

# **Raise Bore**



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### **Company Profile**

The MICON-Drilling GmbH is a worldwide operating service company, specialized in sales and rental of drilling equipment. Decades of experience, high quality standards and focused customer orientation are our unique selling points.

We are a member of the MICON Group, established in Nienhagen/Germany, in 1994. The privately owned company specializes in design, production, inspection and repair of drill string components, drill bits, sophisticated directional drilling systems and additional equipment. Our main focus lies on the technical service for drilling applications in the mining, oil & gas, tunneling and geothermal industries.

An innovative engineering department ensures continuous optimization of all MICON products. Additionally, we are in close contact with a network of several German universities to foster research and development activities.

The MICON Group manufactures drilling equipment in two independent facilities on state-of-theart CNC milling, turning and welding machines. Latest technology and implementation of German engineering guarantee the highest degree of efficiency and quality.



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MICON Buildings "Im Nordfeld", Nienhagen/Germany



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### **Quality Policy**

MICON stands for high quality products Made in Germany. This high quality standard builds the basis for our success and is an integral part of the company policy. This is reflected by long-term and trustful cooperation with our customers.

In order to achieve our high quality objectives the MICON Group manufacturing companies have implemented quality management systems certified according to international standards. The actual certification status of the Group companies is as follows:

MICON Downhole-Tools GmbH:

- ISO 9001:2015 0019058
- API Spec. Q1 (No. Q1-4689)
- API Spec. 7-1 (Monogram License 7-1-1271)
- MICON GmbH & Co.KG:
- ISO 9001:2015 00007159
- ISO3834-2:2006 (D-ZE-16083-01-00-ISO3834-2019.0013.002)

Our global quality objectives lead to specific targets, which are defined by the top management in cooperation with the quality manager. The fulfilment of these specific quality targets is evaluated at least every 12 months in the management review. Our ambition is product reliability and quality that meets the customer requirements as well as your high quality standards. The MICON product cycle includes different process steps. Rigorous acceptance criteria at every process step ensure a consistent high quality level of each product.

![](_page_5_Picture_12.jpeg)

![](_page_5_Figure_13.jpeg)

![](_page_5_Picture_14.jpeg)

CAD based product development

CAD – CAM manufacturing

Permanent quality checks

![](_page_5_Picture_18.jpeg)

High resolution 3-D scanning

![](_page_5_Picture_20.jpeg)

3-D scan evaluation

![](_page_6_Figure_1.jpeg)

### **MICON Raise Bore Equipment**

MICON supplies a wide range of standard raise bore equipment. Highly specialized and customized solutions are available on request. We have a production capacity of more than 3000 raise bore rods and stabilizers per year. Our raise bore equipment is in operation worldwide. A track record of more than 300 successful projects and over 100 km of pilot hole drilling stands for itself.

![](_page_7_Picture_3.jpeg)

Birth of a 12 7/8" Raise Bore Rod

![](_page_7_Picture_5.jpeg)

Raise Bore Rod with DI-22 Thread

![](_page_7_Picture_7.jpeg)

Raise Bore Underground Operation

![](_page_7_Picture_9.jpeg)

**Raise Bore Surface Operation** 

With decades of experience MICON will find the most efficient solution for your individual project by defining the required capacity and scope of work. Our engineering department calculates the required capacity of the raise bore string and evaluates suitable thread configurations. According to this information the appropriate steel grade is selected. MICON offers several steel grades that are a result of comprehensive research together with independent German universities and German steel mills. Extensive testing in our facilities and in the field ensures highest quality and reliability.

Beside standard equipment MICON also provides customized or specifically designed equipment on request.

The MICON quality control and report procedures are in accordance to the latest API and ISO standards. Each product is traceable by serial number and has its own quality certificate that comprises all important material testing data.

![](_page_8_Figure_4.jpeg)

### **Material Specifications**

The utilized alloy steel is specifically adapted for the high demands of raise bore equipment. MICON provides raise bore equipment as Medium Strength, High Strength and Ultra-High Strength Series.

Medium Strength Series									
Material: Alloy Steel, ref. AISI 4330 — available for Raise Bore Rods: 8", 10", 11 ¼", 12 ¾"									
Property	Symbol	Dimension	Raw Material Diameter 200 mm to 350 mm						
Yield Strength	Rp <sub>0.2</sub>	N/mm <sup>2</sup>	≥ 930 (135 ksi)						
Tensile Strength	Rm	N/mm <sup>2</sup>	≥ 1030 (149 ksi)						
Elongation after Fracture (Lo O 4x do)	A4	%	≥ 15						
Reduction of Area	Z	%	≥ 45						
Notch Impact Strength Charpy V-Notch	A	J	≥ 65						
Hardness on Specific Diameter	_	HB	320 - 370						
Hardness on Circumferential Surf	_	HB	≥ 340						

High Strength Series									
Material: Alloy Steel, ref. AISI 4330 mod — available for Raise Bore Rods: 8", 10", 11 1/4", 12 7/8"									
Property	Symbol	Dimension	Raw Material Diameter 200 mm to 350 mm						
Yield Strength	Rp <sub>0.2</sub>	N/mm <sup>2</sup>	≥ 965 (140 ksi)						
Tensile Strength	Rm	N/mm <sup>2</sup>	≥ 1035 (150 ksi)						
Elongation after Fracture (Lo O 4x do)	A4	%	≥ 15						
Reduction of Area	Z	%	≥ 45						
Notch Impact Strength Charpy V-Notch	А	J	≥ 65						
Hardness on Specific Diameter	_	НВ	320 - 380						
Hardness on Circumferential Surf	_	НВ	≥ 340						

Ultra-High Strength Series									
Material: Alloy Steel, ref. AISI 4330 V mod — available for Raise Bore Rods: 10", 11 ¼", 12 1/8", 15"									
Property	Symbol	Dimension	Raw Material Diameter 200 mm to 385 mm						
Yield Strength	Rp <sub>0.2</sub>	N/mm <sup>2</sup>	≥ 1030 (149 ksi)						
Tensile Strength	Rm	N/mm <sup>2</sup>	≥ 1110 (161 ksi)						
Elongation after Fracture (Lo O 4x do)	A4	%	≥ 14						
Reduction of Area	Z	%	≥ 45						
Notch Impact Strength Charpy V-Notch	A	J	≥ 65						
Hardness on Specific Diameter	-	HB	330 - 390						
Hardness on Circumferential Surf	-	HB	≥ 340						

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### **MICON Raise Bore Equipment Standards**

The following standards apply for all MICON Raise Bore equipment:

- Threads zinc-phosphate coated / bonderized
- Pin and box thread protectors included
- Painting of one layer uni-color included
- Packing on pallets in truck or in container included
- Storing of equipment until collection included
- EUR1 certification included
- IPPC certificates of packing material
- MPI, dimensional check and material certificates included
- 🔷 Made in Germany
- Manufacturing plant certified according to ISO 9001/2015

### **Rotary Vertical Drilling System (RVDS)**

Improving existing and designing new equipment for the raise boring industries is a core business and motivation for MICON. The unique Rotary Vertical Drilling System (RVDS) targets drilling service for pilot hole drilling and opens new fields of activities for the raise boring industries.

The RVDS is a pre-programmable, self steering drilling device for drilling vertical holes. It consists of two modules which are integrated in the lower part of the BHA between the drill bit and the first string stabilizer.

Reliability and accuracy of the RVDS service are outstanding. Since 1993 an overall borepath deviation of less than 0.1 % was achieved on over 130,000 drilling meters world wide.

![](_page_10_Picture_17.jpeg)

### MIRIS - Automatic identification of drill rods

During drilling operations, in mining as well as in oilfield, technical or geological problems may occur which may lead to a loss of drilling equipment in hole. The amount of damage in such a case is essentially made up of the value of the well plus the equipment remaining in the well and can easily amount to several million Euros. To be able to claim such a damage from an insurance company and to plan suitable fishing operations for the equipment it is very important to know exactly which equipment was installed and how deep the borehole is.

An itemized list of equipment installed downhole ("tally list") is usually kept by hand on the drill rig. ue to various reasons (illegible serial numbers, bad handwriting, forgotten drill pipes when changing shifts, multiple installation and removal of pipes, etc.) this list is often not 100% correct.

Therefore MICON has developed a system which automatically records drill rods and other equipment and lists the equipment in detail in a database. The system is called MIRIS (MICON Intelligent Rod Identification System). The system works with RFID (Radio-Frequency Identification) by exchanging data between a PC and a transponder in the drill rod via antennas on the drill rig.

Maintenance	Pre-Job	Job	Post-Job	Database
Saves Rod Status, Length, weight, inspection date and serial No. on the trans- ponder via trans- mitter antennas.	Identifies all Rods on the Location by manual RFID scanner.	Identifies all Rods going into and out of the hole.	A summary of all used Rods during the drilling is being created.	All recorded Data will be stored in the data base and can be exported to *.csv file.

#### General system overview

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#### MIRIS operation procedure on the drill site:

- 1 All supplied drill rods are scanned with the RFID manual scanner.
- 2 Run into hole or drilling: Set user interface to "Auto mode: insert rods".
- 3 MIRIS detects the installation of the rods by the antennas mounted on the drill rig.
- 4 The software updates the "Tally List" automatically. Parameters such as the number and total weigth and length of rods are updated.
- 5 Run out of hole: Set user interface to "Auto mode: remove rods".
- 6 MIRIS recognizes the removal of the rods by the antennas.
- 7 The software updates the "Tally List" automatically. Parameters such as the number of rods are updated.
- 8 After the job, MIRIS creates a summary all on-site rods.

The RFID tag (transponder), which doesn't have its own energy supply, is installed into a milled recess into rod body, close to the wrenching area. Individual data sets can be stored in these tags. This might be the serial number, type, length, weight and date of the last inspection.

![](_page_12_Picture_11.jpeg)

Drill Rod with RFID transponder

The data is processed using the MIRIS software developed by MICON.

Ready-to-use drilling rods on the drill rig are detected quickly and precisely using an RFID handheld scanner. The RFID scanner is linked via Bluetooth to a PC in order to transfer the collected data ("list of available drill rods") to a database.

When drill rods are installed or removed in the drill rig, the RFID tags are then detected via a permanently mounted antenna and visualized in real time in a table ("list of drill rods in the borehole"). Since the system cannot recognize at this point (beta software version 09/20) in time whether a rod is being installed or removed, the shift supervisor must confirm each rod detected. An automatic detection is possible after the drillers sets the user interface detection mode to " insert rods" or "remove rods".

At any time the recorded data, for example the number of drill rods and their total weight, can be retrieved. Also the drilling depth can now be determined more easily, because the individual lengths of the drill rods are automatically added up.

In addition, the application data for each individual drill rod is stored and can be transferred to a central database at the customer's site once drilling is complete. This makes it possible to create a CV for each drill rod and to better plan the necessary inspections.

![](_page_13_Figure_4.jpeg)

**MIRIS** user interface

- 1. Details of the selected Rod
- 2. Summary Rods in hole
- 3. Rods on site
- 4. registered Rod
- 5. Rods in the hole

### **Torque-Tension Charts**

Torque-Tension charts are essential to identify appropriate working parameters for your raise bore project. The following charts are valid for the given material parameters of MICON steel grades.

MICON provides specific and highly detailed calculations for each raise bore project.

![](_page_14_Picture_4.jpeg)

#### 8 ¼" DI-22 Connection

#### **Medium Strength:**

Material: AISI 4330 (135 ksi / 930 N/mm<sup>2</sup>), ID: 4 ¾", Torque Factor: 1.0 per API RP7A1

![](_page_14_Figure_8.jpeg)

#### 8 ½" DI-22 Connection

#### **High Strength**

Material: AISI 4330 mod (140 ksi / 965 N/mm<sup>2</sup>), ID: 4 <sup>3</sup>/<sub>4</sub>", Torque Factor: 1.0 per API RP7A1

![](_page_15_Figure_4.jpeg)

#### 9 ¼" DI-22 Connection

#### **Medium Strength:**

Material: AISI 4330 (135 ksi / 930 N/mm<sup>2</sup>), ID: 4 ¾", Torque Factor: 1.0 per API RP7A1

![](_page_16_Figure_4.jpeg)

#### 9 ½" DI-22 Connection

#### High Strength:

Material: AISI 4330 mod (140 ksi / 965 N/mm<sup>2</sup>), ID: 4 <sup>3</sup>/<sub>4</sub>", Torque Factor: 1.0 per API RP7A1

![](_page_17_Figure_4.jpeg)

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#### 9 ½" DI-22 Connection

#### Ultra-High Strength:

Material: AISI 4330 V mod (149 ksi / 1030 N/mm<sup>2</sup>), ID: 4 ¾", Torque Factor: 1.0 per API RP7A1

![](_page_18_Figure_4.jpeg)

#### 10 ½" DI-22 Connection

#### High Strength:

Material: AISI 4330 mod (140 ksi / 965 N/mm<sup>2</sup>), ID: 5 7/8", Torque Factor: 1.0 per API RP7A1

![](_page_19_Figure_4.jpeg)

#### 10 ½" DI-22 Connection

#### Ultra-High Strength:

Material: AISI 4330 V mod (149 ksi / 1030 N/mm<sup>2</sup>), ID: 5 7/8", Torque Factor: 1.0 per API RP7A1

![](_page_20_Figure_4.jpeg)

### **Standard Raise Bore Products**

#### **Rods - Standard**

![](_page_21_Figure_3.jpeg)

#### **Standard Dimensions - imperial:**

OD	Thread	Length	Wrenching			Length		ID		Length
Body	Pin x Box	S/S	Square	Width		S/1 <sup>st</sup> Flat S/2 <sup>nd</sup> Flat		Body	Вог	eback
А	—	С	D	E1	E2	F	G	Н	J	К
10"	8 ¼" DI-22	48" 60"	8" 8 ¼"	2 ¾"	2 ¾"	8 ¼"	1 1⁄2"	4 ¾"	7 1⁄8"	19" 36"
11 1⁄4"	9 ¼" DI-22	48" 60"	9" 9 1⁄4"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85" 10"	1.58″ 2 ½″	4 ¾"	7.69 "	19" 36"
12 7⁄8"	10 ½" DI-22	60"	10" 10 ½"	3 1⁄2"	3 1⁄2"	11 ½"	2 1⁄2"	5 <sup>7</sup> / <sub>16</sub> "	9"	19" 36"

#### **Standard Dimensions - metric:**

OD	Thread	Length	Wrenching			Len	Length		ID	
Body	Pin x Box	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	Воі	reback
Α	—	С	D	E1 E2		F	G	Н	J	К
254.0 mm	8 ¼" DI-22	1219.2 mm 1524.0 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	120.5 mm	181.0 mm	482.6 mm 914.2 mm
285.7 mm	9 ¼" DI-22	1219.2 mm 1524.0 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	40 mm 63.5 mm	120.5 mm	195.26 mm	482.6 mm 914.2 mm
327.0 mm	10 ½" DI-22	1524.0 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	138.1 mm	228.6 mm	482.6 mm 914.2 mm

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#### Starter Rods - Short

![](_page_22_Figure_2.jpeg)

#### **Standard Dimensions - imperial:**

OD	Thread		Length	V	Vrenching		Len	ID	
Body	Pin	Вох	S/S	Square	Wie	Width		S/2 <sup>nd</sup> Flat	Body
А	—	—	С	D	E1 E2		F	G	н
10"	8 ¼" DI-22	6 5/8" API Reg.	23"	8" 8 ¼"	2 ¾"	2 ¾"	8 ¼"	1 1⁄2"	4 ¾"
11 ¼"	9 ¼" DI-22	6 5/8" API Reg.	23"	9" 9 ¼"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85 <b>"</b> 10"	1.58 <b>″</b> 2 ½″	4 ¾"
12 7⁄8"	10 ½" DI-22	6 5/8" API Reg. 7 5/8" API Reg.	23"	10" 10 ½"	3 ½" 4"	3 ½" 4"	11 ½" 12 ½"	2 1⁄2"	5 <sup>7</sup> / <sub>16</sub> "

#### **Standard Dimensions - metric:**

OD	Thread		Length	V	Wrenching			Length		
Body	Pin	Вох	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	
Α	—	—	С	D	E1 E2		F	G	н	
254.0 mm	8 ¼" DI-22	6 5/8" API Reg.	584.2 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	120.5 mm	
285.7 mm	9 ¼" DI-22	6 5/8" API Reg.	584.2 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	40 mm 63.5 mm	120.5 mm	
327.0 mm	10 ½" DI-22	6 5/8" API Reg. 7 5/8" API Reg.	584.2 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	138.1 mm	

#### Starter Rods - Long

![](_page_23_Figure_2.jpeg)

#### Standard Dimensions - imperial:

OD	Thread	Length		Wren	ching		Len	ID	
Body	Pin x Box	S/S	Square		Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body
А	—	С	D	E1	E2	E3	F	G	Н
10"	8 ¼" DI-22	60"	8" 8 ¼"	2 ¾"	2 ¾"	2 ¾"	8 ¼"	1 1⁄2"	4 ¾"
11 1⁄4"	9 ¼" DI-22	60"	9" 9 ¼"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85 <b>"</b> 10"	1.58 <b>″</b> 2 ½″	4 ¾"
12 7⁄8"	10 ½" DI-22	60"	10" 10 ½"	3 1⁄2"	3 1⁄2"	3 1⁄2"	11 ½"	2 1⁄2"	5 <sup>7</sup> / <sub>16</sub> "

#### **Standard Dimensions - metric:**

OD	Thread	Length		Wren	ching		Len	ID	
Body	Pin x Box	S/S	Square		Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body
А	—	С	D	E1 E2 E3			F	G	н
254.0 mm	8 ¼" DI-22	1524.0 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	120.5 mm
285.7 mm	9 ¼" DI-22	1524.0 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	40 mm 63.5 mm	120.5 mm
327.0 mm	10 ½" DI-22	1524.0 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	138.1 mm

#### Stabilizers

![](_page_24_Figure_2.jpeg)

#### **Standard Dimensions - imperial:**

(	DD	Thread	Length	V	Wrenching Leng		gth	I	D	Length	
Body	Hole	Pin x Box	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	Во	reback
A	В	—	С	D	E1	E2	F	G	Н	J	К
10"	11" 12 ¼" 13 ¾"	8 ¼" DI-22	48" 60"	8" 8 ¼"	2 3⁄4"	2 ¾"	8 ¼"	1 1⁄2"	3 3⁄8"	7 1⁄8"	19" 36"
11 ¼"	12 ¼" 13 ¾"	9 ¼" DI-22	48" 60"	9" 9 1⁄4"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85 <b>"</b> 10"	1.58 <b>″</b> 2 ½″	4 ¾"	8"	19" 36"
12 7⁄8"	13 ¾" 15" 16" 17 ½"	10 ½" DI-22	48" 60"	10" 10 ½"	3 1⁄2"	3 1⁄2"	11 ½"	2 1/2"	5 <sup>7</sup> / <sub>16</sub> "	9"	19" 36"

#### **Standard Dimensions - metric:**

OD		Thread	Length	Wrenching			Length		ID		Length
Body	Hole	Pin x Box	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body Bo		reback
A	В	—	С	D	E1	E2	F	G	Н	J	К
254.0 mm	279.4 mm 311.1 mm 349.2 mm	8 ¼" DI-22	1219.2 mm 1524.0 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	85.7 mm	181.0 mm	482.6 mm 914.2 mm
285.7 mm	311.1 mm 349.2 mm	9 ¼" DI-22	1219.2 mm 1524.0 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	40 mm 63.5 mm	120.5 mm	203.2 mm	482.6 mm 914.2 mm
327.0 mm	349.2 mm 381.0 mm 406.4 mm 444.5 mm	10 ½" DI-22	1219.2 mm 1524.0 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	138.1 mm	228.6 mm	482.6 mm 914.4 mm

#### **Roller Reamer**

![](_page_25_Figure_2.jpeg)

#### **Standard Dimensions - imperial:**

OD		Thread		Length	Wrenching			Length		ID	Cutter
Body	Hole	Pin	Вох	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	Size
А	В	—	—	С	D	E1	E2	F	G	Н	L
10"	11" 12 ¼"	8 ¼" DI-22	8 ¼" DI-22 6 <sup>5</sup> / <sub>8</sub> " API Reg.*	48" 60"	8" 8 ¼"	2 ¾"	2 ¾"	8 1⁄4"	1 1⁄2"	2 1⁄2″	2 ½" 4"
11 ¼"	12 ¼"	9 ¼" DI-22	8 ¼" DI-22 6 <sup>5</sup> / <sub>8</sub> " API Reg.*	60"	9" 9 1⁄4"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85 <b>"</b> 10"	1 1⁄2"	2 1⁄2″	4"
12 7⁄8"	13 ¾" 15"	10 ½" DI-22	10 ½" DI-22 6 5/8" API Reg.* 7 5/8" API Reg.*	60"	10" 10 ½"	3 1⁄2"	3 ½"	11 ½"	2 1/2"	3 1⁄2″	4"

#### **Standard Dimensions - metric:**

OD		Thread		Length	N	Wrenching			gth	ID	Cutter
Body	Hole	Pin	Вох	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	Size
A	В	_	—	С	D	E1	E2	F	G	Н	L
254.0 mm	279.4 mm 311.1 mm	8 ¼" DI-22	8 ¼" DI-22 6 <sup>5</sup> / <sub>8</sub> " API Reg.*	1219.2 mm 1524.0 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	63.5 mm	63.5 mm 101.6 mm
285.7 mm	311.1 mm	9 ¼" DI-22	8 ¼" DI-22 6 <sup>5</sup> / <sub>8</sub> " API Reg.*	1524.0 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	38.1 mm	63.5 mm	101.6 mm
327.0 mm	349.2 mm 381.0 mm	10 ½" DI-22	10 ½" DI-22 6 5/8" API Reg.* 7 5/8" API Reg.*	1524.0 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	88.9 mm	101.6 mm

\* Roller Reamer with Float Valve

## MICON~DRILLING

#### **Bit Subs with Float Valve**

![](_page_26_Figure_2.jpeg)

#### **Standard Dimensions - imperial:**

OD		Thread		Length	١	Wrenching			Length		
Body	Hole	Pin	Box	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	
Α	В	—	—	С	D	E1	E2	F	G	Н	
10"	11" 12 ¼" 13 ¾"	8 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	31 ½"	8" 8 ¼"	2 ³⁄4"	2 3⁄4"	8 1⁄4"	1 1⁄2"	4 ¾"	
11 ¼"	12 ¼" 13 ¾"	9 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	31 ½"	9" 9 ¼"	2.95 <b>"</b> 3 ½"	2.95 <b>"</b> 3 ½"	8.85 <b>"</b> 10"	1.58 <b>″</b> 2 ½″	4 ¾"	
12 7⁄8"	13 ¾" 15" 16" 17 ½"	10 ½" DI-22	6 <sup>5</sup> /8" API Reg. 7 <sup>5</sup> /8" API Reg.	31 ½"	10" 10 ½"	3 1⁄2"	3 1⁄2"	11 ½"	2 1⁄2"	5 <sup>7</sup> / <sub>16</sub> "	

#### **Standard Dimensions - metric:**

OD		Thread		Length	۱	Wrenching			Length		
Body	Hole	Pin	Box	S/S	Square	Width		S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body	
А	В	_	—	С	D	E1	E2	F	G	Н	
254.0 mm	279.4 mm 311.1 mm 349.2 mm	8 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	800.1 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	120.5 mm	
285.7 mm	311.1 mm 349.2 mm	9 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	800.1 mm	228.6 mm 234.9 mm	75.0 mm 88.9 mm	75.0 mm 88.9 mm	224.8 mm 254.0 mm	40 mm 63.5 mm	120.5 mm	
327.0 mm	349.2 mm 381.0 mm 406.4 mm 444.5 mm	10 ½" DI-22	6 <sup>5</sup> /8" API Reg. 7 <sup>5</sup> /8" API Reg.	800.1 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	138.1 mm	

#### Pilot Sub with Float Valve - Double Spanner Flat

![](_page_27_Figure_2.jpeg)

#### **Standard Dimensions - imperial:**

OD	Thread		Length	Wrenching			Len	ID	
Body	Pin	Вох	S/S	Square	Wie	dth	S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body
А	—	—	С	D	E1	E2	F	G	н
10"	8 ¼" DI-22	6 5/8" API Reg.	10"	8" 8 ¼"	2 ¾"	2 ¾"	8 ¼"	1 1⁄2"	3 3⁄8"
11 ¼"	9 ¼" DI-22	6 5/8" API Reg.	11 ¼"	9" 9 ¼"	3 1⁄2"	3 1⁄2"	10"	1 1⁄2"	3 3⁄8"
12 %"	10 ½" DI-22	6 5/8" API Reg. 7 5/8" API Reg.	13 ½"	10" 10 ½"	3 1⁄2"	3 1⁄2"	11 ½"	2 1⁄2"	3 <sup>15</sup> / <sub>16</sub> "

#### **Standard Dimensions - metric:**

OD	Thread		Length	Wrenching			Len	ID	
Body	Pin	Вох	S/S	Square	Wi	dth	S/1 <sup>st</sup> Flat	S/2 <sup>nd</sup> Flat	Body
Α	—	—	С	D	E1 E2		F	G	н
254.0 mm	8 ¼" DI-22	6 5/8" API Reg.	254.0 mm	203.2 mm 209.5 mm	69.8 mm	69.8 mm	209.5 mm	38.1 mm	85.7 mm
285.7 mm	9 ¼" DI-22	6 5/8" API Reg.	285.7 mm	228.6 mm 234.9 mm	88.9 mm	88.9 mm	254.0 mm	38.1 mm	85.7 mm
327.0 mm	10 ½" DI-22	6 <sup>5</sup> /8" API Reg. 7 <sup>5</sup> /8" API Reg.	342.9 mm	254.0 mm 266.7 mm	88.9 mm	88.9 mm	292.1 mm	63.5 mm	100.0 mm

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#### Pilot Sub with Float Valve - Single Spanner Flat

![](_page_28_Figure_2.jpeg)

#### Standard Dimensions - imperial:

OD	Thread		Length	Wrend	hing:	Length	ID
Body	Pin Box		S/S	Square	Width	S/1 <sup>st</sup> Flat	Body
А	—	—	С	D	E1	F	G
10"	8 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	5 <sup>13</sup> / <sub>16</sub> "	8" 8 ¼"	2 ¾"	1 1⁄2"	3 3⁄8"
11 1⁄4"	9 ¼" DI-22	6 <sup>5</sup> /8" API Reg.	6 ½"	9" 9 1⁄4"	3 1⁄2"	1 1⁄2"	3 3⁄8"
12 %"	10 ½" DI-22	6 <sup>5</sup> /8" API Reg. 7 <sup>5</sup> /8" API Reg.	8"	10" 10 ½"	3 1⁄2"	2 1⁄2"	3 <sup>15</sup> / <sub>16</sub> "

#### **Standard Dimensions - metric:**

OD	Thread		Length	Wrend	hing	Length	ID
Body	Pin Box		S/S	Square	Width	S/1 <sup>st</sup> Flat	Body
А	—	—	С	D	E1	F	G
254.0 mm	8 ¼" DI-22	6 5/8" API Reg.	147.6 mm	203.2 mm 209.5 mm	69.8 mm	38.1 mm	85.7 mm
285.7 mm	9 ¼" DI-22	6 5/8" API Reg.	165.1 mm	228.6 mm 234.9 mm	88.9 mm	38.1 mm	85.7 mm
327.0 mm	10 ½" DI-22	6 <sup>5</sup> / <sub>8</sub> " API Reg. 7 <sup>5</sup> / <sub>8</sub> " API Reg.	203.2 mm	254.0 mm 266.7 mm	88.9 mm	63.5 mm	100.0 mm

#### Notes

Notes

![](_page_31_Picture_0.jpeg)

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