DIABIT

GK18B

MITSUBISHI MATERIALS

# CASING ADVANCE SYSTEM IN OVERBURDEN DRILLING

MITSUBISHI
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Introduction

New support systems with advanced injection technology have been lately required in tunneling projects in soft ground formations or rock formations covered with overburden.

MITSUBISHI MATERIALS CORPORATION has developed unique Under-Reaming drilling systems and concentric drilling systems with innovative technology in MITSUBISHI brand rock drilling tools applied in civil engineering and mining sectors in the world since 1960's.

Also, laboratory studies and extensive field experiments in every ground formations enabled us to introduce the most consistent, highest quality drilling systems manufactured in the world today.

# C O N T E N T S



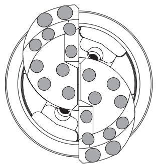
## SAFETY WARNING

- Grinding cutting etc. of carbide insert of rock bits can be potentially hazardous.
  Use adequate ventilation. Refer to the applicable material safety data sheet.
- Heavy object, take appropriate precautions when handling.
- During use, there is a likelihood of tool failure, take appropriate safety measures.
- Tool must be firmly connected and used properly.
- It is prohibited to use tool for other purposes.

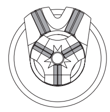
## PRODUCTS

### UNDER-REAMING SYSTEM

**SUPER MAXBIT**

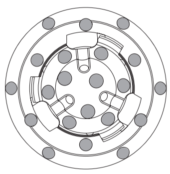


**KANTARO BIT**

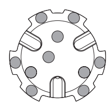


### CONCENTRICAL DRILLING SYSTEM

**ULTRA MAXBIT**



**MICRO CASING BIT**



## APPLICABLE GROUNG FORMATIONS

| 5" | 4" | 3.5" | 3" | 2.5" | 2" | Product | Soil (20≦N<40) | Soil (N≧40) | Soft Rock (qu<5~20N／$mm^2$) | Soft Rock (qu=5~20N／$mm^2$) | Medium-Hard Rock (qu=20~60N／$mm^2$) | Hard Rock (qu≧5~20N／$mm^2$) | Hard Rock (Fresh Condition) | Sand with Ball (φ75~φ300) | Block (φ75~φ300) | Boulder (φ75~φ300) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ● | | | | | SUPER MAXBIT | ■ | ■ | ■ | | | | | | | |
| | | | ○ | ● | ● | KANTARO BIT | ■ | ■ | | | | | | | | |
| ○ | ● | ○ | ○ | | | ULTRA MAXBIT | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | | | ● | ● | MICRO CASING BIT | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

Bit size

●Stocked Size
○Non-Stocked Size

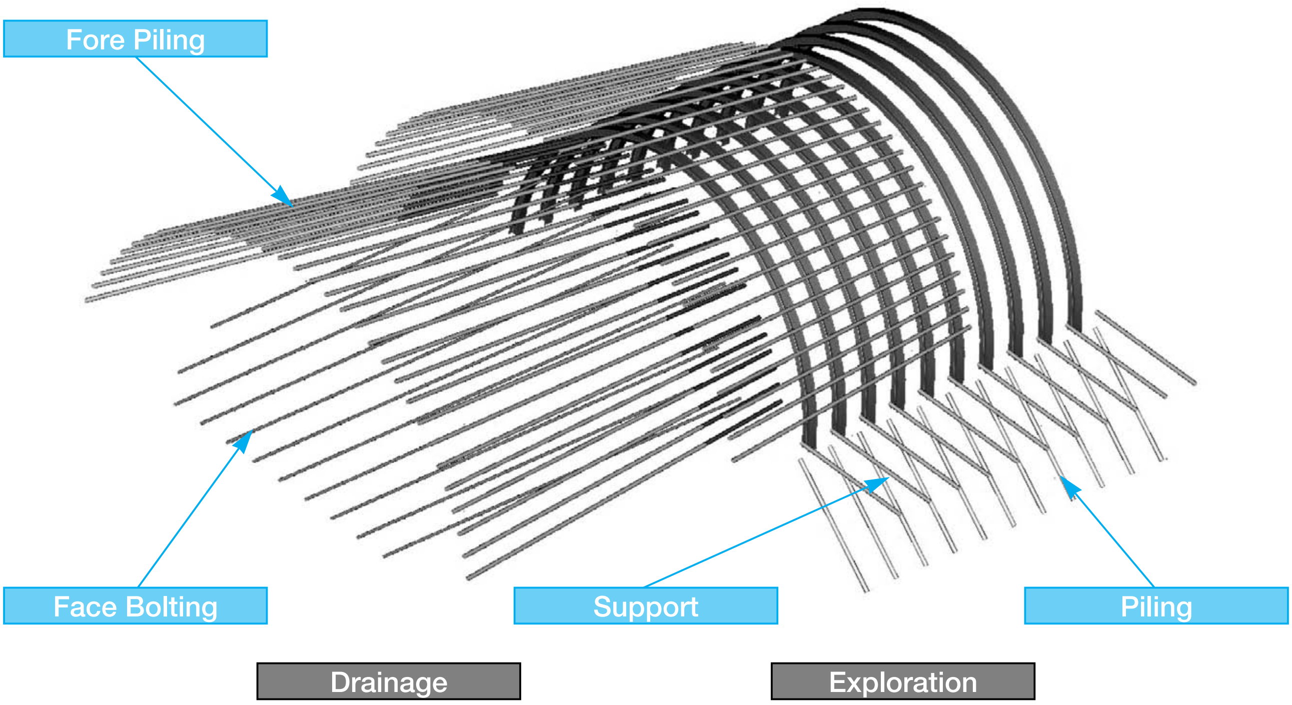
## ADVANTAGES

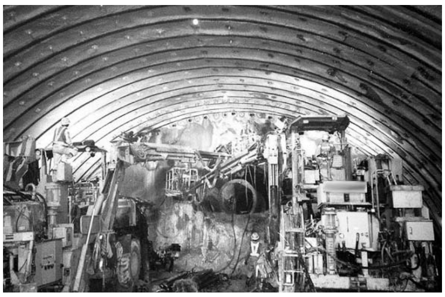
Various System fo Applicable diameter from 2" up 5".
Wide Range of applications dia. 2"-5".

Under-Reaming System : Economical cost per drilled foot in soft formation or shallow holes in any ground formations.

Concentrical Drilling System : High efficieney in drilling hard formation drilling at any angle without deviation.

## APPLICATIONS

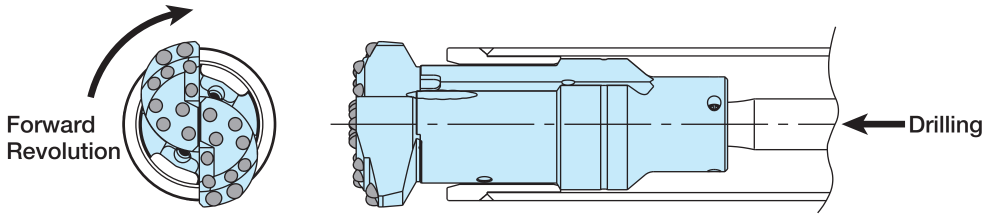


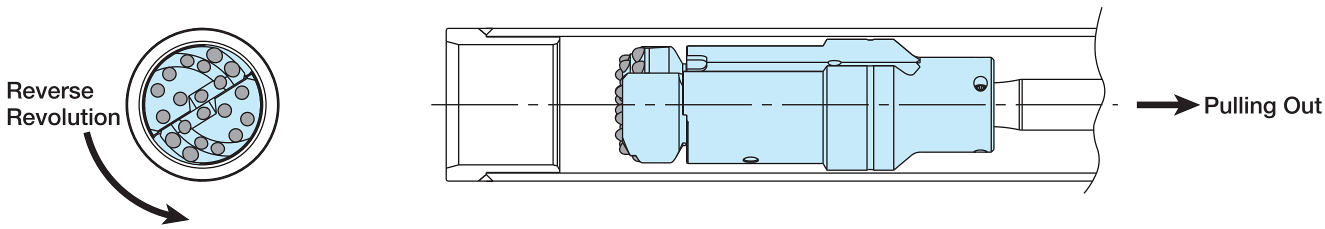
# SUPER MAXBIT

SUPER MAXBIT consits of a bit wing set and a device and its wings keep open while drilling and close position when drill strings are pull out. While drilling, the diameter of bit wings is larger than the outside diameter of the casing pipes and the casing pipes are driven down by percussive energy transmitted from the drifter. SUPER MAXBIT has economical cost per drilled foot for short piles application in soft formation.

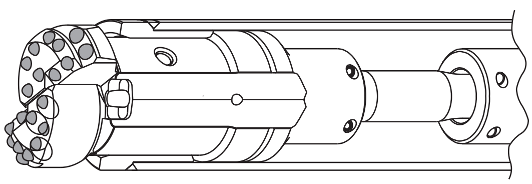
## Drilling position (Extended)



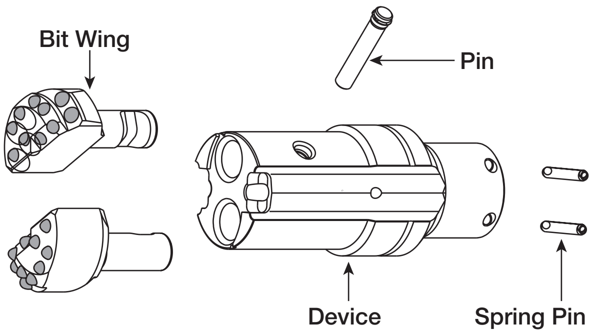

## Pull out position (Retracted)



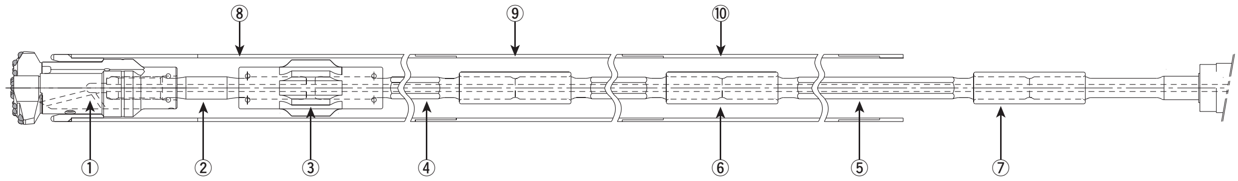

## Assembly

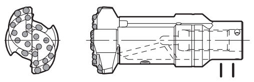
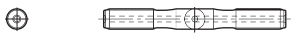
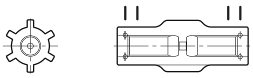
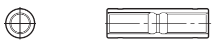
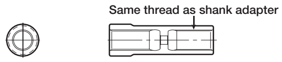
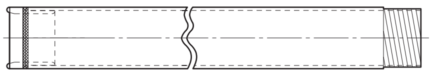
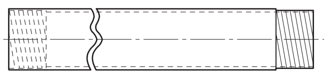
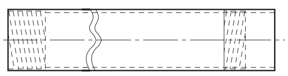


## Components



## Standard 4" SMB system



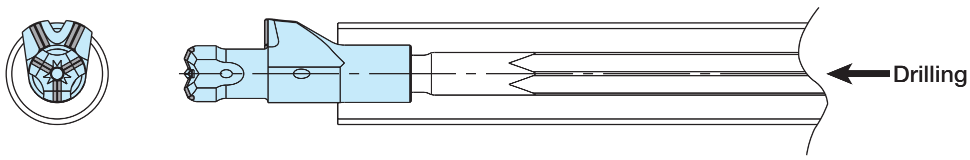

| ① SMB | Part No. | Gauge size mm | Gauge size in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2M38P88<br>(Spare parts)<br>Bit wing：2HEADP88<br>Pin：2PIN88<br>Spring pin：SP-8×45 | 125 | 4 29/32" | 289 | 11 3/8" | <br>2pcs／1set<br>1pce<br>2pcs | 10.3<br>2.7<br>0.08<br>0.02 | 22.7<br>5.9<br>0.18<br>0.04 |
| ② Short rod | Part No. | Body section | | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | ER38M38-340 | Round38 | | 340 | 13 25/64" | | 2.6 | 5.7 |
| ③ Wing sleeve | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | CM38FZ2<br>(Spare parts)<br>Spring pin：SP-8×45 | 95 | 3 3/4" | 245 | 10" | <br>4pcs | 6.2<br>0.04 | 13.6<br>0.08 |
| ④ First rod | Part No. | Body section | | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | EH32M38-3660L | Hex.32 | | 3660 | 12' | | 21.4 | 47.1 |
| ⑤ Extension rod | Part No. | Body section | | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | EH32M38-3050L | Hex.32 | | 3050 | 10' | | 17.7 | 38.9 |
| ⑥ Middle sleeve | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | CM38AG | 54 | 2 1/8" | 190 | 7 15/32" | | 1.9 | 4.2 |
| ⑦ End sleeve | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|   | CR38M38AG<br>CM38AG | 60<br>54 | 2 3/8"<br>2 1/8" | 195<br>190 | 7 43/64"<br>7 15/32" | | 2.0<br>1.9 | 4.4<br>4.2 |
| ⑧ First casing with shoe | Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | SA114-3770S | 114.3 | 4 2/3" | 3840/3770 | 12'7 11/64"<br>12'4 27/64" | Steel pipe | 62.0 | 136.4 |
| ⑨ Middle casing | Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | SB114-3050 | 114.3 | 4 2/3" | 3120/3050 | 10'2 53/64"<br>10' | Steel pipe | 48.5 | 106.9 |
| ⑩ End casing with cap | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|  | SC114-3050<br>VC114-3050 | 114.3<br>114.0 | 4 2/3"<br>4 2/3" | 3050<br>3050 | 10'<br>10' | Steel pipe<br>Plastic pipe | 49.0<br>9.3 | 107.8<br>20.5 |

# KANTARO BIT

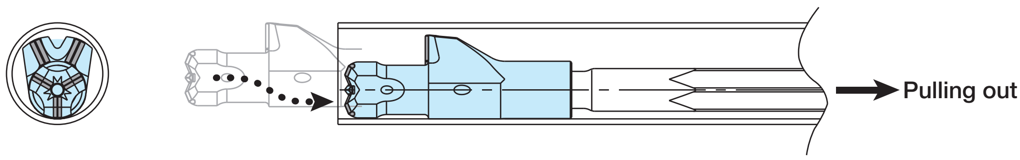
PAT.No. 3382554
PAT.No. 3382555
PAT.No. 3385223

Smallest eccentrice reamer system in the world.
Applied for short holes (Less than 6m) with one casing pipe in soft formation.
Easy drilling, Eays-pulling out.

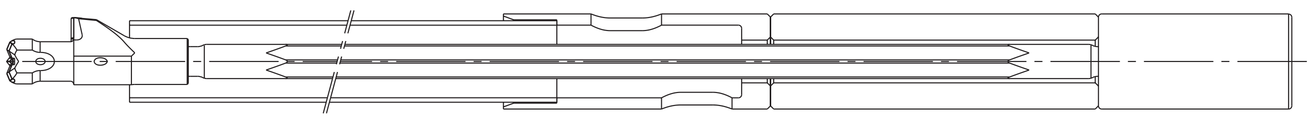
## Drilling position



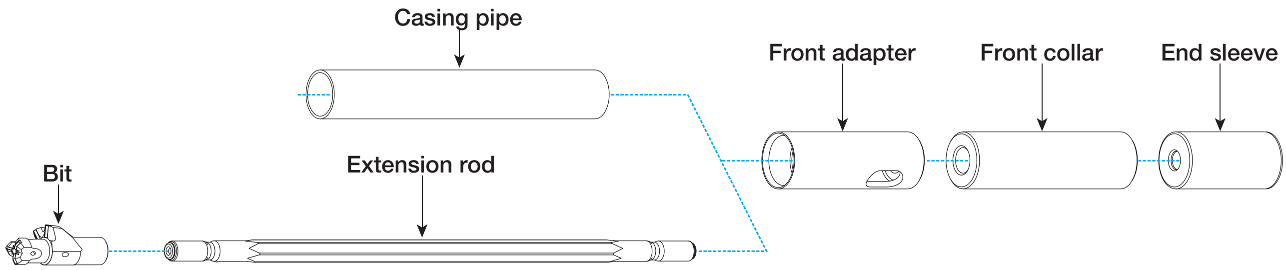

## Pull out position



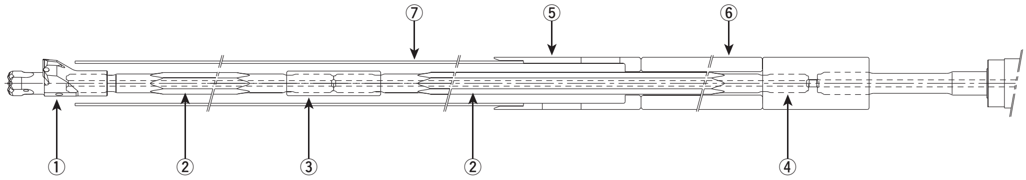

## Assembly

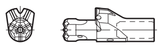


## Components

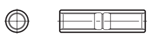


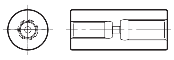
## Standard 2" & 2.5" KANTARO system

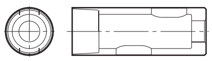


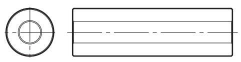

| ① Kantaro bit | Part No. | Gauge size (mm) | Gauge size (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2" WR28ZC63-36Z-B<br>2.5" WR32ZC82-42Z-B | 63<br>82.5 | 2 15/32"<br>6 11/16" | 150<br>170 | 5 29/32"<br>6 11/16" | | 1.0<br>1.5 | 2.2<br>3.3 |

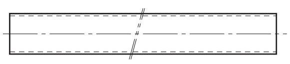
| ② Extension rod | Part No. | Body section | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
|  | 2" EH28R28-3050<br>2.5" EH32R32-3050 | Hex.28<br>Hex.32 | 3050<br>3050 | 10'<br>10' | | 15.0<br>16.5 | 33.0<br>36.3 |

| ③ Sleeve | Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2" CR28DNZ2<br>2.5" CR32DNZ | 38<br>42 | 1 1/2"<br>1 21/32" | 160<br>160 | 6 19/64"<br>6 19/64" | | 0.7<br>0.9 | 1.5<br>2.0 |

| ④ End sleeve | Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2" CR38R28NZ<br>2.5" CR38R32NZ2 | 73<br>75 | 2 7/82"<br>2 61/64" | 181<br>181 | 7 1/8"<br>7 1/8" | | 2.7<br>5.6 | 59.<br>12.3 |

| ⑤ Front adapter | Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2" FA-KE60-210<br>2.5" FA-KE76-212 | 73<br>89 | 2 7/8"<br>3 1/2" | 250<br>250 | 9 27/32"<br>9 27/32" | | 3.5<br>4.7 | 7.7<br>10.3 |

| ⑥ Front collar | Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2" FC-R73/34-211<br>2.5" FC-R89/40-213 | 73<br>89 | 2 7/8"<br>3 1/2" | 307<br>307 | 12' 5/64"<br>12' 5/64" | | 7.9<br>11.9 | 17.4<br>26.2 |

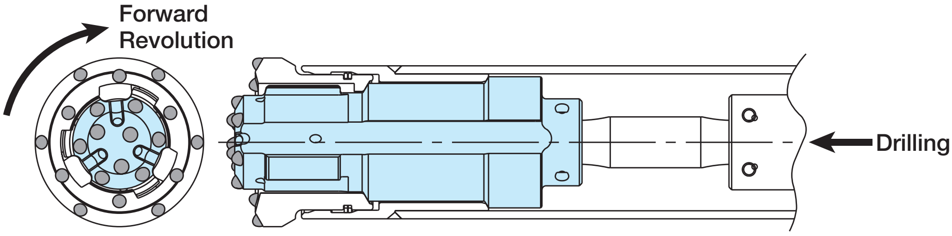
| ⑦ Casing pipe | Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|---|
|  | 2"<br>2.5" | 60.5<br>76.3 | 2 3/8"<br>3' | 5500<br>5500 | 18' 17/32"<br>18' 17/32" | Carbon steel pipe (t=3)<br>Carbon steel pipe (t=4) | 29.0<br>41.0 | 63.8<br>90.2 |

# ULTRA MAXBIT

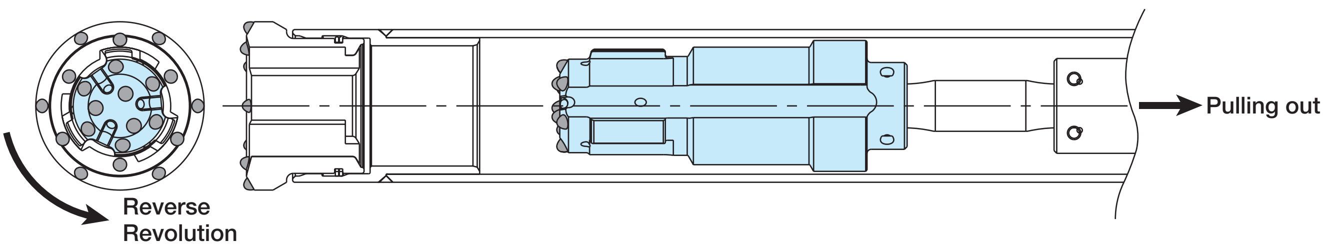
PAT.No. 3709476

ULTRA MAXBIT consists of a ring bit and a pilot bit.
Ring bit has a unique thread connection.
Its strong connection enables easy lock-unlock action and a pilot bit moves independently from a ring bit while flushing cuttings out of a casing pipe.

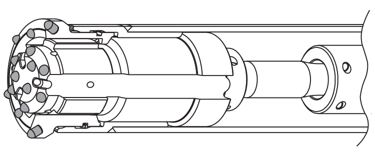
## Drilling position（Locked）



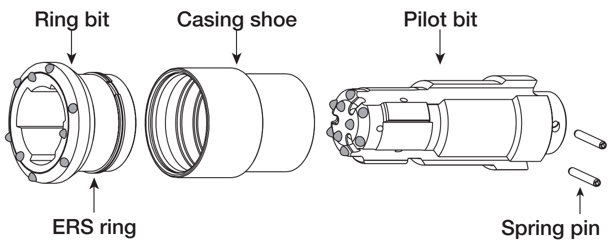

## Pull out position



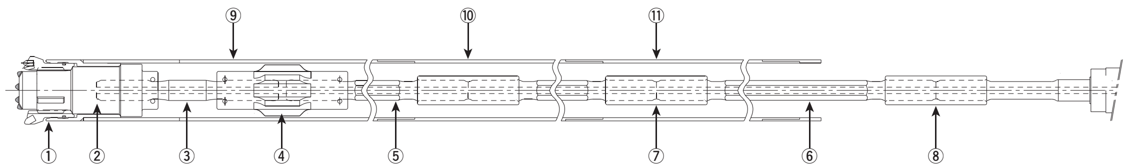

## Assembly



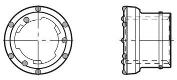
## Components



## Standard 4" UMB system

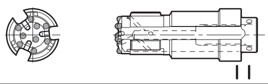



### ① UMB (Ring bit)



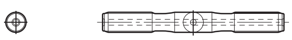
| Part No. | Gauge size mm | Gauge size in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| Standard：UL125BB76 | 125 | 4 29/32" | 92 | 3 5/8" | | 2.7 | 5.9 |
| Heavy duty：UL125R76 | 125 | 4 29/32" | 92 | 3 5/8" | | 2.8 | 6.2 |

### ② UMB (Pilot bit)



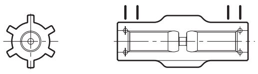
| Part No. | Guide O.D. mm | Guide O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| Standard：UD38MP70BB | 98 | 3 55/64" | 266 | 10 15/32" | | 8.5 | 18.7 |
| Heavy duty：UD38MP70R | 98 | 3 55/64" | 266 | 10 15/32" | | 8.5 | 18.7 |
| (Spare parts) Spring pin：SP-8×45 | | | | | 2pcs | 0.02 | 0.04 |

### ③ Short rod



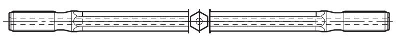
| Part No. | Body section | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|
| ER38M38-340 | Round38 | 340 | 13 25/64" | | 2.6 | 5.7 |

### ④ Wing sleeve



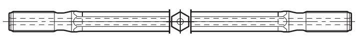
| Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| CM38FZ2 | 95 | 3 47/64" | 245 | 10" | | 6.2 | 13.6 |
| (Spare parts) Spring pin：SP-8×45 | | | | | 4pcs | 0.04 | 0.09 |

### ⑤ First rod



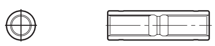
| Part No. | Body section | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|
| EH32M38-3660L | Hex.32 | 3660 | 12' | | 21.4 | 47.1 |
| ※EH32M38-4000L | Hex.32 | 4000 | 13'1 31/64" | | 23.5 | 51.7 |

### ⑥ Extension rod



| Part No. | Body section | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|
| EH32M38-3050L | Hex.32 | 3050 | 10' | | 17.7 | 38.9 |

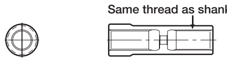
### ⑦ Coupling



| Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| CM38AG | 54 | 2 1/8" | 190 | 7 15/32" | | 1.9 | 4.2 |

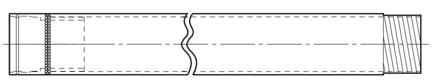
### ⑧ End sleeve

Same thread as shank adapter



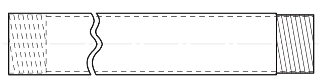
| Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| CR38M38AG | 60 | 2 23/64" | 195 | 7 43/64" | | 2.0 | 4.8 |
| CM38AG | 54 | 2 1/8" | 190 | 7 15/32" | | 1.9 | 4.2 |

### ⑨ First casing with shoe



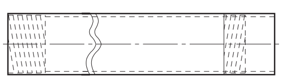
| Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| SA114-3770U | 114.3 | 4 2/3" | 3840<br>3770 | 12'7 11/64"<br>12'4 27/64" | Steel pipe | 62.0 | 136.4 |

### ⑩ Middle casing



| Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| SB114-3050 | 114.3 | 4 2/3" | 3120<br>3050 | 10'2 53/64"<br>10' | Steel pipe | 48.5 | 106.7 |

### ⑪ End casing with cap

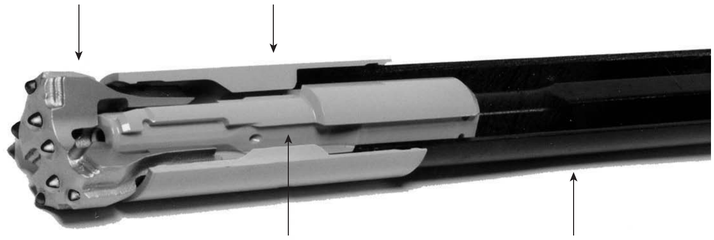


| Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
| SC114-3050 | 114.3 | 4 2/3" | 3050 | 10' | Steel pipe | 49.0 | 107.8 |
| VC114-3050 | 114.0 | 4 2/3" | 3050 | 10' | Plastic pipe | 9.3 | 20.5 |

※in case without ③ and ④

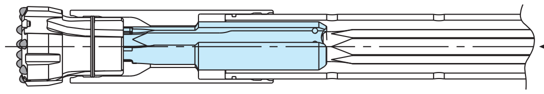
# MICRO CASINGBIT

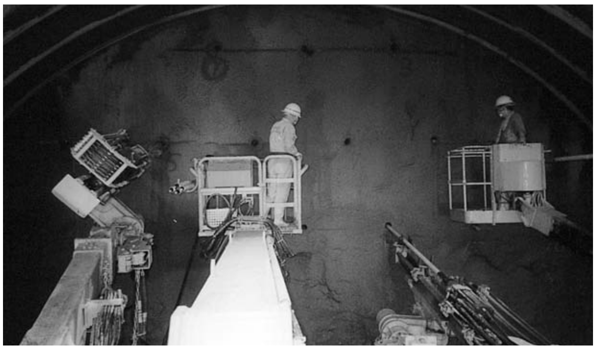
PAT.No. 37903881



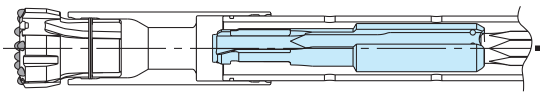

Smallest concentrical drilling system in the world.
applie for longer holes such as face bolting, geological survey and drainage holes.
Maximum record : 50m horizontal hole in Japan.
Plastic casing pipes can be used in Multi slide system.

## Drilling position (Locked)

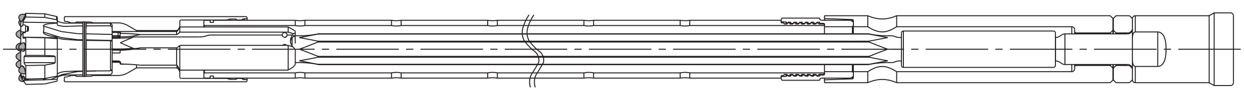


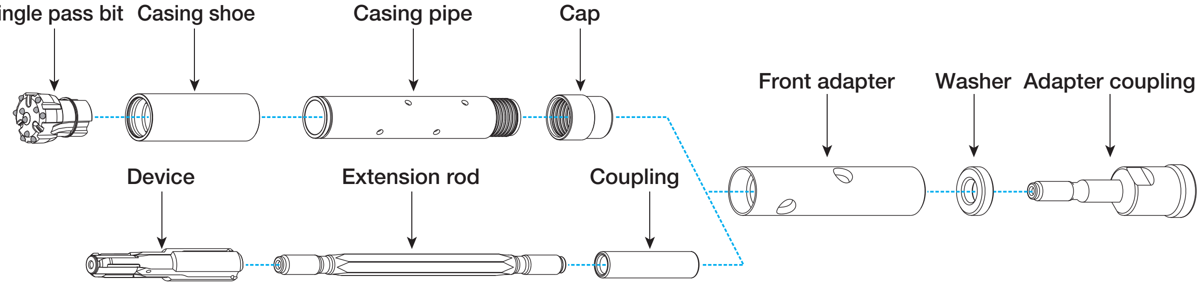
## Pull out position (Unlocked)



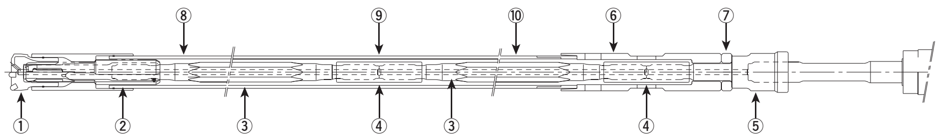

## Assembly

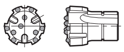


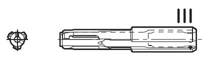
## Components

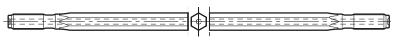


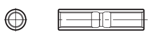
## Standard 2" & 2.5" MCB system

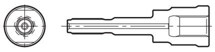


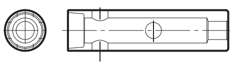

| ① MCB (Single pass bit) | Part No. | Gauge size mm | Gauge size in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2" SP50-37P75<br>2.5" SP65-47P90 | 75<br>90 | 2 61/64"<br>3 35/64" | 100<br>106 | 3 15/16"<br>4 11/64" | | 1.5<br>2.6 | 3.3<br>5.7 |

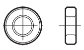
| ② MCB (Device) | Part No. | Guide O.D. mm | Guide O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2" SP50M28-37<br>2.5" SP65M28-47 | 46.5<br>57.5 | 1 53/64"<br>2 17/64" | 255<br>260 | 10 3/64"<br>10 15/64" | | 16.<br>2.5 | 3.5<br>3.5 |
| | (Spare parts)<br>( 2") Spling pin : SP-5X25<br>(2.5") Spling pin : SP-5X28 | | | | | 3pcs<br>3pcs | 0.01<br>0.01 | 0.02<br>0.02 |

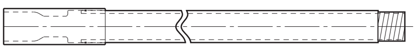
| ③ Extension rod | Part No. | Body section | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|
|  | EH28M28-3050 | Hex.28 | 3050 | 10' | | 14.4 | 31.7 |

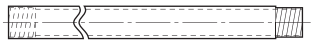
| ④ Coupling sleeve | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | CM28AG | 38 | 1 1/2" | 160 | 6 19/64" | | 0.7 | 1.5 |

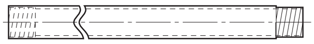
| ⑤ Adapter coupling | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | AM28R38TR2<br>AM28M38TR2 | 76<br>76 | 3'<br>3' | 265<br>265 | 10 7/16"<br>10 7/16" | | 3.4<br>3.4 | 7.5<br>7.5 |

| ⑥ Front adapter | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2" AKE60-300<br>2.5" AKE76-300Z | 76<br>89 | 3'<br>3 1/2" | 300<br>300 | 11 13/16"<br>11 13/16" | | 6.1<br>8.8 | 13.4<br>19.4 |

| ⑦ Washer | Part No. | O.D. mm | O.D. in | Overall length mm | Overall length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | D70-20 | 70 | 2 3/4" | 20 | 25/32" | | 0.4 | 0.9 |

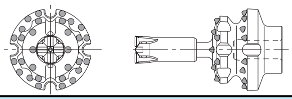
| ⑧ First casing with shoe | Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2" SA60-2995<br>VA60-2995<br>2.5" SA65-2995 | 68.1/60.5<br>68.1/60.0<br>85/76.3 | 2 11/16", 2 3/8"<br>2 11/16", 2 23/64"<br>3 11/32", 3' | 3040/2995<br>3040/2995<br>3040/2995 | 9' 11 11/16", 9' 9 29/32"<br>9' 11 11/16", 9' 9 29/32"<br>9' 11 11/16", 9' 9 29/32" | Steel pipe<br>Steel pipe & Plastic pipe<br>Steel pipe | 23<br>5.5<br>32.5 | 50.6<br>12.1<br>71.5 |

| ⑨ Middle casing | Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2" SB60-3050<br>VB60-3050<br>2.5" SB65-3050 | 60.5<br>60.0<br>76.3 | 2 3/8"<br>2 23/64"<br>3' | 3095/3050<br>3095/3050<br>3095/3050 | 10' 1 27/32", 10'<br>10' 1 27/32", 10'<br>10' 1 27/32", 10' | Steel pipe<br>Plastic pipe<br>Steel pipe | 22.5<br>3.5<br>31.5 | 49.5<br>7.7<br>69.3 |

| ⑩ End casing with cap | Part No. | O.D. mm | O.D. in | Overall length/Effective length mm | Overall length/Effective length in | Remarks | Approx.weight kg | Approx.weight lb |
|---|---|---|---|---|---|---|---|---|
|  | 2i" SC60-3050<br>VC60-3050<br>2.5" SC65-3050 | 60.5<br>60.0<br>76.3 | 2 3/8"<br>2 23/64"<br>3' | 3095/3050<br>3095/3050<br>3095/3050 | 10' 1 27/32", 10'<br>10' 1 27/32", 10'<br>10' 1 27/32", 10' | Steel pipe<br>Plastic pipe<br>Steel pipe | 22.5<br>3.5<br>31.5 | 49.5<br>7.7<br>69.3 |

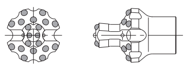
# ACCESSORY

## ① Reaming equipment (4")



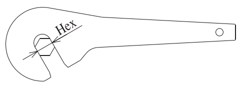
| Part No. | Gauge size (mm) | Gauge size (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
| WM38P150SAZ-51L | 153 | 6 1/32" | 275 | 10 53/64" | | 11.5 | 25.3 |

## ② Reaming bit (2" & 2.5")



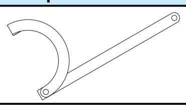
| Part No. | Gauge size (mm) | Gauge size (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
| WM28P102-45R | 102 | 4' | 104.5 | 4 7/64" | | 4.0 | 8.8 |
| WR32P102-45R | 102 | 4' | 104.5 | 4 7/64" | | 4.0 | 8.8 |

## ③ Rod wrench



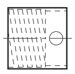

| Part No. | Body section | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|
| RW-H28 | Hex.28 | 430 | 16 59/64" | | 3.8 | 8.4 |
| RW-H32 | Hex.32 | 430 | 16 59/64" | | 5.2 | 11.4 |

## ④ Pipe wrench



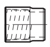
| Part No. | Applicable dia. (mm) | Applicable dia. (in) | Overall length | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|
| PW-114 | 114.3 | 4 1/2" | | 4" | 3.3 | 7.3 |
| PW-76 | 76.3 | 3' | | 2.5" | 1.5 | 3.3 |
| PW-60 | 60.5 | 3/8" | | 2" | 1.5 | 3.3 |

## ⑤ Protection cap



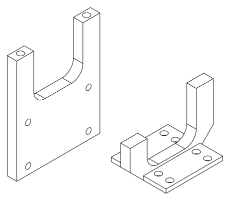
| Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
| 4" HC-4 | 114.3 | 4 2/3" | 120 | 4 23/32" | t=6.0 (15"/64) | 1.1 | 2.4 |

## ⑥ Protection cap



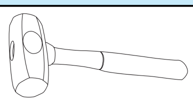
| Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
| 2" SP50-CAP | 65 | 2 9/16" | 75 | 2 61/64" | | 0.6 | 1.3 |
| 2.5" SP65-CAP | 76 | 3' | 115 | 4 1/2" | | 1.0 | 2.2 |

## ⑦ Centralizer



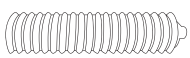
| Part No. | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|
| CR-FR | Furukawa | 17.7 | 38.9 |
| CR-AT | Atlas Copco | 21.0 | 46.2 |
| CR-TM | Sandvik Tamrock | 31.2 | 68.6 |

## ⑧ Hammer (Commercial item)



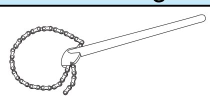
| Part No. | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|
| WH-295 | | 1.3 | 2.9 |

## ⑨ Molybdenum grease (Commercial item)



| Part No. | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|
| MG-400 | 1box (400g cartridge ×20pcs) | 8.0 | 17.6 |

## ⑩ Chain tongs (Commercial item)



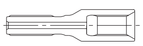
| Part No. | Body overall length (mm) | Body overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|
| CT-51 | 515 | 1'8 9/32" | | 2.7 | 5.9 |

## ⑪ Jig



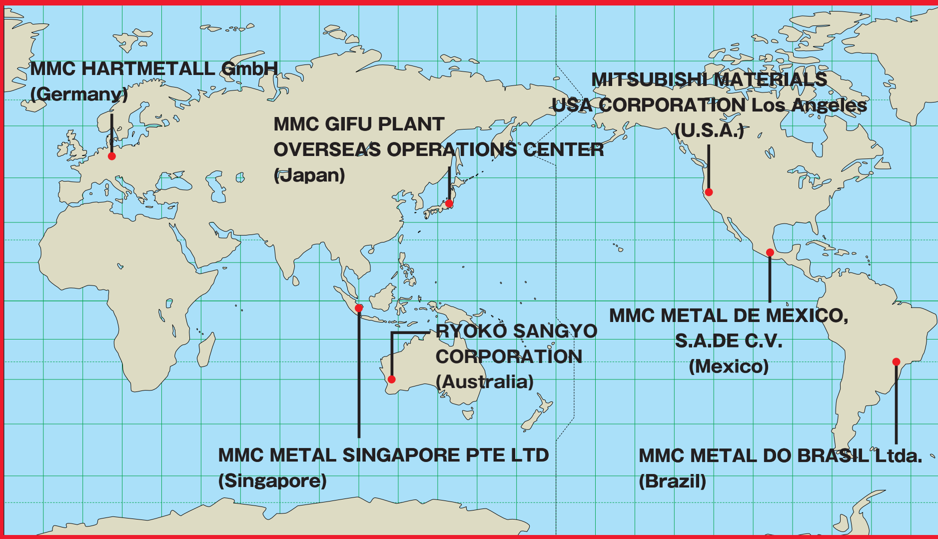
| Part No. | O.D. (mm) | O.D. (in) | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|---|
| PUSHER-5 | 13 | 33/64" | 120 | 4 23/32" | $\phi$5 | 0.06 | 0.13 |
| PUSHER-8 | 16 | 5/8" | 145 | 5 45/64" | $\phi$8 | 0.11 | 0.24 |

## ⑫ Fishing tool



| Part No. | Thread | Overall length (mm) | Overall length (in) | Remarks | Approx.weight (kg) | Approx.weight (lb) |
|---|---|---|---|---|---|---|
| AM38M38AGFZ | 38M | 240 | 9 29/64" | | 2.6 | 5.7 |

## Advanced Manufacturing Methods For Consistently Higher Quality

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