

LEAFLETS



INDEX

BOTTOM DRIVEN EJECTION HEAD (SYMMETRIX-ULTRA MAX BIT-DTH ROX)

DRIVER EJECTION HEAD FOR OVERBURDEN DRILLING

DOUBLE FLUID JET GROUTING WITH DTH

S.T.R.A.JET SYSTEM IV

DOUBLE NOZZLE S.T.R.A.JET SYSTEM

HIGH PRESSURE SWIVEL WITH HYDRODYNAMIC SEALS FOR DOUBLE FLUID JET GROUTING TREATMENT

ON-OFF TOP DRIVE WITH DIVERTER

MEASURING WHILE JETTING SYSTEM

PREVENTERS

2" AND 3" TOP SWIVELS (AIR-WATER-GROUT)

KIT ROTARY

HEX135 RODS WITH OUTER D.324 CASING DRILLING STRING FOR DTH

CHECK GROUT: JET GROUT COLUMN RADIUS MEASURING SYSTEM

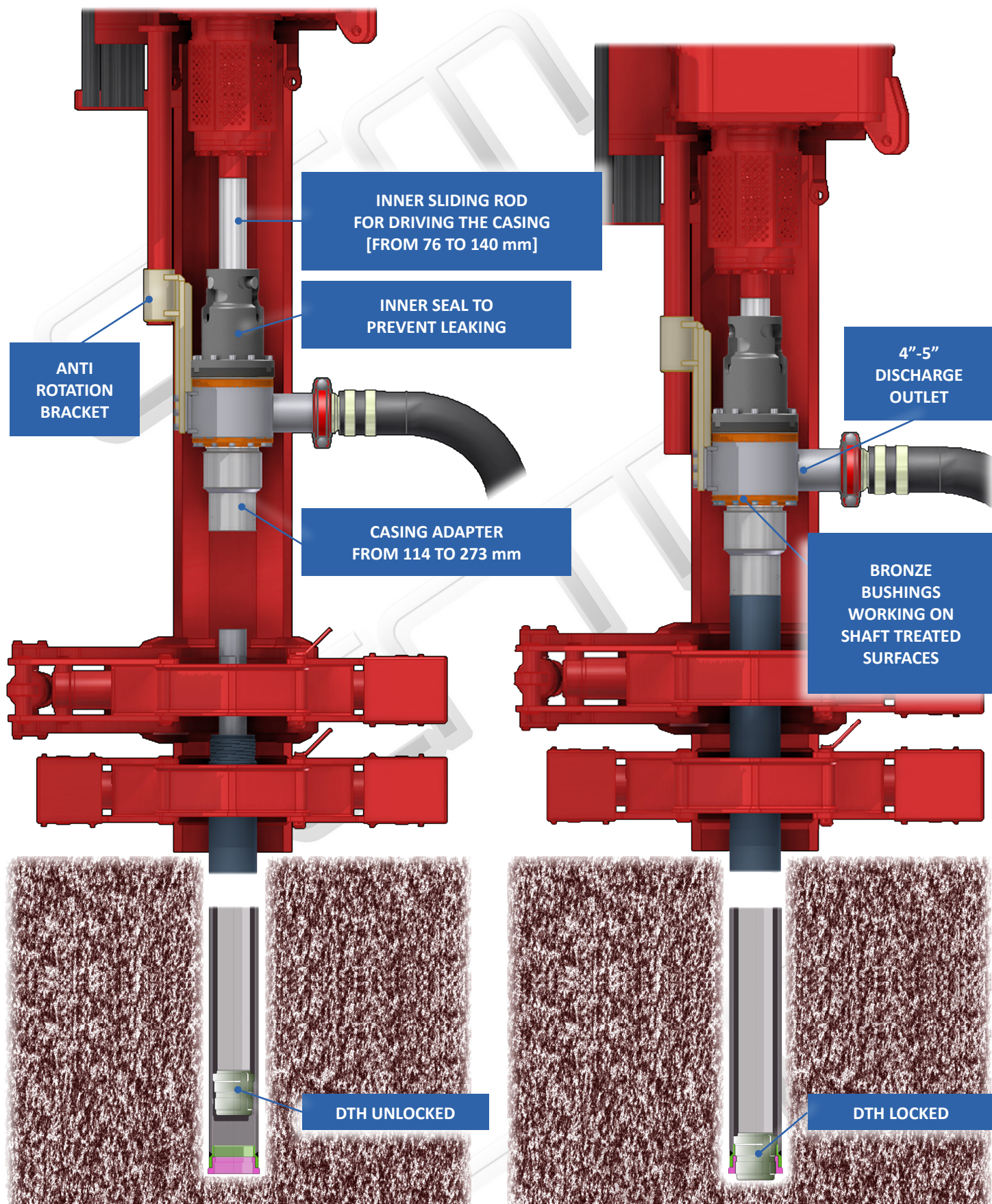
S.T.R.A.JET SYSTEM "XL VERSION"

VERTI JET: REAL TIME HOLE DIRECTIONAL CONTROL WITHOUT OPENING THE STRING

STEERJET SYSTEM: REAL TIME HOLE SURVEY / STEERING

GYRO 2: REAL TIME HOLE DIRECTIONAL CONTROL

S.T.R.A.JET XS





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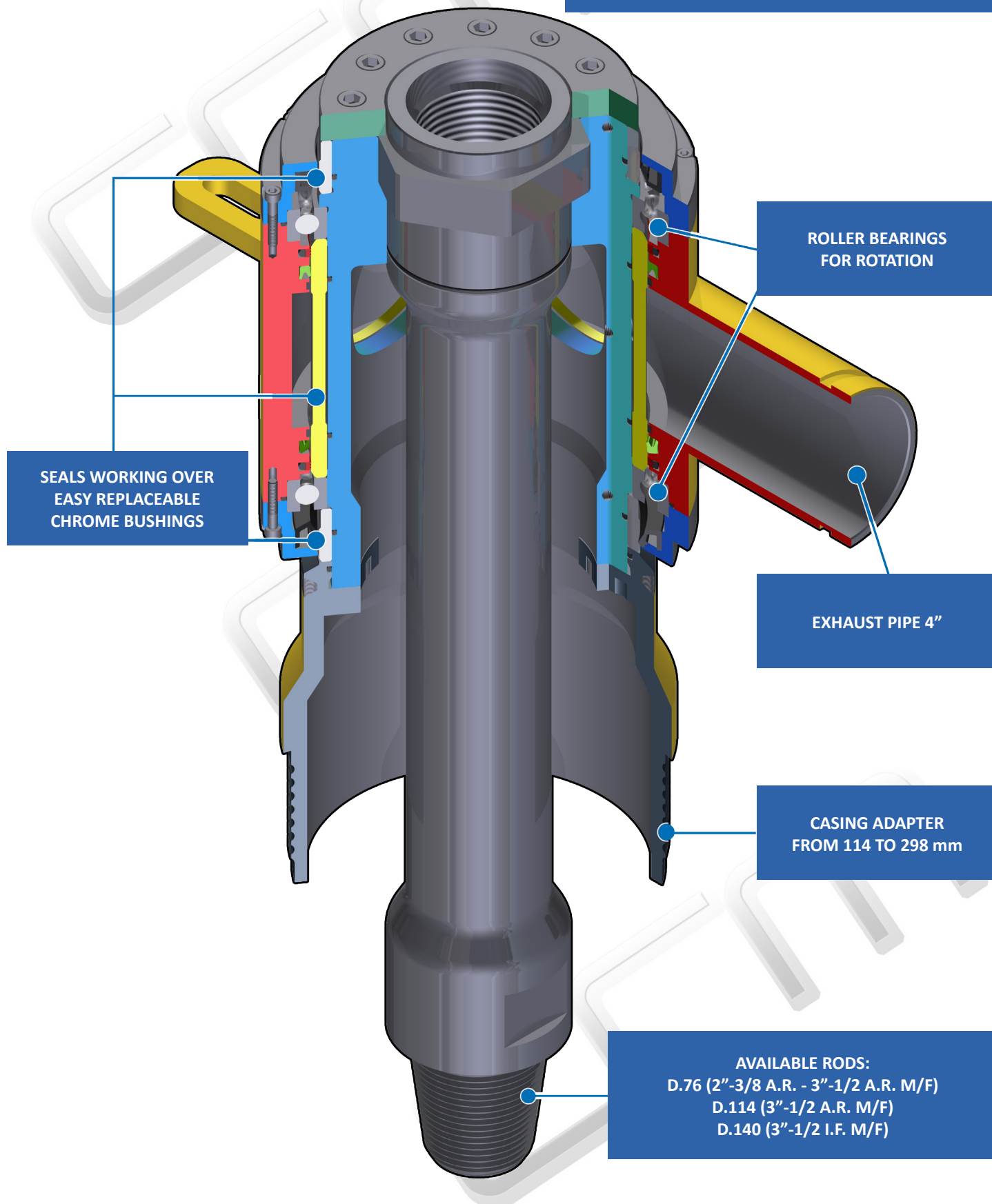
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TECHNICAL DATA:
INNER PASSAGE: 4" (101,7 mm)
RPM MAX: 120
MAX TORQUE: 17 KNm (D.76 2"-3/8 A.R.)





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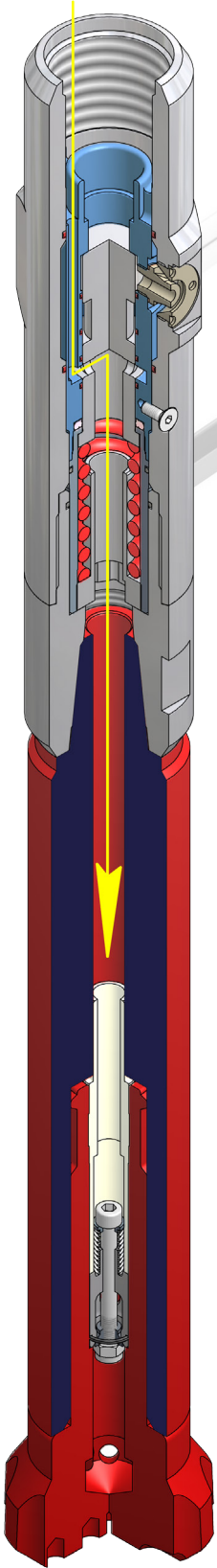
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STEP 1: DRILLING



HAMMER SPECIFICATION

This air dth hammer is designed for double fluid jet grouting treatment. It is equipped with a non-return valve that prevents the grout back pressure to get in. A special seal housed in a longer chuck prevents the grout back pressure to get between the bit and the chuck

Hammer type	4HR		5DH	
Hammer Outside Diameter	97mm	3.82"	124mm	4.88"
Hammer Length (Less Bit, Backhead Shoulder to Chuck)	956mm	37.6"	1054mm	41.5"
Backhead Spanner Flat Size	64mm	2.5"	89mm	3.5"
Drill Bit Shank Type	DHD340A		DHD350R	
Minimum Bit Size	110mm	4.33"	140mm	5.5"
Hammer Weight (Less Bit)	38.6Kg	85Lbs	67.3Kg	148Lbs
Drill Bit Weight (120mm/4 3/4")	10.9Kg	24Lbs	17.7Kg	39Lbs
Piston Weight	7.7Kg	17Lbs	15.0Kg	33.6Lbs
Backhead Stand Off	0.75mm	0.030"	0.75mm	0.030"
Make up Torque	4050-5425 NM	3000-4000 FT Lbs	5085-6780 NM	3750-5000 FT Lbs
Wear Sleeve Reverse Limit	Non Reversible		116.1mm	4.570"
Wear Sleeve Discard Limit	87mm	3.425"	111.8mm	4.400"
Recommended Minimum Air Package	118 l/s @ 10.3 Bar	250 cfm @ 150 psi	283 l/s @ 17.2 Bar	600 cfm @ 250 psi

NOZZLES HOLDER SPECIFICATION

During the DTH hammer drilling the air feeds the hammer while the air duct for the air nozzle is closed. During the double fluid (GROUT-AIR) jet grouting treatment the high pressure grout closes the air duct for the hammer and opens the air duct for the air nozzle. This simultaneous opening and closing is made possible by an automatic distributor inside the monitor.

Code	J-8C214461		J-1C212461	
Ways	2			
Maximum body diameter	119,5 mm	4,7"	119,5 mm	4,7"
Grout nozzles type	J-8C2149XX (From 2.0 to 5.5 mm)		J-8C2149XX (From 2.0 to 5.5 mm) J-8C2149XX-H (From 6.0 to 8.0 mm)	
Grout nozzles thread	1/2" gas			
Air nozzles type	J-8C214900 (D.23 mm) J-8C214921 (D.21 mm)			
Air nozzles thread	1"-1/4 gas			
Hammer connection thread	2"-3/8 A.R.		3"-1/2 A.R.	
Weight	23 Kg	50,7 Lbs	32,5 Kg	71,65 Lbs
Nozzles holder/rod adapter	J-8C214702-H		J-1C212702-H	
Rods code	J-8C214X00-H		J-1C212X00	

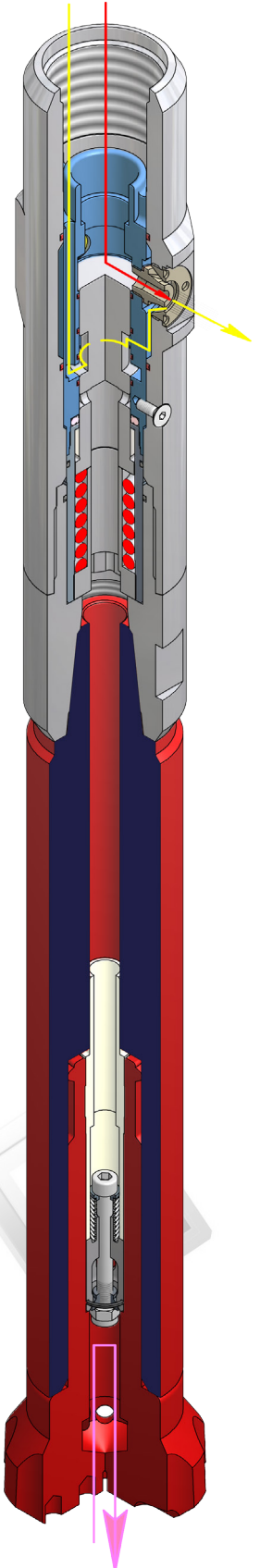
Note: The jet grouting hammer performances are anyhow about 20% less than the standard hammer

= AIR FLOW

= GROUT

PATENTED
RM99A000395

STEP 2: JETTING





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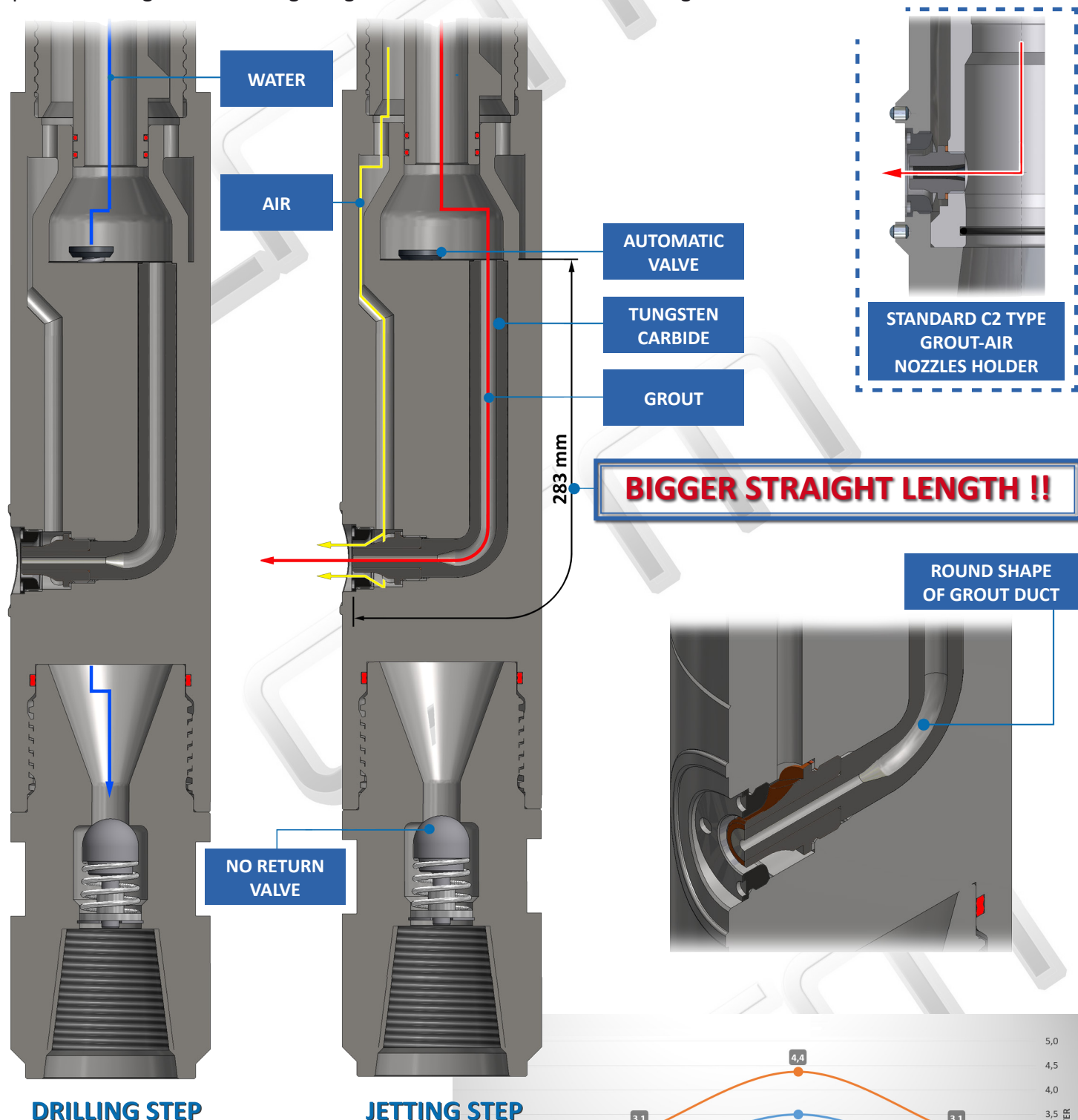
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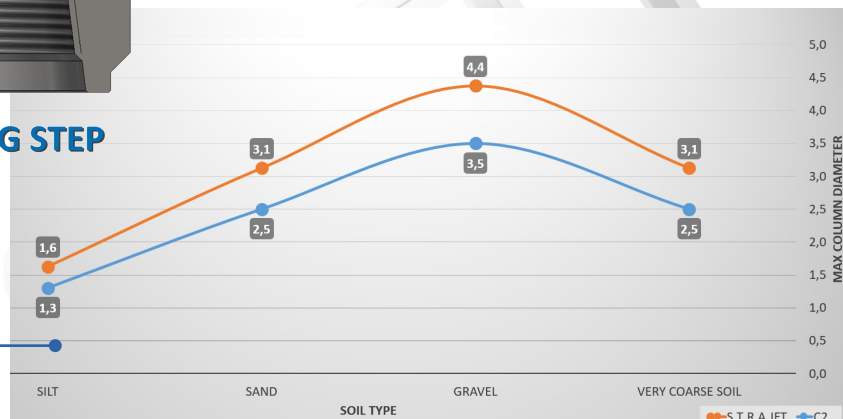
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The strajet is a two ways nozzle holder. In comparison with a standard two ways nozzles holder, it provides a greater cutting force of the grout mix on equal pump's pressure and flow rate. The special design of the grout inner passage reduces the drag by keeping the flow laminar. The nozzle has a longer duct for enhancing the cutting power of the grout flow and getting columns of consolidated soil of a greater diameter.



GREAT DURABILITY !!

COMPARATIVE CHART BETWEEN
STANDARD C2 D.114 AND
STRAJET NOZZLE HOLDERS





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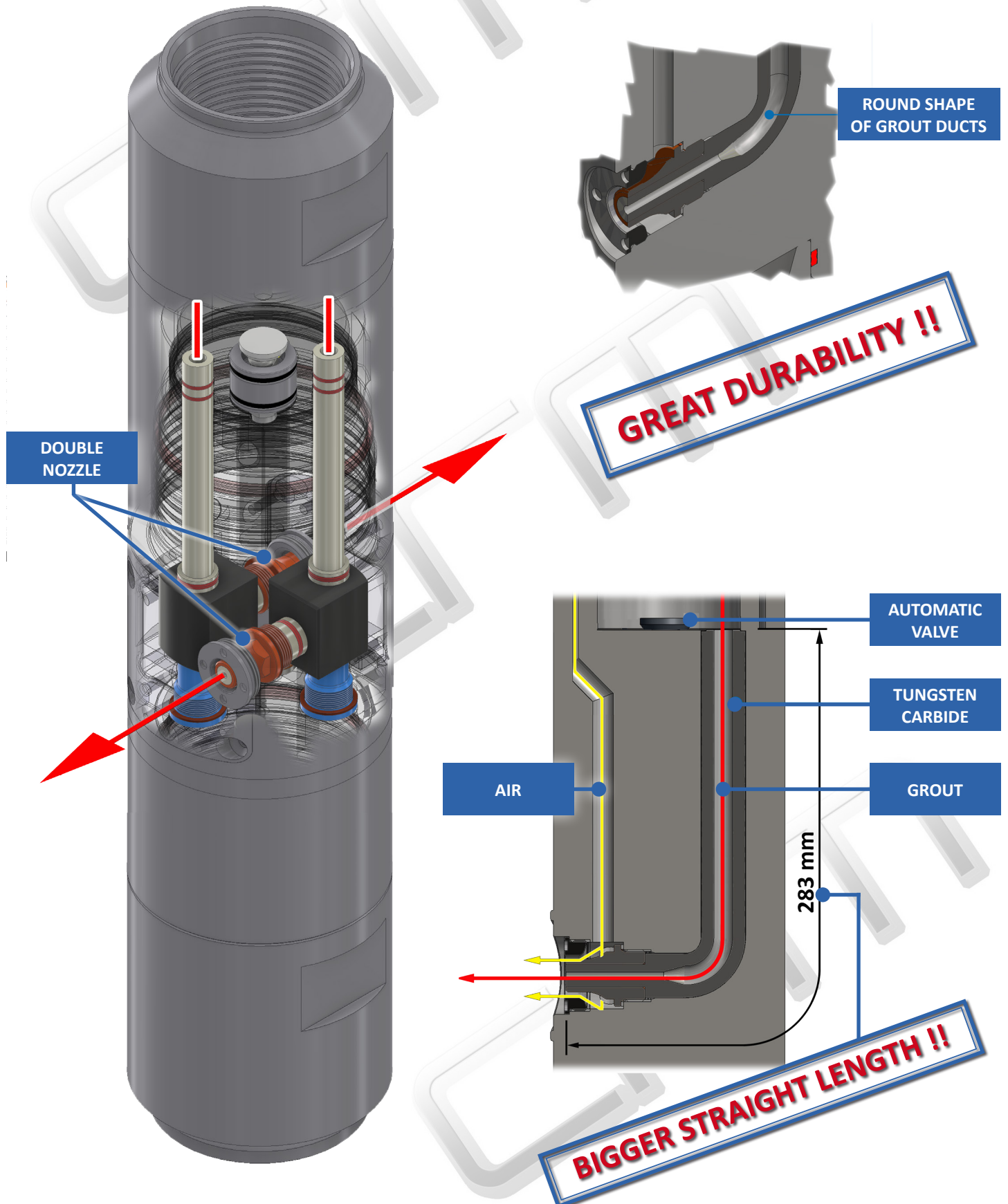
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This is the strajet system version with two nozzles. This is a two ways nozzle holder. In comparison with a standard two ways nozzles holder, it provides a greater cutting force of the grout mix on equal pump's pressure and flow rate. The nozzle has a longer duct for enhancing the cutting power of the grout flow and getting columns of consolidated soil of a greater diameter.





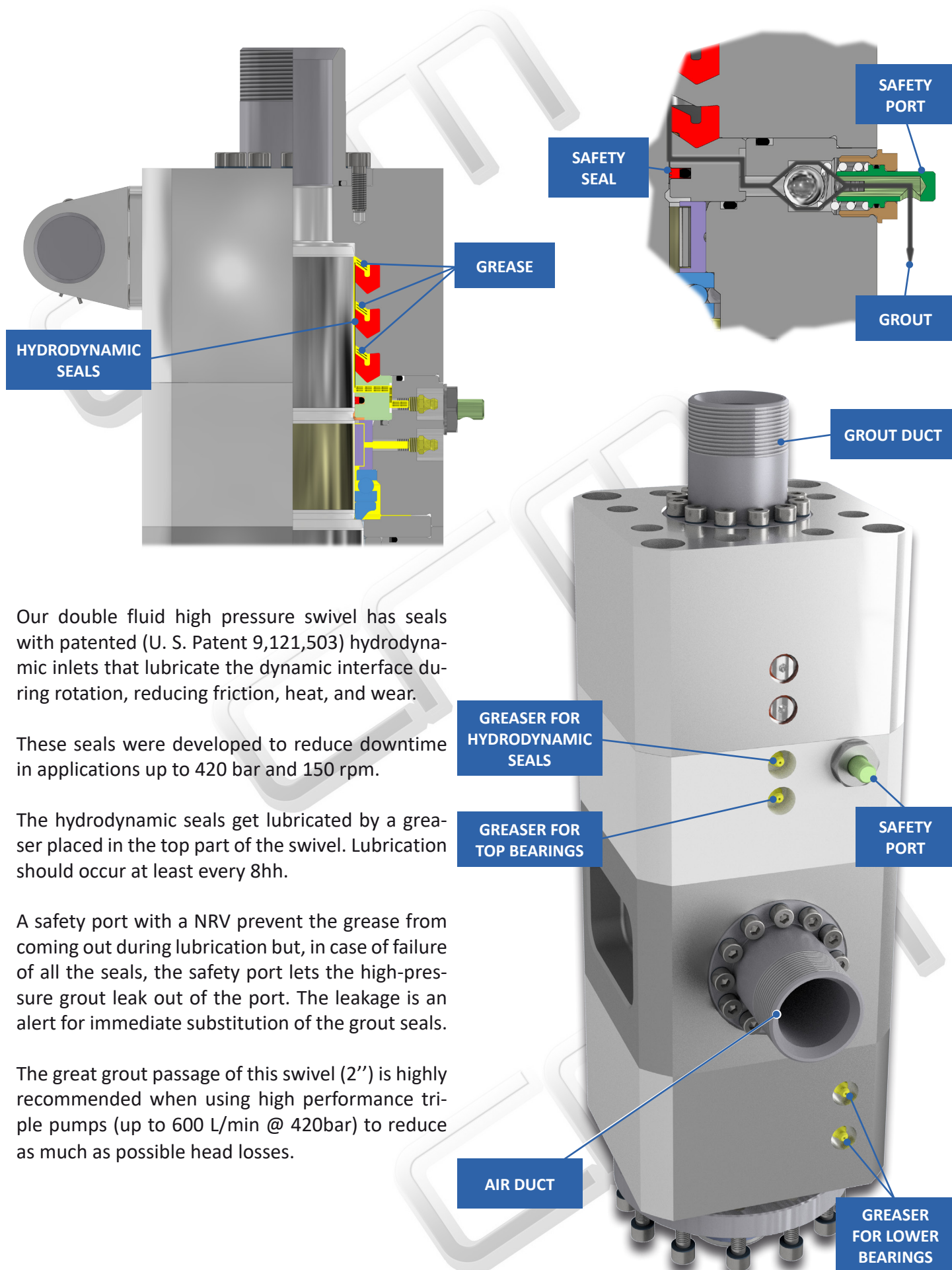
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Our double fluid high pressure swivel has seals with patented (U. S. Patent 9,121,503) hydrodynamic inlets that lubricate the dynamic interface during rotation, reducing friction, heat, and wear.

These seals were developed to reduce downtime in applications up to 420 bar and 150 rpm.

The hydrodynamic seals get lubricated by a greaser placed in the top part of the swivel. Lubrication should occur at least every 8hh.

A safety port with a NRV prevent the grease from coming out during lubrication but, in case of failure of all the seals, the safety port lets the high-pressure grout leak out of the port. The leakage is an alert for immediate substitution of the grout seals.

The great grout passage of this swivel (2") is highly recommended when using high performance triple pumps (up to 600 L/min @ 420bar) to reduce as much as possible head losses.



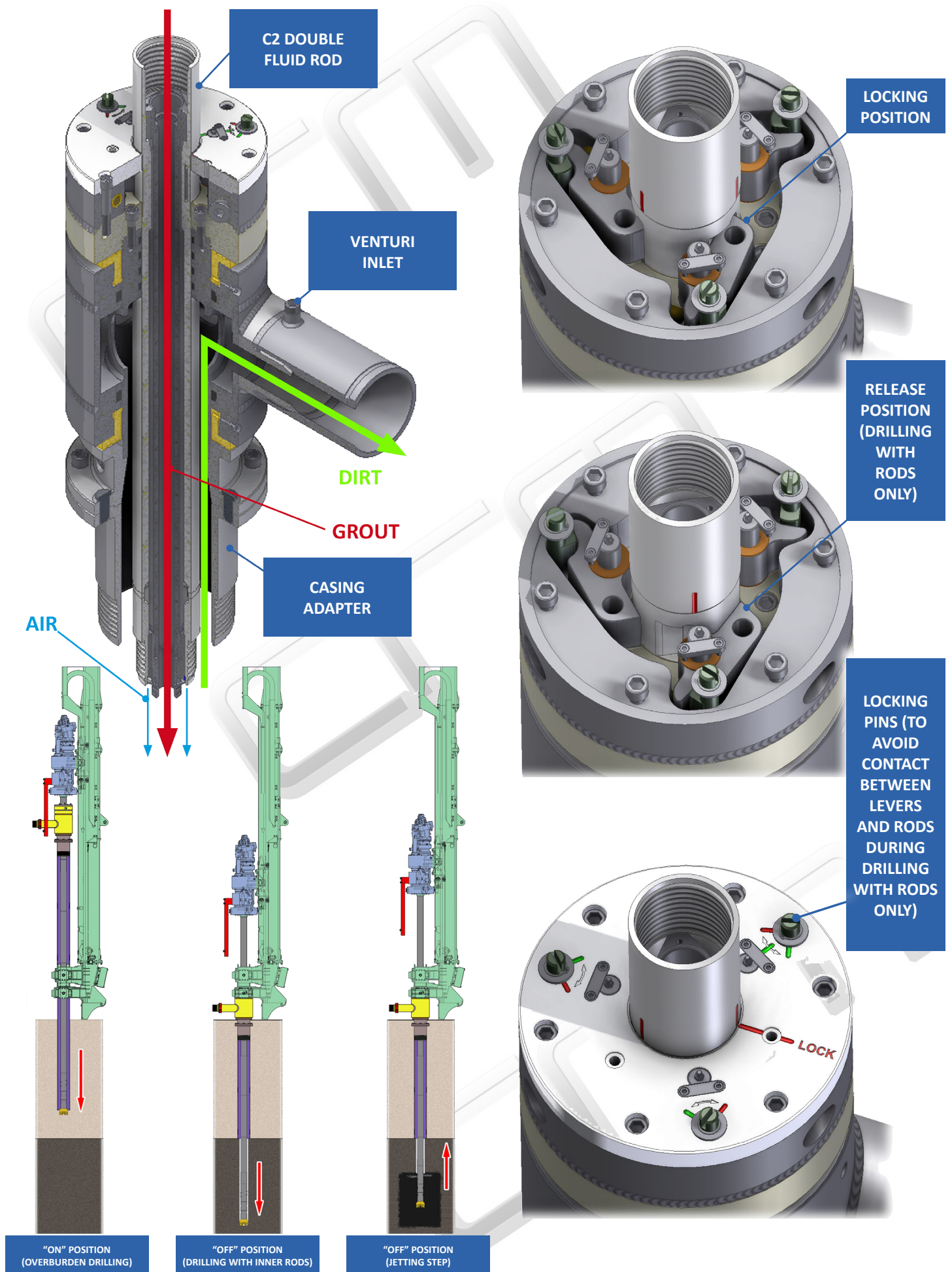
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The knowledge of the JET GROUTING parameters is of great importance for making good soilcrete artefacts. Today the known jet grouting treatment parameters are: nozzle holder lifting speed, rpm, diameter and numbers of nozzles, air pressure, grout mix flow rate, grout mix pressure at the pump and ex post drilling deviation.

A parameter that is not yet available is the drilling deviation in real time. Usually the deviation measurements are not sent to the surface until the deviation sensor is out of the hole and the drilling is done. This has the disadvantage of letting know the drilling deviation ex post and not in real time. Knowing the hole deviation in real time would give the possibility to correct the hole deviation before is too late.

Another parameter that is not yet available is real time downhole pressure inside and out-side the drill pipe just behind the monitor. The real time knowledge of pressure inside the drill pipe allows to measure load losses (useful to understand the real kinetic energy of the grout mix, and therefore the expected column diameter) and the real time knowledge of the downhole pressure in the annulus out of the pipe in proximity of the monitor can be useful to avoid unwanted build-up of pressure inside the hole.

The MWJ (measuring while jetting) system provides you with the real time knowledge of these parameters!

- **Real time deviation**
- **Real time downhole pressure inside drillpipe**
- **Real time downhole pressure outside drillpipe**

MWJ consists of the JEAN LUTZ and CRM RICOR (a box with slip rings), the CRM MWJ rods, and the JEAN LUTZ CICOR an instrumented double fluid rod that measures drilling deviations, down the hole pressure inside the pipe and in the annulus. The data collected are subsequently sent to surface through the MWJ rods and the RICOR.



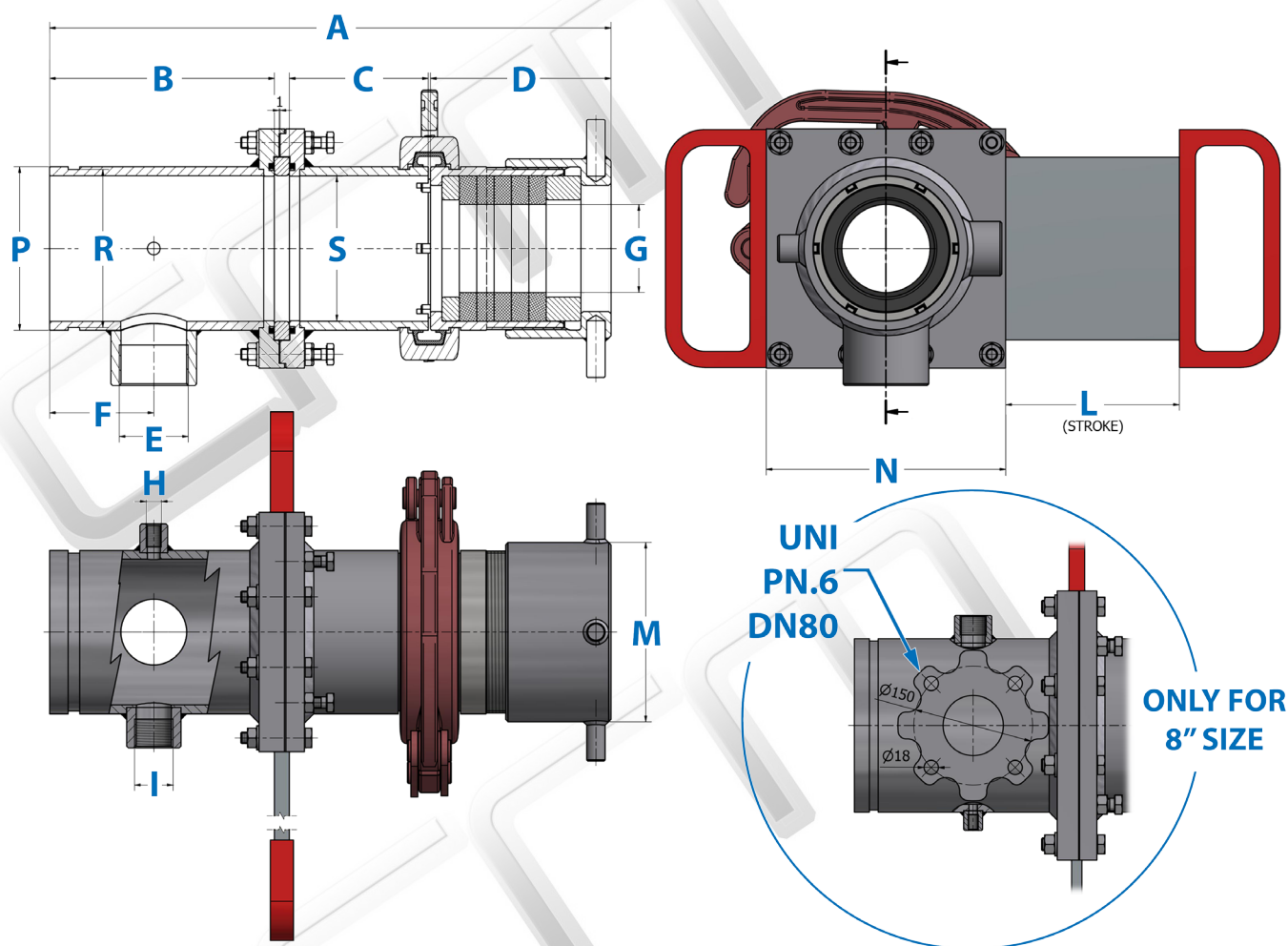
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PREVENTER SIZE	G (RODS DIAMETERS)	A	B	C	D	E	F	H	I	L	M	N	P	R	S
4"	60; 63,5	398	198	83	115	2"G	90	1/4"G	1"G	120	150	180	114	109,5	98,3
5"	76,1; 88,9; 101,6	485	194	120	156	2"G	90	1/4"G	1"G	150	155	207	141,3	136,5	125
6"	114,3; 127; 133	550	194	150	192	2"1/2 G	90	1/4"G	1"G	190	218	260	168,3	163,4	152
8"	140; 152; 168; 178	594	256	132	156	UNI PN.6	150	1/4"G	1"G	240	228	340	219,1	213,8	199



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2" TOP SWIVEL

MAX PRESSURE: 18 MPa

MIN.-MAX TEMPERATURE: -30°C; +120°C

MAX DRILLING SPEED DRY RUN: 30 RPM (MAX 2h)

MAX DRILLING SPEED WITH MEDIUM: 90 RPM

WEIGHT: 13 KG

3" TOP SWIVEL

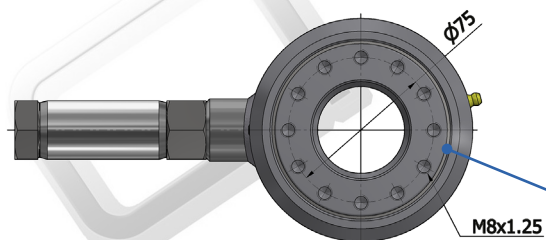
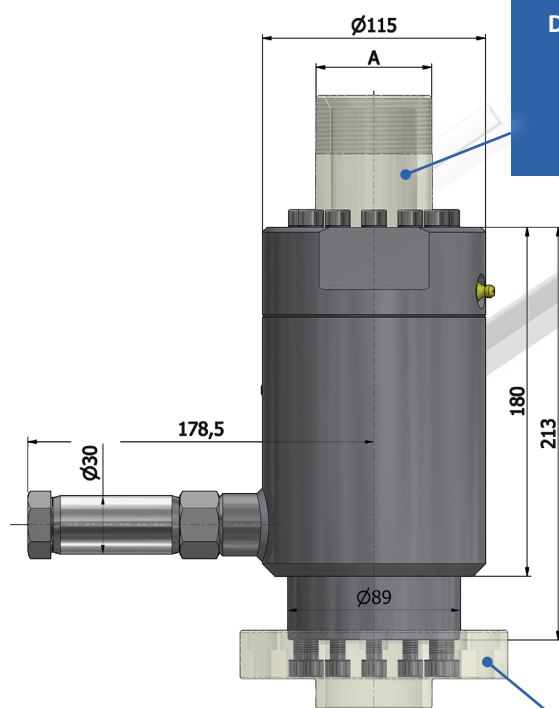
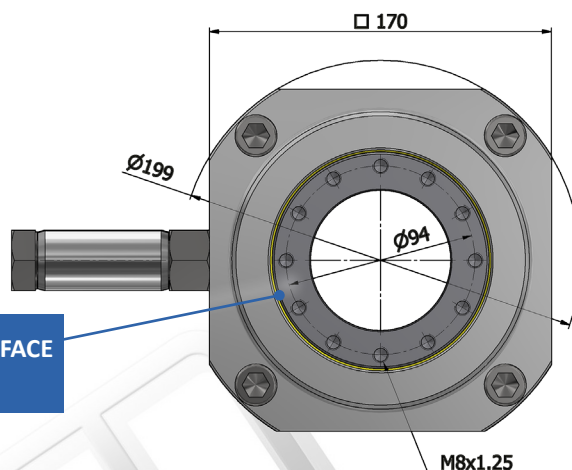
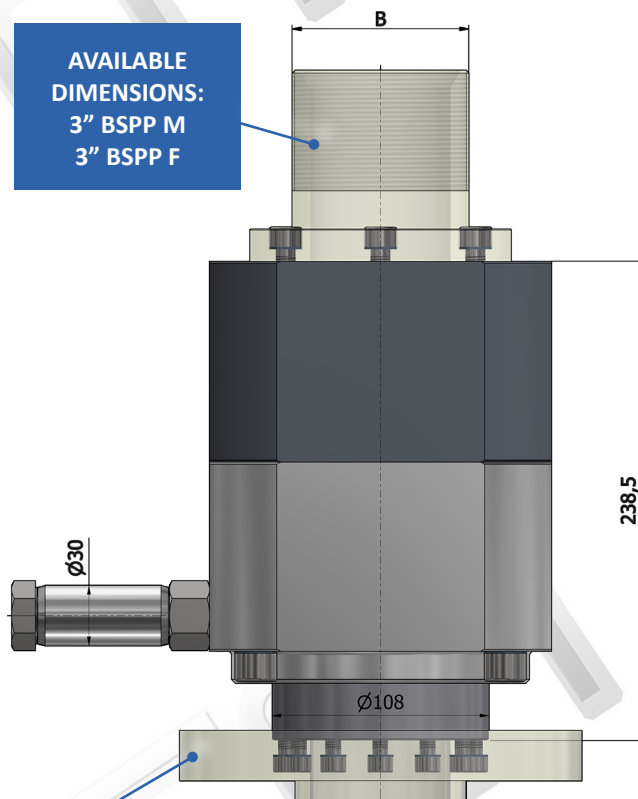
MAX PRESSURE: 18 MPa

MIN.-MAX TEMPERATURE: -30°C; +120°C

MAX DRILLING SPEED DRY RUN: 25 RPM (MAX 2h)

MAX DRILLING SPEED WITH MEDIUM: 85 RPM

WEIGHT: 28 KG

LOWER INTERFACE
DETAILAVAILABLE
DIMENSIONS:
2" BSPT M
2" BSPP M
2" NPT M
2" NPT FAVAILABLE
DIMENSIONS:
3" BSPP M
3" BSPP FFULLY
CUSTOMIZABLE
ADAPTER



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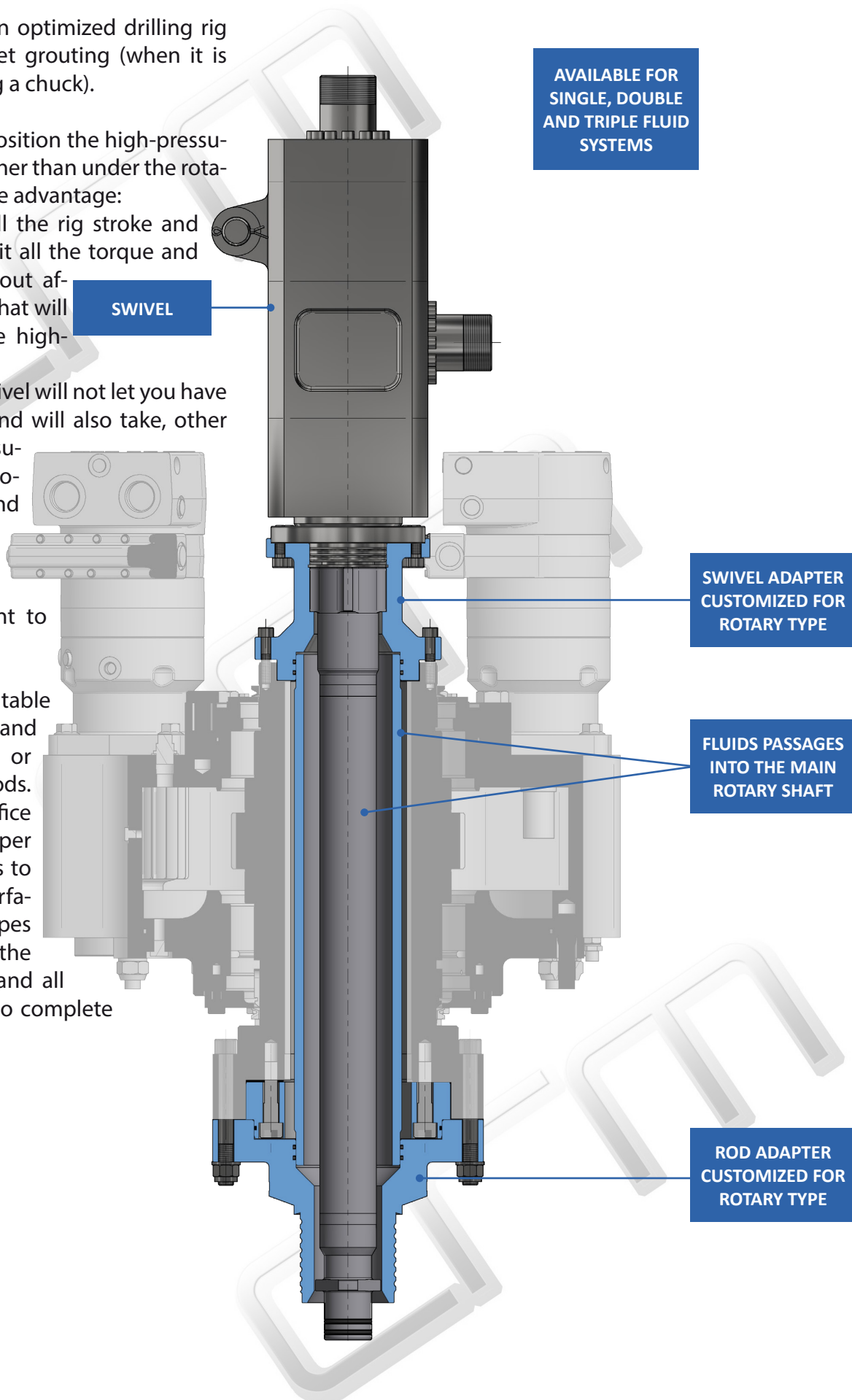
The Rotary Kit is an optimized drilling rig configuration for jet grouting (when it is not possible having a chuck).

This Kit allows to position the high-pressure swivel on top rather than under the rotary. This has a double advantage:

- (i) you can have all the rig stroke and
- (ii) you can transmit all the torque and pull available without affecting the swivel that will only withstand the high-pressure grout mix.

An under rotary swivel will not let you have all the rig stroke and will also take, other than the high-pressure grout mix, the rotary torque, pull and push and it might also be subjected to eccentric rotation with detriment to the grout seals life.

This system is suitable for any rotary type and for single, double or triple fluid jetting rods. Our technical office will design the upper and lower adapters to fit the rotary interface flanges, the pipes passing through the rotary main shaft and all the parts needed to complete the kit.





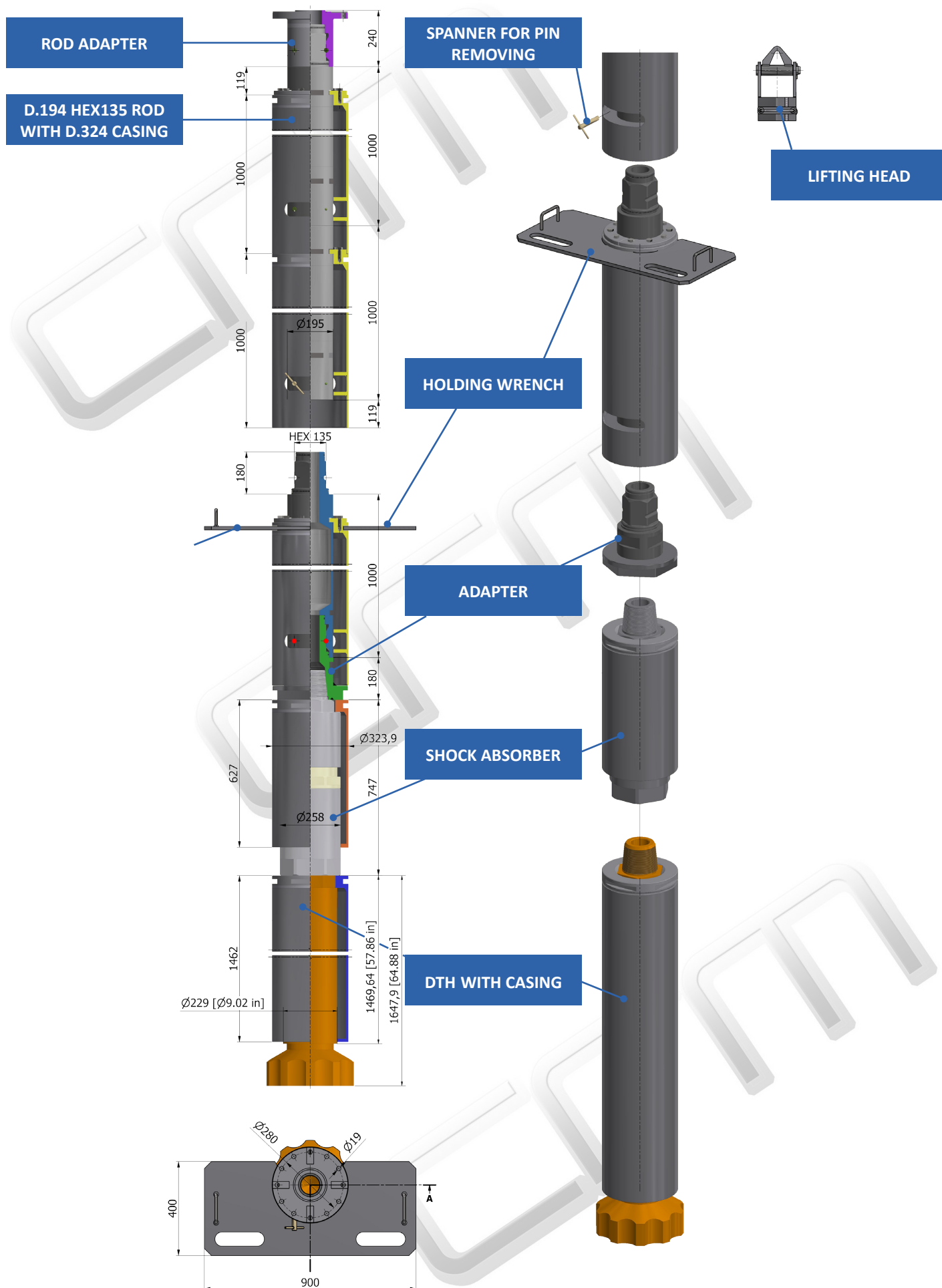
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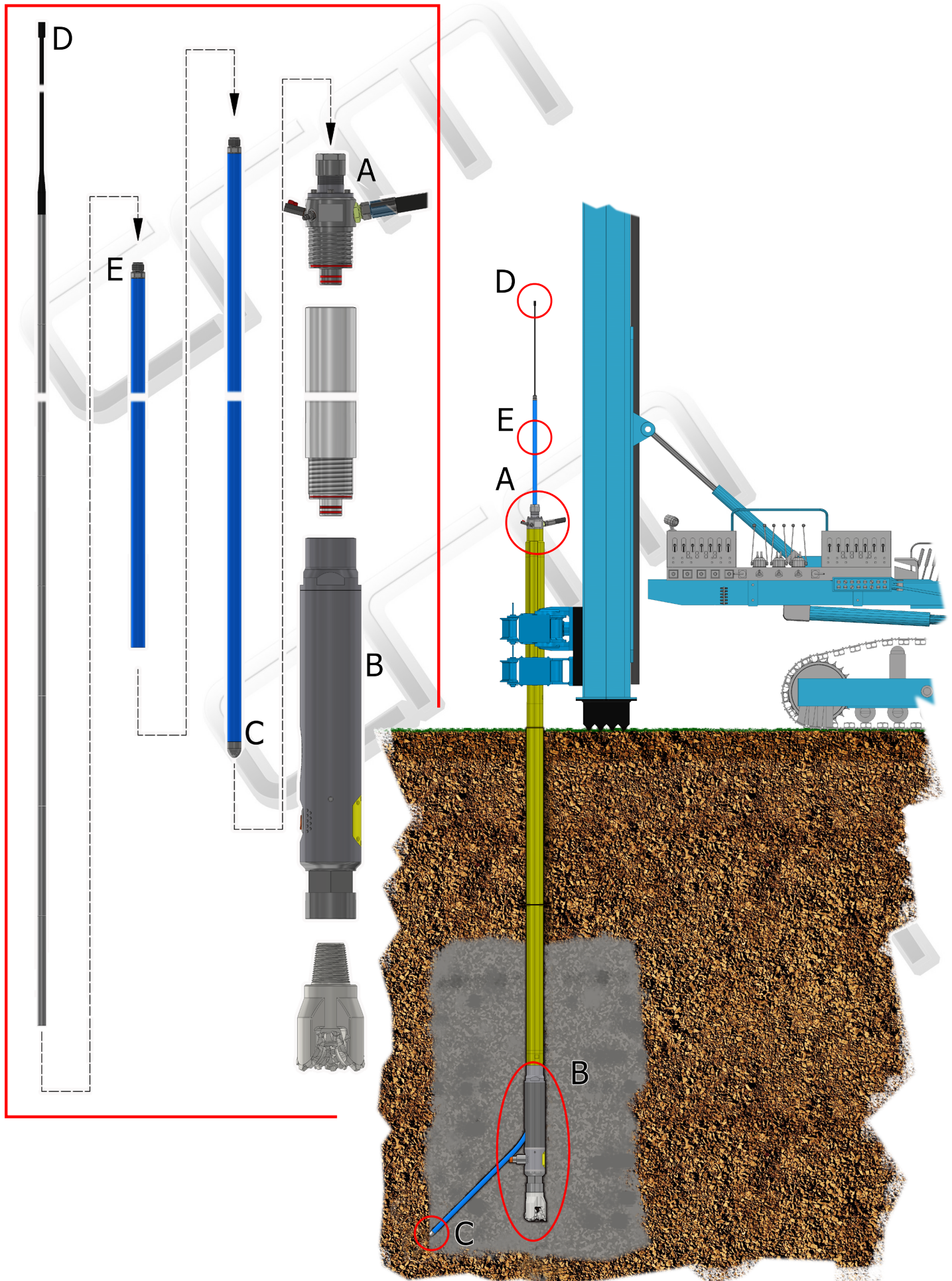
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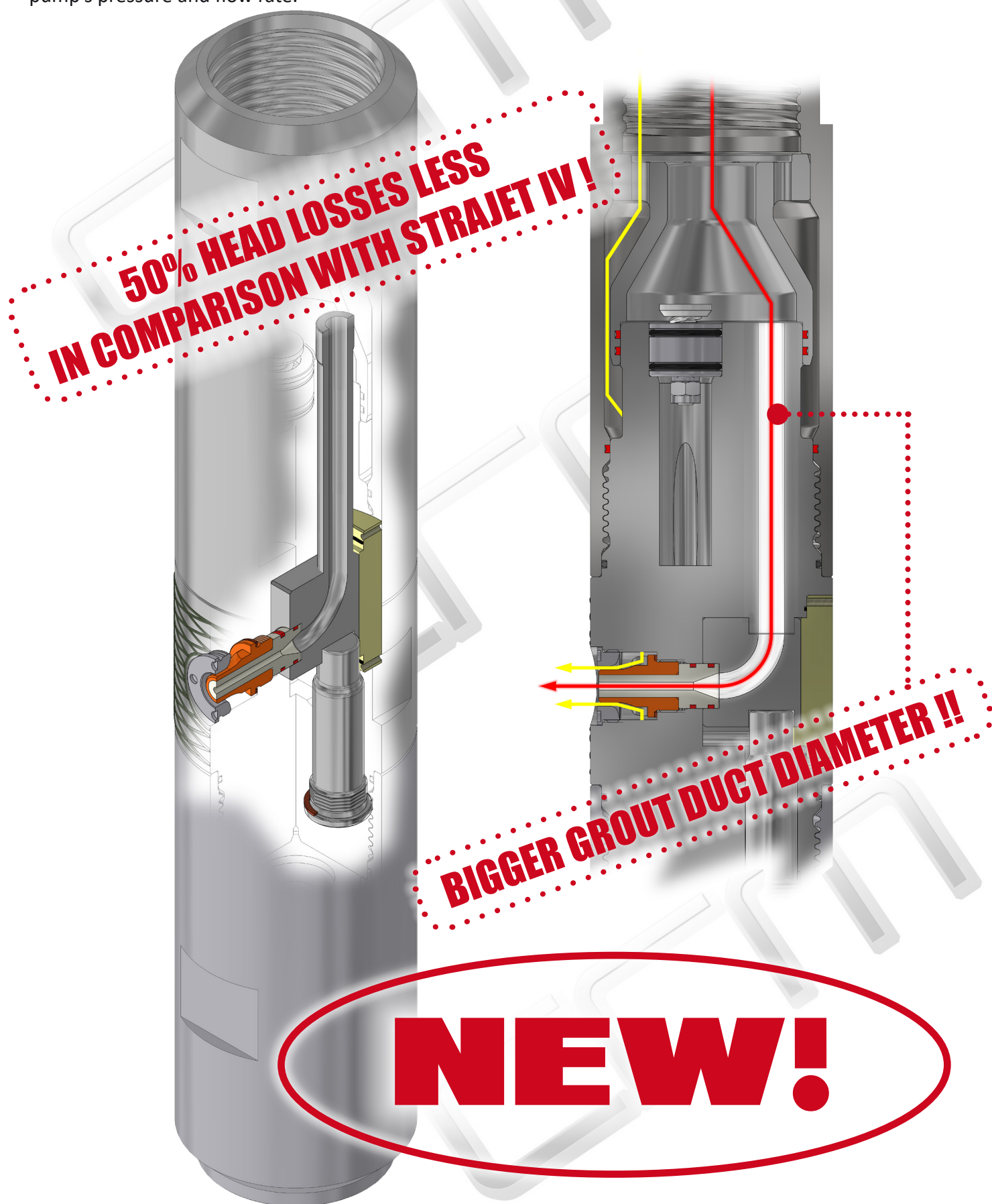
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The **XL STRAJET** is a nozzle holder suitable for triple pump that can work at around 400 bar and 600 L/min. The difference is in the size of the inner duct (ID 15mm vs ID 11mm). This will save around 50% of the head losses induced by the 11 ID of the STRAJET IV inner duct and provides a greater cutting force of the grout mix on equal pump's pressure and flow rate.





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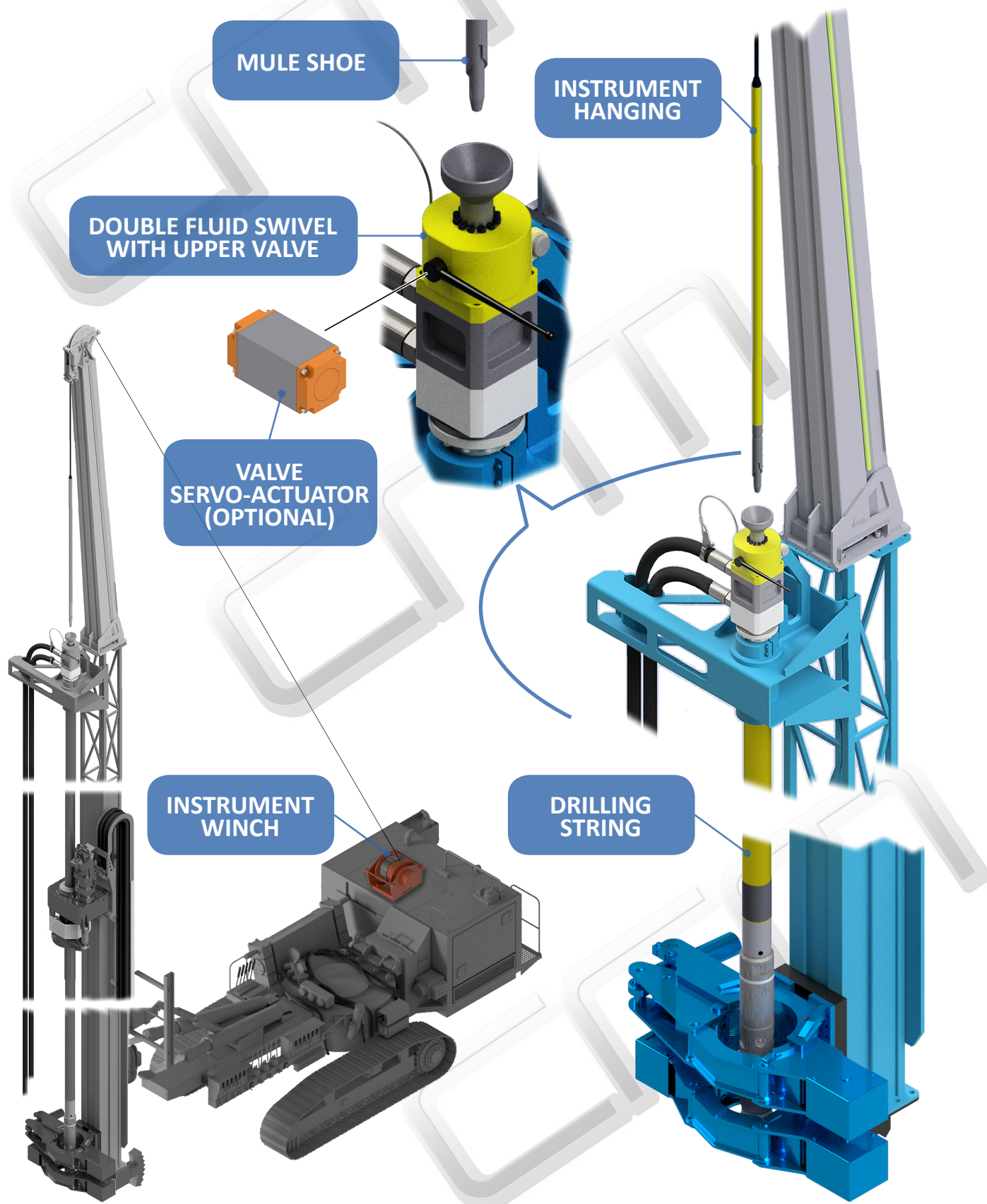
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REAL TIME ADVANTAGES:

- DECIDING IF STOP DRILLING BECAUSE OF EXCESS OF DEVIATION OR CONTINUING DRILLING.
- CHECKING THE HOLE WITHOUT OPENING THE STRING.
- AVOIDING RODS FAILURES FOR UNEXPECTED BENDING
- CORRECT DEVIATIONS.



VERTI JET SPECIFICATIONS

EXPLORER SENSOR ACCURACY

TYPICAL POSITIONAL ACCURACY	0.24% (max 2.4 m/1000 m)
INCLINATION	±0.1°
AZIMUTH	±0.5°
ROLL	±0.5°
REPEATIBILITY	2 sigma
RATE CAPABILITY	±2000°/s

EXPLORER GYRO PROBE

DIAMETER	40 mm / 25 mm
LENGTH	700 mm / 460 mm
TYPE	WIRELIN / BATTERY (LIVE / MEMORY)
TECHNOLOGY	MEMS (Micro Electro Mechanical System)
POWER CONSUMPTION	1.2 W
MEMORY SIZE	8 GB
COMMUNICATIONS	SERIAL RS-485 / PLC
BATTERY TYPE	RECHARGEABLE NiMH
BATTERY CHARGE LIFETIME	8 HOURS

EXPLORER USEFUL DATA

COMPUTER	ALGIZ 10 RUGGED TABLET PC (MIL-STD-810G)
COMPUTER OS	WINDOWS 10
SOFTWARE	WASSARA NAVIGATOR™ (FOR SURVEYING, QC, REPORTS)
RUNNING GEAR	BUILT-IN 200 BAR PRESSURE RATED
CONTROL UNIT	LKAB WASSARA SURVEY WINCH CONTROLLER MKII



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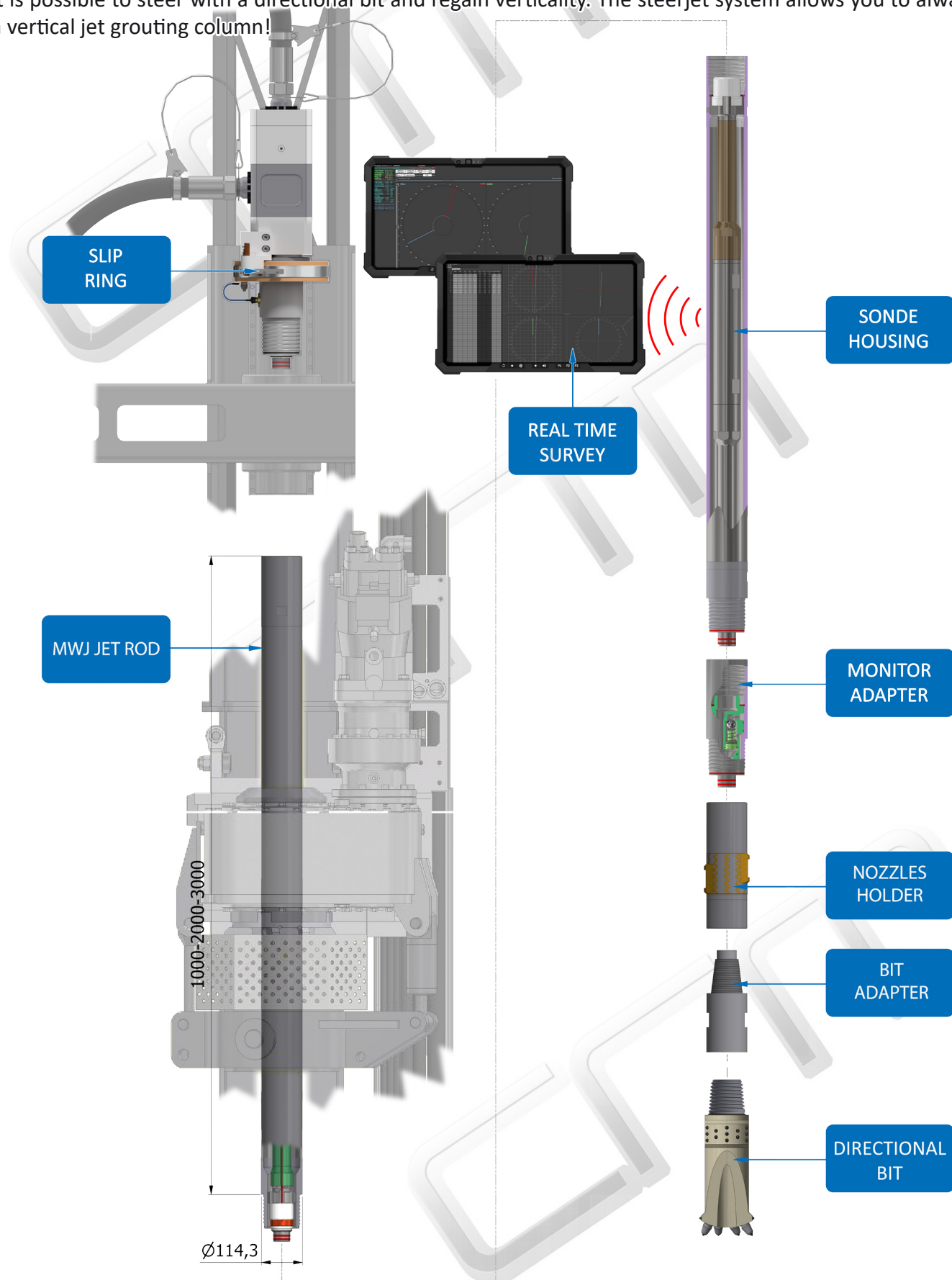
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The Steerjet system is the first jet grouting drilling system that provides you with a real time hole survey and toolface i.e.: the angle measured in a plane perpendicular to the drillstring axis that is between a reference direction on the drillstring and a fixed reference. If during drilling a deviation occurs and the toolface is known, it is possible to steer with a directional bit and regain verticality. The steerjet system allows you to always get a vertical jet grouting column!



STEERJET SPECIFICATIONS

ORIENTATION SENSOR

ANGULAR ACCURACY

AZIMUTH (LATITUDE $\pm 45^\circ$)	$\pm 0.3^\circ$
INCLINATION	$\pm 0.1^\circ$
TOOLFACE	$\pm 0.1^\circ$
OPERATING TEMPERATURE RANGE	-40°C to 125°C
SIZE (PRESSURE BARREL)	1"-3/8 (35mm) DIAMETER
	15"-3/4 (400mm) LENGTH
SIZE (NAKED)	1"-1/8 (28 mm) DIAMETER
	11"-1/4 (286 mm) LENGTH
WEIGHT	4,6 lbs (2,1 Kg) (PRESSURE BARREL)
	0,9 lbs (0,4 Kg) (NAKED)
SHOCK	1000 g 1 ms
VIBRATION	20 G RMS 5 Hz to 1000 Hz

TOP END UNIT

OPERATING TEMPERATURE RANGE	-30°C to 50°C
SIZE	4"x9"x7" (101.6x228.6x177.8 mm)
WEIGHT	2.65 lbs (1.2 Kg)
SYSTEM POWER	110 to 240 VAC (0.8 A)
	50 Hz to 60 Hz

DRILLER'S DISPLAY

OPERATING TEMPERATURE RANGE	-30°C to 50°C
SIZE	16"x1.5"x9" (406.4x38.1x228.6 mm)
WEIGHT	6.95 lbs (3.15 Kg)
POWER	Driller's display is powered from the Top End Unit with an interconnect cable over 200 feet long.



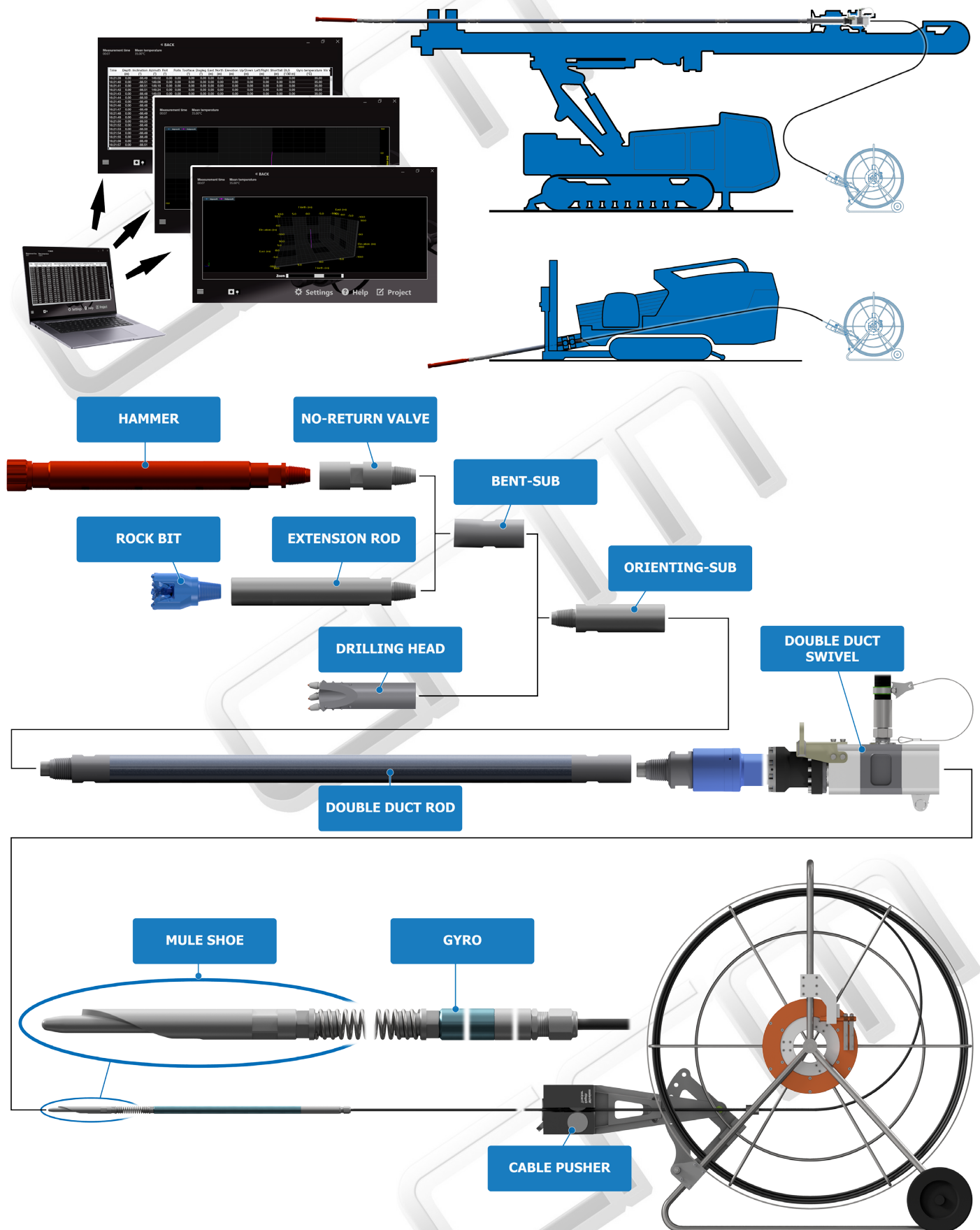
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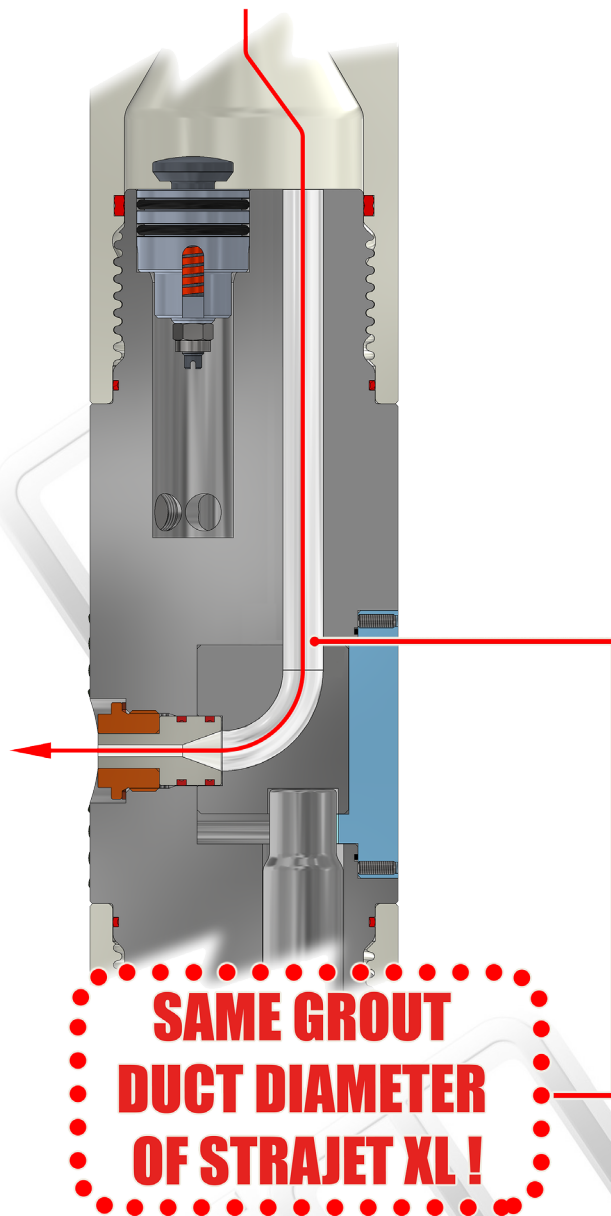
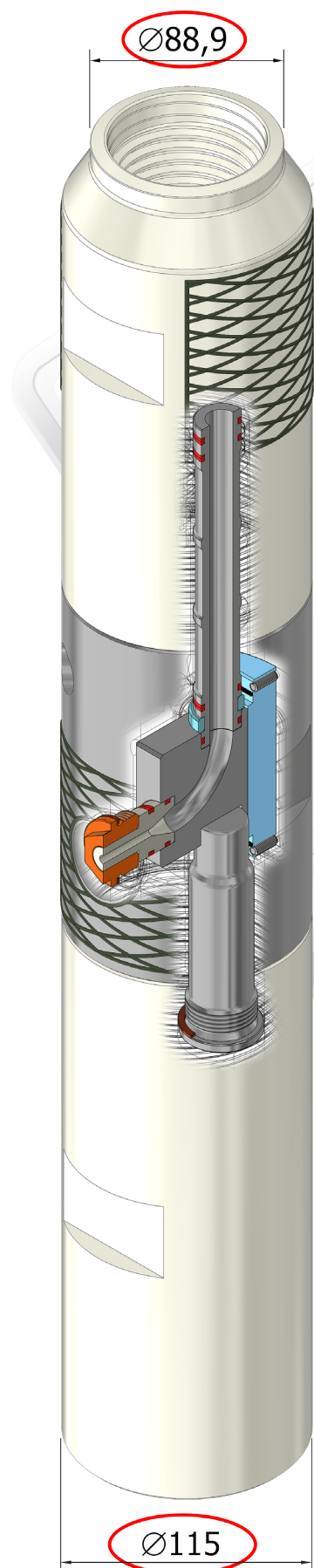
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The STRAJET XS is CRM latest high efficiency monitor. It combines the outstanding performance of the STRAJET monitors (it has the same grout duct of the STRAJET XL) with smaller outer dimensions (just 115mm of diameter). It is designed for monofluid applications where you need to use d. 90mm single fluid rods. Its small dimensions help to minimize drilling problems and ease lifting operations during the jetting treatment.



NEW!



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