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1.10. Ø89 Hot Stab

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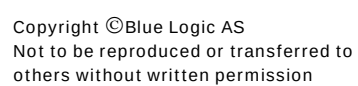




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REVISION CHANGE/RECORD

REV	REASON FOR REVISION/ DESCRIPTION OF CHANGES
01	First issue
02	Instructions for replacing lock brick added
03	Ø89 DP Press Stab 10k Long-term J-Lock with Bleed Off Function, BB9770, added



1. INTRODUCTION

The purpose of this document is to present a comprehensive Operation and Maintenance manual for the Blue Logic designed Ø89 Hot Stab System.

All relevant aspects with regards to safe and correct use, installation, operation, maintenance, and storage are covered.

The Ø89 Hot Stab Program includes the following general main components:

- BB7746, Ø89 DP Stab 10k Interv MP 1" 90 deg. Interf wJ-Lock
- BB7598, Ø89 DP Stab 10k Interv MP 1" 15 Deg Interf wJ-Lock
- BB6432, Ø89 DP Stab 10k Interv MP 1" 65 Deg Interf wJ-Lock,
- BB8222, Ø89 DP Test Receptacle 10k MP 9/16" wJ-Lock
- BB6496, Ø89 DP Parking Receptacle 10Bar Long-term fit 6/8 holes J-Lock
- BB8388, Ø89 DP Receptacle 10k Long-term wJ-L 1" WN Sch 80 8 Holes Interf
- BB8195, Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf
- BB6465, Ø89 DP Press Stab 10k Long-term wJ-Lock
- BB8227, Ø89 DP Protection Stab Vented Long-term
- BB8226, Ø89 DP Stab Protection Sleeve
- BB9770, Ø89 DP Press Stab 10k Long-term J-Lock with Bleed Off Function

1.1. DOCUMENT USE

This document shall be used as general information for all aspects related to safe use, installation, removal, maintenance and storage of the Ø89 Hot Stab System. Included in this Operation and Maintenance Manual are sequential step-by-step procedures for typical offshore operations which can be used for establishing detailed specialized offshore/subsea procedures. These lists can also be used for documentation of performed work and sequences if required.

TECHNICAL DOCUMENT

1.2. ABBREVIATIONS

ROV	Remotely Operated Vehicle
HPU	Hydraulic Power Unit
FAT	Factory Acceptance Test
MOB	Mobilisation
DEMOB	Demobilisation
SOW	Scope of Work
DP	Dual Port
BL	Blue Logic
HP	High Pressure
CW	Clockwise
CCW	Counter Clockwise

1.3. REFERENCES

Latest version of the following documents.

Id	Doc. No/Rev/	Originator	Document Title
1.	BB7746	BL	Ø89 DP Stab 10k Interv MP 1" 90 deg. Interf wJ-Lock
2.	BB7598	BL	Ø89 DP Stab 10k Interv MP 1" 15 Deg Interf wJ-Lock
3.	BB6432	BL	Ø89 DP Stab 10k Interv MP 1" 65 Deg Interf wJ-Lock
4.	BB8222	BL	Ø89 DP Test Receptacle 10k MP 9/16" wJ-Lock
5.	BB6496	BL	Ø89 DP Parking Receptacle 10Bar Long-term fit 6/8 holes J-Lock
6.	BB8388	BL	Ø89 DP Receptacle 10k Long-term wJ-L 1" WN Sch 80 8 Holes Interf
7.	BB8195	BL	Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf
8.	BB6465	BL	Ø89 DP Press Stab 10k Long-term wJ-Lock
9.	BB8227	BL	Ø89 DP Protection Stab Vented Long-term
10.	BB8226	BL	Ø89 DP Stab Protection Sleeve
11.	BB7414	BL	Recommended Spares Ø89 Stab System
12.	600189-TD-0004	BL	FAT Procedure for Ø89 DP Hot Stab
13.	600189-TD-0003	BL	FAT Procedure for Ø89 Hot Stab Program
14.	BB9770	BL	Ø89 DP Press Stab 10k Long-term J-Lock with Bleed Off Function

2. TECHNICAL DESCRIPTION

2.1. GENERAL

The Ø89 Hot Stab System is designed according to API 17H Type 3 and based on Blue Logic's range of large bore hot stab program.

It is the responsibility of the end user to make sure that the product is used in such a manner for which it is designed. This includes accounting for material/fluid compatibility, sour service, temperature, pressure rating etc. Refer to specific product drawing which includes all relevant information. If product drawing is lacking information/unclear, please contact Blue Logic for assistance.

TECHNICAL DOCUMENT

2.2. Ø89 DP STAB, BB6432, BB7598 & BB7746

The Ø89 intervention hot stab is fabricated in Aluminium Bronze material type JM7 which have excellent lubrication properties and will ensure problem free use and protection of the receptacle through years of operation and connection/disconnections.

The Ø89 DP Stab is available in 3 configurations, i.e. with different angles for the hydraulic interface:

- BB6432: 65° exit
- BB7598: 15° exit
- BB7746: 90° exit

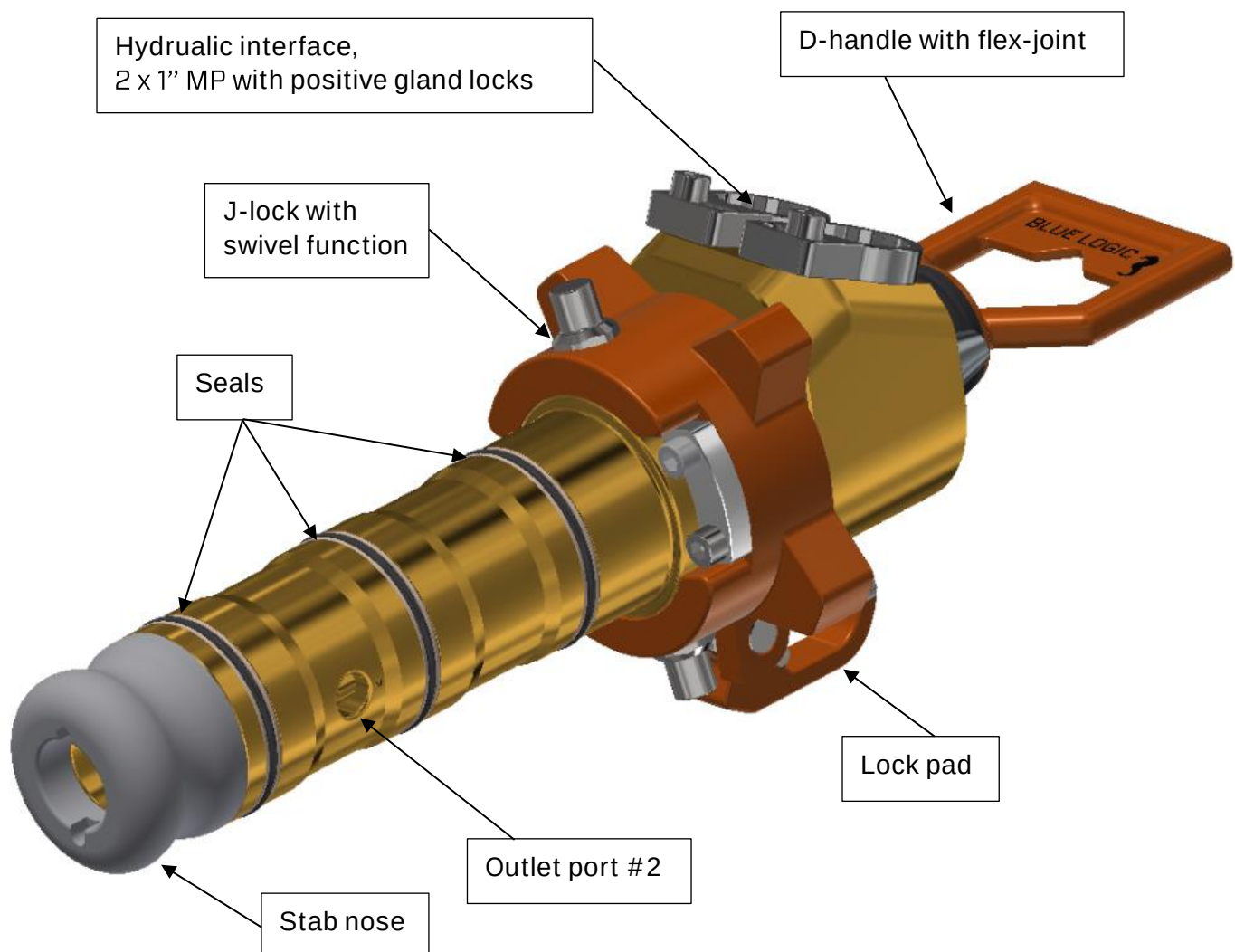


Figure 1, Ø89 Dual Port Stab

The stab nose is fabricated in PEHD 1000 to ensure easy entering and no damages to the receptacle.

TECHNICAL DOCUMENT

The handle is designed for easy operation and handling using either parallel or 3-finger manipulator claw. It is connected to the stab with a Blue Logic standard flex joint system allowing for easy replacement of either handle or the flexible rubber element offshore if required.

The manipulator operated J-lock locking mechanism is designed to prevent undesired unlocking and removal from the receptacle. Note also that the inherent pressure balanced hot stab design ensures no pressure induced separation forces between the pressure stab and the receptacle.

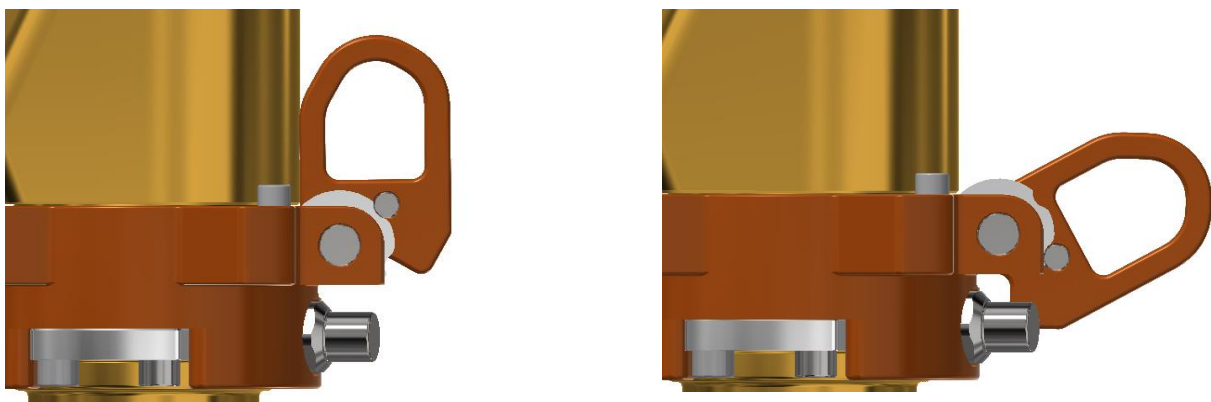


Figure 2, Locking mechanism, unlocked (left) and locked (right)

Material for the stab seals is RU15/PEEK1, compatible with most relevant fluids and have excellent mechanical properties ensuring long service life without need for replacement. The primary stab seals can be replaced offshore without need for any disassembly of the stab, see section 6.5 for instructions.

Technical Data – Ø89 DP Stab

Overall dimensions	Ø190 x 616 mm
Weight in air	32,6 kg
Weight in water	28,4 kg
Material	UNSC63200 (OM7)
Working Pressure	10 000 Psi / 690 Bar
Test pressure	15 000 Psi/ 1035 Bar
Temperature range	-18/+121°C
Nominal bore	Ø17,8 mm
Design Standard	17H Type 3
Hose interface	2 x 1" MP

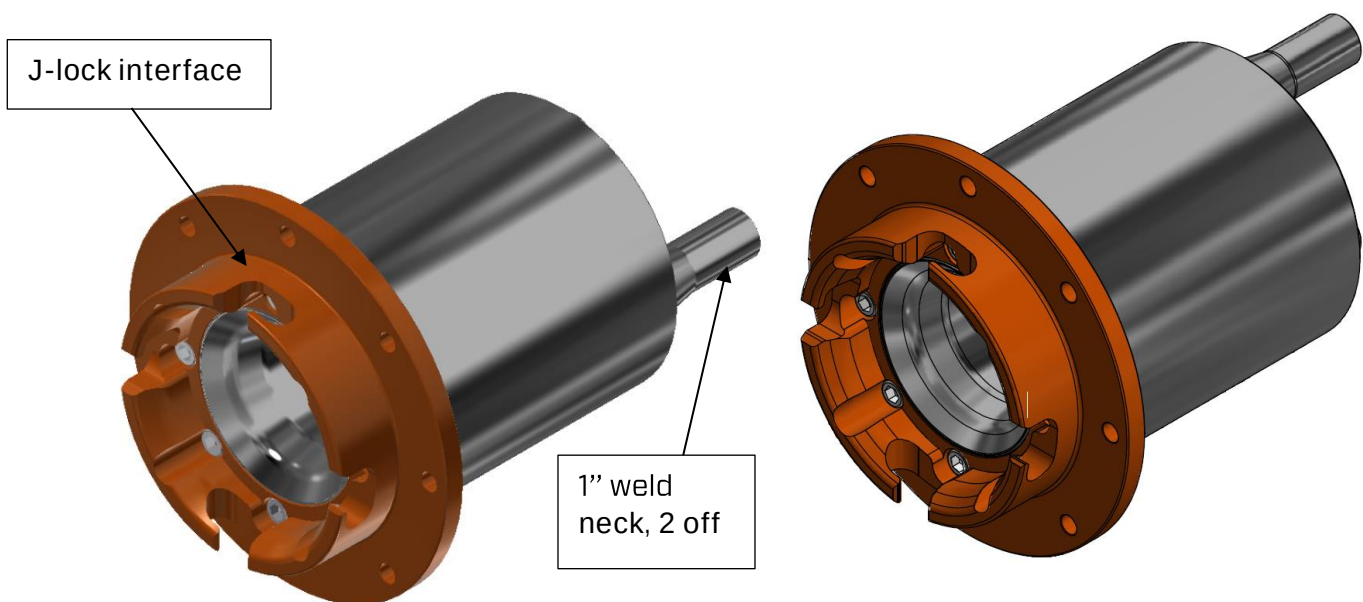
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2.3. Ø89 DP RECEPTACLE, BB8195& BB8388

The Ø89 receptacle is machined from one solid forged bolt in Super Duplex material intended for long-term subsea service. Integrated J-lock for locking the stab once inserted. Hydraulic interface represented by 2 off 1" weld necks.

2 configurations are available, main difference is schedule for weldneck , sch 80 & 160:

- BB8195, Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf
- BB8388, Ø89 DP Receptacle 10k Long-term wJ-L 1" WN Sch 80 8 Holes Interf



BB8195, Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf

BB8388, Ø89 DP Receptacle 10k Long-term wJ-L 1" WN Sch 80 8 Holes Interf

Technical Data – Ø89 DP Receptacle

	BB8195	BB8388
Overall dimensions	Ø270 x 300 mm	
Weight in air	48,9 kg	48,5
Weight in water	42,5 kg	42,1
Material	S32750 Super Duplex	
Working Pressure	10 000 Psi / 690 Bar	
Test pressure	15 000 Psi/ 1035 Bar	
Temperature range	-18/+121°C	
Nominal bore	Ø20,7 mm	Ø24,3
Design Standard	17H Type 3	
Hydraulic interface	2 x 1" Weld Neck, Sch. 160	2 x 1" Weld Neck, Sch. 80
Mechanical interface	8 x Ø13 on PCD Ø240	

TECHNICAL DOCUMENT

2.4. Ø89 DP TEST RECEPTACLE, BB8222

The Ø89 DP Test Receptacle is designed for pressure testing of Ø89 Hot Stabs and/or Ø89 Pressure Stabs on deck prior to operation to verify pressure integrity.

The test receptacle consists of a standard Ø89 receptacle with J-lock interface and 2 off MP 9/16" ports for connection of pressure test unit.

The test receptacle is installed onto a plate to keep an upright position. The 350x350 mm foundation plate has 4 off Ø17 holes for bolting onto other equipment as required.

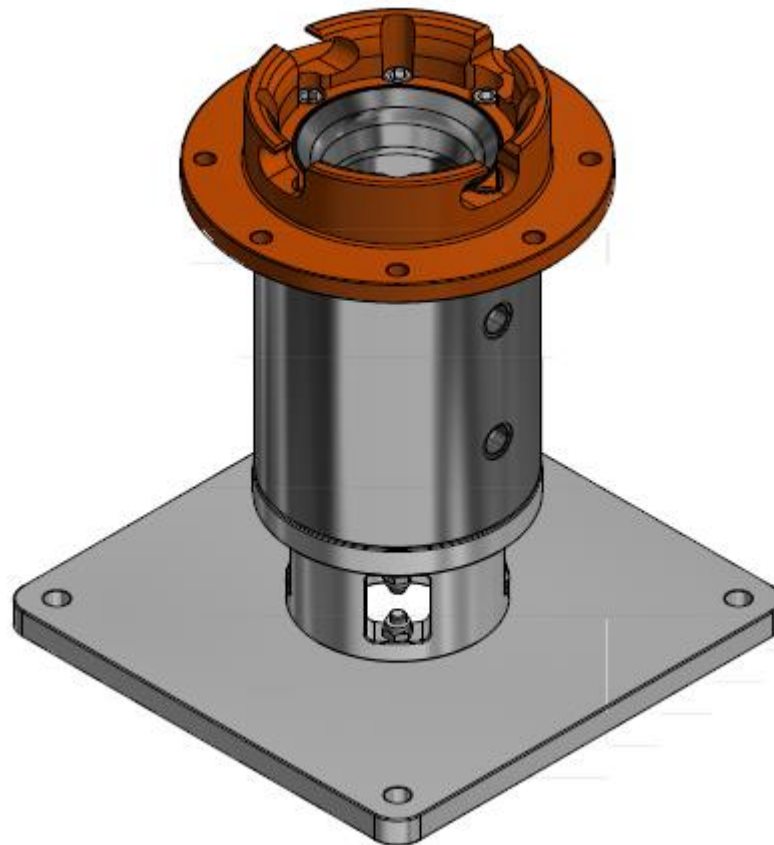


Figure 3, Ø89 Test Receptacle

Overall dimensions	350 x 350 x 404 mm
Weight	49,1 kg
Material	S32750 Super Duplex / Al 6082 T6
Working Pressure	10 000 Psi / 690 Bar
Test pressure	15 000 Psi/ 1035 Bar
Temperature range	-18/+121°C
Design Standard	17H Type 3
Hydraulic interface	MP 9/16"
Mechanical interface	4 x Ø17 at 300 x 300 mm

TECHNICAL DOCUMENT

2.5. Ø89 DP PRESSURE STAB, BB6465

The Ø89 DP Pressure Stab is designed for long-term installation in the Ø89 receptacle to act as a pressure barrier. The pressure stab has a simplified design compared to the Ø89 DP Stab with no hydraulic ports.

All metallic parts are constructed in Super Duplex. Stab nose is in PEHD 1000 quality similar to the intervention stab.

The pressure stab's J-lock mechanism is identical to the intervention stab's J-lock.



Figure 4, Ø89 Pressure Stab

Technical Data – Ø89 DP Pressure Stab

Overall dimensions	Ø190 x 531 mm
Weight	20,2 kg
Weight in water	17,2 kg
Material	S32750 Super Duplex
Working Pressure	10 000 Psi / 690 Bar
Test pressure	15 000 Psi/ 1035 Bar
Temperature range	-18/+121°C
Design Standard	17H Type 3

TECHNICAL DOCUMENT

2.6. Ø89 DP PRESSURE STAB WITH BLEED-OFF, BB9770

The Ø89 DP Pressure Stab with Bleed-Off is designed for long-term installation in the Ø89 receptacle to act as a pressure barrier.

This pressure stab is identical to the standard pressures stab, BB6465, but has a bleed-off feature to allow bleed-off prior to disconnection.

The bleed-off function is operated by pulling the spring-loaded handle by the ROV manipulator. Both ports will be bled off upon activation and the handle is self-retracting.

Maximum pressure for bleed off is 5 000Psi / 345Bar.

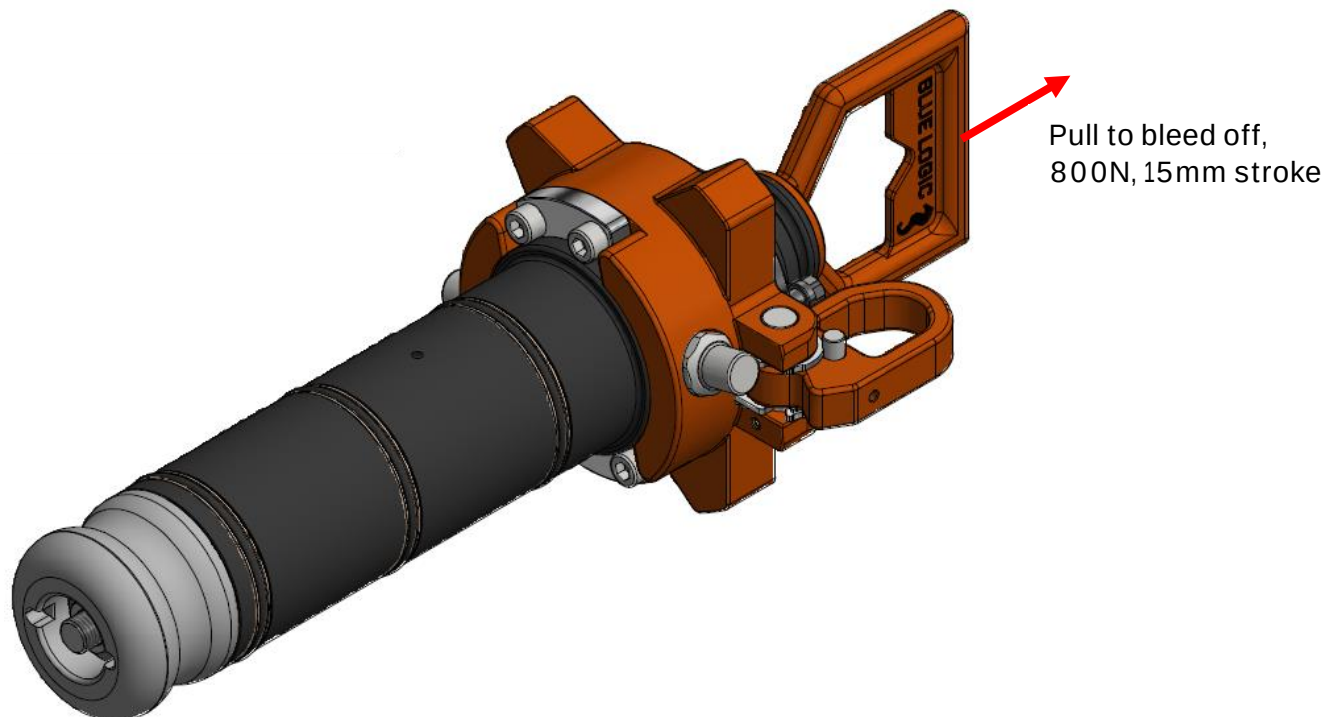


Figure 5, Ø89 Pressure Stab with Bleed-Off

Technical Data – Ø89 DP Pressure Stab with Bleed-Off

Overall dimensions	Ø190 x 547 mm
Weight	22,1 kg
Weight in water	18,9 kg
Material	S32750 Super Duplex
Working pressure	10 000 Psi / 690 Bar
Max. bleed-off pressure	5 000 Psi / 345 Bar
Pull-force for bleed-off	800 N / 81,5 kg
Bleed-off stroke length	15 mm
Test pressure	15 000 Psi/ 1035 Bar
Temperature range	-18/+121°C
Design Standard	17H Type 3

TECHNICAL DOCUMENT

2.7. Ø89 DP PROTECTION STAB, BB8227

The Ø89 DP Protection Stab is designed for long-term installation in the Ø89 receptacle to act as a protection against debris and marine growth. The protection stab is vented, thus not designed for pressure retaining.

All metallic parts are constructed in Super Duplex. Stab body made of PEHD 1000.

The protection stab has no J-lock and is designed to be kept in position by friction between seals and receptacle seal surface.

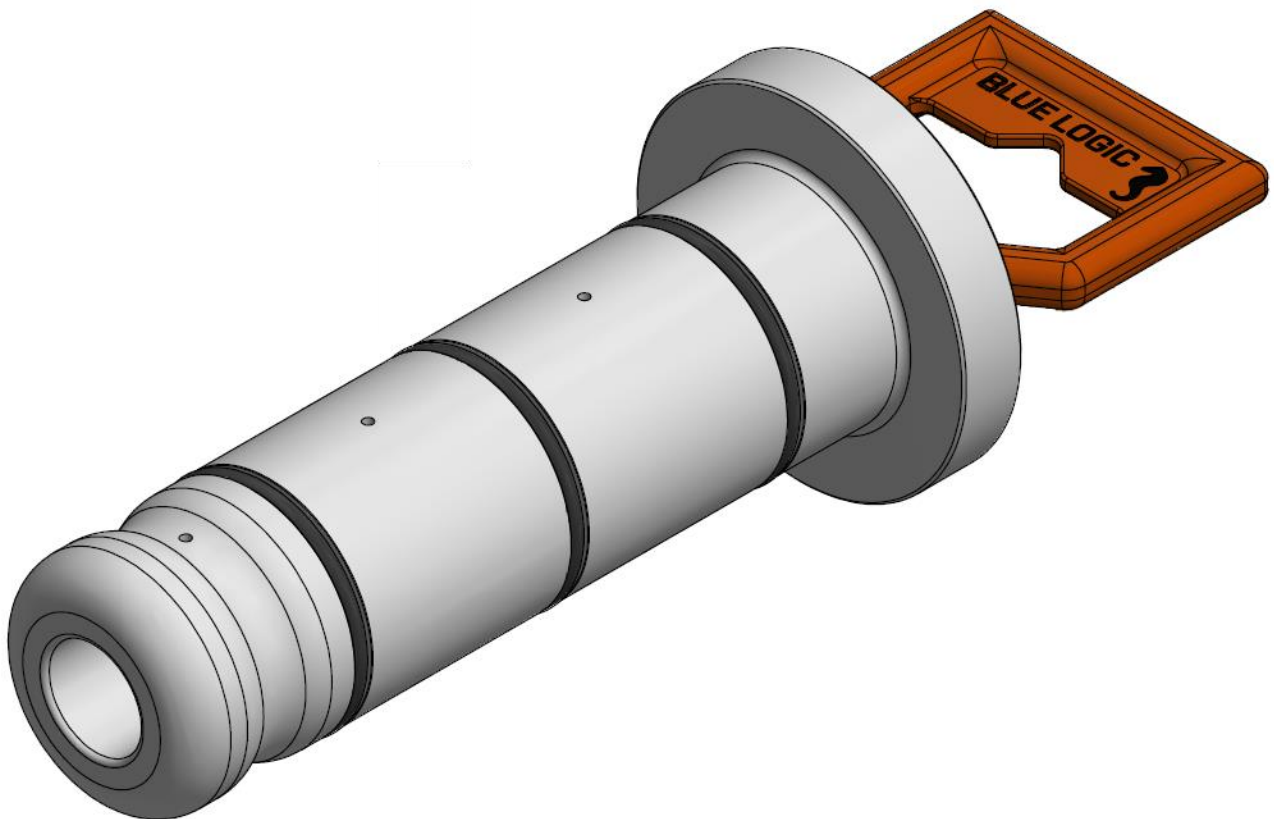


Figure 6, Ø89 Protection Stab

Technical Data – Ø89 DP Protection Stab

Overall dimensions	Ø140 x 442 mm
Weight	3,2 kg
Weight in water	1,0 kg
Material	PEHD 1000 & S32750 Super Duplex
Working Pressure	NA
Test pressure	NA
Temperature range	-18/ +80°C
Design Standard	17H Type 3

TECHNICAL DOCUMENT

2.8. Ø89 PARKING RECEPTACLE, BB6496

The parking receptacle is constructed in PEHD 1000 and Super Duplex for long-term installation. The purpose is to act as parking and protection of the Ø89 DP Pressure Stab during operation. The parking receptacle is designed for maximum 10 Bar pressure.

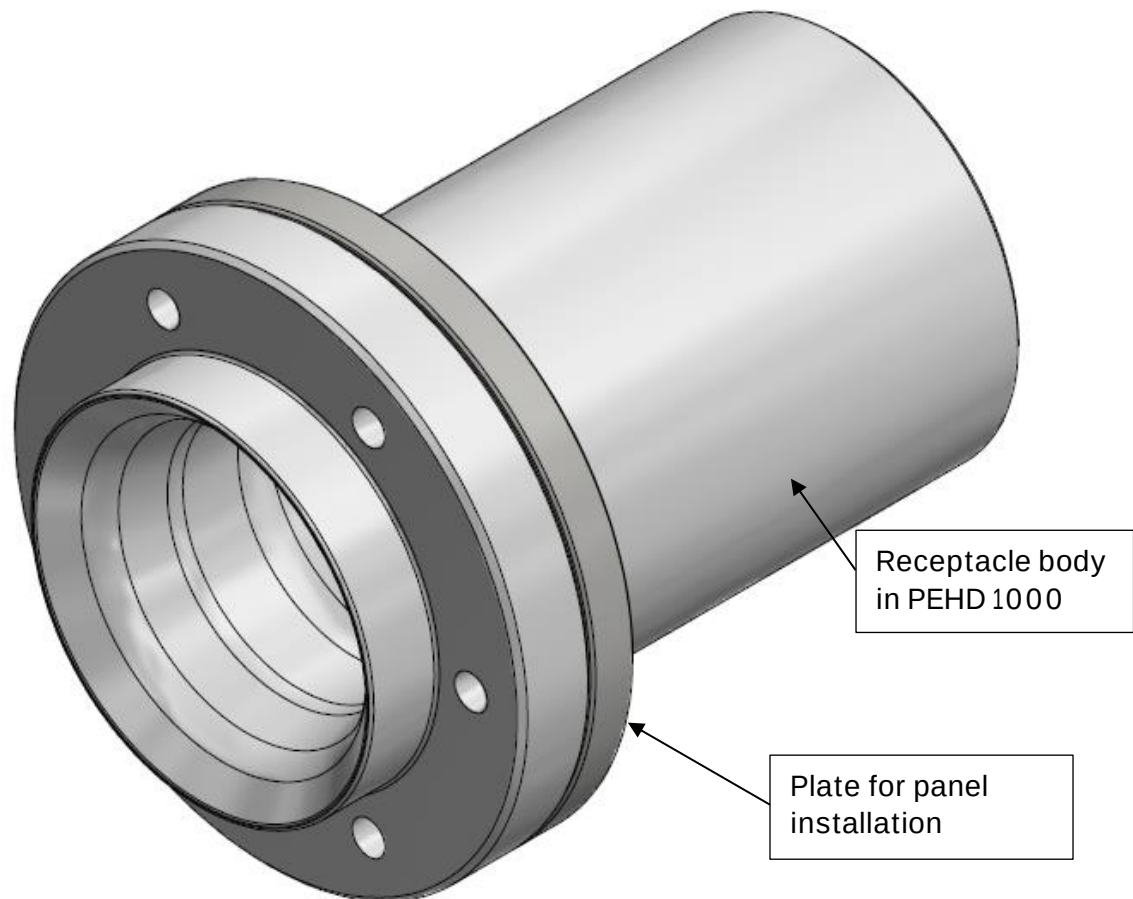


Figure 7, Ø89 Parking Receptacle

Technical Data – Ø89 Parking Receptacle

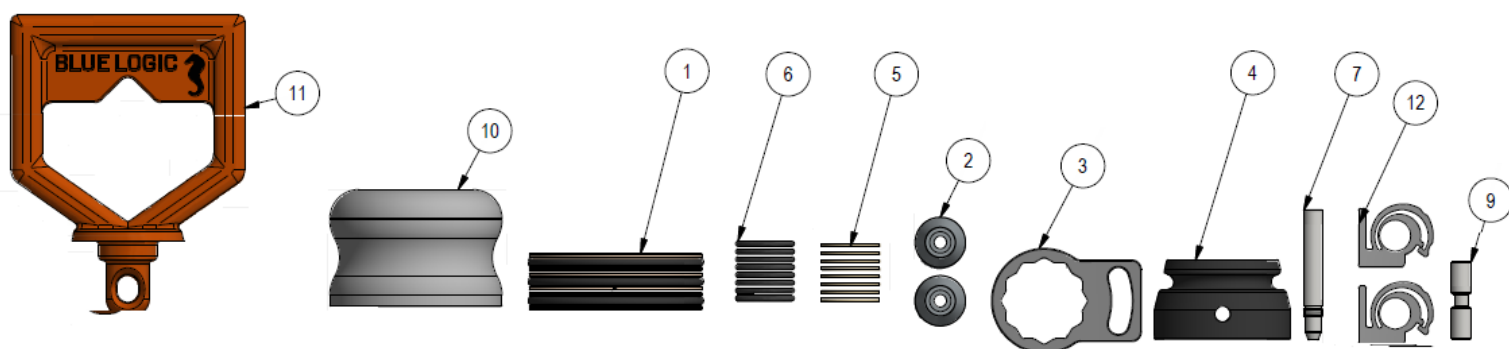
Overall dimensions	Ø195 x 245 mm
Weight	3,9 kg
Weight in water	1,4 kg
Material	PEHD1000 & S32750 Super Duplex
Working Pressure	10 bar
Temperature range	-18/+80°C
Design Standard	17H Type 3



2.9. SPARE KIT

Typical recommended spare part kit will include the below listed items. The parts included in the spare kit is illustrated next page. A spare kit drawing is included in APPENDIX 1

ID	Qty	Article No.	Description	Parent Equipment
1.	6	104589	Ø89 Stab Seal RU15-PEEK	Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
2.	2	102091	Zinc Anode Ø26 H=20mm	Ø89 DP Stab
3.	1	BB7745	Lock Bracket V3	Ø89 DP Stab
4.	2	PA0050	Flex Element Nitril 85/90 sh	Ø89 DP Stab Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
5.	8	101050	Back Up Ring Ø30xØ26x1.5 ST08-K Peek1 Cut	Ø89 DP Stab
6.	8	104273	O-Ring BS120 D1=25,07 D2=2,62 RU15	Ø89 DP Stab
7.	1	PA0051	Lock Bolt For Flex Handle	Ø89 DP Stab
8.	1	BA1581	Lock Bolt For Flex Handle SD.	Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
9.	2	BB6468	Ø10mm Bolt	Ø89 DP Stab Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
10.	2	BB6451	Guide Nose Ø89	Ø89 DP Stab Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
11.	2	PA0049	D-Handle SD	Ø89 DP Stab Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
12.	4	BB7527	Lock Brick ver. 03	Ø89 DP Stab Ø89 DP Press Stab Ø89 DP Press Stab w. Bleed-Off
13.	3	105220	Internal T-Seal 32x39x8,1	Ø89 DP Press Stab w. Bleed-Off
14.	1	102946	O-Ring BS242 D1=101,19 D2=3,53	Ø89 DP Press Stab w. Bleed-Off



Recommended spare parts for BB6432 Ø89 DP Stab 10k Interv MP 1" wJ-Lock

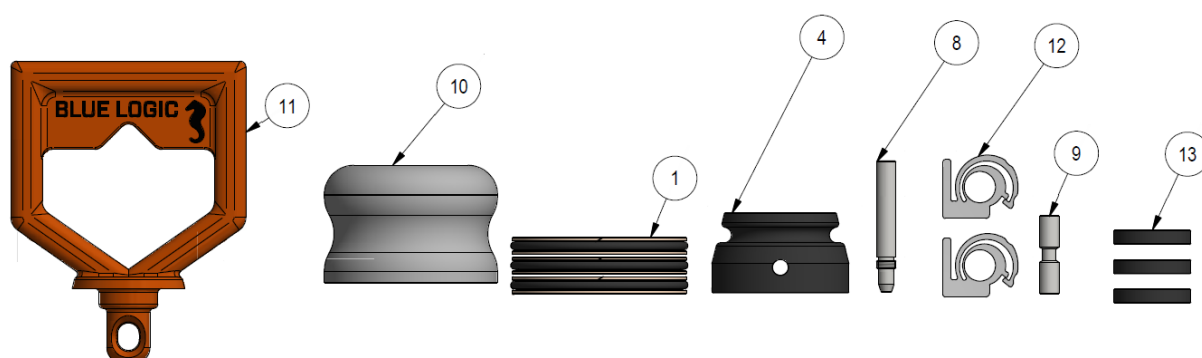
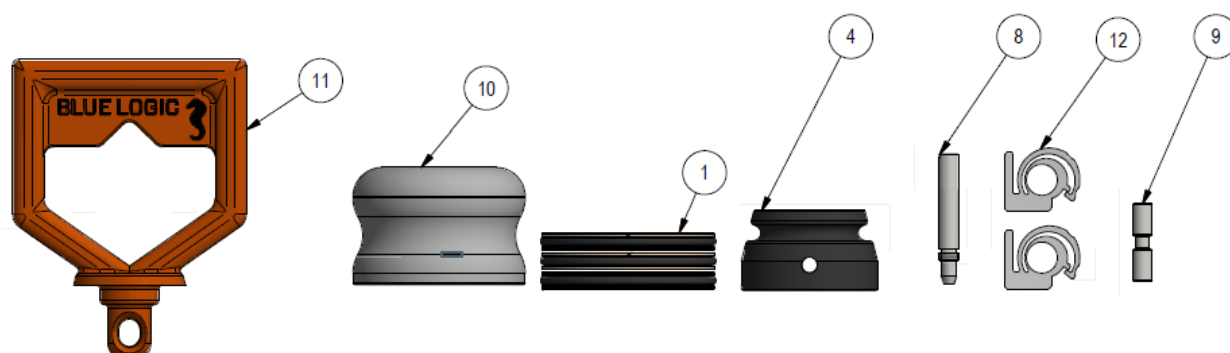


Figure 8, Spare part kit for Ø89 DP Stab (top), Ø89 DP Pressure Stab (mid) and Ø89 DP Pressure Stab with Bleed-Off (bottom)

TECHNICAL DOCUMENT

3. INSTALLATION

3.1. RECEPTACLE

3.1.1. Mechanical Installation

The Receptacle shall be bolted onto the structure directly by use of the integrated installation interface as described in drawing BB8195 and BB8388, ref. APPENDIX 1. Blue Logic recommends installing the receptacle vertically. This will ease guidance of the stab and any debris or dirt will then fall through the receptacle. Make sure to allow free space for the stab nose underneath/behind the receptacle, minimum envelope $\varnothing 100 \times 150$ mm.

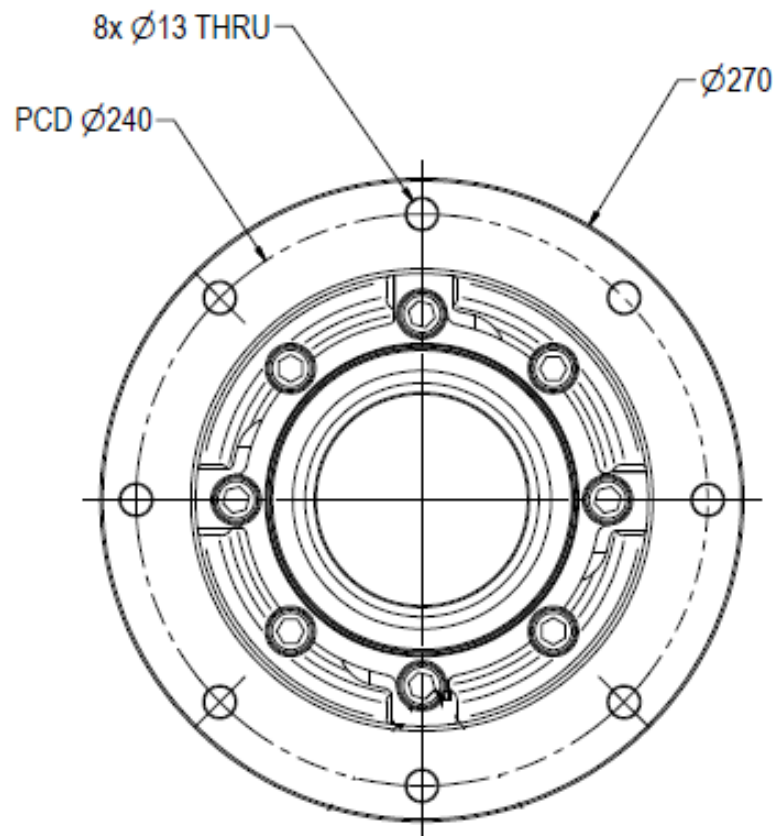


Figure 9, Interface details for receptacle installation, BB8195 & BB8388

TECHNICAL DOCUMENT

3.1.2. Hydraulic Connection

The Receptacle is equipped with two 1" WN Sch 160 or Sch 80 weld necks for direct welding to piping. Reference is made to drawing BB8195 and BB8388, APPENDIX 1, for details and position. Beveling and welding in accordance with Client requirements.

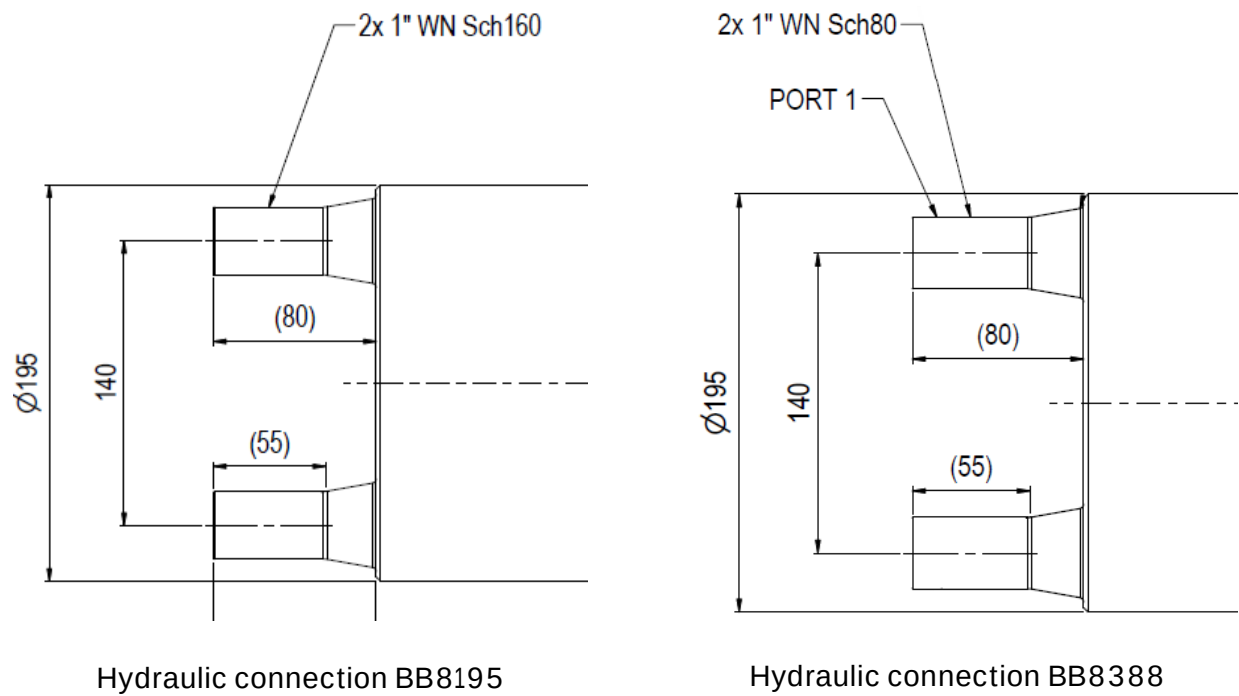


Figure 10, Receptacle hydraulic interface details.

TECHNICAL DOCUMENT

3.2. STAB

3.2.1. Hydraulic Connection

The Ø89 DP Stab have 2 off 1" MP interfaces for connection of hoses. Both ports are labelled with corresponding port number.

The fittings shall be secured by fastening the positive gland locks after torque-up:

- Unscrew the M10 socket head bolts to release the positive gland locks
- Put the hose through the positive gland locks, install and tighten the hydraulic fittings
- Put the positive gland locks into position, make sure to lock the fitting from anti clockwise rotation and tighten the M10 bolt, 39Nm. Repeat for the other port.

Further details can be found in drawings BB6432, BB7598 & BB7746, APPENDIX 1 .

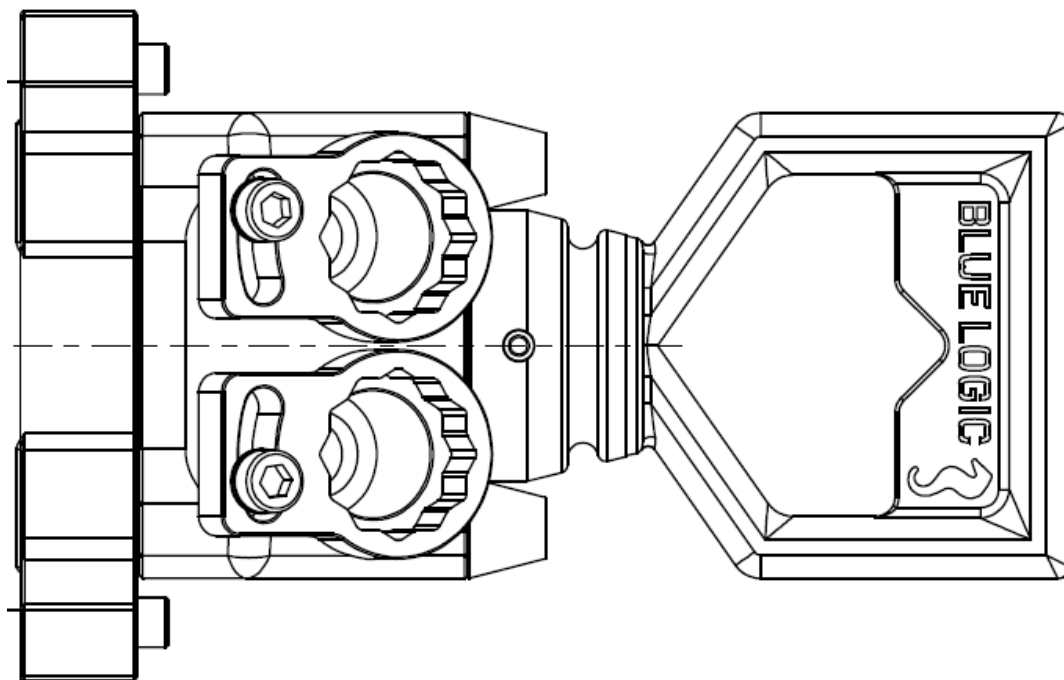


Figure 11, Hydraulic interface for Ø89 DP Stab.

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4. PREPARATION FOR USE

4.1. ONSHORE PREPARATIONS

Prior to shipping offshore, a mobilisation/ verification check shall be performed. All functions to be tested and verified. The below check list shall be used as a guideline for activities to be performed prior to offshore mobilisation.

4.1.1. Mobilisation Check List

No.	Description	Chk/Verified
1.	Inspect the following equipment visually: - Stabs and protection sleeves - Receptacles - Parking receptacles - Pressure stabs - Protection stabs	
2.	Inspect surface treatment undamaged.	
3.	Inspect stab seals for damages. Replace if in doubt.	
4.	Inspect pressure stab seals for damages. Replace if in doubt.	
5.	Inspect receptacle seal areas undamaged and no scratches.	
6.	Verify correct packing and documentation available.	

**TECHNICAL DOCUMENT****5. OPERATION****5.1. PRE DIVE CHECK**

Prior to dive, the Ø89 Hot Stab System shall be inspected and function tested.

5.1.1. Ø89 DP Stab Pre Dive Check List

No.	Description	Chk/Verified
1.	Perform a visual inspection - Seals - Hoses and connection - J-lock mechanism	
2.	Verify smooth operation of J-lock mechanism and locking pad. Check that locking pad can be retained in upper and lower position.	

5.1.2. Ø89 DP Pressure Stab Pre Dive Check List

No.	Description	Chk/Verified
1.	Perform a visual inspection - Seals - J-lock mechanism	
2.	Verify smooth operation of J-lock mechanism and locking pad. Check that locking pad can be retained in upper and lower position.	

5.1.3. Ø89 DP Pressure Stab with Bleed-Off Pre Dive Check List

No.	Description	Chk/Verified
1.	Perform a visual inspection - Seals - J-lock mechanism	
2.	Verify smooth operation of J-lock mechanism and locking pad. Check that locking pad can be retained in upper and lower position.	
3.	Verify smooth operation of bleed-off function. Check correct self-retract of handle.	

**TECHNICAL DOCUMENT****5.1.4. Ø89 DP Protection Stab Pre Dive Check List**

No.	Description	Chk/Verified
1.	Perform a visual inspection - Seals - Stab body	

5.2. Ø89 DP STAB CONNECTION

No.	Description	Chk/Verified
1.	Remove the pressure stab if installed in the receptacle and park in parking receptacle, ref section 5.8.	
2.	Insert the Ø89 DP stab all the way into the receptacle. Align J-lock pins as required to enter slots.	
3.	Rotate the J-lock ring CW to lock the stab in position.	
4.	Pull the lock pad down into the J-lock's slot to prevent unintentional rotation of the locking system.	
5.	Perform flow operation according to procedure.	

5.3. Ø89 DP STAB DISCONNECTION

No.	Description	Chk/Verified
1.	Stop operations according to procedure.	
2.	Unlock the stab from the receptacle by putting the lock pad in upper position and rotate the J-lock ring CCW.	
3.	Pull the stab out of the receptacle and park in parking position on ROV.	
4.	Reinstall pressure stab according to section 5.4	

TECHNICAL DOCUMENT

5.4. Ø89 DP PRESSURE STAB CONNECTION

This procedure is valid for both versions of the pressure stab, i.e. with or without bleed-off feature.

No.	Description	Chk/Verified
1.	Insert the Ø89 DP pressure stab all the way into the receptacle. Align J-lock pins as required to enter slots.	
2.	Rotate the J-lock ring CW to lock the stab in position.	
3.	Pull the lock pad down into the J-lock's slot to prevent unintentional rotation of the locking system.	

5.5. Ø89 DP PRESSURE STAB DISCONNECTION

No.	Description	Chk/Verified
1.	Unlock the pressure stab from the receptacle by putting the lock pad in upper position and rotate the J-lock ring CCW.	
2.	Pull the pressure stab out of the receptacle and park in parking receptacle. Verify that the parking receptacle is clean and no debris and/or foreign objects present prior to insertion.	

5.6. Ø89 DP PRESSURE STAB WITH BLEED-OFF DISCONNECTION

No.	Description	Chk/Verified
1.	If system is pressurised, perform bleed-off by pulling the pressure stab's D-handle. Hold in extended position until pressure is equalized. Release handle and let self-return. NOTE: Maximum pressure for bleed-off is 345 bar!	
2.	Unlock the pressure stab from the receptacle by putting the lock pad in upper position and rotate the J-lock ring CCW.	
3.	Pull the pressure stab out of the receptacle and park in parking receptacle. Verify that the parking receptacle is clean and no debris and/or foreign objects present prior to insertion.	

**TECHNICAL DOCUMENT****5.7. Ø89 DP PROTECTION STAB CONNECT AND DISCONNECT**

No.	Description	Chk/Verified
1.	Insert the Ø89 protection stab all the way into the receptacle. The protection stab will be held in position due to seal-induced friction force.	
2.	Disconnect by simply pulling the protection stab out of the receptacle.	

5.8. POST DIVE CHECK

No.	Description	Chk/Verified
1.	Perform a visual inspection - Seals - Hoses - Surface treatment - Verify smooth operation of J-lock mechanism	
2.	Clean all equipment with fresh water.	
3.	Dry off equipment and apply protective oil such as WD-40 or similar prior to storage.	
4.	Install stabs into dedicated protection sleeves if available and put assy into dedicated transport boxes.	



6. MAINTENANCE

6.1. GENERAL

The Ø89 Hot Stab System is a robust subsea connection system with few critical moving parts. If moving parts is not filled with salt and sand/ dirt particles but cleaned and lubricated at a regular basis, the only parts which will need to be routinely replaced is the seal system.

There are however a few important inspections points which shall be performed periodically to guarantee problem free use and operation of the stab system.

- Mob/Demob inspection and control
- Daily inspection during offshore operations
- Weekly inspection during offshore operations
- Yearly inspection and maintenance

For MOB/demob, please see above section 4.1.1.

For daily inspection during offshore operations; please see above section 5.1 for pre-dive activities and section 5.8 for post dive.



6.2. WEEKLY MAINTENANCE

No.	Description	Chk/Verified
1.	Perform a visual inspection of stab. Inspect surface treatment and verify no corrosion issues. Special attention should be made to the following: - Seals - Seal areas - Stab nose - ROV handle - Fittings and hoses - Surface treatment - Anodes	
2.	Hose down the stab to remove any debris and/or foreign objects	
3.	Operate the J-lock and lock pad, verify correct function and smooth movement.	
4.	For pressure stab with bleed-off; check for smooth movement of handle and correct self-retract .	
5.	Ensure protective oil applied and no water/moisture entrapped on critical parts.	

6.3. MONTHLY MAINTENANCE

No special activities required on a monthly basis. If the stab system has been extensively used and repeatedly exposed to dirt and aggressive fluids, all seals shall be inspected and replaced if required.

6.4. YEARLY MAINTENANCE

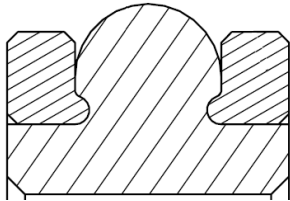
It is recommended to return the equipment to Blue Logic for full inspection, maintenance, and testing.

No.	Description	Chk/Verified
1.	Inspect all stab seals. Replace if required.	
2.	Check all mechanical functions, verify smooth operation. Inspect for scratches and general wear.	
3.	Function-test stab and receptacle, perform a full leakage test at working pressure to verify seal integrity.	

TECHNICAL DOCUMENT

6.5. SEAL REPLACEMENT

Replacement of the stab seals is feasible to perform in field as described in the below section. The procedure covers both stab and pressure stab as the seals are identical.

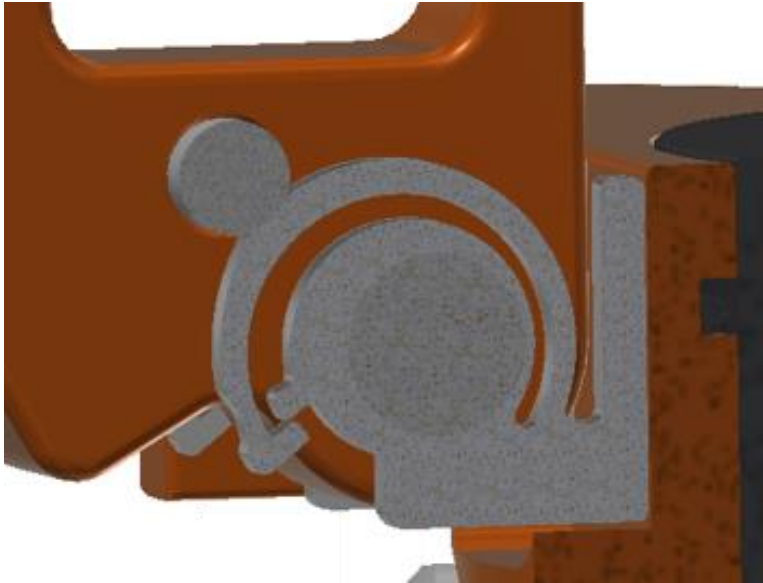
No.	Description	Chk/Verified
1.	Place the stab upside down in a vice or similar.	
2.	Gently remove the back-up rings in PEEK, avoid damage as they will be re-used. Blow the split of the ring with compressed air to ease removal.	
3.	Start with the seal closest to the D-handle. Use a long nose plier to grab the top of the seal and pull out of the seal groove.	
4.	Push the seal along the stab and over the other seals to remove from stab. If re-use not an option; cut the seal for quick removal.	
5.	Repeat until all seals have been removed. Clean stab and seal grooves thoroughly to remove all debris and foreign objects. Inspect seal groove surfaces for damage.	
6.	Apply a thin layer of Vaseline or similar to seals and stab prior to installing the new seals.	
7.	Install the seals starting with the one closest to the stab-nose. The following seals can then be pushed over the first seal. The seals are bi-directional, thus installable both ways.	
8.	Finally install two back-up rings per seal according to figure. The back-up rings <u>must</u> be installed as shown:	

As an option, a dedicated Seal Replacement Tool is available. Please contact Blue Logic for further details.

TECHNICAL DOCUMENT

6.6. LOCK-BRICK REPLACEMENT

Replacement of the stab's lock-brick is feasible to perform in field as described in the below section. The replacement sequence is illustrated next page.

No.	Description	Chk/Verified
1.	Remove the set screw using a 3mm Allen key.	
2.	Push out the hinge-bolt.	
3.	Remove old lock-bricks and insert new, article BB7527, between lock-pad and hinge brackets in this orientation: 	
4.	Re-insert the hinge-bolt. Make sure to position the bolt's lock-groove at the set screw position.	
5.	Install the M6 set screw using a 3mm Allen key. Apply Loctite 243 to set screw to lock in position. Let the Loctite cure according to Loctite specification.	

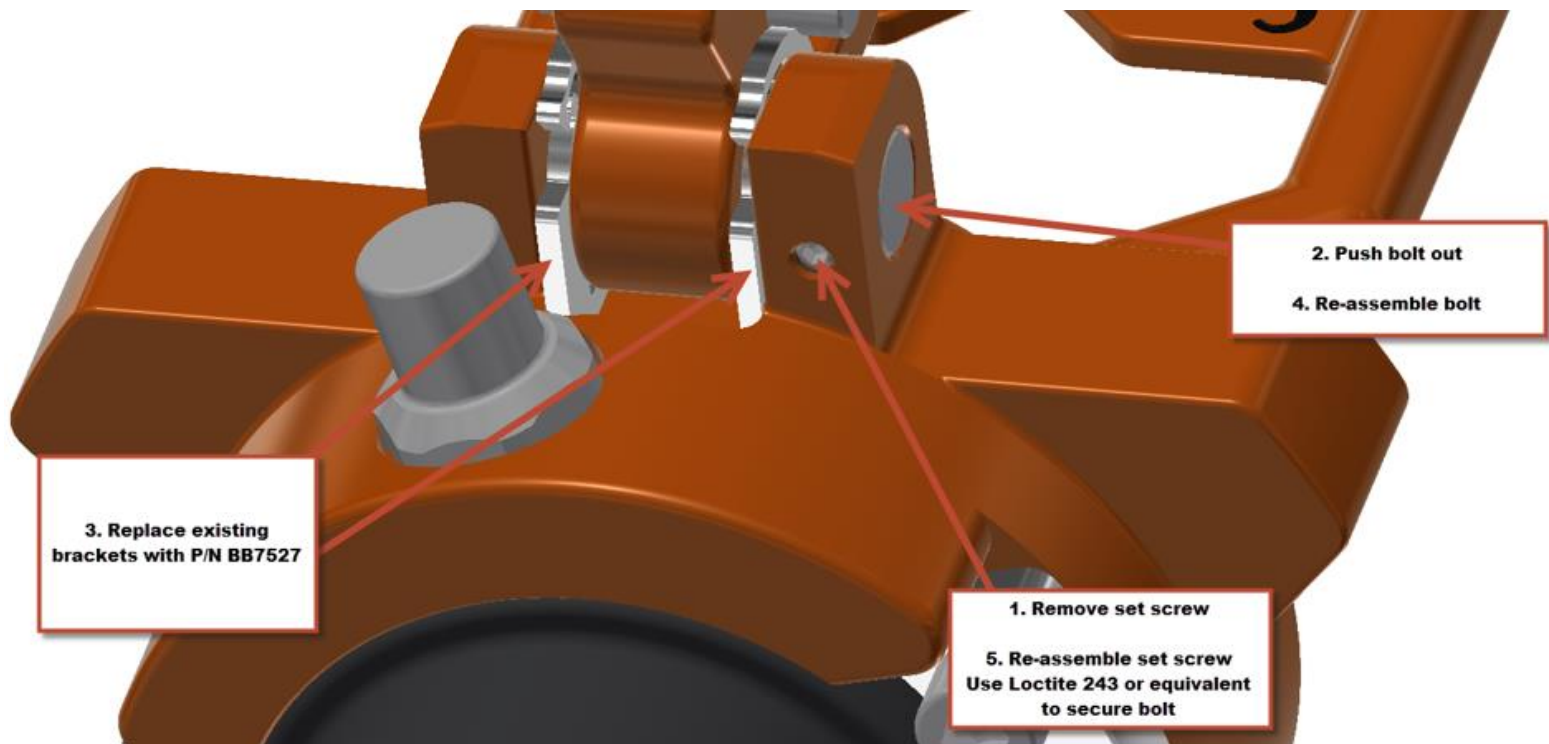


Figure 12, Replacement of Lock-Bricks



7. STORAGE AND TRANSPORT

7.1. STORAGE

No.	Description	Chk/Verified
1.	Visual inspect the equipment for damages and wear.	
2.	Ensure correct post dive sequence followed (see above sections)	
3.	Apply preservation oil and secure in storage boxes.	

7.2. TRANSPORT

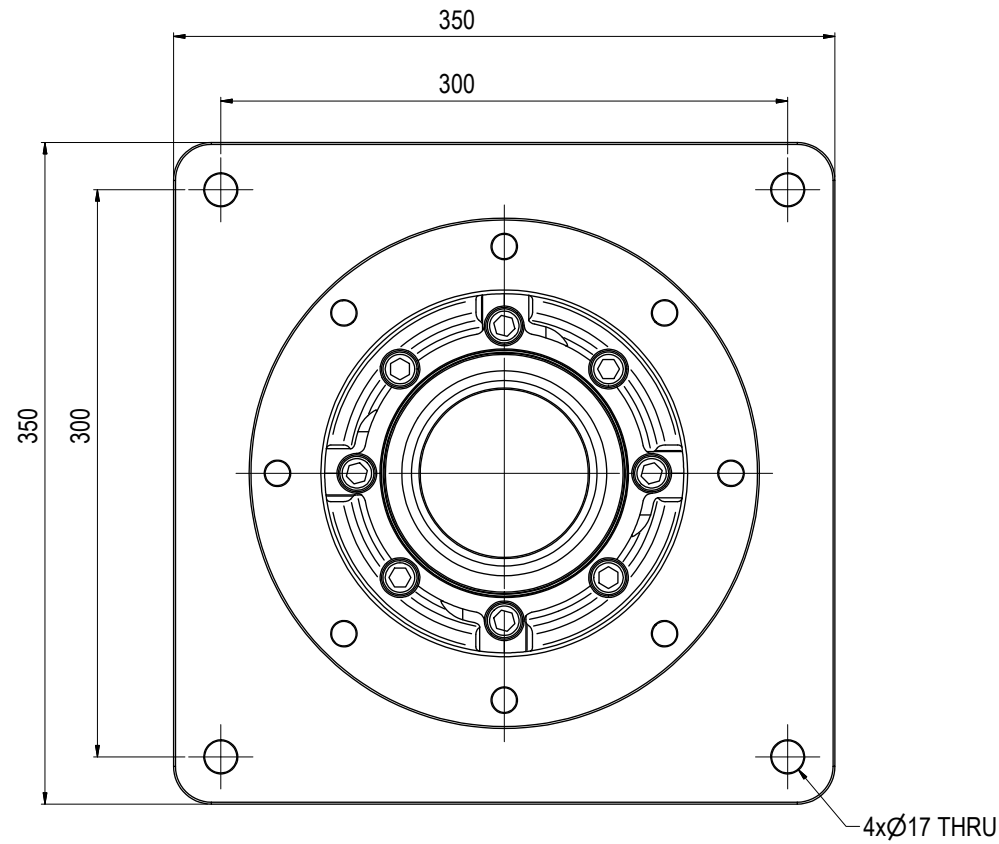
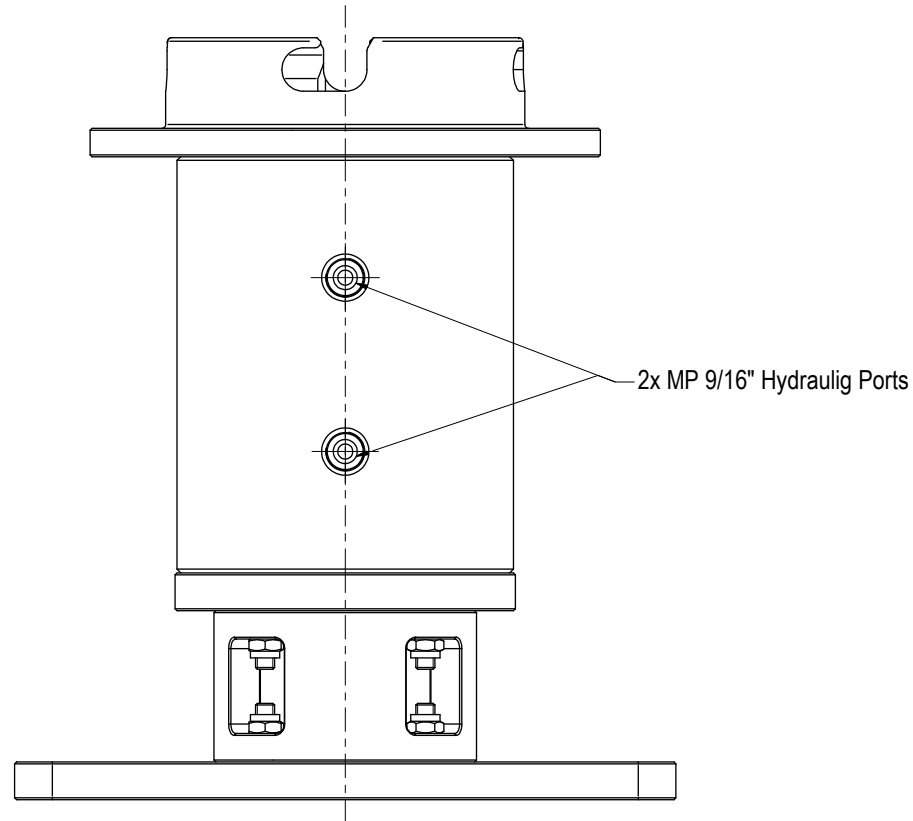
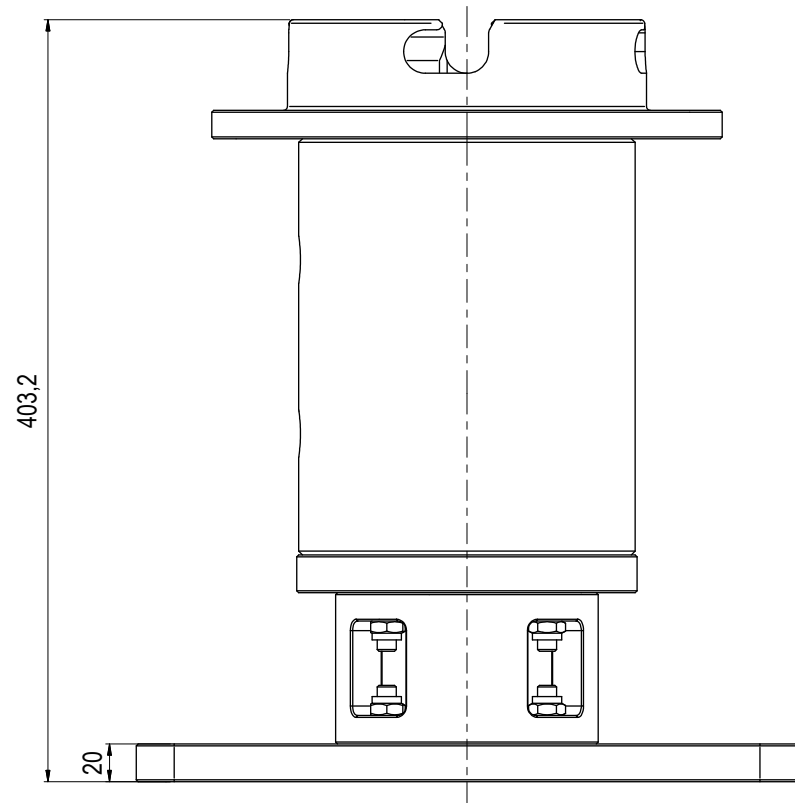
No special precautions are needed for transport. However, the following should be verified:

1. Packed in suitable packaging for sufficient protection during transport
2. Sender Name and Address clearly visible
3. Receiver Name and address clearly visible
4. Inventory list correct filled out



APPENDIX 1 SYSTEM DRAWINGS

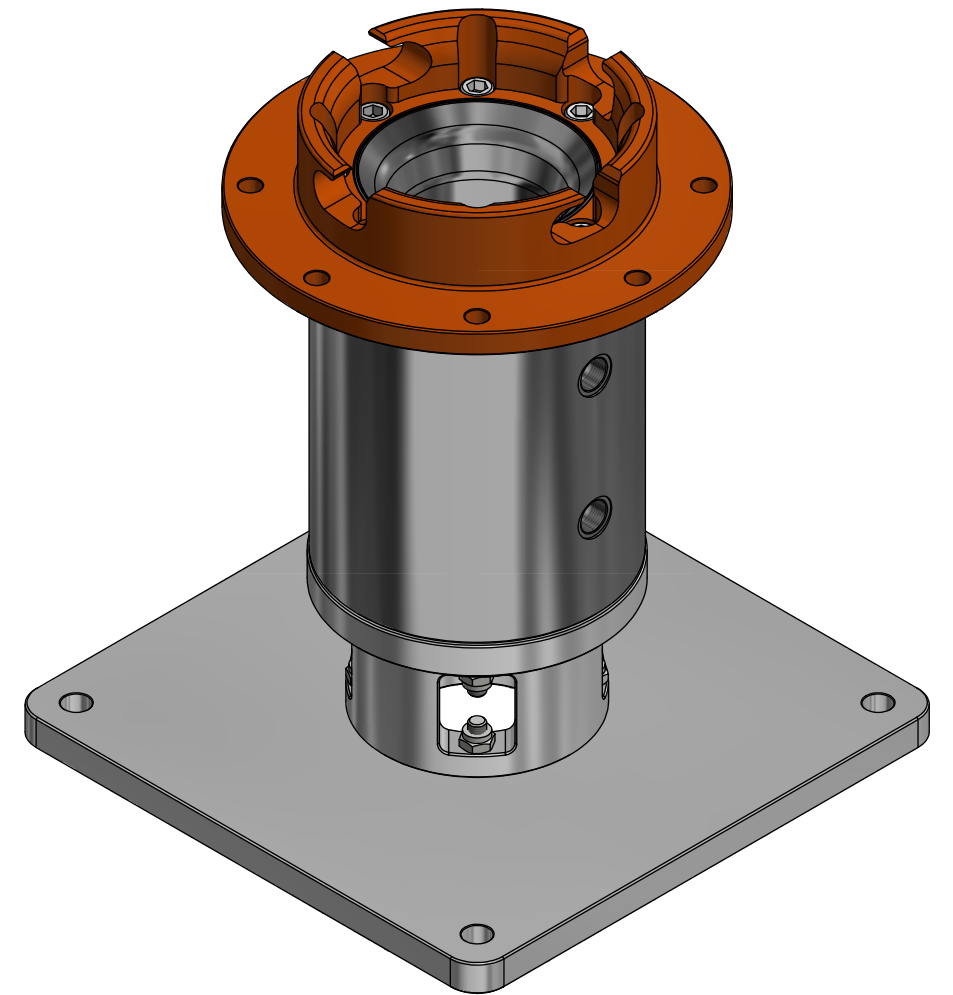
Doc. No/Rev/	Drawing Title
BB7746	Ø89 DP Stab 10k Interv MP 1" 90 deg. Interf wJ-Lock
BB7598	Ø89 DP Stab 10k Interv MP 1" 15 Deg Interf wJ-Lock
BB6432	Ø89 DP Stab 10k Interv MP 1" 65 Deg Interf wJ-Lock
BB8222	Ø89 DP Test Receptacle 10k MP 9/16" wJ-Lock
BB6496	Ø89 DP Parking Receptacle 10Bar Long-term fit 6/8 holes J-Lock
BB8388	Ø89 DP Receptacle 10k Long-term wJ-L 1" WN Sch 80 8 Holes Interf
BB8195	Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf
BB6465	Ø89 DP Press Stab 10k Long-term wJ-Lock
BB9770	Ø89 DP Pr Stab 10k Long-term J-Lock with Bleed Off Function
BB8227	Ø89 DP Protection Stab Vented Long-term
BB8226	Ø89 DP Stab Protection Sleeve
BB7414	Recommended Spares Ø89 Stab System



NOTE: 1
DESIGN CODE:
API 17H Type 3
API 6A

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.02. Receptacle
Sub Group: 1.89.423.02. Dual

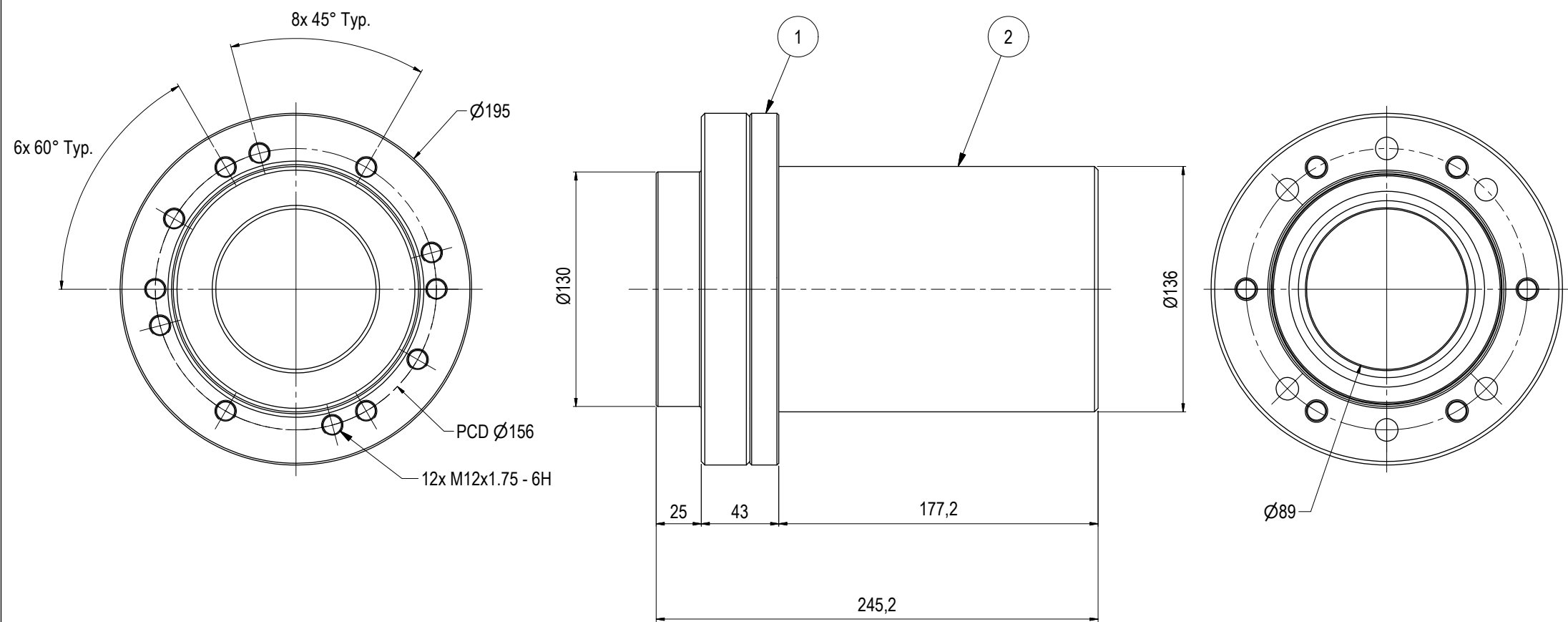
NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: 690
Design Water Depth: N/A
Material: Long-term
Weight in Air: 49,1 kg
Volume: 8,27 dm³
Submerged Weight: 40,62 kg
Surface Area: 8803 cm²
Hydraulic: MP 9/16"
Mechanical: N/A
Electrical: N/A
Com. & Protocol: N/A



Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.
03	3.10.2022	7-IFC (Issued for Construction)		HNJ	TAN	HNJ
02	13.9.2022	7-IFC (Issued for Construction)		HNJ	TAN	HNJ
01	16.5.2022	2-IFT (Issued for Tender)		HNJ	NA	NA

Dwg Scale: NTS	Drawing title: Ø89 DP Test Rec 10k MP 9/16" wJ-Lock	Dwg Proj: 
Dwg Format: A3	Drawing number: BB8222	Rev: 03

Parts List			
ITEM	QTY	PART No.	DESCRIPTION
1	1	BB6495	Ring for Ø89 Park Rec
2	1	BB6494	Body for Ø89 DP Park Rec

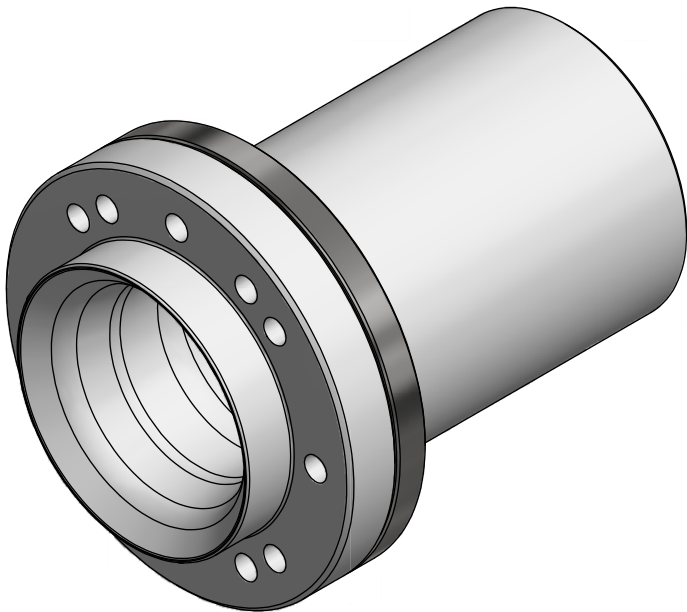


NOTE: 1
DESIGN CODE:
API 17H Type 3

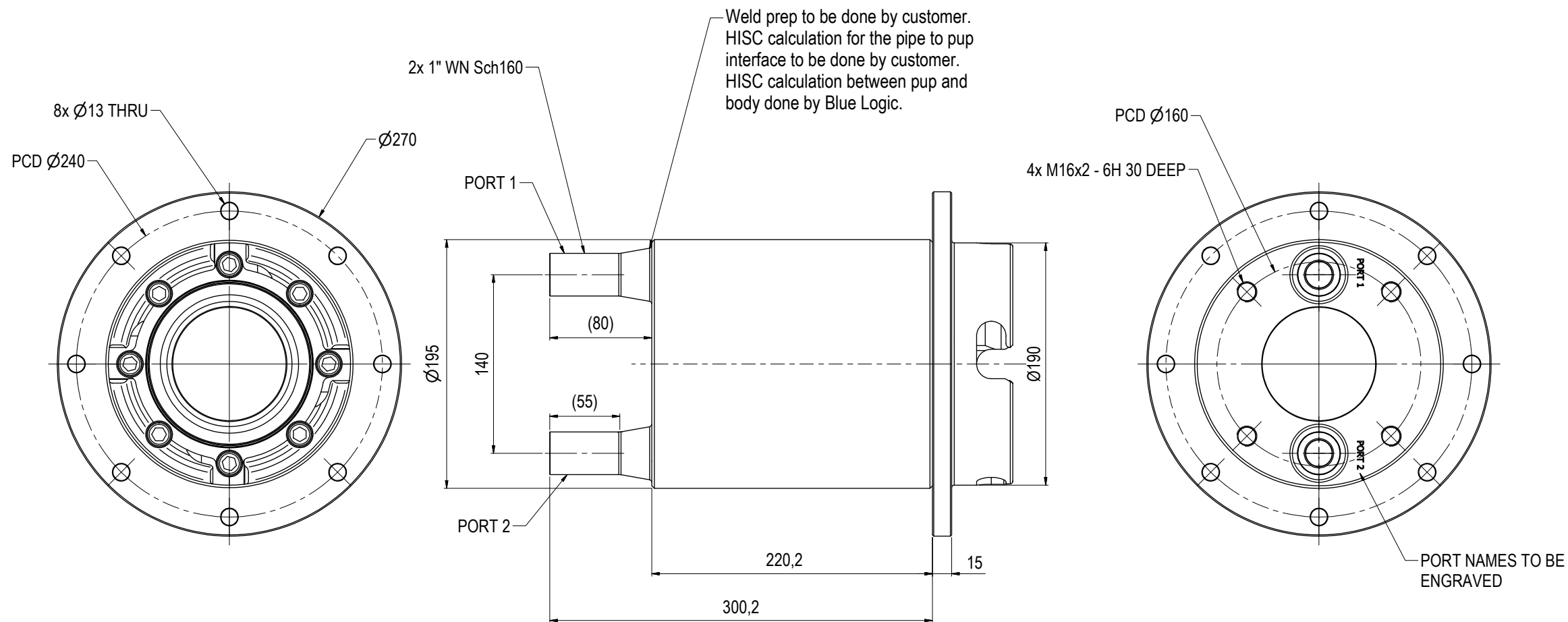
NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.02. Receptacle
Sub Group: 1.89.423.02. Dual

NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: 10
Design Water Depth: N/A
Material: Long-term
Weight in Air: 3,9 kg
Volume: 2,43 dm^3
Submerged Weight: 1,37 kg
Surface Area: 2812 cm^2
Hydraulic: N/A
Mechanical: 12x M12 @ PCD Ø156
Electrical: N/A
Com. & Protocol: N/A

NOTE: 4
ADDITIONAL INFORMATION:
Ø89 Parking Receptacle for Ø89 Dual Port Stab designed in PEHD 1000 and Super Duplex material suitable for long-term installation.



04	11.7.2022	7-IFC (Issued for Construction)		HNJ	TAN	HNJ	BLUE LOGIC	Dwg Scale: NTS	Drawing title: Ø89 DP Park Rec 10Bar Long-term fit 6/8 holes J-Lock	Drawing number: BB6496	Rev. 04
03	28.2.2022	7-IFC (Issued for Construction)		WTJ	HNJ	WTJ		Dwg Proj: NTS			
02	17.9.2021	7-IFC (Issued for Construction)		HNJ	WTJ	LGH		Dwg Format: A3			
01	20.4.2021	2-IFT (Issued for Tender)		HNJ	N/A	N/A					
Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.					



NOTE: 1
DESIGN CODE:
API 17H Type 3

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.02. Receptacle
Sub Group: 1.89.423.02. Dual

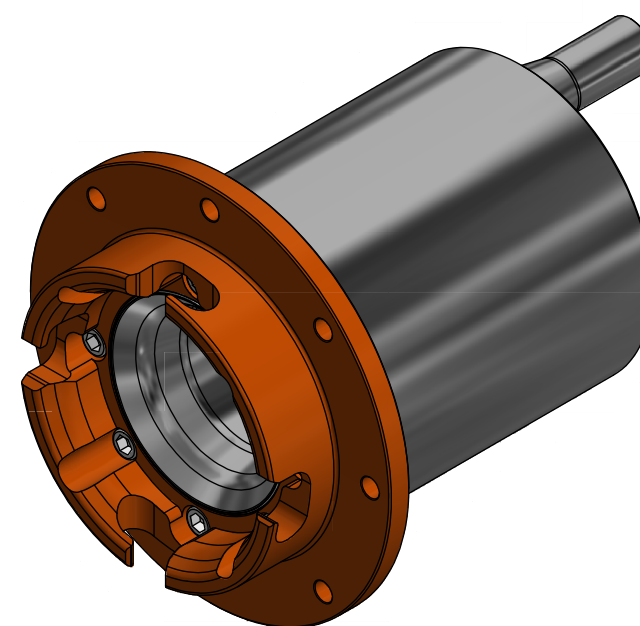
NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: 690
Design Water Depth: N/A
Material: Long-term
Weight in Air: 48,9 kg
Volume: 6,23 dm³
Submerged Weight: 42,52 kg
Surface Area: 5085 cm²
Hydraulic: 1" WN Sch 160
Mechanical: N/A
Electrical: N/A
Com. & Protocol: N/A

NOTE 4
NON SPECIFIED TOLERANCES TO BE IN
ACCORDANCE WITH NS-ISO 2768-1M

NOTE 5
RECEPTACLE TO BE CONNECTED TO CP SYSTEM

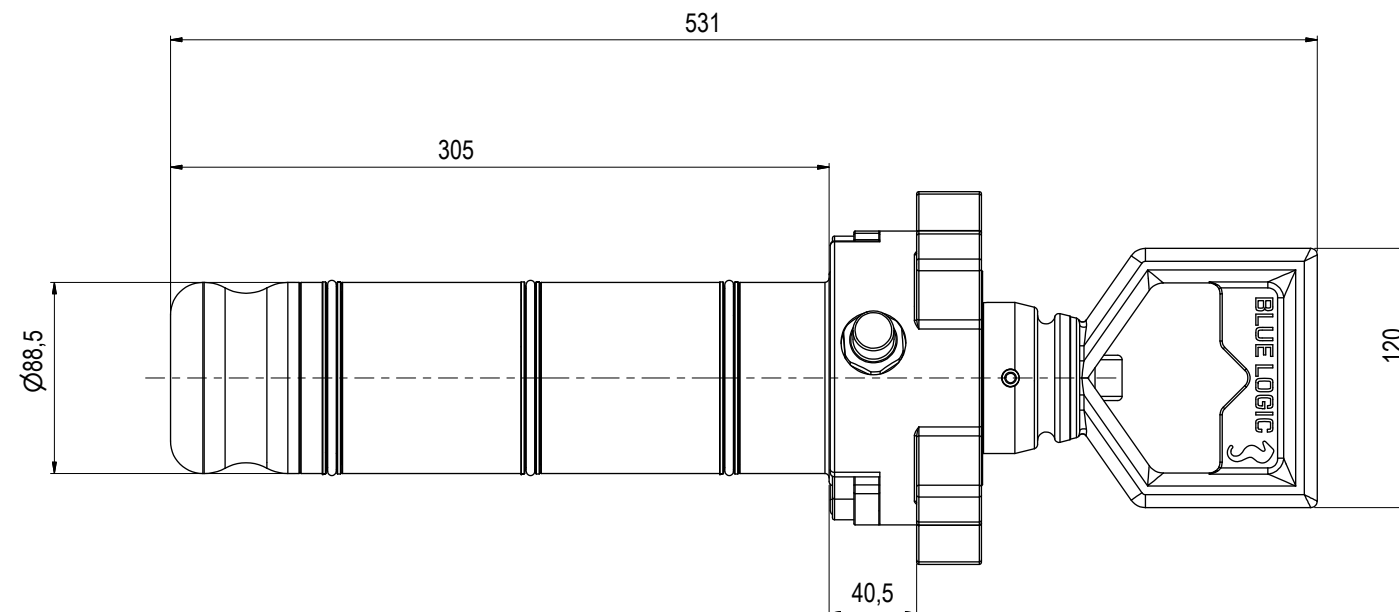
NOTE: 6
ADDITIONAL INFORMATION:
Ø89 Dual Port Receptacle designed according to API 17H Type 3 in
Super Duplex (32750) material suitable for permanent installation. The
Receptacle is pressure rated to 690 Bar / 10 000 Psi and machined from
a forged bolt inclusive the 1" weld necks. Integrated J-lock to lock the
Stab in position.

NOTE: 7
OPERATION & MAINTENANCE INFORMATION:
OMM 500420-TD-0012



Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.
01	16.5.2022	7-IFC (Issued for Construction)		WTJ	PIA	HNJ

Dwg Scale: NTS Dwg Proj: A3	Drawing title: Ø89 DP Rec 10k Long-term wJ-L 1" WN Sch 160 8 Holes Interf	Drawing number: BB8195	Rev. 01
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NOTE: 1
DESIGN CODE:
API 17H Type 3

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.04. Pressure
Sub Group: 1.89.425.02. Dual

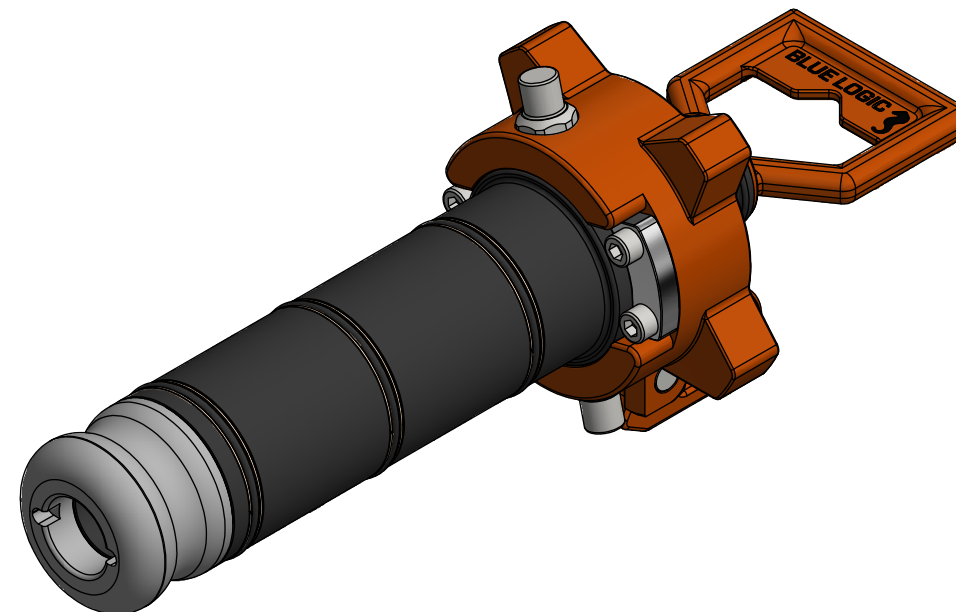
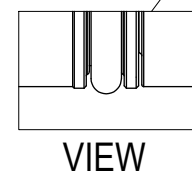
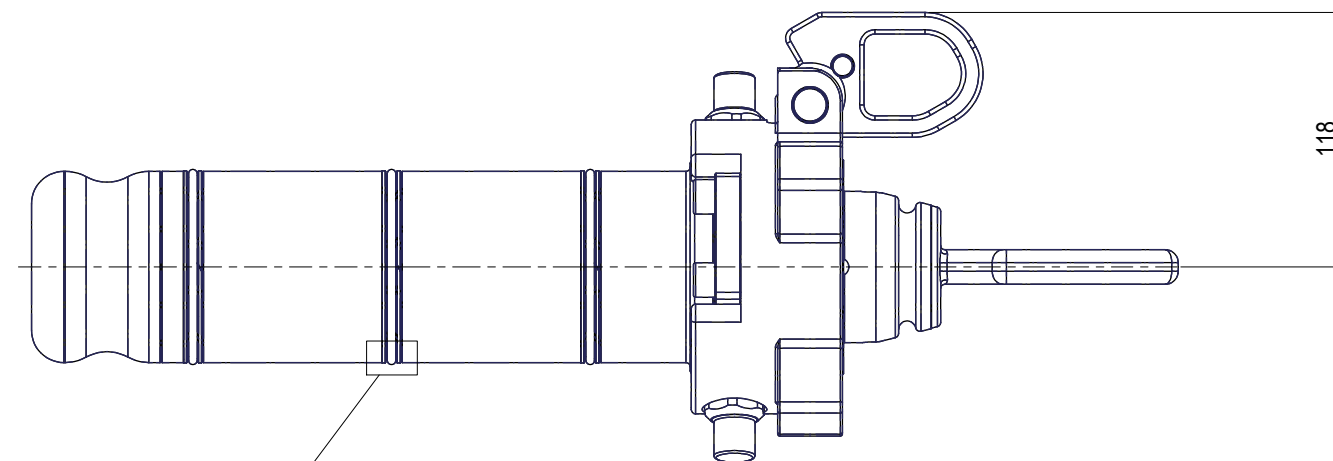
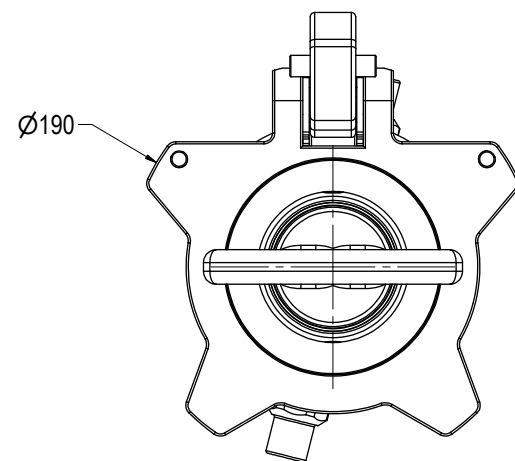
NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: 690
Design Water Depth: N/A
Material: Long-term
Weight in Air: 20,1 kg
Volume: 2,85 dm^3
Submerged Weight: 17,23 kg
Surface Area: 4205 cm^2
Hydraulic: N/A
Mechanical: N/A
Electrical: N/A
Com. & Protocol: N/A

NOTE 4
NON SPECIFIED TOLERANCES TO BE IN
ACCORDANCE WITH NS-ISO 2768-1M

0,5-3mm	± 0,1
3-6mm	± 0,1
6-30mm	± 0,2
30-120mm	± 0,3
120-400mm	± 0,5
400-1000mm	± 0,8
1000-2000mm	± 1,2
2000-4000mm	± 2,0

NOTE: 5
ADDITIONAL INFORMATION:
Ø89 Dual Port Pressure Stab (blind stab) designed according to API 17H Type 3. Fabricated in Super Duplex (32750) material with Xylan coating and intended for long-term subsea service. Integrated, manipulator-operated J-lock mechanism to lock the Stab into the Receptacle after connection. Additional lock included to prevent unintentional rotation after installation.
Stab nose in PEHD 1000 for gentle guiding of Stab into Receptacle. Seal material is RU15 (HNBR) with back up rings in PEEK.

NOTE: 6
OPERATION & MAINTENANCE INFORMATION:
OMM 500420-TD-0012



07	17.2.2022	7-IFC (Issued for Construction)		HNJ	LGH	HNJ
06	15.2.2022	7-IFC (Issued for Construction)		HNJ	LGH	HNJ
05	10.1.2022	7-IFC (Issued for Construction)		HNJ	LGH	HNJ
04	3.11.2021	7-IFC (Issued for Construction)		WTJ	HNJ	WTJ
Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.

BLUE LOGIC

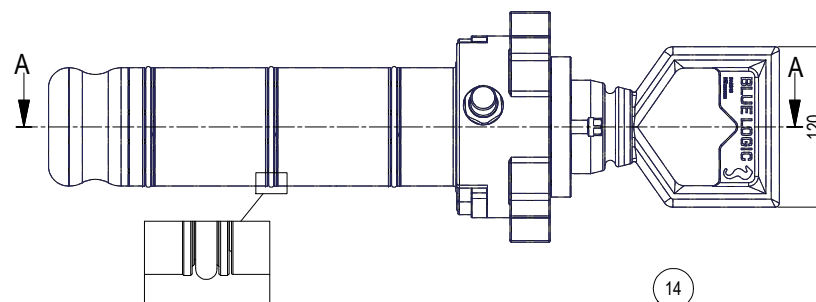
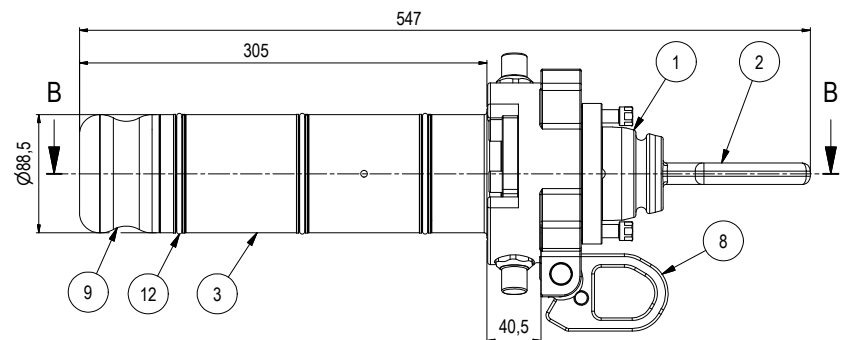
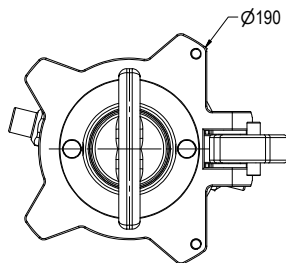
Dwg Scale:
NTS
Dwg Proj:
Dwg Format:
A3

Drawing title:
Ø89 DP Press Stab 10k Long-term wJ-Lock

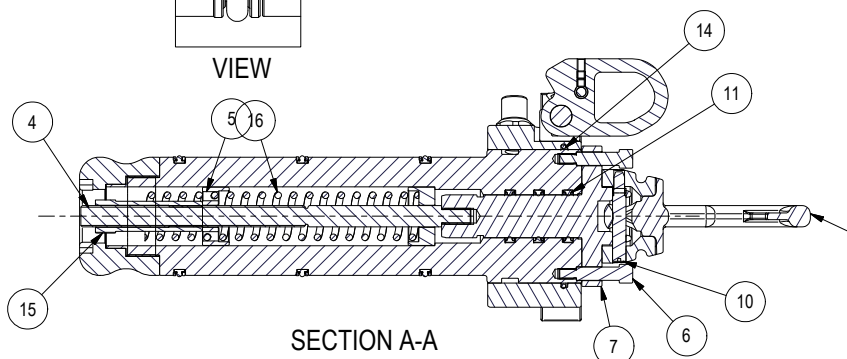
Drawing number:
BB6465

Rev.
07

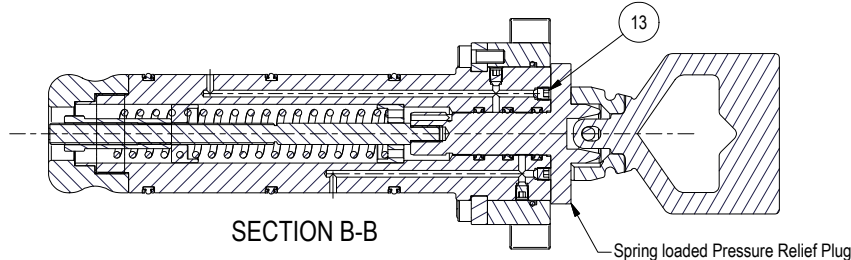
Parts List				
ITEM	QTY	PART No.	DESCRIPTION	MATERIAL
1	1	PA0050	Flex Element Nitril 85/90 sh	Rubber
2	1	PA0049	D-Handle SD	UNS J93404 Casted Super Duplex
3	1	BB9806	Modified BB6466	S32750 SUPER DUPLEX
4	1	BB9786	Spring Bolt	S32760 SUPER DUPLEX
5	2	BB9775	Washer	S32750 SUPER DUPLEX
6	2	BB9773	Pin Bolt M8	S32750 SUPER DUPLEX
7	1	BB9771	Flex-Joint Base w/Bleed Ports V2	S32760 SUPER DUPLEX
8	1	BB6472	Ø89 DP J-Lock System	S32760 SUPER DUPLEX
9	1	BB6451	Guide Nose Ø89	PEHD 1000
10	1	BA1581	Lock Bolt For Flex Handle SD.	S32750 SUPER DUPLEX
11	3	105220	Internal T-Seal 32x39x8,1	HNBR/PEEK
12	3	104589	Ø89 Stab Seal RU15-PEEK	HNBR/PEEK
13	4	104071	Lee A.F.O Sealing Plug PLAA3724020A	MP 35 N
14	1	102946	O-Ring BS242 D1=101,19 D2=3,53	NITRIL SH.70
15	1	BB9824	Spring Nut	S32750 SUPER DUPLEX
16	1	105240	Compression Spring 15 x Dy36,5 x L 205 MP35	MP 35 N



VIEW

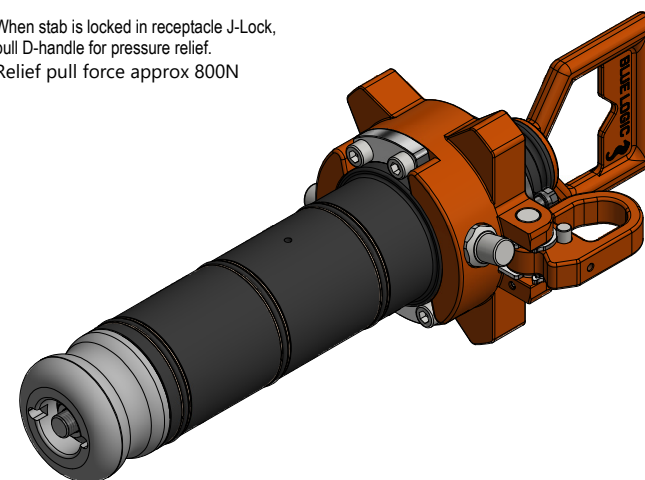


SECTION A-A



SECTION B-B

When stab is locked in receptacle J-Lock, pull D-handle for pressure relief.
Relief pull force approx 800N



NOTE: 1
DESIGN CODE:
API 17H Type 3

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.04. Pressure
Sub Group: 1.89.425.02. Dual

NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: 690
Design Water Depth: 3000m
Material: Long-term
Weight in Air: 22,1 kg
Volume: 3,1 dm³
Submerged Weight: 18,89 kg
Surface Area: 5577 cm²
Hydraulic: N/A
Mechanical: API 17H
Electrical: N/A
Com. & Protocol: N/A

NOTE: 4
ADDITIONAL INFORMATION:
Ø89 Dual Port Pressure Stab (blind stab) designed according to API 17H Type 3. Fabricated in Super Duplex (S32750/S32760) material with Xylan coating and intended for long-term subsea service. Integrated, manipulator-operated J-Lock mechanism to lock the Stab into the Receptacle after connection. Additional lock function included to further prevent unintentional rotation and disconnection after installation. The pressure stab is equipped with a ROV operated pressure relief function to ensure pressure bleed off prior to disconnection of the stab. Bleed off function is activated by pulling the ROV handle prior to de-activation of the main J-Lock function. Bleed off pull out force approx 800N
Stab nose in PEHD 1000 for gentle guiding of Stab into Receptacle. Seal material is RU15 (HNBR) with back up rings in PEEK.

04	7.9.2023	7-IFC (Issued for Construction)		HNJ	TAN	HNJ
03	28.8.2023	7-IFC (Issued for Construction)		HNJ	TAN	HNJ
02	1.6.2023	7-IFC (Issued for Construction)		HNJ	LGH	HNJ
01	20.3.2023	2-IFT (Issued for Tender)		HNJ	NA	NA
Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.

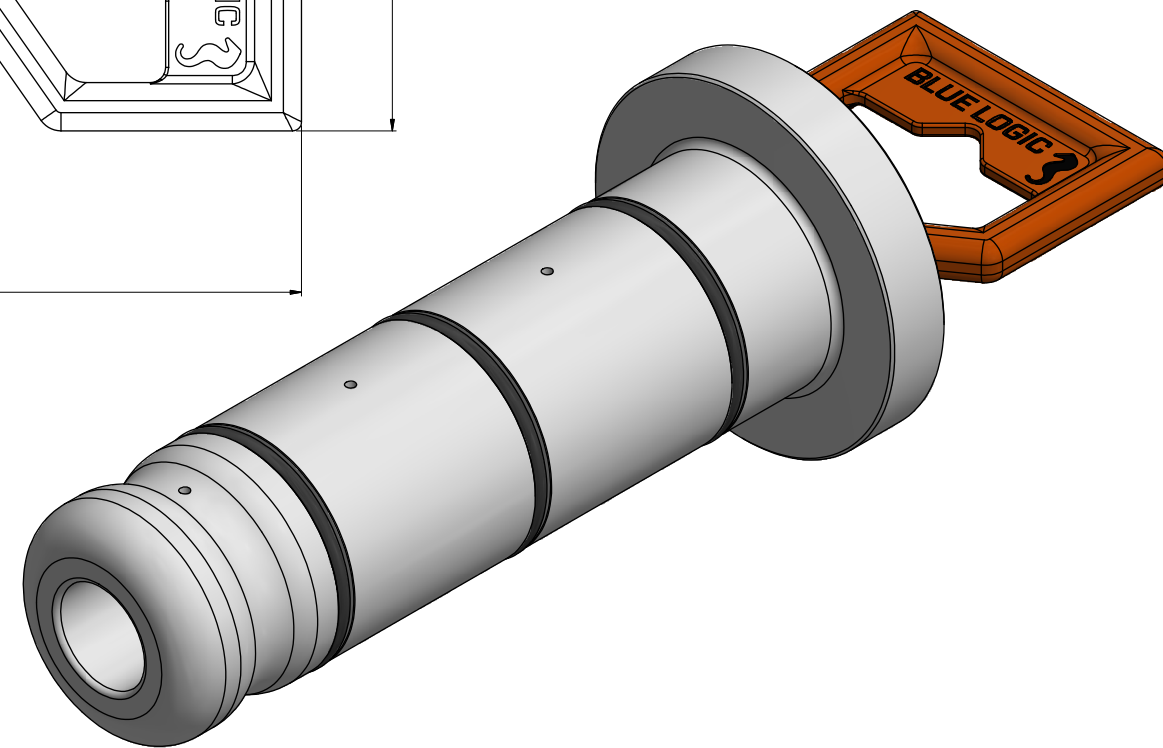
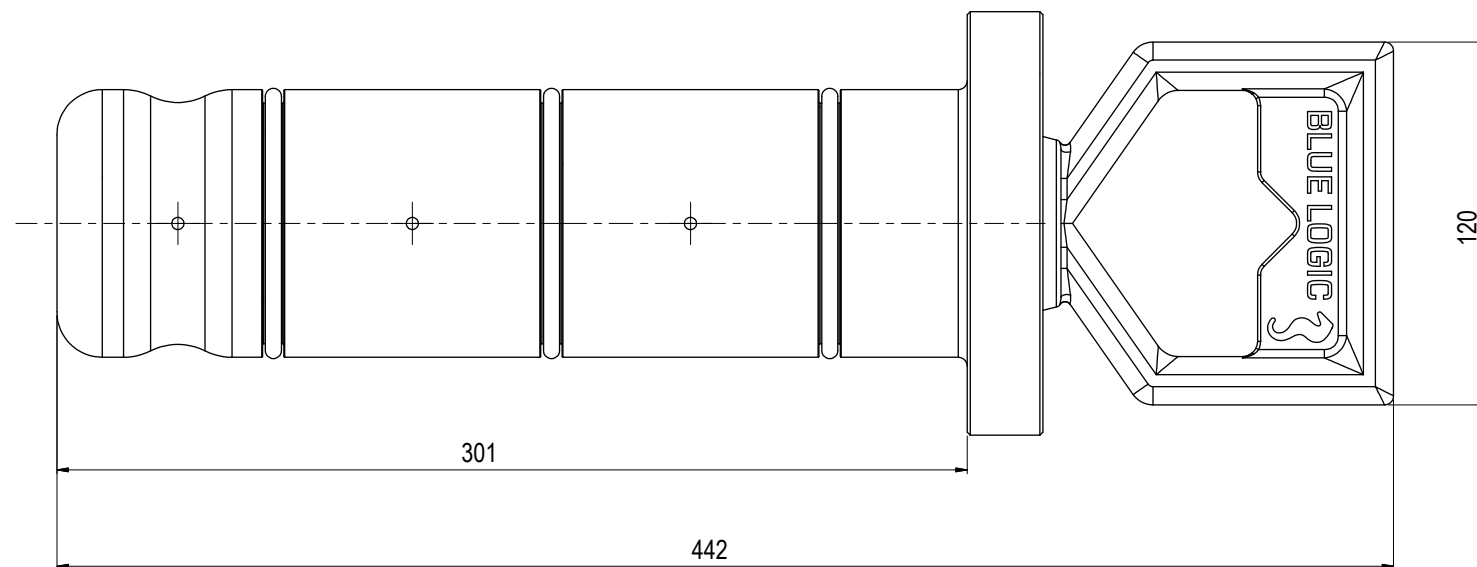
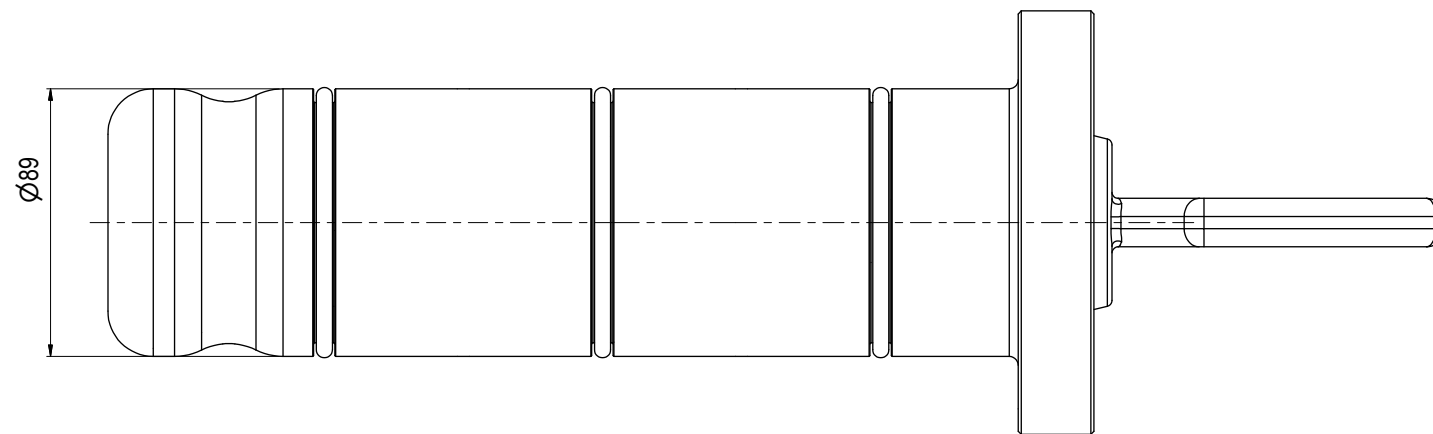
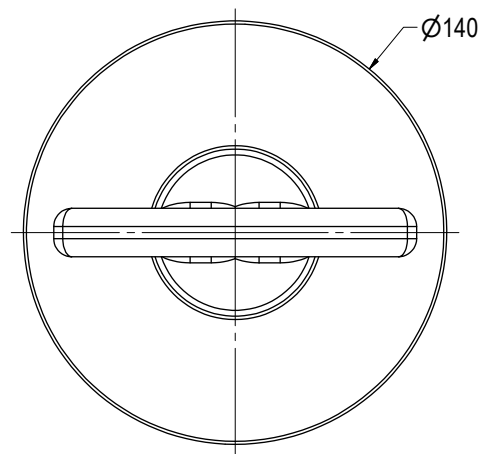
BLUE LOGIC

Dwg Scale:
NTS
Dwg Prop:
Dwg Format:
A3

Drawing title:
Ø89 DP Pr Stab 10k Long-term J-Lock with Bleed Off Function

Drawing number:
BB9770

Rev.
04



NOTE: 1
DESIGN CODE:
API17H Type 3

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.03. Protection
Sub Group: 1.89.424.02. Dual

NOTE: 3
INTERFACE INFORMATION:
Pressure Rating Bar: Vented
Material: Long-term
Weight: 3,2 kg
Volume: 2,24 dm³
Surface Area: 2079 cm²
Hydraulic: N/A
Mechanical: N/A
Electrical: N/A
Com. & Protocol: N/A

Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.
02	13.9.2022	7-IFC (Issued for Construction)		HNJ	TAN	HNJ
01	18.5.2022	2-IFT (Issued for Tender)		HNJ	NA	NA

BLUE LOGIC 

Dwg Scale:
NTS
Dwg Proj: 
Dwg Format:
A3

Drawing title:
Ø89 DP Prot Stab Vented Long-term

Drawing number:
BB8227

Rev.
02

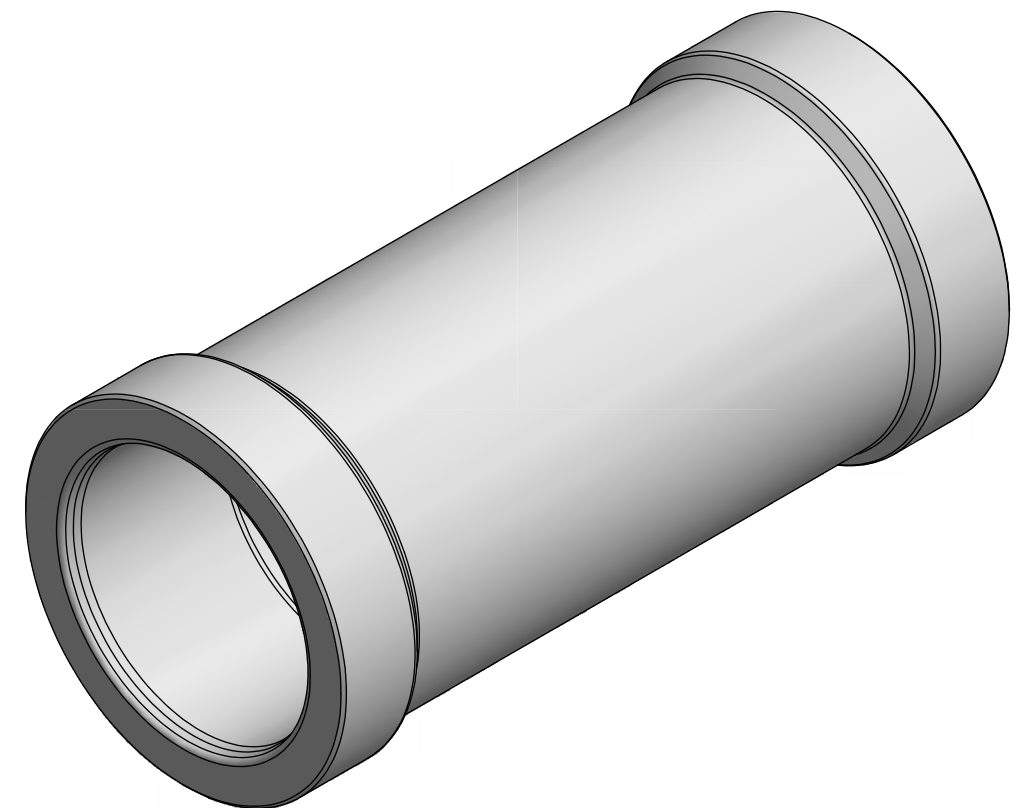
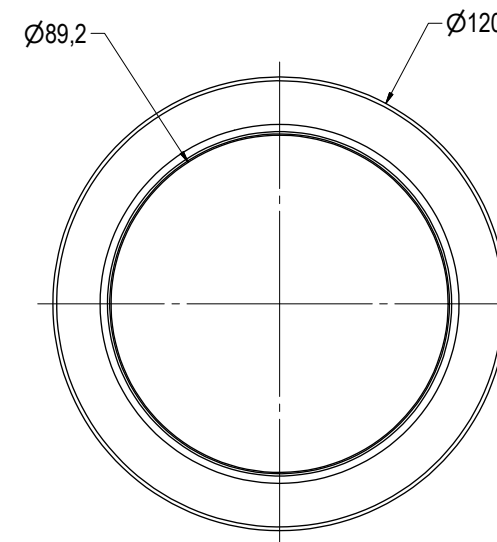
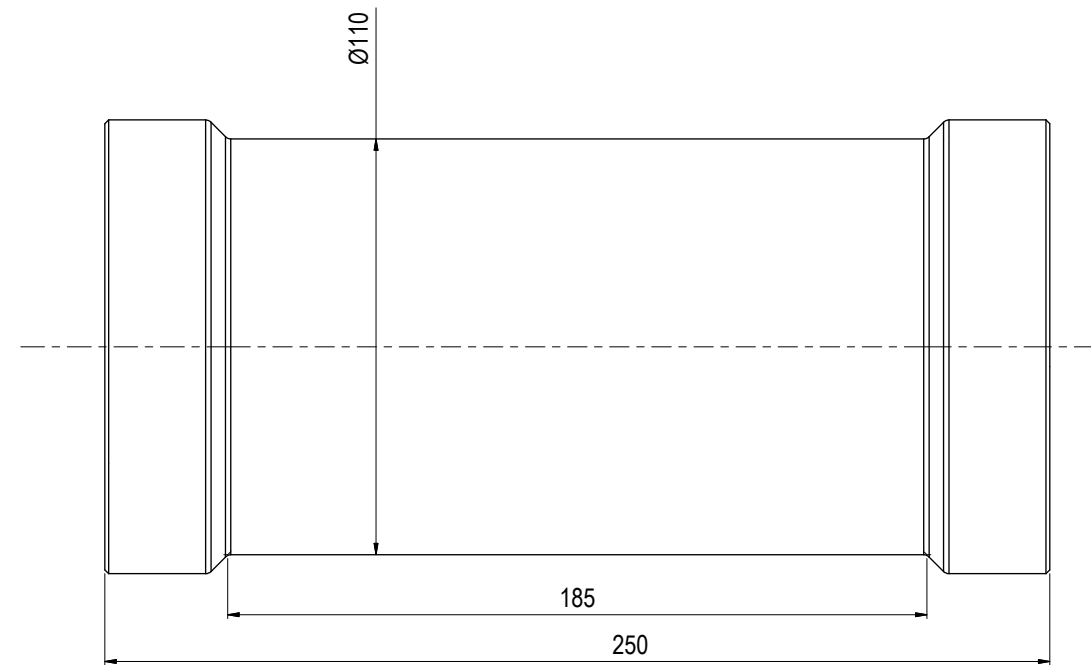
NOTE: 1
DESIGN CODE:
API 17H Type 3

NOTE: 2
TECHNICAL CLASSIFICATION:
Article Type: 001-Hot Stabs
Main Group: 1.10. Ø89 Hot Stab
Intermediate Group: 1.89.01. Stab
Sub Group: 1.89.422.02. Dual

NOTE: 3

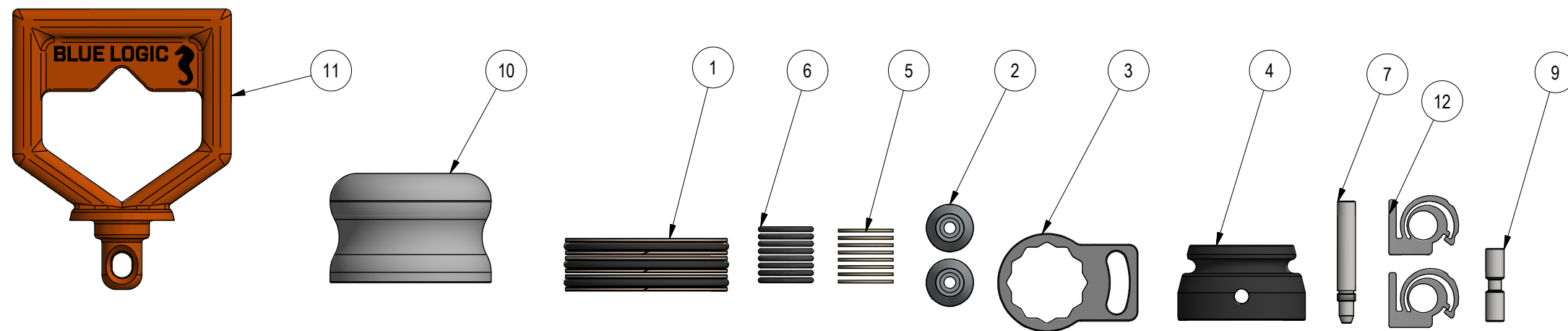
INTERFACE INFORMATION:

Pressure Rating Bar:	N/A
Material:	PEHD 1000
Weight:	0,8 kg
Volume:	0,87 dm ³
Surface Area:	1696 cm ²
Hydraulic:	N/A
Mechanical:	N/A
Electrical:	N/A
Com. & Protocol:	N/A

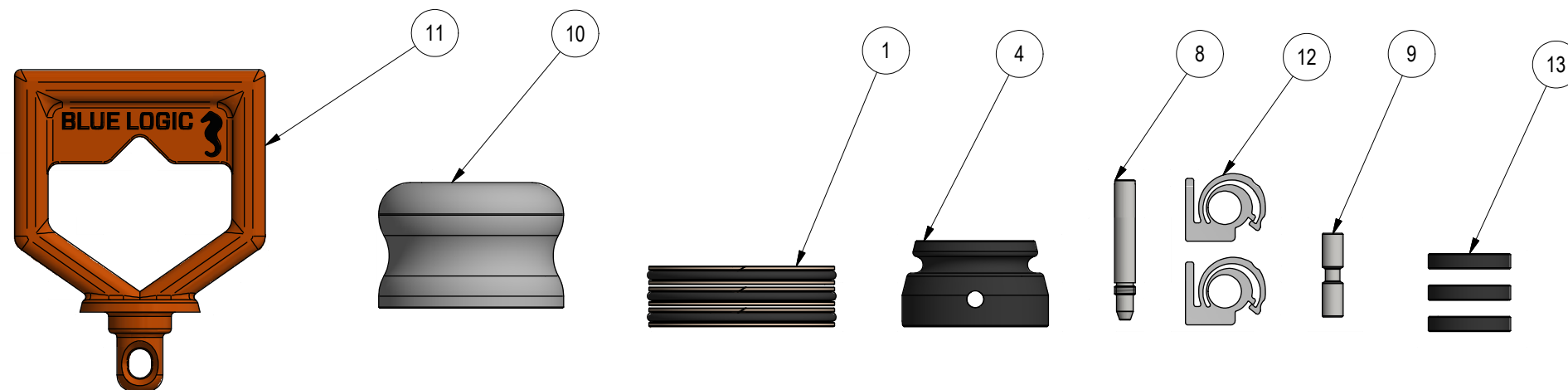


						BLUE LOGIC	Unless Noted Otherwise:	Dwg. Scale: NTS	Drawing title: Ø89 DP Stab Protection Sleeve		
							Dim. Tol: NS-ISO 2768-1	Dwg Proj: 			
							Roughness: Ra	Dwg Format: A3			
02	13.9.2022	7-IFC (Issued for Construction)									
01	18.5.2022	2-IFT (Issued for Tender)									
Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.	Fillet Rad: Corner Rmax:	Break Edges: (R. Alt. 45°) R= 0.1-0.5	Drawing number: BB8226		Rev. 02

Parts List			
ITEM	QTY	PART No.	DESCRIPTION
1	6	104589	Ø89 Stab Seal RU15-PEEK
2	2	102091	Zinc Anode Ø26 H=20mm
3	1	BB7745	Lock Bracket V3
4	2	PA0050	Flex Element Nitril 85/90 sh
5	8	101050	Back Up Ring Ø30xØ26x1.5 ST08-K Peek1 Cut
6	8	104273	O-Ring BS120 D1=25,07 D2=2,62 RU15
7	1	PA0051	Lock Bolt For Flex Handle
8	1	BA1581	Lock Bolt For Flex Handle SD.
9	2	BB6468	Ø10mm Bolt
10	2	BB6451	Guide Nose Ø89
11	2	PA0049	D-Handle SD
12	4	BB7527	Lock Brick ver. 03
13	3	105220	Internal T-Seal 32x39x8,1



Recommended spare parts for BB6432 Ø89 DP Stab 10k Interv MP 1" wJ-Lock



Recommended spare parts for BB9770 Ø89 DP Pr Stab 10k Long-term J-Lock with Bleed Off Function

FOR INFORMATION ONLY

[illegible]