

Specialists for Overburden Drilling Products

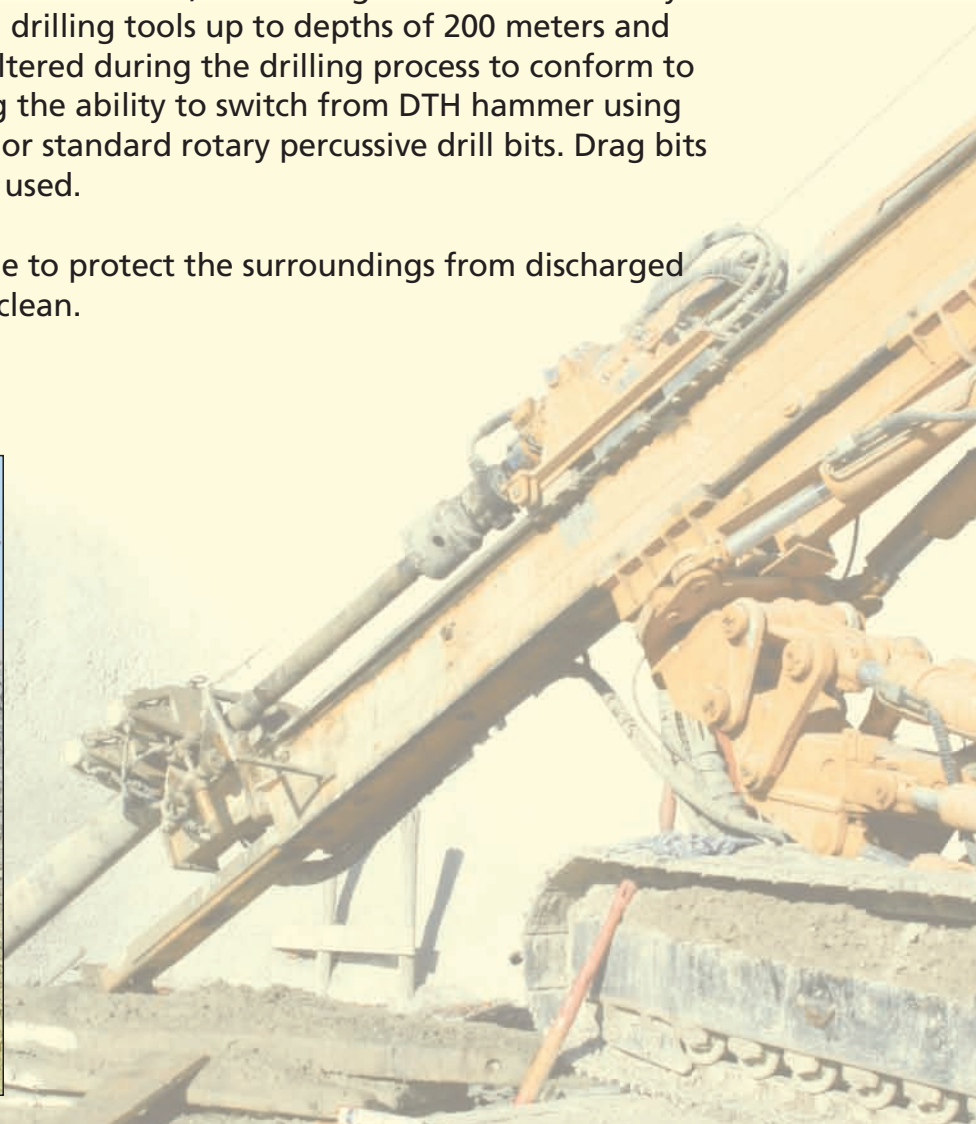
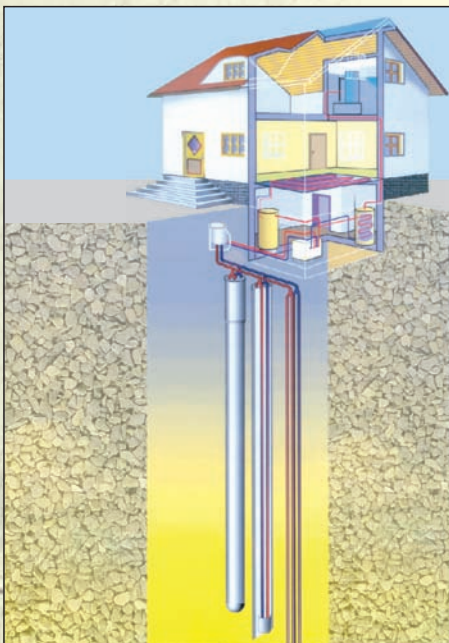
Geothermal Drilling Systems D 146 – D 219.1 with double head drilling unit

Geothermal energy is very popular at the moment and is provided by Geothermal loops coupled to geothermal energy pumps. The drilling process is very challenging as there are ground layers with different hydraulic characteristics and pressure conditions to pass through. Therefore this type drilling is mostly carried out using double head drilling units with independently counter rotating rods.

The outer rods, also called protection rods, are only used for drilling in overburden conditions or broken formations. Then, the drilling will be continued by inner rods with corresponding drilling tools up to depths of 200 meters and more. The drill string can be altered during the drilling process to conform to certain requirements including the ability to switch from DTH hammer using standard drill bits to eccentric or standard rotary percussive drill bits. Drag bits or Rock Roller bits can also be used.

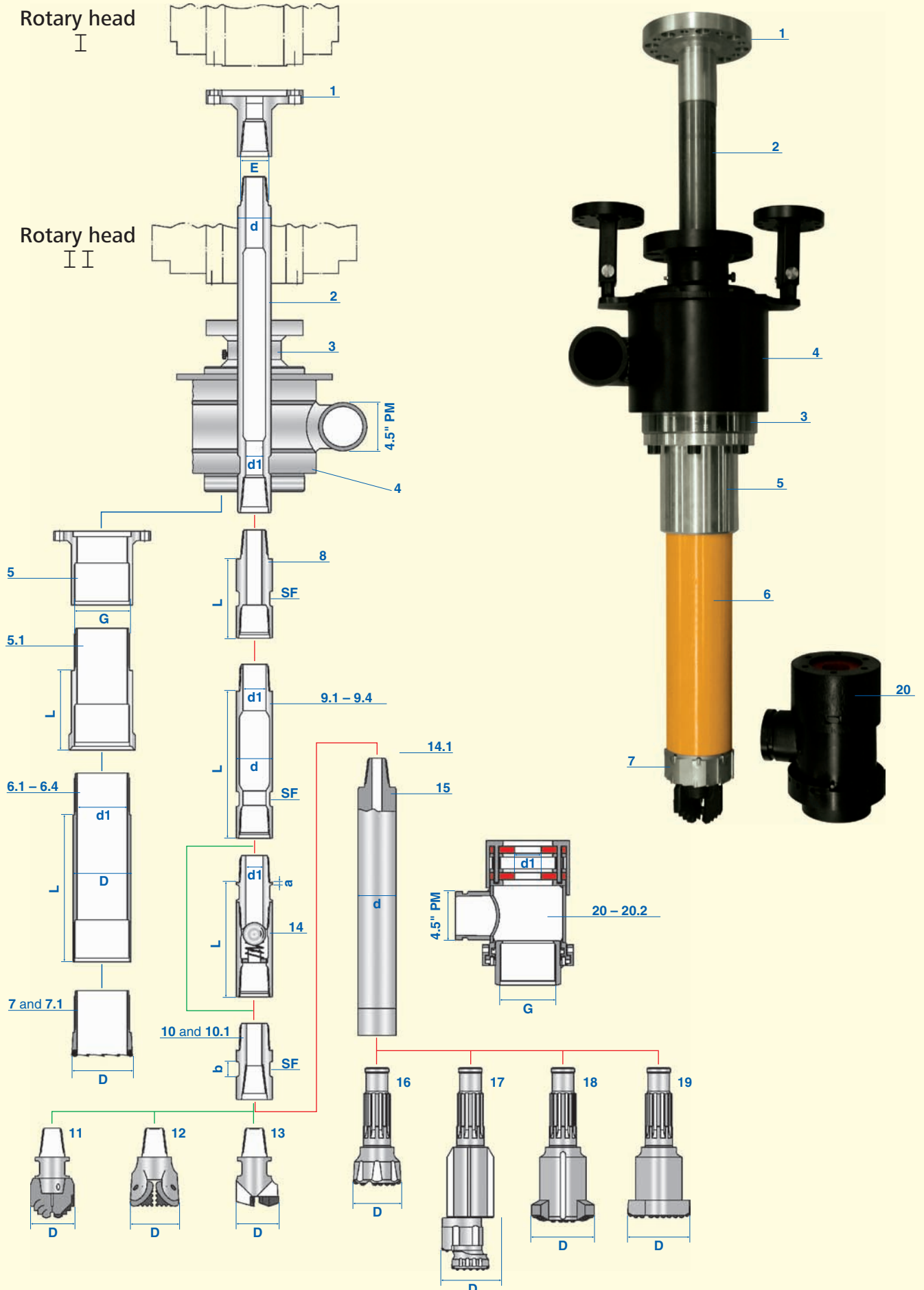
Special preventers are available to protect the surroundings from discharged borings and keep the job site clean.

Example of application:



Geothermal Drilling Systems

with double rotary drilling unit



Geothermal Drilling System D 146

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 146, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 146, 2 starts, cyl. LHT male/female (G) x 300mm length with feed hopper
6	Casing D 146, 2 starts, cyl. LHT x 10mm wth x 123mm (d1). Quality tubes: S355J2H; Welding ends: high tempered steel, MIG welded to tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 146, 2 starts, cyl. LHT male x D 155mm, button type, wear protection
7.1	Casing bit D 146, 2 starts, cyl. LHT male x D 155mm, with special TC inserts, wear protection
8	Wear part d 88.9, 1 start, cyl. RHT male/female x 300mm length with spanner flat
9	Rotary tubes d 88.9, 1 start, cyl. RHT x 8.8mm wth x 56mm (d1) with groove D = 75mm x 20mm width on female side. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 88.9, 1 start, cyl. RHT male x female thread suitable to pos. 12
10.1	Adaptor d 88.9, 1 start, cyl. RHT male x female thread suitable to pos. 15
11	Rotary bit d 88.9, 1 start, cyl. RHT male x D 120mm, 3 wings, stepped form, TC fitted
12	Roller bit d 88.9, 2 7/8" API Reg. male thread x D 120.7mm (4 3/4")
13	Rotary bit d 88.9, 1 start, cyl. RHT male x D 120mm, 3 wings, fitted with TC plates
14	Back pressure valve d 88.9, 1 start, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 92mm x connecting thread 2 3/8" API Reg. male
16	DTH hammer drill bit D = 120mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 115" x D 148mm/115mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 115" x D 148mm/115mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 115" x D 148mm/115mm, button type, shaft according to DTH hammer
20	Soil preventer D 146, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 146, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 146, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 88.9, 1 start, cyl. RHT male

Fishing bell d 88.9, 1 start, cyl. RHT male

Spanner SW 65 x 500mm length

Lifting cap d 88.9, 1 start, cyl. RHT female

Lifting cap D 146, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.

Geothermal Drilling System D 152.4

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 152.4, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 152.4, 2 starts, cyl. LHT male/female x 300mm length with feed hopper
6	Casing D 152.4, 2 starts, cyl. LHT x 10mm wth x 130mm (d1). Quality tubes: S355J2H; Welding ends: high tempered steel, MIG welded to tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 152.4, 2 starts, cyl. LHT male x D 160mm, button type, wear protection
7.1	Casing bit D 152.4, 2 starts, cyl. LHT male x D 160mm, with special TC inserts, wear protection
8	Wear part d 88.9, 1 start, cyl. RHT male/female x 300mm length with spanner flat
9	Rotary tubes d 88.9, 1 start, cyl. RHT x 8.8mm wth x 56mm (d1) with groove D = 75mm x 20mm width on female side. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 88.9, 1 start, cyl. RHT male x female thread suitable to pos. 12
10.1	Adaptor d 88.9, 1 start, cyl. RHT male x female thread suitable to pos. 15
11	Rotary bit d 88.9, 1 start, cyl. RHT male x D 125mm, 3 wings, stepped form, TC fitted
12	Roller bit d 88.9, 2 7/8" API Reg. male thread x D 120.7mm (4 3/4")
13	Rotary bit d 88.9, 1 start, cyl. RHT male x D 125mm, 3 wings, fitted with TC plates
14	Back pressure valve d 88.9, 1 start, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 92mm x connecting thread 2 3/8" API Reg. male
16	DTH hammer drill bit D = 127mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 130" x D 162mm/125mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 130" x D 165mm/127mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 130" x D 165mm/127mm, button type, shaft according to DTH hammer
20	Soil preventer D 152.4, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 152.4, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 152.4, 2 starts, cyl. LHT female (G) x d 88.9 (d1 = 80mm) x connection 4.5" PM. Thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 88.9, 1 start, cyl. RHT male

Fishing bell d 88.9, 1 start, cyl. RHT male

Spanner SW 65 x 500mm length

Lifting cap d 88.9, 1 start, cyl. RHT female

Lifting cap D 152.4, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.

Geothermal Drilling System D 168.3

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 168.3, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 168.3, 2 starts, cyl. LHT male/female x 300mm length with feed hopper
6	Casing D 168.3, 2 starts, cyl. LHT x 10mm wth x 145mm (d1). Quality tubes: S355J2H; Welding ends: high tempered steel, either friction welded or MIG welded on tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 168.3, 2 starts, cyl. LHT male x D 170mm, button type, wear protection
7.1	Casing bit D 168.3, 2 starts, cyl. LHT male x D 170mm, with special TC inserts, wear protection
8	Wear part d 114.3, 2 starts, cyl. RHT male/female x 300mm length with spanner flat
9	Rotary tubes d 114.3, 2 starts, cyl. RHT x 8.8mm wth x 80mm (d1) with groove D = 101mm x 20mm width. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 12
10.1	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 15
11	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 140mm, 3 wings, stepped form, TC fitted
12	Roller bit d 114.3, 3 1/2" API Reg. male thread x D 142.8mm (5 5/8")
13	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 140mm, 3 wings, fitted with TC plates
14	Back pressure valve d 114.3, 2 starts, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 121mm x connecting thread 3 1/2" API Reg. male
16	DTH hammer drill bit D = 140mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 140" x D 178mm/140mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 140" x D 185mm/141mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 140" x D 180mm/140mm, button type, shaft according to DTH hammer
20	Soil preventer D 168.3, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 168.3, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 168.3, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 114.3, 2 starts, cyl. RHT male

Fishing bell d 114.3, 2 starts, cyl. RHT male

Spanner SW 95 x 500mm length

Lifting cap d 114.3, 2 starts, cyl. RHT female

Lifting cap D 168.3, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.

Geothermal Drilling System D 177.8

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 177.8, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 177.8, 2 starts, cyl. LHT male/female x 300mm length with feed hopper
6	Casing D 177.8, 2 starts, cyl. LHT x 10mm wth x 154mm (d1). Quality tubes: S355J2H; Welding ends: High tempered steel, threads machined into tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 177.8, 2 starts, cyl. LHT male x D 185mm, button type, wear protection
7.1	Casing bit D 177.8, 2 starts, cyl. LHT male x D 185mm, with special TC inserts, wear protection
8	Wear part d 114.3, 2 starts, cyl. RHT male/female x 300mm length with spanner flat
9	Rotary tubes d 114.3, 2 starts, cyl. RHT x 8.8mm wth x 80mm (d1) with groove D = 101mm x 20mm width. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 12
10.1	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 15
11	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 150mm, 3 wings, stepped form, TC fitted
12	Roller bit d 114.3, 3 1/2" API Reg. male thread x D 149.2mm (5 7/8")
13	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 150mm, 3 wings, fitted with TC plates
14	Back pressure valve d 114.3, 2 starts, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 121mm x connecting thread 3 1/2" API Reg. male
16	DTH hammer drill bit D = 150mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 140" x D 178mm/150mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 140" x D 190mm/149mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 150" x D 189mm/149mm, button type, shaft according to DTH hammer
20	Soil preventer D 177.8, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 177.8, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 177.8, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 114.3, 2 starts, cyl. RHT male

Fishing bell d 114.3, 2 starts, cyl. RHT male

Spanner SW 95 x 500mm length

Lifting cap d 114.3, 2 starts, cyl. RHT female

Lifting cap D 177.8, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.

Geothermal Drilling System D 203

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 203, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 203, 2 starts, cyl. LHT male/female x 300mm length with feed hopper
6	Casing D 203, 2 starts, cyl. LHT x 10mm wth x 180mm (d1). Quality tubes: S355J2H; Welding ends: tempered steel, threads MIG welded to tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 203, 2 starts, cyl. LHT male x D 210mm, button type, wear protection
7.1	Casing bit D 203, 2 starts, cyl. LHT male x D 210mm, with special TC inserts, wear protection
8	Wear part d 114.3, 2 starts, cyl. RHT male/female x 300mm length with spanner flat
9	Rotary tubes d 114.3, 2 starts, cyl. RHT x 8.8mm wth x 80mm (d1) with groove D = 101mm x 20mm width. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 12
10.1	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 15
11	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 175mm, 3 wings, stepped form, TC fitted
12	Roller bit d 114.3, 3 1/2" API Reg. male thread x D 171.5mm (5 7/8")
13	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 175mm, 3 wings, fitted with TC plates
14	Back pressure valve d 114.3, 2 starts, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 121mm x connecting thread 3 1/2" API Reg. male
16	DTH hammer drill bit D = 175mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 140" x D 210mm/167mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 165" x D 212mm/165mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 165" x D 211mm/165mm, button type, shaft according to DTH hammer
20	Soil preventer D 203, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 203, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 203, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 114.3, 2 starts, cyl. RHT male

Fishing bell d 114.3, 2 starts, cyl. RHT male

Spanner SW 95 x 500mm length

Lifting cap d 114.3, 2 starts, cyl. RHT female

Lifting cap D 203, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.

Geothermal Drilling System D 219.1

with double rotary drilling unit

Pos.	Description
1	Flange d 88.9, 1 start, cyl. RHT female (E), suitable for rotary head I (indicated with order)
2	Balance rod d 88.9, 1 start, cyl. RHT male/female x 56mm (d1) x 2000mm length (or according to double rotary head)
3	Ejection bell with connecting flange suitable to rotary head II as well as bolt circle suitable to flange pos. 5
4	Rotary preventer with discharge connection PM 4.5"
5	Flange D 219.1, 2 starts, cyl. LHT female (G) suitable to ejection bell, pos. 3
5.1	Wear part D 219.1, 2 starts, cyl. LHT male/female x 300mm length with feed hopper
6	Casing D 219.1, 2 starts, cyl. LHT x 10mm wth x 195mm (d1). Quality tubes: S355J2H; Welding ends: high tempered steel, threads MIG welded to tubes
6.1	3000 mm length
6.2	2000 mm length
6.3	1500 mm length
6.4	1000 mm length
7	Casing bit D 219.1, 2 starts, cyl. LHT male x D 225mm, button type, wear protection
7.1	Casing bit D 219.1, 2 starts, cyl. LHT male x D 225mm, with special TC inserts, wear protection
8	Wear part d 114.3, 2 starts, cyl. RHT male/female thread x 300mm length with spanner flat
9	Rotary tubes d 114.3, 2 starts, cyl. RHT x 8.8mm wth x 80mm (d1) with groove D = 101mm x 20mm width. Quality tubes: S355J2H; Welding ends: high tempered steel, surface nitrated. Welding ends friction welded to tubes
9.1	3000 mm length
9.2	2000 mm length
9.3	1500 mm length
9.4	1000 mm length
10	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 12
10.1	Adaptor d 114.3, 2 starts, cyl. RHT male x female thread suitable for pos. 15
11	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 190mm, 3 wings, stepped form, TC fitted
12	Roller bit d 114.3, 3 1/2" API Reg. male thread x D 193.7mm (7 5/8")
13	Rotary bit d 114.3, 2 starts, cyl. RHT male x D 190mm, 3 wings, fitted with TC plates
14	Back pressure valve d 114.3, 2 starts, cyl. RHT male/female x length adjusted to length of DTH hammer (indicated with order), opening in female direction (optional)
14.1	Shock absorber for DTH hammer pos. 15 (without picture)
15	DTH hammer d = 146mm x connecting thread 3 1/2" API Reg. male
16	DTH hammer drill bit D = 190mm, button type, shaft according to DTH hammer type
17	DTH hammer drill bit "EBEX 190" x D 237mm/191mm, button type, shaft according to DTH hammer
18	DTH hammer drill bit "Super Jaws T 190" x D 237mm/191mm, button type, shaft according to DTH hammer
19	DTH hammer drill bit "Super Maxbit 190" x D 237mm/191mm, button type, shaft according to DTH hammer
20	Soil preventer D 219.1, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Standard version
20.1	Soil preventer D 219.1, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) seperable with bayonet lock
20.2	Soil preventer D 219.1, 2 starts, cyl. LHT female (G) x d 114.3 (d1 = 100mm) x connection 4.5" PM. Thread (G) and sealing part seperable with bayonet lock

Tools

Fishing tap d 114.3, 2 starts, cyl. RHT male

Fishing bell d 114.3, 2 starts, cyl. RHT male

Spanner SW 95 x 500mm length

Lifting cap d 114.3, 2 starts, cyl. RHT female

Lifting cap D 219.1, 2 starts, cyl. LHT female

Signs & Symbols

LHT = left hand thread; RHT = right hand thread; D = outer diameter; d = diameter inner tube; cyl. = cylindrical; con. = conical
SF = spannerflat; L = length; wth = wall thickness; G = thread connection outer tube; E = thread connection inner tube.

The following threads are on offer: right hand, left hand, cylindrical or conical. All casings can be made friction-welded.

Please note that this production sheet shows only standard versions due to the many possible tool variations. Special designs on request.