

BUMA REVERSE CIRCULATION DRILLING RIG



Company Introduction

BUMACE is a leading manufacturer and supplier of foundation drilling equipment in Korea. Since founded in 1992, BUMA has been supplying equipment all over the world and has earned a reputation for high quality products and extensive knowledge of foundation work and methodologies.

Our mission is to provide customers with innovative solutions based on engineering principles and years of experience.





BUMA + PREMIUM

Bore piling for big structure building and bore piling at any offshore condition
Bore piling for bridge & terminal (Coal, Oil & Gas)
Bore piling for jetty & Harbour & Drydocks



Casing Oscillator



Reverse Circulation Drilling Rig



Casing Rotator



Spherical Grab



Hammer Grab

Reverse Circulation Drilling Rig Method



Reverse Circulation Drilling System (RCD), also known as airlifting, is an effective drilling method that exploits compressed air, as it is injected into the drill pipe below water level, to reduce the density of the internal water column and remove slurries through the circulation. The mixture of water, air and cuttings is then flushed out through the drill pipe into settling tanks.

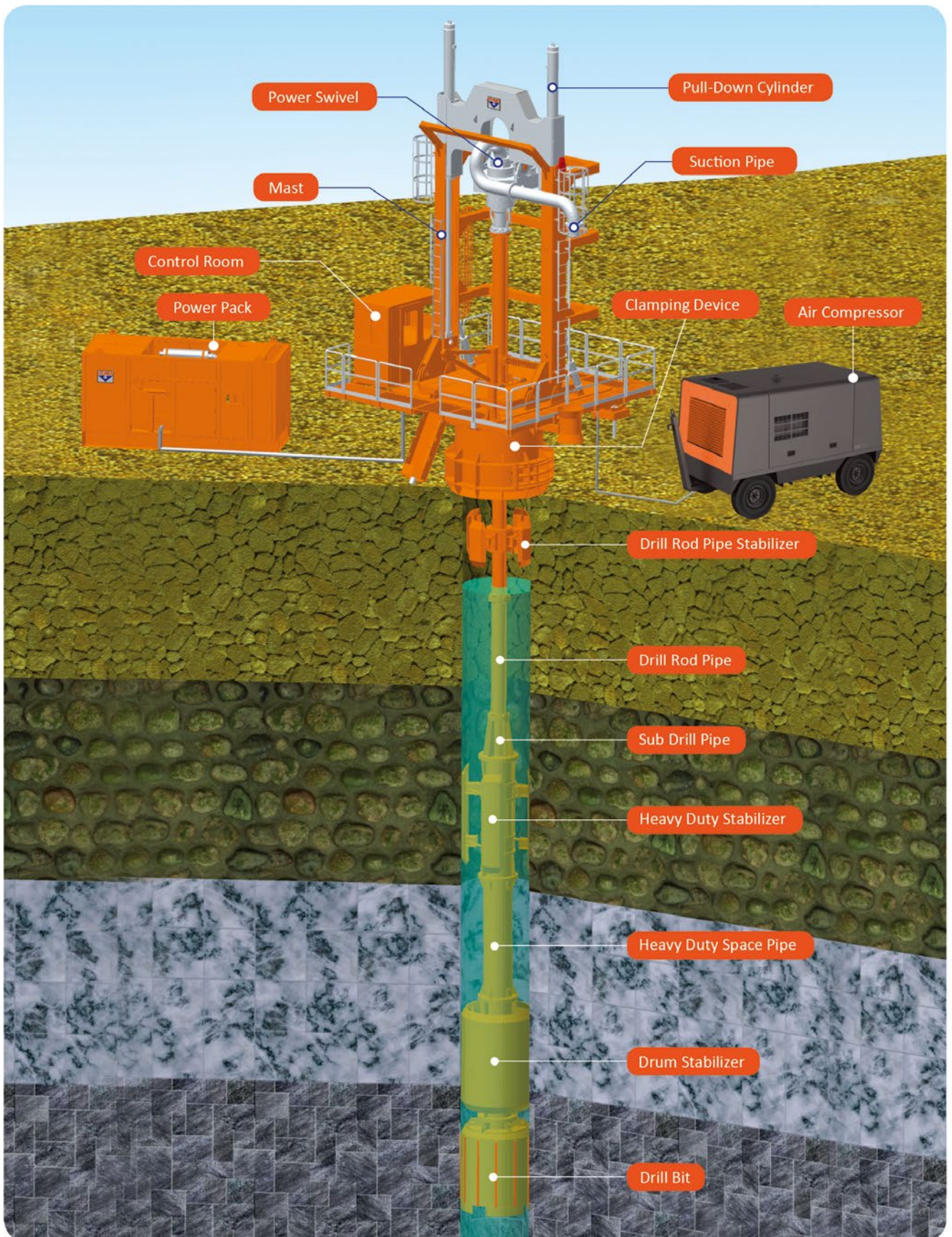
Working with RCD Rigs is highly efficient, safe and environmentally friendly solution for drilling large diameters and depths. If you fall into one of the following conditions, RCD is the best Solution to deal with it.

- 1) Large Diameter (Larger than 800 mm)
- 2) Deep Depth (Deeper than 20 m)
- 3) Hard Rock Drilling (~ 350 MPa)
- 4) Bore Piling in Marine Condition.

BUMA Construction Equipment



Composition



Reverse Circulation Drilling Rig

Specification

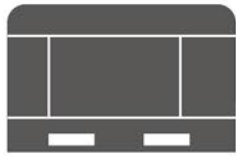
Model	R1315	R1815	R1820	R3025	R3030	R3833	R9050
Max. Drilling Diameter	1,500 mm	1,500 mm	2,000 mm	2,500 mm	3,000 mm	3,300 mm	5,000 mm
Max. Drilling Torque	129 kN.m	179 kN.m	179 kN.m	300 kN.m	300 kN.m	372 kN.m	879 kN.m
Rotation Speed	0-24 rpm	0-16.2 rpm	0-16.2 rpm	0-21 rpm	0-21 rpm	0-20 rpm	0-8 rpm
Thrust/Pull-Up Force	88 ton / 129 ton	88 ton / 129 ton	88 ton / 129 ton	122 ton / 201 ton	122 ton / 201 ton	122 ton / 201 ton	265 ton / 394 ton
Mast Tilting	22°	22°	26°	30°	32°	35°	30°
Platform Tilting	16°	16°	20°	16°	12.5°	10.5°	10°
Weight (Approx.) -Including Clamping Device	21.8 ton	27.8 ton	28.5 ton	36.0 ton	39.8 ton	41.9 ton	100 ton
Drill String	NW 200	NW 200	NW 200 / NW 300	NW 300	NW 300	NW 300	NW 350
PowerPack	P2612C / P3618C / P4214D	P2612C / P3618C / P4214D	P2612C / P3618C / P4214D	P3618C / P5318C / P4218D	P3618C / P5318C / P4218D	P6028C	P6128V

** The specifications are subject to change for improvements or customer's requirement

Necessary Equipment & Tools



Crane



Air Compressor



Water Pump



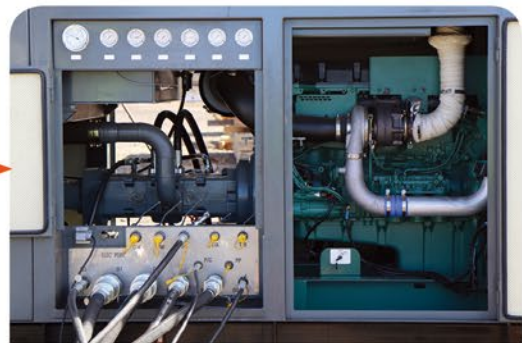
Generator

Equipment	RCD R1815	RCD R1815	RCD R3025	RCD R3030
Lifting Crane	100 ton-grade	100 ton-grade	120 ton-grade	120 ton-grade
Air Compressor	Volume 600 cfm Pressure 8 bar Air Hose 2"- 40 m	Volume 600-800 cfm Pressure 8 bar Air Hose 2"- 40 m	Volume 800 cfm Pressure 8 bar Air Hose 2"- 40 m	Volume 800 cfm Pressure 8 bar Air Hose 2"- 40 m
Water Pump	Volume 5 m ³ /min Head 20-30 m Water Hose 8"	Volume 5-10 m ³ /min Head 20-30 m Water Hose 8"	Volume 10 m ³ /min Head 20-30 m Water Hose 8"	Volume 10 m ³ /min Head 20-30 m Water Hose 8"
Generator	Generator 175 kW	Generator 175 kW	Generator 175 kW	Generator 175 kW

** In Marine applications, a jack-up barge (20 x 40 m) and disposal barge may be needed.

** The total amount of air pressure needed varies depending on drilling depth. In general, for every 10m of depth, 1bar of pressure is required. Given that the air pressure gradually seeps out in the course of construction, the bar should be set at a higher level than recommended.

Power Pack



Specification

Model	Emission Compliance	Engine Output & rpm	Hyd.Pump 250bar (Max. 350bar)	Dimension	Weight
P2612C	TIER 2, 3	194 kW / 260 HP / 2,200 rpm	201 ℓ/min x 2	1,912 W x 4,000 L x 2,283 H	7.5 ton
P2812V	TIER 3	210 kW / 286 HP / 2,200 rpm	201 ℓ/min x 2	1,912 W x 4,000 L x 2,283 H	7.5 ton
P3618V	TIER 3	265 kW / 360 HP / 2,100 rpm	324 ℓ/min x 2	1,912 W x 4,800 L x 2,476 H	9 ton
P3618C	TIER 3	268 kW / 360 HP / 2,100 rpm	324 ℓ/min x 2	1,912 W x 4,900 L x 2,476 H	9 ton
P3818C	TIER 4F	283 kW / 380 HP / 2,100 rpm	324 ℓ/min x 2	1,912 W x 4,800 L x 2,476 H	9 ton
P4214D	TIER 1	307 kW / 418 HP / 1,800 rpm	252 ℓ/min x 2	1,912 W x 4,900 L x 2,476 H	9 ton
P4218D	TIER 1	307 kW / 418 HP / 1,800 rpm	324 ℓ/min x 2	1,912 W x 4,900 L x 2,476 H	9 ton
P5318C	TIER 3, 4F	399 kW / 535 HP / 2,100 rpm	324 ℓ/min x 2	1,912 W x 5,400 L x 2,562 H	11 ton
P5418V	TIER 3	397 kW / 540 HP / 1,800 rpm	324 ℓ/min x 2	1,912 W x 5,400 L x 2,562 H	11 ton
P5518V	TIER 4F	405 kW / 551 HP / 1,900 rpm	324 ℓ/min x 2	1,912 W x 5,400 L x 2,300 H	11 ton
P6028C	TIER 3, 4F	447 kW / 600 HP / 2,100 rpm	504 ℓ/min x 2	1,912 W x 5,400 L x 2,562 H	11.5 ton
P6128V	TIER 4F	450 kW / 612 HP / 1,800 rpm	504 ℓ/min x 2	1,912 W x 5,400 L x 2,562 H	11.5 ton

** The specifications are subject to change for improvements or customer's requirement

Drill String

BUMA provides 2 different size of drill pipes, each of which is decided based on internal pipe diameter, NW200 (183 mm) and NW300 (302 mm). NW200 pipe goes hand in hand with R1820 machine (smaller) and 1.5 diameter of shaft (shorter)

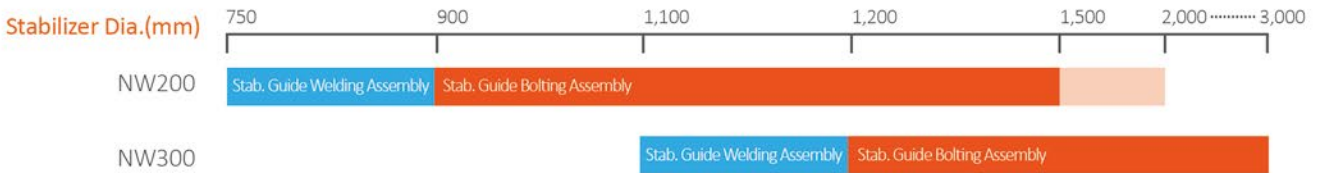


Basic Drill String

To prevent the bottom part of casing from buckling, the Basic Drill String is required. The Basic Drill String is composed of Drum Stabilizer, Heavy Duty Space Pipe, Heavy Duty Stabilizer and a Sub Drill Pipe (Reducing Pipe).

Drill Rod Pipe Stabilizer

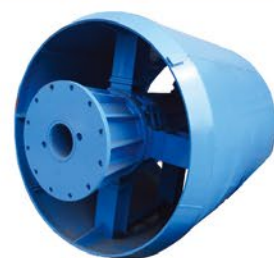
To prevent the Drill String from bending, we strongly suggest you use 1 Drill Rod Pipe Stabilizer in every 3 Drill Rod Pipes (1 Drill Rod Pipe = 3 m).



Drill Rod Pipe Stabilizer

Heavy Duty Stabilizer

Drum Stabilizer



Drill Bit

BUMA provides 3 types of Roller Cutters for different soil conditions



Tooth Cutter



Designed for drilling soft soil and soft rock layers (0 ~ 75 MPa).

TCI Button Cutter



Designed for drilling hard rock layers (80 ~ 250 MPa).

TCI Button Disc Cutter



Designed for drilling hard rock layers (80 ~ 350 MPa).

** Drill bits are designed for use in both soil and rock layers.

Specification

Drill Bit Cutting Dia.	850 mm	1,050 mm	1,350 mm	1,650 mm	1,830 mm	2,300 mm	2,750 mm
Drill Bit Length	1,500 mm	2,000 mm	2,000 mm	2,000 mm	2,500 mm	2,500 mm	2,500 mm
Suction Pipe	NW 200	NW 200	NW 200 / NW 300	NW 300	NW 300	NW 300	NW 300
Roller Cutter	8 SER.	8 SER.	12 SER.	12 SER.	12 SER.	12 SER.	12 SER.
-5° Cutter							
+10° Cutter	2	2	2	3	3	7	11
+20° Cutter	N/A	N/A	N/A	2	2	3	3
+35° Cutter	2	3	N/A	N/A	N/A	N/A	N/A
+40° Cutter	N/A	N/A	3	3	4	5	6
Total	5	6	6	9	11	17	22
Weight	1,500 kg	2,500 kg	3,500 kg	6,000 kg	7,650 kg	10,500 kg	14,300 kg



Kennedy Mill Road Harrodsburg KY, USA

Pile Diameter : Ø 2,520 mm

Depth : 85.5 m

Rock : Hard Rock 100~150 MPa

Equipment : RCD R3030



Kowloon Express Train Station Kowloon, Hong Kong

Pile Diameter : \varnothing 2,500 mm
Depth : 60 m
Rock : Granite 130~170 MPa
Equipment : RCD R3025



Black Sea Dry Dock Novorossiysk, Russia

Pile Diameter : Ø 2,520 mm

Depth : 85.5 m

Rock : Hard Rock 100~150 MPa

Equipment : RCD R1820

30

29

Таблица характеристик	
Параметр	Значение
Модель	R1820
Производитель	BUMA
Год выпуска	2018
Мощность двигателя	1800 кВт
Скорость вращения	1000 об/мин
Диаметр трубы	2520 мм
Длина трубы	85.5 м
Тип грунта	Твердые породы
Средняя прочность	100-150 МПа
Средняя глубина	85.5 м
Средняя температура	15 °C
Средняя влажность	70%
Средняя плотность	2.5 т/м³
Средняя скорость ветра	5 м/с
Средняя температура воздуха	15 °C
Средняя температура воды	15 °C
Средняя температура грунта	15 °C
Средняя влажность грунта	70%
Средняя плотность грунта	2.5 т/м³
Средняя скорость течения	0.5 м/с
Средняя глубина течения	0.5 м
Средняя температура течения	15 °C
Средняя влажность течения	70%
Средняя плотность течения	2.5 т/м³
Средняя скорость осадков	0.5 м/с
Средняя глубина осадков	0.5 м
Средняя температура осадков	15 °C
Средняя влажность осадков	70%
Средняя плотность осадков	2.5 т/м³



Signature Bridge Delhi, India

Pile Diameter : Ø 1,250 mm

Depth : 49 m

Rock : Weathered Basalt,

Hard Rock 80~120 MPa

Equipment : RCD R1820



Belo Horizonte Bridge Expansion Belo horizonte, Brazil

Pile Diameter : Ø 1,300 mm

Depth : 50 m

Equipment : RCD R1315



Bandra Worli Sea Link Mumbai, India

Pile Diameter : Ø 1,500 mm

Depth : 50 m

Rock : Basalt 200 MPa ~

Equipment : RCD R1820

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