350PS)/1850min ⁻¹
Weight	7.3ton 16,093lb
Dimension(L×W×H)	4800mm×2100mm×2112mm 15.7ft×6.90ft×6.92ft
● ≪ ≫ shows the weight with sub chuck system(Optional extra)	

● < > shows the weight with sub chuck system(Optional extra)



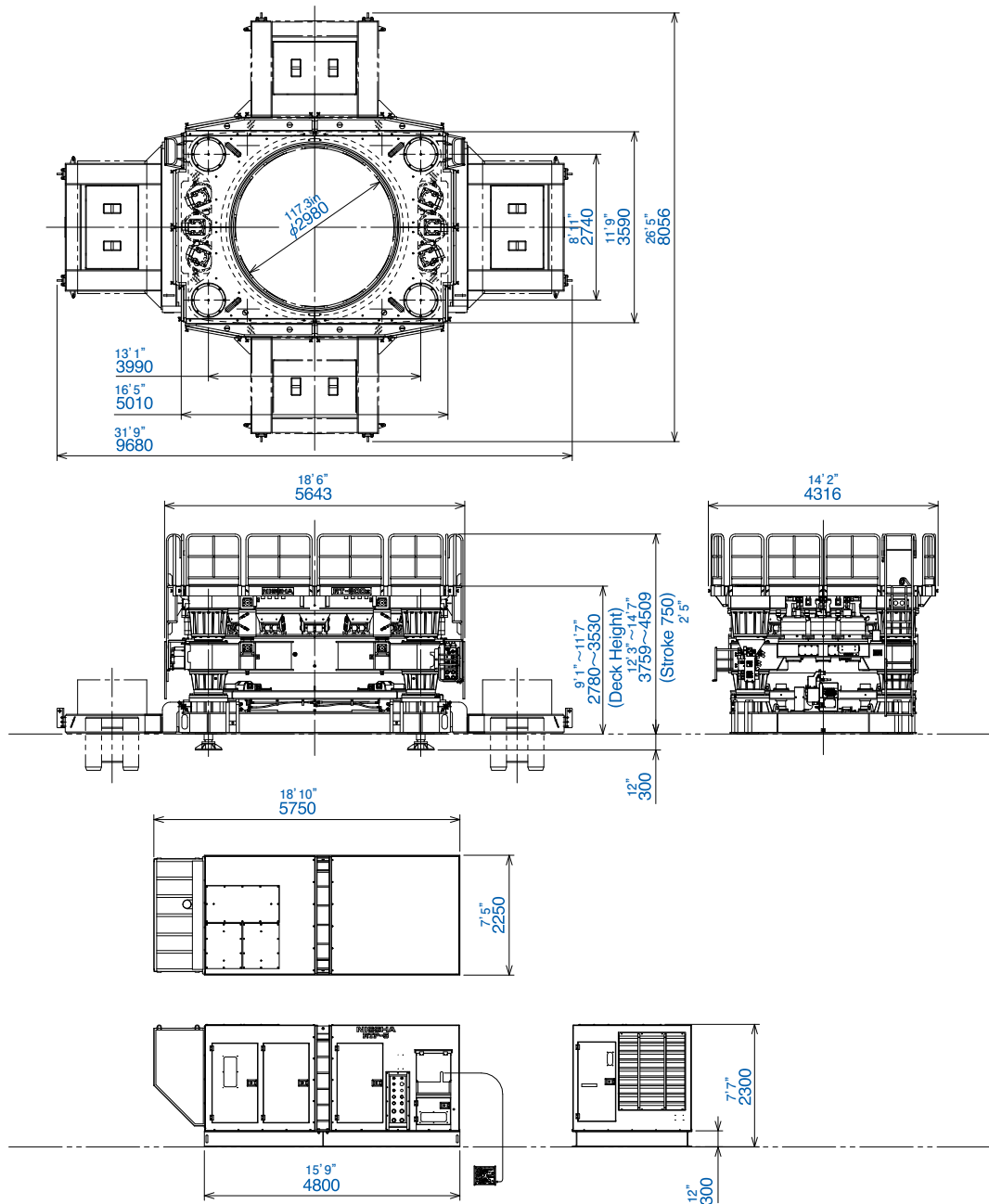
SUPERTOP

STANDAD type

RT-300Ⅲ

CASING ROTATOR RT-300Ⅲ			
Borehole dia.	2000mm-3000mm	78.7in~118.1in	
Extracting force (Normal/Emergency)	4020kN (410tf)/4470kN (456tf)	903,731lbf/1,004,895lbf	
Pushing down force (Hydraulic+Deadweight)	820kN (84tf)+390kN (40tf)	184,343lbf + 87,675lbf	
Thrust jack stroke	750mm	2.4ft	
Torque (Normal/*Emergency)	5280/3100/1780kN-m (539/316/182tf-m)*6040kN-m (616tf-m) 3,894,328/2,286,442/1,312,860lbf-ft 4,454,875lbf-ft		
Rotation speed	0.6/1.0/1.7min ⁻¹		
Weight	53.0 {57.5} ton	116,845lb (126,766lb)	
HYDRAULIC POWER PACK RTP-5			
Engine	KOMATSU SAA6D140E-5		
Output	370kW(503PS)/1800min ⁻¹		
Weight	10.0ton	22,046lb	
Dimension(L×W×H)	5750mm×2250mm×2300mm		18.9ft×7.4ft×7.5ft
● ◀ ▶ shows the weight with sub chuck system(Optional)			

● < > shows the weight with sub chuck system(Optional)



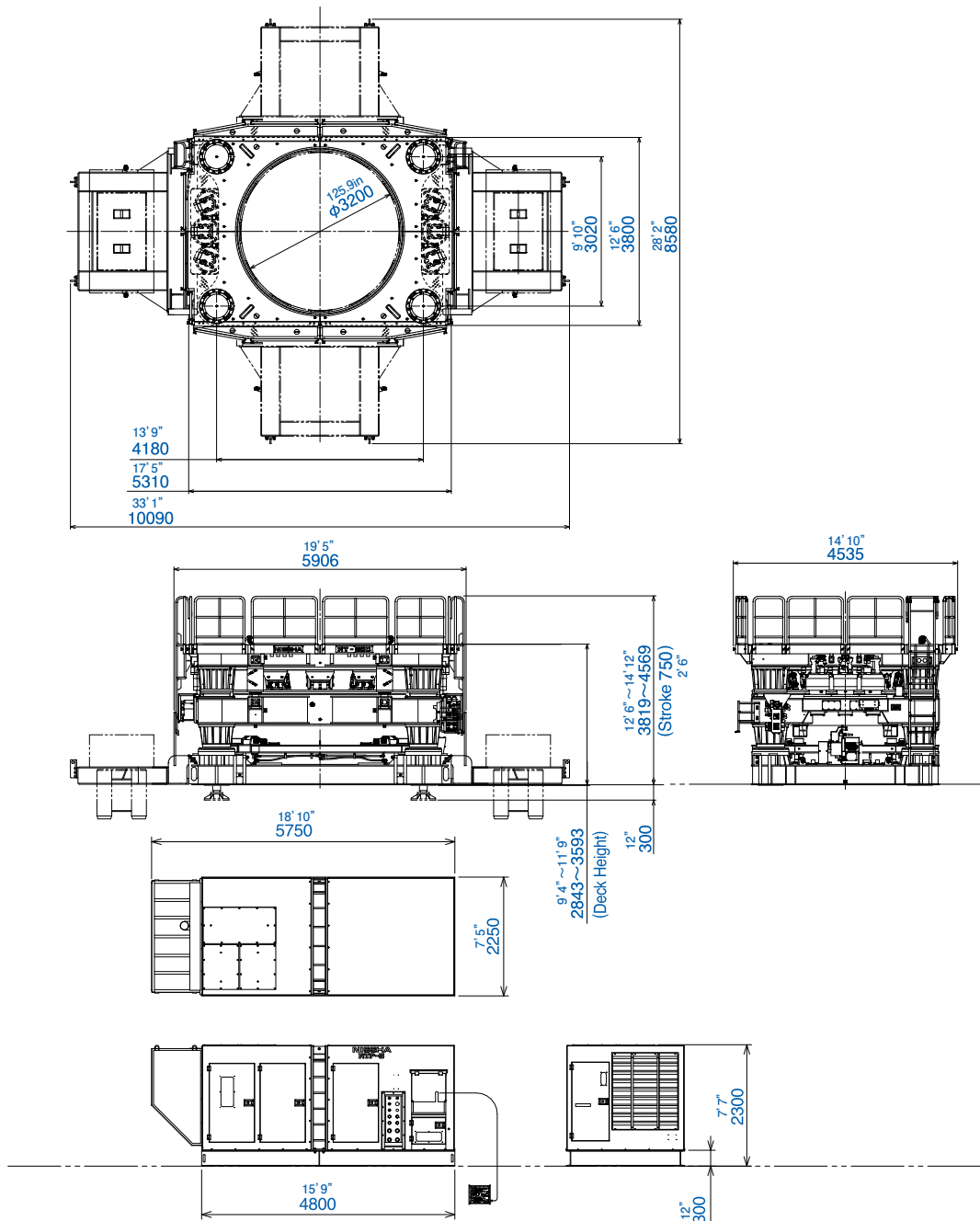
SUPERTOP

STANDAD type

RT-320

CASING ROTATOR RT-320		
Borehole dia.	2300mm~3200mm	90.5in~125.9in
Extracting force	4320kN(440tf)/4640kN(470tf)	971,174lbf/1,043,113lbf
Pushing down force (Hydraulic+Deadweight)	940kN(96tf)+430kN(44tf)	211,320lbf+96,667lbf
Thrust jack stroke	750mm	2.4ft
Torque	5750/3350/1940kN-m(587/342/198tf-m)*6570kN-m(670tf-m)	4,240,982/2,470,833/1,430,870lbf-ft
Rotation speed	0.5/0.9/1.6min ⁻¹	
Weight	58.3 (63.0) ton	128,529lb (138,891lb)
HYDRAULIC POWER PACK RTP-5A		
Engine	KOMATSU SAA6D140E-5	
Output	370kW(503PS)/1800min ⁻¹	
Weight	10.0t	22,046lb
Dimension(L×W×H)	5750mm×2250mm×2300mm	18.9ft×7.4ft×7.5ft

● ◁ ▷ shows the weight with sub chuck system(Optional extra)



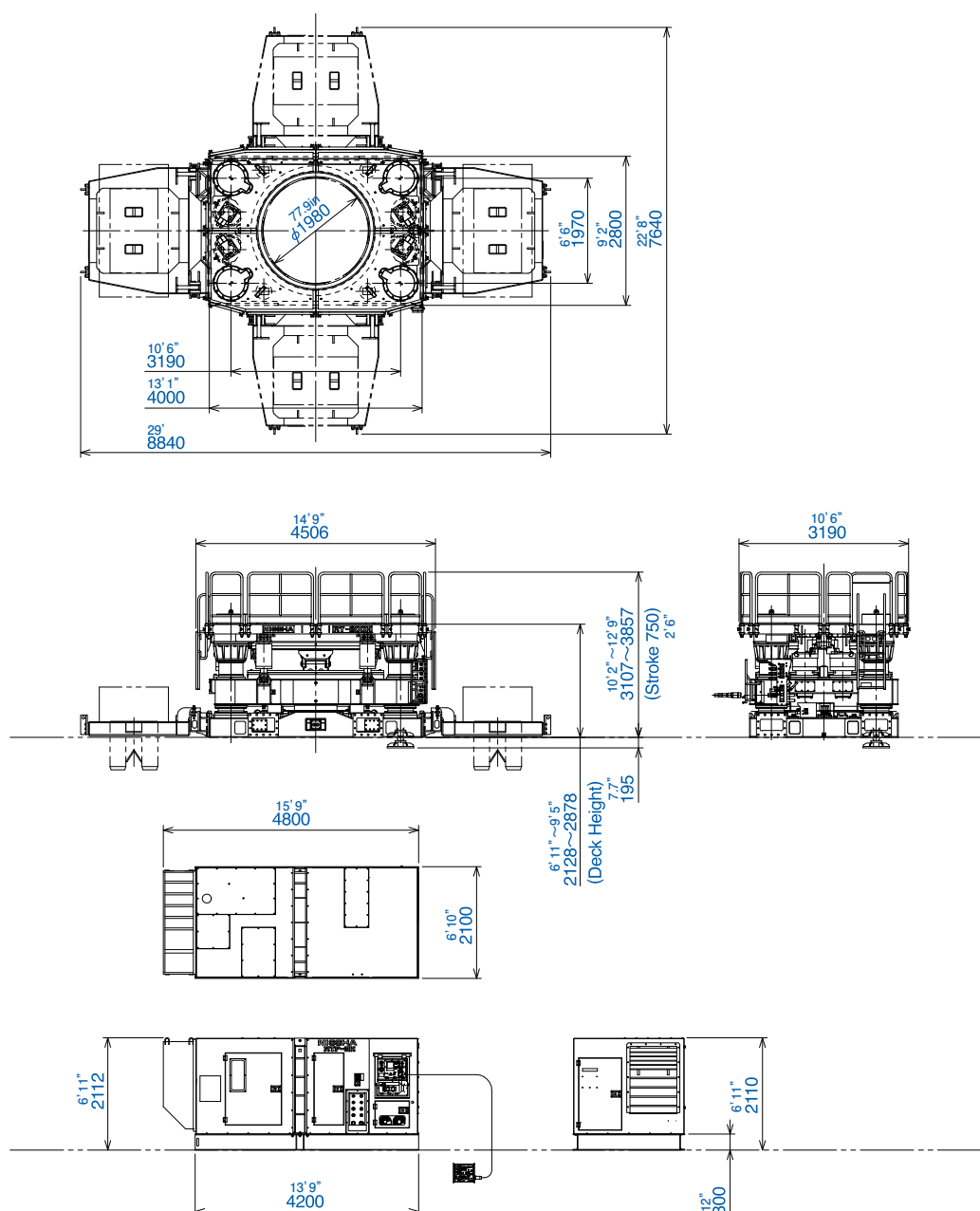
SUPERTOP

HIGH POWER type

RT-200H

CASING ROTATOR RT-200H		
Borehole dia.	1000mm-2000mm	39.4in~78.7in
Extracting force (Normal/Emergency)	3450kN (352tf)/3940kN (402tf)	775,590lbf/885,747lbf
Pushing down force (Hydraulic+Deadweight)	590kN (60tf)+250kN (26tf)	132,637lbf + 56,202lbf
Thrust jack stroke	750mm	2.4ft
Torque (Normal*/Emergency)	2950/1740/1010kN-m (301/177/103tf-m)*3130kN (319tf-m)	2,175,808/1,283,358/744,937lbf-ft
Rotation speed	0.9/1.5/2.5min ⁻¹	
Weight	34.1 (35.8) ton	75,177lb (78,925lb)
HYDRAULIC POWER PACK RTP-3H		
Engine	HINO P11C-UP	
Output	257kW (350PS)/1850min ⁻¹	
Weight	7.3ton	16,093lb
Dimension (L×W×H)	4800mm×2100mm×2112mm	15.7ft×6.90ft×6.93ft

● < > shows the weight with sub chuck system(Optional extra)



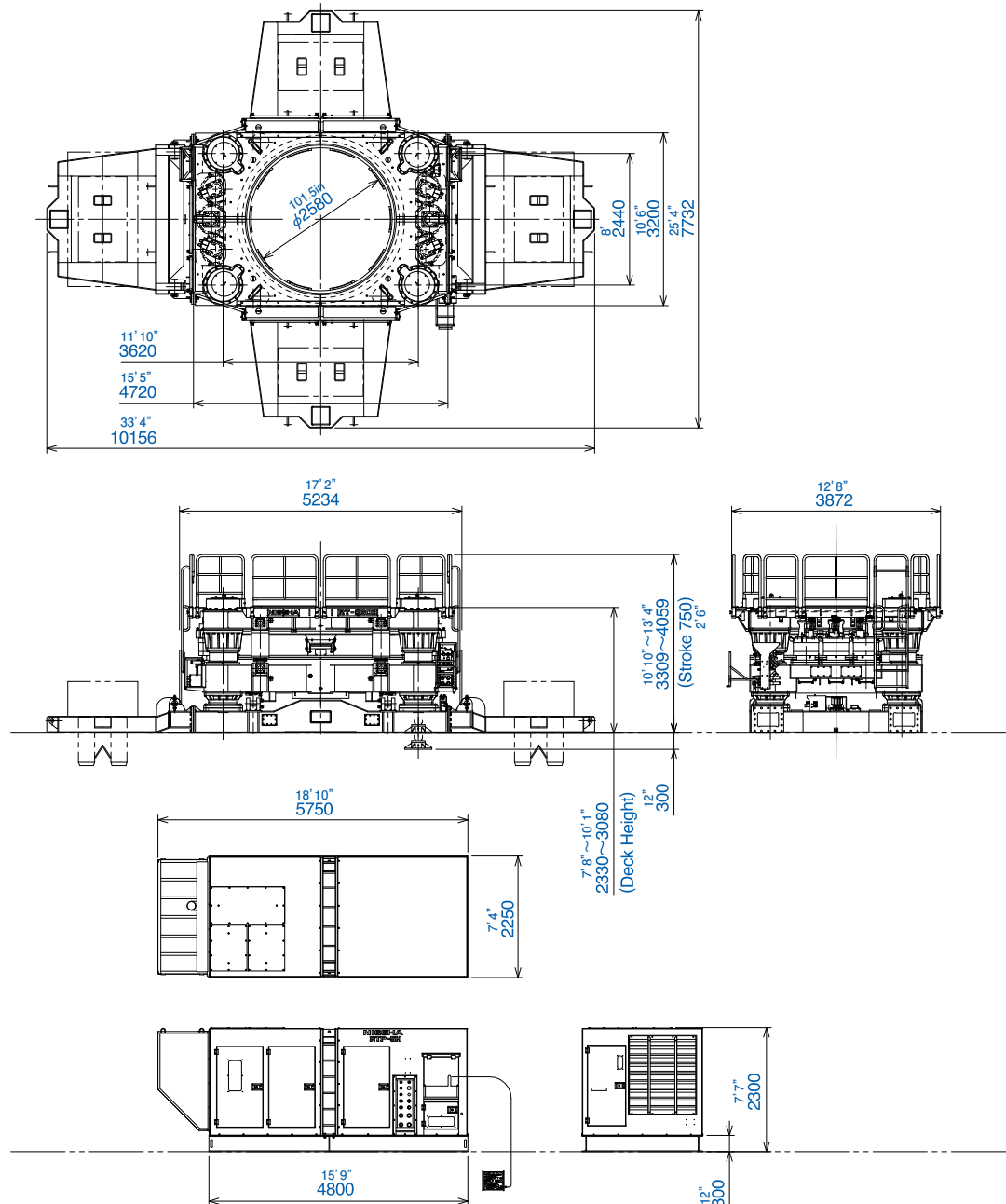
SUPERTOP

HIGH POWER type

RT-260H

CASING ROTATOR RT-260H		
Borehole dia.	1500mm-2600mm	59in~102.3in
Extracting force (Normal/Emergency)	3800kN(388tf)/4340kN(443tf)	854,273lbf/975,670lbf
Pushing down force (Hydraulic+Deadweight)	830kN(85tf)+350kN(36tf)	186,591lbf+80,931lbf
Thrust jack stroke	750mm	2.4ft
Torque (Normal/*Emergency)	5100/3000/1740kN-m (520/306/177tf-m)*5950kN(607tf-m)	3,761,566/2,212,686/1,283,358lbf-ft 4,388,494lbf-ft
Rotation speed	0.6/1.1/1.9min ⁻¹	
Weight	46.5 (48.4) ton	102,514lb (106,703lb)
HYDRAULIC POWER PACK RTP-5H		
Engine	KOMATSU SAA6D140E-5	
Output	370kW(503PS)/1800min ⁻¹	
Weight	10.0ton	22,046lb
Dimension(L×W×H)	5750mm×2250mm×2300mm	18.9ft×7.4ft×7.5ft

● ◁ ▷ shows the weight with sub chuck system(Optional extra)



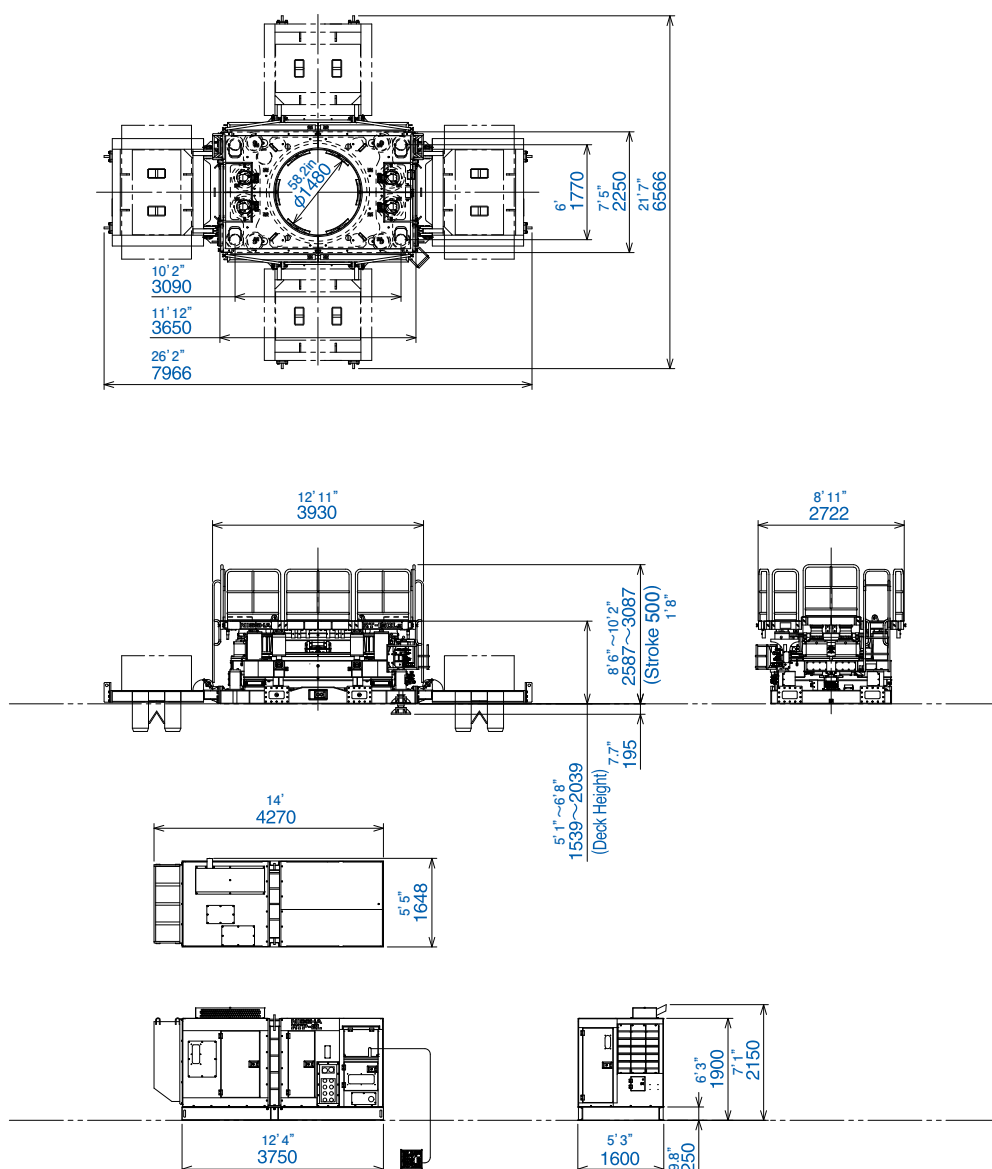
SUPERTOP

LOW HEAD type

RT-150LII

CASING ROTATOR RT-150LII			
Borehole dia.	800mm~1500mm	31.4in~59.1in	
Extracting force	1970kN(201tf)	442,873lbf	
Pushing down force (Hydraulic+Deadweight)	390kN(40tf)+130kN(13tf)	87,675lbf + 29,225lbf	
Thrust jack stroke	500mm	1.6ft	
Torque	1230/420kN-m(125/43tf-m)	907,201/309,776lbf-ft	
Rotation speed	1.5/4.3min ⁻¹		
Weight	17.0《17.7》ton	37,478lb (39,021lb)	
HYDRAULIC POWER PACK RTP-2L			
Engine	HINO J08E-TM		
Output	159kW(216PS)/2000min ⁻¹		
Weight	5.5ton	12,125lb	
Dimension(L×W×H)	4270mm×1648mm×2150mm	14.0ft×5.4ft×7.1ft	

● < > shows the weight with sub chuck system(Optional extra)



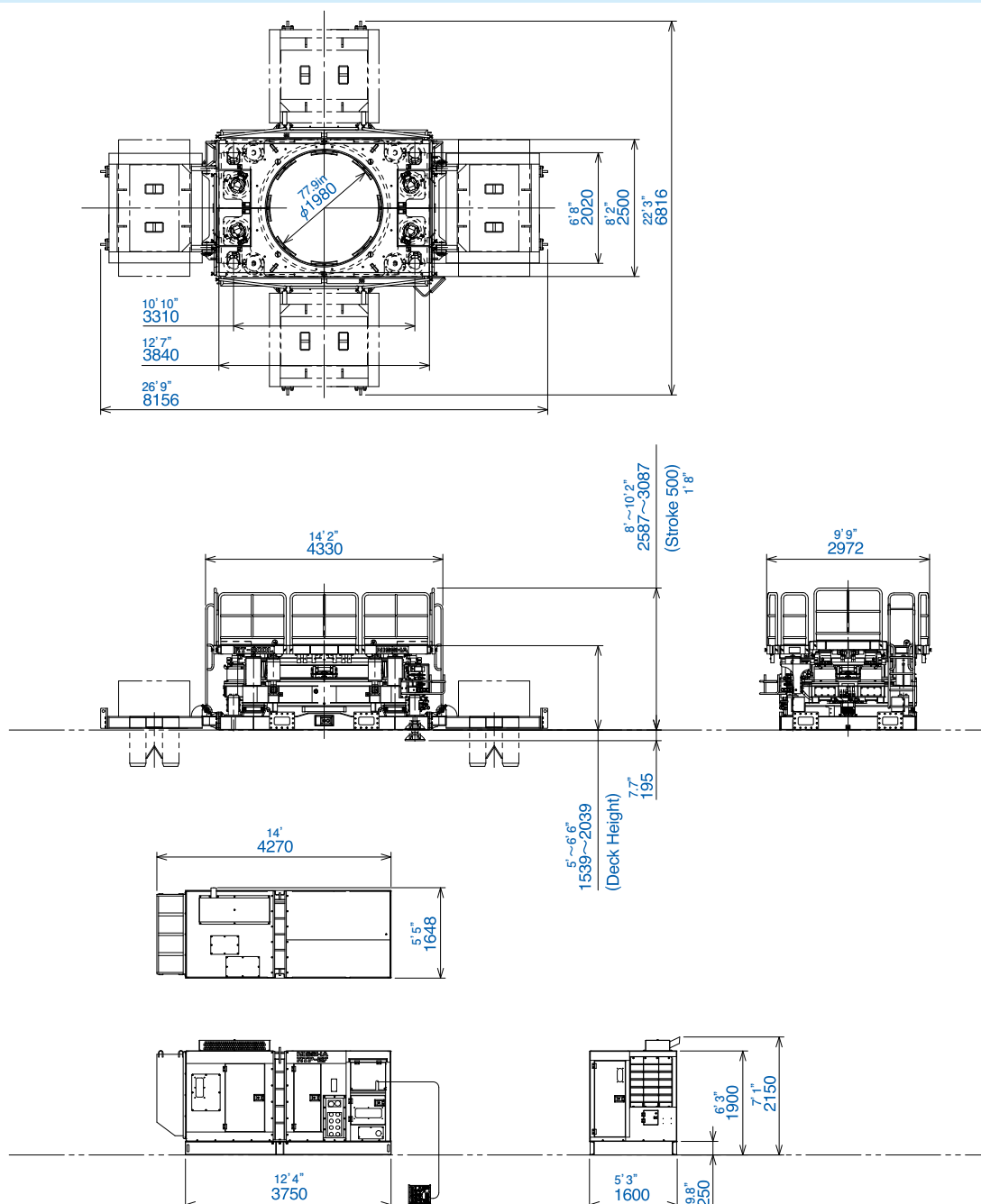
SUPERTOP

LOW HEAD type

RT-200L

CASING ROTATOR RT-200L		
Borehole dia.	1000mm-2000mm	39.4in~78.7in
Extracting force	1970kN(201tf)	442,873lbf
Pushing down force (Hydraulic+Deadweight)	390kN(40tf)+150kN(15tf)	87,675lbf+31,473lbf
Thrust jack stroke	500mm	1.6ft
Torque	1540/530kN-m(157/54tf-m)	1,135,845/390,907lbf-ft
Rotation speed	1.2/3.4min ⁻¹	
Weight	18.5 (19.2) ton	40,785lb (42,328lb)
HYDRAULIC POWER PACK RTP-2F		
Engine	HINO J08E-TM	
Output	159kW(216PS)/2000min ⁻¹	
Weight	5.5ton	12,125lb
Dimension(L×W×H)	4270mm×1600mm×2150mm	14.0ft×5.4ft×7.0ft

● < > shows the weight with sub chuck system(Optional)



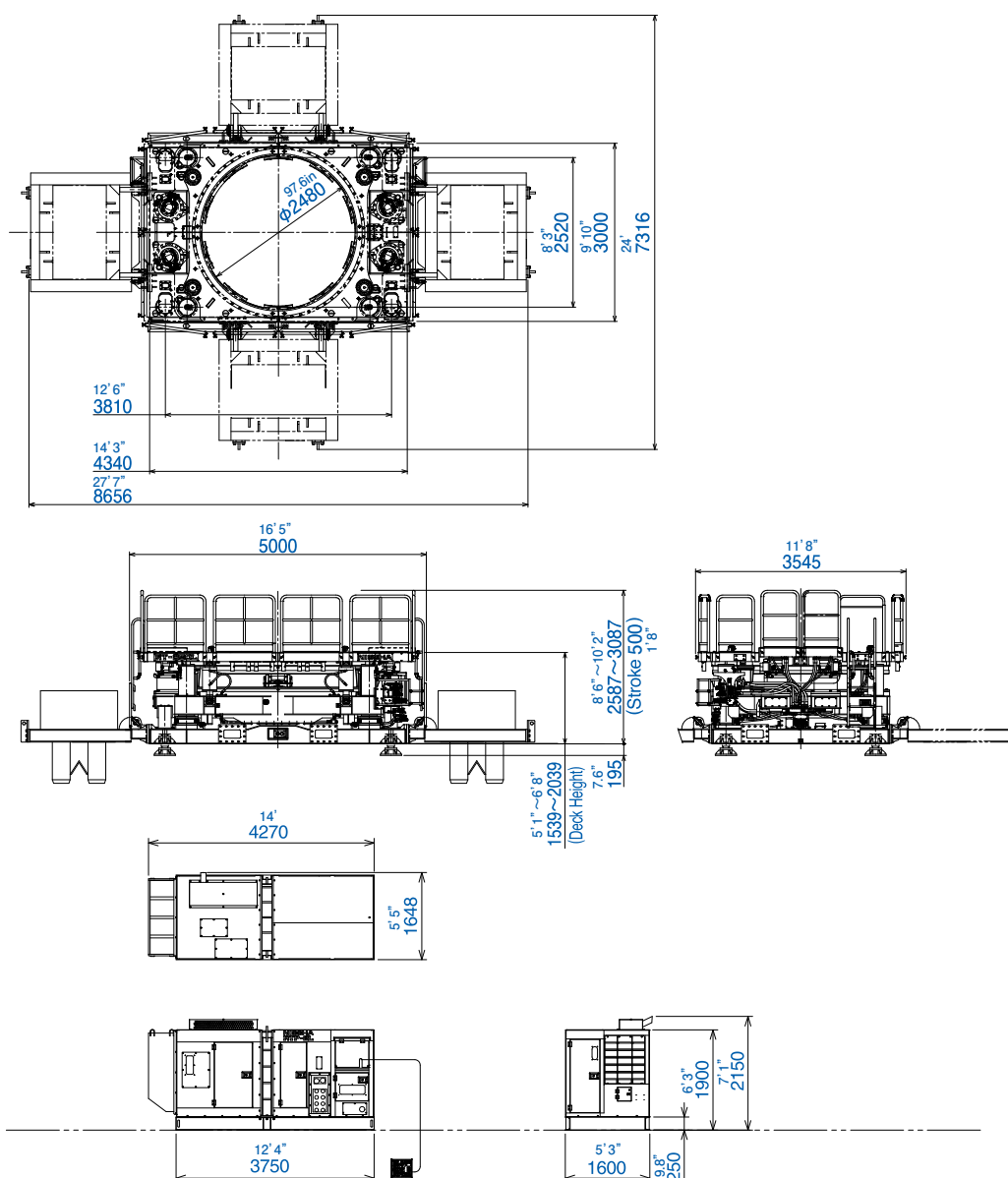
SUPERTOP

LOW HEAD & LIGHT type

RT-250L

CASING ROTATOR RT-250L			
Borehole dia.	1500mm~2500mm 59.0in~98.4in		
Extracting force	2360kN(241tf) 530,549lbf		
Pushing down force (Hydraulic+Deadweight)	390kN(40tf)+170kN(17.8tf) 87,675lbf+38,217lbf		
Thrust jack stroke	500mm 1.6ft		
Torque	1860/630kN-m(190/64tf-m) 1,371,865/464,664lbf-ft		
Rotation speed	1.0/2.9min ⁻¹		
Weight	22.3 {23.1} ton 49,163lb {50,926lb}		
HYDRAULIC POWER PACK RTP-2W			
Engine	HINO J08E-TM		
Output	159kW(216PS)/2000min ⁻¹		
Weight	5.5ton 12,125lb		
Dimension(L×W×H)	4270mm×1600mm×2150mm 14.0ft×5.2ft×7.0ft		
● < > shows the weight with sub chuck system(Optional extra)			

● < > shows the weight with sub chuck system(Optional extra)



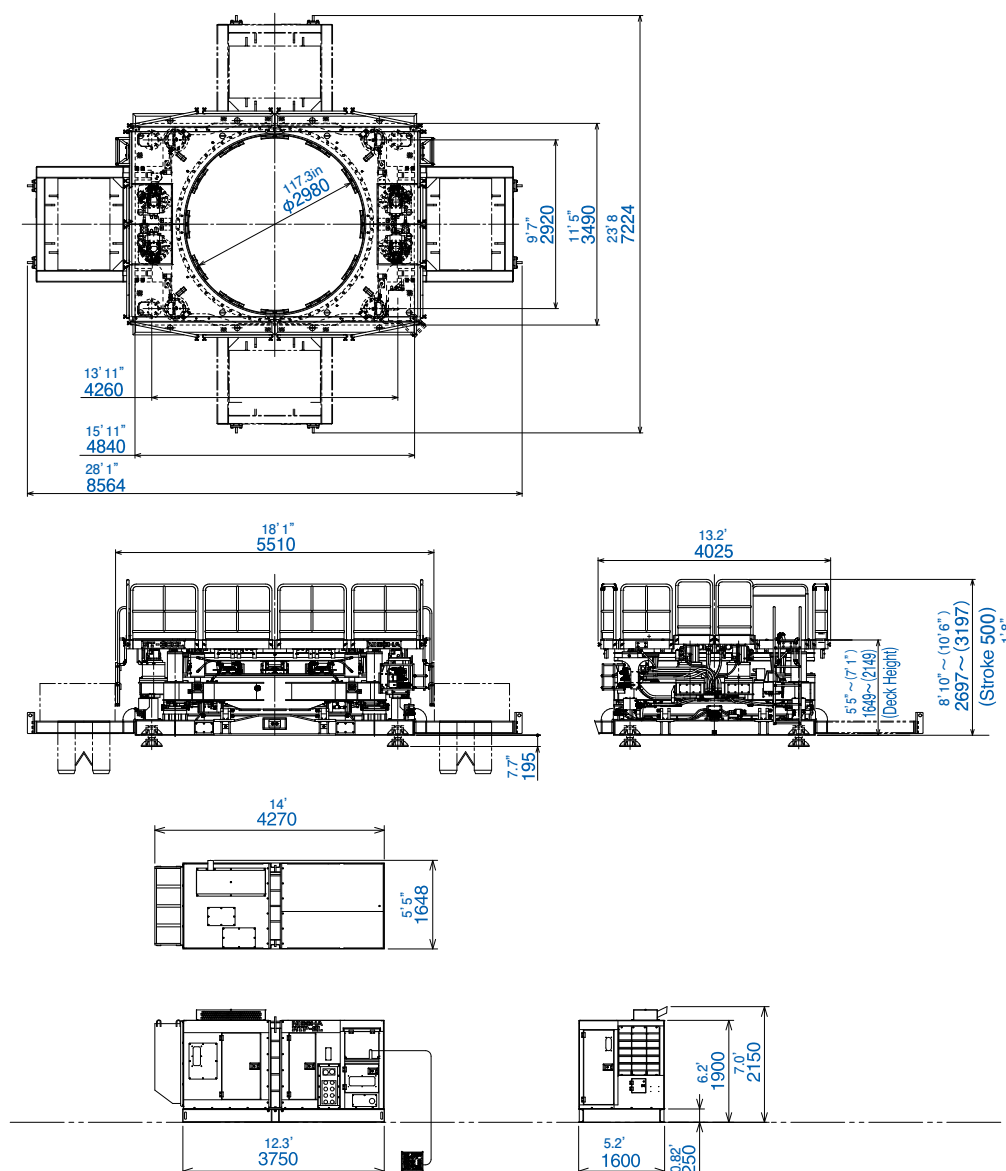
SUPERTOP

LOW HEAD & LIGHT type

RT-300L

CASING ROTATOR RT-300L			
Borehole dia.	2000mm～3000mm	78.7in～118.1in	
Extracting force	2460kN(251tf)	553,030lbf	
Pushing down force (Hydraulic+Deadweight)	390kN(40tf)+190kN(19.8tf)	87,675lbf+42,713lbf	
Thrust jack stroke	500mm	1.6ft	
Torque	2190/735kN-m(223/75tf-m)	1,615,261/542,108lbf-ft	
Rotation speed	0.9/2.5min ⁻¹		
Weight	25.7《26.8》ton	56,658lb (59,083lb)	
HYDRAULIC POWER PACK RTP-2K			
Engine	HINO J08E-TM		
Output	159kW(216PS)/2000min ⁻¹		
Weight	5.5ton	12,125lb	
Dimension(L×W×H)	4270mm×1600mm×2150mm	14.0ft×5.2ft×7.0ft	
● 〈 〉 shows the weight with sub chuck system(Optional extra)			

● < > shows the weight with sub chuck system(Optional extra)



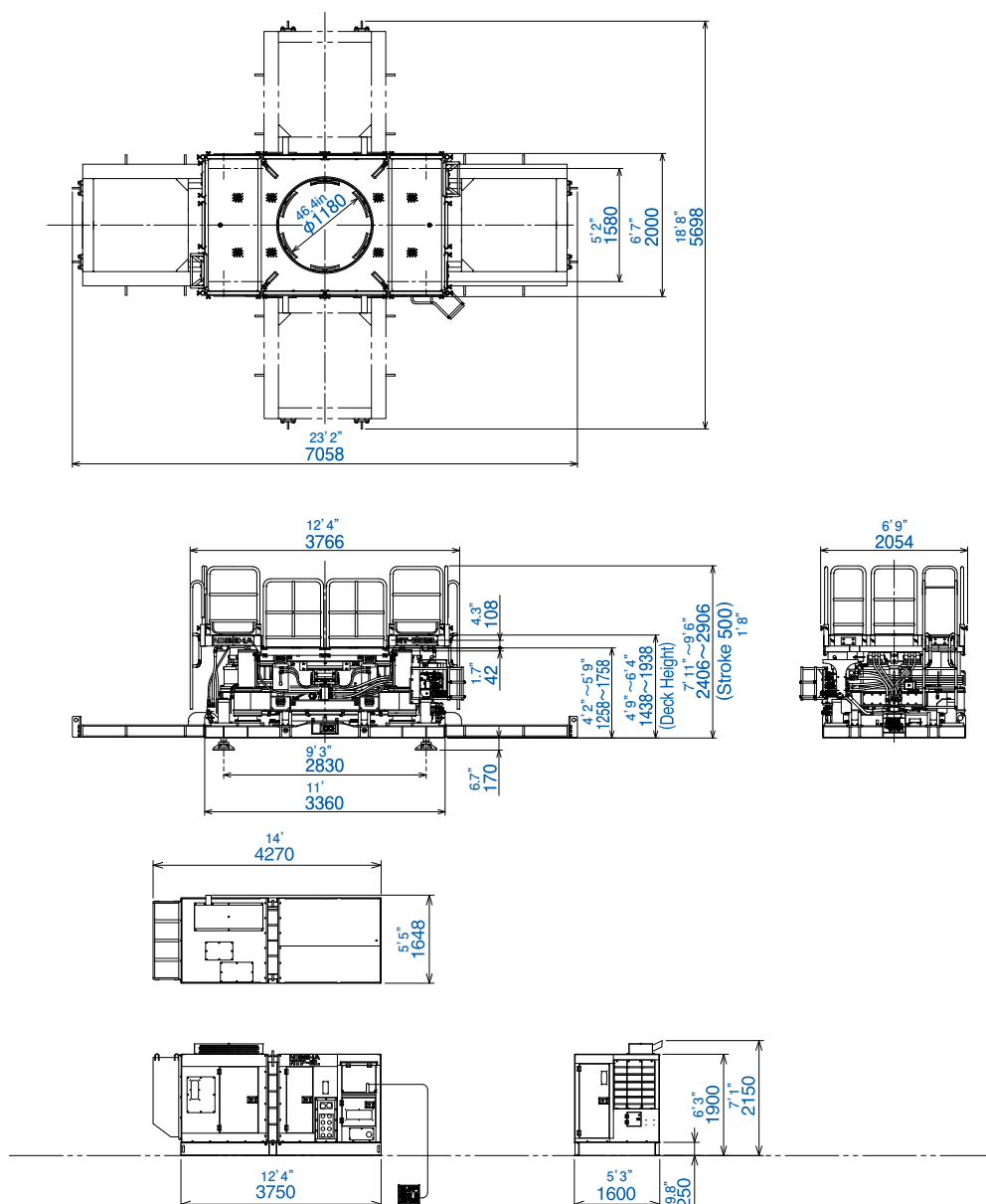
SUPERTOP

ULTRA LOW HEAD & LIGHT type

RT-120SL

CASING ROTATOR RT-120SL			
Borehole dia.	800mm~1200mm	31.4in~47.2in	
Extracting force	981kN(100tf)	220,537lbf	
Pushing down force (Hydraulic+Deadweight)	294kN(30tf)+103kW(10.5tf)	66,093lbf + 23,155lbf	
Thrust jack stroke	500mm	1.6ft	
Torque	814/275kN-m(83/28tf-m)	600,375/202,829lbf-ft	
Rotation speed	2.3/6.8min ⁻¹		
Weight	13.5 (14.0) ton	29,762lb (30,864lb)	
HYDRAULIC POWER PACK RTP-2T			
Engine	HINO J08E-TM		
Output	159kW(216PS)/2000min ⁻¹		
Weight	5.5ton	12,125lb	
Dimension(L×W×H)	4270mm×1600mm×2150mm	14.0ft×5.4ft×7.0ft	

● < > shows the weight with sub chuck system(Optional extra)



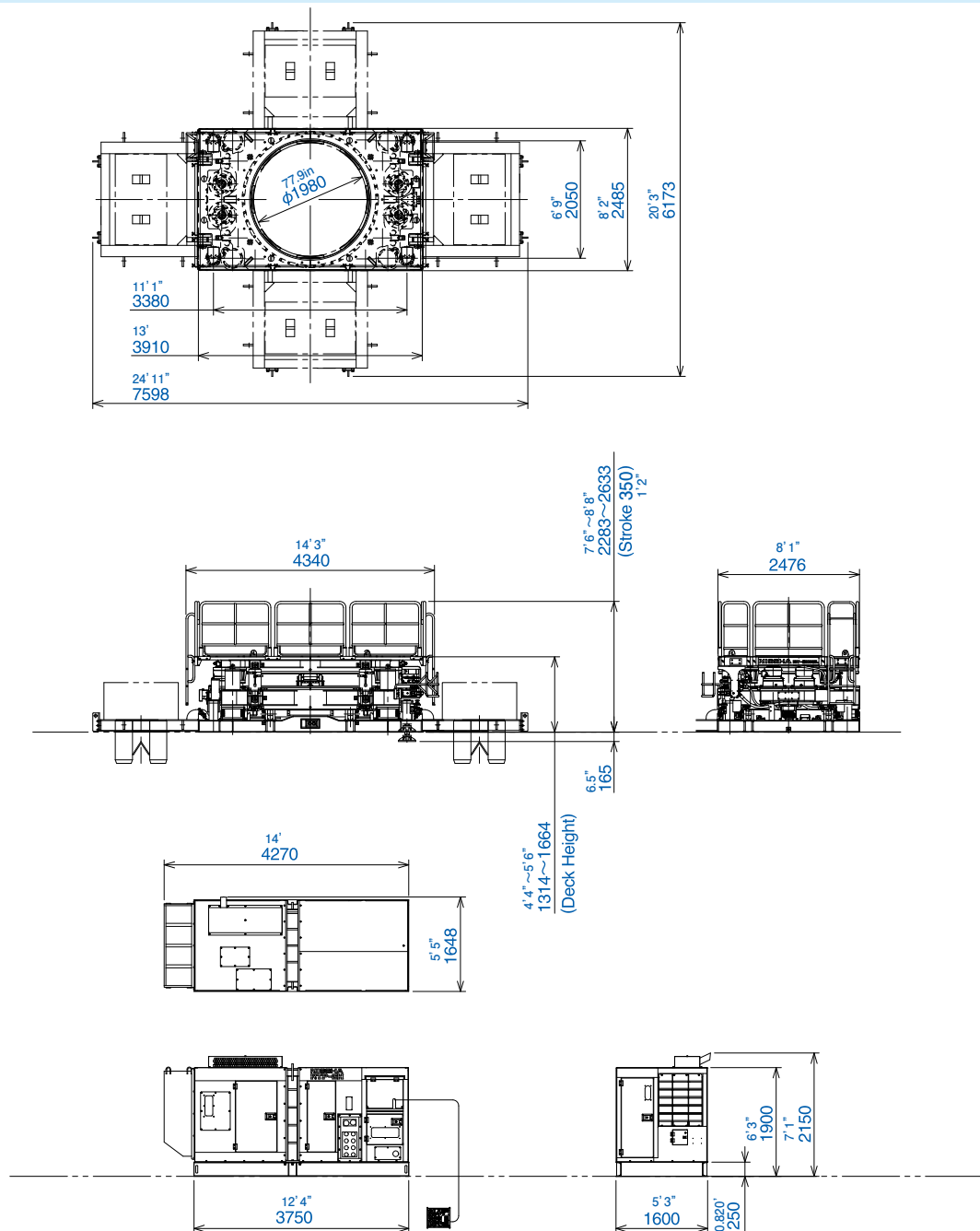
SUPERTOP

ULTRA LOW HEAD & LIGHT type

RT-200SL

CASING ROTATOR RT-200SL			
Borehole dia.	1000mm~2000mm	39.3in~78.7in	
Extracting force	990kN(101tf)	222,560lbf	
Pushing down force (Hydraulic+Deadweight)	440kN(45tf)+110kN(11tf)		98,915lbf + 24,728lbf
Thrust jack stroke	350mm	1.1ft	
Torque	1000/460kN-m(102/47tf-m)		737,562/339,278lbf-ft
Rotation speed	2.0/4.0min ⁻¹		
Weight	14.6《15.2》ton	32,187lb《33,510lb》	
HYDRAULIC POWER PACK RTP-2H			
Engine	HINO J08E-TM		
Output	159kW(216ps)/2000min ⁻¹		
Weight	5.5ton	12,125lb	
Dimension (L×W×H)	4270mm×1648mm×2150mm		14.0ft×5.4ft×7.0ft
● 《 》 shows the weight with sub chuck system(Optional extra)			

● 〈 〉 shows the weight with sub chuck system(Optional extra)



SUPERTOP

Distributor

Manufacturer



URL <http://www.n-sharyo.co.jp/>

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Due to company policy of continuous development and improvement, NIPPON SHARYO reserves the right to change designs and specifications without notice.

CAT.No.143B