



DRILLING TECHNIQUE

FOR THE SPECIAL
FOUNDATION INDUSTRY

DRILLING TECHNIQUE

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- 1 · OVERBURDEN DRILLING SYSTEM
with rotary drill head unit
- 2 · OVERBURDEN DRILLING SYSTEM
with hydraulic drifter
- 3 · OVERBURDEN DRILLING SYSTEM
with double head drilling unit (rotary / rotary)
- 4 · OVERBURDEN DRILLING SYSTEM
with double head drilling unit (rotary / rotary-percussion)
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with double head drilling unit (rotary / rotary)
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with rotary drill head unit and hydraulic chuck
- 11 · GEOTHERMAL DRILLING SYSTEM
with Double Head Unit (Rotary/Rotary)
- 12 · REVERSE CIRCULATION DRILLING SYSTEM
- 13 · PRODUCT FOCUS
drill bits, discharge preventers, flushing heads etc.

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OVERBURDEN DRILLING SYSTEM

with rotary drill head unit

1 OVERBURDEN DRILLING SYSTEM DUPLEX D 88.9 mm – 323.9 mm (3-1/2" – 12-3/4") with rotary drill head unit



A method of drilling through the overburden with the aid of an outer casing to support the borehole wall is the so-called duplex drilling process. The system depicted here is drilled simultaneously with outer casings and inner rods and driven by a rotary head unit.

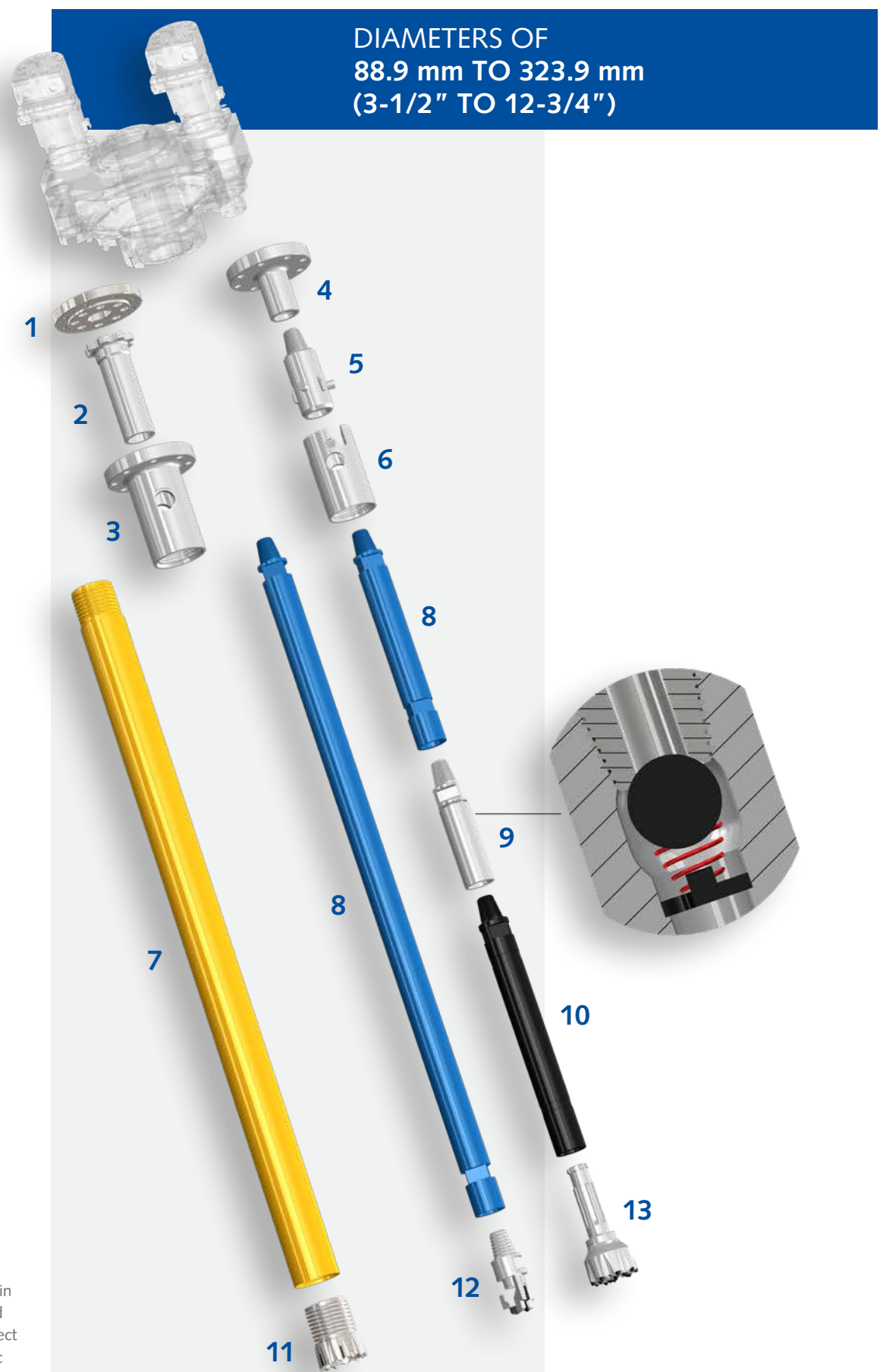
The flushing for the discharge of the cuttings is directed through the centre of the inner drill string, conveyed to the toe of the borehole and carried back up the drill string, in the annular space between the inner surface of the outer casing, and the outer surface of the inner rod, above ground and expelled from the system.

Depending on the ground formations, casing bits and rotary drill bits are utilised and / or a DTH hammer as well. If the use of flushing media such as air or water are prohibited during drilling due to structural or environmental concerns, then an auger drill rod may be used to discharge the drill cuttings to surface, in a similar fashion to an Archimedean screw. In this case, the outer casings and inner auger drill rods are drilled successively. First the outer casing string and then the auger string are drilled in succession or vice versa.

There is a complete systems offering from D 88.9 mm (3-1/2") to D 323.9 mm (12-3/4") available with a wide sortiment of external casings and inner rod combinations, as well as a plethora of ground specific drill bit designs available.

OVERBURDEN DRILLING SYSTEM DUPLEX

with rotary drill head unit



COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific

- 1 Interface flange between rotary head and balancing rod
- 2 Balancing rod for the inner drill rods with interlocking teeth to connect to ejection flange
- 3 Ejection flange / bell for the outer casing with interlocking teeth to connect to balancing rod
- 4 Flange to inner rods to suit rotary head unit
- 5 Bayonet adapter connection with radial pins to inner rods
- 6 Bayonet casing bell connection with mating slots to bayonet adapter and ejection port
- 7 Rotary casing (outer drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 8 Rotary drill rods (inner drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 9 Check valve
- 10 Down-The-Hole (DTH) Hammer
- 11 Casing bit
- 12 Rotary drill bit
- 13 DTH drill bit

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



OVERBURDEN DRILLING SYSTEM with hydraulic drifter

2 OVERBURDEN DRILLING SYSTEM DUPLEX D 88.9 mm – 219.1 mm (3-1/2" – 8-5/8") with hydraulic drifter



A method of drilling through the overburden with the aid of an outer casing to support the borehole wall is the so-called duplex drilling process. The system depicted here is drilled simultaneously with outer casings and inner rods and driven by a hydraulic drifter. The drill string thus experiences both rotation and percussion.

The flushing for the discharge of the cuttings is directed through the centre of the inner drill string, conveyed to the toe of the borehole and carried back up the drill string, above ground and expelled from the system.

The hydraulic drifter rotates and transmits percussive energy from above through the complete drill string (that consists of the outer casings and inner drill rods) driving it through the overburden.

As the impact energy through the whole drill string dissipates with length, this system is suited to shallow boreholes. With the aid of flushing rings encompassing the flushing bell, a discharge preventer (diverter) may be realised that expels the drill cuttings in a controlled manner and contamination free.

There is a complete systems offering from D 88.9 mm (3-1/2") to D 219.1 mm (8-5/8") available with a wide sortiment of external casings and inner rod combinations, as well as a plethora of ground specific drill bit designs available.

OVERBURDEN DRILLING SYSTEM DUPLEX

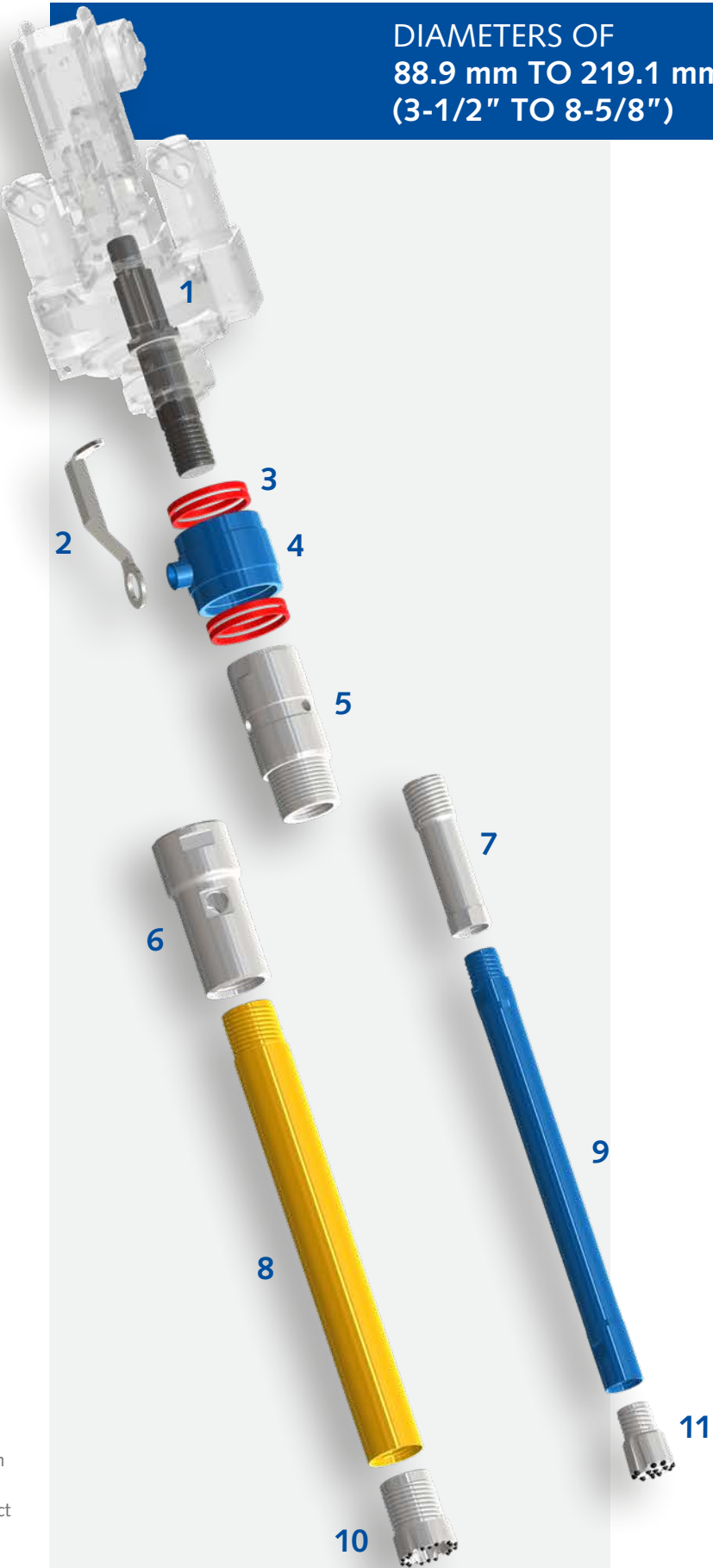
with hydraulic drifter

DIAMETERS OF
88.9 mm TO 219.1 mm
(3-1/2" TO 8-5/8")

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Shank adapter to suit hydraulic drifter brand and model
- 2 Flushing ring holder tailor-made to integrate seamlessly with brand and model of hydraulic drifter as well as drill mast characteristics
- 3 Flushing ring lip seals
- 4 Flushing ring with a suitable / incorporated hose connection
- 5 Flushing shaft to suit shank adapter, ejection bell and balancing rod
- 6 Ejection bell to suit flushing shaft and outer casings
- 7 Balancing rod to suit flushing shaft and inner drill rods
- 8 Roto-percussive casings (outer drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 9 Roto-percussive drill rods (inner drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 10 Casing bit
- 11 Percussion bit

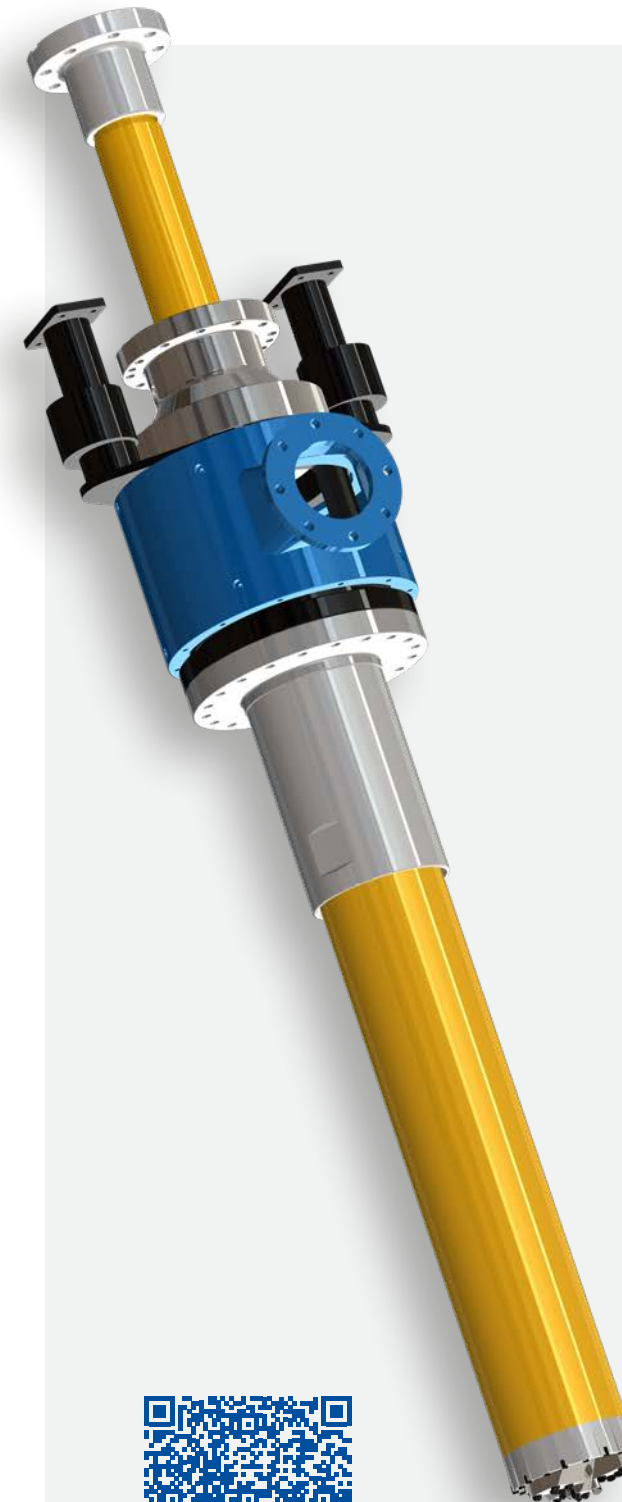
The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



OVERBURDEN DRILLING SYSTEM with double head drilling unit (rotary / rotary)

3 OVERBURDEN DRILLING SYSTEM D 88.9 mm – 323.9 mm (3-1/2" – 12-3/4") with double head unit (rotary / rotary)



Depending on the intended purpose of the borehole, for instance, to support a bored diaphragm wall, or a subterranean curtain wall, a cased drilling system is necessary to realise such a borehole. The system listed here features an external and an internal drill string, respectively, each driven independently by rotary head units that can also be moved in relation to one another.

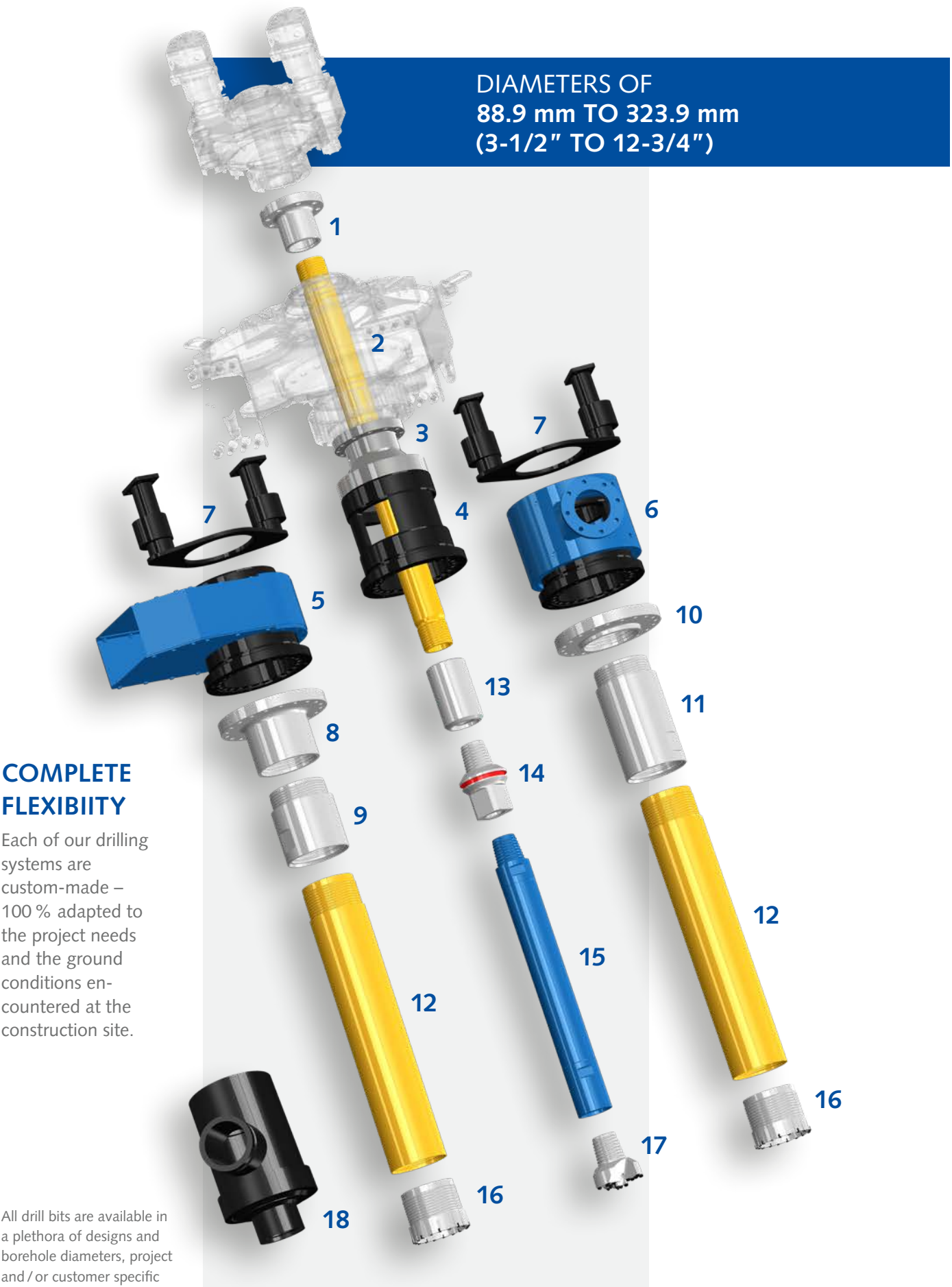
This system is characterised by outer casings and inner drill rods that rotate in opposite directions to each other. The flushing for the discharge of the cuttings is directed through the centre of the inner drill string, conveyed to the toe, of the borehole and carried back up the drill string together with the spoils, above ground and expelled from the system.

Due to the individual movement of the rotary heads on their respective slide carriages, it is possible to either drill with the inner drill string completely retracted and encased within the outer drill string, or to drill with the inner drill string leading the outer drill string acting like a pilot. The latter method results in a greater drilling accuracy.

Depending on the ground conditions, the inner rods are continuously rotated with rotary drill bits doing the cutting / drilling work, otherwise, a DTH hammer is utilised. Should flushing with air or water be prohibited due to inherent structural or environmental concerns, inner auger drill rods may be used to carry the spoils to the surface. The system is particularly suitable for deep boreholes, whilst allowing the use of extension drill bits, if preferred.

OVERBURDEN DRILLING SYSTEM

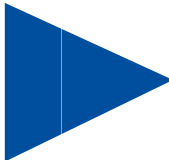
with double head unit (rotary / rotary)



COMPLETE FLEXIBIITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Flange to suit the rear rotary head unit
- 2 Balancing rod with length adapted to machine and double head
- 3 Double flange to suit front rotary head unit and balancing rod
- 4 Ejection bell
- 5 Ejection bell with splash protection
- 6 Discharge preventer / diverter
- 7 Holder / Traverse for splash protection or discharge preventer / diverter
- 8 Drive flange to suit outer casings
- 9 Adaptor-sub (thread-saver, starter casing, grout injection pipe)
- 10 Interface flange (centring flange)
- 11 Adaptor-sub (thread-saver, starter casing, grout injection pipe)
- 12 Rotary casing (outer drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 13 Adaptor-sub (thread-saver)
- 14 Injection adaptor / piston
- 15 Rotary drill rods (inner drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 16 Casing bit
- 17 Rotary drill bit
- 17.1 DTH hammer and DTH drill bit (not shown)
- 18 Soil / ground preventer – delivered with a sheath type connection, threaded connection, bayonet system or as a multi-part system

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

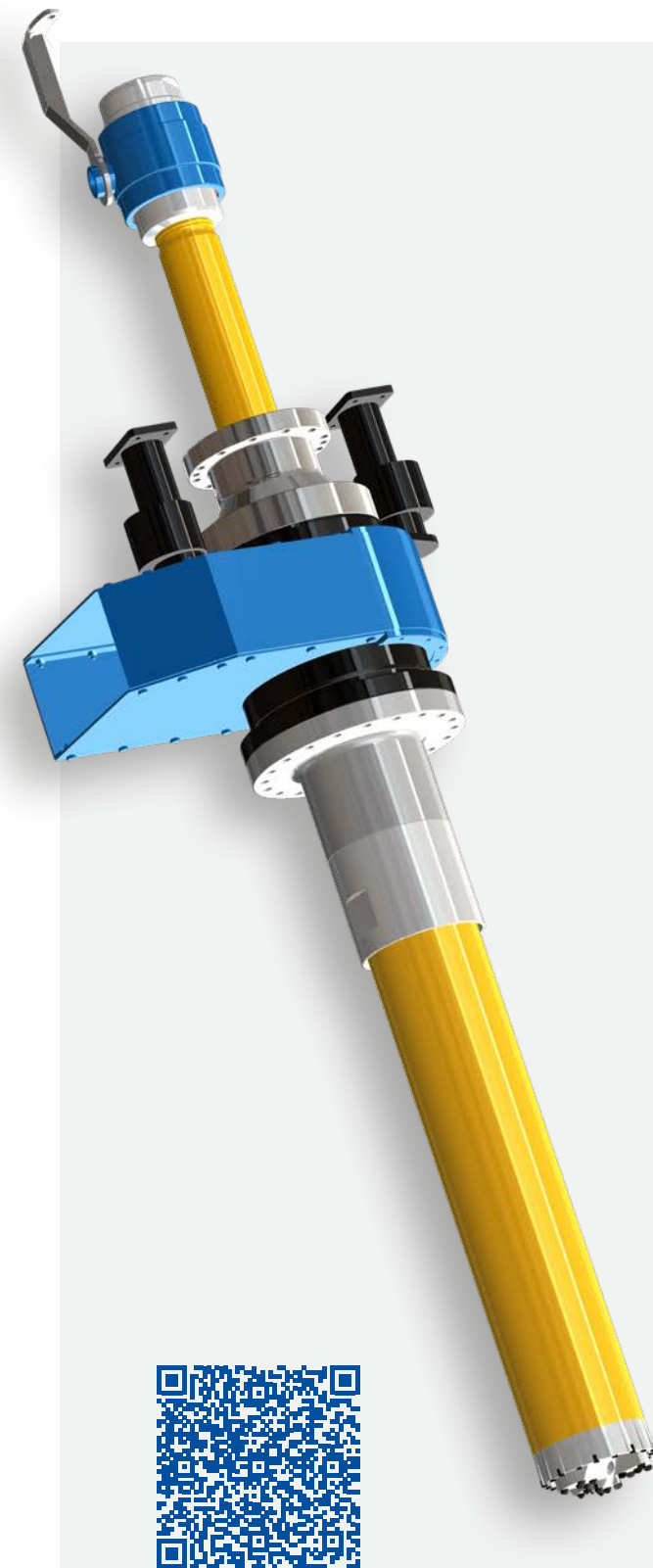
THE SYSTEM IN ACTION



OVERBURDEN DRILLING SYSTEM

with double head drilling unit (rotary / rotary-percussion)

4 OVERBURDEN DRILLING SYSTEM D 88.9 mm – 219.1 mm (3-1/2" – 8 5/8") with double head unit (rotary / rotary percussion)



Depending on the intended purpose of the borehole, for instance, to support a bored diaphragm wall, or a subterranean curtain wall, a cased drilling system is necessary to realise such a borehole. The system listed here features an external and an internal drill string, respectively. The internal drill string is driven by a hydraulic drifter, while the outer drill string is driven by a rotary head or vibro drill head unit, each drill string driven independently from the other.

This system is characterised by outer casings and inner drill rods that rotate in opposite directions to each other. The flushing for the discharge of the cuttings is directed through the centre of the inner drill string, conveyed to the toe, of the borehole and carried back up the drill string together with the spoils, above ground and expelled from the system.

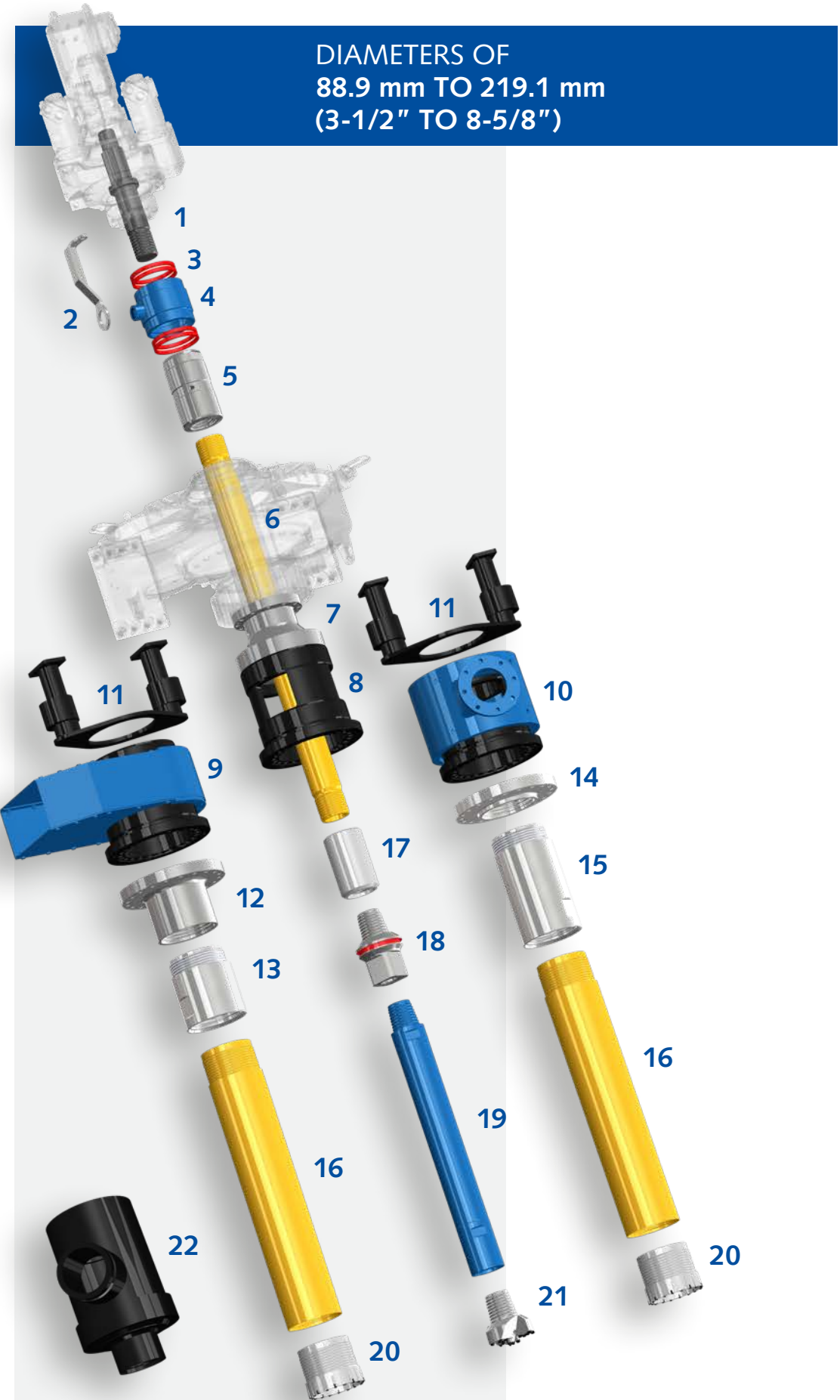
Due to the individual movement of the rotary heads on their respective slide carriages, it is possible to either drill with the inner drill string completely retracted and encased within the outer drill string, or to drill with the inner drill string leading the outer drill string acting like a pilot. The latter method results in a greater drilling accuracy. For this reason, the system is applied in canopy tube, exploratory drilling, as well as anchor drilling applications.

Depending on the ground conditions, the inner percussion rods that are continuously rotated with percussion may be simultaneously drilled with a DTH hammer. Here a specially designed flushing head, the Dual Percussive Flushing Head (DPFH) allows for the simultaneous operation of hydraulic drifter and DTH hammer.

Should flushing with air or water be prohibited due to inherent structural or environmental concerns, inner auger drill rods may be used to carry the spoils to the surface.

OVERBURDEN DRILLING SYSTEM

with double head unit (rotary / rotary percussion)



COMPLETE FLEXIBIITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific

- 1 Shank adapter to suit hydraulic drifter brand and model
- 2 Flushing ring holder taylor-made to integrate seamlessly with brand and model of hydraulic drifter as well as drill mast characteristics
- 3 Flushing ring lip seals
- 4 Flushing ring with a suitable / incorporated hose connection
- 5 Flushing shaft to suit shank adapter, ejection bell and balancing rod
- 6 Balancing rod with length adapted to machine and double head
- 7 Double flange to suit front rotary head unit and balancing rod
- 8 Ejection bell
- 9 Ejection bell with splash protection
- 10 Discharge preventer / diverter
- 11 Holder / Traverse for splash protection or discharge preventer / diverter
- 12 Drive flange to suit outer casings
- 13 Adaptor-sub (thread-saver, starter casing, grout injection pipe)
- 14 Interface flange (centring flange)
- 15 Adaptor-sub (thread-saver, starter casing, grout injection pipe)
- 16 Rotary casing (outer drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 17 Adaptor-sub (thread-saver)
- 18 Injection adaptor / piston
- 19 Rotary percussion drill rods (inner drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 20 Casing bit
- 21 Percussion drill bit
- 22 Soil / ground preventer – delivered with a sheath type connection, threaded connection, bayonet system or as a multi-part system

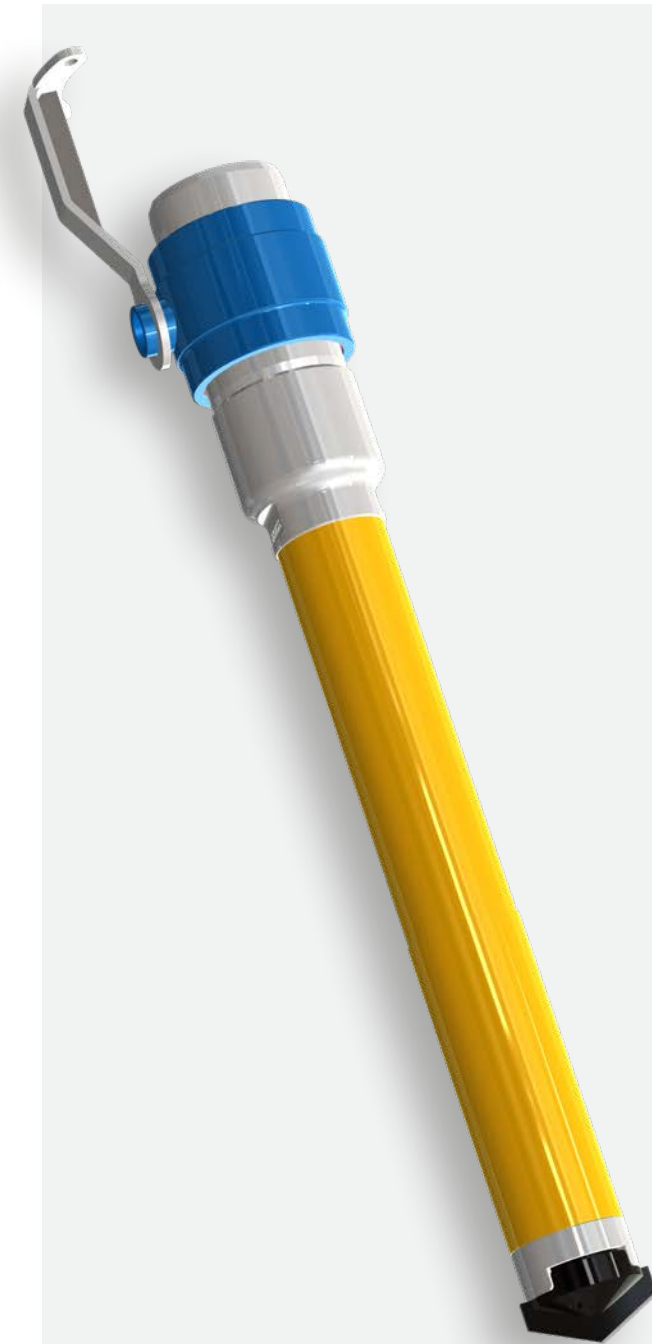
The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



DRIVE DRILLING SYSTEM with hydraulic drifter

5 DRIVE DRILLING SYSTEM D 88.9 mm – 152.4 mm (3-1/2" – 6") with hydraulic drifter



A simple method of drilling through the overburden is with the so-called drive drilling system. The system makes use of the principle of displacement, whereby a single casing is driven through the overburden with the use of a hydraulic drifter. The drill string thus experiences both rotation and percussion.

The displacement work is carried out by a cone shaped tip that fits perfectly to the end of the drill string drill, and is also constrained in the direction of rotation. Once the desired depth of the borehole has been reached, the tip is pushed off. By the pushing off of the sacrificial bit, the casing interior is freed up to allow the introduction of temporary or permanent anchors, injections, Gewi piles etc.

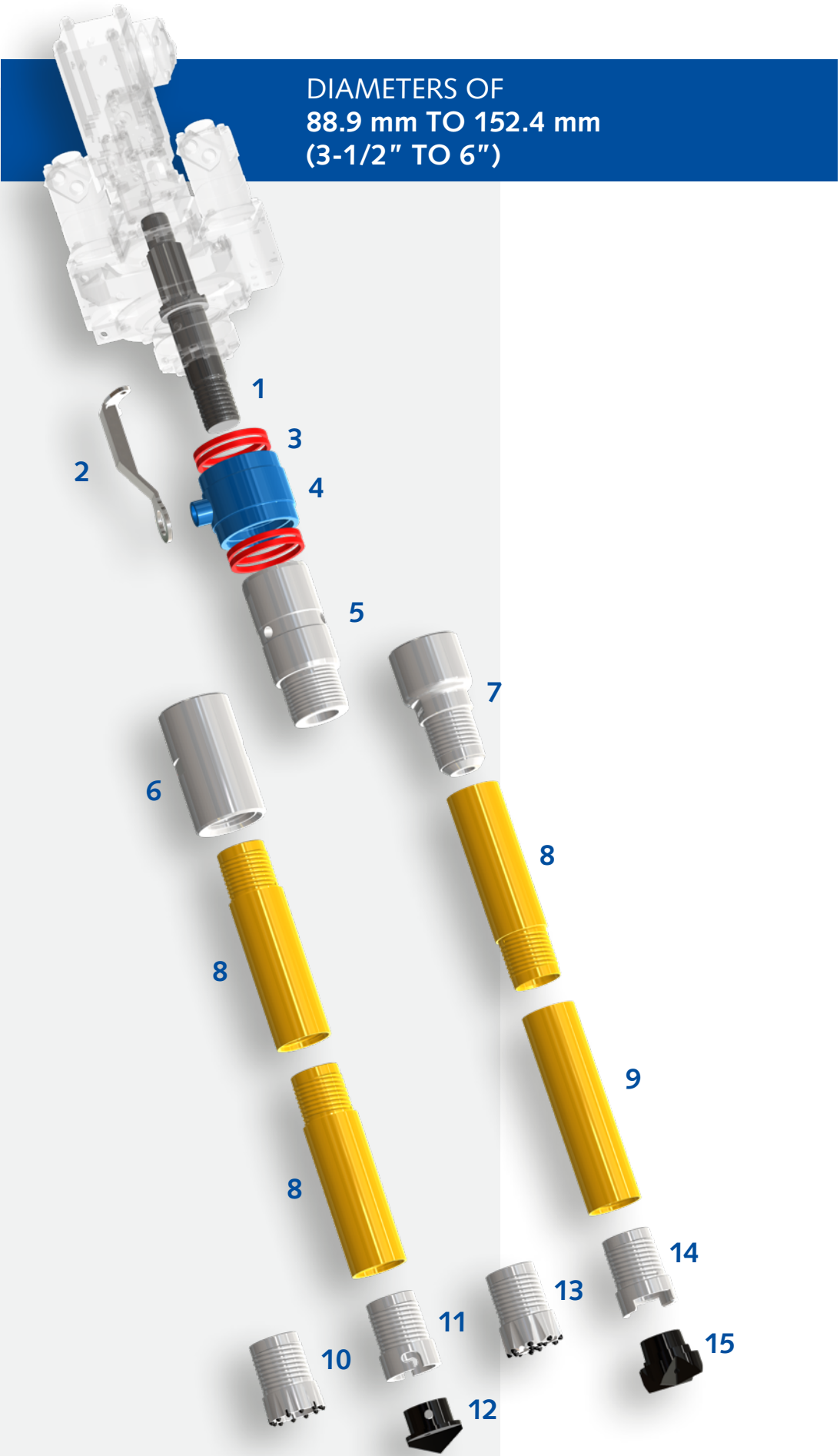
The drill bit remains in the borehole and is considered to be lost. Should the ground formations contain rock deposits, the cone is replaced by a lost or sacrificial percussion drill bit made further wear-resistant via hard armouring, carbide tipping etc.

Flushing can then always be used to discharge the drilled cuttings as long as inclusions, the presence of caverns or sub-surface erosion may be excluded.

Also, drill bits can be adapted during project execution to perform more effectively against water pressure or different ground conditions, thereby increasing penetration rates.

DRIVE DRILLING SYSTEM

with hydraulic drifter



COMPLETE FLEXIBILITY

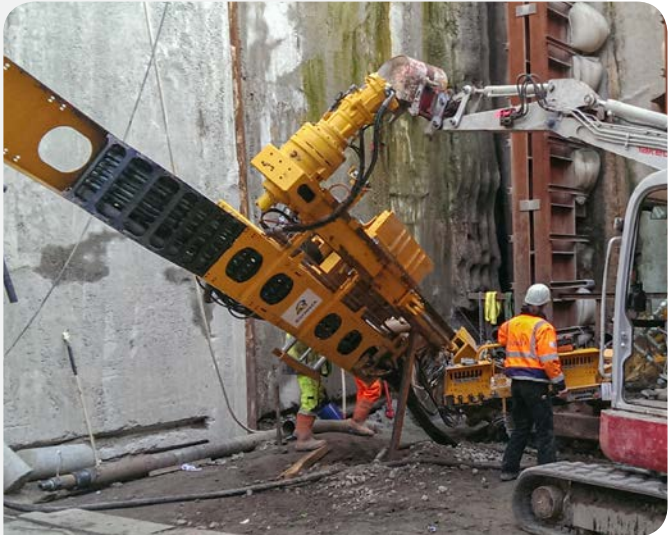
Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific

- 1 Shank adapter to suit hydraulic drifter brand and model
- 2 Flushing ring holder tailor-made to integrate seamlessly with brand and model of hydraulic drifter as well as drill mast characteristics
- 3 Flushing ring lip seals
- 4 Flushing ring with a suitable / incorporated hose connection
- 5 Flushing shaft to suit shank adapter, ejection bell and balancing rod
- 6 Drive adapter
- 7 Drive pin
- 8 Roto-percussive casings – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 9 Starter casing with box threads at both ends in conjunction with a drive pin
- 10 Casing bit
- 11 Drive shoe with machined grooves for bayonet coupling system
- 12 Sacrificial percussion bit with radial pins for bayonet coupling system
- 13 Percussion bit
- 14 Drive shoe with machined slots for bayonet type coupling system
- 15 Sacrificial percussion bit with radial groove type coupling

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



MICROPILE DRILLING SYSTEM with double head drilling unit (rotary / rotary)

6 MICROPILE DRILLING SYSTEM D 244.5 mm – 508 mm (9-5/8" – 20") with double head unit (rotary / rotary)



Small diameter piles are designed for different applications. They transfer their loads over skin friction to the load-bearing subsoil / stratum. For their realisation, even small drilling rigs can be used in confined conditions.

In many cases double-head drilling rigs are chosen.

When drilling in mixed soils with rock deposits, often a DTH Hammer together with augers as internal drill string are utilised for the better discharge of the drilled cuttings. If the soil conditions permit it, an internal drill string consisting only of auger drill rods and a rotary drill bit may be used.

MICROPILE DRILLING SYSTEM

with double head unit (rotary / rotary)

DIAMETERS OF
244.5 mm TO 508 mm
(9-5/8" TO 20")

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Flange to suit the rear rotary head unit
- 2 Balancing rod with length adapted to machine and double head
- 3 Ejection bell to suit front rotary head unit equipped with splash protection
- 4 Drive flange to suit outer casings
- 5 Rotary casing (outer drill string) – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 6 Adaptor-sub (thread-saver) to balancing rod and inner drill string / drill rods or auger drill rods
- 7 Auger drill rods (inner drill string) to match outer drill string – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 8 Adaptor-sub (thread-saver, starter casing, grout injection pipe)
- 9 DTH shock absorber
- 10 DTH hammer
- 11 Auger drill bit
- 12 DTH percussion bit
- 13 Casing bit

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



SIMPLEX JET GROUTING DRILLING SYSTEM

with rotary drill head unit and hydraulic chuck

7 SIMPLEX JET GROUTING DRILLING SYSTEM D 63,5 mm – 114.3 mm (2-1/2" – 4-1/2") with rotary head unit and hydraulic chuck



This drilling system is an erosion based system that creates in situ engineered geometries, such as columns, of mixed soil-cement in the subsoil. The aim is to improve the ground conditions by i.e. consolidation, vertical shoring or slicing the soil structure by means of a high velocity jet of grout at pressures of 100 bar (1450 psi) to 600 bar (8700 psi). The drill tools have been specifically designed to withstand these high pressures.

The drilling process is primarily performed with a rotary head unit and external flushing.

Having reached the final depth, the rods will be retracted slowly, allowing a jet of cement suspension to cut through the surrounding ground. The corresponding nozzles are mounted within the monitor. The drilled cuttings are partly discharged with the return movement of the flushing medium, partly homogenised with cement.

There are complete systems from D 63,5 (2-1/2") up to D 114.3 (4-1/2") with different nozzle diameters and drill bit types available that are suitable for boulders and loamy grounds and other ground conditions.

SIMPLEX JET GROUTING DRILLING SYSTEM

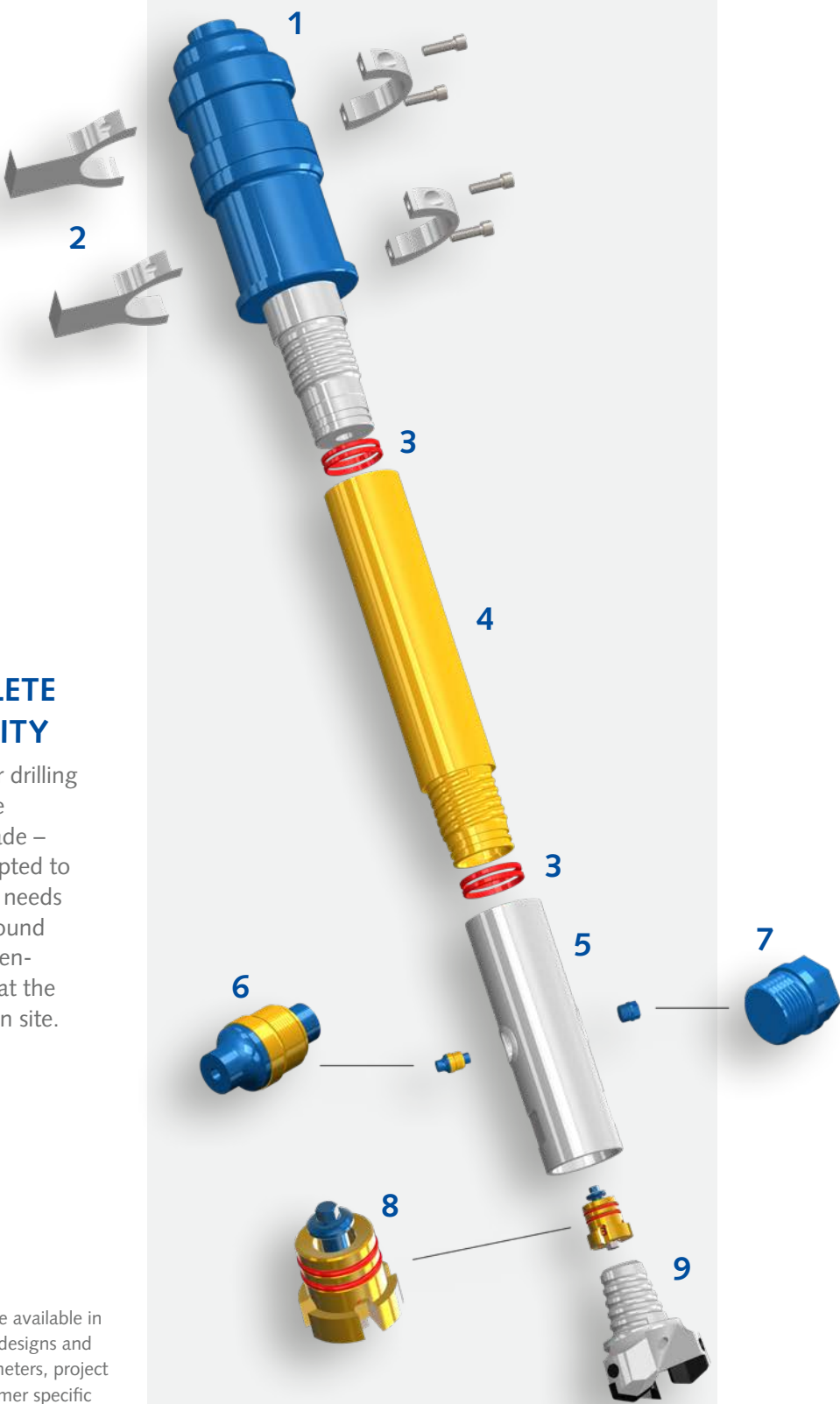
with rotary head unit and hydraulic chuck

DIAMETERS OF
63,5 mm TO 114.3 mm
(2-1/2" TO 4-1/2")

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Simplex jet grouting flushing head (swivel)
- 2 Flushing head (swivel) mounting brackets
- 3 U-seal (1 set of 2)
- 4 Simplex jet grouting tubes – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 5 Simplex jet grouting monitor with nozzle seats
- 6 Jet grouting nozzles in diameters of 2 mm (5/64") to 8.5 mm (21/64")
- 7 Sealing plug
- 8 Jet grouting automatic valve with matching springs (blanche, green, copper, red and blue) Each colour has a certain spring force. More information available upon request.
- 9 Rotary drill bit / drag bit

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions.

THE SYSTEM IN ACTION



SIMPLEX JET GROUTING DRILLING SYSTEM with hydraulic drifter

8 SIMPLEX JET GROUTING DRILLING SYSTEM D 76,1 mm – 114,3 mm (3" – 4-1/2") with hydraulic drifter



This drilling system is an erosion based system that creates in situ engineered geometries, such as columns, of mixed soil-cement in the subsoil. The aim is to improve the ground conditions by i.e. consolidation, vertical shoring or slicing the soil structure by means of a high velocity jet of grout at pressures of 100 bar (1450 psi) to 600 bar (8700 psi). The drill tools have been specifically designed to withstand these high pressures.

The drilling process is primarily performed with a hydraulic drifter and external flushing.

Having reached the final depth, the rods will be retracted slowly, allowing a jet of cement suspension to cut through the surrounding ground. The corresponding nozzles are mounted within the monitor. The drilled cuttings are partly discharged with the return movement of the flushing medium, partly homogenised with cement.

There are complete systems with D 76,1 (3") up to 114,3 (4-1/2") with different nozzle diameters and percussion drill bit types available that are suitable for soils with rocky enclaves and rocky strata.

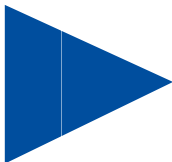
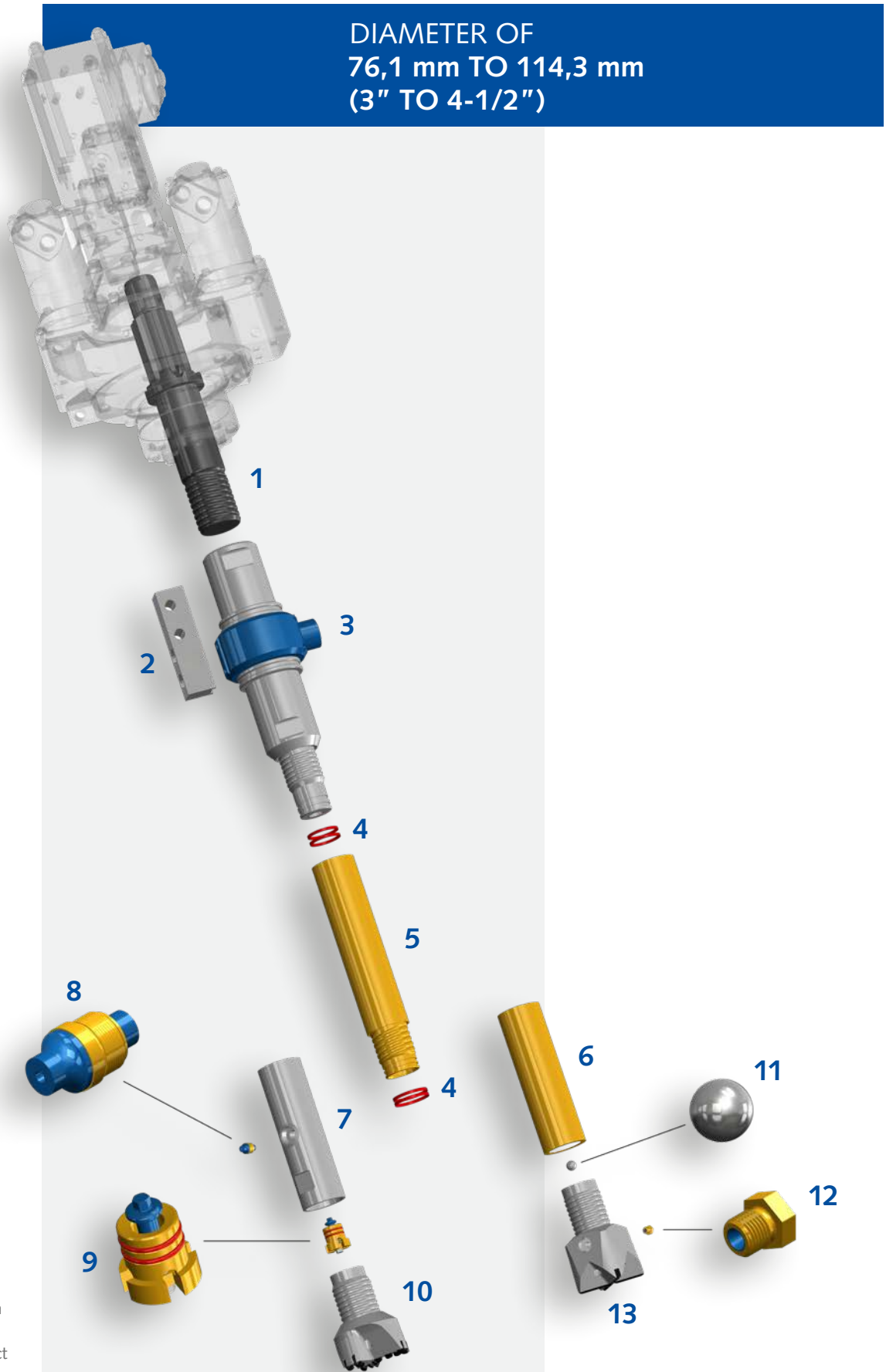
SIMPLEX JET GROUTING DRILLING SYSTEM

with hydraulic drifter

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Shank adapter to suit hydraulic drifter brand and model
- 2 Flushing ring holder taylor-made to integrate seamlessly with brand and model of hydraulic drifter as well as drill mast characteristics
- 3 Simplex jet grouting flushing head (swivel) to suit shank adapter and jet grouting tubes
- 4 U seals (1 set of 2)
- 5 Simplex jet grouting tubes – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 6 Starter rod with box threads at both ends – connected to a percussion drill bit with incorporated nozzle seat
- 7 Simplex jet grouting monitor with nozzle seats
- 8 Jet grouting nozzles in diameters of 2 mm (5/64") to 8.5 mm (21/64")
- 9 Jet grouting automatic valve with matching springs (blanche, green, copper, red and blue) Each colour has a certain spring force. More information available upon request.
- 10 Percussion drill bit
- 11 Steel ball (to be used with the drop ball method if preferred)
- 12 Jet grouting nozzles in diameters of 2 mm (5/64") to 8.5 mm (21/64")
- 13 Percussion drill bit with nozzle seats and steel ball seat (drop-ball method)

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions.

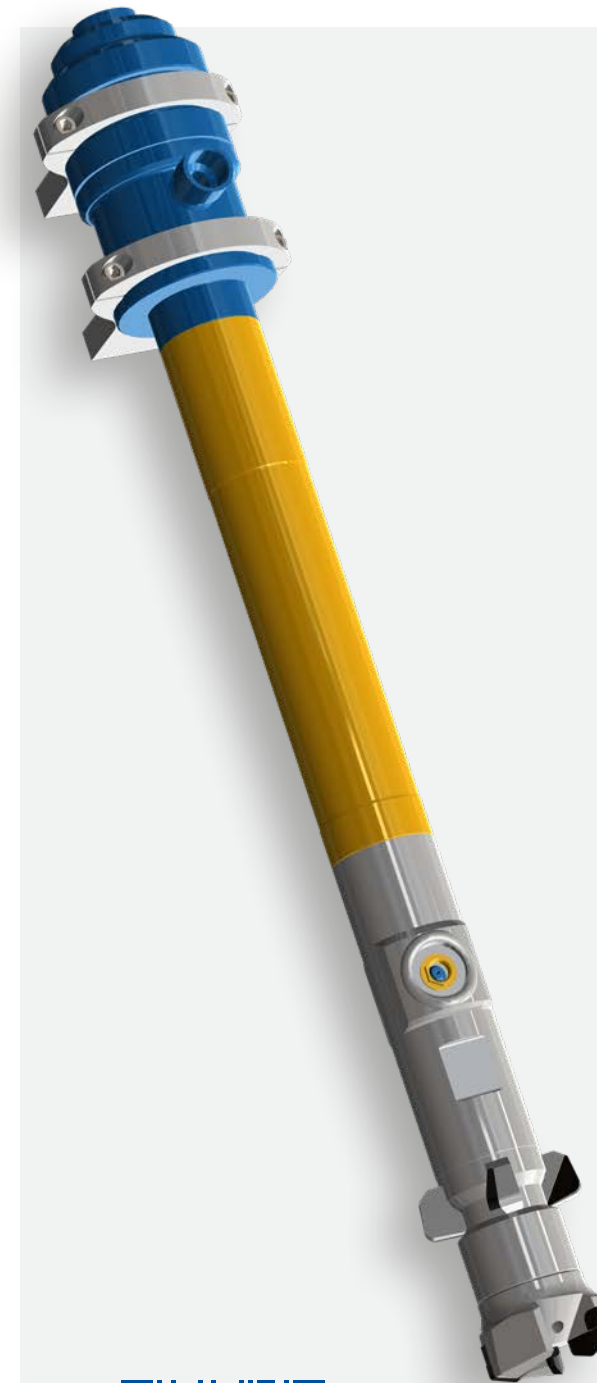
THE SYSTEM IN ACTION



DUPLEX JET GROUTING DRILLING SYSTEM

with rotary drill head unit and hydraulic chuck

9 DUPLEX JET GROUTING DRILLING SYSTEM D 76.1 mm – 114.3 mm (3" – 4-1/2") with rotary head unit and hydraulic chuck



This drilling system is an erosion based system that creates in situ engineered geometries, such as columns, of mixed soil-cement in the subsoil. The aim is to improve the ground conditions by i.e. consolidation, vertical shoring or slicing the soil structure by means of a high velocity jet of grout at pressures of 100 bar (1450 psi) to 600 bar (8700 psi). The drill tools have been specifically designed to withstand these high pressures.

The drilling process is primarily performed with a rotary head unit and external flushing.

Having reached the final depth, the rods will be retracted slowly, allowing a jet of cement suspension to cut through the surrounding ground. The corresponding nozzles are mounted within the monitor. The drilled cuttings are partly discharged with the return movement of the flushing medium, partly homogenised with cement.

There are complete systems from D 76.1 (3") up to D 114.3 (4-1/2") with different nozzle diameters and drill bit types available that are suitable for boulders and loamy grounds and other ground conditions.

DUPLEX JET GROUTING DRILLING SYSTEM

with rotary head unit and hydraulic chuck

DIAMETERS OF
76.1 mm TO 114.3 mm
(3" TO 4-1/2")

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific

- 1 Duplex jet grouting flushing head (swivel)
- 2 Flushing head (swivel) mounting brackets
- 3 U-seal (1 set of 2) for the outer tubes
- 4 U-seal (1 set of 2) for the inner tubes
- 5 Duplex jet grouting tubes – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 6 Duplex jet grouting monitor with nozzle seats
- 7 Jet grouting nozzles in diameters of 2 mm (5/64") to 8.5 mm (21/64")
- 8 Jet grouting air nozzle
- 9 Sealing plug for high pressure passage
- 10 Sealing plug for air passage
- 11 Air passage sealing plug for non-air supported jet grouting (not shown)
- 12 Jet grouting automatic valve with matching springs (blanche, green, copper, red and blue) Each colour has a certain spring force. More information available upon request.
- 13 Rotary reamer – only in combination with a rotary drill bit
- 14 Rotary drill bit / drag bit

The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions.

THE SYSTEM IN ACTION



TRIPLEX JET GROUTING DRILLING SYSTEM

with rotary drill head unit and hydraulic chuck

10 TRIPLEX JET GROUTING DRILLING SYSTEM D 114.3 mm – 133 mm (4-1/2" – 5-15/64") with rotary head unit and hydraulic chuck



This drilling system is an erosion based system that creates in situ engineered geometries, such as columns, of mixed soil-cement in the subsoil. The aim is to improve the ground conditions by i.e. consolidation, vertical shoring or slicing the soil structure by means of a high velocity jet of grout at pressures of 100 bar (1450 psi) to 600 bar (8700 psi). The drill tools have been specifically designed to withstand these high pressures.

The drilling process is primarily performed with a rotary head unit and external flushing.

Having reached the final depth, the rods will be retracted slowly, allowing a jet of cement suspension to cut through the surrounding ground. The corresponding nozzles are mounted within the monitor. The drilled cuttings are partly discharged with the return movement of the flushing medium, partly homogenised with cement.

There are complete systems from D 114.3 (4-1/2") up to D 133 (5-15/64") with different nozzle diameters and drill bit types available that are suitable for boulders and loamy grounds and other ground conditions.

TRIPLEX JET GROUTING DRILLING SYSTEM

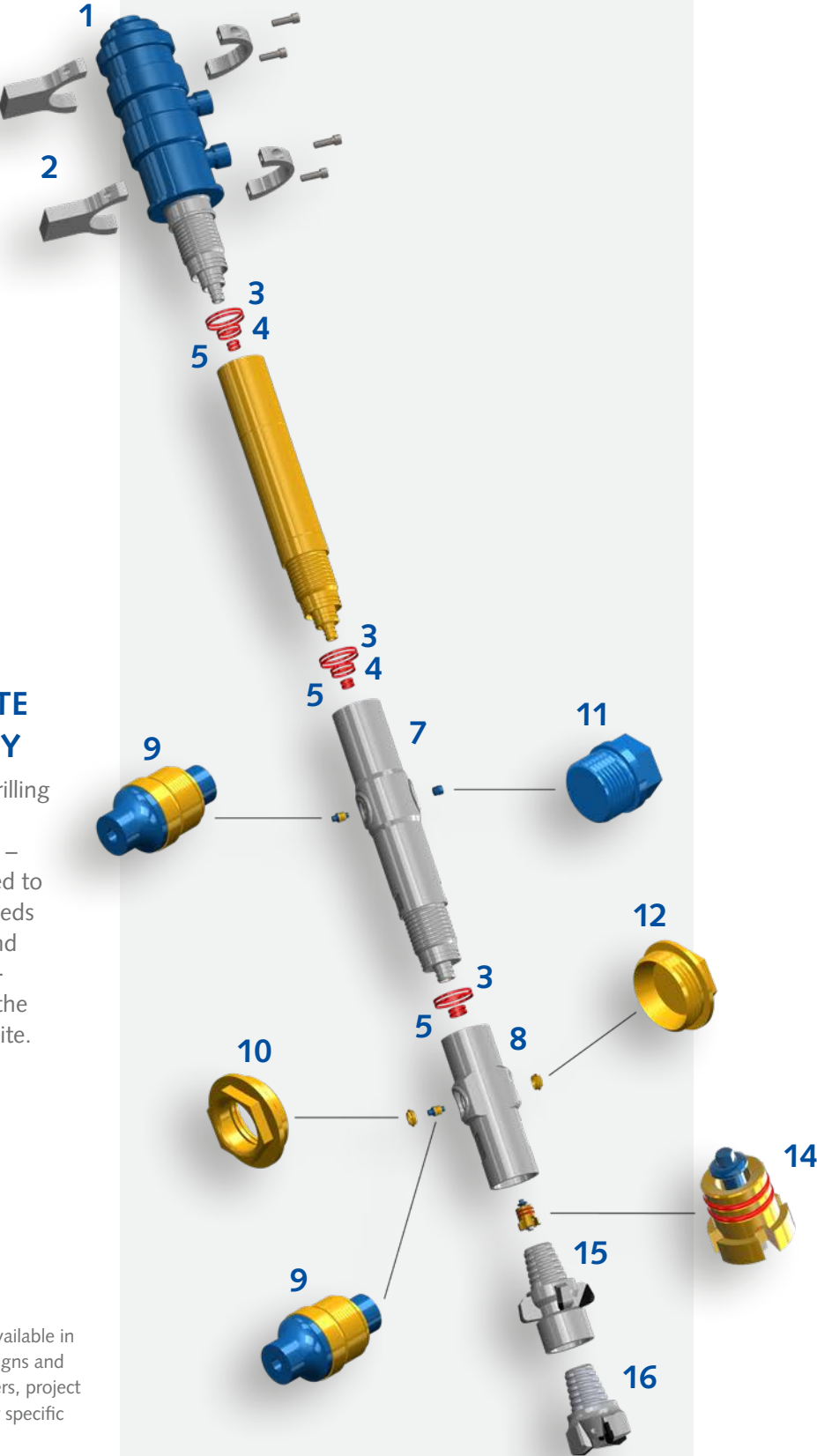
with rotary head unit and hydraulic chuck

DIAMETERS OF
114.3 mm TO 133 mm
(4-1/2" TO 5-15/64")

COMPLETE FLEXIBILITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and / or customer specific



- 1 Triples jet grouting flushing head (swivel)
- 2 Flushing head (swivel) mounting brackets
- 3 U-seal (1 set of 2) for the outer tubes
- 4 U-seal (1 set of 2) for the first inner tubes
- 5 U-seal (1 set of 2) for the second inner tubes
- 6 Triples jet grouting tubes – in lengths of 500 mm (approx. 1-5/8') to 6000 mm (approx. 20')
- 7 Triples jet grouting monitor with nozzle seats – Part 1
- 8 Triples jet grouting monitor with nozzle seats – Part 2
- 9 Jet grouting nozzles in diameters of 2 mm (5/64") to 8.5 mm (21/64")
- 10 Jet grouting air nozzle
- 11 Sealing plug for high pressure passage
- 12 Sealing plug for air passage
- 13 Air passage sealing plug for non-air supported jet grouting (not shown)
- 14 Jet grouting automatic valve with matching springs (blanche, green, copper, red and blue) Each colour has a certain spring force. More information available upon request.
- 15 Rotary reamer – only in combination with a rotary drill bit
- 16 Rotary drill bit / drag bit

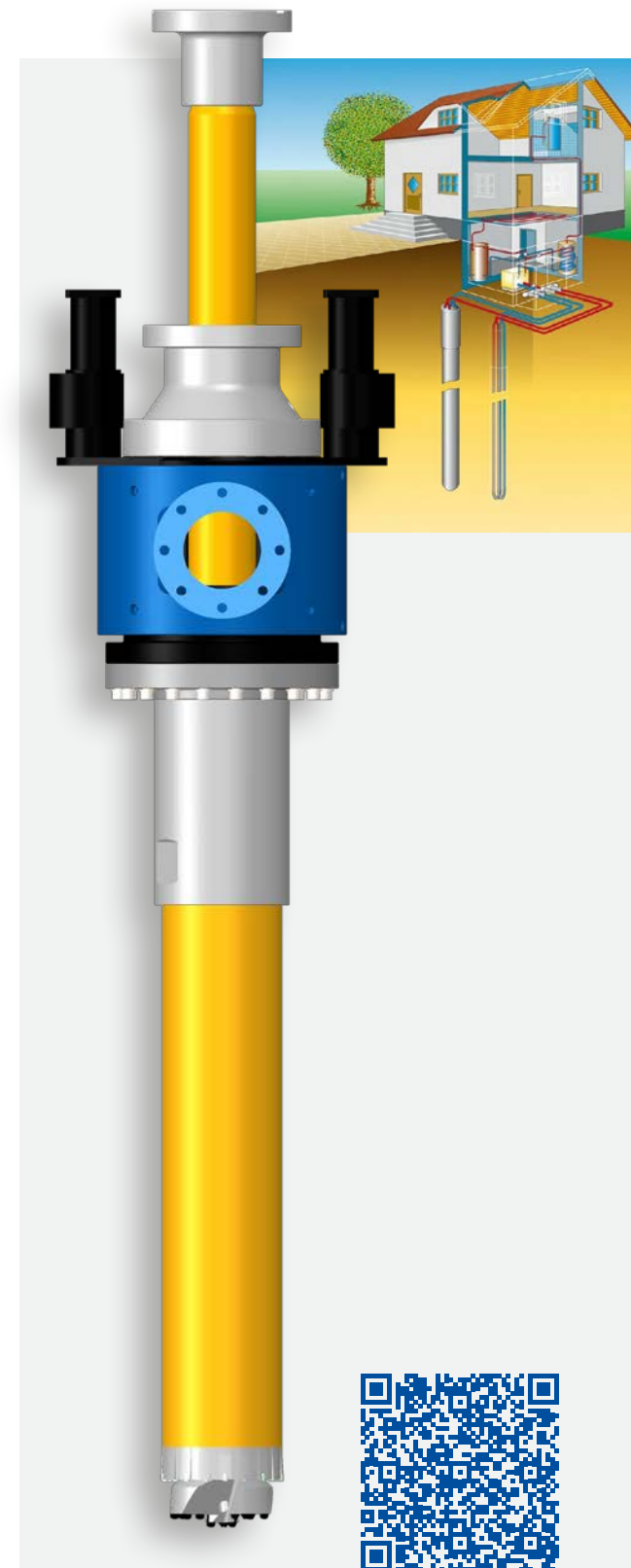
The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions.

THE SYSTEM IN ACTION



GEOHERMAL DRILLING SYSTEM with Double Head Unit (Rotary/Rotary)

11 GEOTHERMAL DRILLING SYSTEM D 152,4 mm – 219,1 mm (6" – 8-5/8") with double head unit (rotary/rotary)



Geothermal probes, coupled with geothermal heat pumps, is currently the most common medium utilising geothermal energy.

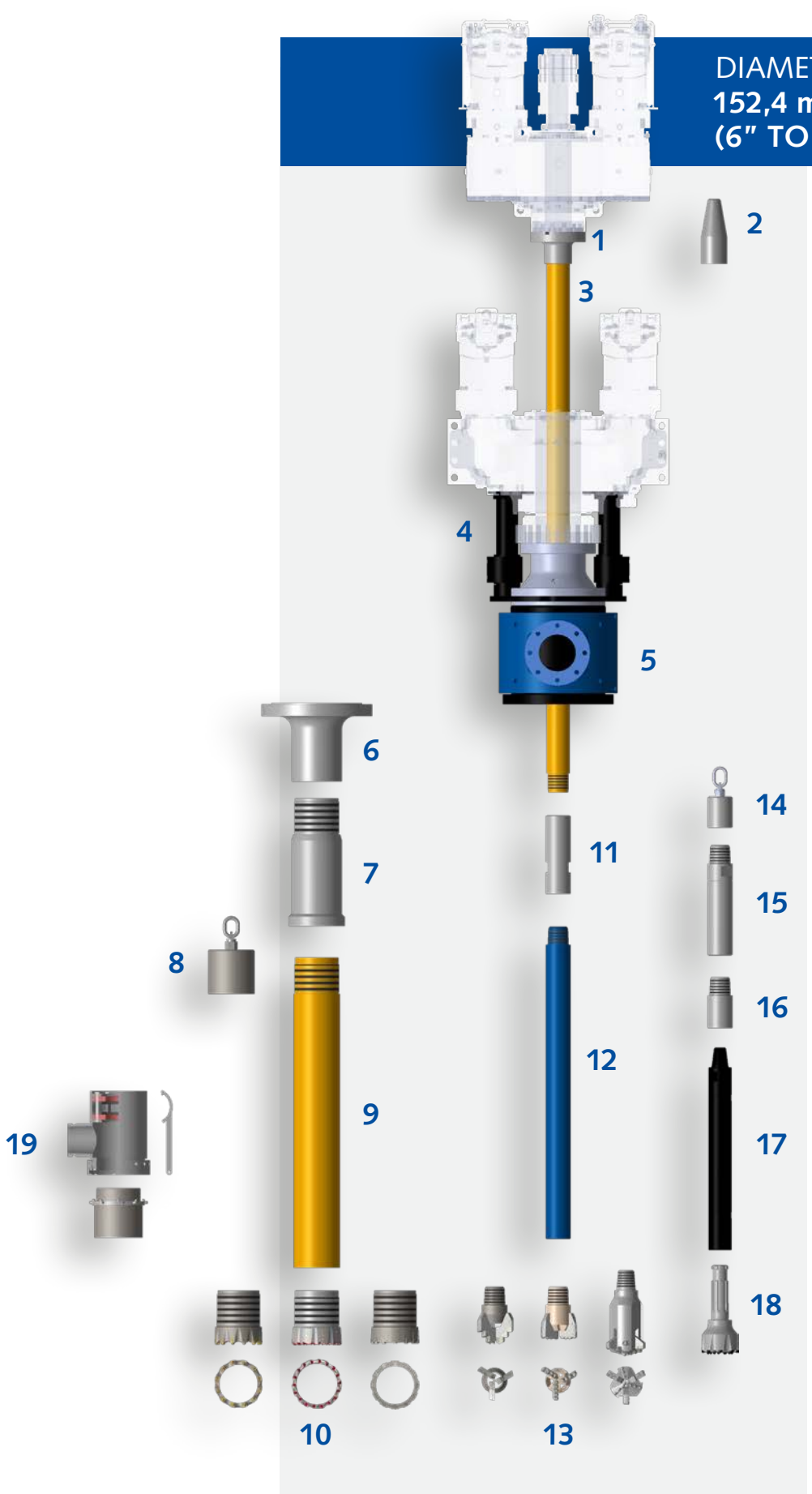
Drilling of boreholes, intended for the insertion of geothermal probes into the ground, require the penetration of diverse layers of rock strata that typically possess different hydraulic properties, fluid pressure conditions as well as groundwater with different hydro-chemical characteristics.

The complicated nature of these ground conditions, requires drill rigs with a double head setup to drive, as well as move the external and internal drill strings independently to one another. The outer rotary casings, also referred to as "shield tubes", are usually utilised in the overburden and in unconsolidated rock formations. Subsequent to the execution of the overburden drilling phase, the intended borehole depth, sometimes deeper than 200 m (approx. 660') can then be realised by drilling further with the internal drill string only.

Alternative drilling methods can be applied, which is of course dependent on the ground conditions. For instance, Down-the-Hole (DTH) hammer with standard or extension drill bits, rotary drill bits and round-attack pick reinforced rotary drill bits, are some of the options available. A contamination free job-site is guaranteed via discharge preventers mounted on the rotary head unit (when drilling through the overburden), and soil / ground preventers when drilling with the inner drill string only.

GEOHERMAL DRILLING SYSTEM

bottom mounted preventer on rotary head unit



COMPLETE FLEXIBIITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

All drill bits are available in a plethora of designs and borehole diameters, project and /or customer specific

- 1 Flange suitable for the rear rotary head unit and balancing rod
- 2 Assembly cap for balancing rod
- 3 Balancing rod available in custom machine-dependent lengths and designs
- 4 Holders for rotary preventers suitable for front rotary head unit
- 5 Rotary discharge preventer / preventer “pot”
- 6 Drive flange suitable for outer casing
- 7 Thread-saver / starter (outer casing)
- 8 Lift-sub for outer casing
- 9 Rotary casing (external) – in lengths from 500 mm to 6000 mm
- 10 Rotary casing bit
- 11 Thread-saver / sub-adaptor (inner drill string)
- 12 Rotary drill rod (inner rod) – in lengths from 500 mm to 6000 mm
- 13 Rotary drill bit
- 14 Lift-sub for inner drill string
- 15 Check valve
- 16 Sub-adaptor inner connection to DTH hammer
- 17 DTH hammer with shock absorber
- 18 DTH drill bit
- 19 Ground preventers – please see next page

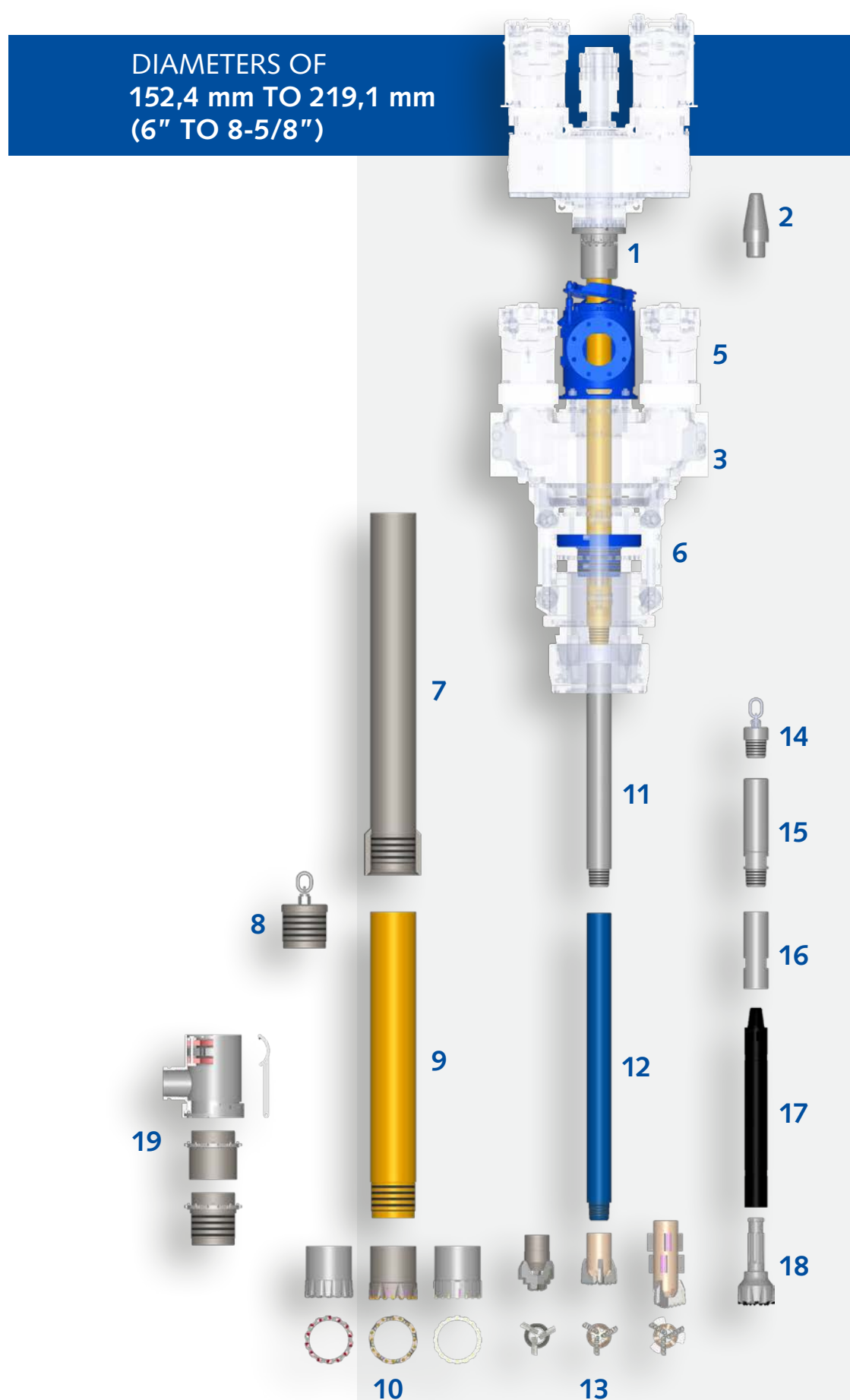
The thread profiles are available in right-hand (RHT) and left-hand (LHT), as well as conical and cylindrical versions. All supplied casings are realised through various manufacturing methods and are application specific.

THE SYSTEM IN ACTION



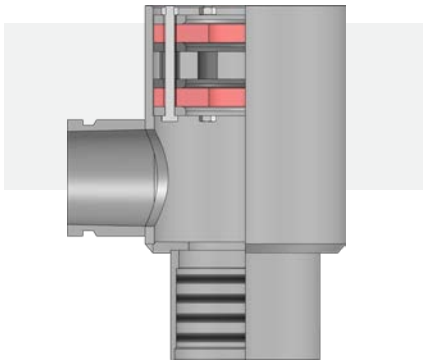
GEOHERMAL DRILLING SYSTEM

top mounted preventer between rotary head units



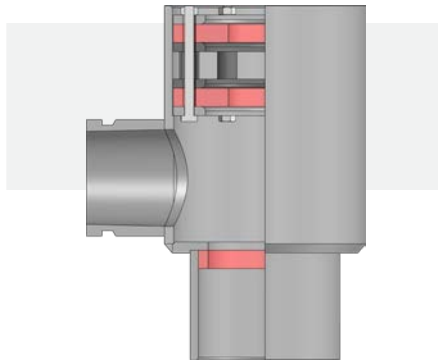
All drill bits are available in a plethora of designs and borehole diameters, project and /or customer specific

GROUND PREVENTER FOR GEOTHERMAL DRILLING SYSTEMS



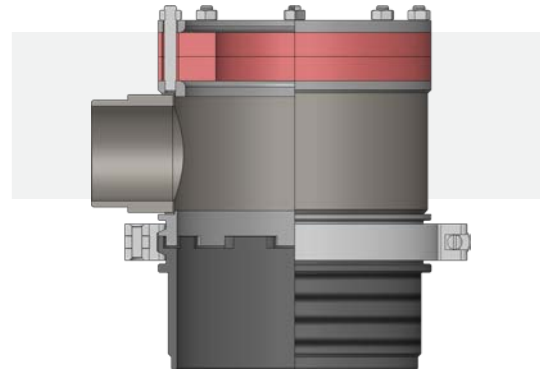
19.1

Ground preventer standard with threaded connection to outer casing



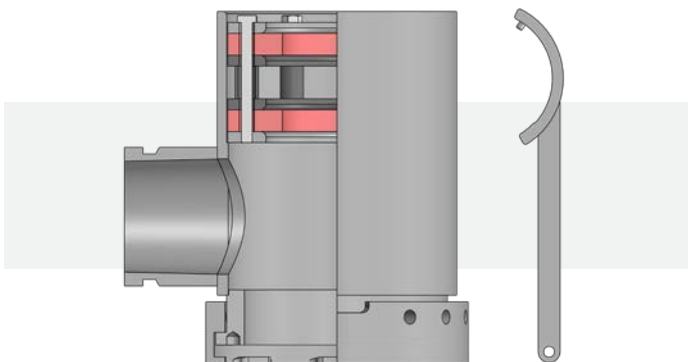
19.2

Ground preventer with sheath (non-threaded connection)



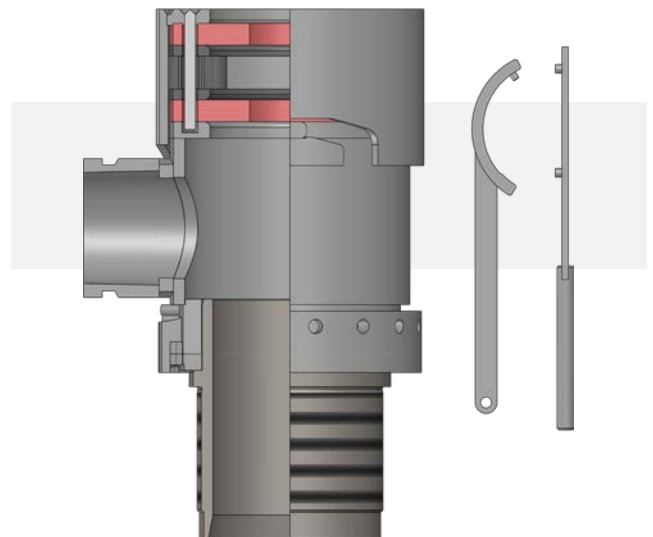
19.3

Ground preventer most compact design with male threads



19.4

Ground preventer with bayonet locking system bottom with hook spanner



19.5

Ground preventer with double bayonet locking system top / bottom with hook spanners

REVERSE CIRCULATION BOHRSYSTEM

12 REVERSE CIRCULATION DRILLING SYSTEM D 139.7 mm – D 406 mm (5-1/2" – 16")



Reverse Circulation (RC) drilling is a drilling method, mostly associated with mining and exploration, where it is used to quickly and economically obtain mineral uncontaminated samples from the ground.

In foundation drilling applications, Reverse Circulation (RC) drilling can offer the same significant advantages as in mineral exploration.

This method is characterised by the use of dual-wall drill pipes to deliver compressed air down the outer casing and carry cuttings back up to surface through the inner rod.

Many advantages of Reverse Circulation (RC) drilling in mineral exploration also apply to foundation drilling, including: high-quality sample collection; fast drilling rates; and minimal water usage; are especially valuable for construction projects.

Efficiency, adaptability to the most varied of ground conditions, including unstable ground, as well as the minimal environmental impact make RC drilling a preferred option in foundation works, site investigations, and urban construction projects where environmental impact is crucial.

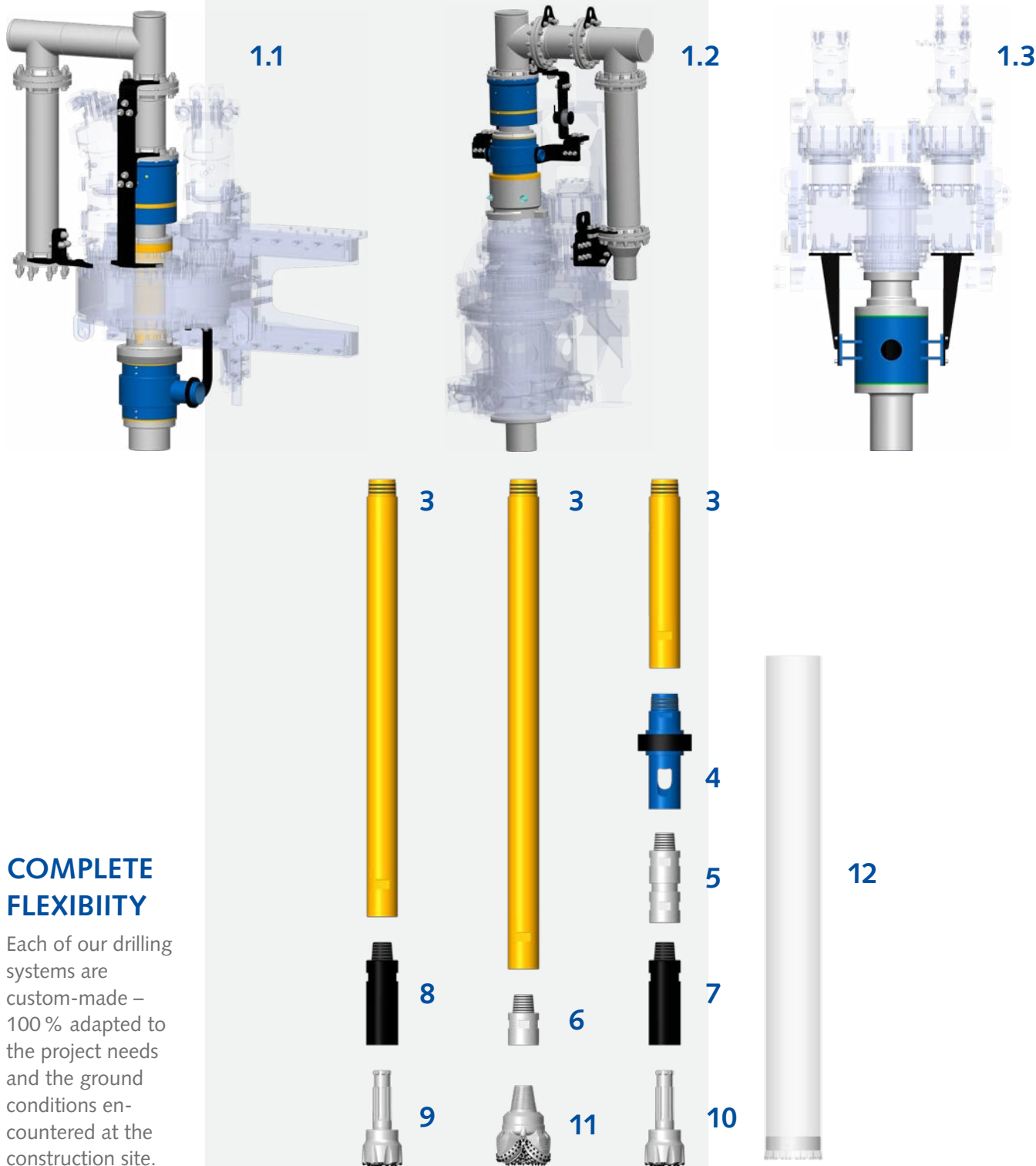
With Sysbohr's tool conversion kits, any drill rig, equipped for Kelly drilling, or conventional drilling, can be easily converted to RC drilling economically.

Drill rig utilisation is increased, putting a new drilling methodology into the field with the existing drill fleet, at a fraction of the cost of acquiring a dedicated new machine.

THREADED REVERSE CIRCULATION DRILLING SYSTEM

with undermount, top mount or split swivel setup

ROD DIAMETERS OF
139,7 mm TO 323,9 mm
(5,5" TO 12,75")



COMPLETE FLEXIBIITY

Each of our drilling systems are custom-made – 100 % adapted to the project needs and the ground conditions encountered at the construction site.

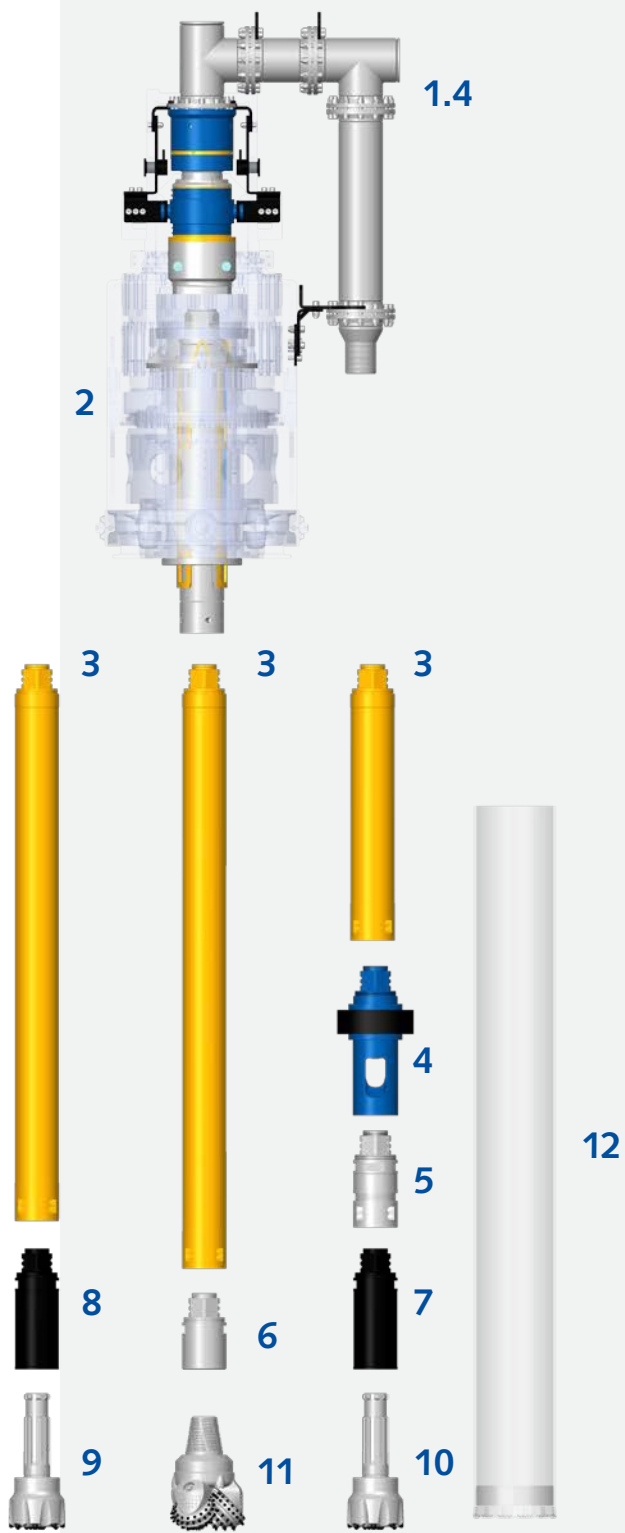
- 1 Reverse circulation (RC) discharge swivel conversion kits
 - 1.1 Split swivel top & undermount
 - 1.2 Combi swivel top mount
 - 1.3 Combi swivel undermount
 - 1.4 Kelly rig RC conversion kit with top mounted swivel
- 2 Kelly rig reverse circulation (RC) adapter
- 3 Reverse circulation (RC) casings - in lengths of 1500 mm to 12000 mm
- 4 Interchange for conventional DTH hammer in hybrid setup
- 5 Shock absorber
- 6 Adaptor-sub
- 7 Coventional DTH hammer
- 8 DTH reverse circulation (RC) hammer
- 9 DTH reverse circulation (RC) drill bit
- 10 DTH drill bit /casing advancement system
- 11 Tricone bit
- 12 Outer casing /reverse circulation (RC) shroud

HEXAGONAL REVERSE CIRCULATION DRILLING SYSTEM

with undermount, top mount or split swivel setup and kelly conversion kit

ROD DIAMETERS OF
193,7 mm TO 406,4 mm
(7,625" TO 16")

THE SYSTEM IN ACTION



RC RODS – THREADED VERSION



Rod Diameter OD		Rod Wall Thickness Outer Tube		Inner Tube Inside Diameter		Length, effective	
139,7 mm	5,5"	8 mm	0,31"	76,3 mm	3"	1500 mm – 6000 mm	5' – 20'
177,8 mm	7"	8,8 mm	0,35"	98,3 mm	3,9"	1500 mm – 6000 mm	5' – 20'
219,1 mm	8 5/8"	10 mm	0,4"	109,4 mm	4,3"	1500 mm – 6000 mm	5' – 20'
273 mm	10 3/4"	12,5 mm	0,5"	148,3 mm	5,8"	1500 mm – 6000 mm	5' – 20'
323,9 mm	12 3/4"	12,5 mm	0,5"	194 mm	7,6"	1500 mm – 6000 mm	5' – 20'

RC RODS – HEX VERSION



Rod Diameter OD		Rod Wall Thickness Outer Tube		Inner Tube Inside Diameter		Length, effective	
193,7 mm	7 5/8"	10 mm	0,4"	84 mm	3,3"	1500 mm – 12000 mm	5' – 40'
273 mm	10 3/4"	12,5 mm	0,5"	122 mm	4,8"	1500 mm – 12000 mm	5' – 40'
355,6 mm	14"	12,5 mm	0,5"	158 mm	6,2"	1500 mm – 12000 mm	5' – 40'
406,4 mm	16"	12,5 mm	0,5"	199 mm	7,8"	1500 mm – 12000 mm	5' – 40'

PRODUCT FOCUS

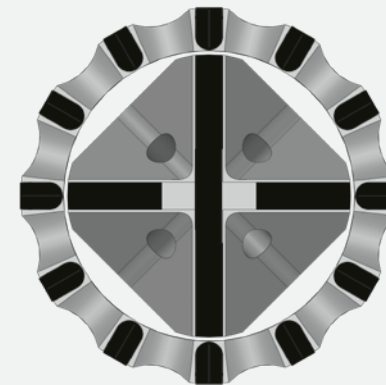
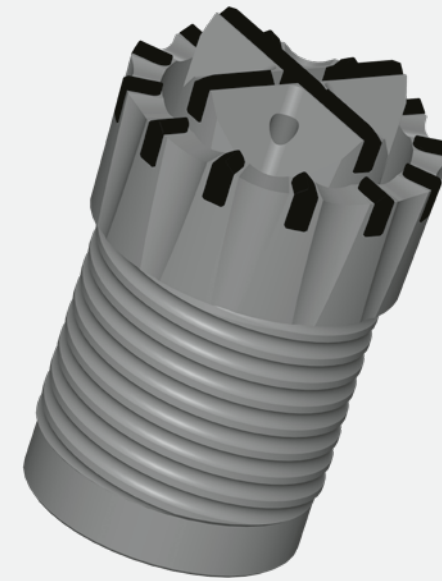
drill bits, discharge preventers, flushing heads etc.



PRODUCT FOCUS

SYSBOHR®
Drilling Technique for the Construction Industry

DRILL BITS



In order to work in the most diverse of geologies, and to achieve the best possible drilling progress in these geologies, various drilling methods and expertise are essential. Choosing the correct drill bit for the geology at hand rounds off the drilling tool setup. This makes the process complete. Customised drill bits from D 51 mm (2-1/64") to D 620 mm (24-13/32") outer diameter can be realised to suit to a customer's requirements.

Drill bits are divided into different categories, depending on the type of use.

- Casing bits / crowns
- Rotary drill bits
- Rotary percussion bits
- Sacrificial / lost bits
- Auger drill bits
- Cutter drill bits
- Extension drill bits

To manufacture the drill bits, high-quality materials are used for the main body, and the appropriate thread profile is turned or milled into that body.

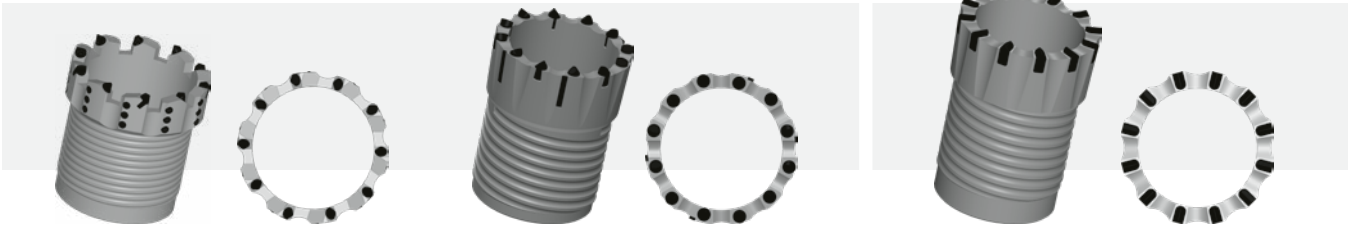
Various cemented carbides are utilised in button inserts / plates and assembled onto the bit body, including PCD geometries. The inserts are described as follows based on their geometries and working action:

- | | |
|------------------------------|----------------------------------|
| • Octagonal | • PCD (PDC) |
| • Wedge-shaped scraping type | • Round attack picks |
| • Hemispherical | • Weld-on teeth (J-tooth design) |
| • Ballistic | • Weld-on studs |
| • Plate | |

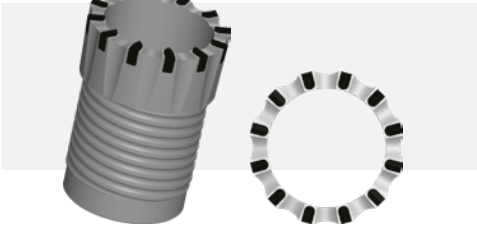


DRILL BITS

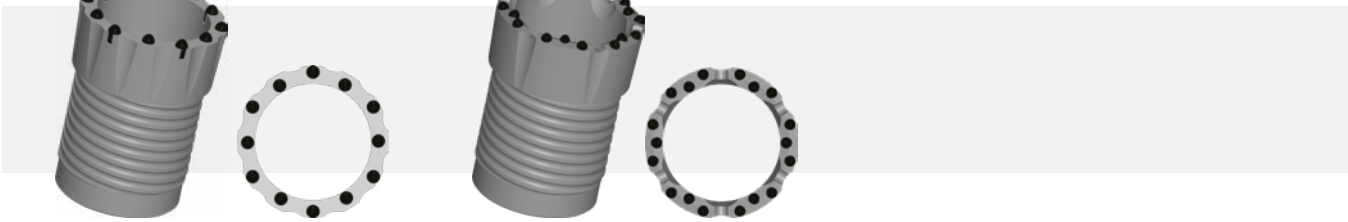
CASING BITS FOR ROTARY PERCUSSIVE DRILLING



Rotary percussive casing bits with wedge-shaped, scraping type, button inserts

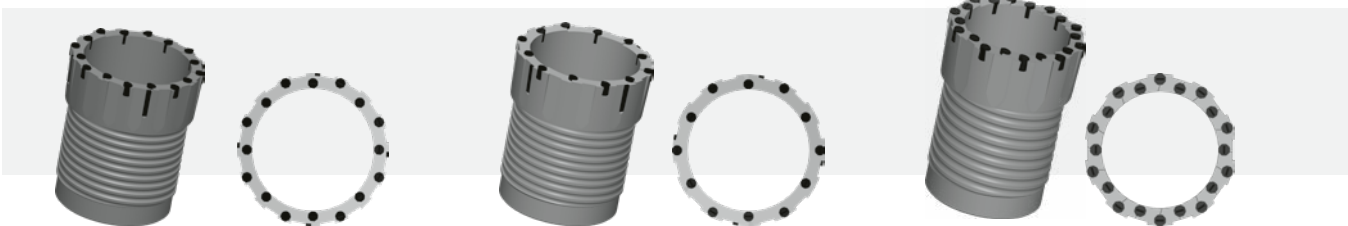


Rotary percussive casing bits with plate type tungsten carbide cutters

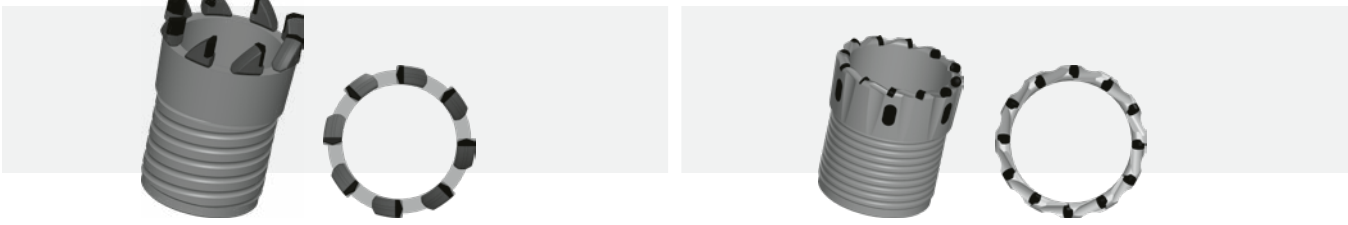


Rotary percussive casing bits with tungsten carbide button inserts (hemispherical or ballistic)

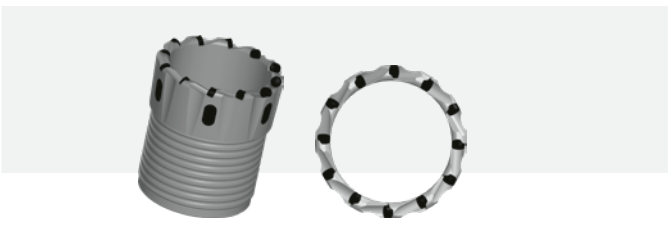
CASING BITS FOR PURE ROTARY DRILLING



Rotary casing bits with octagonal type button inserts

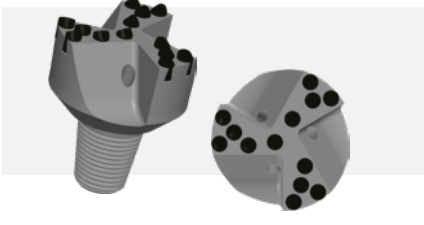


Rotary casing bits with weld-on cutter inserts (J-tooth).

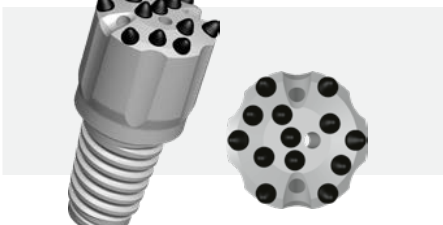


Rotary casing bits with PCD (PDC) button inserts

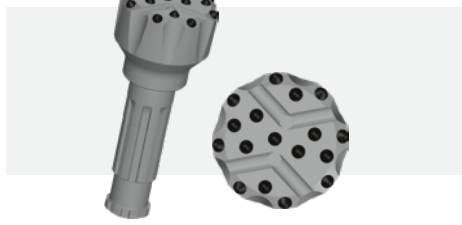
FULL FACE DRILL BITS FOR ROTARY PERCUSSIVE DRILLING



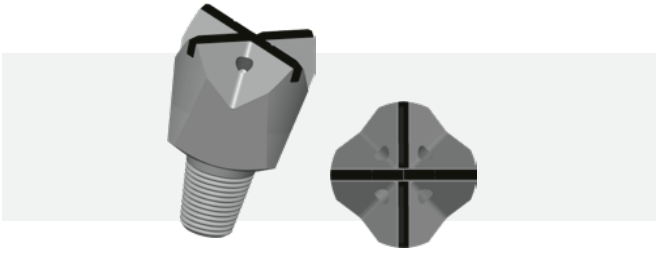
Rotary percussive drill bit with wedge-shaped, scraping type, button inserts



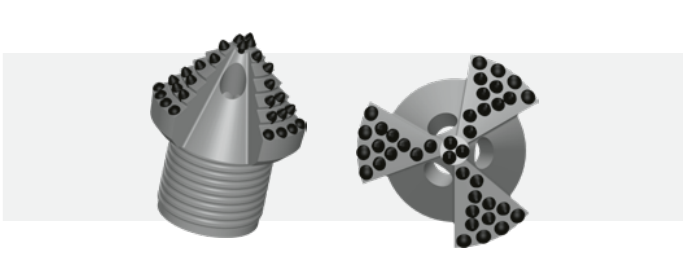
Rotary percussive drill bit with tungsten carbide inserts (full face)



Rotary percussive drill bit for down-the-hole applications

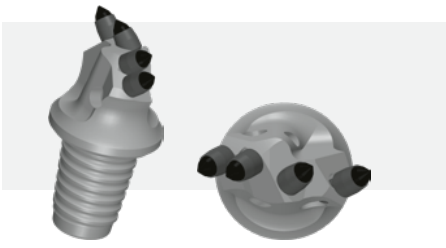


Rotary percussive drill bit, tungsten carbide plate, cross version

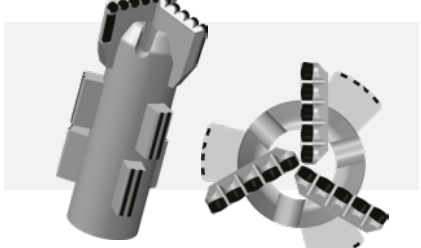


Rotary percussive drill bit with tungsten carbide button inserts (hemispherical and ballistic)

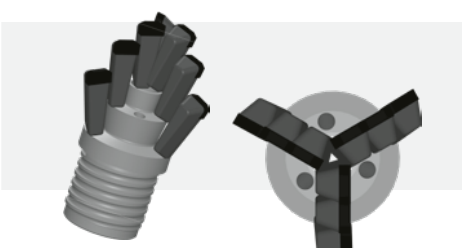
FULL FACE DRILL BITS FOR PURE ROTARY DRILLING



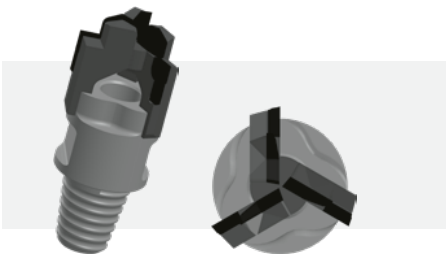
Rotary drill bit with round attack picks



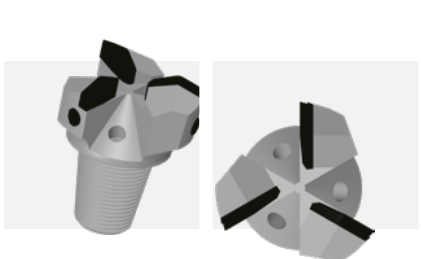
Rotary drill bit with PCD (PDC) cutters



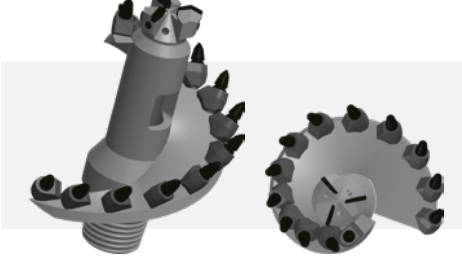
Rotary drill bit, claw bit type



Rotary drill bit, stepped type

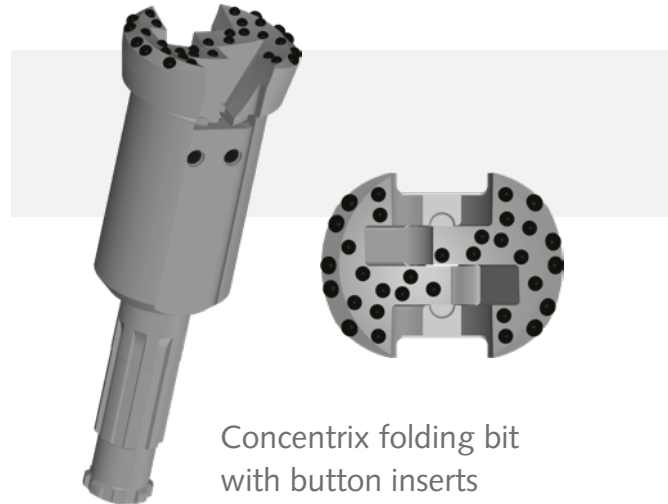


Rotary drill bit with tungsten carbide cutters

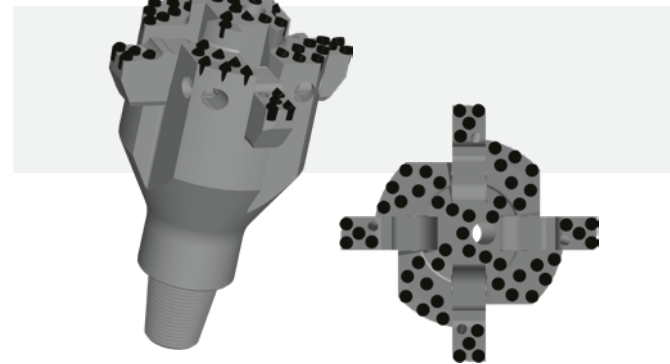


Auger drill bit with round attack picks

EXTENSION DRILL BITS



Concentrix folding bit
with button inserts



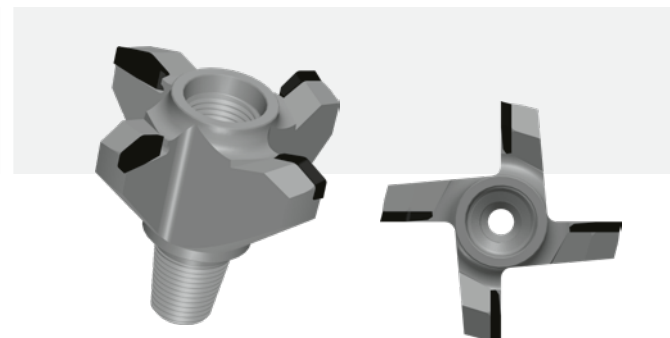
Extension bit
with wedge-shaped,
scraping type, button inserts

CUTTER ("MILLING" TYPE) DRILL BITS



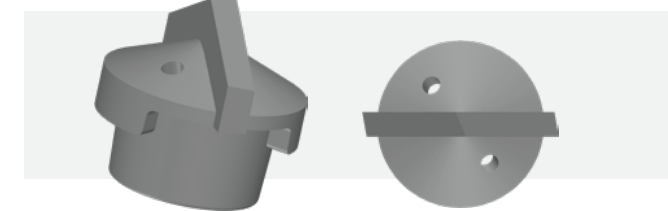
Cutter bit with
interchangeable studs

ROTARY REAMER

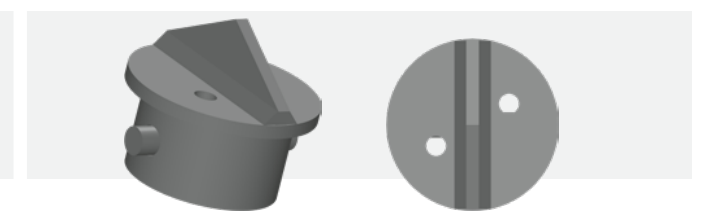


Reamer, multi-wing
with plate cutters

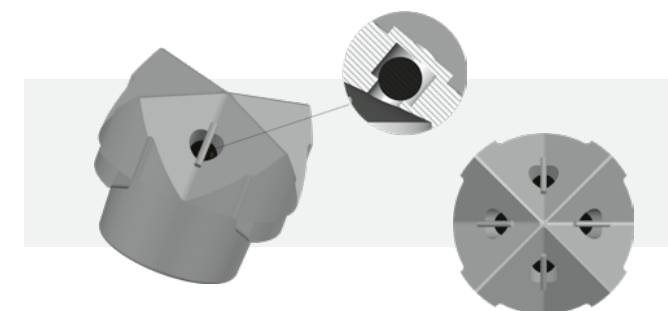
SACRIFICIAL / LOST DRILL BITS



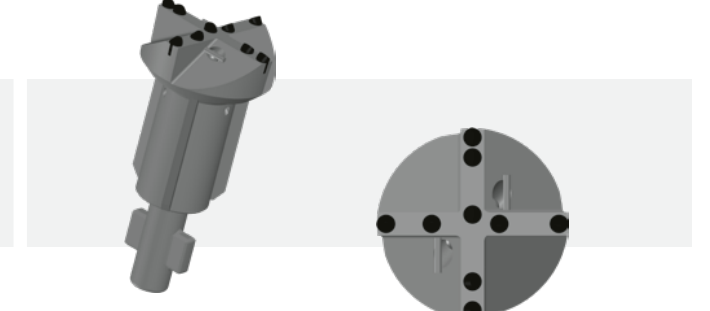
Lost blade with radial groove



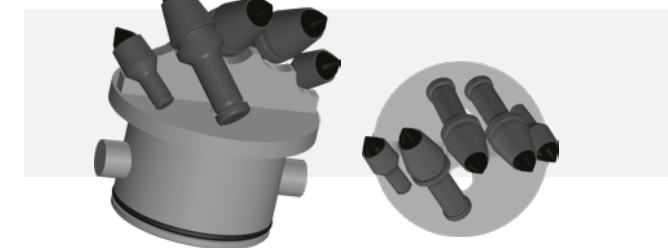
Lost blade with bayonet connection
(radial pin-and-groove)



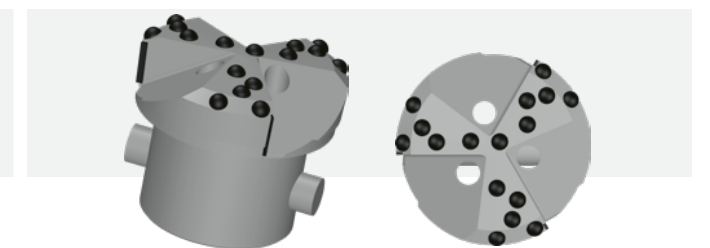
Lost cross bit with radial groove
and non-return ball valve for
drilling against water pressure



Latch drill bit
with wedge-shaped,
scraping type, button inserts



Lost blade with bayonet
connection (radial pin-and-groove)
and round attack picks



Rotary percussive drill bit
with wedge-shaped, scraping type,
button inserts, multi-wing and bayonet
connection (radial pin-and-groove)

PRODUCT FOCUS

drill bits, discharge preventers, flushing heads etc.



PRODUCT FOCUS

SYSBOHR®
Drilling Technique for the Construction Industry

ROTARY DISCHARGE PREVENTER / DIVERTER FOR ROTARY CASINGS

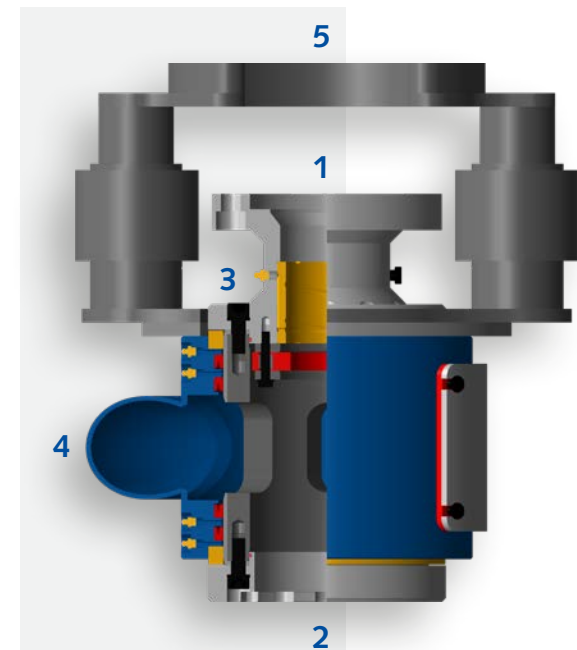


The function of the rotary discharge preventer is to transfer the torque of the rotary head unit to the rotary casings whilst simultaneously providing controlled discharge of the drilled cuttings i. e. contamination control.

The flushing media that is directed through the flushing head and the drill strings to the toe of the borehole, returns together with the drilled cuttings up the drill string and is ejected and directed, with the aid of the discharge preventer, into a settlement tank.

The size of the external casing and the intended application (single rotary head or double head) will define the type and model of discharge preventer / diverter to be used.

DISCHARGE PREVENTER / DIVERTER

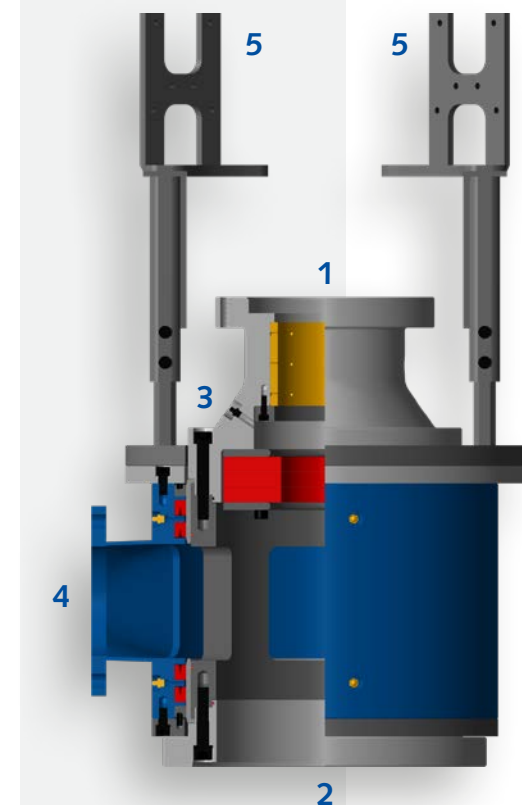


DISCHARGE PREVENTER / DIVERTER D 230 DOUBLE HEAD

The D 230 is intended to be used for outer casing sizes of D 114.3 mm (4-1/2") up to D 219.1 mm (8-5/8"). A maximum torque of 12.5 kNm, maximum allowable retraction force of 12 tonnes with a maximum 50 RPM rounds off this model.

Discharge preventer / diverter D 230 consisting of:

- 1 Double flange connection to rotary head unit
- 2 Casing drive flange for casings D 114.3 mm – D 219.1 mm (D 4-1/2" – D 8-5/8")
- 3 Guide bushing for balancing rods with D 60 mm – D 110 mm (D 2-23/64" – D 4-21/64")
- 4 Connection to discharge hose in different configurations (Putzmeister, Perrot, DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit

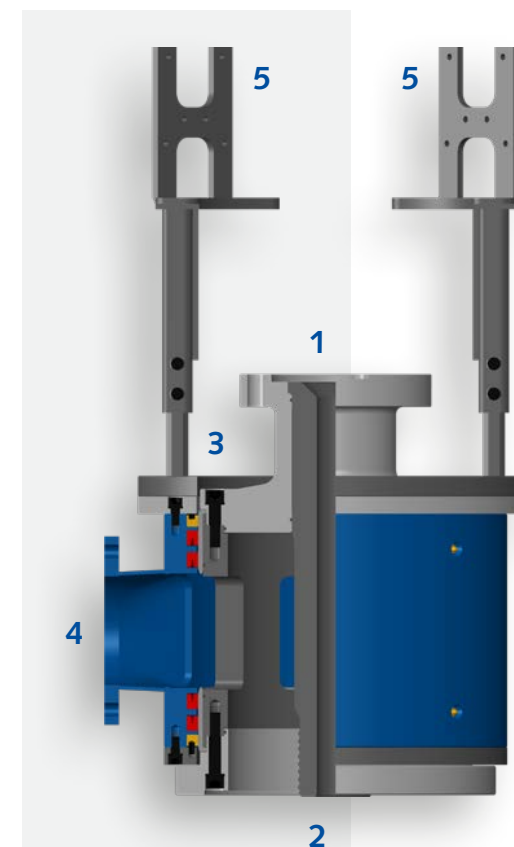


DISCHARGE PREVENTER / DIVERTER D 365 DOUBLE HEAD

The D 365 is intended to be used for outer casing sizes of D 219.1 mm (8-5/8") up to D 323.9 mm (12-3/4"). A maximum torque of 50 kNm, maximum allowable retraction force of 40 tonnes with a maximum 50 RPM rounds off this model.

Discharge preventer / diverter D 365 consisting of:

- 1 Double flange connection to rotary head unit
- 2 Casing drive flange for casings D 219.1 mm – D 323.9 mm (D 8-5/8" – D 12-3/4")
- 3 Guide bushing for balancing rods with D 60 mm – D 110 mm (D 3-1/2" – D 4-27/32")
- 4 Connection to discharge hose in different configurations (Putzmeister, Perrot, DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit

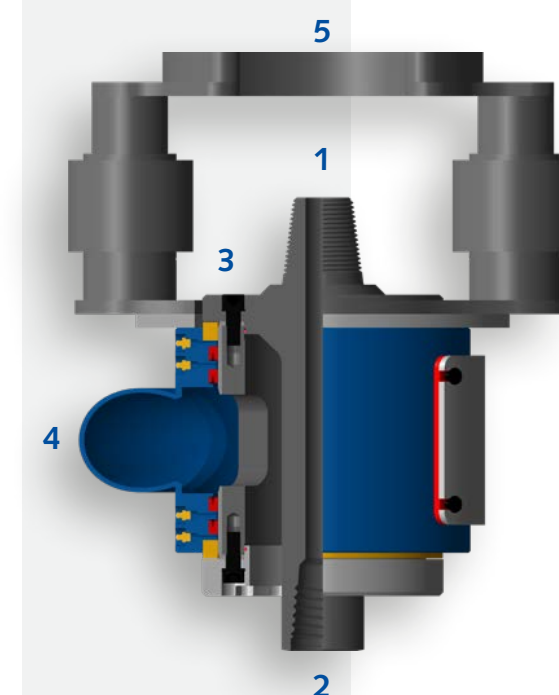


DISCHARGE PREVENTER / DIVERTER DUPLEX SINGLE HEAD WITH PIN-AND-SOCKET CONNECTOR

The discharge preventer / diverter Duplex is a variant to be used with a single rotary head unit with flange connection. In this configuration, the adaptor / balancing rod for the inner drill rods is connected to the double flange with a pin-and-socket connection system.

Discharge preventer / diverter consisting of:

- 1 Double flange connection to rotary head unit
- 2 Casing drive flange for the outer casings
- 3 Adaptor / balancing rod to connection for the inner rods
- 4 Connection to discharge hose in different configurations (Putzmeister, Perrot, DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit

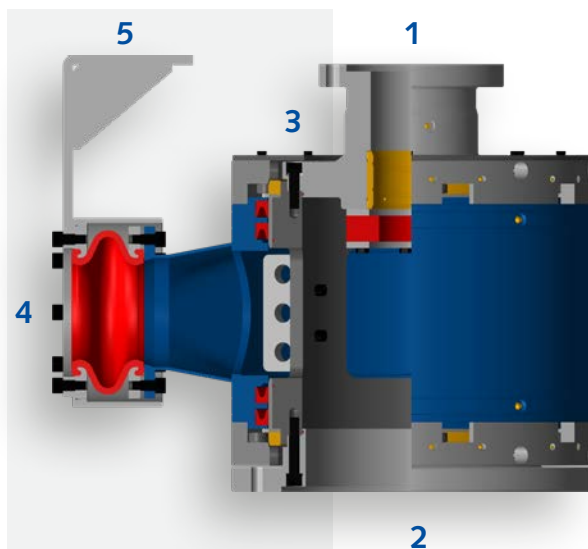


DISCHARGE PREVENTER / DIVERTER DUPLEX SINGLE HEAD WITH THREAD CONNECTION

The discharge preventer / diverter Duplex is a variant to be used with a single rotary head unit with threaded connection. In this configuration, the adaptor / balancing rod for the inner drill rods is connected to the diverter with bolts.

Discharge preventer / diverter consisting of:

- 1 Threaded connection to rotary head unit
- 2 Casing drive flange for the outer casings
- 3 Adaptor / balancing rod to connection for the inner rods
- 4 Connection to discharge hose in different configurations (Putzmeister, Perrot, DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit

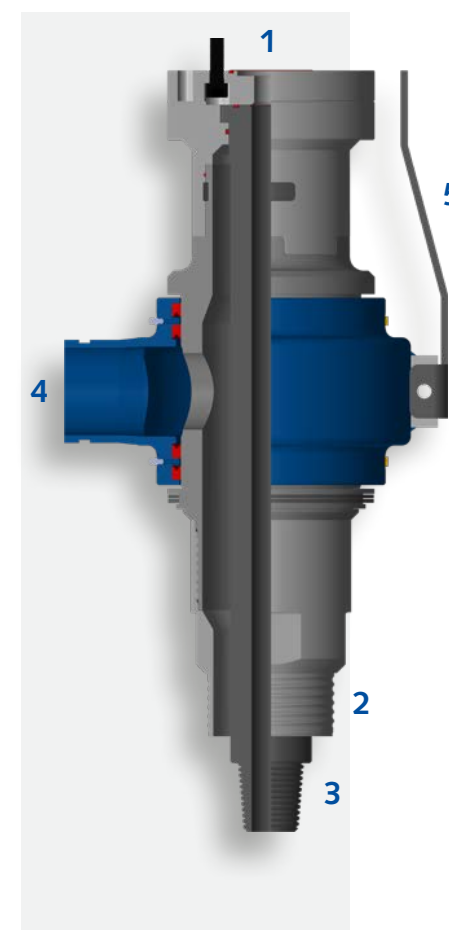


DISCHARGE PREVENTER / DIVERTER D 440 DOUBLE HEAD

The D 440 is intended to be used for outer casing sizes of D 323.9 mm (12-3/4") up to D 508 (20"). A maximum torque of 110 kNm, maximum allowable retraction force of 60 tonnes with a maximum 25 RPM rounds off this model.

Discharge preventer / diverter D 440 consisting of:

- 1 Double flange connection to rotary head unit
- 2 Casing drive flange for casings
D 323.9 mm – D 508 mm (D 12-3/4" – D 20")
- 3 Guide bushing for balancing rods with
D 105 mm – D 150 mm (D 4-9/64" – D 5-29/32")
- 4 Connection to discharge hose in different configurations
(DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit



DISCHARGE PREVENTER / DIVERTER DUPLEX SINGLE HEAD WITH PIN-AND-SOCKET CONNECTOR

The discharge preventer / diverter Duplex is a variant to be used with a single rotary head unit with flange connection. In this configuration, the components are easily interchangeable due to the pin-and-socket connections.

Discharge preventer / diverter Duplex consisting of:

- 1 Double flange connection to rotary head unit
- 2 Adaptor to connection for the outer casings
- 3 Adaptor / balancing rod to connection for the inner rods
- 4 Connection to discharge hose in different configurations
(Putzmeister, Perrot, DIN-flange etc.)
- 5 Traverse / holder to match rotary head unit

PRODUCT FOCUS

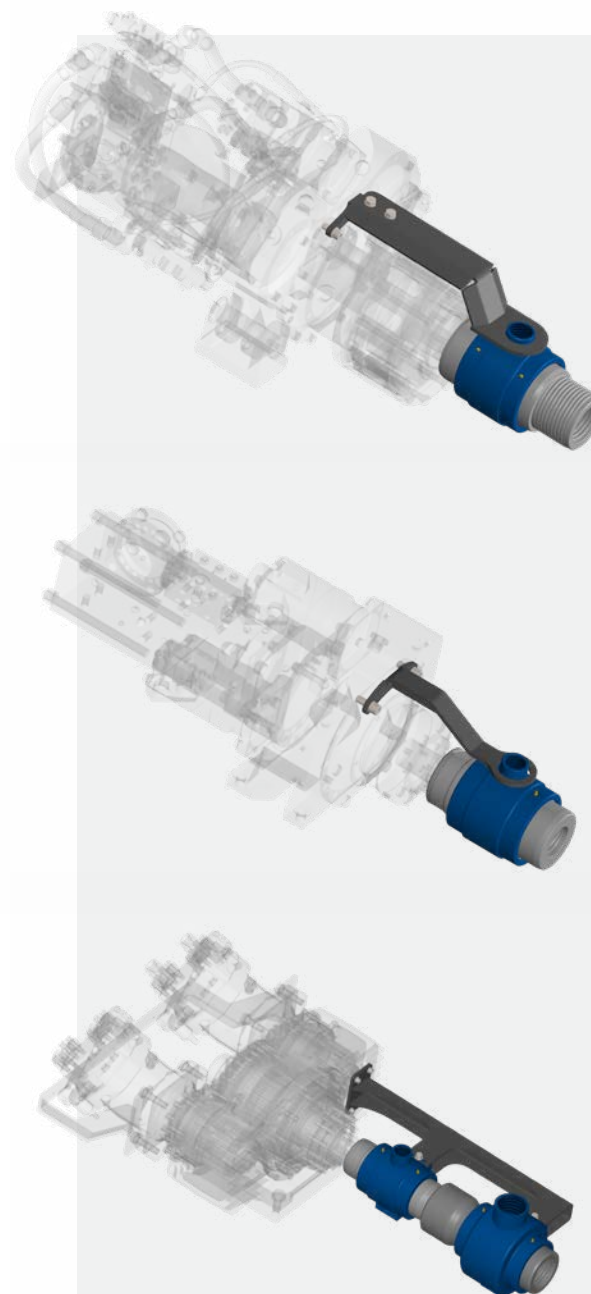
drill bits, discharge preventers, flushing heads etc.



PRODUCT FOCUS

SYSBOHR[®]
Drilling Technique for the Construction Industry

FLUSHING HEADS / SWIVELS



Sysbohr's highly qualified team develop custom tooling and economically efficient solutions for all drilling projects in the special civil engineering and geothermal energy sectors.

In order to increase the penetration rate of the drill string during the drilling process, and to transport the drilled cuttings from the toe of the borehole to the surface, flushing medium is introduced into the system.

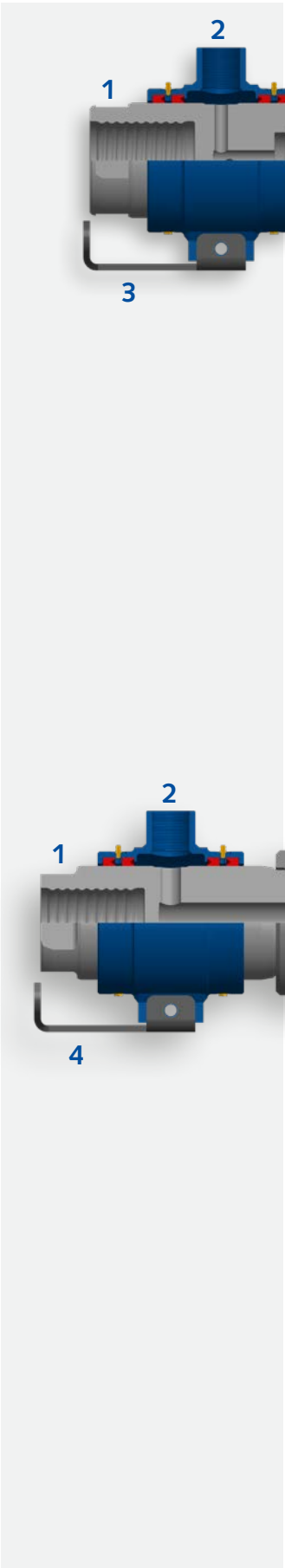
The flushing medium can be water or air, or a combination thereof, and can be introduced into the drill string via the side inlet of the flushing head / swivel.

With the incorporation of various ejection bell and flushing ring designs and combinations, the drilled cuttings and flushing medium may be transported and ejected in a controlled manner through the flushing head / swivel.

For the production of grout bodies in anchor work, the cement suspension may be introduced to the system through the flushing head / swivel.

High pressure as well as low pressure flushing head / swivel versions with the respective sealing technology can be supplied for the most challenging projects.

FLUSHING HEADS / SWIVELS



VARIANT 1

This flushing head / swivel variant is mostly used in double head configurations, but can also be encountered in single drifter applications.

Percussive flushing head consisting of:

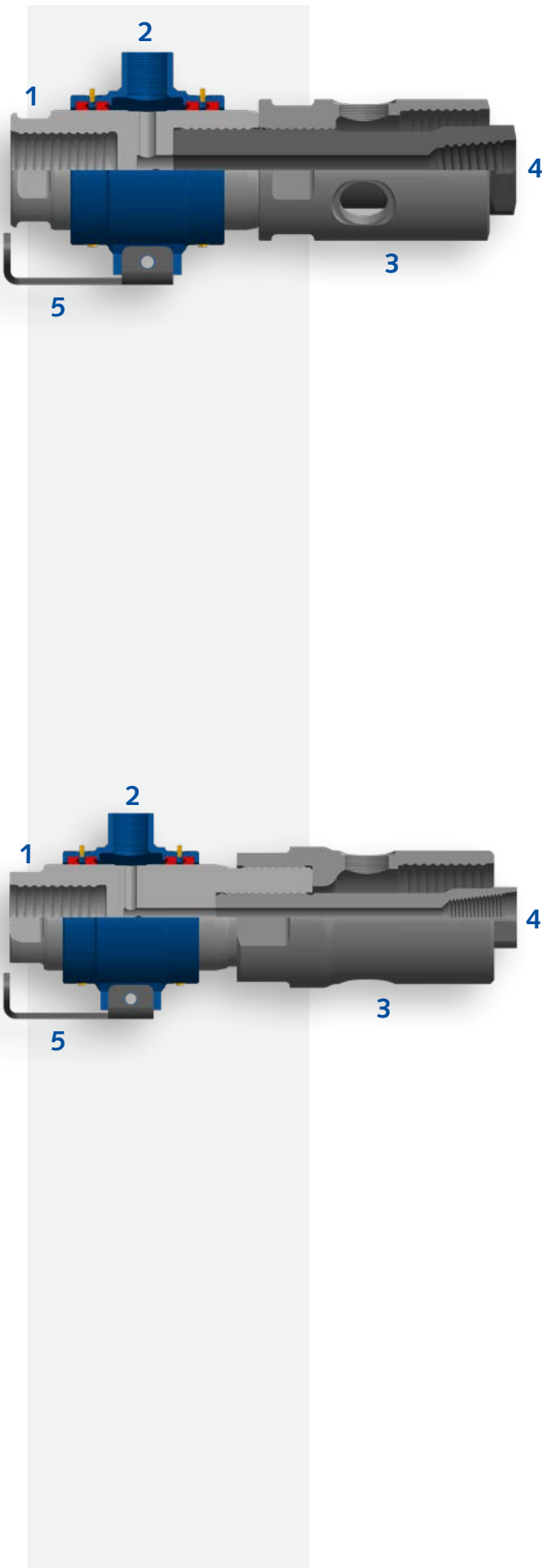
- 1 Flushing shaft with thread types to suit shank adaptor and anchor or balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Traverse / holder to match hydraulic drifter

VARIANT 2

This flushing head / swivel is mostly used in outer flushing applications. A thread-saver design has been incorporated into the head to make replacement easier and more versatile.

Percussive flushing head consisting of:

- 1 Flushing shaft with thread types to suit shank adaptor and anchor or balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Percussion drive nipple / box to match the flushing shaft and outer casing
- 4 Traverse / holder to match hydraulic drifter



VARIANT 3

This flushing head / swivel is the shortest Duplex variant. The drilled cuttings are transported within the drill string annulus up to, and directed out of the ejection bell. This variant is especially suited to confined operating conditions. All parts are interchangeable.

COMPACT Duplex percussive flushing head consisting of:

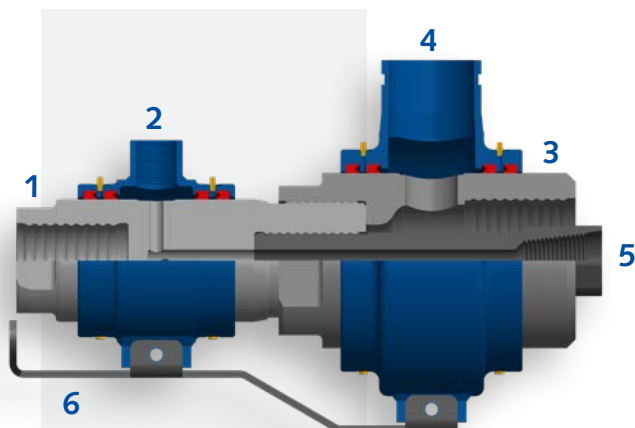
- 1 Flushing shaft with thread types to suit shank adaptor and anchor or balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Ejection bell to suit balancing rod and outer drill string with ejection bell discharge ports (the ejection bell discharge ports may be closed off if and when required).
- 4 Balancing rod to flushing shaft and inner drill string
- 5 Traverse / holder to match flushing ring and hydraulic drifter

VARIANT 4

This flushing head / swivel is the most common Duplex variant. The drilled cuttings are transported within the drill string annulus up to, and directed out of the ejection bell. All parts are interchangeable.

Duplex percussive flushing head consisting of:

- 1 Flushing shaft with thread types to suit shank adaptor, ejection bell and balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Ejection bell to suit balancing rod and outer drill string with ejection bell discharge ports (the ejection bell discharge ports may be closed off if and when required).
- 4 Balancing rod to flushing shaft and inner drill string
- 5 Traverse / holder to match flushing ring and hydraulic drifter

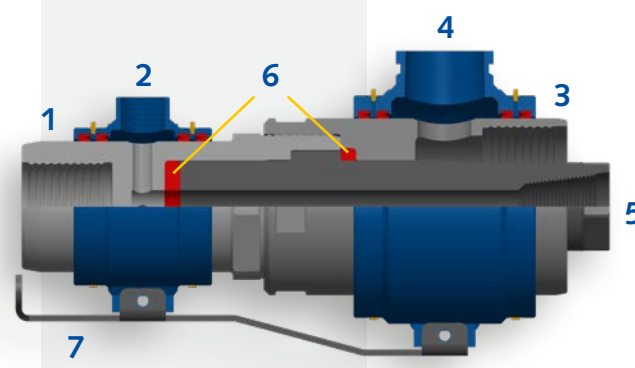


VARIANT 5

This flushing head / swivel is a duplex variant with an additional discharge flushing ring. The drilled cuttings are transported within the drill string annulus up to, and directed out of the ejection bell, thereby discharging in a controlled manner. All parts are interchangeable.

Duplex percussive flushing head consisting of:

- 1 Flushing shaft with thread types to suit shank adaptor, ejection bell and balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Ejection bell to suit flushing shaft and outer drill string with ejection ports
- 4 Discharge preventer / diverter flushing ring to suit ejection bell
- 5 Balancing rod to flushing shaft and inner drill string
- 6 Traverse / holder to hold flushing ring, discharge preventer / diverter flushing ring to hydraulic drifter

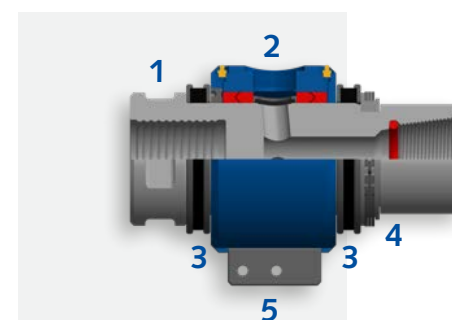


VARIANT 6

This flushing head / swivel is a duplex variant with an additional discharge flushing ring and a damped unit connected to the balancing rod. This enables the simultaneous use of a hydraulic drifter and DTH hammer. The drilled cuttings are transported within the drill string annulus up to, and directed out of the ejection bell, thereby discharging in a controlled manner. All parts are interchangeable..

Dual percussive flushing head consisting of:

- 1 Flushing shaft with thread types to suit shank adaptor, ejection bell and balancing rod
- 2 Flushing ring with thread type G 1" – G 3"
- 3 Ejection bell to suit flushing shaft and outer drill string with ejection ports
- 4 Discharge preventer / diverter flushing ring to suit ejection bell
- 5 Balancing rod to flushing shaft and inner drill string
- 6 Damper units
- 7 Traverse / holder to hold flushing ring, discharge preventer / diverter flushing ring to hydraulic drifter



VARIANT 7

This flushing head / swivel is a high pressure variant and can withstand up to 500 bar (7252 psi). Mostly utilised in water driven DTH hammer applications, and can be easily coupled to a shank adaptor.

High pressure flushing head consisting of:

- 1 Flushing shaft with thread type to suit shank adaptor and high pressure tubes
- 2 Flushing ring with thread type G 1-1/2"
- 3 Damper units
- 4 Securing elements
- 5 Traverse / holder to hold flushing ring, and to suit hydraulic drifter

PRECISION ENGINEERED DRILLING SOLUTIONS FROM INITIAL CONCEPT TO FINAL TOOL SYSTEMS – EVERYTHING UNDER ONE UMBRELLA!



Sysbohr's highly qualified team develop custom tooling and economically efficient solutions for all drilling projects in the special civil engineering and geothermal energy sectors.

THE ADDED ADVANTAGE

Project planning including: Support and guidance of drilling personnel over the entire duration of the project at hand. Quick and on-track customer results mirrored by Sysbohr's quick turn around times from order to final delivery.

We look forward to being your partner of choice on your next projects and challenges.

SYSBOHR GMBH

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Sysbohr's offering includes the development and production of tools and accessories for the entire range of applications in diameters from 51 mm (2") to 610 mm (24").

The systems shown in this product catalogue show standard system variants and can be combined together to form unique systems if required.

Non-off-the-shelf products for complex drilling applications and extreme drilling conditions can be tailor-made to meet customer needs and expectations.

Sysbohr's sales team look forward to guiding customers through a detailed in-house consulting process, whereby a comprehensive drilling solution is identified and generated.



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