

# RT-200H

Casing Rotator  
(High-Power type)

# SPECIFICATION

November, 2010



**Nagoya, Japan**

**Tel : 81- (52) - 623 - 3529**

**Fax: 81- (52) - 623 - 4349**

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

# CONTENTS

	<b>PAGE</b>
<b>1. SPECIFICATIONS OF ROTATOR .....</b>	<b>2</b>
<b>2. SPECIFICATIONS OF HYDRAULIC POWER PACK .....</b>	<b>2</b>
<b>3. GENERAL DIMENSIONS OF RT-200H ROTATOR .....</b>	<b>3</b>
<b>4. GENERAL DIMENSIONS OF RTP-3H HYDRAULIC POWER PACK .....</b>	<b>4</b>
<b>5. STRUCTURE AND FUNCTIONS .....</b>	<b>5</b>
<b>6. STANDARD SCOPE OF SUPPLY .....</b>	<b>8</b>
<b>7. OPTIONAL EXTRA .....</b>	<b>8</b>
<b>8. GENERAL CONDITIONS .....</b>	<b>9</b>

## 1. SPECIFICATIONS OF ROTATOR

1.1 Model	RT-200H
1.2 Bore hole diameter	1000 to 2000 mm (Additional collar sets (optional extra) are necessary for smaller boring diameter than 2000 mm)
1.3 Casing extracting force (Normal)	3450 kN (352 tf)
(Emergency use)	3940 kN (402 tf)
1.4 Casing driving (push-down) force	590kN(Hydraulic)+250kN(Dead weight) (60 tf + 26 tf)
1.5 Thrust cylinder stroke	750 mm
1.6 Torque (Normal)	2950/1740/1010 kN·m (301/177/103 tf·m)
(Emergency use)	3130 kN·m (319 tf·m)
1.7 Rotation speed	0.9/1.5/2.5 min <sup>-1</sup> (0.9/1.5/2.5 rpm)
1.8 Weight (Excluding collar set and sub chuck (optional extra))	34.1 ton
(Equipped sub chuck (optional extra) excluding collar set)	35.8 ton

## 2. SPECIFICATIONS OF HYDRAULIC POWER PACK

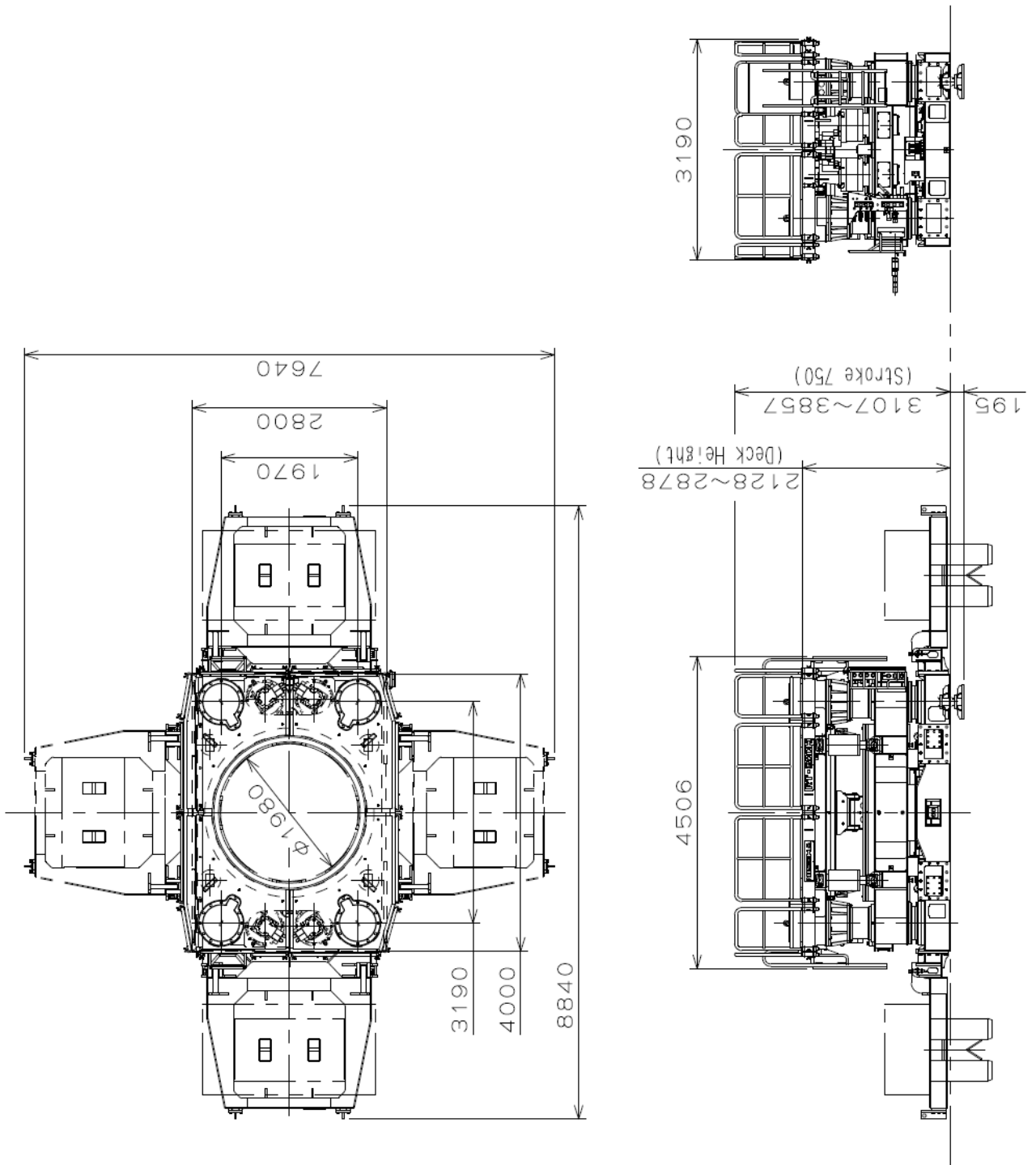
2.1 Model	RTP-3H
2.2 Diesel engine	
1) Maker	Hino Motors, Ltd.
2) Model	P11C-UP
3) Type	Water cooled, 4-cycle, overhead valve, in-line, 6-cylinder, direct fuel injection, turbo-charged
4) Rated output	257 kW / 1850 min <sup>-1</sup> (350 PS / 1850 rpm)

Note: This diesel engine complies with EU Stage IIIA and USA Tier3 of emission standards.

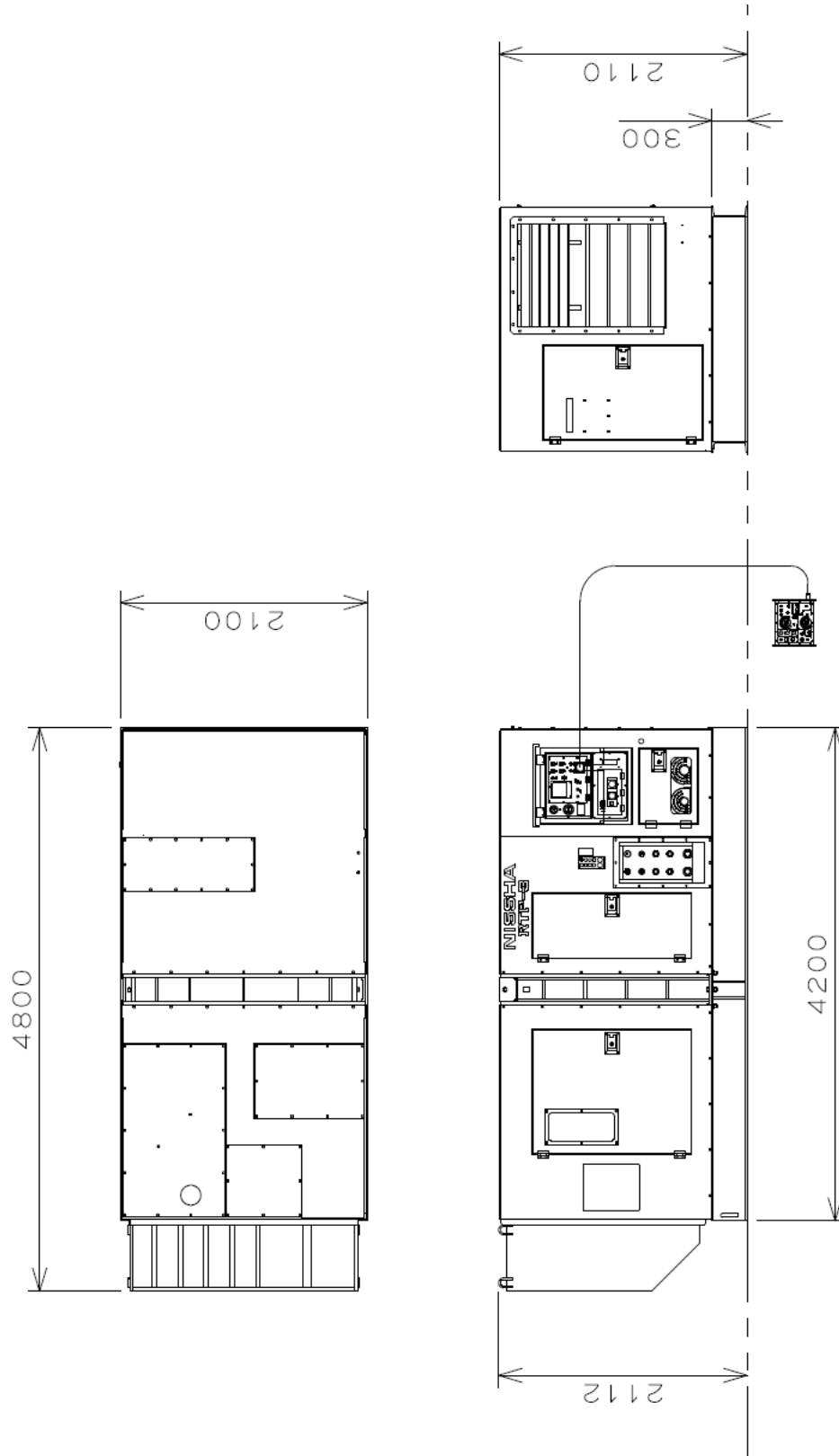
### 2.3 Hydraulic pump

1) Variable displacement plunger pump for rotation	
Flow	288 lit./min x 2 pcs.
Pressure	32.4 MPa (330 kgf/cm <sup>2</sup> )
2) Variable displacement plunger pump for drive/extraction, chucking	
Flow	320 lit./min
Pressure	29.4 MPa (300 kgf/cm <sup>2</sup> )
3) Gear pump for leveling	
Flow	63 lit./min
Pressure	20.6 MPa (210 kgf/cm <sup>2</sup> )
2.4 Dimensions (L x W x H)	4,800 mm x 2,100 mm x 2,112 mm
2.5 Operating weight	7.3 ton

### 3. GENERAL DIMENSIONS OF RT-200H ROTATOR



#### 4. GENERAL DIMENSIONS OF RTP-3H HYDRAULIC POWER PACK



## 5. STRUCTURE AND FUNCTIONS

### 5.1 Outline

The casing rotator is separated into two main components, which are a rotator, model RT-200H, and a hydraulic power pack, model RTP-3H, for facilitating their installation work at restricted sites.

### 5.2 Rotator

#### 1) Separate/stationary type

The rotator and hydraulic power pack are connected with hydraulic hoses equipped quick-release couplings and controlled through a remote control box or a radio control box (Optional extra) as desired.

The rotator can be lifted with 4 sling ropes and shackles, which are supplied as standard accessories, and place it to the point where the pile to be constructed by a crawler crane of 70 tons and larger lifting capacity.

#### 2) Leveling

The rotator can be maintained at horizontal position by extending and retracting four leveling jacks located on its lower frame.

#### 3) Chucking

The rotator can secure and release the casing of  $\varnothing 2000$  (Nominal size) by eight (8) pieces of wedge-type chucks installed around the casing and four chuck cylinders, with no regard for the location of the chucking mechanism.

The chucks are mounted between upper and lower ball-raced bearings, which eliminates connection and disconnection work of their hydraulic hoses when opening and closing the chucks.

The chuck can also secure the casings ranging from 1000 to 1800 mm in diameter by adding respective sizes of clamp collar sets.

#### 4) Rotation

The casing secured by the chucks can be rotated both clockwise and counter-clockwise directions through four drive motors.

The rotation speed can be adjusted from 0 to  $2.5 \text{ min}^{-1}$  by a speed control dial and high/low range by a speed change-over switch. The maximum torque is 2950 kN-m (301 tf-m).

#### 5) Driving/extraction

The casing can be driven and extracted by four thrust cylinders with the stroke of 750 mm. The maximum driving force is 840 kN (86tf) including the dead weight of 250 kN (26tf) and the extraction force is 3450 kN (352tf).

6) Torque/extraction force booster

In case that the casing is hard to be extracted in order to high skin friction force generated around the casing so called as “Casing stuck”, its extraction force and torque can be increased approximately 6 to 15 percent more than their ratings for approximately 3 seconds by pressing an emergency button on the control box.

7) B-CON: Automatic bit load control

The bit load can be constantly controlled at the desired value by a built-in microcomputer.

8) Automatic up and down function

The casing can be move up/down with the desired set up timing while using the B-CON.

9) Automatic oscillation

The casing can be oscillated with the desired change-over timing by the timers, the oscillation direction is automatically changed over at the set up timing.

10) Sub chuck (Optional extra)

In case that the drilling depth is comparatively deep, the weight of the casing may exceed the lifting capacity of the assistant crane when the casing is extracted. The sub chuck holds the casing while the main chuck is released and fills the gap of overload of the assistant crane.

The maximum allowable holding force: 1960 kN (200 ton)

### 5.3 Hydraulic power pack

1) Enclosure

The hydraulic power pack is provided with thick steel plate enclosure, lined by sound-absorbing materials for noise prevention.

The hydraulic power pack can be lifted with a lifting device on the top of the enclosure by sling ropes.

2) Diesel engine

The hydraulic power pack is powered by a diesel engine of model HINO P11C-UP, water cooled, 4-cycles, turbo-charged and direct fuel injection type.

The rated output is 257 kW/1850 min<sup>-1</sup> (350 PS/1850 rpm).

This diesel engine complies with EU StageIII A and USA Tier3 of emission standards.

3) Hydraulic pump

2-variable displacement plunger pump of 228 lit./min at 32.4 MPa (330kgf/cm<sup>2</sup>) for rotation.

1-variable displacement plunger pump of 320 lit./min at 29.4 MPa (300kgf/cm<sup>2</sup>) for drive/extraction and chucking.

1-gear pump of 61 lit./min at 20.6 MPa (210kgf/cm<sup>2</sup>) for leveling.

5.4 Remote control box

1) Remote control button

2) Radio control button

3) Emergency lamp

4) Chuck open button

5) Chuck open/close switch

6) Engine stop button

7) Engine speed control switch

8) Jack power button

9) Torque meter

10) Extraction/chuck force meter

11) Rotation direction change-over switch

12) Drive/extraction change-over switch

13) Rotation/oscillation change-over switch

14) Oscillation timer

15) Rotation speed high/low change-over switch.

16) Rotation speed adjuster

17) B-con switch

The desired bit load or torque can be constantly controlled for avoiding overload.

18) Automatic up/down switch

The casing can be automatically moved up and down at the desired timing.



## 6. STANDARD SCOPE OF SUPPLY

- 6.1 Rotator model: RT-200H ..... 1 unit  
equipped with the following accessories;
- 1) Sling rope and shackles ..... 4 sets
  - 2) Reaction bracket ..... 2 pcs.
  - 3) Spike ..... 2 pcs.
  - 4) Step ..... 1 set
  - 5) Guard pipe ..... 4 pcs.
  - 6) Remote control box with cable of 20 meters long and plugs/receptacles ..... 1 set

- 6.2 Hydraulic power pack model: RTP-3H ..... 1 unit  
provided with hydraulic hoses of 20m long with quick-release couplings.

### 6.3 Others

- 1) B-con: Automatic bit load control ..... 1 set
- 2) Inclinometer ..... 1 set
- 3) Torque/extraction force booster ..... 1 set
- 4) Automatic up/down function ..... 1 set
- 5) Automatic oscillation ..... 1 set

## 7. OPTIONAL EXTRA

- 1) Clamp collar for main chuck  
     $\varnothing$ 1800, 1600, 1500, 1300, 1200, 1100, 1000 ..... Each set - 8 pcs.
- 2) Clamp collar for sub chuck  
     $\varnothing$ 1800, 1600, 1500, 1300, 1200, 1100, 1000 ..... Each set - 8 pcs.
- 3) Sub chuck set ..... 1 set
- 4) Radio control ..... 1 unit
- 5) Operator's room ..... 1 unit

## 8. GENERAL CONDITIONS

This specifications shall cover the standard specification of model RT-200H Casing Rotator and RTP-3H Hydraulic Power Pack (here-in-after called "The machine") manufactured by NIPPON SHARYO, LTD.

The general arrangement and principal dimensions of the machine are shown in the drawing attached.

### 1) Design and workmanship

The machine shall be designed to perform the maximum efficiency with the least fuel consumption and the lowest maintenance costs.

The workmanship shall be of the first class in all respects.

The machine shall be built for simple mechanical arrangement and easy in inspection and maintenance.

### 2) Materials

The materials used in the manufacture of the machine shall be of the highest quality, free from defects and imperfections.

Principal materials such as bolts, nuts, seals and steel plates used in the machine confirm to the Japanese Industrial Standards. (Almost equal to ISO)

### 3) Test and inspection

Routine test and inspection in our factory shall be final.

### 4) Painting and lettering

Under-coating by anti-rust paint and enamel finishing shall be performed in accordance with manufacturer's standard practice.

Main parts of the equipment shall be painted in NISSHA Green and other equipment in manufacturer's standard.

### 5) Service conditions

The equipment shall meet the following service conditions.

Ambient temperature: -10 deg. C or higher and 40 deg. C or lower.

### 6) Warranty

All the machine specified herein shall be warranted by us for a period of twelve (12) calendar months after the date of being put into operation, or fourteen (14) months after the date of shipment at a Japanese port, or one thousand engine operation hours according to the service hour meter, whichever is soonest.

The warranty shall cover defects in design, materials and workmanship only, shall not applicable to damage sustained mishandling of the machine or normal wear and tear.

The warranty shall not be applicable to the parts and materials mentioned below.

- ① Cutting bits
- ② Wear plates
- ③ Wire ropes
- ④ Rubber made parts
- ⑤ Seals as o-rings, seal rings, back-up rings, etc.
- ⑥ Gaskets and sheet packings
- ⑦ Filter elements
- ⑧ Batteries
- ⑨ Electric wiring
- ⑩ Glasses
- ⑪ Other quick moving parts
- ⑫ Lubricants

... concluded