Pre-insulated solutions

Second issue | 07/2022

LOGSTOR Installation Manual for Weld Joints

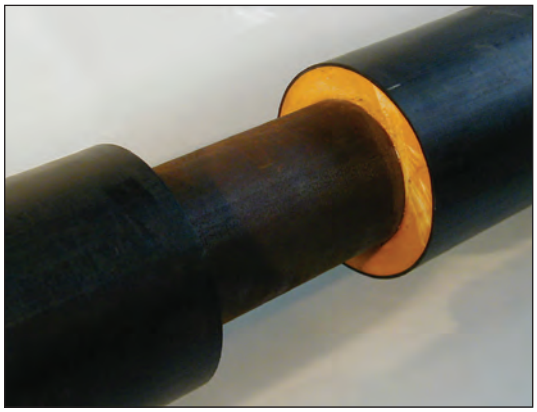
Kingspan®

Contents

Preparing the joint location

Distance between outer casing ends

The BandJoints are available in several lengths, designated STD and XL, respectively or with the length 630 mm or 1020 mm stated. (See the table in Section 2.7 Total and cutting lengths of BandJoints).
Adapt the distance between the outer casings, using perpendicular cuts in relation to the steel pipe.
EWJoints are available in two kinds of lengths: Standard length and lengths for E-Comps.



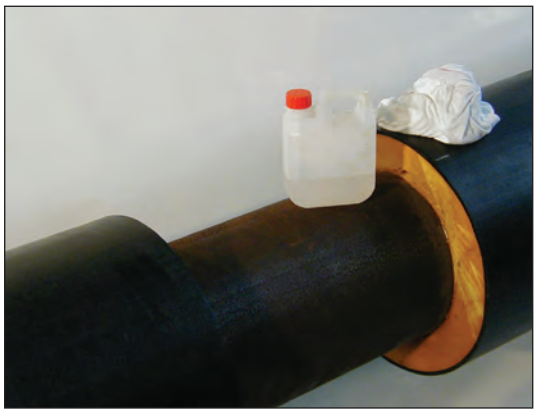
IMPORTANT!

In case the distance between the outer casings is too long or has been shortened by cuts not perpendicular to the pipe axis, contact between the welding wires in the joint and the outer casing in the entire circumference is not possible!

So the welding will not be carried out properly!

Cleaning and grinding

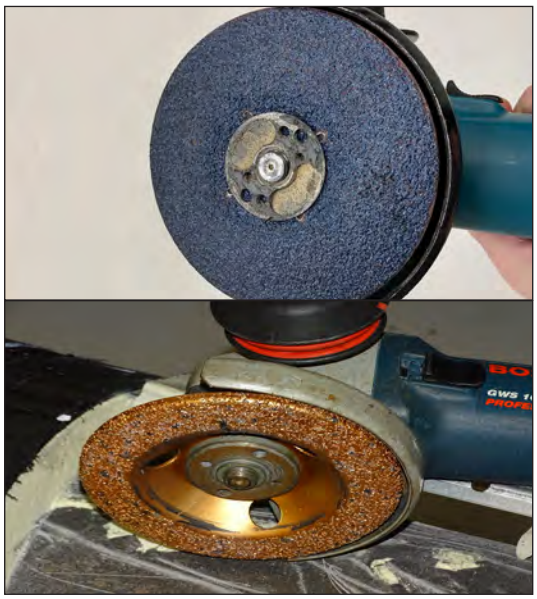
Remove dirt and moisture from the BandJoint casing before grinding the casing.



It is particularly important to remove oil products, such as grease etc., from cranes and excavators before grinding.

Before grinding, moisture must be removed by preheating the casing and steel pipe to 20-30°C using a gas flame.

Immediately before grinding the outer casing, degrease it with min. 93% alcohol.



Use grind discs or diamond discs for grinding. Grind discs are recommended for casing dimensions ø 90-1400 mm. Diamond discs are recommended for casing dimensions ø 355-1400 mm.

For EWJoint emery cloth, grain size 36, can be used.

Grind extra 20 mm of the contact surfaces of the outer casing outside the rim, so it is evenly matt and rough. This enables visual inspection of the activation by the supervisor.

By means of visual inspection make sure, that the pipe has been ground all around.

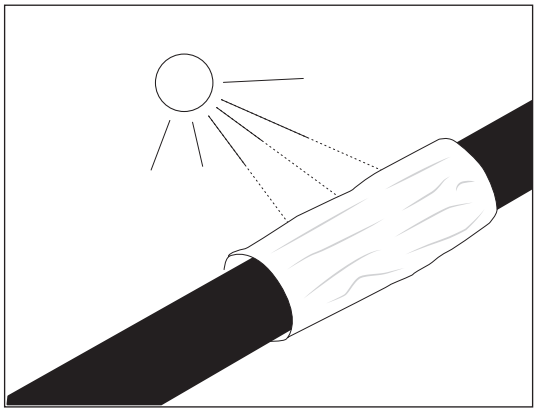
Storage, handling, and weather

Storage and handling

Weld joints must be stored vertically.

Max. temperature during transport and storage:
- EWJoint: 40°C
- BandJoint: 60°C

The casing joint must remain in the wrapping foil to protect it against the sunlight and heat, until installation is initiated.



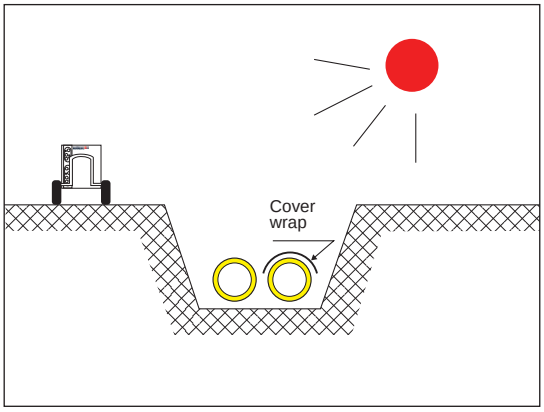
Weather conditions

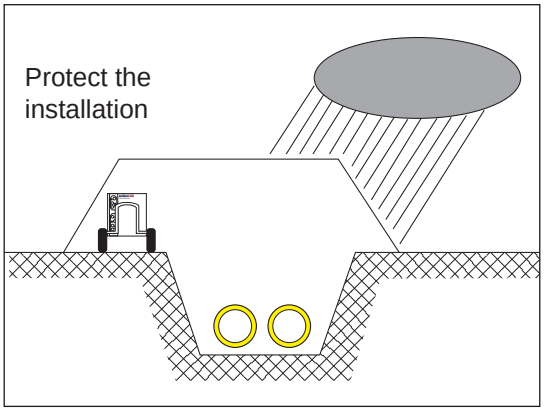
As mentioned, the quality of the weld depends very much on the temperature and cleanness of the welded materials.
The casing material is black PE which reaches high temperatures, when exposed to sunlight.
If the temperature difference between top and bottom of the casing exceeds 30°C, then the casing must be protected from the sunlight to ensure a homogeneous weld progress.

Carry out the installation under a tent or a parasol when it rains, snows or is required by other weather conditions.

Foaming outer casings with cold or warm service pipes:

Application: Is the service pipe temperature too hot or too cold for foaming, the service pipe must be protected with Alveolit before foaming. Alveolit is applicable for service pipe temperatures below +10°C or above +50°C.



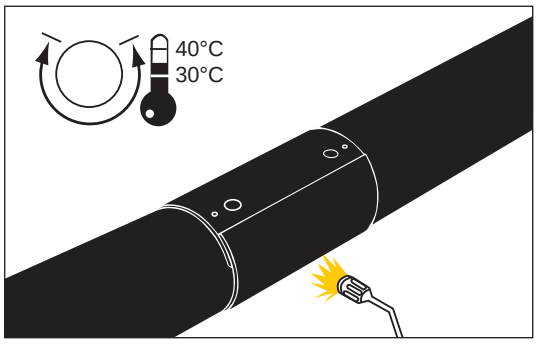


Foaming preparations

Outdoor temperature:

If the outdoor temperature is below +10°C, the outer casing parts are preheated with a soft gas flame to 30-40°C, just before the foam liquid is filled in.

If hot water circulates in the pipes it is sufficient, that the casing joint parts have a temperature of approx. 20°C.



Installation of BandJoint Ø90–200 mm

After thorough cleaning and grinding, as mentioned in the instructions under Preparing the joint location, installation of the BandJoint can start.

The Ø 90 – 200 mm BandJoint is designed so the terminals for the welding wires must be pulled out from the side.

This design allows the joint to be more or less folded.

Therefore, BandJoint can be used for all dimensions from Ø 90 – 125 mm outer casings.

BandJoint is used for Ø 140 – 200 mm outer casings.

Installing the depth guard

Place the depth guard, which supports the welding pressure at the longitudinal weld, right below the outer casing, approx. 7 cm from the top, so the filling holes of the joint are in 12 o'clock position.

Push / drive the guard into one foam end right below the outer casing using the impact cushion, press it down and push / drive it into the other foam end, using the impact cushion from the tool tray.

Installation of BandJoint Ø90–200 mm

Installing the depth guard, ***continued***

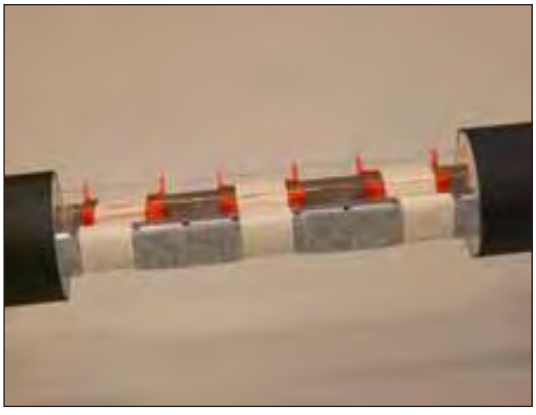
Check that the insertion depth is the same on each side by means of the inspection holes at the end of the depth guard.

Install and tighten the two plastic screws until they touch the steel pipe.

The excess piece of the screws are removed with a saw.

Place the felt piece on the depth guard to ensure that the welding temperature in the longitudinal weld is reached.

Secure the felt using minimum 3 pieces of tape. Place the tapes so they do not cover the venting holes in the depth guard.



Installation of BandJoint Ø90–200 mm

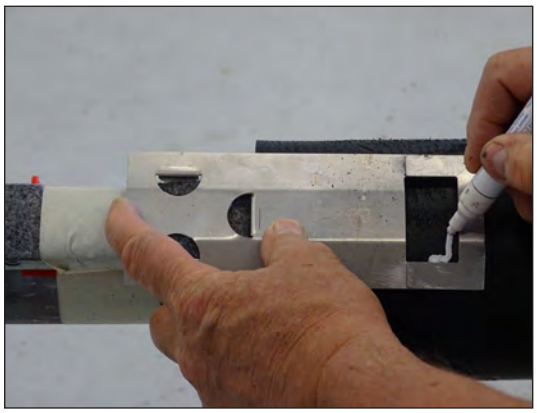
Installing the depth guard, ***continued***

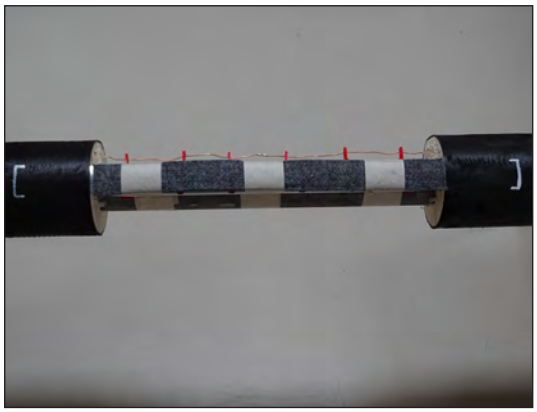
Having installed the depth guard and felt, use the template in the tool tray to mark the proper position of the BandJoint.

Hold the template against the depth guard so the stud is adjacent to the outer casing in transverse direction.

Mark the following on the casing with chalk: 2 parallel lines corresponding to the width of the depth guard and 1 circumferential line for centring the casing joint.

There must NOT be marking chalk on the casing in the weld zone!

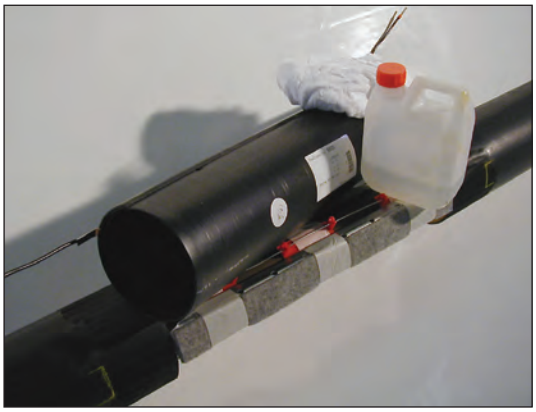




Installation of BandJoint Ø90–200 mm

Pre-installing the BandJoint

Unpack the BandJoint. Clean the overlapping area of the joint with alcohol and grind it, so activation marks are visible 20 mm outside the overlap on the outer casing.

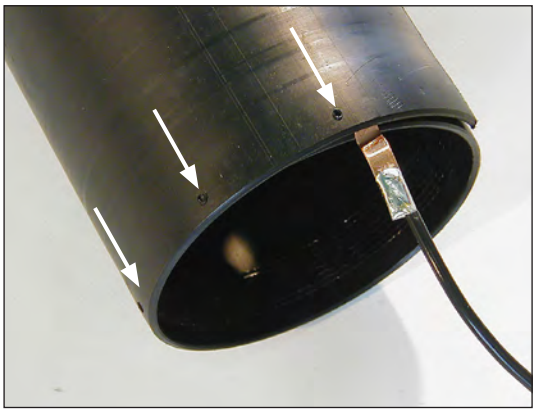


The size of the overlap for each dimension is marked on the joint.

The first mark from the interior edge indicates the largest dimension where grinding is to be carried out across the joint.

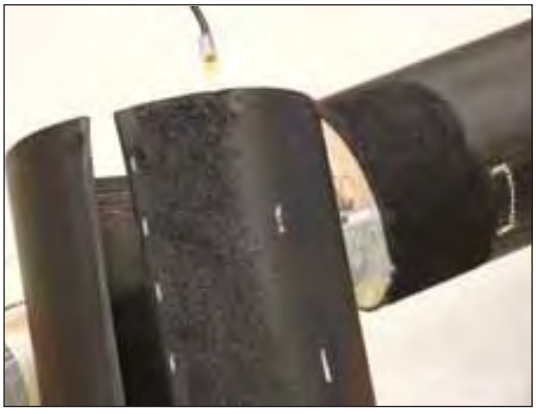
For BandJoint Ø 90-125 mm:
the first mark = Ø 125 mm,
the next mark = Ø 110 mm, and
the final mark = Ø 90 mm.

Likewise for BandJoint Ø 140-200 mm.



Grind the joint from the interior edge to 20 mm outside the overlap.

Do not grind the welding wires!

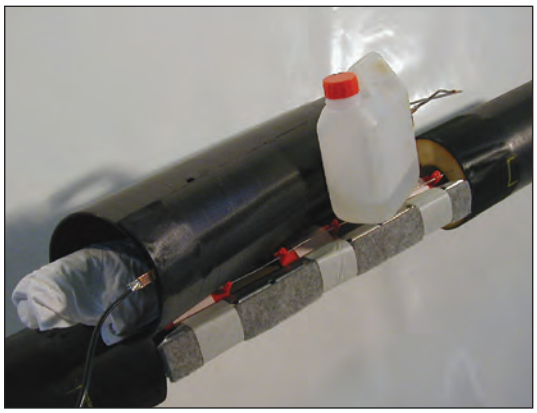


Installation of BandJoint Ø90–200 mm

Pre-installing the BandJoint, ***continued***

Before placing the BandJoint on the outer casing, degrease all interior welding wires; the ground exterior area; and the ground outer casing with alcohol.

Do NOT touch the welding surfaces and the ground casing after degreasing!!



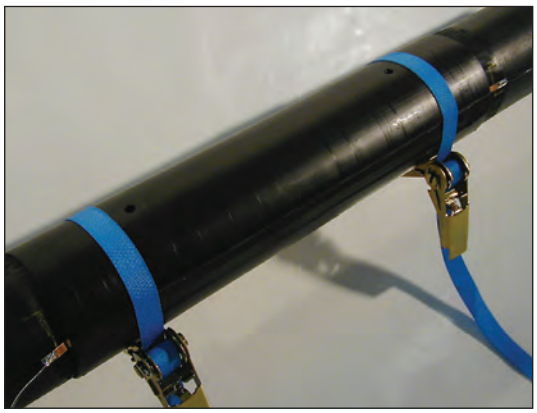
Hold the BandJoint above the outer casing and pull it down, so the two filling holes are placed in 12 o'clock position.

Pull the ground area over the depth guard.

The BandJoint is kept in place by means of two 25 mm straps. Place the straps just outside the filling holes on each side.

Use the two circumferential lines from the the template to centre the BandJoint to ensure that all embedded welding wires are in contact with the outer casing.

The distance from the rim of the casing joint to the mark must be the same on each side.

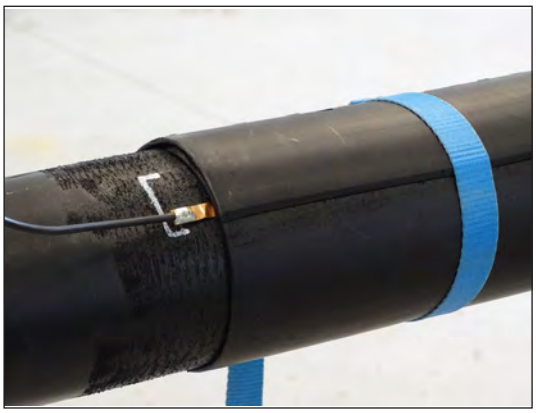


Installation of BandJoint Ø90–200 mm

Pre-installing the BandJoint, ***continued***

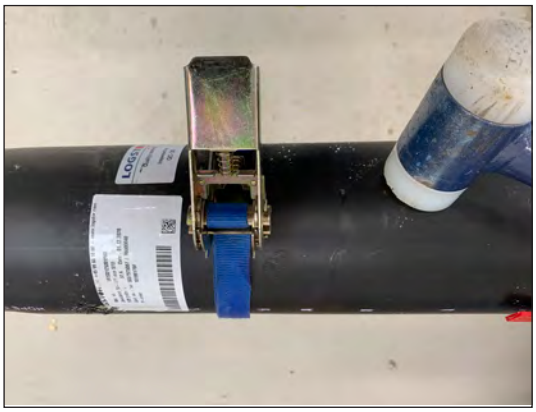
The overlap must be positioned on the depth guard. To ensure this, use the longitudinal marks on the casing. The lowest line indicates the position of the edge of the exterior overlap.

Place the straps in such a way that there is only a single layer of straps in the welding zone and so that the handles do not obstruct the longitudinal pressure rail.



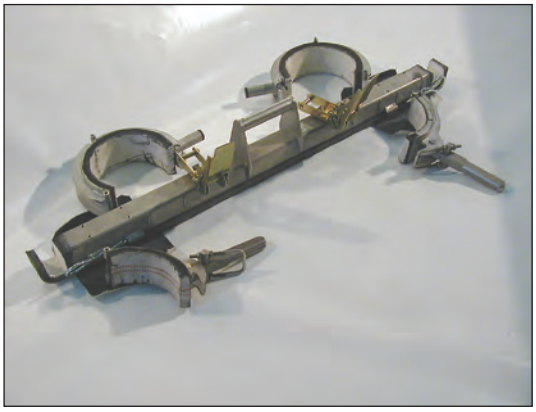
During tightening, knock gently with the synthetic hammer to establish contact between the welding wires and the outer casing.

Do not hammer directly in the weld zone.



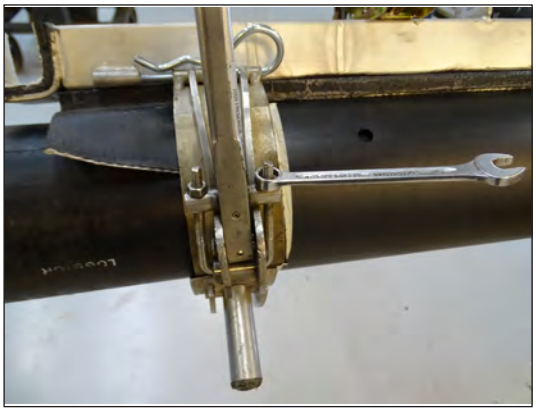
Assembling the pressure tool

The pressure tool for the Ø 90–200 mm BandJoint is a mechanical tool that generates the required welding pressure by compressing the strong sponge rubber on the tool.



The fitter must ensure, that the tool has been sufficiently tightened by adjusting the tightening screws.

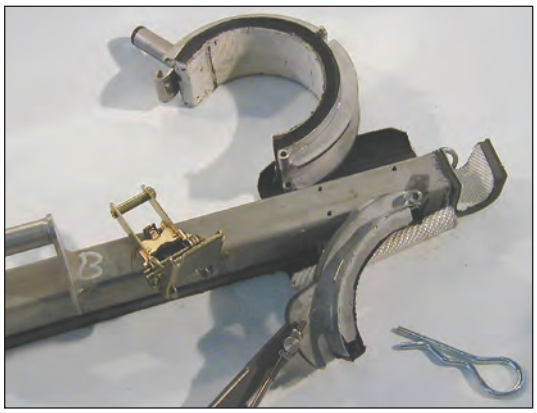
If the inlay in the pressure tool is worn or damaged, it is sent to LOGSTOR Service Department for service.



Installation of BandJoint Ø90–200 mm

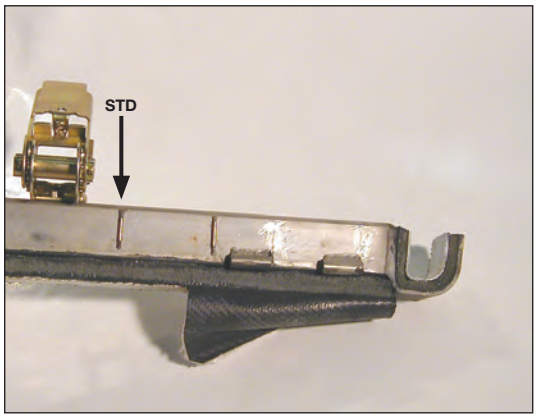
Assembling the pressure tool, ***continued***

Install the divided, circumferential pressure bands on the longitudinal rail with split pins in the welded bushings on the longitudinal rail.



The function of the two round steel bars, which are welded onto one side of the longitudinal rail, is to mark the centring position of the tool.

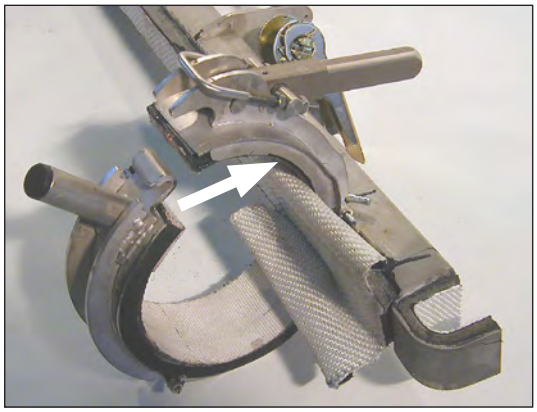
The markings fit the filling holes in the casing joint so that the pressure on the circumferential pressure bands is positioned above the welding wires.



The installation equipment comprises longitudinal rails in two lengths; one for STD and one for XL.

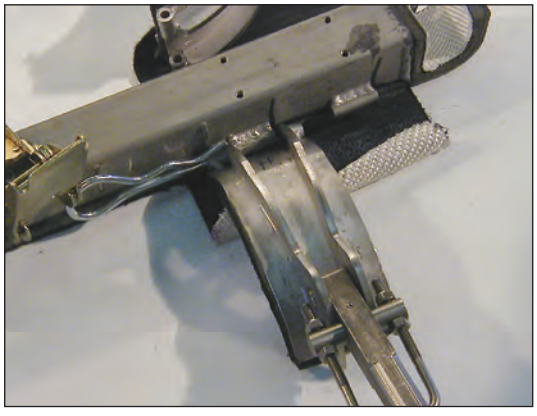
A steel plate is mounted on one side of the short halves of the circumferential pressure band. This plate is to keep the overlap of the casing joint in place during welding.

Install the short halves so that this side is against the end of the longitudinal rail.



Use the short rail to install a standard casing joint. Install the circumferential pressure bands on the short rail in the bushings closest to the centre.

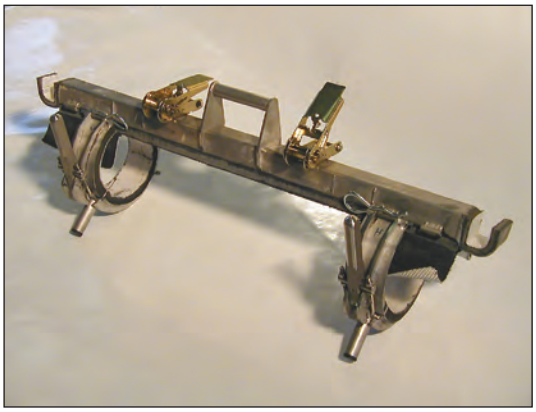
Install the short half of the circumferential pressure bands on the side of the pressure rail with the two round, welded steel bars.



Installation of BandJoint Ø90–200 mm

Assembling the pressure tool, ***continued***

Install all the pressure bands in the position that matches the joint length to be welded, and the tool is ready to be used.

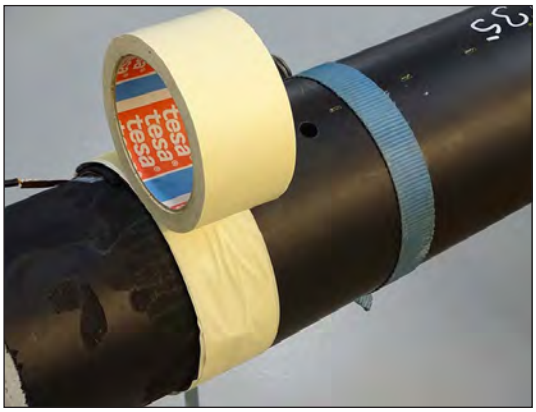


Installing the pressure tool

Place tape around the BandJoint in the welding zone to prevent the pressure band from sticking to the BandJoint.

Place the first round of tape with the adhesive side upwards. Now twist the tape, so the adhesive sides face each other. This makes it easier to remove the tape.

When the joint has been installed, remove the tape to enable visual inspection.



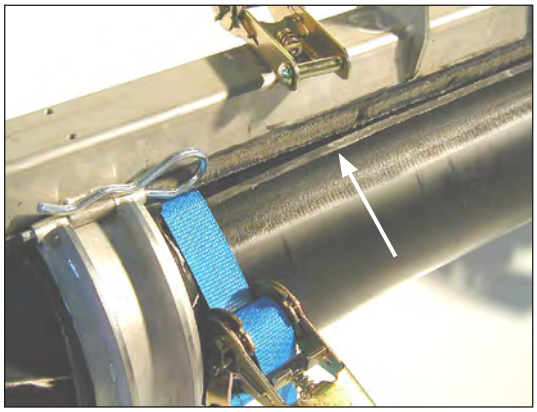
Open the clamping fixture on the circumferential pressure bands.

Installation of BandJoint Ø90–200 mm

Installing the pressure tool, ***continued***

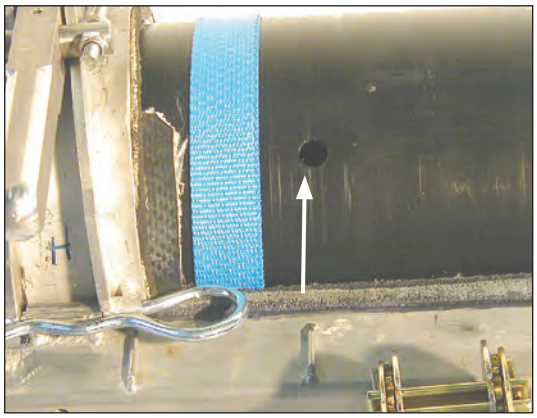
Place the tool above the pre-installed casing joint.

The edge of the longitudinal rail must be aligned with the edge of the exterior overlap of the casing joint.



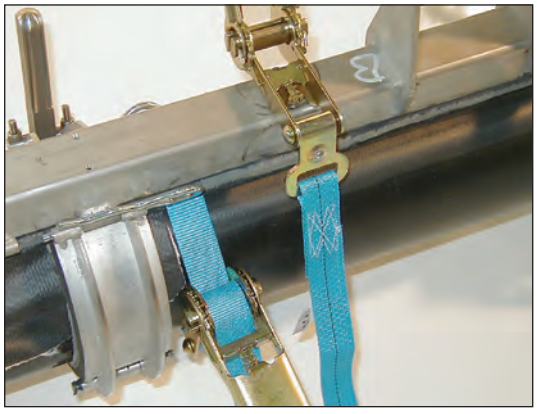
Use the marking on the longitudinal rail to centre the tool.

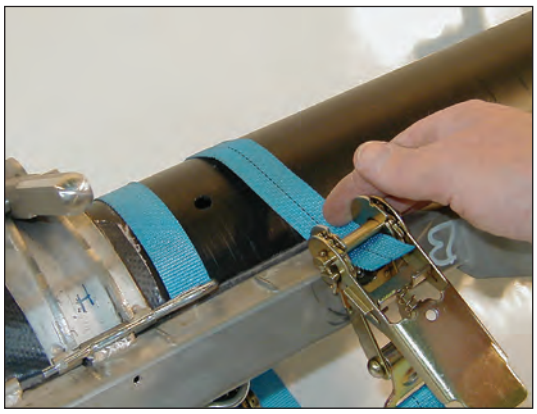
Ensure that the mark for the joint length to be installed fits against the filling holes of the casing joint.



Install two 25 mm straps round the casing joint and longitudinal rail to ensure the welding pressure on the longitudinal weld of the casing joint.

Attach the strap on one side of the clamping fixture, pull it round and tighten it.

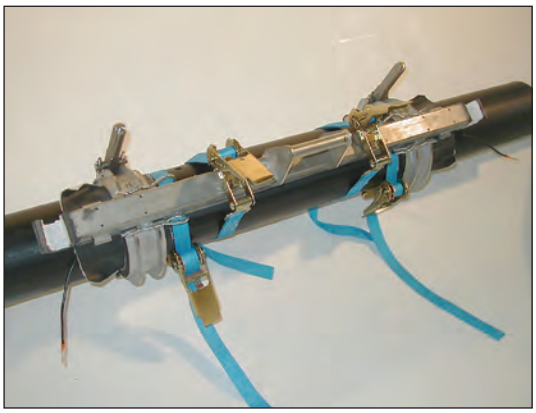




Installation of BandJoint Ø90–200 mm

Installing the pressure tool, *continued*

When the rail has been correctly tightened, loosen the two straps on the casing joint.



Cable connection

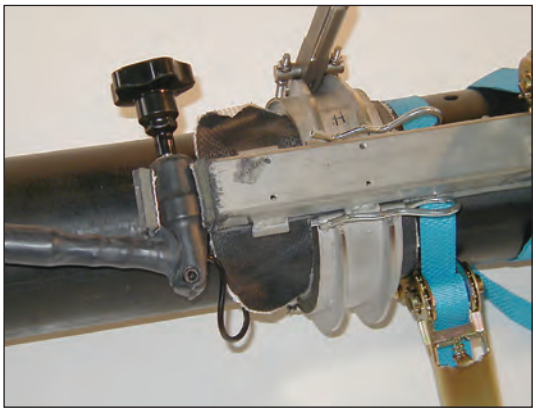
Connect the welding cables to the WeldMaster front.

Each cable has a power and a sensor connector which are connected to red and blue tap respectively. Follow the colour codes.

Connect the cables to terminals in the casing joint, and place the clamping handles in the holders on the rail.

Start the WeldMaster (See the section “WeldMaster”).

The 6-digit weld file No. MUST be transferred to the casing joint to ensure traceability.



Leakage test

Remove the cables when the joint has been welded. The pressure tool is removed after 20 min. or when the casing joint has cooled to a temperature below 80°C.

Remove the circumferential tape.

Leakage test the joint.

If no compressed air is available, use leakage test equipment:

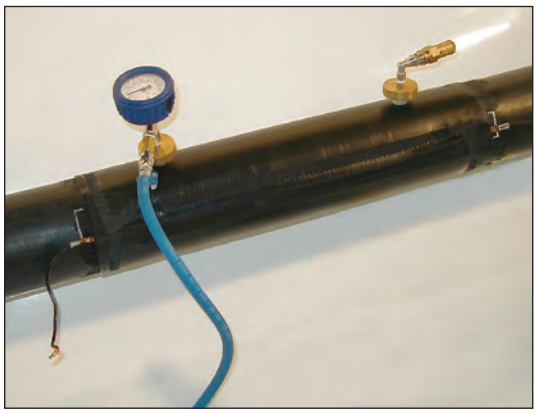
Product No: 9050 0000 027 011.

Drill the filling holes in the casing joint to 17.5 mm.

The drill has a stop feature to prevent damage to alarm wires in the casing joint.

Place the rubber plugs from the leakage test equipment in the holes and tighten them.

Pressurise the casing joint up to 0.2 bar.



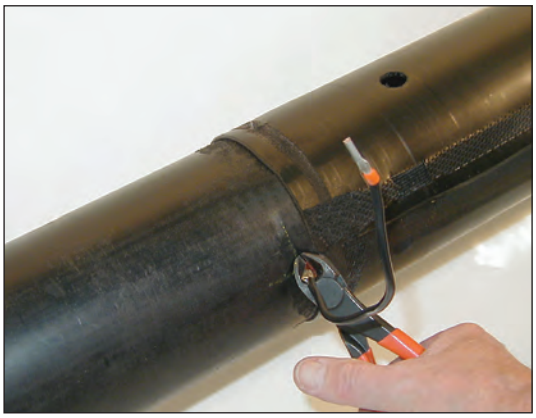
Installation of BandJoint Ø90–200 mm

Leakage test, ***continued***

Spray soapy water on all the welding surfaces.

Reweld the BandJoint in case of leakage. (Refer to the rewelding instructions, page 2.12.1).

When the casing joint has been submitted to a leakage test and approved, cut the terminals.



The casing joint is now ready to be insulated. (See ”Insulating and sealing holes”, page 2.6.1 as well as Handling & Installation section 7 ”Insulating joints”).

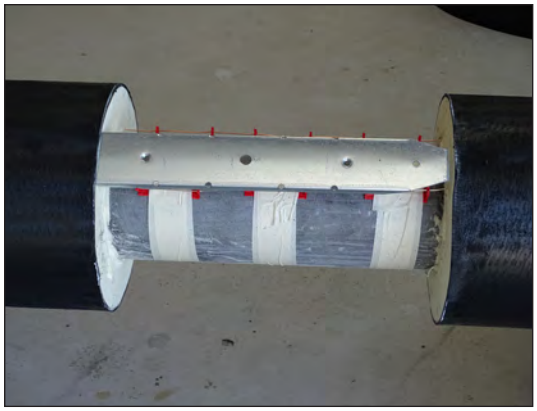
Installing BandJoint Ø225–800 mm

After thorough cleaning and grinding, as described in the instructions under Preparing the joint location, installation of the BandJoint can start.

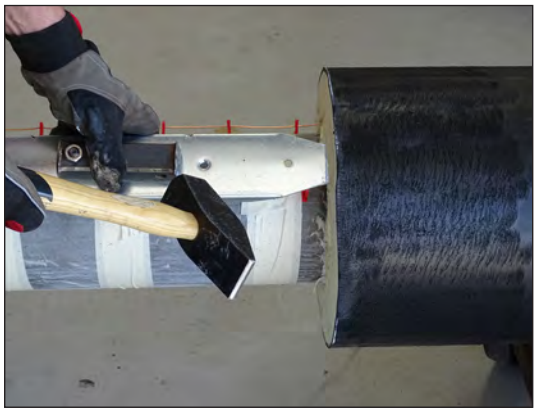
Dimensions ø 225-800 mm are available in 630 mm and 1020 mm lengths.

Installing the depth guard

Place the depth guard, which supports the welding pressure, at the longitudinal weld 8-10 cm from the top of the pipe.



Push / Drive the guard into one foam end just under the outer casing using the impact cushion, press it down and push / drive it into the other foam end using the impact cushion.



Install and tighten the two adjusting screws into the insulation foot, using a 5 mm hexagon key.

Tighten the adjusting screws lightly.

Major series 2 and 3 may require a longer adjusting screw or insulation foot.

Installing BandJoint Ø225–800 mm

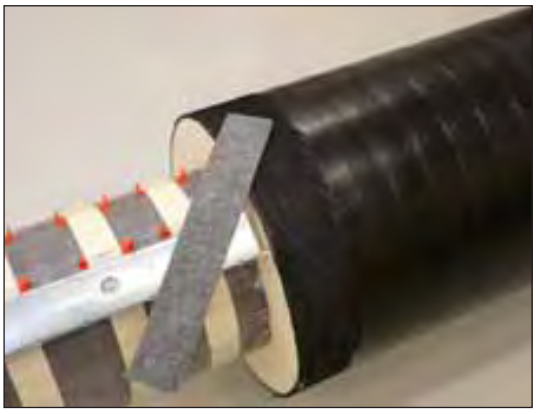
Installing the depth guard, ***continued***

Tighten the depth guard bolts lightly.

The distance from the screws to the alarm wire must be min. 15 mm.

Remove the remaining part of the screws using a grinder.

Place a piece of felt on the depth guard in order to ensure that the welding temperature in the longitudinal welding is reached.



Secure the felt, using minimum 3 pieces of tape. Place the tape pieces so they do not cover the venting holes in the depth guard.

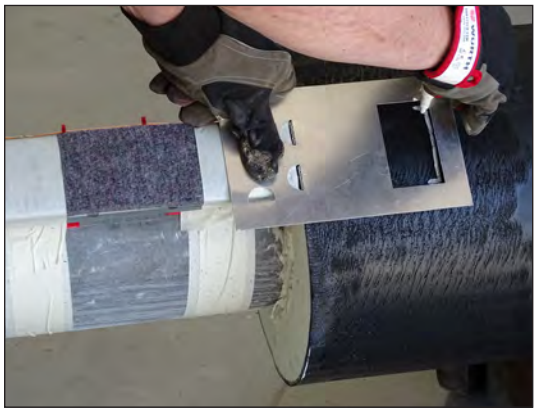
Installing BandJoint Ø225–800 mm

Installing the depth guard, ***continued***

Having installed the depth guard and felt, use the template in the tool tray to mark the proper position of the BandJoint.

Hold the template against the depth guard so that the two studs are adjacent to the outer casing in a sideways direction.

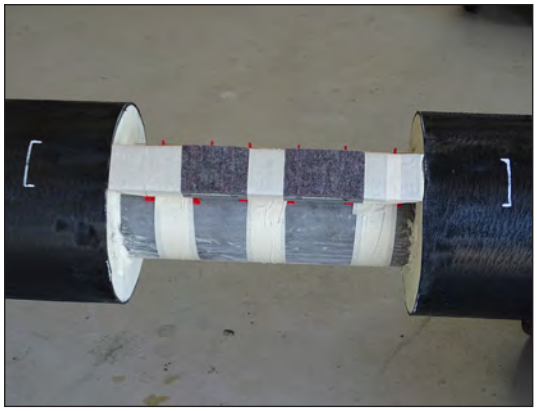
There must not be marking chalk in the weld zone.



Are pipes and fittings with recessive foam end delivered, then a special template is to be used.

Mark the following on the casing with chalk: two parallel lines, corresponding to the width of the depth guard, and one circumferential line on the outer casing.

There must not be marking chalk in the weld zone.

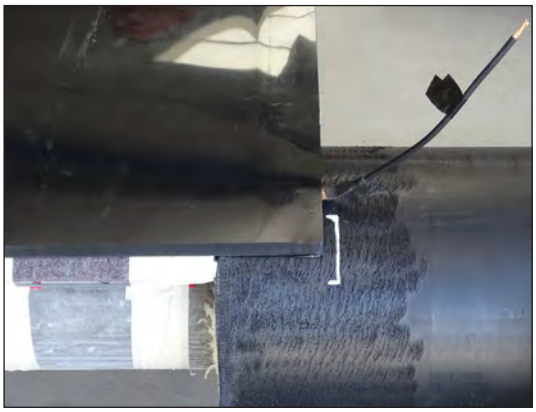


Installing BandJoint Ø225–800 mm

Pre-installing the BandJoint

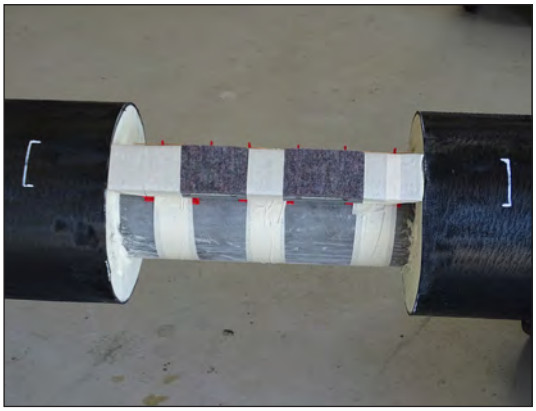
Remove the transport package from the BandJoint. Clean the overlapping area on the casing joint with alcohol and grind it like the outer casing.

As for BandJoint made of a plate ø225 - 800 the terminal exits at the end of the casing joint and filling holes are drilled on site.



Before placing the BandJoint on the outer casing, degrease the joint and the ground outer casing with alcohol.

After degreasing, do not touch the welding surfaces!



Installing BandJoint Ø225–800 mm

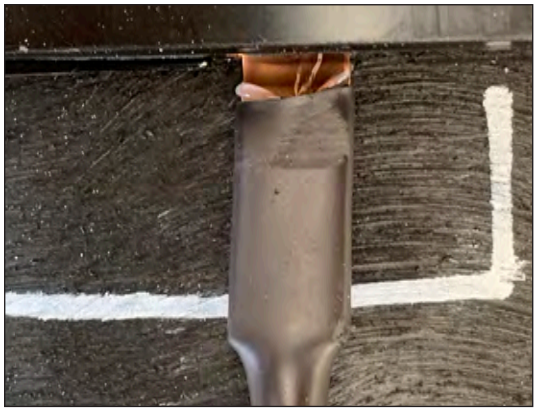
Pre-installing the BandJoint, ***continued***

BandJoints in dimensions ø225-800 are delivered without pre-drilled holes

The top part of the BandJoint overlap must flush with the top line on the outer casing, marked using the template and indicating the width of the depth guard.

Use the two circumferential lines to centre the BandJoint to ensure that all embedded welding wires are in contact with the outer casing.

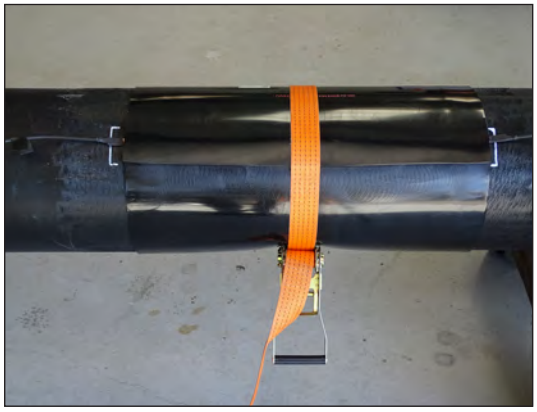
Place the BandJoint so that the distance from the rim of the casing joint to the lines is the same on each side.



Secure the BandJoint in the centre with a 50 mm strap for dim. Ø225 – 800 mm.

Place the strap handle in such a way that there is only a single layer of straps in the weld zone and so that the handle does not obstruct the longitudinal pressure rail.

Make sure that the strap does not cover the 2D bar code on the joint label.



Installing BandJoint Ø225–800 mm

Pre-installing the BandJoint, ***continued***

During tightening, knock on the BandJoint with the synthetic hammer to establish the best possible contact between the welding wires and the outer casing.

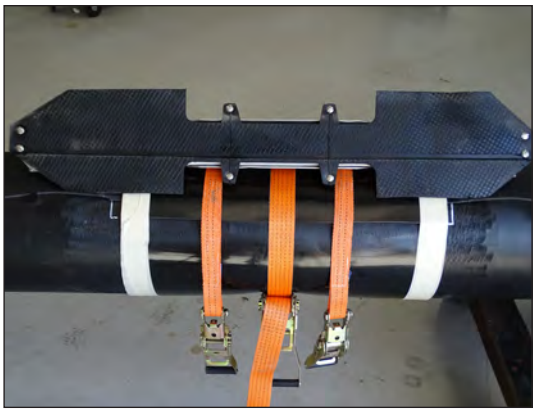
Do not knock in the area where the weld wires are placed.

Installing the pressure band/rail

It is recommended toplace tape around the BandJoint in the weld zone to prevent the pressure band from getting stuck to the BandJoint and so minimise the wear on the pressure band.

Remove tape after the installation has been completed to enable visual inspection of the joint.

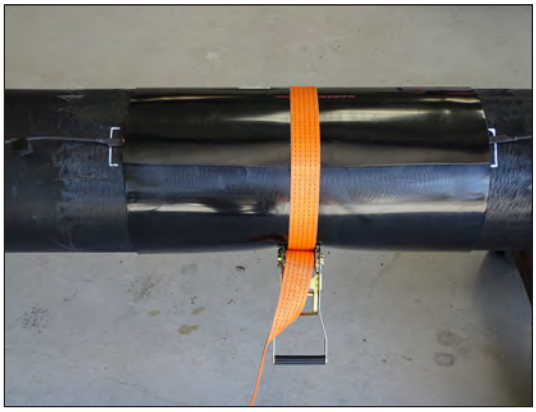
The back of the longitudinal pressure rail has a bevelled rubber plate.



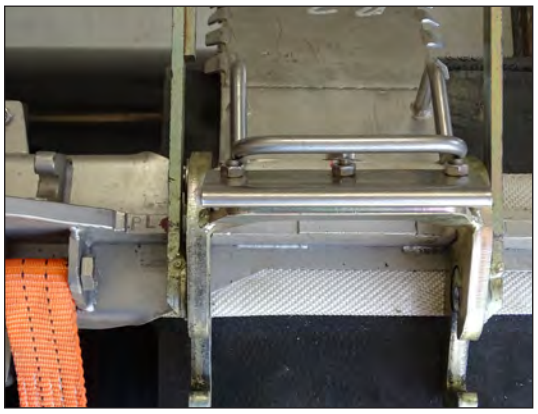
Installing BandJoint Ø225–800 mm

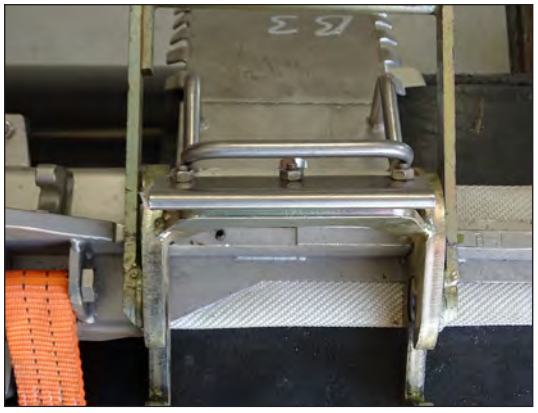
Installing the pressure band/rail, ***ontinued***

Place the pressure rail so that the bevelled edge of the rubber plate is adjacent to the BandJoint overlap.



Take care to place the circumferential pressure band correctly compared to the mark on the longitudinal pressure rail.





Installing BandJoint Ø225–800 mm

Installing the pressure band/rail, ***ontinued***

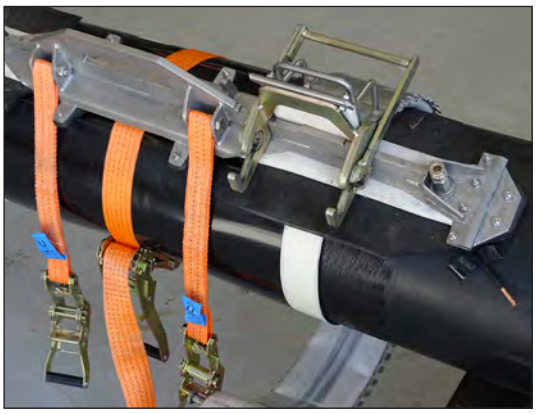
Use the filling holes of the casing joint and the two straps on the pressure rail to centre the pressure rail longitudinally over the casing joint.

BandJoint made of a plate has no holes, but is centered after the edge of the casing joint.

Install the two straps for the longitudinal pressure rail and tighten them lightly to maintain the pressure rail in its proper position, when installing the circumferential pressure bands.

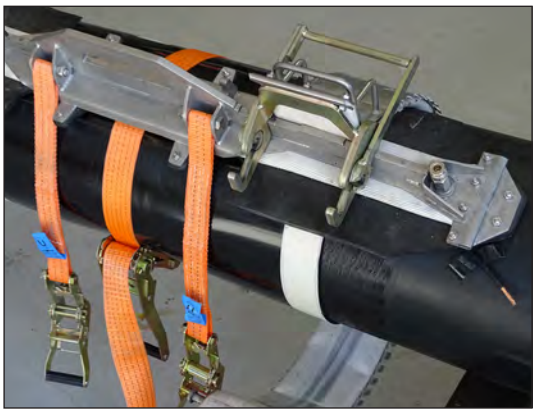
The longitudinal pressure rail is also used during welding to fix the circumferential pressure bands.

The installation equipment comprises longitudinal pressure bands in two lengths; one for 630 mm and a longer one for 020 mm.



Fix the circumferential pressure bands in their proper positions by means of the installation grooves at the ends of the pressure rail.

Use the inner ones for the short models (630 mm) and the outer ones for the long models (1020 mm).



Installing BandJoint Ø225–800 mm

Installing the pressure band/rail, ***ontinued***

The circumferential pressure bands can open.

The clamping fixture to lock the circumferential band has a slot, which fits over the longitudinal pressure rail.

Compressed-air connections

Connect compressed air from the compressor to the reduction box using the red (high pressure) connecting hoses.

Use blue (low pressure) hoses from the reduction box to the pressure rail and pressure band.

Connect the three-way distributor with valve to the blue hose.

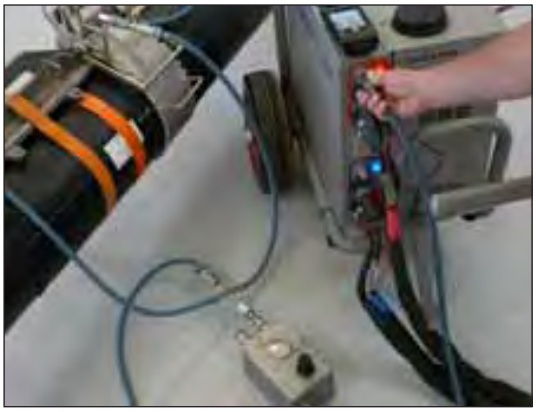
Connect the short coupling hose with the T-piece between one pressure band and the longitudinal pressure rail.

Installing BandJoint Ø225–800 mm

Compressed-air connections, ***continued***

Connect the two plugs from the three-way connection to the circumferential pressure bands.

Connect the final coupling from the three-way connection to the WeldMaster using a blue hose in the required length.



Adjusting and applying compressed air

Adjust the air pressure in the reduction box by lifting the black adjusting screw and turning it until the proper pressure, 1.5 bar, has been reached.

Pressing the black button down again locks the welding pressure.

The pressure in the reduction box is guiding. When the PDA is connected, the pressure is checked with the PDA.

WeldMaster/WeldMaster Light ensures that the pressure is within the tolerance range of 1.4 - 1.7 bar during the welding process.

Remove and bend the short coupling hose on the pressure rail, before activating the air pressure.

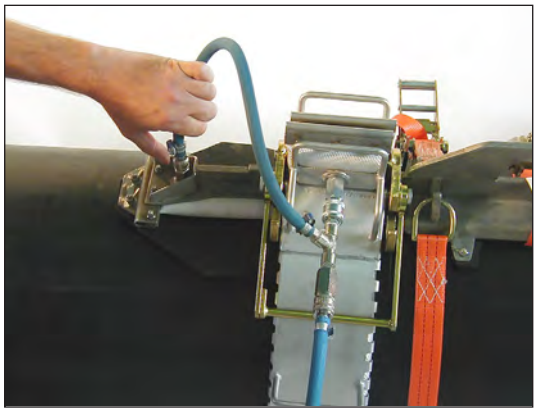
Installing BandJoint Ø225–800 mm

Adjusting and applying compressed air, ***continued***

Activate the welding pressure by pushing the black ring on the three-way distributor forward.

Loosen all straps and knock with the synthetic hammer when the two circumferential pressure bands are pressurised.

Connect the short coupling hose to the longitudinal pressure rail.

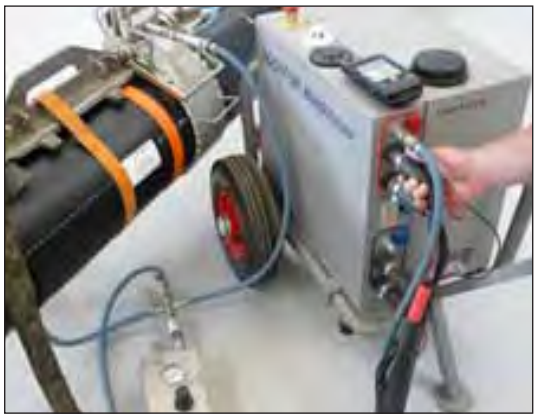


Cable connection

Connect the welding cables to the WeldMaster front.

Each cable has a power and a sensor connector which are connected to red and blue tap respectively.

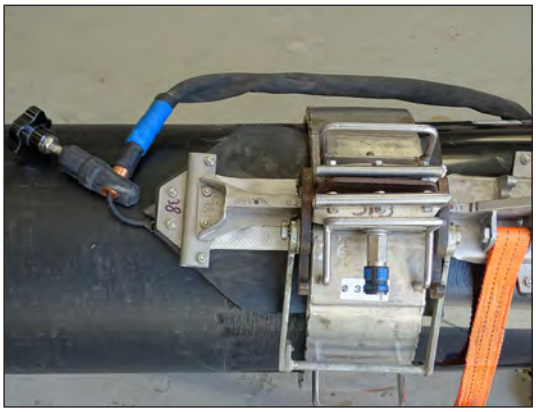
Connect the two cables from the Weldmaster to the terminals in the casing joint. Connect them carefully. Ensure thorough cleaning. Ensure good connection and tighten the clamps thoroughly.



Cable connection, ***continued***

Start the WeldMaster (See the section “WeldMaster”).

The 6-digit weld file No. MUST be transferred to the casing joint to ensure traceability.



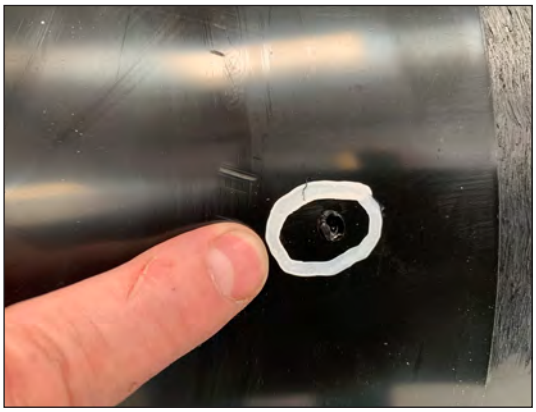
Leakage test

Remove the cables and pressure bands, when the casing joint has been welded and cooled below 80°C.

The valve on the three-way distributor must be closed, before removing the pressure bands and pressure rail.

Check that the bands and rail are depressurised, before removing them.

Having removed the pressure bands, check that the two holes in the welding zone have been filled with melted PE. See illustrations of inspection hole before and after welding.



If the holes are not filled, reweld the casing joint after cooling to ambient temperature. (See ”Rewelding the casing joint”, p. 2.12.1).

Perform a leakage test of the casing joint.

Drill two 17.5 mm holes for leakage testing and foaming.

Installing BandJoint Ø225–800 mm

Leakage test, ***continued***

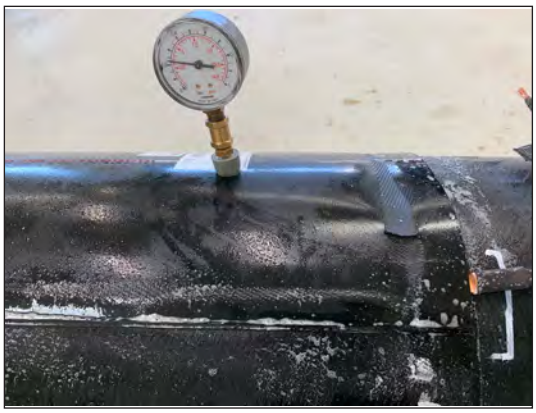
Insert the rubber plugs from the leakage test equipment in the holes and tighten them.

Pressurize the casing joint with 0.2 bar.

Spray soapy water on all welding surfaces.

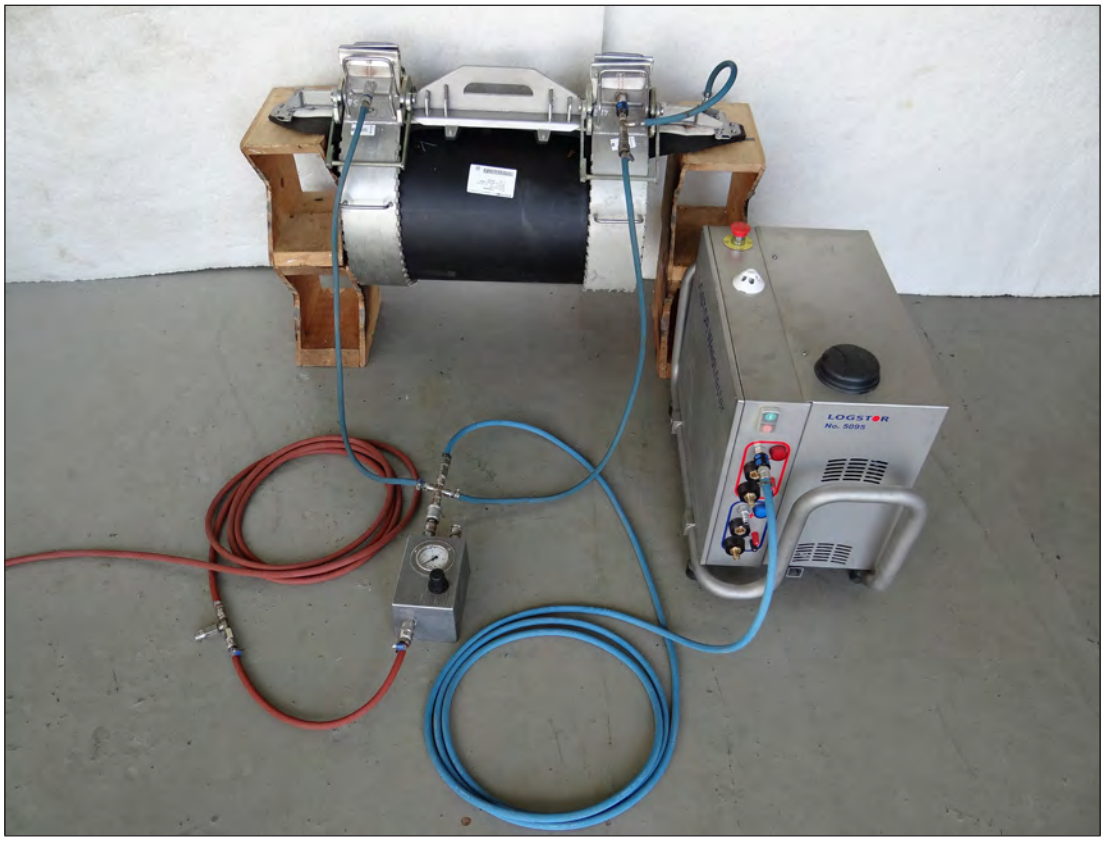
Reweld the casing joint in case of leakage. (See ”Rewelding the casing joint”, page 2.12.1).

When the casing joint has been submitted to a pressure test and approved, cut the terminals. The casing joint is now ready to be insulated.
(See ”Insulating and sealing holes”, page 2.6.1 as well as Handling & Installation section 7 ”Insulating joints”).

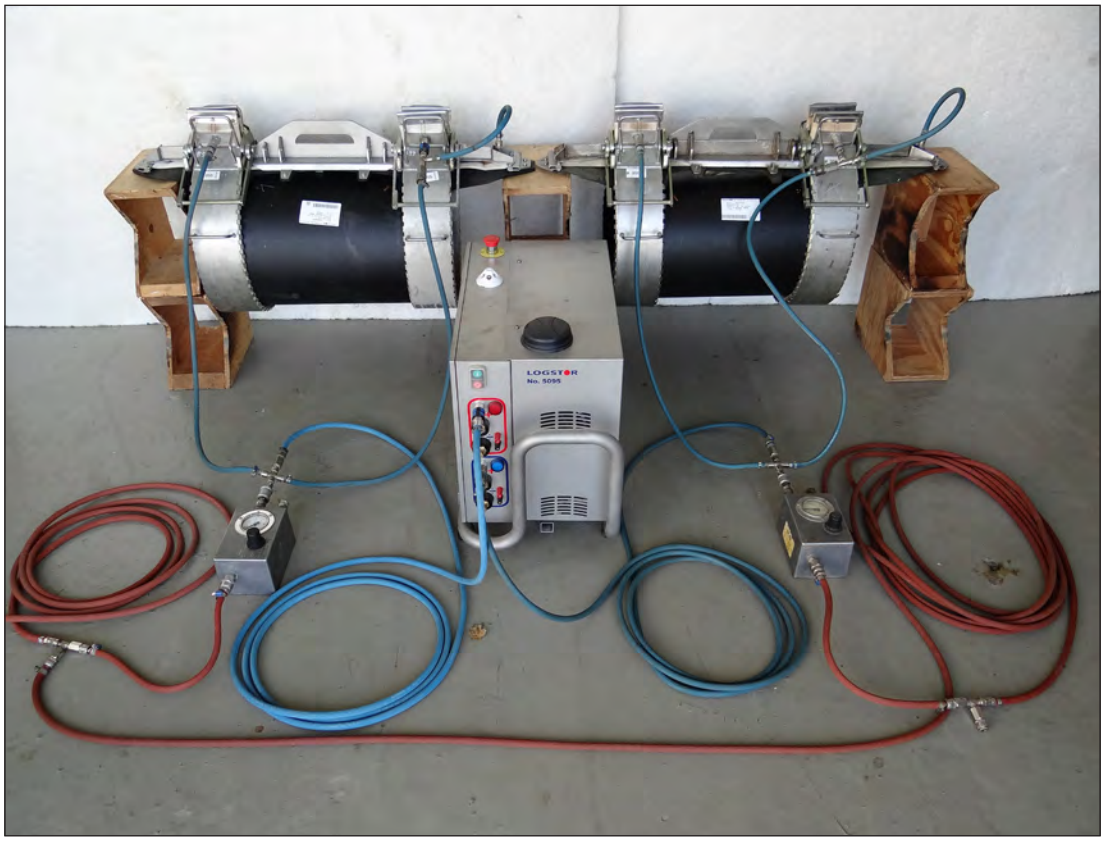


Correct connection of pressure tubes to WeldMaster

Welding one BandJoint



Welding two BandJoints



Flexible pressure tool for BandJoint ø 225-800 mm

Pressure tool contents

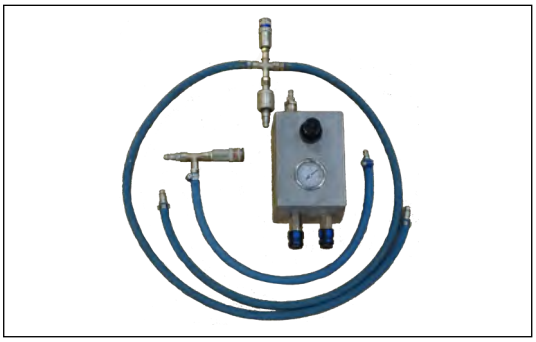
Handle with pressure bands for flexible tool ø225 – 800.

Longitudinal pressure band for flexible pressure tool for casing joint 630 mm. Also available for casing joint 1020 mm.

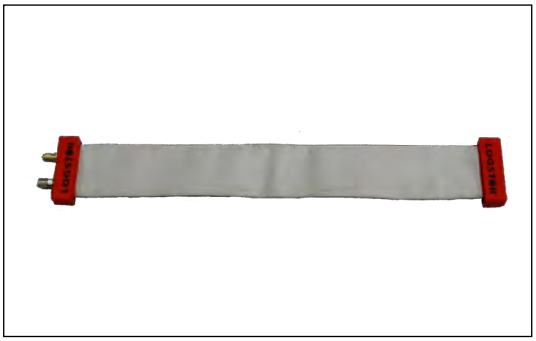
All pressure bands are equipped with a safety valve.

Pressure rail for flexible tool for casing joint 630 mm. Also available for casing joint 1020 mm.

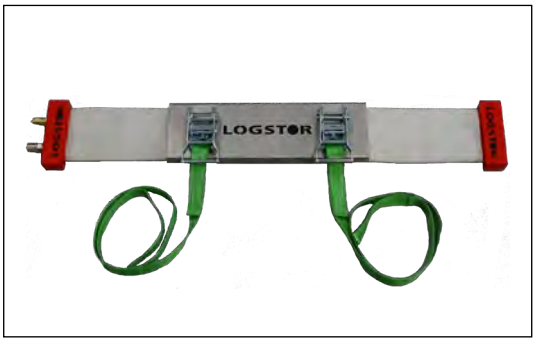
Pressure tube and reduction box for flexible pressure tool.



Pressure band for flexible tool for casing joint 630 mm. Also available for casing joint 1020 mm.



Pressure band and pressure rail for flexible tool for casing joint 630 mm. Also available for casing joint 1020 mm.



Flexible pressure tool for BandJoint ø 225-800 mm

Maintenance

At regular intervals inspect tubes, tools, and safety equipment for damage.

Minimum every third month inspect the pressure bands which are used regularly for damages and leaks.

Pay special attention to the fold at both sides of the pressure bands as regards leaks.

Check for leaks by adding air pressure and use leak spray.

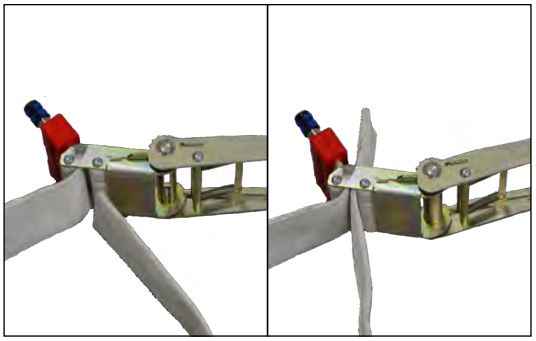
Likewise check the pressure band for wear on the side, facing the casing joint.

Register, that the pressure band has been inspected - by entering the date on the pressure band or under comments in the casing joint installation report.

Regularly check the tool for visible damages, including safety valve and handles.

Installing circumferential pressure tube in buckle tool

Insert the circumferential pressure tube in the handle for the flexible pressure tool as illustrated.



Installing BandJoint

Install the BandJoint in accordance with Weld Joint Manual p. 2.3.1-2.3.6.

It is recommended to install tape in the weld zones to ensure a long service life of the pressure tubes. Remove the tape, before leakage testing.

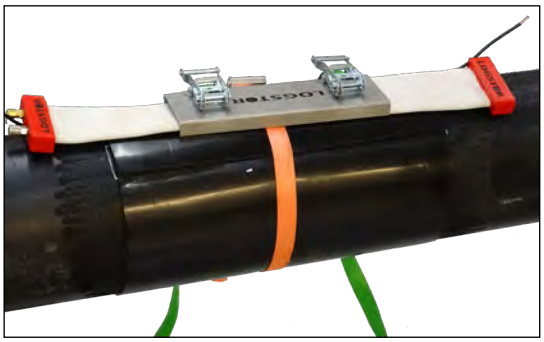
Now install the flexible pressure tool as described in the following.

Flexible pressure tool for BandJoint ø 225-800 mm

Installing pressure tool

Place the pressure band for the flexible tool loosely on top of the casing joint.

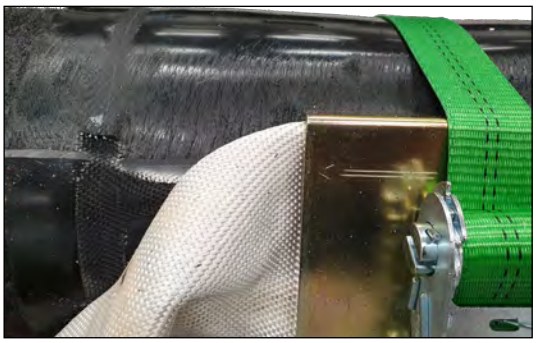
Place the pressure rail loosely over the tube.



Center the pressure rail and tube on the casing joint, so the pressure rail overlaps approx. 20 mm in relation to the overlap on the casing joint. Fix it with straps.

Ensure that the straps do not cover the 2D bar code on the joint label.

The arrows of the pressure rail are flush with the edge of the overlap on the casing joint at both ends.

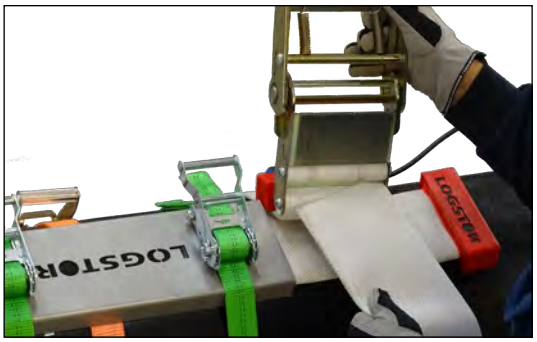


Place the handle with pressure tube, as it appears from the illustration.

Pull the pressure tube around the pipe and insert it back into the handle.

Place the pressure tube, so it is 20-30 mm outside the rim of the casing joint.

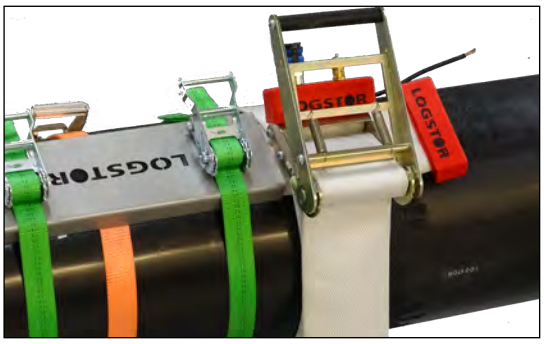
Make sure the pressure tube is not twisted.



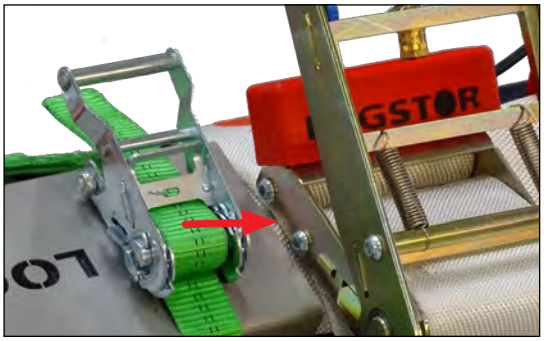
Flexible pressure tool for BandJoint ø 225-800 mm

Installing pressure tool, *continued*

Place the pressure tube in the handle and tighten it manually, so the pressure tube is in contact with the joint in the entire circumference. Now tighten the handle with the ratchet function.



The two bolts must be in the middle of the pressure rail.

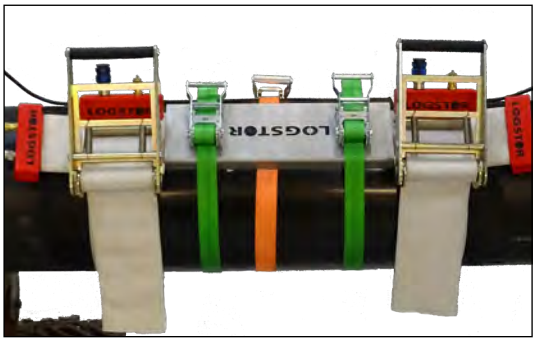


Pull the pressure tube tight, until the circumferential joint edge becomes visible through the pressure tube, corresponding to a pull of approx. 15-20 kg.

Repeat the procedure at the other side of the casing joint.

Be careful not to damage the terminals on the casing joint.

When the flexible pressure tool has been correctly installed as it appears from the illustration, connect the compressed air tubes.



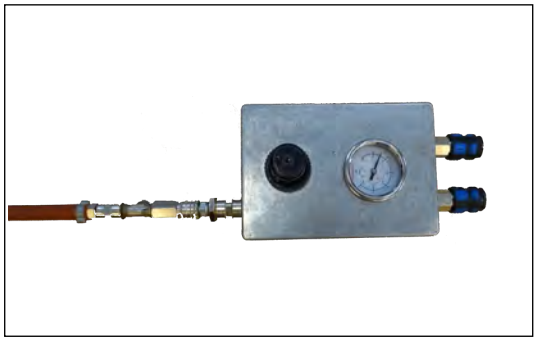
Flexible pressure tool for BandJoint ø 225-800 mm

Connecting pressure tubes

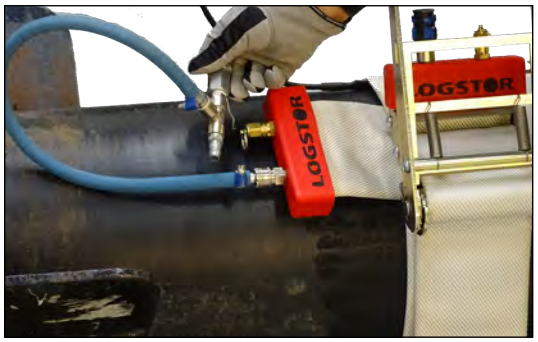
Connect the red tube (high pressure) to the reduction box.

Adjust the pressure on the reduction box to 1.5 bar. The pressure on the reduction box is guiding.

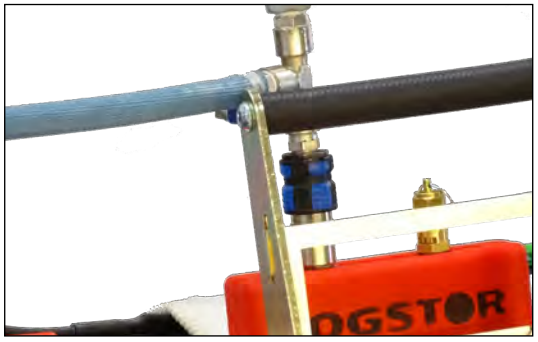
When the PDA is connected, check the pressure according to the PDA.



Install the small coupling on the longitudinal pressure band.



Install the big couplings on the circumferential pressure bands.



The valve of the distributor must be in closed position, until all pressure tubes have been connected.

Flexible pressure tool for BandJoint ø 225-800 mm

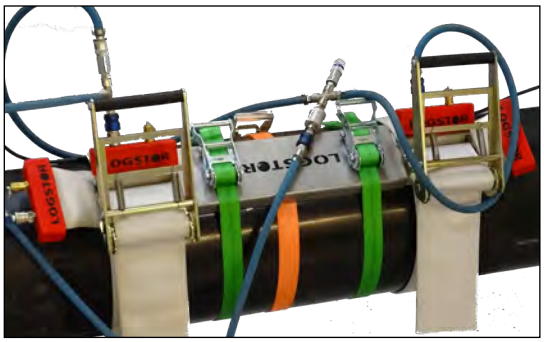
Connecting pressure tubes *continued*

Connect the blue tube (low pressure) to the reduction box.

When all tubes have been connected, open the valve, so the pressure bands are pressurized.

During tightening, knock on the BandJoint with the synthetic hammer to establish the best possible contact between the welding wires and the outer casing.

Loosen the middle spanner after the pressure bands have been pressurized.



Connect welding cables, sense cables, and return air tube from the reduction box to the front of the WeldMaster/WeldMaster Light.

Connect the two cables from the WeldMaster/ WeldMaster Light to the terminals in the casing joint - take care to make a good connection. Fasten the clamps.

Check that the pressure on the PDA is 1.5 bar. The WeldMaster/WeldMaster Light monitors that the pressure is within the allowable tolerances during the weld process (1.4 – 1.7 bar).

Now continue the installation as described in the Weld Joint Manual p. 2.2.12 and the WeldMaster section.

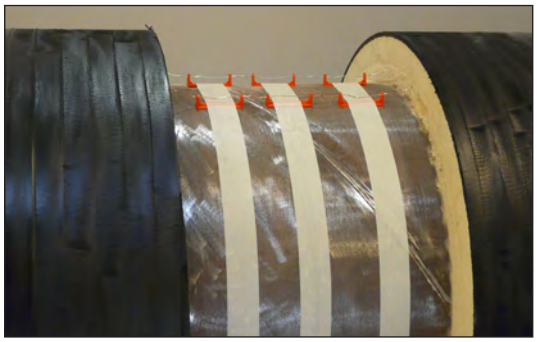
Installing BandJoint ø 900-1400 mm

Preparing the joint location

After thorough cleaning with alcohol and grinding as described under instructions for ”Preparing the joint location”, the installation of the BandJoint can start.

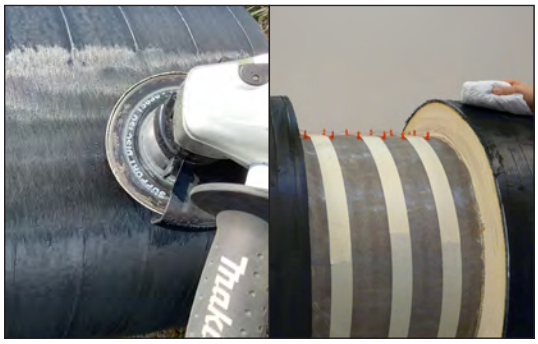
Alarm wires

1. Connecting and securing alarm wires.
   See Handling & Installation Manual sections 23.3 and 23.4.



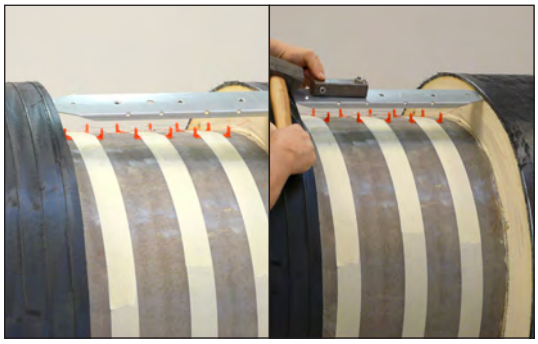
Grinding the outer casing

2. Activate the plastic surface by grinding it.
   See Weld Joint Manual page 1.1.1.



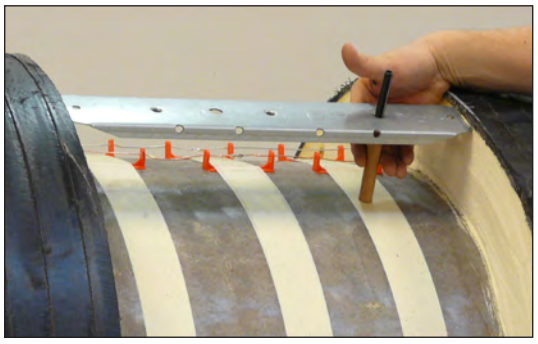
Installing the depth guard

3. Install the depth guard at a safe distance, minimum 50 mm, from the alarm wires. Install the depth guard at the top of the pipe in a position between 10 and 2 o’clock. Push/drive the guard into one foam end directly under the outer casing, press it down and push/drive it into the other foam end by means of the impact cushion from the tool tray, until the inserts into both foam ends are the same.



4. Adjust the height of the guard.
   Install and screw the two/three adjusting bolts down into the insulator foot by means of a 5 mm hexagon key.

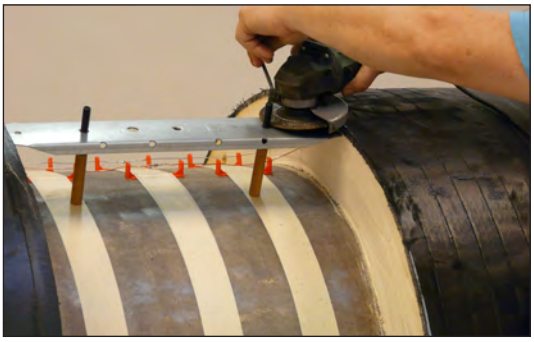
Note! In connection with insulation series where the foam thickness is ≥ 85 mm long bolts or insulators are used.



Installing BandJoint ø 900-1400 mm

Installing the depth guard, ***continued***

5. Remove the surplus part of the screws, using a grinder.



6. Place a piece of felt on the depth guard in order to ensure that the welding temperature in the longitudinal weld is reached.

   Secure the felt with 3 pieces of tape which are placed so they do not cover the venting holes of the depth guard.

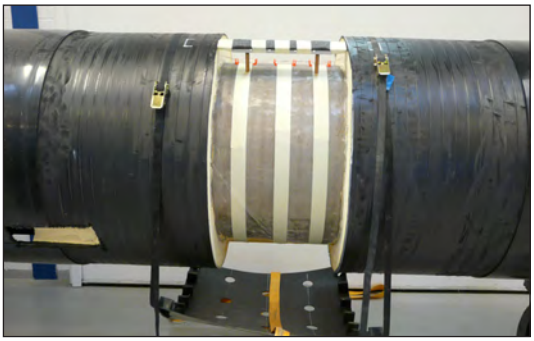
   By means of the template mark the position of the depth guard on the outer casing at both ends.

   There must not be marking chalk in the weld zone.

Guiding tool for BandJoint

7. It is possible to use a guiding tool (PE plate with spacers) to guide the BandJoint around the outer casing.

   Prior to fixing the guiding tool, install a strap (yellow) for later fixation of the BandJoint.



   Place the guiding tool symmetrically at the bottom and secure it against the outer casing by means of loosely tightened straps (black).

Installing BandJoint ø 900-1400 mm

Preparations for joint installation

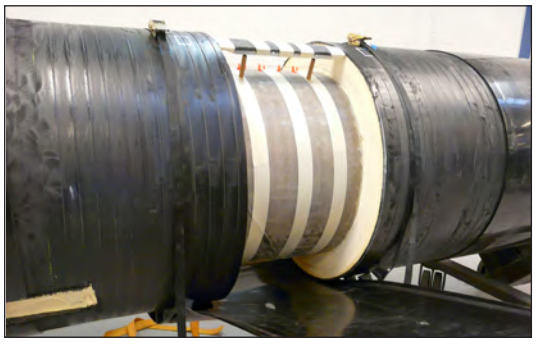
8. Place the casing joint in a clean and dry environment and remove the protective foil. Make sure not to damage the welding wires, when using tools.

The protective foil can be used as a plane for the BandJoint during cleaning.

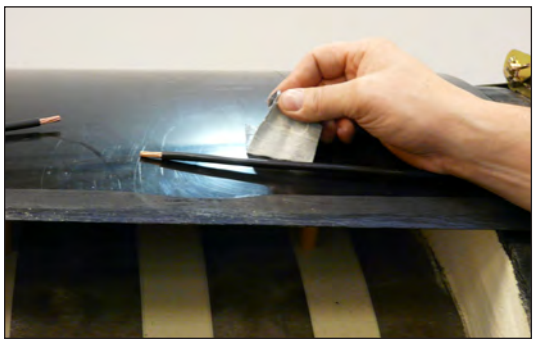
9. Remove the protective cardboard and any tape over the terminals.

10. Clean the casing joint.
Clean the weld zones with the embedded copper wires, using alcohol.

11. Insert the end of the BandJoint with terminals into the opening of the guiding tool and move/push it around the outer casing.



12. Remove the tape from the terminal cables. Bend the cables over the outer casing.



Installing BandJoint ø 900-1400 mm

Grinding the overlap

13. Clean the surface of the overlap with alcohol and activate it by grinding it in a width of approx. 20 cm, however so the entire overlap is ground. This enables visual control of the grinding by the inspection.

    Grinding shall be carried out on the top surface of the casing joint at the end where the terminals are placed.

    Clean the ground area with alcohol.

Adjusting the casing joint

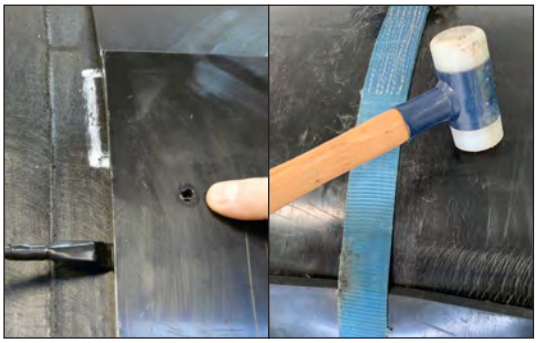
14. Loosely thighten the strap (yellow), and position the casing joint with the synthetic hammer in accordance with the marking on the outer casing.

    Tighten the strap, when the casing joint is in position.

    Remove the guiding tool.

    NOTE!
    After welding, the two inspection holes in the welding zones must be filled with melted PE.

    Mark any holes with chalk or indian ink, so they are easier to locate after welding.



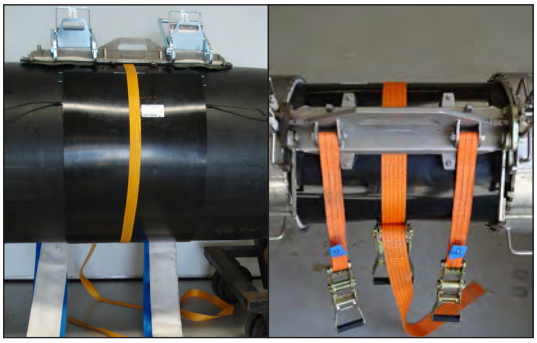
Installing pressure bands

15. The back of the longitudinal pressure rail has a bevelled rubber plate.

    Place the pressure rail so that the bevelled edge of the rubber plate is adjacent to the BandJoint overlap.

    The position of the pressure rail may be marked with a marker pen.

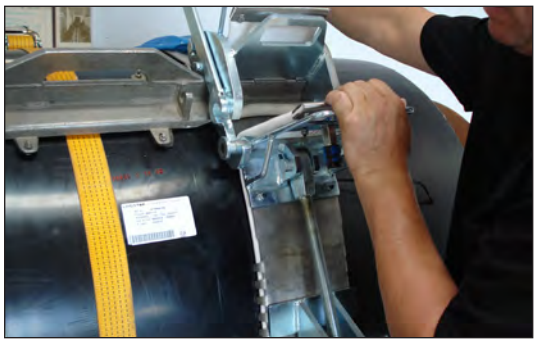
16. The circumferential nylon bands are placed over the longitudinal pressure rail in the slot, corresponding to the casing joint length.
    Take care that the straps do not cover the 2D bar code on the joint label.



Installing BandJoint ø 900-1400 mm

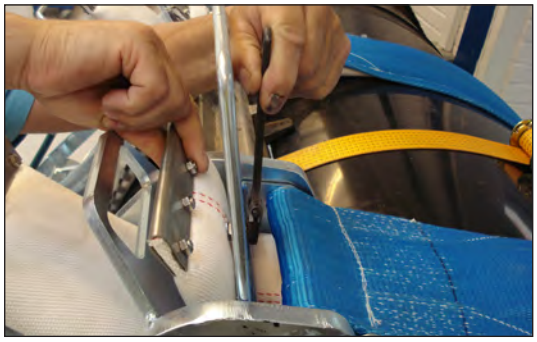
Installing pressure bands, ***continued***

17. Attach the band to the hook of the clamping fixture.



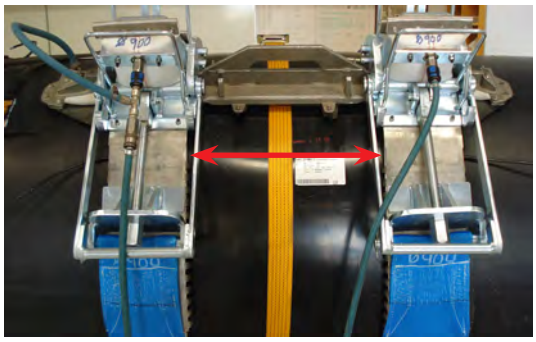
18. Push the hook of the clamping fixture into the slot and turn the locking device back.

19. Tighten up the hose for the circumferential nylon band on the back of the guide, and fasten the nut.



Securing pressure bands

20. To make sure that the distance between the two circumferential nylon bands are correct, measure the distance between them on each side of the casing joint. Measurements are made between the two clamping fixtures, and a check measurement of the nylon bands having the same distance is carried out.



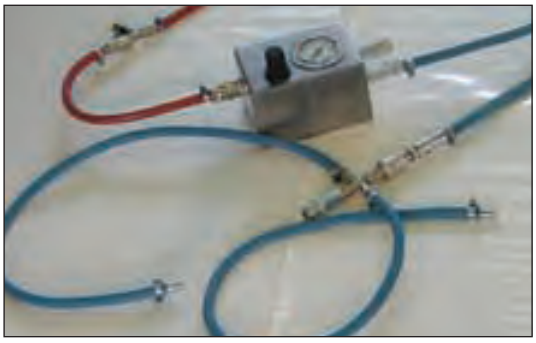
Installing BandJoint ø 900-1400 mm

Compressed air connections

21. Connect compressed air from the compressor to the reduction box using the red (high pressure) connecting hoses.

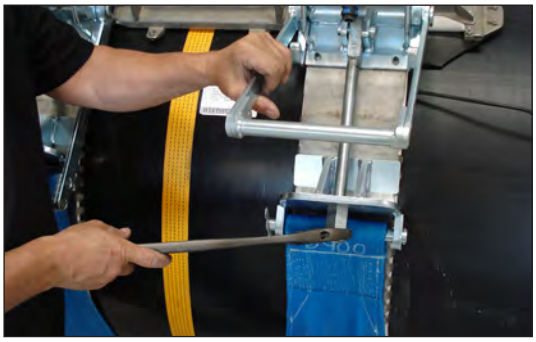
    Use blue (low pressure) hoses from the reduction box to the pressure rail and pressure band.

    Connect the three-way distributor with valve to the blue hose.



22. Check the entire circumference, to make sure the hose is covered by the nylon band.

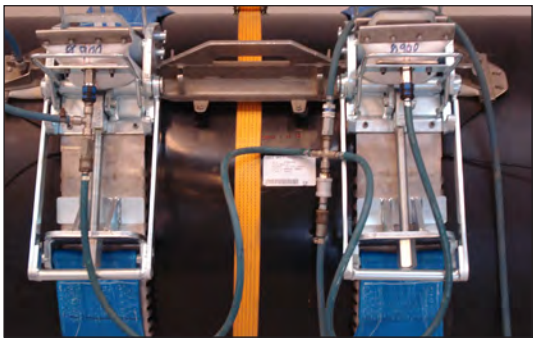
23. Tighten the outside nylon band additionally by means of the nut so a finger can just come between the nylon band and the hose.



24. Connect the short coupling hose with the T-piece between one pressure band and the longitudinal pressure rail.

    Connect the two plugs from the three-way connection to the circumferential pressure bands.

    Connect the final coupling from the three-way connection to the WeldMaster using a blue hose in the required length.

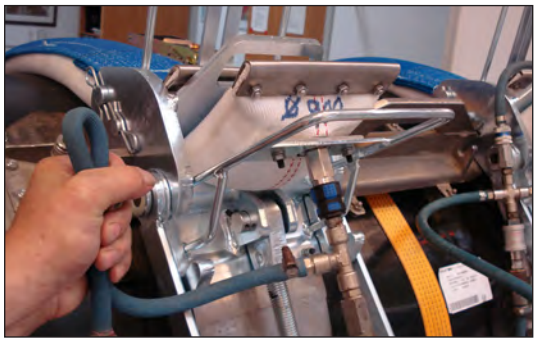


Installing BandJoint ø 900-1400 mm

Adjusting and applying compressed air

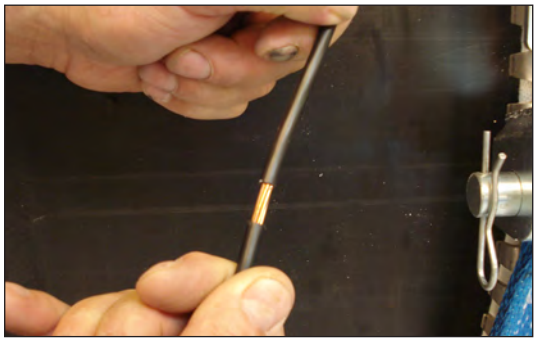
25. Adjust the air pressure in the reduction box by lifting the black adjusting screw and turning it until the proper pressure, **2.8 bar**, has been reached.
Pressing the black button down again locks the welding pressure.
The pressure in the reduction box is guiding. When the PDA is connected, the pressure is checked with the PDA.
The WeldMaster ensures that the pressure is within the tolerance range of 2.5 - 3.0 bar during the welding process.
Remove and bend the short coupling hose on the pressure rail before activating compressed air.

26. Activate the welding pressure by pushing the valve ring on the three-way distributor forward.
To establish the best possible contact between joint and casing, knock with the synthetic hammer when the two circumferential pressure bands are under **2.8 bar pressure**.
Connect the short coupling hose to the longitudinal pressure rail.
Remember to loosen the straps!



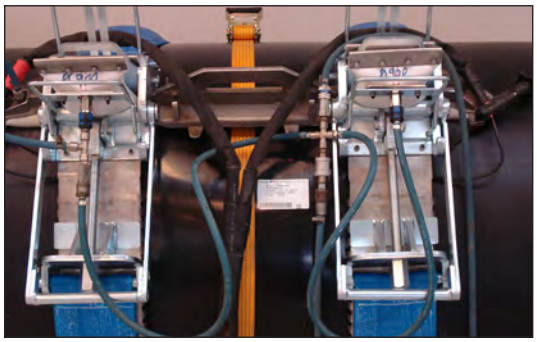
Cable connection

27. Remove the insulation from the cable.



28. Connect the welding cables to the WeldMaster front.

    Each cable has a power and a sensor connector which are connected to red and blue tap respectively. Follow the colour codes.



Cable connection *continued*

29. Connect the two cables from the Weldmaster to the terminals in the casing joint. Connect them carefully to ensure good connection and tighten the clamps.

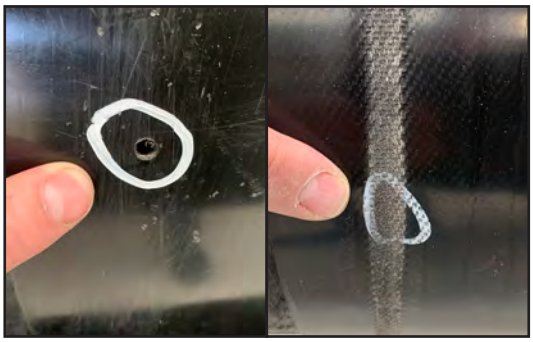
    Start the WeldMaster (See the section “WeldMaster”).

    The 6-digit weld file No. MUST be transferred to the casing joint to ensure traceability.

Checking the welding zone

30. After cooling to 80°C remove the pressure bands and check that the two inspection holes in the welding zone are filled with melted PE.

    If the holes are not filled, reweld the casing joint after cooling (see the section ”Rewelding the casing joint”).

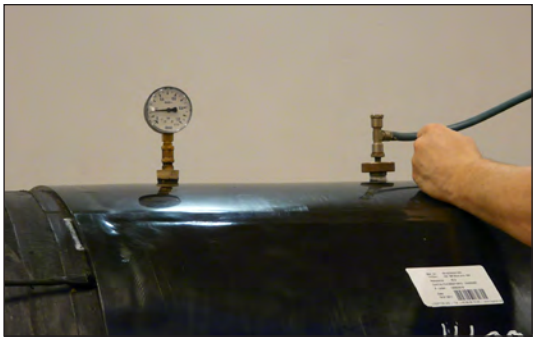


Foaming preparations

31. Drill two ø17.5 mm holes at the highest position as close to the outer casing ends as possible.

Leakage test

32. Perform a leakage test on the casing joint using the leakage test equipment.



Leakage test, ***continued***

33. Install the leakage test equipment in the two pre-drilled holes - the manometer in one hole and the blind plug in the other hole.

    Connect the red compressed air hose to the pressure test equipment.
    Adjust the pressure to 0.2 bar, using the control button.
    Check the plastic welds with leak detection spray/soapy water.

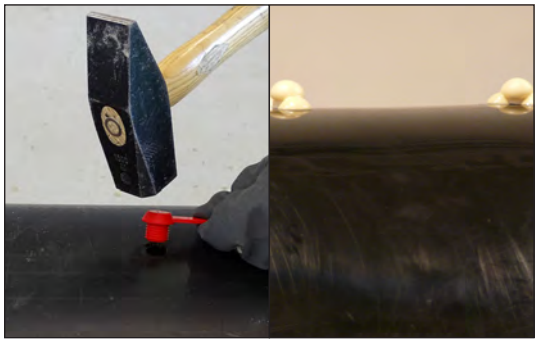
    In case of a leak, the casing joint must be rewelded (See the section ”Rewelding the casing joint”, page 2.12.1).

Foaming

34. **With machine foam**
    Install a vent plug in one venting hole.
    Foam the casing joint in the other hole.
    Install the other vent plug.

    With foam packs
    If 2 foam packs are required per casing joint, preparations must be made, so they can be filled into the joint immediately after each other. Always start with the smallest foam pack. It may be an advantage to be 2 persons to carry out the task. If 3 or 4 foam packs are required per casing joint, 2 foam packs must be filled in simultaneously. This requires that an additional venting hole be drilled. Remember to order an additional plug set.

See ”Insulating and sealing holes”, page 2.6.1 as well as Handling & Installation section 7 ”Insulating joints”.



Sealing the holes

35. Seal the holes.
    (See section 2.6.1 ”Insulating and sealing holes”).

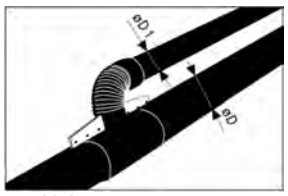
45° BandJoint branch or 90° parallel branch

Installation instructions

LOGSTOR

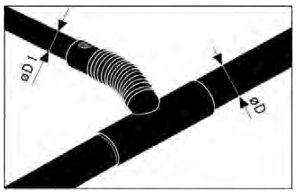
Installation guide: connecting piece for T-joint

SXT-WPJoint

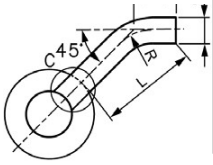


øD: 90-315
øD1: 77-200

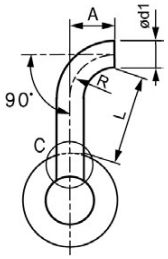
TSJoint/BandJoint Flextra



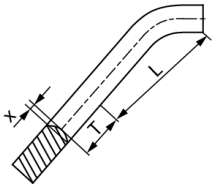
øD: 125-450
øD1: 90-160

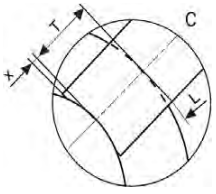


Branch	ød1	20/25	28	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	125	160	140	140	140	140	150	190	222	170
	A	135	135	100	100	90	90	160	145	120	123
SXT-WPJoint 45°	L	320	320	320	320	320	320	370	370	380	380
TS / BandJoint Flextra 45°	L	320	320	320	320	320	320	350	370	380	-



Branch	ød1	20/25	28	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	125	160	140	140	140	140	150	190	165	170
	A	175	175	140	140	140	140	150	190	165	170
SXT-WPJoint 90°	L	270	280	280	280	290	300	310	320	350	360
TS / BandJoint Flextra 90°	L	250	250	250	250	250	250	250	320	350	-





ød1 / ød	X 20/25	28	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
33,7	3	5	4							
42,4	2	4	3	6						
48,3	-	3	3	5	9					
60,3	-	2	2	4	6	9				
76,1	-	-	-	3	5	7	11			
88,9	-	-	-	2	4	6	9	17		
114,3	-	-	-	-	3	4	7	12	18	
139,7	-	-	-	-	3	3	6	9	13	25
168,3	-	-	-	-	2	3	5	8	11	19
219,1	-	-	-	-	-	2	3	6	8	14
273	-	-	-	-	-	-	3	-	-	-
323,9	-	-	-	-	-	-	2	-	-	-

SAP No. 1999 0000 002 106
Drawing No. 1999-A001 R05

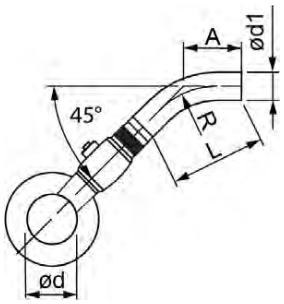
Hot tap valve →

45° BandJoint branch or 90° parallel branch

Installation instructions, ***continued***

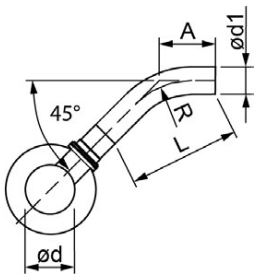
LOGSTOR

Installation guide: connecting piece and hot tapping



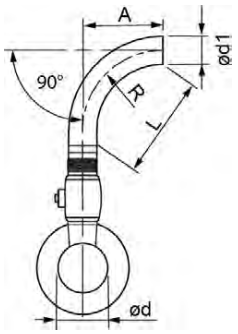
Danfoss hot tapping 45°

Branch	ød1	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	140	140	140	140	150	190	222	170
	A	100	100	90	90	160	145	120	123
SXT-WPJoint 45°	L	230	230	230	200	250	230	250	190
TS / BandJoint Flextra 45°	L	200	200	200	200	210	230	250	-



Tonisco hot tapping 45°

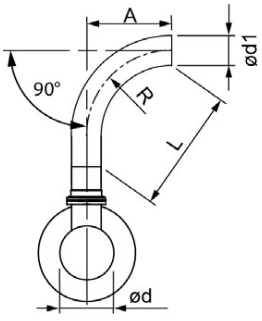
Branch	ød1	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	140	140	140	140	150	190	222	170
	A	100	100	90	90	160	145	120	123
SXT-WPJoint 45°	L	-	240	240	240	280	280	300	300
TS / BandJoint Flextra 45°	L	-	230	250	250	270	280	300	-



Danfoss hot tapping 90°

Branch	ød1	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	140	140	140	140	150	190	222	170
	A	100	100	90	90	160	145	120	123
SXT-WPJoint 90°	L	200	200	220	200	215	*245	235	210
TS / BandJoint Flextra 90°	L	190	190	190	190	200	*245	235	-

*) Important: The free ends of the branch ø76,1/140 (series 1) are shortened 50 mm to 170 mm



Tonisco hot tapping 90°

Branch	ød1	26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3
	R	140	140	140	140	150	190	222	170
	A	100	100	90	90	160	145	120	123
SXT-WPJoint 90°	L	-	230	230	230	230	*280	280	280
TS / BandJoint Flextra 90°	L	-	200	200	200	210	*280	280	-

*) Important: The free ends of the branch ø76,1/140 (series 1) are shortened 50 mm to 170 mm

← Connecting piece

BandJoint branch Flextra

BandJoint branch Flextra
45°, 90° or straight

The BandJoint branch Flextra consists of a BandJoint with one or two branch pipes welded onto it. The BandJoint branch Flextra is to be welded onto the main pipe and shrunk on the branch.

The branch is cross-linked and with integrated mastic.

A long collar ensures the double sealing of the branch.

Dimensions according to the Product Catalogue:

Main pipe:
ø125-315 mm (For single pipe and TwinPipe)
ø355–710 mm (For TwinPipe)
ø125-710 mm (For TwinPipe main pipeo and two single pipe branches)

Branch:
ø90 – 125 mm
ø140–160 mm

Installation instructions

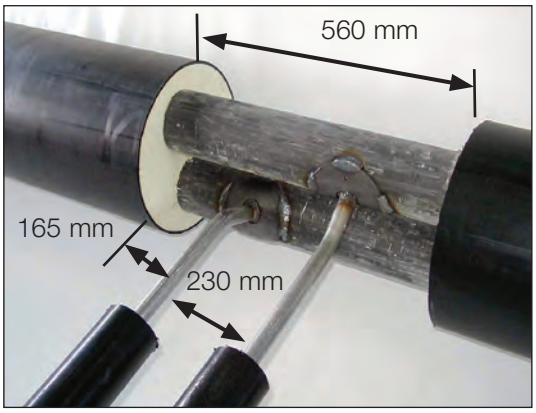
If a steel bend is used, remove 220 mm insulation from the branch, measured from the weld.

If a press coupling is welded directly on to the main pipe, measure from the upper edge of the casing on the main pipe to 20 mm before the shrinkable part of the branch. Remove the insulation from this section.

Installation instructions, ***continued***

If a BandJoint branch Flextra with one branch is used, 440 mm insulation must be removed from the main pipe.

If a BandJoint branch Flextra with two branches is used, 560 mm insulation must be removed from the main pipe as it appears from the illustration.



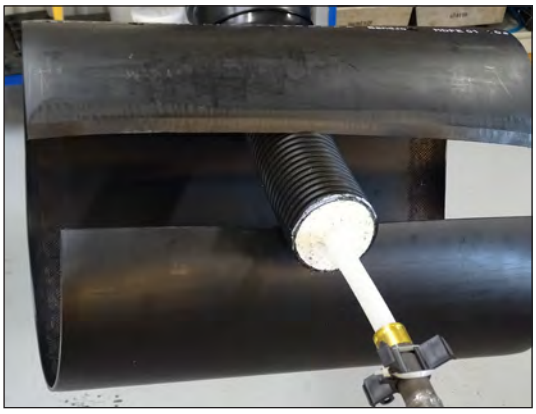
The branches must be welded 165 mm from the casing to the centre of the pipe piece, and the centre distance between the 2 branches must be 230 mm.

In the following installation of a BandJoint branch Flextra with one branch is described.

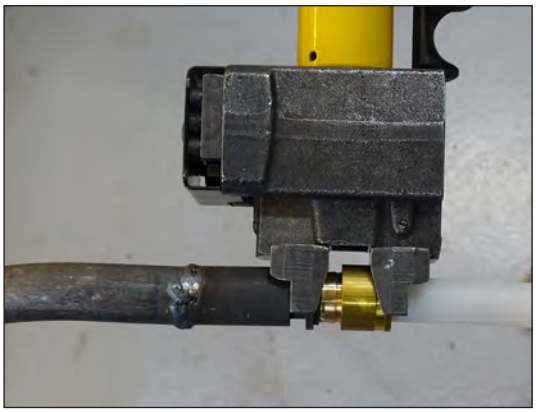
The installation principle for BandJoint branch Flextra with two branches is the same.

Pull the collar and T-shoe onto the branch. If the casing joint is not be installed immediately, it must be covered.

Install press couplings, if any, on the branch or weld pipe piece and branch together.



Compress the pres coupling.



Installation instructions, ***continued***

Clean all surfaces in the jointing area. The surfaces must be CLEAN and DRY.

Now clean with alcohol.

Remove dirt and moisture from the BandJoint casing before grinding the casing.

It is particularly important to remove oil products, such as grease etc., from cranes and excavators before grinding.

Moisture can be removed by preheating the casing to 20-30°C using a gas flame.

Immediately before grinding the outer casing, degrease it with min. 93% alcohol.

Grain size of grinding wheel: 36.

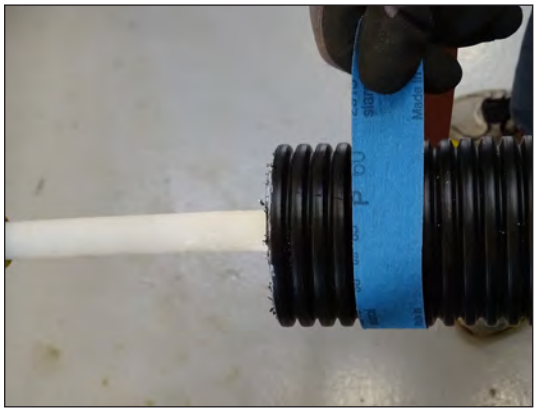
Grind extra 20 mm of the contact surfaces of the outer casing outside the rim, so it is evenly matt and rough. This enables visual inspection of the activation by the supervisor.

After grinding degrease with alcohol.

Activate the contact surfaces of the branch with emery cloth, grain size 60. Remove any loose grinding dust.

Avoid touching the ground contact surfaces.

Remember to install spacers, which are delivered with the steel branch.

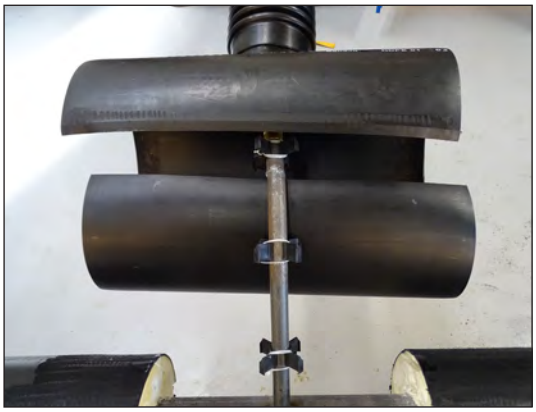


Installation instructions, ***continued***

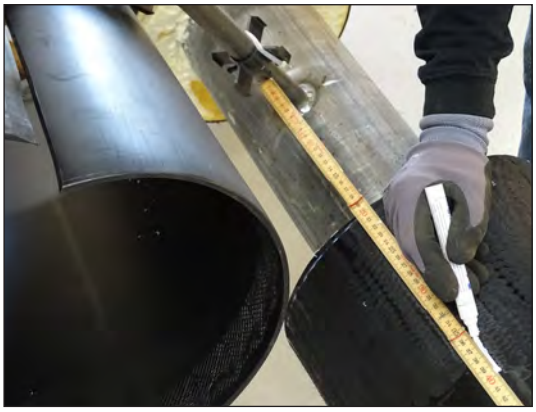
Heat the corrugation, until it is so flexible that it can be compressed and pulled over the branch.

Unfold the T-shoe, and pull it down over the branch.

Turn the T-shoe and pull it down over the main pipe.

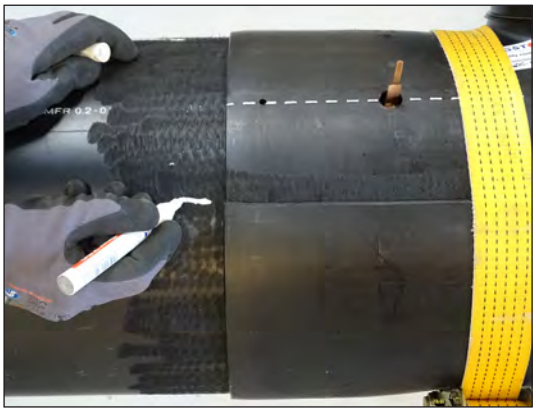


Mark the middle of the steel branch on both sides outside the welding zone.



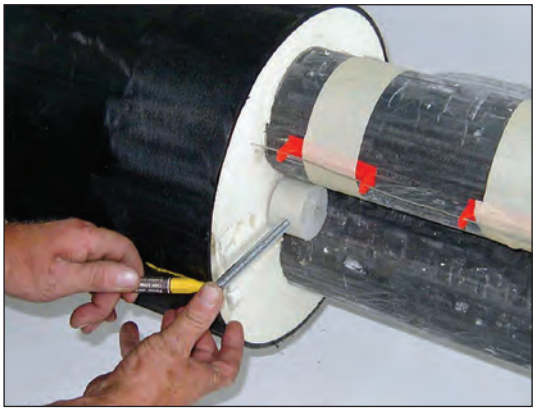
Centre the casing joint over the joint.

Mark where the casing joint ends meet longitudinally.



When using BandJoint branch Flextra in TwinPipe systems, the depth guard must be installed with the use of supporting chocks in dimension range ø 125-710 mm as it appears from the illustration.

In the following installation on a single pipe is described.



Installation instructions, ***continued***

Mount and tighten the two adjusting screws into the insulator foot, using a 5 mm hexagon key.

Tighten the adjusting screws loosely.

At major series 2 and 3 a longer adjusting screw or insulator foot may be necessary

The distance from the screws to the alarm wires must be min. 15 mm.

Remove the excessive piece of the screws with a grinder.

Fix the felt with minimum 3 pcs. of tape, placed so they do not cover the venting holes in the depth guard.

Installation instructions, ***continued***

After installation of depth guard and felt the template for marking the correct position of BandJoints is used.

There must not be marking chalk in the weld zone.

Hold the template against the depth guard so that the two studs are adjacent to the outer casing in a sideways direction.

Use the 2 lines in circumferential direction to centre the BandJoint and ensure that all embedded welding wires are in contact with the outer casing. Place the BandJoint so the distance from the joint rim to the lines at each side is the same.

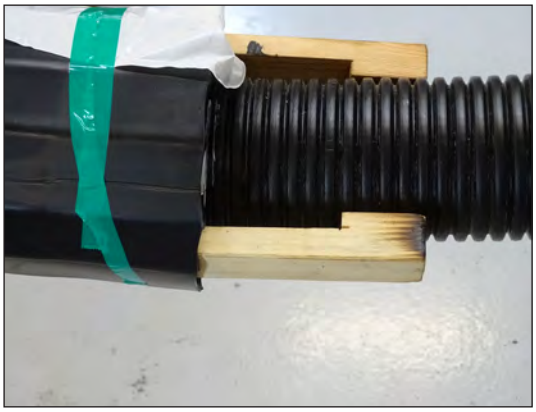
Secure the BandJoint for dimension Ø225 – 710 mm in the middle with a strap. A 50 mm strap is recommended.

Place the clamping handle so there is only a single layer of straps in the welding zone and so that the handle does not obstruct the longitudinal pressure rail.

During tightening knock on the BandJoint with a synthetic hamme to establish the best possible contact between welding wires and outer casing.

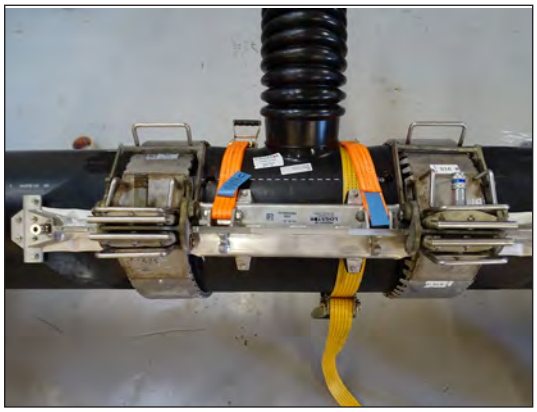
Centre the branch with wedges to keep it in place.

Press the T-shoe down, until the branch has cooled.



Installation instructions, *continued*

Install the pressure tool and weld in accordance with the installation instructions for BandJoint.



Remove the cover from the sealing bands on the branch.

Check that the cover has been completely removed.

If necessary, use heat shield to protect the corrugated flexible pipe.

Shrink the shrinkable end of the branch. Start shrinking on the underside.

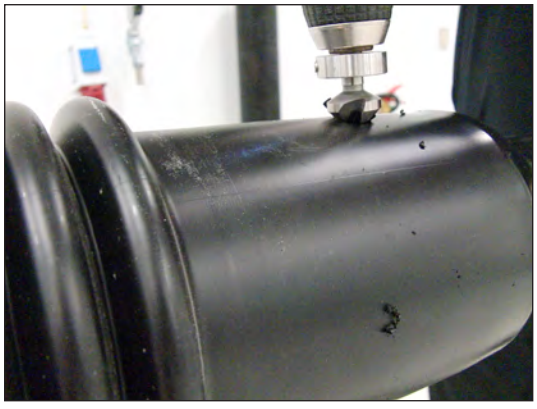
Place the rubber plugs of the leakage test equipment in the holes and tighten them.

Pressure the casing joint up to approx. 0.2 bar.

Spray soapy water on all joints to check that they are tight.

Drill a ø25 mm hole in the branch, using a drill with depth stop to prevent damage to the service pipe..

Distance from the rim of the reduction: approx. 30 mm.



Installation instructions, ***continued***

Install one venting plug in the hole in the branch and one in one of the holes in the main pipe. It is important that venting takes place from the highest point of the branch.

Foam the joint through the last hole, and install the last venting plug.

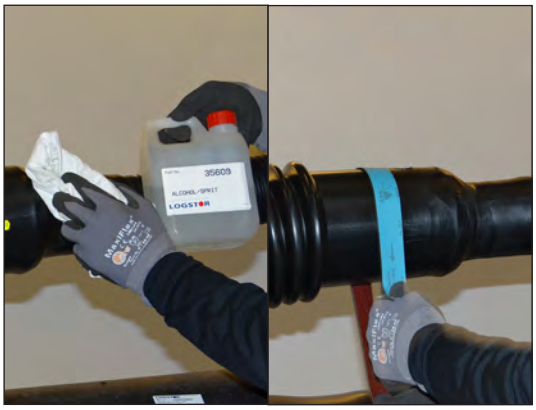
Wait at ltest 30 min. for degassing to complete. Remove the venting plugs by turning and lifting them.

Remove visible foam or waste, if any.

Clean the contact surfaces of the colllar on the branch with alcohol.

Grind the contact surfaces with emery cloth.

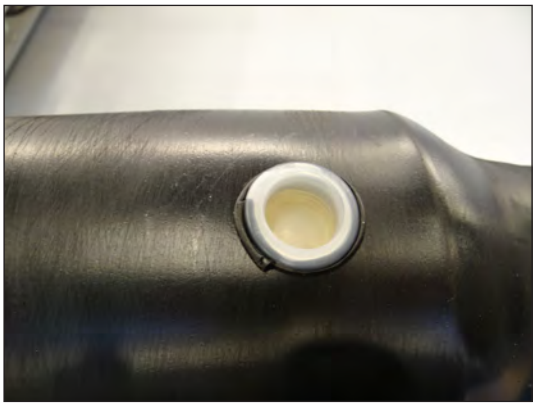
Remove loose grinding dust.



Remove the protective foil from the expansion plugs and check the sealing compound.

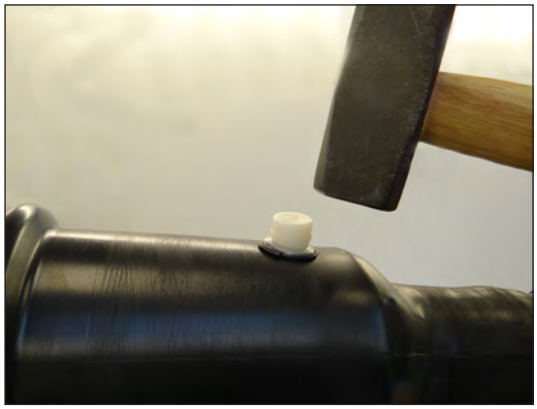
Briefly activate the area around the plug with a hard flame.

Install the expansion plug in the hole and press, until the sealing compound is evenly distributed under the collar of the plug.



Installation instructions, ***continued***

Centre the taper lock in the expanion plug and drive it completely in with a hammer.



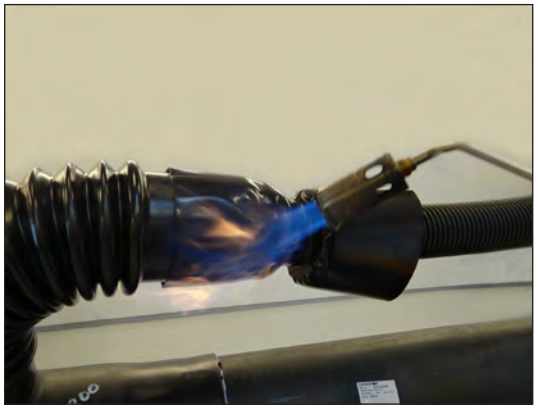
Activate the contact surface of the collar on the TS saddle branch with a gas burner to a surface temperature of min. 65°C.

If necessary, protect the FlextraPipe with a heat shield.

Remove the packaging and paper from the collar.

Check that the paper has been completely removed.

Place the collar approx. 50 mm over the expansion plug and shrink it towards the branch.



Insulating and sealing holes

Insulating and sealing holes on BandJoint, see section 2.6 Insulating and sealing holes.

Inspection and documentation

Inspect the T-joint.

Criterion for approval of welding plug: Two visible beads.

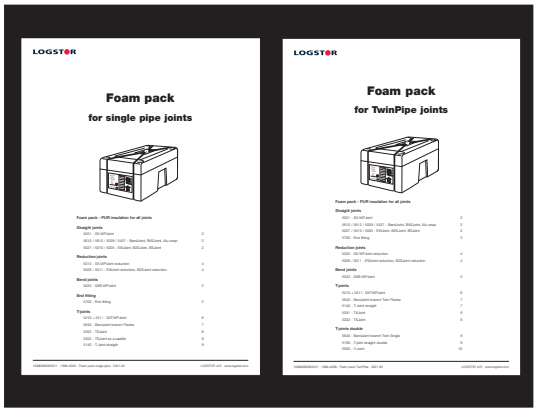
The joint is complete.

Visual inspection and documentation, if any, see the section ”General”.

BandJoint - Insulating and sealing holes

Insulating and sealing holes

Refer to the foam pack instructions.



It is recommende to pull the plastic foil back over the casing joint after foaming and leave it there, until the weld plugs are to be installed.

If the ambient temperature is > 30°C on foaming and foaming at lower temperatures are preferred the foam holes should be sealed with tape.

The plastic foil must be removed prior to backfilling the trench.

In general foaming is to be carried out in accordance with Handling & Installatin section 7 ”Insulating joints”.

Prepare the required foam pack and venting plugs.

If 2 foam packs are required per casing joint, preparations must be made, so they can be filled into the joint immediately after each other. It may be an advantage to be 2 persons to carry out the task.

If 3 or 4 foam packs are required per casing joint, an additional venting hole must be be drilled. Remember to order an additional plug set.

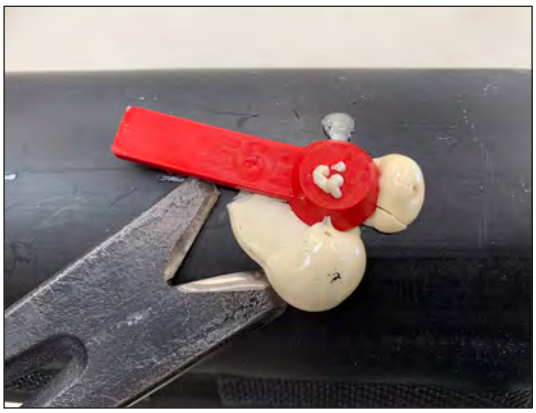
Drill a hole on each side of the casing joint, 150 mm from the edge, and a hole in the centre of the joint.

Mix the foam pack as specified and insert the plugs into the filling holes, using a hammer.

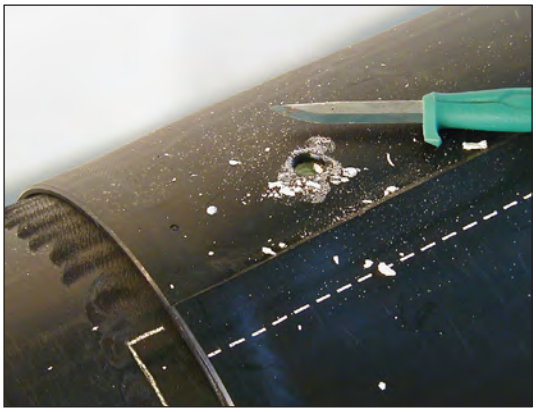
Insulating and sealing holes, ***continued***

10 minutes after foaming the venting plug can be turned halfway round to facilitate the later dismantling of the venting plug.

After min. 30 minutes' curing, the venting plugs can be removed, using the peen on the hammer or a crowbar.

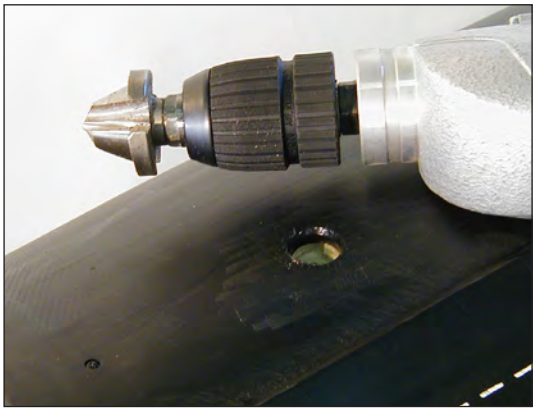


Use a knife to remove foam remnants around the filling hole.



Ensure that the plug welder has reached 250°C (482 F), before using it to butt weld the conical plugs.

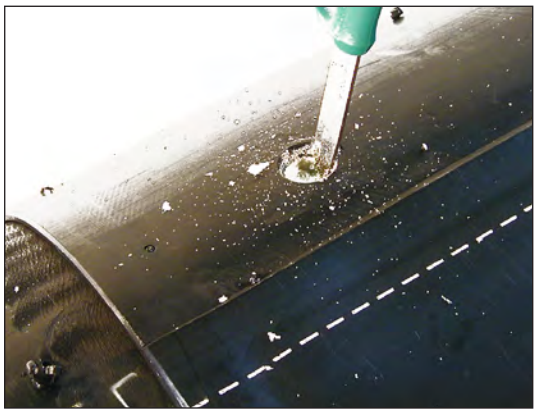
The plug box contains conical drills in three sizes: 35 mm, 43 mm and 50 mm.
The 35 mm drill is used to seal filling holes.
The 43 mm drill is used for repairs when the weld of a 35 mm plug cannot be approved.
The 50 mm drill is used for cable connections.
Mount the proper drill in the drilling machine. Drill until you reach the stop position on the conical drill. Cable connection ø 50 mm requires an open socket welder.



BandJoint - Insulating and sealing holes

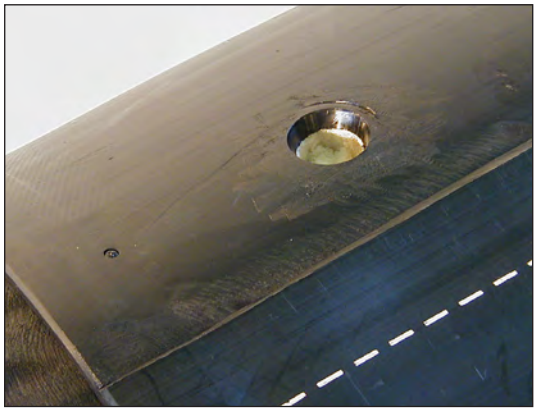
Insulating and sealing holes, ***continued***

Use a knife to remove foam from the drilled hole, thus ensuring sufficient room for the plug welder.



Remove foam remnants to prepare the hole for welding the conical plug.

Clean all surfaces in the welding zone (casing joint and weld plug) with alcohol.



Adjust the plug tool from the plug box by adjusting the vertical lever to the actual casing joint dimension, so the top of the weld plug follows the outline of the casing joint.

When the plug welder has reached a temperature of 250°C (482 F), place the conical plug in the cup and the opposite part in the conical hole.

BandJoint - Insulating and sealing holes

Insulating and sealing holes, ***continued***

When the plug welder fuses PE plug and joint materials, lips form. It is important to keep the plug welder steady.

Heat the hole edge by pressing the plug welder down. The weld plug and the foam hole are heated at the same time to the correct temperature with the plug welder.
When the flat side of the press plug welder is 1-2 mm above the casing joint and the plug has sunk approx. 1 mm, the pressure is relieved approx. 10 seconds.

Remove the heated plug from the cup using the plug tool; remove the plug welder from the hole and press the plug downwards until the legs rest on the outer casing and the upper edge of the plug is flush with the surface of the casing joint (max 1 mm above).

The plug must NOT be pressed further down. The pressure must be constant and held still for at least **1 min**.
There must be 2 beads regularly spaced around the plug.
Repeat the process with the other plug.

If the butt welding operation has been carried out properly, lips have generated from the plug and the joint materials, indicating proper heating of the materials.

Check the joint.
Criteria for approving the joint:
- No excessive local melting
- Minor deformations from the pressure band may occur
- No excessive foam at ends or welding plugs
- No visible embedded welding wires at the circumferential welds and the longitudinal weld.

The PDA has approved the welding process according to the acceptance criteria.

Manual inspection points in the PDA have been entered
- inspection of alarm wires
- leakage test has been carried out
- inspection of foaming
- visual inspection of the casing joint

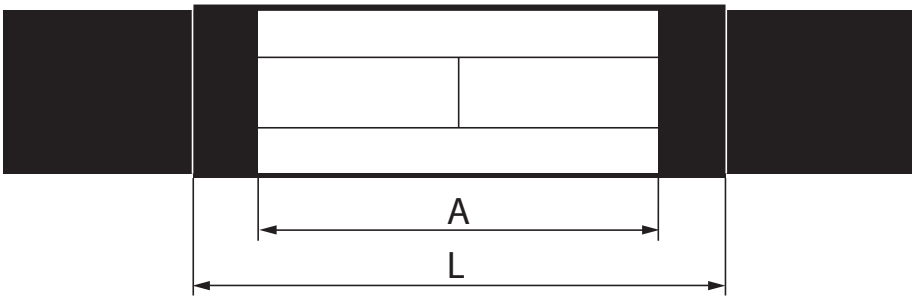
Criteria for approving welding plug:
- Two visible beads

The joint is finished.

BandJoint - Cutting lengths for BandJoint

Table for total and cutting lengths for BandJoints

Outer casing	STD		630		XL		1020	
	Cutting A mm	Casing joint length L mm	Cutting A mm	Casing joint length L mm	Cutting A mm	Casing joint length L mm	Cutting A mm	Casing joint length L mm
90-200	420-455	570			680-715	830		
225-1400			420-455	630			810-845	1020



Installing reductions with BandJoint

Reductions

In some cases, it is possible to carry out a reduction, using a BandJoint over two different casing dimensions.
No angular displacement may occur in connection with the reduction.

When using BandJoint as a reduction local PE melt may occur.

Ø90 – 200 mm
In this range of dimensions reduction is possible for the following dimensions:
Ø 90 – 110 mm
Ø 110 – 125 mm
Ø 160 – 180 mm
Ø 180 – 200 mm
Besides the following dimensions can be carried out, using a special part No.:
Ø 125 – Ø 140
Ø 140 – Ø 160

Ø225 – 500 mm
In this range of dimensions, it is only possible to carry out reductions, using a standard BandJoint in the following dimensions:
Ø 225 – 250 mm

Ø90 – 1400 mm
Any other reduction, irrespective of size, can be carried out as a EWJoint reduction or a preinsulated reduction.

Installation instructions for reduction with a BandJoint

For the reduction the BandJoint for the largest dimension is used.

Remove dirt and moisture from the outer casing and pull the BandJoint over the pipe to mark the location of the depth guard.

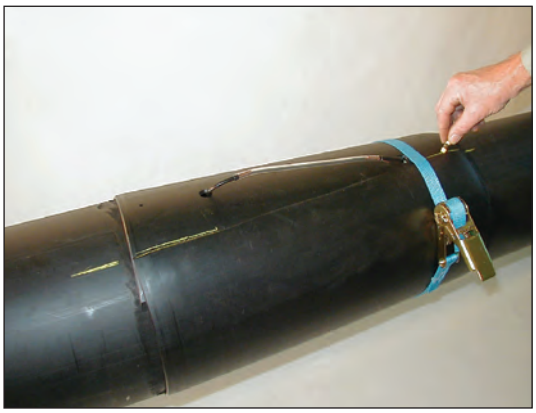
Installing reductions with BandJoint

Installation instructions for reduction with a BandJoint, ***continued***

Use a strap to fix the casing joint and turn the filling holes into 12 o'clock position.

Mark the casing to indicate where the depth guard is to be installed, and mark the casing casing joint to indicate where to grind.

The mark on the casing joint will be the upper edge of the depth guard.



Remove the casing joint and clean and brush as described under "Preparing the joint location".

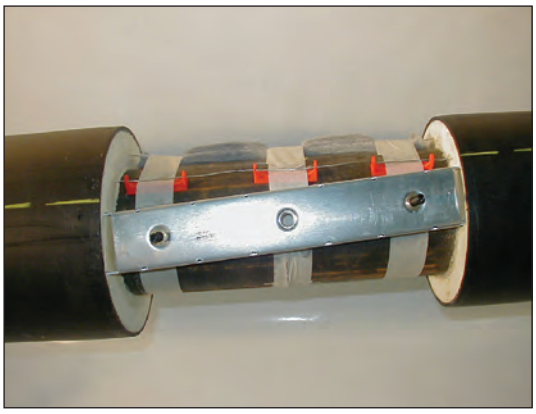
Grind the casing joint up to the mark.

Installing depth guard

Install the depth guard in the same way as a standard casing joint is installed.

However, as a result of the outer casing reduction the depth guard will not be parallel to the service pipe.

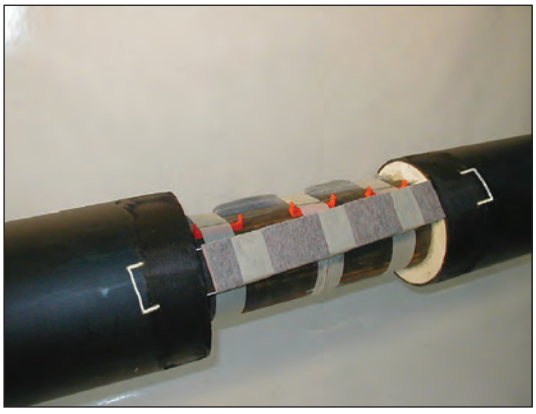
Install the upper edge of the depth guard up to the mark on the outer casing.



Install the guard directly under the outer casing and tighten the screws lightly. Cut the screws and instal felt on the guard.

Use the template to mark the casing and centre the BandJoint after the marks.

There must not be marking chalk in the weld zone.

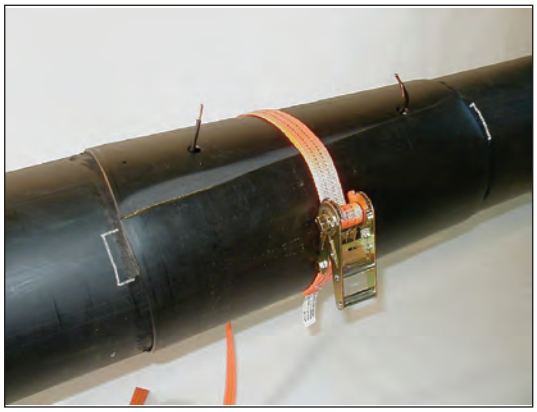


Installing reductions with BandJoint

Installing depth guard, ***continued***

Use alcohol to degrease all ground surfaces as well as the interior of the casing joint. Do not touch the welding surface after degreasing, unless you wear gloves.

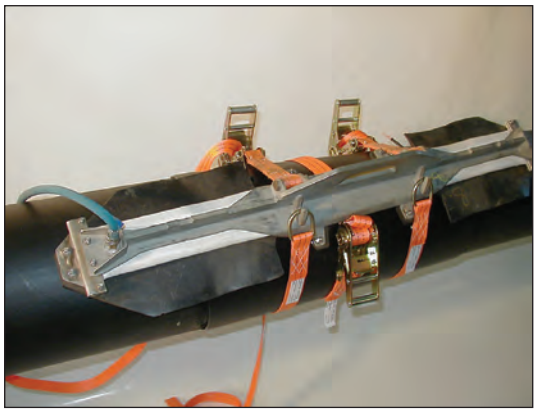
Pull the casing joint over the pipe and fix it in the centre, using a strap.



Installing pressure bands/rail

The same pressure tool is used, however, the circumferential bands come in two sizes.

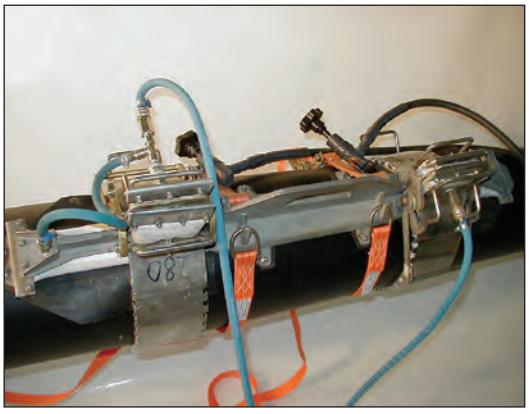
Fix the longitudinal pressure rail to ensure that the pressure remains on the inserted depth guard.



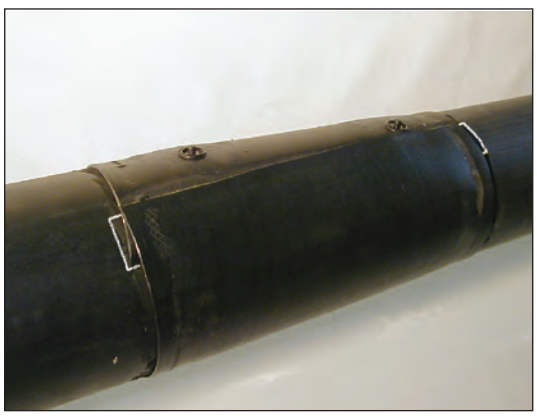
Now install the circumferential pressure bands as usual.

Connect the longitudinal pressure rail.

Connect the cables from the WeldMaster and weld the casing joint as usual.



Leakage test, foam and seal the filling holes according to the same instructions as those for standard joints.



Installing BandJoint - Bevelling

Bevelling

At some positions bevelling the service pipe is allowed for minor directional changes.

When bevelling, always use a standard casing joint, as longer casing joints will result in insufficient insulation on the outside.

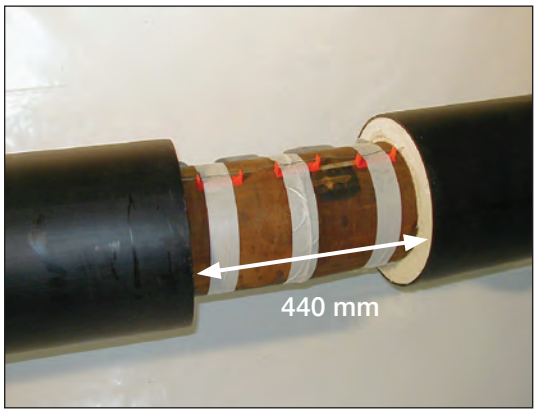
When a BandJoint is used in connection with bevelling, the pipe work must be adapted in accordance with the table below.

Max. bevelling, °v	BandJoint
0	ø 90-1400 mm
1	ø 90-1400 mm
2	ø 90-1400 mm
3	ø 90-710 mm
4	ø 90-500 mm

Installation instructions when bevelling

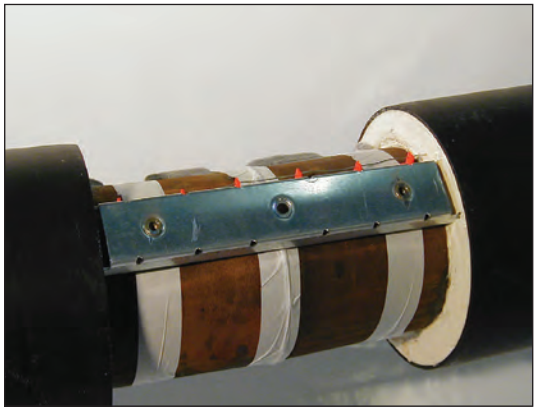
Check the distance between the exterior of the outer casings. After welding, the distance must not exceed 440 mm.

After thorough cleaning with alcohol and grinding, as described in the instructions under “Preparing the joint location”, installation of the BandJoint can start.



Installing depth guard

Install the depth guard on the outside to make room for the longitudinal pressure rail.

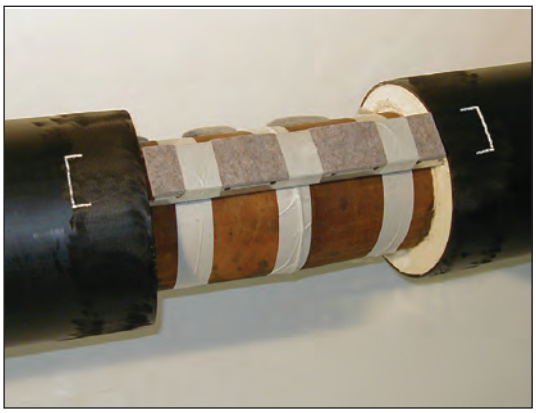


Installing BandJoint - Bevelling

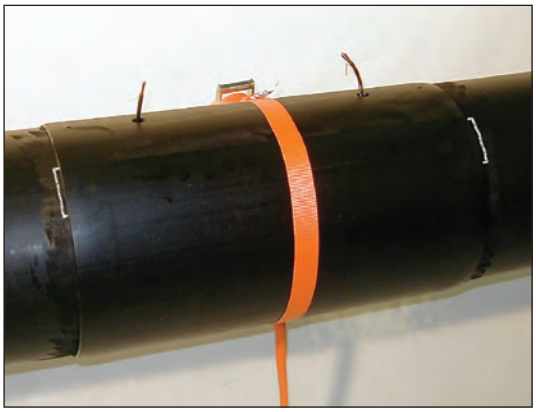
Installing depth guard, ***continued***

Install the depth guard just under the outer casing and tighten the screws lightly, attach the felt and mark the location of the depth guard on the casing, using the template.

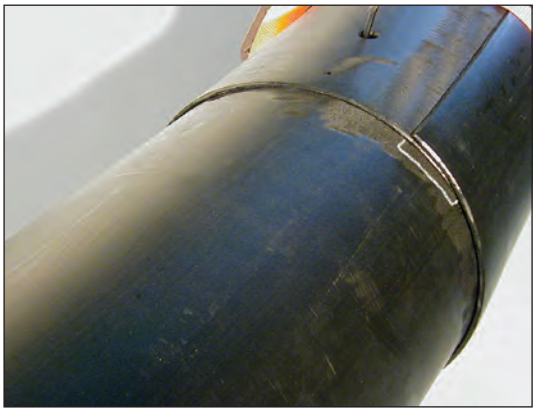
There must not be marking chalk in the weld zone.



Pull the BandJoint over the pipe and fix it with a strap.



In order to establish the best possible contact between the wires in the BandJoint and the outer casing, tighten and knock thoroughly with the synthetic hammer.



Longitudinal and circumferential pressure bands can now be installed in the same way as described for a normal standard BandJoint. (See instructions under “Installing pressure bands”).

Connect the longitudinal pressure rail.

Connect the cables from the WeldMaster and weld the casing joint as usual.

Installing BandJoint - Bevelling

Installing depth guard, ***continued***

After welding, proceed according to the instructions under “Leakage test” and “Insulating and sealing holes”, page 2.6.1.

Repairing the outer casing

Repairing the outer casing

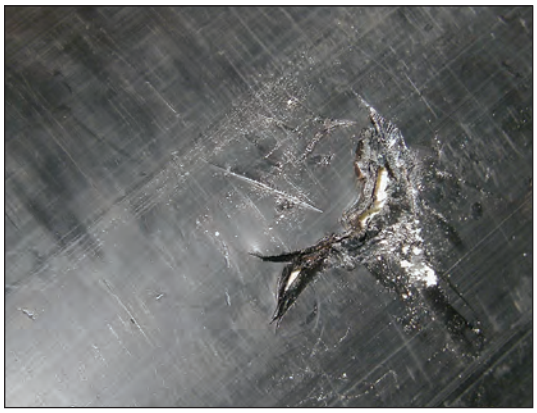
Minor mechanical damages to the outer casing can be repaired, using conical plugs.

In case of major damages, remove the outer casing and foam, and install a BandJoint in the length required.

(Refer to the table for cutting and total lengths of the casing joint p. 2.7.1).

Repair, using plugs

Repair, using max. 10 plugs is acceptable; if more are required, it is recommended to cut out for a casing joint that fits the damage.



Drill a conical hole for the welding plug where the crack starts and ends to stop the notch.

Weld plugs.
Remove beads from the plug and casing to make room for the conical drill.

Repair, using plugs, ***continued***

Now drill and weld the number of plugs, required to close the crack.

Weld the plugs, so they overlap.

Repair, using a BandJoint and an intermediary repair piece

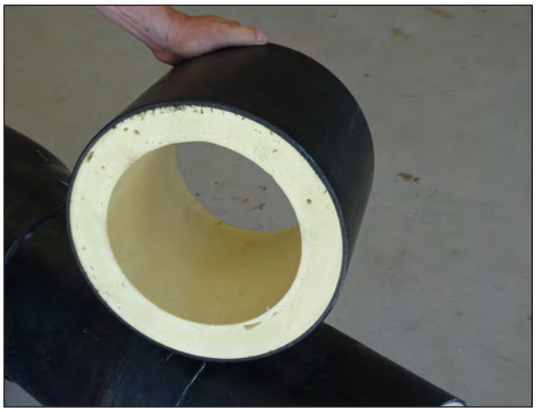
Any BandJoint lengths can be used for repairs.

If the longest BandJoint is not long enough, use an intermediary repair piece and two casing joints.

The intermediary repair piece is 900 mm and is shortened to the required length.

The intermediary repair piece has holes for the alarm wires.

Strip the outer casing in a length that matches the intermediary repair piece and the two casing joints according to the table on p. 2.7.1.



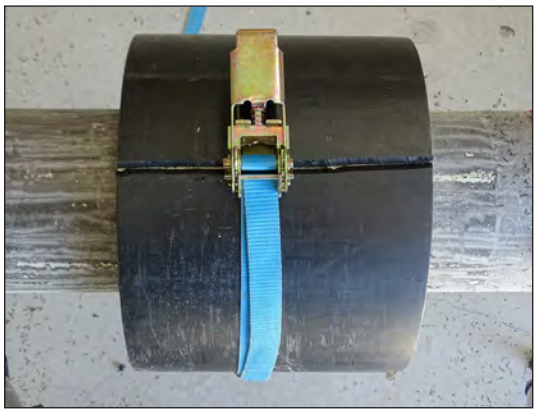
Split the intermediary repair piece lengthwise and cut the opposite insulation out for the outer casing. (I.e. a slot).

Repair, using a BandJoint and an intermediary repair piece, ***continued***

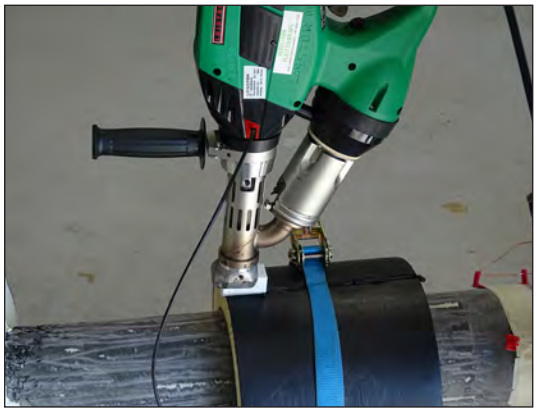
Pull the intermediary repair piece over the service pipe.

Fix the intermediary repair piece with a strap.

Mill the cut and prepare it for extrusion

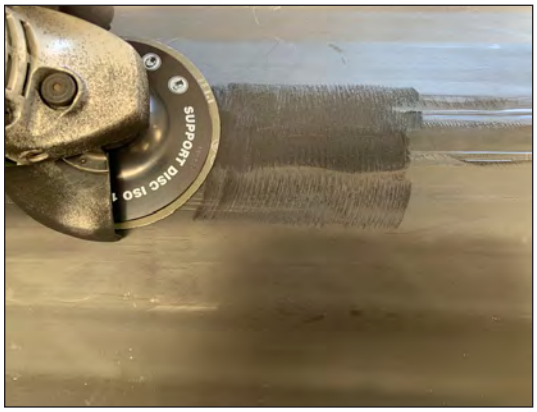


Make 2 spot welds with the the extruder.



When the extrusion has cooled down, remove the strap and finish the extrusion welding.

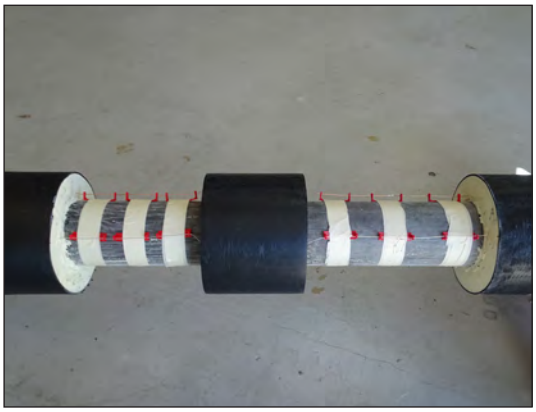
After cooling grind the instalaltion zone.



Repairing the outer casing

Repair, using a BandJoint and an intermediary repair piece, ***continued***

The pipe is ready for the installation of two casing joints.



Casing joint installation - report

JOINT INSTALLATION **REPORT** Page no.: _____	Job site address: _____ _____	Customer/Contractor: _____ _____	LOGSTOR

Joint type	Dim. Casing pipe	Joint no.	Surveillance system: Continuity resistance	Surveillance system: Insulation resistance	Joint file no.	Leak test	Foam-ing	Visual accept	Comments
		F							
		R							
		F							
		R							
		F							
		R							
		F							
		R							

JOINT TYPE		**LOGSTOR Surveillance System**	Responsible fitter wires:	Responsible fitter joint:	Responsible fitter foaming:	Inspector:
01: SX	07: SXT					
02: BX	08: T2S	01: Logstor Detect □	Date:_____	Date: _____	Date:_____	Date:_____
03: B2S	09: SXB	02: Brandes □				
04: BS	10: EW	03: HDW □				
05: C2L	11: BJ	04: Others	Sign.:_____	Sign.: _____	Sign.:_____	Sign.:_____
06: SXB	12: PJ					

BandJoint - Rewelding casing joints

Rewelding the casing joint

There are the following reasons why it may be necessary to reweld a casing joint:

1. If the weld time does not comply with the acceptance criteria in the PDA
2. If the effect does not comply with the acceptance criteria in the PDA
3. There are no visible indents from the pressure band in the weld zone
4. If the two inspection holes in the weld zones are not filled with melted PE
5. If the leakage test indicates that the casing joint is not tight.

If one or more of the above acceptance criteria are not met, the casing joint may be rewelded max. 3 times.

However, in case of impurities in the welding surfaces, for example sand, rewelding will do no good.

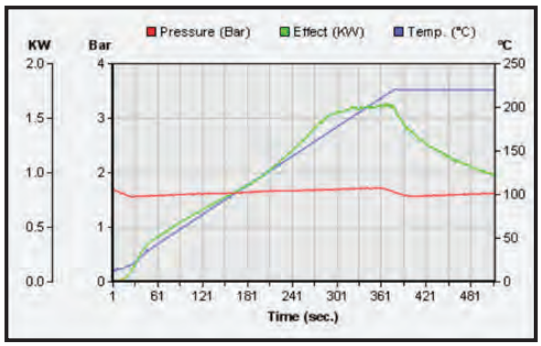
Before rewelding, the casing joint must have cooled down to the ambient temperature. Rewelding can only be done, if the temperature, indicated by the PDA is lower than the ambient temperature ± 25°C. If the temperature is higher than that, rewelding is not permitted.

Type	From ø mm	To ø mm	Weld temperature °C
BandJoint STD, XL	90	200	200
BandJoint 630/1020	225	1400	220

BandJoint - Typical welding cycles

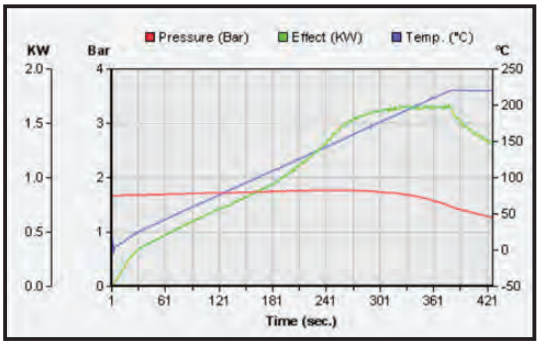
Typical welding cycles

Correct weld cycle for BandJoint ≥ ø225 mm.



The weld time has not been obtained.

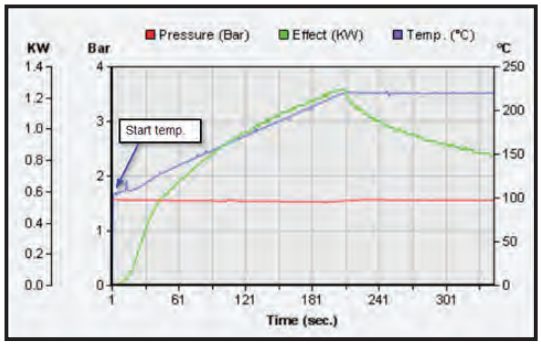
Rewelding is possible



The effect has not been obtained.

The start temperature is too high. This indicates that there were broken wires before weld start.

The casing joint must be discarded.



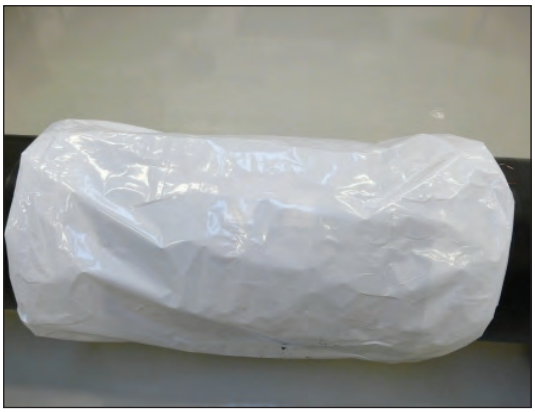
Installation instructions

The EWJoint includes:

1. Shrink sleeve
2. Welding strips with 2D bar code
3. Venting plugs / Welding plugs, delivered in a bucket

INFO:
Leave the wrapping foil on the sleeve until installation to avoid exposure to sunlight and heat.

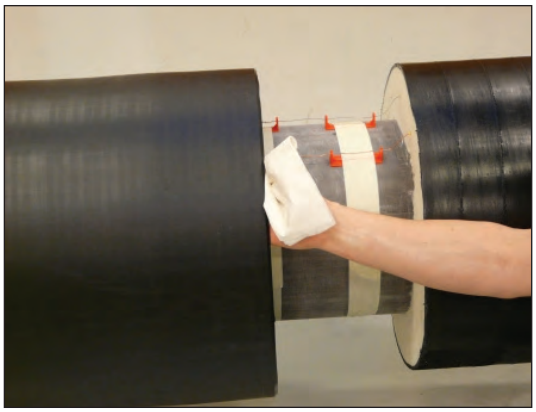
The shrink sleeve remains in the wrapping foil.



After thorough cleaning and grinding as described in the section ”Preparing joint location” the installation af the EWJoint can begin.

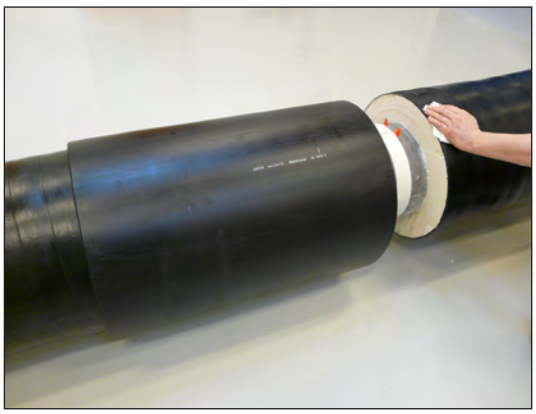
Remove moisture with a gas flame by pre-heating the casing to 20-30°C before grinding.

Remove the packing from the shrink sleeve. Do not use cutting tools.



Leave the packing on the pipeline. Pull the sleeve half-way onto the joint and clean the inside of the sleeve carefully with min. 93% alcohol.

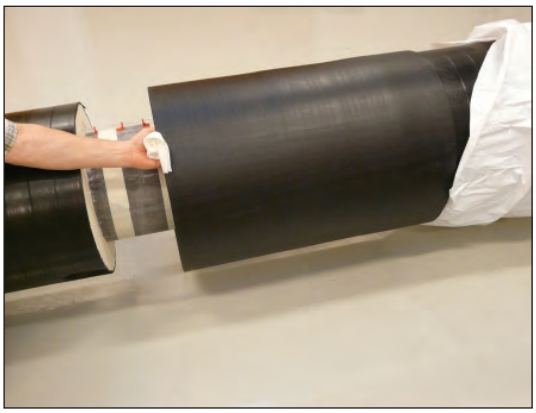
Clean the foam surfaces and the end of one of the casing pipes in such a way that the sleeve can be pulled onto a totally clean casing pipe, i.e.
the length of the sleeve + 200 mm.



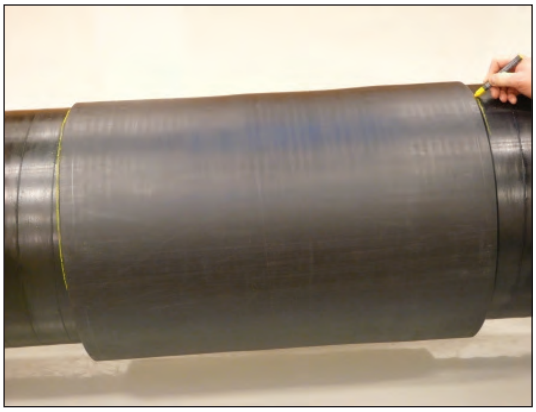
Installation instructions, ***continued***

Pull the clean sleeve end onto the cleaned pipe end.
Clean the inside of the other sleeve end carefully, using 93% alcohol.
Check that the inside and outside of the sleeve are CLEAN and DRY.

Clean the other casing pipe at least to a distance of 300 mm from the pipe end.



Place the sleeve over the middle of the joint. Mark both joint ends on the casing pipes and mark the joint and the casing at the 12 o'clock position.

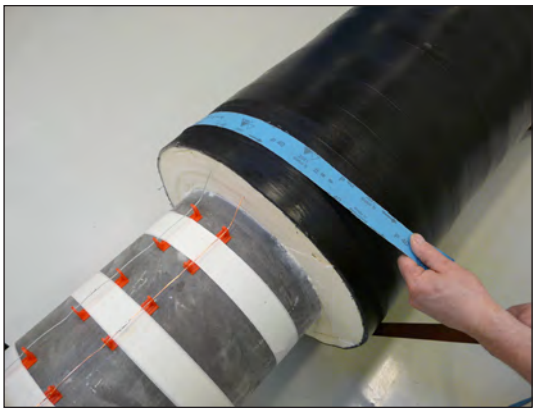


Pull the joint onto the cleaned end.

Grind the casing pipes thoroughly with grind/ diamant disc or abrasive cloth, grain size 36.

Grind extra 20 mm of the contact surfaces of the shrink sleeve so grinding marks are visible outside the sleeve rim. (This enables visual inspection of the activation by the supervisor).

Check that the entire circumference has been ground.

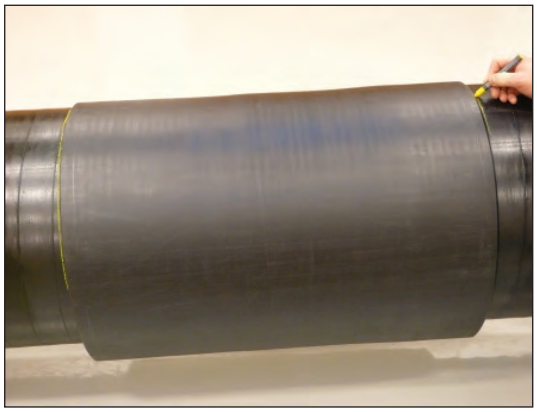


Mark the position of the welding strips at the distance X.
D≤ 800 mm. → X = 20 mm,
D > 800 mm. → X = 30 mm.

Installation instructions, ***continued***

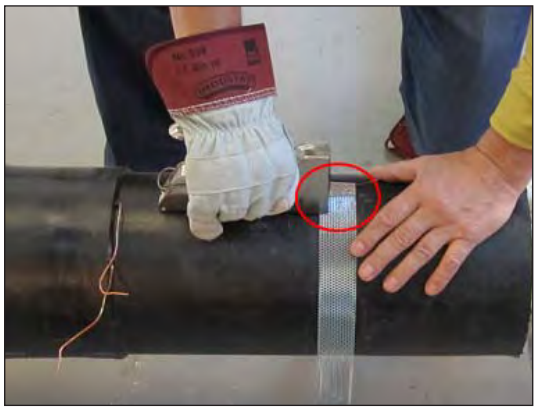
Place the joint against the marking on the casing and use the joint end to mark all the way round.

There must not be marking chalk in the weld zone.



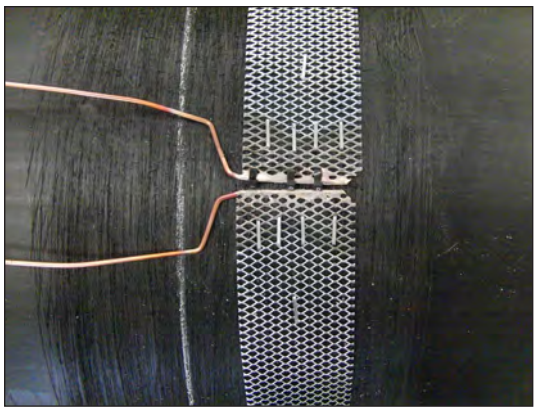
Fix the welding strips with staples as indicated in the picture and with staples spaced 250 mm apart round the casing pipes.

As regards size of staples and staple gun, see p. 6.3.2 ”Trailer equipment”.



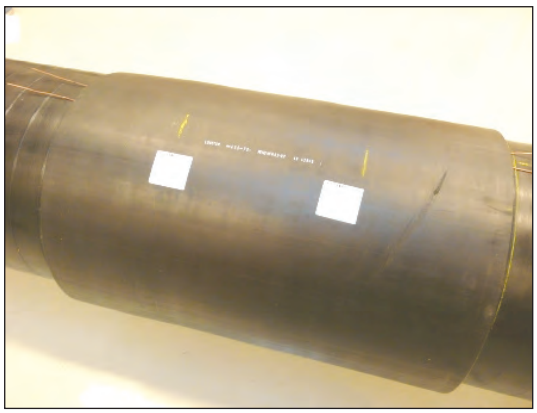
Position of staples in the welding strip:

Stretch the welding strips to the extent where they are close to but DO NOT touch each other (3 mm).



Pull the joint in place between the markings.

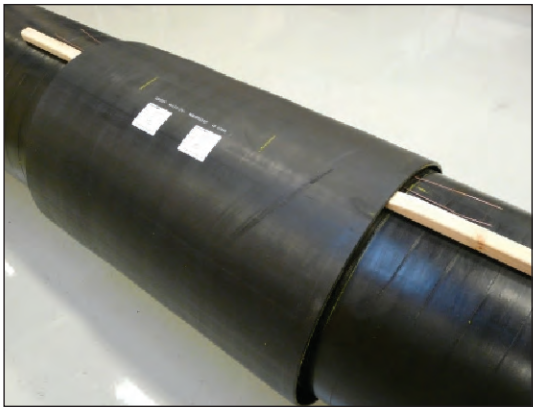
Dismount the 2D bar code from the welding strips and fix them on the joint for reading with the PDA.



Installation instructions, ***continued***

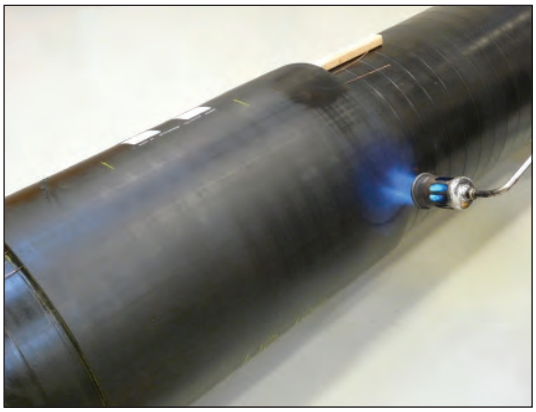
Use wooden wedges for centering of the joint to the casing pipe, if necessary.

The wooden wedges must not cover the welding strips.



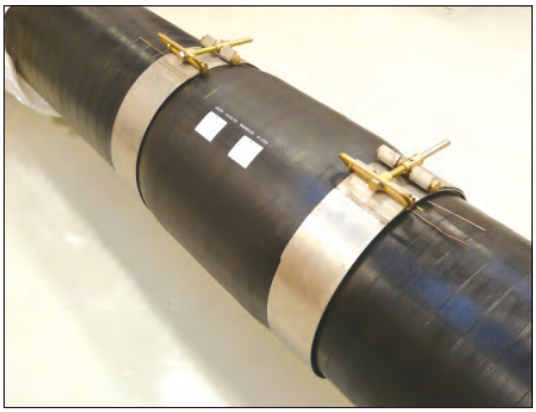
Shrink the sleeve ends, until they have full contact with the welding strips and casing.

Ensure that the copper terminals cannot melt into the outer casing by lifting them a bit.

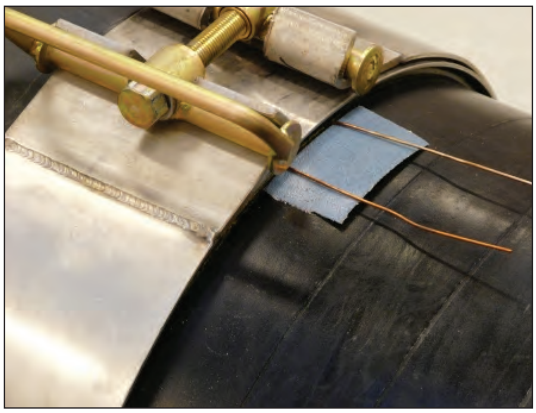


Mount the clamps, so that they exceed the joint ends by 5 – 10 mm.
Tighten the clamps so that the casing is only just deformed.

Has the joint become cold, reheat it before installing the clamps.
This prevents melted PE at the joint ends.



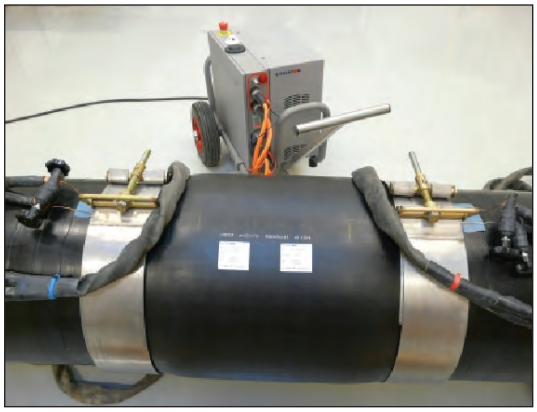
Mounting a piece of emery cloth under the terminal threads prevents them from melting into the casing pipe.



Installation of EWJoint, mechanical pressure tool

Installation instructions, ***continued***

Fasten the welding clamps on the uppermost ends of the terminal threads.



Hold the upper part of the PDA over the label.

Press ”scan” and data about casing joint type, diameter, and resistance are automatically entered.

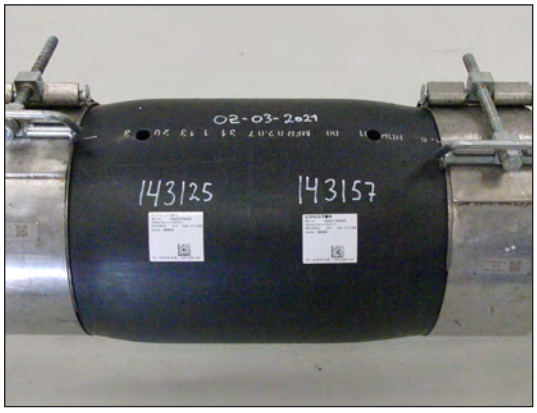
When manually entering dimensions ø630 to 800 with a 40 mm wide welding strip in the PDA, EW-W40 must must be chosen.

Start welding.

The 6-digit weld file MUST be noted on the casing joint for traceability purposes.

WeldMaster stops automatically when the welding is finished.

Remove the clamps once they are ≤ 80°C warm.



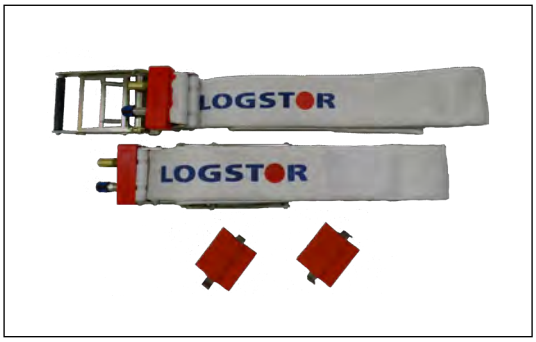
Installation of EWJoint, flexible pressure tool

Pressure tool contents

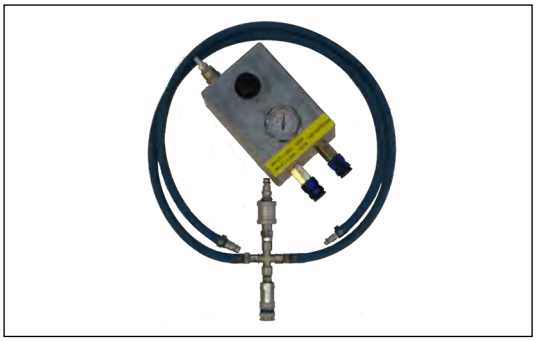
Handle with pressure bands for flexible tool ø225 – 800.

All pressure bands are equipped with a safety valve.

Support wedges for handles.



Pressure tube and reduction box for flexible pressure tool.



Maintenance

At regular intervals inspect tubes, tools, and safety equipment for damage.

Minimum every third month inspect the pressure bands which are used regularly for damages and leaks.

Pay special attention to the fold at both sides of the pressure bands as regards leaks.

Check for leaks by adding air pressure and use leak spray.
Likewise check the pressure band for wear on the side, facing the casing joint.

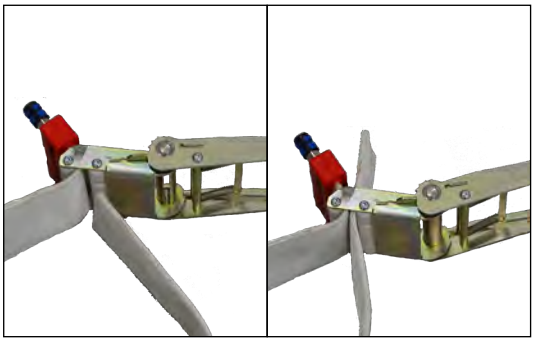
Register, that the pressure band has been inspected - by entering the date on the pressure band or under comments in the casing joint installation report.

Regularly check the tool for visible damages, including safety valve and handles.

Installation of EWJoint, flexible pressure tool

Installing circumferential pressure tube in buckle tool

Insert the circumferential pressure tube in the handle for the flexible pressure tool as illustrated.



Installing EWJoint

Install the EWJoint in accordance with Weld Joint Manual p. 3.1.1-3.1.4.

It is recommended to install tape in the weld zones to ensure a long service life of the pressure tubes. Remove the tape, before leakage testing.

Now install the flexible pressure tool as described in the following.

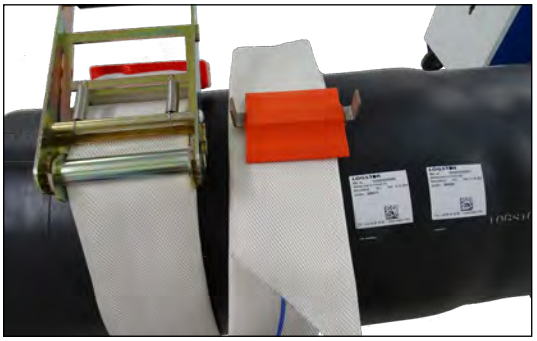
Installing pressure tool

Place the handle with the pressure tube as illustrated.

Pull the pressure tube around the pipe and insert it back into the handle.

Make sure the pressure tube is not twisted.

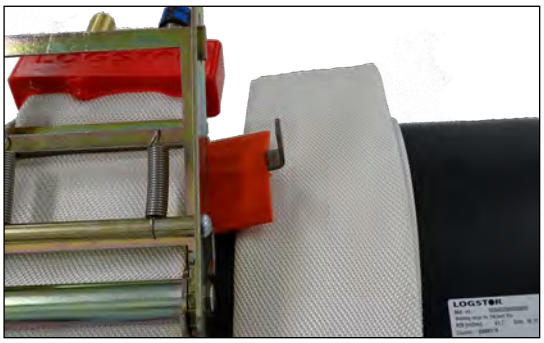
Place the wedge as illustrated.



Installation of EWJoint, flexible pressure tool

Installing pressure tool, ***continued***

Push the wedge between the two rollers.



Place the pressure tube so it is flush with the rim of the casing joint.

When the pressure tube has been placed in the handle and tightened, the steel bracket of the wedge must be between the two bolts on the handle.

Pull the pressure tube tight. Check that the tube is flush with the rim of the casing joint.

Tighten the tube with a pull of approx. 15-20 kg.

Repeat the procedure at the other end of the casing joint.

Be careful not to damage the terminals on the casing joint.

When the flexible pressure tool has been correctly installed as illustrated, connect the compressed air tubes.

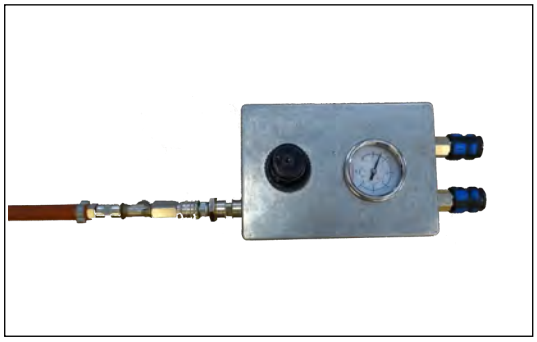
Installation of EWJoint, flexible pressure tool

Connecting pressure tubes

Connect the red tube (high pressure) to the reduction box.

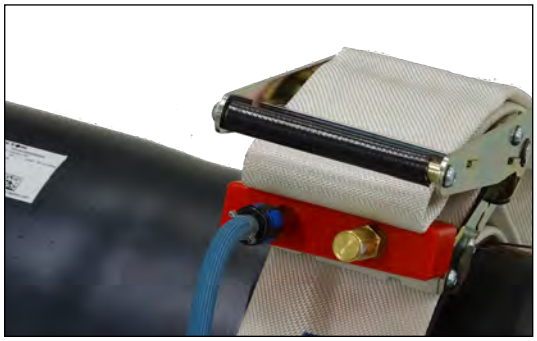
Adjust the pressure on the reduction box to 1.5 bar. The pressure on the reduction box is guiding.

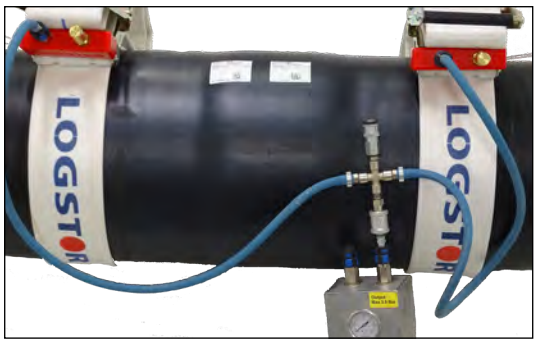
When the PDA is connected, check the pressure according to the PDA.



The valve of the distributor must be in closed position, until all pressure tubes have been connected.

Install the blue tubes on the longitudinal pressure bands.





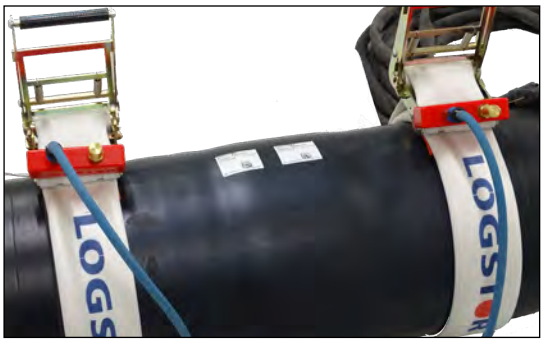
Installation of EWJoint, flexible pressure tool

Connecting pressure tubes *continued*

Connect the last coupling from the 3-way-valve to the WeldMaster/WeldMaster Light with a blue tube in the necessary length.

When all tubes have been connected, open the valve, so the pressure bands are pressurized.

Check that:
- both pressure bands are pressurised
- the pressure bands are placed correctly
- the pressure bands are not in contact with the terminals



Connect welding cables and sense cables to the front of the WeldMaster/WeldMaster Light.

Connect the two cables from the WeldMaster/WeldMaster Light to the terminals in the casing joint - take care to make a good connection. Fasten the clamps.

Check that the pressure on the PDA is 1.5 bar. The WeldMaster/WeldMaster Light monitors that the pressure is within the allowable tolerances during the weld process (1.4 – 1.7 bar).

Hold the upper part of the PDA over the label.

Press ”scan” and data about casing joint type, diameter, and resistance are automatically entered.

Start welding.

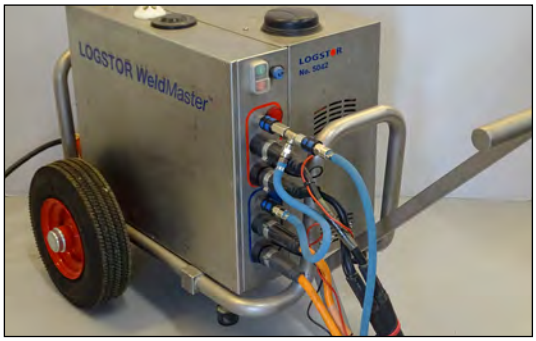
The 6-digit weld file MUST be noted on the casing joint for traceability purposes.

Installation of EWJoint, flexible pressure tool

Connecting pressure tubes *continued*

When using WeldMaster Light one side can be welded at a time.

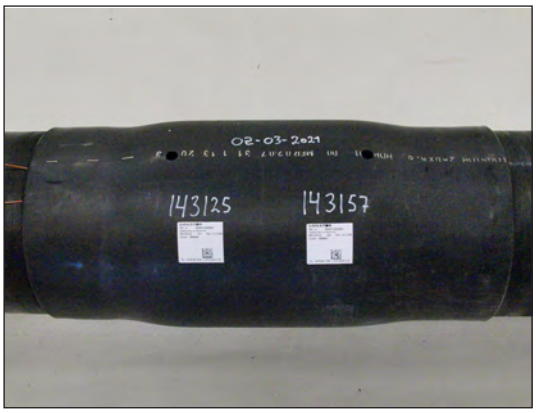
When using WeldMaster both sides of the EWJoint can be welded at the same time.



Now continue the installation as described on p. 3.1.6 - 3.1.13.

Installation instructions, ***continued***

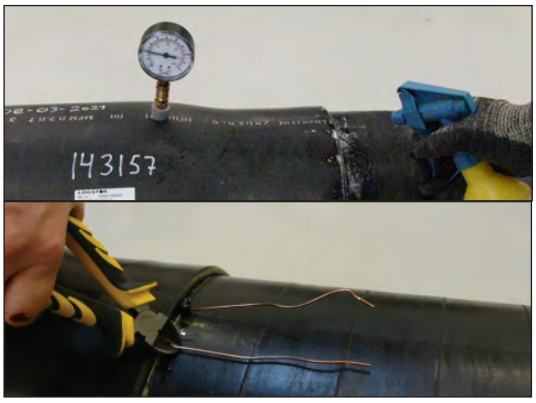
Drill two ø 17,5 holes at the highest spot as close as possible to the casing joint ends



Perform a leakage test at 0.2 bar.

Check the plastic welds with a leak detector and visually check the plastic welds for air bubbles.

Cut the terminal threads at the sleeve edge, when the joint has been leakage tested and is leakproof.

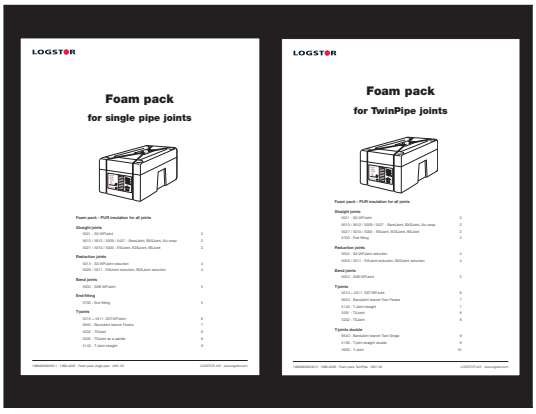


Refer to the foam pack instructions.

It is recommende to pull the plastic foil back over the casing joint after foaming and leave it there, until the weld plugs are to be installed.

If the ambient temperature is > 30°C on foaming and foaming at lower temperatures are preferred the foam holes should be sealed with tape.

The plastic foil must be removed prior to backfilling the trench.



Installation instructions, ***continued***

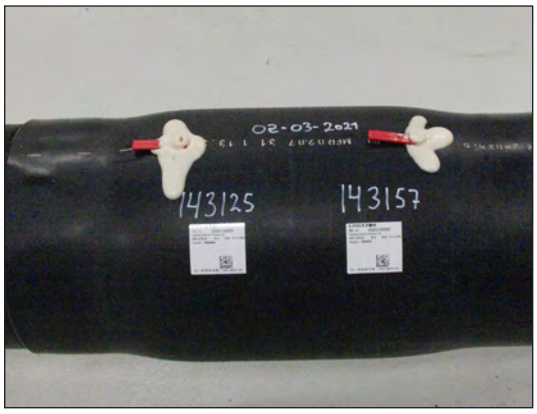
In general foaming is to be carried out in accordance with Handling & Installatin section 7 ”Insulating joints”.

If 2 foam packs are required per casing joint, preparations must be made, so they can be filled into the joint immediately after each other. Use the smallest foam pack first. It may be an advantage to be 2 per-sons to carry out the task.

If 3 or 4 foam packs are required per casing joint, an additional venting hole must be be drilled. Remember to order an additional plug set.

Drill a hole on each side of the casing joint, 150 mm from the edge, and a hole in the centre of the joint.

Mix the foam pack as specified and insert the venting plugs into the filling holes, using a hammer.



10 minutes after foaming the venting plug can be turned halfway round to facilitate the later dismantling of the venting plug.

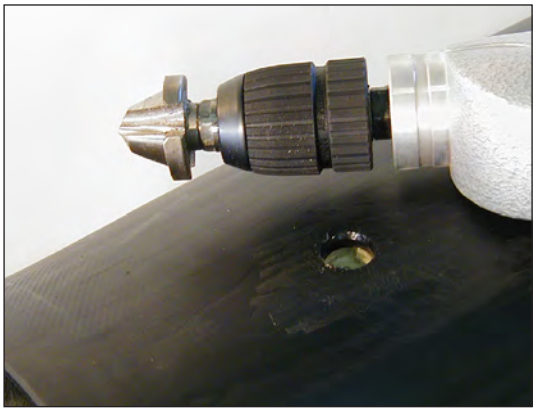
After min. 30 minutes’ curing, the venting plugs can be removed, using a flat crowbar.

Installation instructions, ***continued***

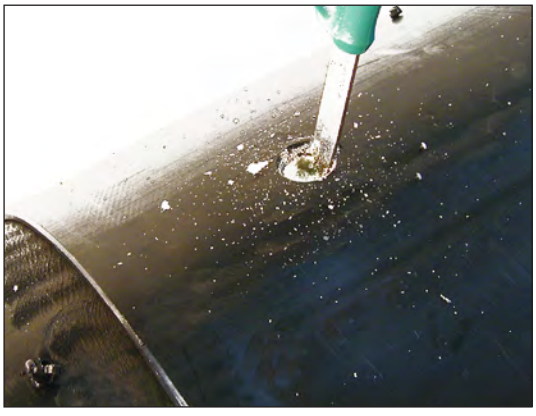
Use a knife to remove foam remnants around the filling hole.

Connect the plug box to 230V supply. Ensure that the plug welder has reached 250°C (482 F), before using it to butt weld the conical plugs.

The plug box contains conical drills in three sizes: 35 mm, 43 mm and 50 mm.
The 35 mm drill is used to seal filling holes.
The 43 mm drill is used for repairs when the weld of a 35 mm plug cannot be approved.
The 50 mm drill is used for cable connections.
Mount the proper drill in the drilling machine.
Drill until you reach the stop position on the conical drill.
The 50 mm cable connection requires open welding mirror.



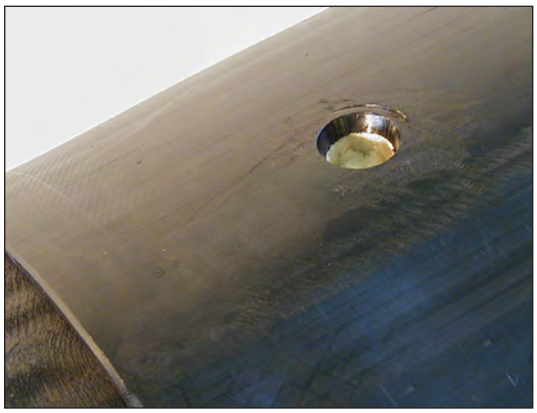
Use a knife to remove foam from the drilled hole, thus ensuring sufficient room for the plug welder.



Installation instructions, ***continued***

Remove foam remnants to prepare the hole for welding the conical plug.

Clean all surfaces in the welding zone (casing joint and weld plug) with alcohol.



Adjust the plug tool from the plug box by adjusting the vertical lever to the actual casing joint dimension, so the top of the weld plug follows the outline of the casing joint.

When the plug welder has reached a temperature of 250°C (482 F), place the conical plug in the cup and the opposite part in the conical hole.

Installation instructions, ***continued***

When the plug welder fuses PE plug and joint materials, lips form. It is important to keep the plug welder steady.

Heat the hole edge by pressing the plug welder down. The weld plug and the foam hole are heated at the same time to the correct temperature with the plug welder.
When the flat side of the press plug welder is 1-2 mm above the casing joint and the plug has sunk approx. 1 mm, the pressure is relieved approx. 10 seconds.

Remove the heated plug from the cup using the plug tool; remove the plug welder from the hole and press the plug downwards until the legs rest on the outer casing and the upper edge of the plug is flush with the surface of the casing joint (max 1 mm above).

The plug must NOT be pressed further down. The pressure must be constant and held still for at least 1 min.

There must be 2 beads regularly spaced around the plug.

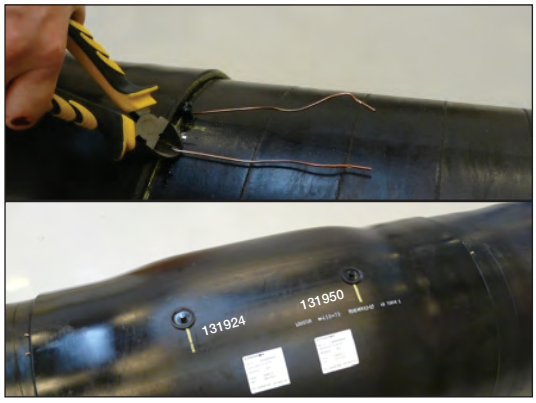
Repeat the process with the other plug.

If the butt welding operation has been carried out properly, lips have generated from the plug and the joint materials, indicating proper heating of the materials.

Installation instructions, ***continued***

Check the joint.

Criteria for approval of EWJoints:
- No visible welding strips
- No excessive local melting
- Minor deformations from the pressure band may occur, but not major local deformations.
- No excess foam at joint ends or welding plugs



The PDA has approved the welding process according to the acceptance criteria.

Manual inspection points in the PDA have been entered
- inspection of alarm wires
- leakage test has been carried out
- inspection of foaming
- visual inspection of the casing joint

Criteria for approval of welding plug:
- Two visible beads

The joint is finished.

Rewelding EWjoint

There are the following reasons why it may be necessary to reweld a casing joint:

1. The welding time does not comply with the acceptance criteria of the PDA
2. The offset effect does not comply with the acceptance criteria of the PDA
3. There are no visible deformations from the pressure band in the welding zone
4. If the leakage test indicates that the casing joint is not tight.

If one or more of the above acceptance criteria are not met, the casing joint may be rewelded max. 3 times.

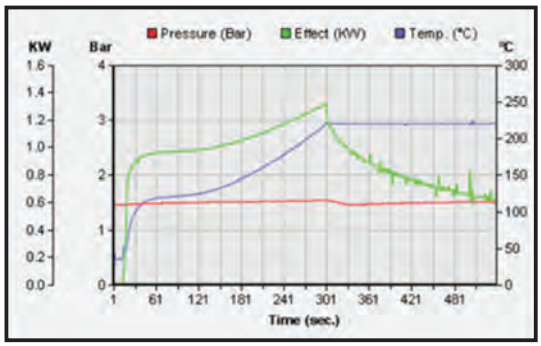
In case of impurities in the welding surfaces, for example sand, rewelding will do no good.

	From ø mm	To ø mm	Weld temperature °C
EWJoint	90	560	220
	630	1000	220
	1100	1400	220

Installation of EWJoint, typical welding course

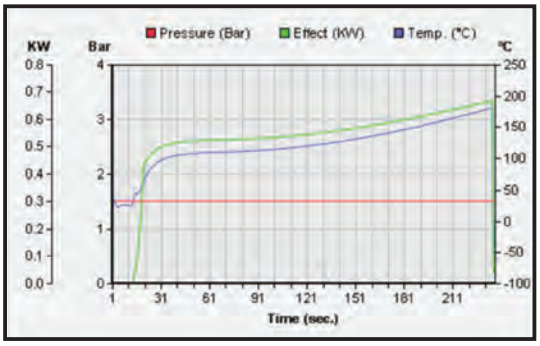
Typical welding course

Correct weld course for EWJoint.



The weld time has not been obtained.

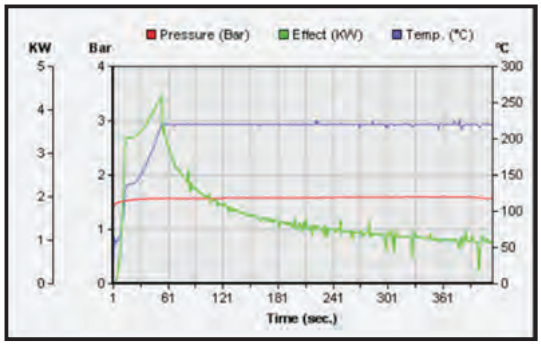
Rewelding is possible



The effect has not been obtained.

Possible reasons: The joint is not in close contact with the outer casing or a wrong joint dimensionhas been selected.

After cooling to minimum 80°C the joint can be rewelded.



JOINT INSTALLATION **REPORT** Page no.: _____	Job site address: _____ _____	Customer/Contractor: _____ _____	LOGSTOR

Joint type	Dim. Casing pipe	Joint no.	Surveillance system: Continuity resistance	Surveillance system: Insulation resistance	Joint file no.	Leak test	Foam-ing	Visual accept	Comments
		F							
		R							
		F							
		R							
		F							
		R							
		F							
		R							

JOINT TYPE		**LOGSTOR Surveillance System**	Responsible fitter wires:	Responsible fitter joint:	Responsible fitter foaming:	Inspector:
01: SX	07: SXT					
02: BX	08: T2S	01: Logstor Detect □	Date:_____	Date: _____	Date:_____	Date:_____
03: B2S	09: SXB	02: Brandes □				
04: BS	10: EW	03: HDW □				
05: C2L	11: BJ	04: Others	Sign.:_____	Sign.: _____	Sign.:_____	Sign.:_____
06: SXB	12: PJ					

TSJoint with mastic - Installation instructions

Application

TSJoint with mastic is primarily used for branching to FlexPipe and FlextraPipe.

Main pipe dimension: 140-450 mm
Branch dimension: 90-125 mm and
140-160 mm

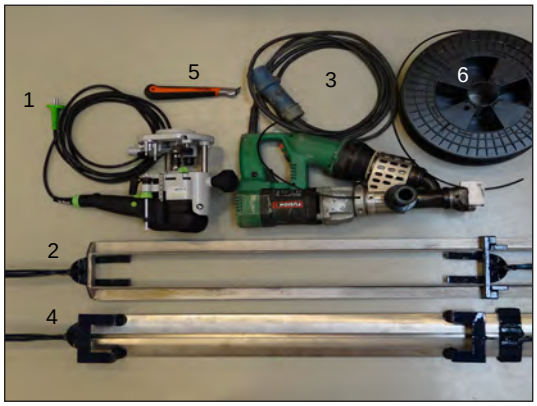
Tools

Use the following tools to install TSJoint with mastic:

1. Alcohol, min. 93%
2. Stripping tool/saw
3. Leakage test equipment
4. Plug retaining tool
5. Plug welder
6. Emery cloth:
   grain size 60 :ø90 - 280
   Emery cloth or grind disc
   grain size 36: ø315 -450
7. Indian ink
8. Hammer
9. Gloves
10. Temperature measuring device
11. Folding ruler
12. Gas burner:
    Ø 50 mm: ø90 - 280 mm
    Ø 60 mm: ø315 - 450 mm

Extrusion welding equipment

1. PE milling machine
2. PE router fence
3. Extrusion welder
4. Installation rail for extrusion welding
5. Triangular scraper
6. PE-wire



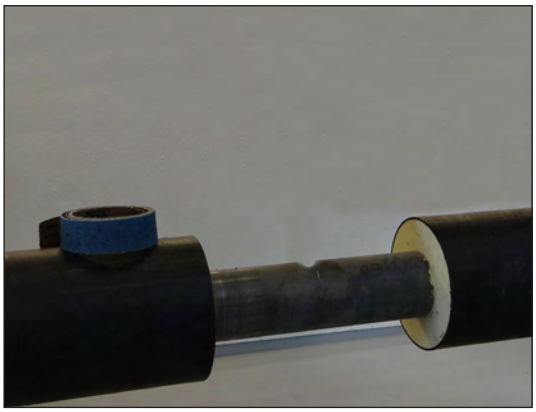
TSJoint with mastic - Installation instructions

Installation instructions

1. Cut off approx. 400 mm of the outer casing and insulation.

   Take care not to damage alarm wires, if any.

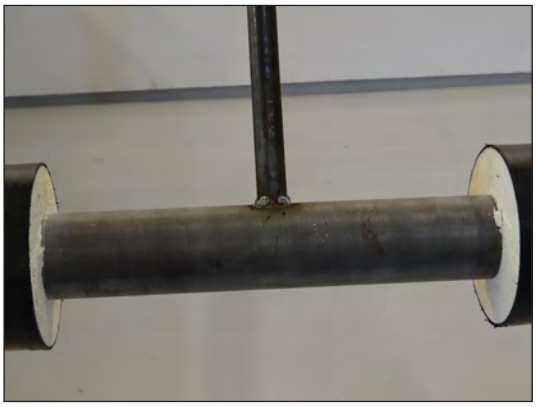
   Remove insulation remnants from the service pipe.



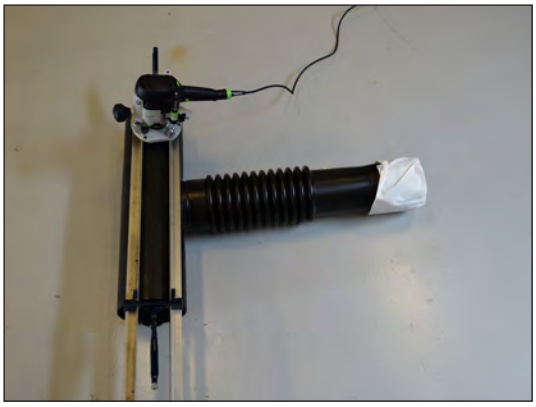
2. Weld the connecting piece onto the main pipe.

   Shortening measurements in accordance with enclosed instructions for steel connecting pieces.

   At hot tapping valves, if any, the spindle must be parallel with the main pipe.



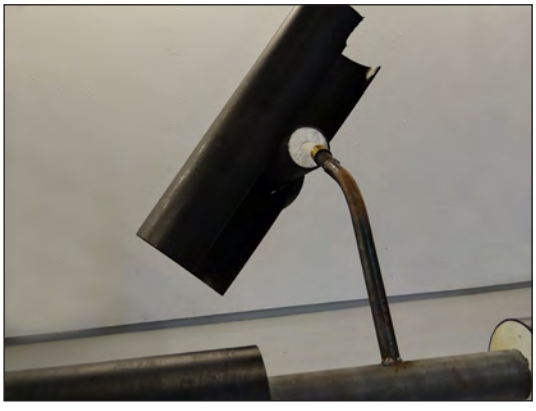
3. Install the router fence on the main pipe and cut the T-shoe bottom, so the longitudinal weld is placed in approx. 2 o'clock position.



4. Pull the collar and the T-shoe onto the branch.

   If installation is not to take place immediately, the casing joint must be covered.

   Install the compression coupling, if any, on the branch or weld the connecting piece and branch together.



TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

5. Remove insulation and casing joint from the branch to 220 mm from the weld.

6. Clean all surfaces in the jointing area. The surfaces must be CLEAN and DRY.

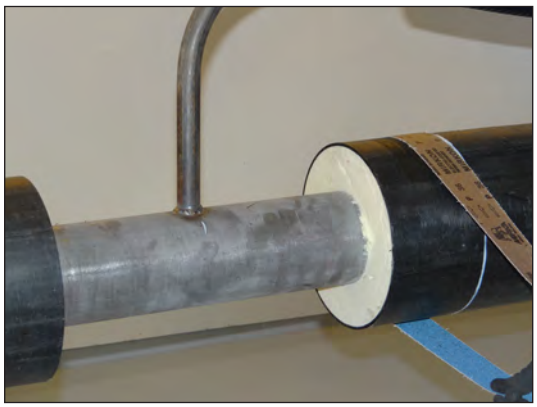
   Then clean the surfaces with alcohol.

7. Mark ½ a T-shoe length to each side of the connecting branch all round the main pipe.

8. Grind the contact surfaces of the main pipe and the branch with emery cloth, so grind marks are visible 20 mm outside the rim. This enables visual control of the grinding by the inspection.

   Remove the grind dust.

   Avoid touching the ground contact surfaces.

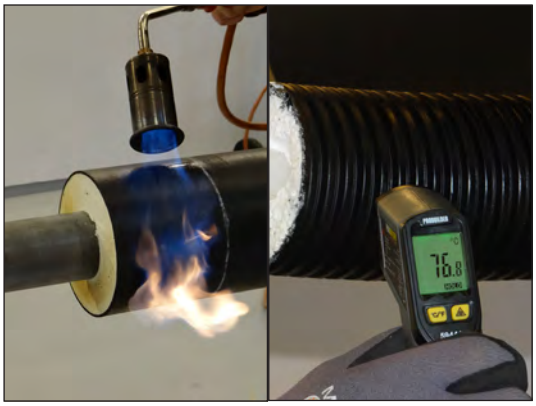


TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

9. Place the spacers in the middle of the bend and in the middle of the straight section.

10. Activate the contact surfaces with a gas burner to a suface temperature of min. 65°C.



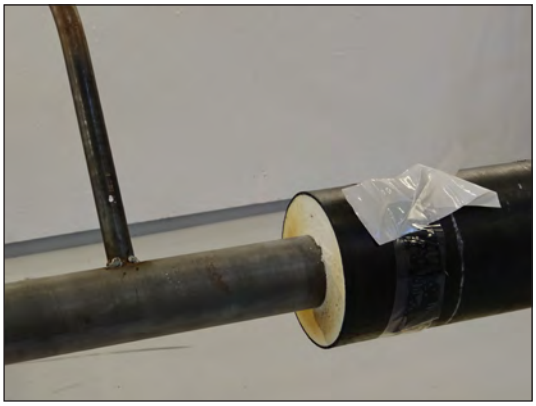
11. Install sealing tape around the casing pipes approx. 30 mm inside the markings.

    Unfold the protective foil towards the casing pipe.

    Squeeze the ends of the mastic tape together.

    Check that the casing joint is CLEAN and DRY inside.

    Clean with alcohol.



TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

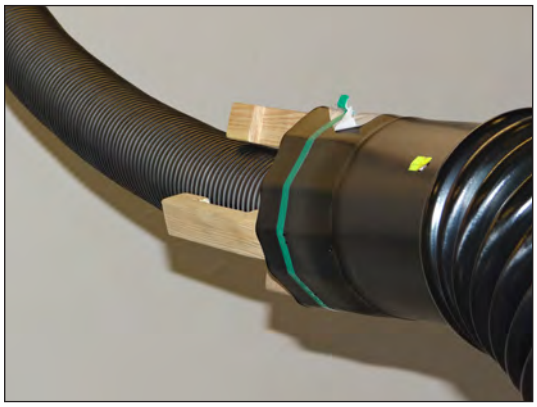
12. Heat the corrugation, until it is so flexible that it can be compressed und pulled over the branch.

    Unfold the T-shoe and pull it down over the branch.

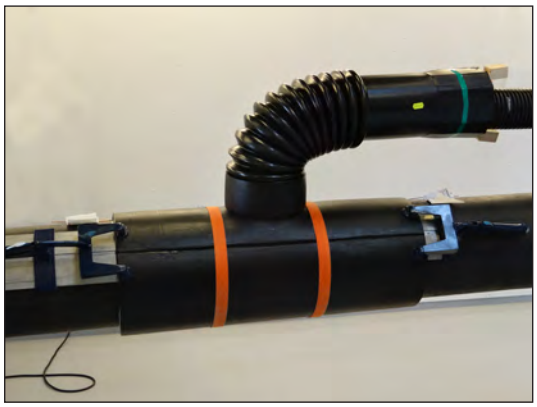
    Turn the T-shoe around, while pulling it down over the main pipe.

13. Centre the branch with wedges to keep it in position.

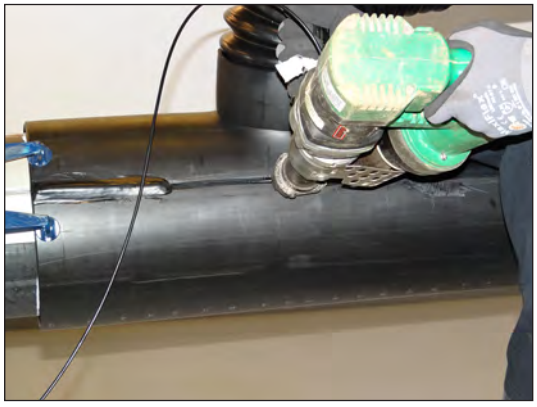
    Hold the T-shoe down, until the branch has cooled.



14. Place the rail for extrusion welding under the longitudinal joint. Fix it at both ends.



15. Extrusion weld the longitudinal joint in accordance with valid instructions.



TSJoint with mastic - Installation instructions

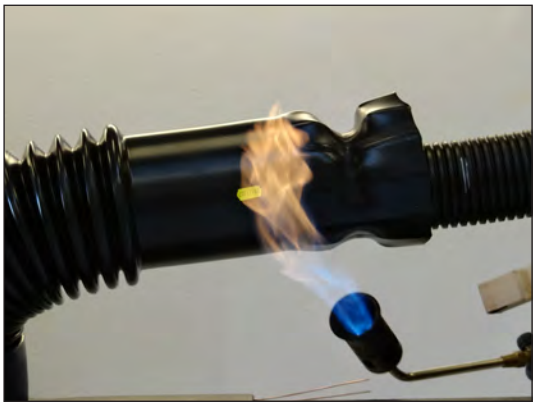
Installation instructions, ***continued***

16. Remove the cover from the sealing tapes on the branch. Check that all the cover has been removed.

    Possibly use heat shield to protect the corrugated flexible pipe.

    Shrink the shrinkable end of the branch.

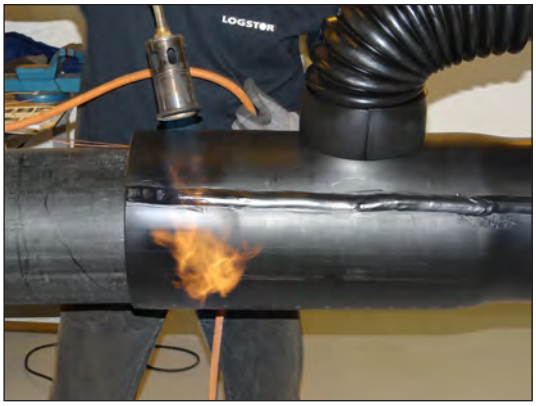
    Start shrinking at the underside.



17. Remove the cover from the sealing tapes on the main pipe. Check that all the cover has been removed.

    Shrink both ends of the T-shoe bottom, until full contact with the sealing tape and the outer casing.

    Clean the joint and casing and grind them as described earlier, so grind marks are visible 20 mm outside the rim of the open shrink sleeve.



18. Centre an open shrink sleeve over one end of the T-shoe bottom, so the thick end faces the T-joint.

    Centre the closure patch over the joint of the sleeve.
    Heat the closure patch, until a net structure becomes visible on the top side.
    Press the closure patch down.

    Use the gas burner to shrink from the T-shoe towards the casing pipe. The sealing compound must be visible at both ends in the entire circumference. The surface structure must be smooth after shrinkage.

    Repeat the process with the other shrink sleeve over the other end.

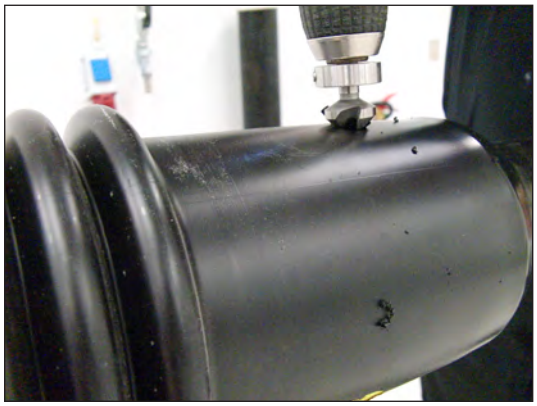
TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

19. Drill a ø25 mm hole in the branch. Use a drill with bit stop.

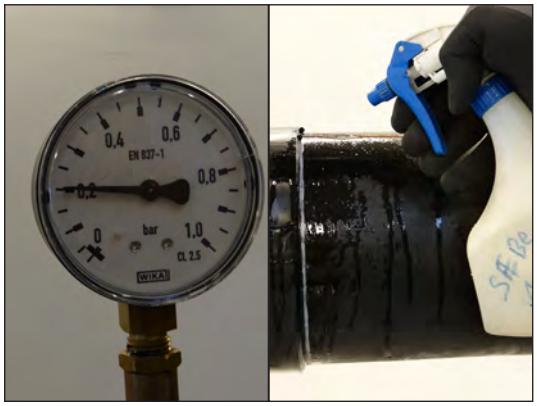
    Distance from the rim of the reduction: 30 mm.

    Drill two ø 17.5 mm holes in the T-shoe bottom: One at each end as close to the outer casing ends as possible - in approx 11 o'clock position for parallel branches and at the top for 45° branches.



20. When the T-joint has cooled (handwarm), leakage test at 0.2 bar.

    Inspect the casing joint ends visually using soapy water.



21. Install a venting plug in the hole in the branch and in one of the holes in the main pipe.

    Foam the casing joint in the last hole and install the last venting plug. Always foam at the lowest point and vent at the highest point.

    Wait at least 30 min. for degassing to complete.

    Remove the venting plugs by turning and lifting them.
    In general foaming is to be carried out in accordance with Handling & Installatin section 7 "Insulating joints".

    Remove excess foam or spillage, if any.

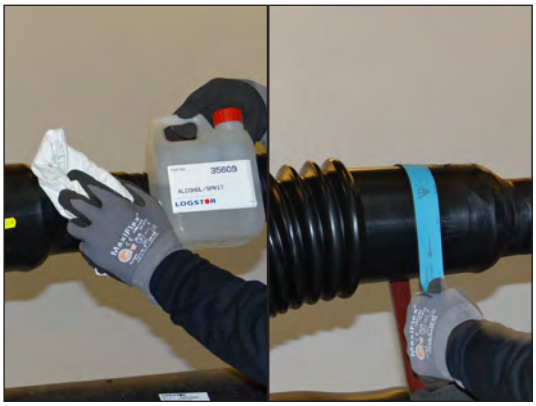
TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

22. Clean the contact surface of the collar on the branch of the T-shoe with alcohol.

    Grind the contact surfaces with emery cloth.

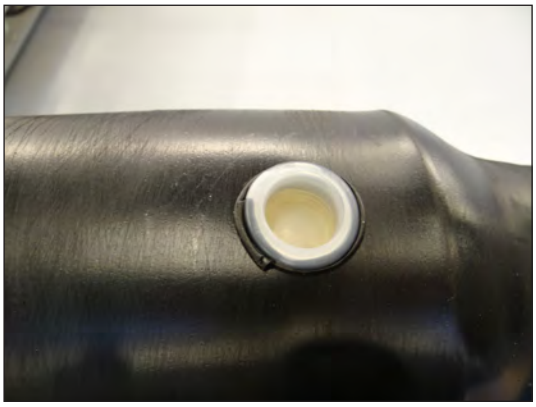
    Remove grind dust, if any.



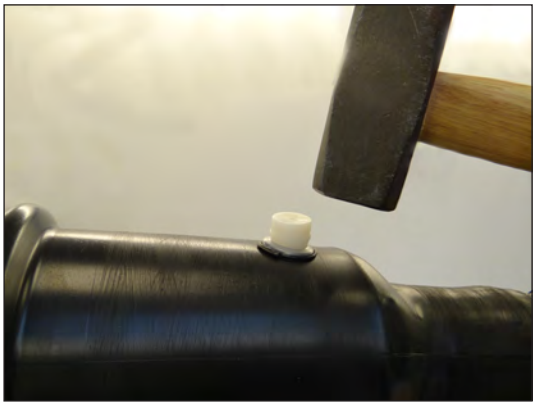
23. Remove the protective foil from the expansion plug and check the sealing compound.

    Shortly activate the area around the plug with a hard flame.

24. Insert the expansion plug in the hole and press, until the sealing compound is evenly distributed under the collar of the plug.



25. Centre the wedge plug in the expansion plug and drive it completely into the plug with a hammer.



TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

26. Activate the contact surface of the collar on the branch of the T-shoe with gas burner to a surface temperature of min. 65°C. Protect any FlextraPipe with heat shield.

    Remove pakaging and paper from the collar.
    Check that all paper has been removed.

    Place the collar approx. 50 mm over the expansion plug, and shrink it towards the branch.

27. Clean the rim of the hole and the joint surface around the two filling holes on the T-shoe.

    Mill the holes with a ø 35 mm conical miller.
    Remove any residues after milling.

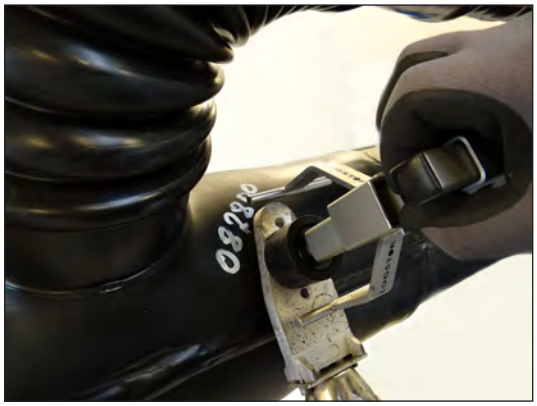
28. Adjust the plug retaining tool around the plug hole to the actual casing dimension.

    Insert the weld plug in the plug retaining tool and clean it and the plug hole with alcohol.

    Heat the plug welding tool to 250°C (482 F) .

29. Place the weld plug in the conical hole of the plug welder and the opposite side of the tool in the filling hole, so the weld plug and the rim of the hole are heated at the same time.

    When the flat side of the plug welder touches the casing joint and the plug has sunk approx. 1 mm, the pressure is relieved approx. 10 seconds.



TSJoint with mastic - Installation instructions

Installation instructions, ***continued***

30. Immediately press the weld plug into the hole.

    Before removing the plug retaining tool, hold the pressure constant yet soft for 1 minute, until the welding zone is hand-warm.

    There has to be 2 visiible beads all around the plug.

    Repeat the process with the other weld plug.

31. Inspect the T-joint.

    Criterion for approval of weld plug:
    - Two visible beads

    Criteria for approval of the longitudinal weld:
    - Filler material must fill the weld completely
    - The surface of the weld seam must be convex
    - The weld seam must be min. 10% and max. 40% of the wall thickness higher than the casing surface
    - An imprint of the extrusion shoe must be visible on both sides of the weld seam.

    The joint is complete.

    Visual inspection and documentation, if any, see the section ”General”.

TSJoint with welding strips - Installation instructions

Application

TSJoint with welding strips is primarily used for branching to FlexPipe and FlextraPipe, when a weld solution on the main pipe is preferred.

Main pipe dimension: 140-450 mm
Branch dimension: 90-125 mm and
140-160 mm

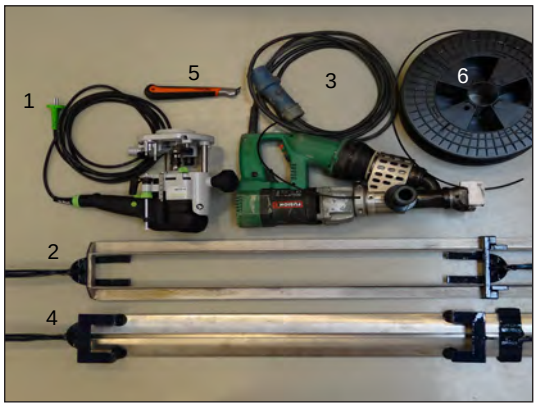
Tools

Use the following tools to install TSJoint with welding strips:

1. Alcohol, min. 93%
2. Stripping tool/saw
3. Leakage test equipment
4. Plug retaining tool
5. Plug welder
6. Emery cloth:
   grain size 60: ø 90-280 mm (branch)
   Emery cloth/grind disc:
   grain size 36: ø 315-450 mm
7. Indian ink
8. Hammer
9. Gloves
10. Temperature measuring device
11. Folding ruler
12. Gas burner:
    Ø 50 mm: ø90 - 280 mm
    Ø 60 mm: ø315 - 450 mm

Extrusion welding equipment

1. PE milling machine
2. PE router fence
3. Extrusion welder
4. Installation rail for extrusion welding
5. Triangular scraper
6. PE-wire



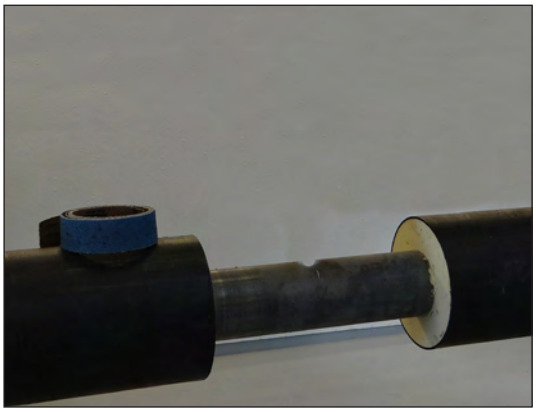
TSJoint with welding strips - Installation instructions

Installation instructions

1. Cut off approx. 400 mm of the outer casing and insulation.

   Take care not to damage alarm wires, if any.

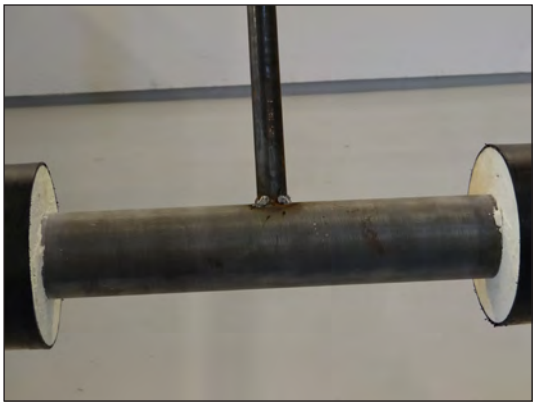
   Remove insulation remnants from the service pipe.



2. Weld the connecting piece onto the main pipe.

   Shortening measurements in accordance with enclosed instructions for steel connecting pieces.

   At hot tapping valves, if any, the spindle must be parallel with the main pipe.



3. Install the router fence on the main pipe and cut the base of the T-shoe op, using a milling machine, so the longitudinal weld is approx. in 2 o'clock position.

4. Pull the collar and T-shoe onto the branch.
   If the casing joint is not to be installed immediately, it must be covered.
   If necessary, install the compression coupling on the branch or weld the connecting piece and the branch together.

TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

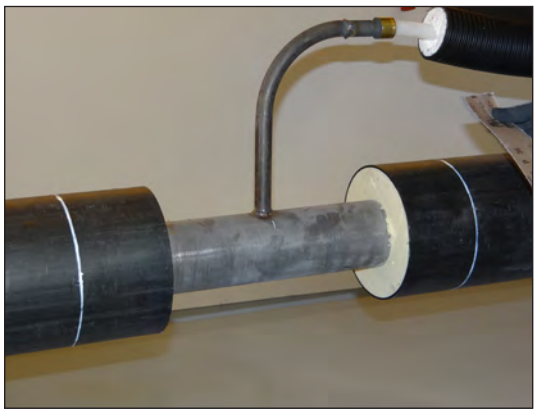
5. Remove insulation and outer casing from the branch to 220 mm from the weld.

6. Clean all surfaces in the jointing area. The surfaces must be CLEAN and DRY.

   Then clean the surfaces with alcohol.

7. Mark half the length of the T-shoe on the outer casing, measured from the middle of the branch towards both sides.

8. Extend the mark around the entire circumference of the outer casing.



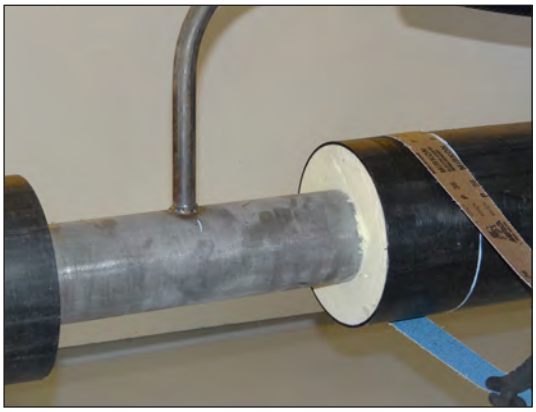
TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

9. Grind the contact surfaces of the main pipe and the branch with emery cloth, so grind marks are visible 20 mm outside the rim. This enables visual control of the grinding by the inspection.

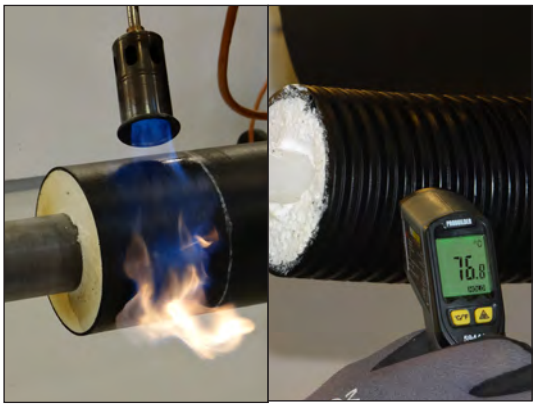
   Remove the grind dust.

   Avoid touching the ground contact surfaces.



10. Place the spacers in the middle of the bend and in the middle of the straight section.

11. Activate the contact surfaces with gas burner to a suface temperature of min. 65°C.



12. Mark the position of the welding strips 20 mm inward from the mark.

TSJoint with welding strips - Installation instructions

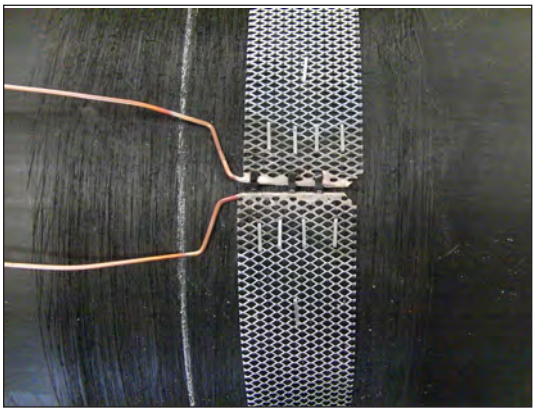
Installation instructions, ***continued***

13. Fasten the welding strips with staples as it appears from the illustration and with staples approx. 250 mm apart around the outer casing.

    Stretch the welding strips homogeneously, so they are close to, but DO NOT touch each other (3 mm).

    Check that the T-shoe is CLEAN and DRY inside.

    Clean with alcohol.



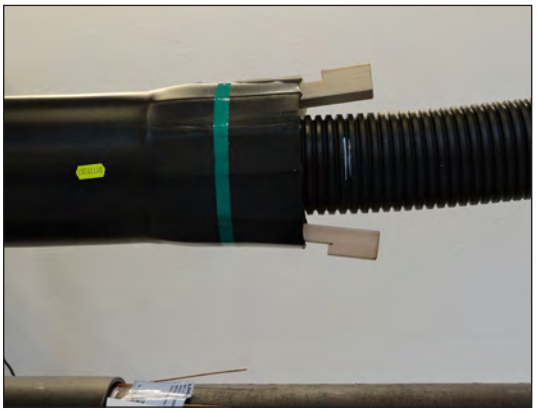
14. Heat the corrugation, until it is so flexible that it can be compressed and pulled over the branch.

    Unfold the T-shoe and pull it down over the branch.

    Turn the T-shoe around, while pulling it down over the main pipe.

15. Center the branch with wedges to keep it in position.

    Hold down the T-shoe, until the branch has cooled.



TSJoint with welding strips - Installation instructions

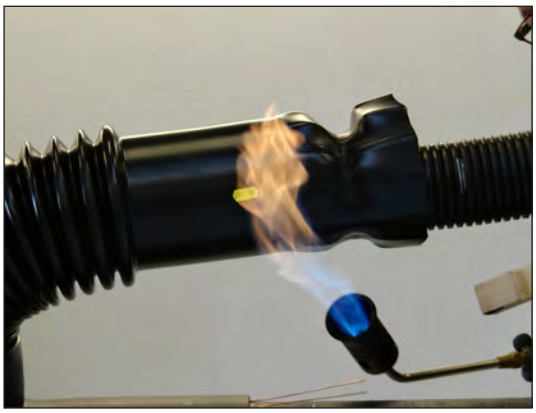
Installation instructions, ***continued***

16. Remove the cover from the sealing tapes on the branch.
    Check that all cover has been removed.

    Use heat shield, if necessary, to protect the corrugated flexible pipe.

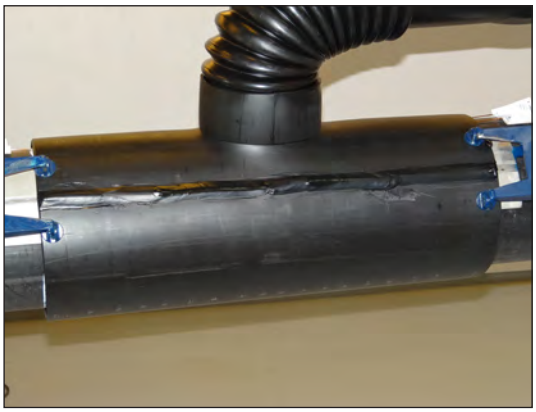
    Shrink the shrinkable end of the T-shoe onto the branch.

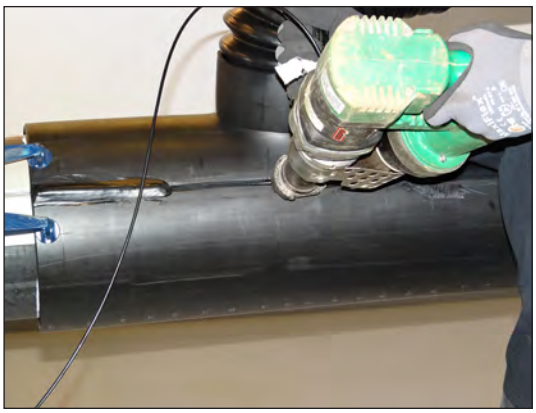
    Start shrinking on the lower part.



17. Place the installation rail funder the longitudinal joint. Fix it at both ends.

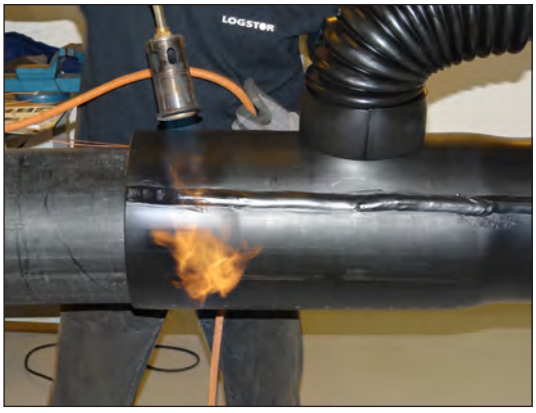
    Extrusion weld the longitudinal joint in accordance with valid instructions.





18. Remove the 2D barcode on the welding strips and attach them to the outer casing for reading with the PDA.

    Shrink the ends of the T-shoe bottom, until they have full contact with the welding strips and the outer casing.



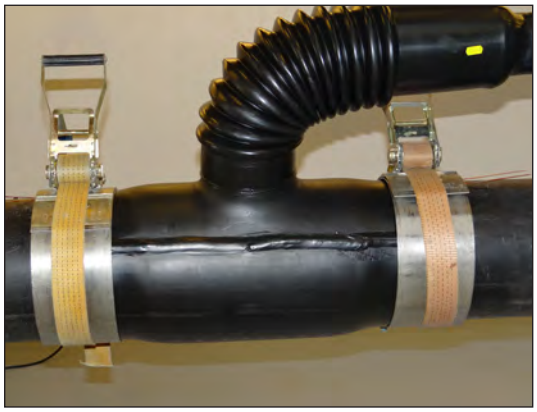
TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

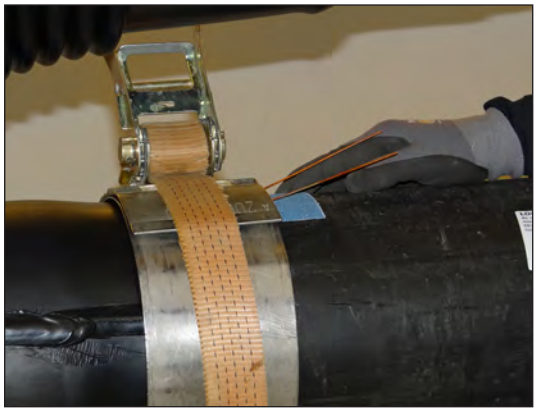
19. When the T-shoe has cooled down (50°C), mount the clamps so they exceed the ends of the T-shoe end by 5–10 mm.

    Tigthen the clamps around the outer casing, until they are fixed.

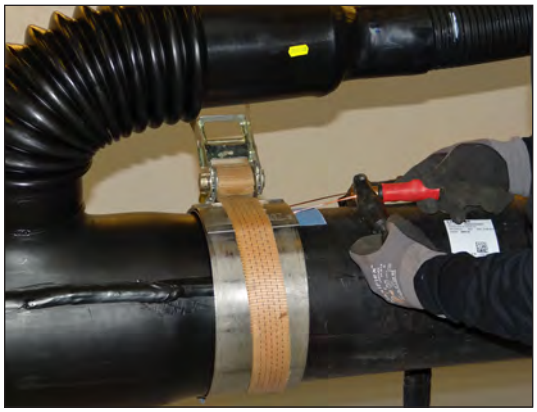
    If flexible pressure tool is used, pleasae see p. 3.1.7-12.



20. Mount emery cloth under the terminals to prevent them from melting into the outer casing.



21. Fasten the welding clips to the outermost ends of the terminal threads.



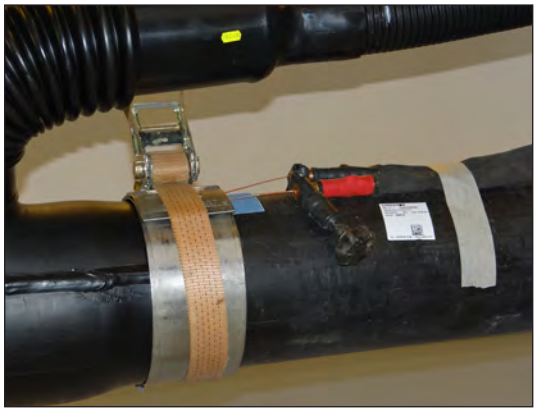
22. Scan the 2D-barcode with the PDA.

    Start welding.

    The 6-digit weld file MUST be written on the casing joint for traceabilitiy purposes.

    WeldMaster stops automatically, when the welding is finished.

    When the PDA shows 80°C or lower, remove the clamps.



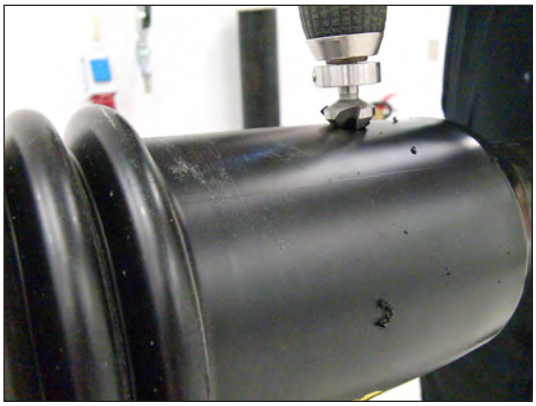
TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

23. Drill a ø25 mm hole in the branch, using a drill with a bit stop.

    Distance from the rim of the reduction: 30 mm

    Drill two ø 17.5 mm holes in the T-shoe bottom - in 11 o'clock position at the parallel branch and at the top at 45° branch - one in each end as close as possible to the outer casing ends.



24. When the T-joint has cooled (handwarm), leakage test at 0.2 bar.

25. Inspect the casing joint ends visually, using soapy water.

TSJoint with welding strips - Installation instructions

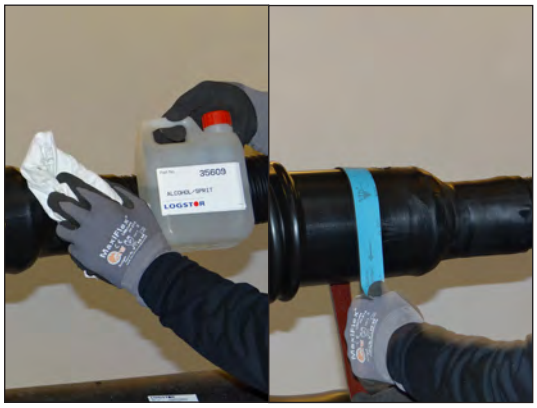
Installation instructions, ***continued***

26. Install a venting plug in the hole in the branch and in one of the holes in the main pipe.
    Foam the casing joint in the last hole and install the last venting plug.
    Wait at least 30 min. for degassing to complete.
    Remove the venting plugs by turning and lifting them.
    In general foaming is to be carried out in accordance with Handling & Installatin section 7 ”Insulating joints”.
    Remove excess foam or spillage, if any.

27. Clean the contact surface of the collar on the branch of the T-shoe with alcohol.

    Grind the contact surfaces with emery cloth.

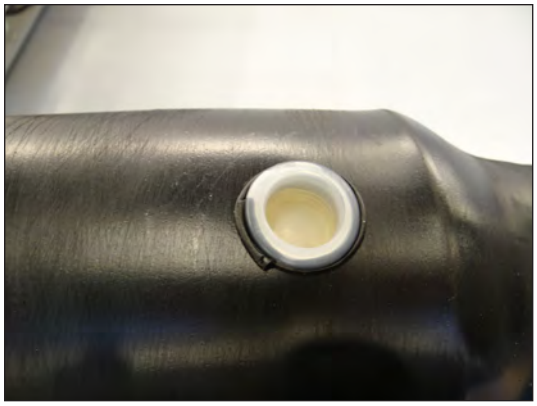
    Remove grind dust, if any.



28. Remove the protective foil from the expansion plug and check the sealing compound.

    Shortly activate the area around the plug with a hard flame.

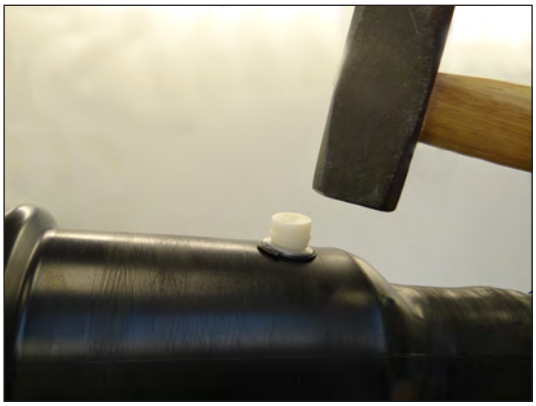
29. Insert the expansion plug in the hole and press, until the sealing compound is evenly distributed under the collar of the plug.



TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

30. Centre the wedge plug in the expansion plug and drive it completely into the plug with a hammer.



31. Activate the contact surface of the collar on the branch of the T-shoe with gas burner to a surface temperature of min. 65°C.
    If necessary, protect the FlextraPipe with a heat shield.

    Remove pakaging and paper from the collar.

    Check that all paper has been removed.

    Place the collar approx. 50 mm from the expansion plug and shrink it towards the branch.

32. Clean the rim of the hole and the joint surface around the two foam holes on the T-shoe.

    Mill the holes with a ø 35 mm conical miller.
    Remove any residues after milling.

33. Adjust the plug retaining tool around the foam hole to the actual casing dimension.

    Insert the weld plug in the plug retaining tool and clean it and the plug hole with alcohol.

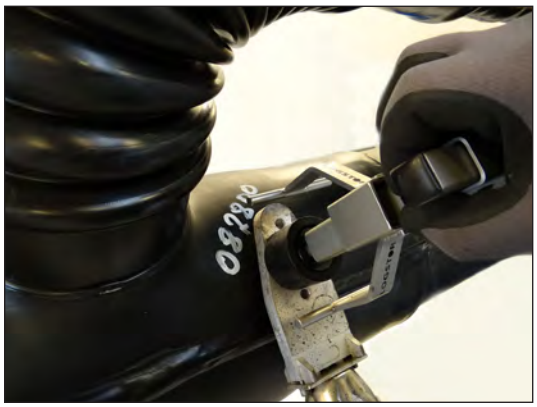
    Heat the plug welding tool to 250°C (482 F).

TSJoint with welding strips - Installation instructions

Installation instructions, ***continued***

34. Place the weld plug in the conical hole of the plug welder and opposite side of the tool in the filling hole, so the weld plug and the rim of the hole are heated at the same time.

    When the flat side of the plug welder touches the casing joint and the plug has sunk approx. 1 mm, the pressure is relieved approx. 10 seconds.



35. Immediately press the weld plug into the hole.

    Before removing the plug retaining tool, hold the pressure constant yet soft for 1 minute, until the welding zone is hand-warm.

    There have to be 2 visible beads all around the plug.

    Repeat the process with the other weld plug.

36. Inspect the T-joint.

    Criterion for approval of weld plug:
    - Two visible beads

    Criteria for approval of the longitudinal extrusion weld:
    - Filler material must fill the weld completely
    - The surface of the weld seam must be convex
    - The weld seam must be min. 10% and max. 40% of the wall thickness higher than the casing surface
    - An imprint of the extrusion welding shoe must be visible on both sides of the weld seam.

    Criterion for approval of weld on main pipe, please see p. 3.1.17.

    The joint is complete.

    Visual inspection and documentation, if any, see the section ”General”.

TSJoint used as a saddle T-joint - Installation instructions

Application

TSJoint as saddle T-joint is primarily used for branching from single pipes in major dimensions to FlexPipe and FlextraPipe.

Main pipe dimension: 355-560 mm
Branch dimension: 90-125 mm
140-160 mm

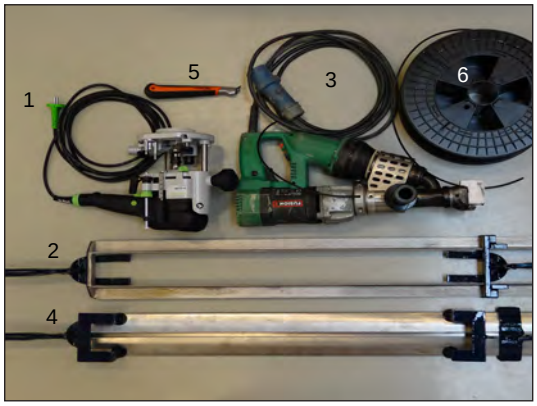
Tools

Use the following tools to install TS SaddleJoint:

1. Alcohol, min. 93%
2. Stripping tool/saw
3. Leakage test equipment
4. Plug retaining tool
5. Plug welder
6. Emery cloth, grain size 60 on branch
7. Indian ink
8. Hammer
9. Gloves
10. Temperature measuring device
11. Folding rule
12. Gas burner:
    Ø 50 mm: ø90 - 280 mm
    Ø 60 mm: ø315 - 450 mm

Welding equipment

1. PE milling machine
2. PE router fence
3. Extrusion welder
4. Installation rail for extrusion welding
5. Triangular scraper
6. PE-wire



TSJoint used as a saddle T-joint - Installation instructions

Installation instructions

1. Centered around the branch, mark a hole with a diameter corresponding to 350 mm.
   Cut after the marking.
   Cut off the outer casing and insulation where the branch is to be welded on, so it fits the measurements on the saddle.

   Take care not to damage alarm wires, if any.

   Remove insulation remnants from the service pipe.

2. Check that the inside of the TS saddle is CLEAN and DRY.

   Weld the connecting piece onto the main pipe.
   Shortening measurements in accordance with enclosed instructions for steel connecting pieces.

   Weld the compression coupling onto the connection piece

   Pull the collar and the TS saddle onto the branch. If installation is not to take place immediately, the TS saddle must be covered.

   Install the compression coupling on the branch or weld the connecting piece and the branch together.

3. Remove insulation from the branch to 220 mm from the weld.

TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

4. Place spacer in the middle of the bend and in the middle of the straight section.

   Clean all surfaces in the jointing area. The surfaces must be CLEAN and DRY.

   Then clean the surfaces with alcohol.

   Heat the corrugation, until it is so flexible, that it can be compressed and pulled over the branch.

   Now pull it over the connecting piece.

5. Mark the position of the TS saddle on the main pipe.
   Pull the TS saddle back onto the branch.

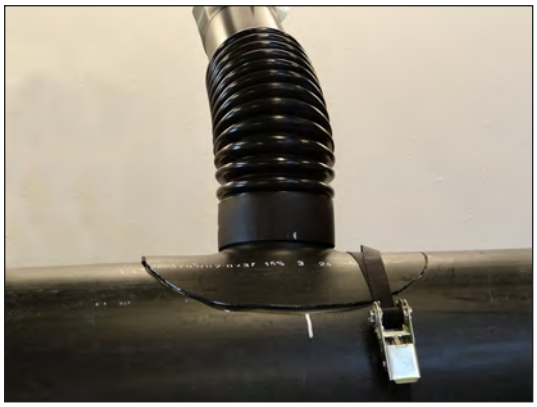
   If the corrugation has become cold, heat it again.

   Cut off the casing material after the mark.

   Clean the casing material towards the foam surface with alcohol.

6. Heat the corrugated branch and pull the TS saddle onto the main pipe.

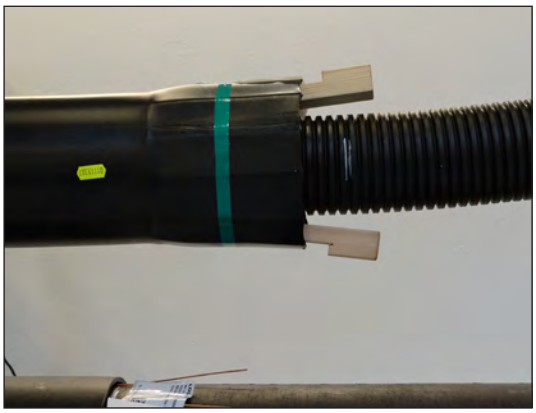
   Hold down the TS saddle and keep it in place, until it has cooled.



TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

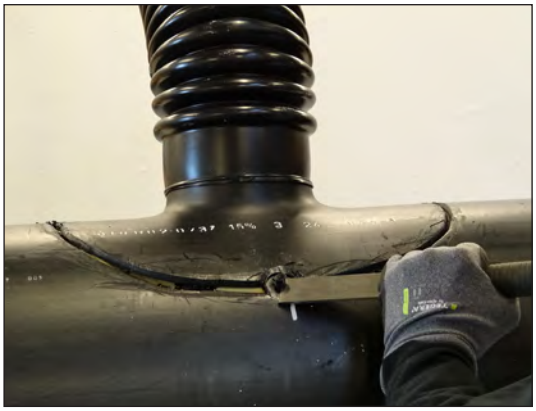
7. Centre the branch with wedges to keep it in position



8. Make a V-shaped notch around the TS saddle in accordance with valid instructions.

9. Fix the TS saddle by means of extrusion welding or use of weld plugs in 4 positions.

   If weld plugs are used, they must be beveled, so they are level with the outer casing.



10. Now extrusion weld around the TS saddle in accordance with valid instructions.

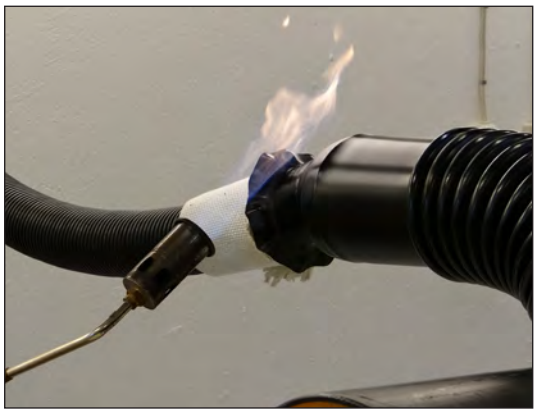
TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

11. Shrink the shrinkable end of the TS saddle onto the branch.

    Start shrinking on the lower part.

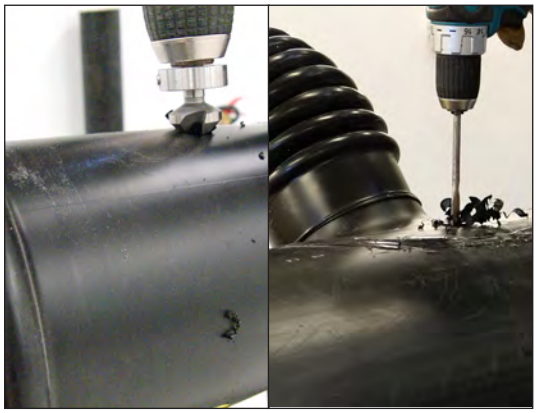
    If necessary, use a heat shield to protect the corrugated flexible pipe.



12. Drill a ø25 mm hole in the branch, using a drill with a bit stop.

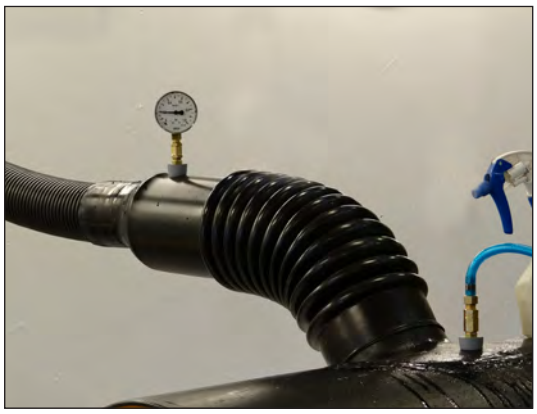
    Distance from the rim of the reduction: 40 mm

    Drill one ø 17.5 mm hole in the TS saddle on the main pipe.



13. When the T-joint has cooled (handwarm), leakage test at 0.2 bar.

    Inspect the casing joint ends visually, using soapy water.



14. Install a venting plug in the hole in the branch.
    Foam the casing joint through the hole in the main pipe and install the last venting plug.
    Wait at least 30 min. for degassing to complete.
    Remove the venting plugs by turning and lifting them.
    In general foaming is to be carried out in accordance with Handling & Installatin section 7 ”Insulating joints”.
    Remove excess foam or spillage, if any.

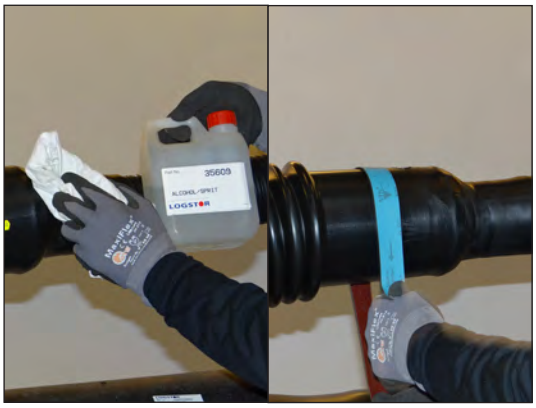
TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

15. Clean the contact surface of the collar of the branch with alcohol.

    Grind the contact surfaces with emery cloth.

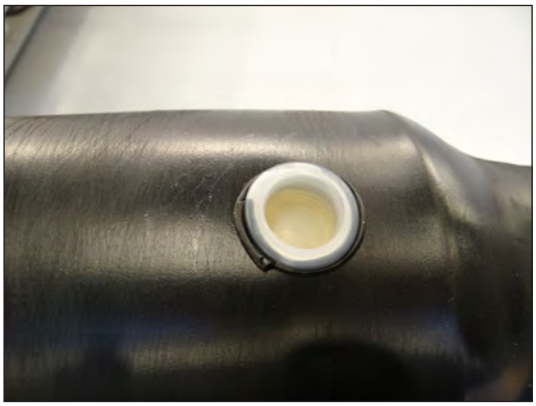
    Remove the grind dust.



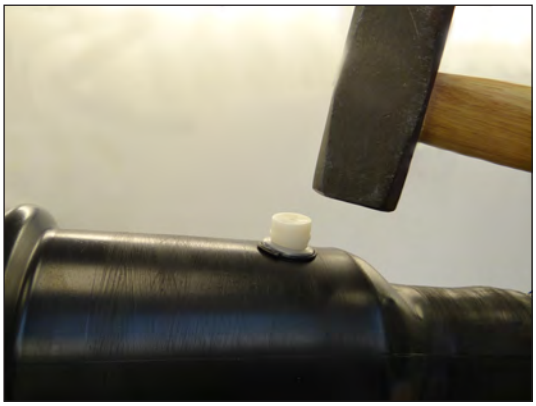
16. Remove the protective foil from the expansion plug and check the sealing compound.

    Shortly activate the area around the plug with a hard flame.

17. Insert the expansion plug in the hole and press, until the sealing compound is evenly distributed under the collar of the plug.



18. Centre the wedge plug in the expansion plug and drive it completely into the plug with a hammer.



TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

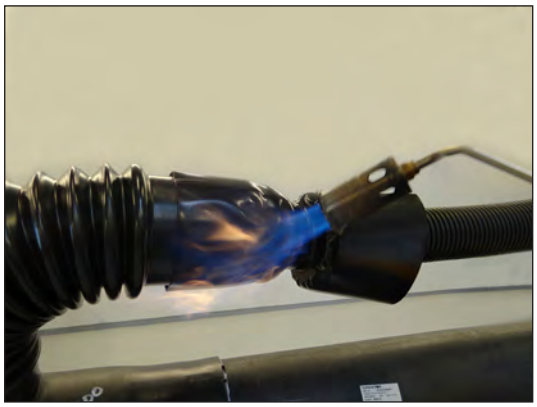
19. Activate the contact surface of the collar on the branch of the TS saddle with gas burner to a surface temperature of min. 65°C.

    If necessary, use a heat shield to protect the FlextraPipe.

    Remove pakaging and paper from the collar.

    Check that all paper has been removed.

20. Place the collar approx. 50 mm from the expansion plug and shrink it towards the branch.



21. Clean the rim of the hole and the joint surface around the foam hole on the main pipe.

    Mill the hole with a ø 35 mm conical miller.

    Remove any residues after milling.

22. Adjust the plug retaining tool around the plug hole to the actual casing dimension.

    Insert the weld plug in the plug retaining tool and clean it and the plug hole with alcohol.

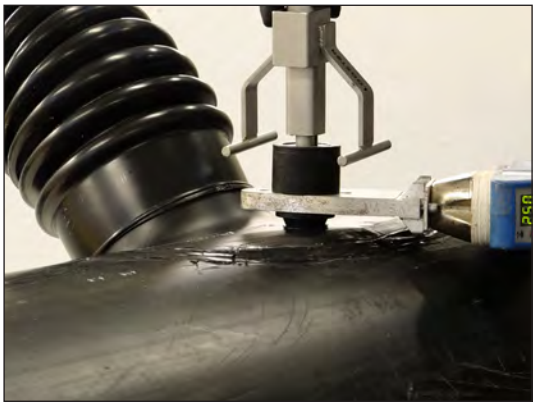
    Heat the plug welding tool to 250°C (482 F).

TSJoint used as a saddle T-joint - Installation instructions

Installation instructions, ***continued***

23. Place the weld plug in the conical hole of the plug welder and the opposite side of the tool in the filling hole, so the weld plug and the rim of the hole are heated at the same time.

    When the flat side of the plug welder touches the casing joint and the plug has sunk approx. 1 mm, the pressure is relieved approx. 10 seconds.



24. Immediately press the weld plug into the hole.

    Before removing the plug retaining tool, hold the pressure constant yet soft for 1 minute, until the welding zone is hand-warm.

    There has to be 2 beads visible all around the plug.

25. Inspect the T-joint.

    Criterion for approval of weld plug:
    - Two visible beads

    Criteria for approval of the extrusion weld:
    - Filler material must fill the weld completely
    - The surface of the weld seam must be convex
    - The weld seam must be min. 10% and max. 40% of the wall thickness higher than the casing surface
    - An imprint of the extrusion welding shoe must be visible on both sides of the weld seam

    The joint is complete.

    Visual inspection and documentation, if any, see the section ”General”.

WeldMaster/Weldmaster Light - General

Introduction

The WeldMaster is a mobile welding machine welding the PE on preinsulated pipes. It is used to weld the LOGSTOR casing joints: BandJoint and EWJoint.

The welding machine is available in two versions:
1. WeldMaster (2 x 5 kW output)
2. WeldMaster Light (1 x 5 kW output)

Function

The WeldMaster machine supplies the welding wires in the casing joint with the required energy for heating and melting the casing joint and the plastic casing of the pipe.

Specifications

	WeldMaster	WeldMaster Light
Dimensions	740 x 380 x 560 mm (L x W x H)	740 x 380 x 340 (L x W x H)
Weight	WeldMaster = 48 kg 2 sets of cables (16 m) of 24 kg each = 48 kg Drawbar and rubber wheels= 9 kg	WeldMaster Light = 30 kg 1 set of cables (16 m) = 14 kg Drawbar and rubber wheels = 9 kg
Capacity	ø 90 - ø 1400 mm casing joints	Standard: ø 90 - ø 560 mm casing joints Upgraded: ø 90 - ø 1400 mm casing joints
Mains voltage	3x230/400 VAC ± 4% 50Hz	3x230/400 VAC ± 4% 50Hz
Mains connection	5-pole 16A CEE plug (3 phases - zero - earth)	5-pole 16A CEE plug (3 phases - zero - earth)
Fuses	Control unit: 2 A time-lag Supply voltage: 16A	Control unit: 2 A time-lag Supply voltage: 16A
Power consumption	Maximum 10 kW (2 x 5 kW)	Maximum 5 kW (1 x 5 kW)
Output voltage	Maximum 49 VDC	Maximum 49 VDC
Output current	Maximum 250 ADC	Maximum 250 ADC
Protection class	IP 23	IP 23

Operating conditions

Min. operating temperature: -20°C
Max. operating temperature: +40°C
Max. humidity: 85%

Make sure that the area around the welding machine is well ventilated.

Transport

WeldMaster is a mobile welding machine suitable for casing joint installation on site.

Assembly and installation

WeldMaster is easy to assemble and prepare for casing joint installation. Connect cables and connectors to the WeldMaster according to the pictograms and the colours directly on the WeldMaster.

WeldMaster/Weldmaster Light - General

Adjustments and programming

THe WeldMaster is controlled and adjusted by means of a PDA. As to the PDA functions, see section 5.2 in this manual.

Cleaning

Always keep the WeldMaster and auxiliary tools as clean as possible. Only use water (not pressure washer) for cleaning, when the equipment has been disconnected from the power supply.

Maintenance

Always keep the WeldMaster and auxiliary tools in good condition.

Minimum every second year or if necessary more often tools must be sent to LOGSTOR Service for a maintenance check.

Worn tools are to be replaced or repaired to ensure a good and safe operation.

Service and calibration

At LOGSTOR's Service Department every 2nd year or when necessary.

The date for the next inspection appears from the label on the WeldMaster.

Operators

LOGSTOR recommends that the WeldMaster and auxiliary tools are only operated by trained operators.

Safety, hazards, and warnings

The WeldMaster and auxiliary tools do not contain dangerous, mobile parts.

Compressed air

The auxiliary tools are operated with compressed air. Note! Damages/faults on compressed-air hoses and connectors can be potentially dangerous, if the hose comes loose and whips a person.For detailed instructions, see p. 2.2.16 in the Weld Joint Manual.

Power

Always check that cables are not damaged. If a cable is damaged, it must be replaced or repaired immediately.

The electric panel of the WeldMaster should not be opened. Only trained operators should open it.

Keep the WeldMaster and auxiliary tools as dry as possible during casing joint installation.

Hot surfaces

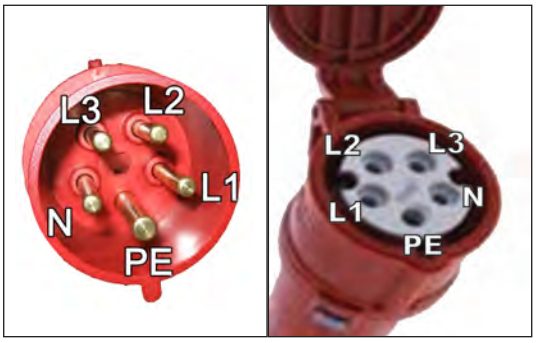
Note! Some areas of the casing joint may become hot during and after welding. Do not touch these areas and use protective clothing.

CEE plug 16A

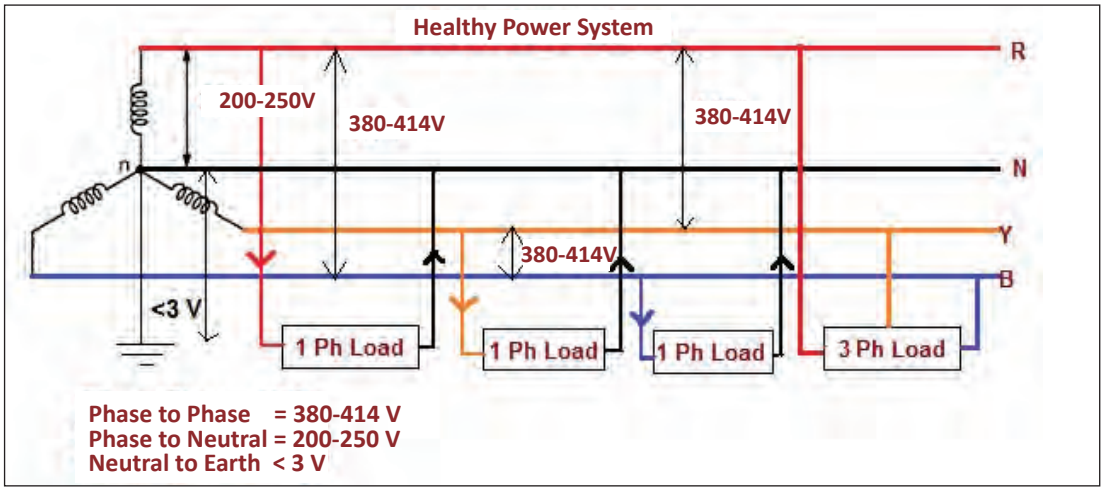
PE = Earth – Colour/Green/Yellow
N = Neutral – Colour/Blue
L1 + L2 + L3 = Phase

Measured voltage.
N - L1 = 200-250 V
N - L2 = 200-250 V
N - L3 = 200-250 V

L1 - L2= 380-414 V
L1 - L3= 380-414 V
L2 - L3= 380-414 V



Schematic diagram:



NOTE!
During installation there must be earth connection and it must be fully functional.
In case of power supply from a generator, make sure earth rod has been established.

Phase sequence tester

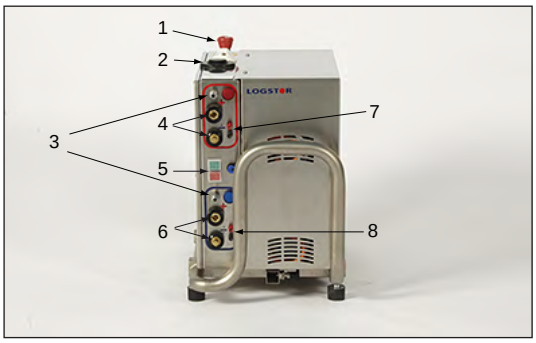
Before connecting the plug to the WeldMaster check that the cords have been correctly connected by inserting the plug in the phase sequence tester.

ONLY connect the WeldMaster, when the phase sequence tester is green or connectors have been inspected by a skilled electrician!

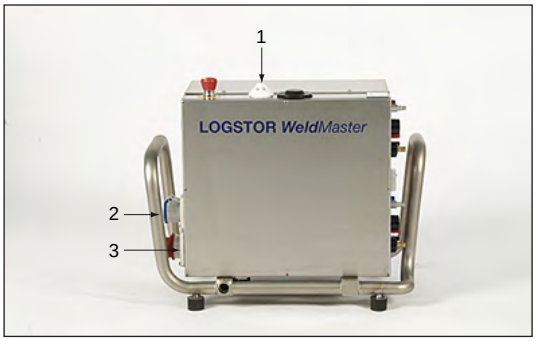
WeldMaster/Weldmaster Light - General

WeldMaster/ WeldMaster Light

1. Emergency stop button
2. Bluetooth antenna
   (Range: max. 30 m)
3. Air pressure connection (for BandJoint and EWJoint)
4. Welding cable connection (red tap)
5. Start/Stop
6. Welding cable connection (blue tap)
7. Sensor wire connection (red tap)
8. Sensor wire connection (blue tap)



1. Thermometer probe
2. Tap, 230 V
   (Only to be used to charge the PDA)
3. Mains voltage



Weldmaster (2x5kW output), for 2 sets of cables

WeldMaster Light

Weldmaster Light (1x5kW output), for 1 set of cables

Cable sets

To establish connection between the WeldMaster and the casing joint two sets of welding cables are available.

The cable, marked with red is connected to the red terminals of the welding machine.

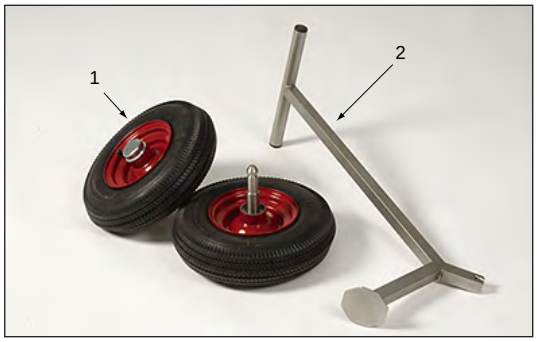
The cable, marked with blue is connected to the blue terminals of the welding machine.

Accessories

1. Transport wheels
2. Drawbar

standard for WeldMaster.

Additional equipment for WeldMaster Light.



Bushings for accessories

Bushing for drawbar

Bushing for transport wheels

PDA

Welding is initiated and monitored by means of a handheld unit, a PDA which transmits/ receives data to and from the welding machine.

Up-to-date data about casing dimensions and resistance in the welding wires can be read on a 2D bar code label (2 dimensional) on the casing joint, the welding strip or keyed in manually.

The progress of the welding process is illustrated graphically on the PDA's screen.

NOTE!
The PDA functions are the same for WeldMaster and WeldMaster Light.

WeldMaster/Weldmaster Light - General

Front view of the PDA

1. Power button (on/off)
2. Yellow button to activate 2D bar code scanner
3. Toggle button to switch between the red and blue channel
4. Orange button to activate the orange letters and arrows
5. Backspace (delete)
6. Button (bulb) to turn the display light on/off.
   NB! It is only the light NOT the programme that is turned off!

1. Pen to navigate on the PDA screen
2. Lights indicating the charging status of the battery
   a. Green light: Mobile data communication
   b. Orange light (blinking): Charging
   c. Orange light (constant): Fully charged
   d. Red light: Low battery
3. 2D bar code scanner (on the top of the PDA)

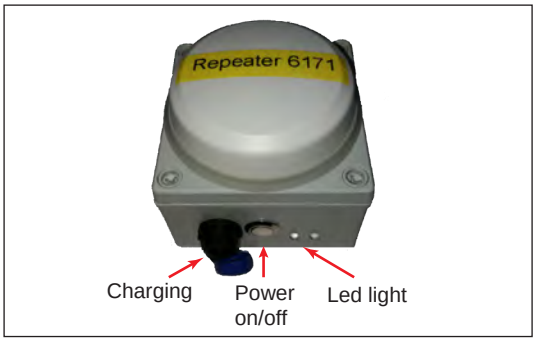
The battery life is approximatley 8 hours, depending on how it is used.

The battery can be replaced at the back of the PDA.

Repeater

A repeater is used to extend the bluetooth signal between the PDA and the WeldMaster. Make a connection between the PDA and repeater and pair the repeater with a WeldMaster for a better bluetooth connection.

Standard for WeldMaster.
Additional equipment for WeldMaster Light.



WeldMaster/Weldmaster Light - PDA instructions

Login screen

By turning on the PDA a login screen will appear. Log in by filling in contractor name and password. These are given by the LOGSTOR administrator, provided you have bought a licence. Access to apply for licence is found www.logstor.com under Tools.

Use the ”on screen keyboard” by selecting the grey touch button to the right of the ”password bar”. (marked with red)

Select ”Login”.

Check that the time corresponds to the local time, if not, update the time.

Login screen, ***continued***

NOTE:
If you fill in a wrong contractor name or password, or if there is no connection possible between the PDA and the LOGSTOR WeldMaster Portal, you will be able to access the welding program anyway.
The data collected, without being logged in, will be uploaded when the PDA is connected again.

IMPORTANT
If you could not log in, make a report of all performed welds to the LOGSTOR administrator. The administrator will ”clean up” the weld data on the LOGSTOR WeldMaster Portal. Otherwise the data will not be available for your customer.

When working in tunnels or underground log in on the PDA before descending. Hereafter connection to the WeldMaster can be established in the tunnel. When surfacing the weld data are transferred to the WeldMaster Portal.

Start menu

By starting up the PDA and logging in, the start menu appears.

1. Contractor
   This is the same name as filled in on the login page and to whom the weld data will be uploaded.
2. Connect to WeldMaster
   Connect to a WeldMaster and/or a repeater. (see ”Connection”)
3. Welding
   Go to the welding program (see ”Welding”)
4. New GPS position
   Sets a new position for a weld after it has been moved. (Typically used where a weld is performed at one place and later on moved to a new position)
   Scan the 2D bar code again after placing the weld at the right position. The PDA recognizes the weld and changes the GPS coordinates for the new position.
5. Upload data
   Starts the upload process.
   Here you can choose to upload via a mobile network or WiFi.

6. Config
   The language can be changed by selecting ”Config”.
   Enter the password 123 and click OK.
   Now you can select one of the following languages: English, Danish, German or Dutch.
   (If you have a PDA with a Chinese operating system, you also have the option of selecting Chinese).
   Restart the PDA by holding the red button down, until you can choose Restart.
   By putting a tick next to text, the text remains in the text box (the text is maintained during scanning.
7. Battery indicator
   You will receive a warning at 20% and 10% of battery power. If the battery power is < 10% it is not possible to start a weld.
8. Log off
   The system will automatically log off after 8 hours without activity.
9. Date and time of last upload
10. Software information

WeldMaster/Weldmaster Light - PDA instructions

Connection

It is necessary to set up a connection between the components in the WeldMaster concept. (Just like a connection between a mobile phone and a wireless headset)

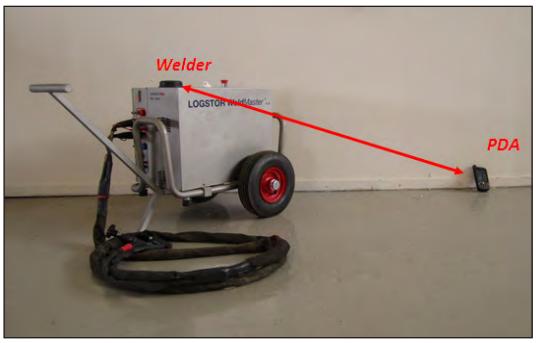
You only have to make a new connection if you add a new component (WeldMaster or repeater), i.e. a new PDA is used. The PDA will remember the connected components if the same components are used for a connection the next time.

There are 2 ways to make a connection:

Direct connection

There is a direct connection between the PDA and the WeldMaster.

PDA <--> WeldMaster



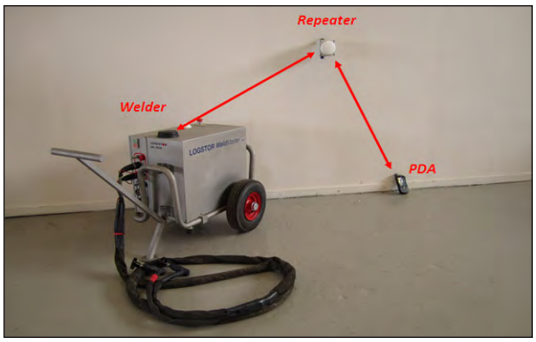
Direct connection

Extended connection

Recommended in e.g. deep excavations, when working behind soil embankments and the like.

There is a connection between the PDA and the repeater and between the repeater and the WeldMaster.

PDA <--> Repeater <--> WeldMaster



Extended connection

WeldMaster/Weldmaster Light - PDA instructions

Connection screen

Select ”Connect to WeldMaster” in the Start menu (2) and the connection screen will appear. The connection screen is used to pair the WeldMaster, the repeater and the PDA together.

In the connection screen there is information about which WeldMaster or repeater is available to connect to. The line will be red if there is a connection with the PDA (1). This may take a few minutes.

Direct connection:
To make a direct connection with a WeldMaster, select the correct WeldMaster from the list. The line will be red, if there is a connection.

1. Information on WeldMaster with an open bluetooth channel.
2. One step back in the menu.
3. Software and print information.
4. Search for other available welders.
5. Go to the welding program.

Extended connection:
First connect to a repeater.

Status appears as follows:
- Red marking means ”connected”
- Yellow marking means ”can be selected”

When a repeater has been selected, it may take up to 2 minutes, before connection is estabhlished.

It is now possible to connect repeater and WeldMaster.

Connection screen, ***continued***

Choose the correct WeldMaster on the screen and select ”Pair”. Now the repeater and the WeldMaster are paired. (is red)

The WeldMaster and repeater are paired until a new unit is connected.

1. Information on WeldMaster with an open bluetooth channel.
2. To close the program to pair a WeldMaster with a repeater.
3. To pair a WeldMaster with a repeater.

Project Information

By selecting ”Welding” in the start menu or in the Connection Screen, the ”Project Information” screen will appear.
Now select:

- Customer (3) from the menu.
  Do not type in a customer. If a customer is not in the PDA list, the customer can be added via LOGSTOR WeldMaster Portal.
- Project (4)

and fill in your own name (5).

NOTE:
The welding program will not start up, before these 3 lines have been selected. This information will now be stored for all performed welds, until it is changed manually or the project is uploaded.

Select ”Welding” to get into the welding program.

Project Information, ***continued***

1. Finished project (see below)
2. Back
   Select ”Back” to go one step back in the program.
3. Customer
   A list with customers will appear. If a customer is not in the PDA list, the customer can be added via the LOGSTOR WeldMaster Portal. See section 54.
   You can do it yourself or ask the LOGSTOR administrator for assistance.
4. Project
   Select the project name from the list, fill it in manually, or scan it with the 2D scanner.
5. User
   Scan or type in your name (for fitters).
6. Welding
   Start the welding program.

Finished project

By returning to Project Information after the welds have been finished, the project will be marked as finished with an ”X” (1). Within a few minutes the finished project will be uploaded automatically to the LOGSTOR WeldMaster Portal. Do not turn off the PDA until the finished projects have been uploaded.
It is possible to mark the project as unfinished by removing the ”X”. Do this within a few minutes after the project is marked as finished. The project will now stay on the PDA.

NOTE:
If the PDA is turned off before the projects have been uploaded, the projects will automatically be uploaded the next time the PDA is switched on and it has a connection to the web server.

Welding

If Weld 1 (red) has been chosen on the PDA, welding will be carried out with red cables/ connections. This appears from the red frame on the PDA.

The following data can be entered by scanning the 2D bar code on the label of the joint or welding wire (1 - 3):

1. Type of weld joint
2. If the casing joint is an EWJoint, reply ”yes” or ”no” to, whether it is with an EW air pressure tool.
3. Outside diameter of casing joint [mm]
4. Resistance of the welding wires (R20) [mOhm]

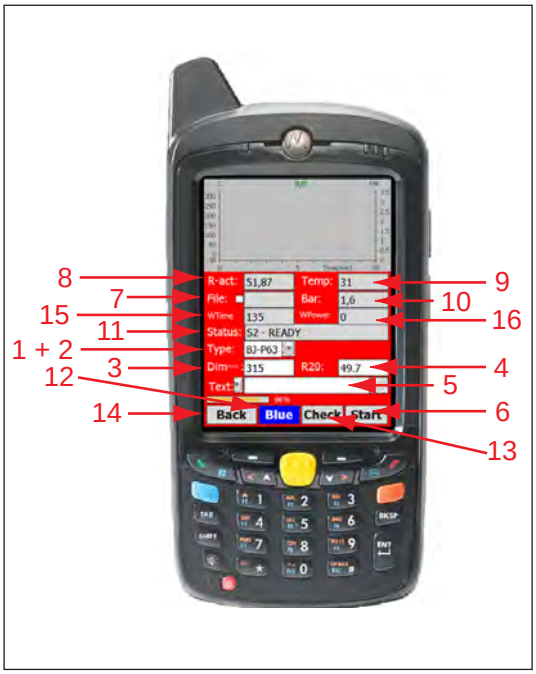
NOTE:
Data on diameter, type and resistance are kept in the respective fields, until they are changed or the program is terminated.
When welding the background colour of the graph changes:
- BandJoint: grey
- EWJoint: black

5. Text
   In the text box an optional text, e.g. identification text, may be entered. A keypad appears and disappears by selecting the keypad icon.

IMPORTANT when welding BandJoints
Before start make sure that the welding clips are clean. If necessary clean them with a file.

Before starting up a new weld, check whether the actual resistance (7) and the calculated temperature (8) are correct.
If the calculated temperature deviates ±25°C, there is a problem with the casing joint. Replace it with a new one.

6. Start a new weld
7. File name
   The 6-digit number MUST be transferred to the casing joint to ensure traceability.
8. Actual resistance in welding wires [mOhm]
9. Calculated temperature of welding wires [°C]
10. Air pressure [bar]



Type	Casing joint
EW-W40	EWJoint 40 mm
EW	EWJoint
Branch	BandJoint-branch
BJ-s	Standard BandJoint [STD]
BJ-e	E BandJoint [XL]
BJ-P630	BandJoint from a plate
BJ-P1020	BandJoint from a plate

Welding, *continued*

11. Status of the WeldMaster (ready in this window).
12. Toggle button between red/blue channel (WeldMaster Light: Only 1channel = red)
13. Check for the weld inspection
14. One step back in the menu
15. WTime shows the weld time
16. WPower shows the output power

If the casing joint is an EWJoint, you have to choose whether installation is carried out with flexible pressure band with air pressure or straps.

Process control

After the welding is finished, cooled down, the joint tested, and the foam and plugs have been installed, the joint must be inspected.

From the PDA it appears whether the welding process has been approved or rejected.

If the welding process has been approved, the file number is green.

If the welding process has been rejected, the file number is red, and the fitter will immediately receive the following message on the PDA: ”Welding criteria not reached”.

See illustrations.

Process control, ***continued***

The message will state whether the cause is time or effect or both.

Re-welding

If the welding process is rejected by the PDA, re-weld can be done up to 3 times.

Choose the relevant file to be re-welded from the drop-down menu of the PDA. See illustration.

Now the text field says as follows:

”RW XXXXXX” (file number).

RW is short for ”Re-weld”. See illustration.

That will also appear from the documentation on the web portal.

Manual inspection points

The fitter shall carry out and document the following four inspection points:

1. Alarm
   Alarm wires in the joint have been inspected as regards open wire and insulation according to the acceptance criteria.
2. Pressure test
   A leakage test has been carried out with 0.2 bar air pressure and the joint is leak-proof.
3. Foamed
   There is visible foam at the venting plugs.
4. Visual inspected
   The installed casing joint, incl. weld plugs, have been visually inspected.

See illustration.

This will also appear from the documentation on the web portal, where the colour of the inspection points change from light to dark.

If above inspection points have not been carried out and documented, the following message will appear on the PDA: ”There are unfinished weldings, Continue?”

See illustration.

If you continue with unfinished inspection points, it cannot be changed subsequently on the web portal.

Corrective actions

If re-welding does not result in an approved welding process, there are two options:

1. To remove the rejected casing joint and replace it with a new one
2. To take corrective actions after previous agreement with the customer.

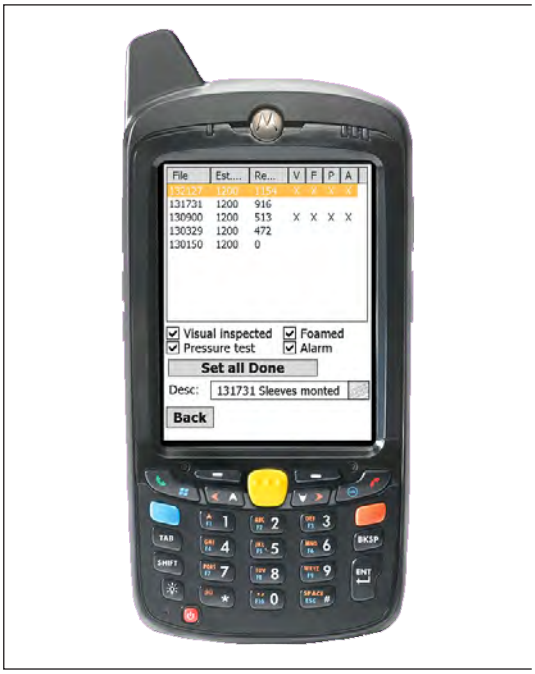
Press ”Check” on the PDA.

See illustration.

Find the file number of the relevant casing joint and click on that number.

Describe the corrective action in the field ”Desc:” including with whom it has been agreed upon.

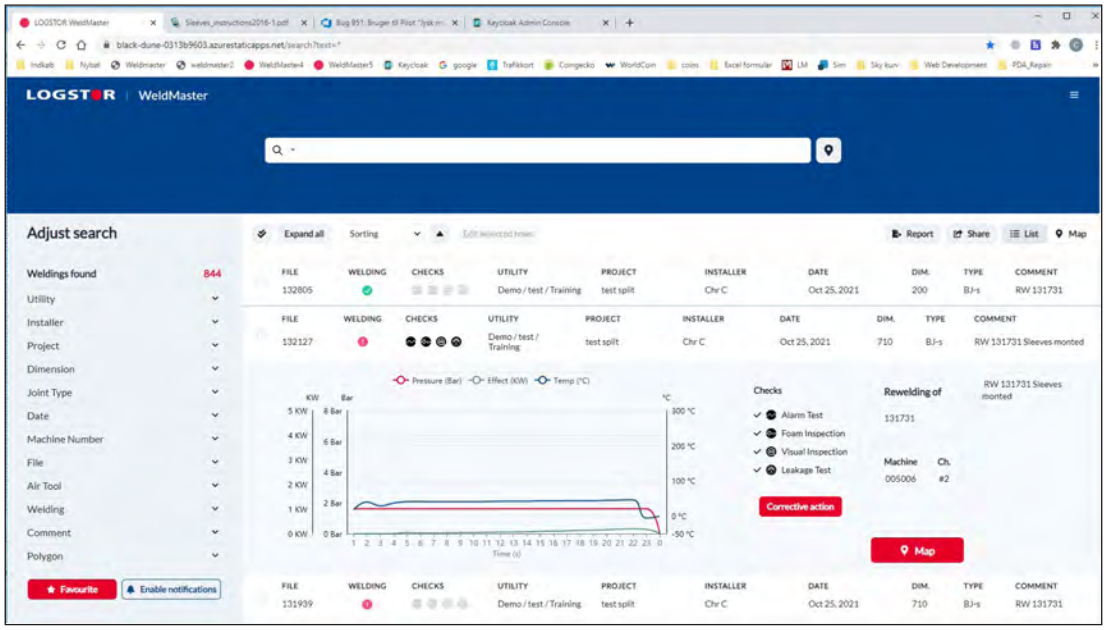
See illustration.



Corrective actions, ***continued***

The corrective action may be extrusion welding or installation of a shrink wrap.

This will also appear from the documentation on the web portal.



The fitter's immediate superior shall find the relevant weld joint on the web portal and manually approve the corrective actions in the field "corrective action" and press "Manually approved".

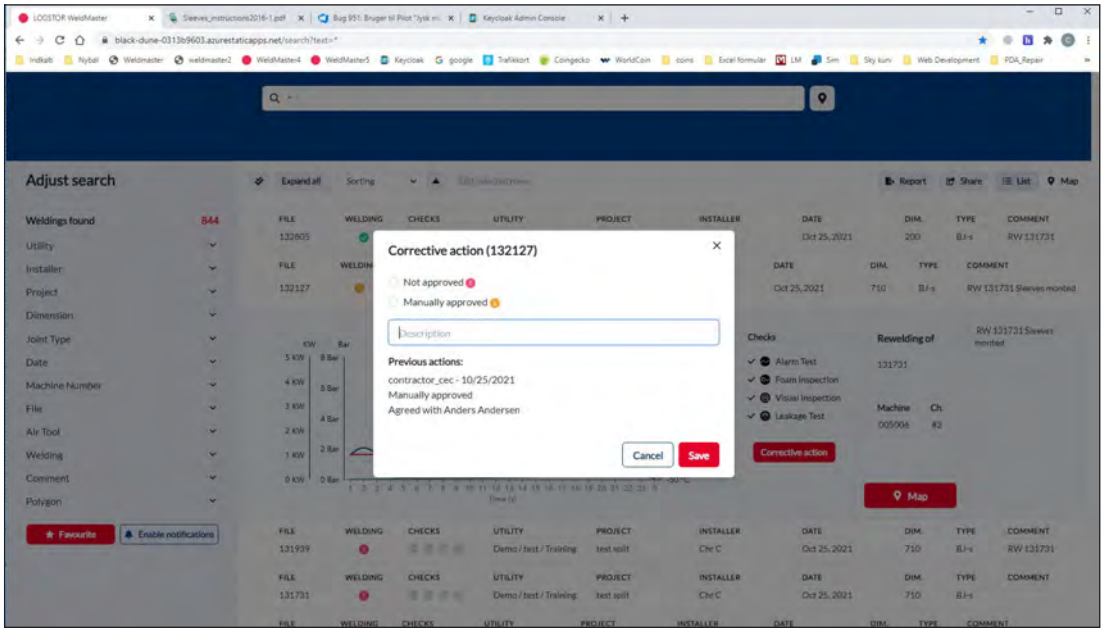
Now the colour on the web portal changes from red to orange. The colour cannot be changed to green.

The end customer can choose to override the decision, and the contractor can then change the colour back to red.

Corrective actions, ***continued***

It is stated in the comments field who at the customer's has given acceptance of the corrective action.

See illustration.



Upload data

The PDA will automatically upload all projects marked as finished (see ”Project Information”) to the LOGSTOR WeldMaster Portal. This takes place a few minutes after the projects are marked as finished. The PDA only needs to be turned on and in the start menu.

It is possible to upload data by selecting “Upload data”. You can upload either by means of a GPRS connection (mobile network) or a WLAN connection (WIFI). Select the preferred connection and select “Upload data”.

The PDA screen shows when it has finished uploading data.

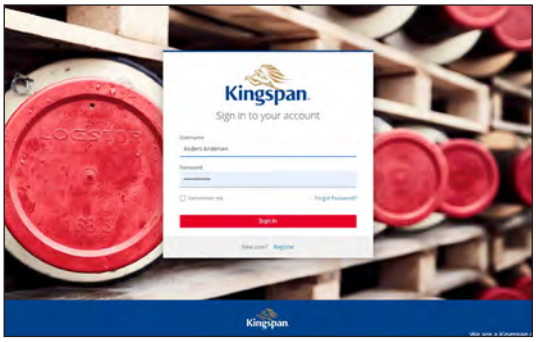
The data can now be checked on the LOGSTOR WeldMaster Portal.

WeldMaster/Weldmaster Light - LOGSTOR Portal

Login

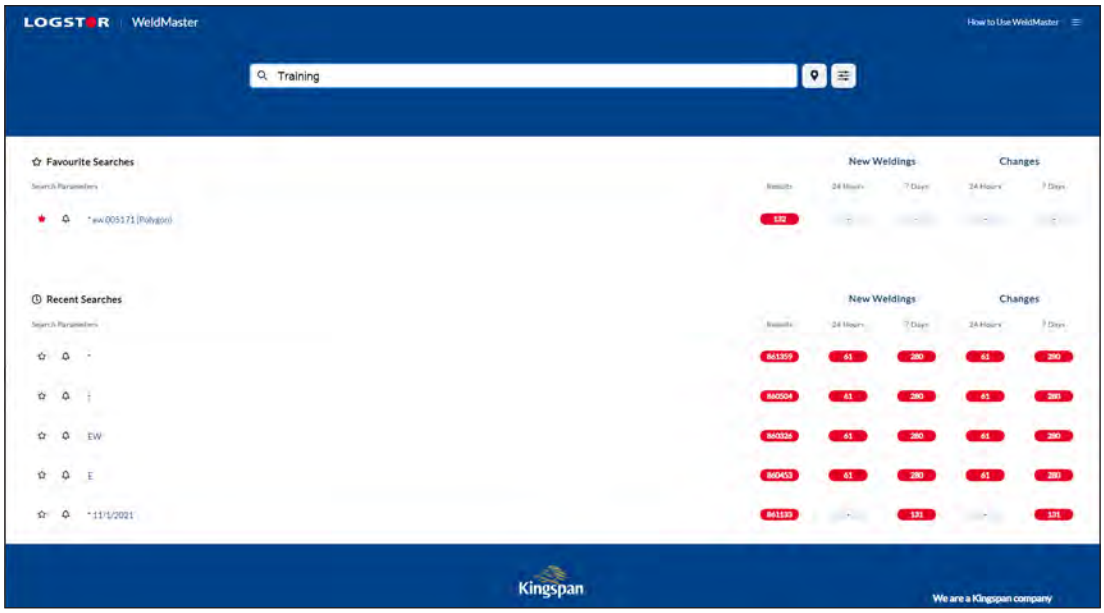
1. Open your internet browser, and type weldmaster.logstor.com
2. Type in your username and password, and click on ”Login”.

All data are protected and any kind of access requires user name and password. This means that unauthorized persons do not have access to the information.



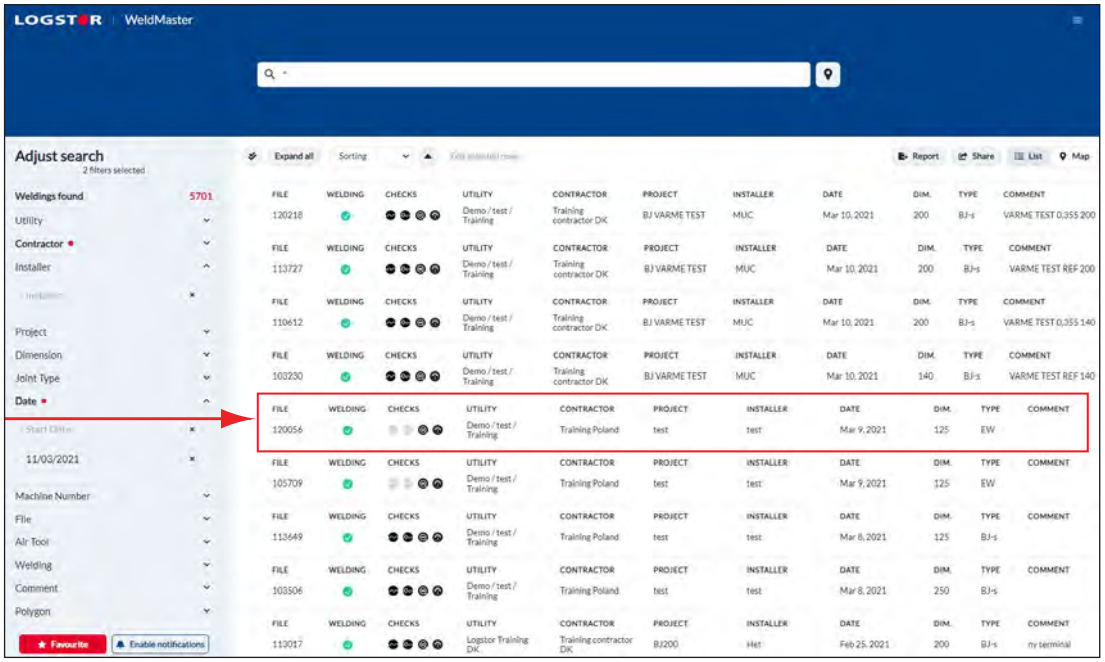
Start page/ Dashboard WeldMaster Portal

3. Here it is possible to search on projects, towns/cities etc.

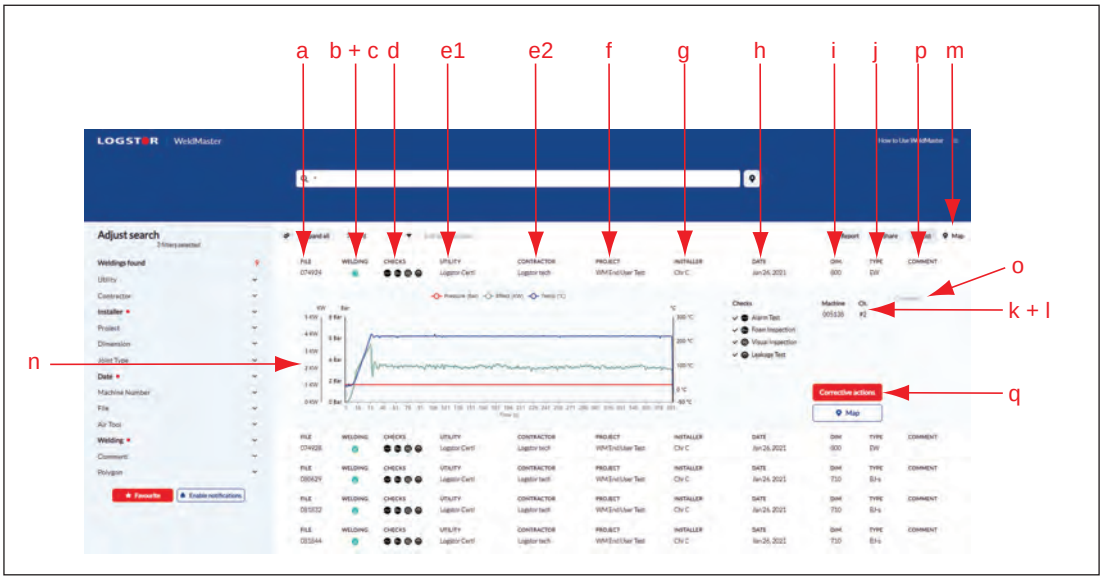


Example of a chosen search

4. Now you enter the WeldMaster Portal from which all welds from the chosen search appear. By clicking on a line detailied information about the chosenweld appears.



Accessible information about the chosen weld



5. The WeldMaster Portal gives the user the possibility of seeing the documentation for all casing joints, installed with this system.

Accessible information for each casing joint:

a. File number
b. Approved casing joint (green) or not approved casing joint (red)
c. Any corrective action on the casing joint (orange)
d. Performed inspection points (pale grey if not performed, black if performed)
e. E1 = Customer
   E2 = Contractor
f. Project name
g. Fitter's initials
h. Date
i. Casing joint dimension
j. Casing joint type
k. Number of WeldMaster
l. Channel of WeldMaster
m. GPS-location in a map
n. Welding curves
o. Reference to any re-welding
p. Comments
q. Corrective action

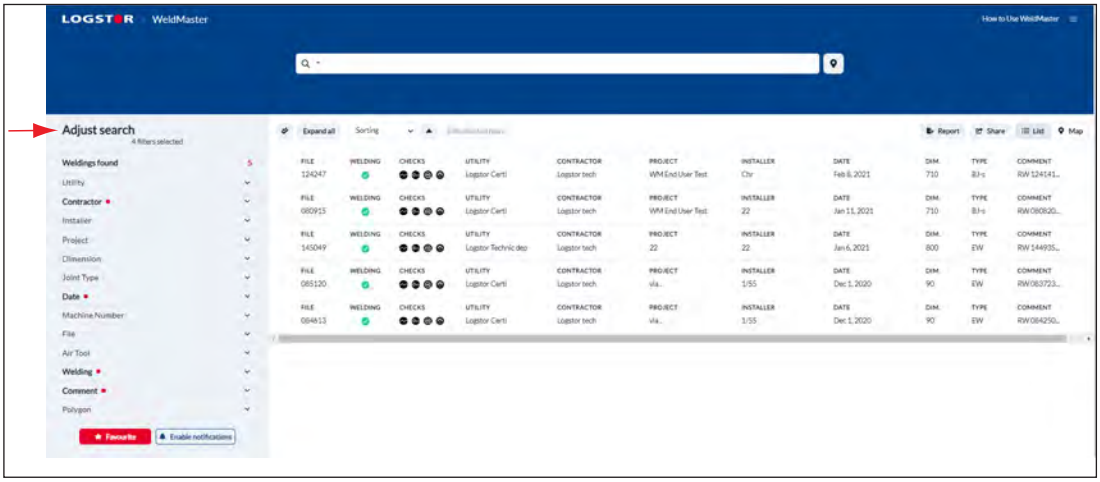
Search options

The following criteria are searchable:

Contractor, Installer, Project, Dimension, Joint type, Date, Machine number, File, Air tool, Welding (Approved, Not approved, Manually approved and Unknown which are welds prior to the WeldMaster 5.0 update). See illustration.

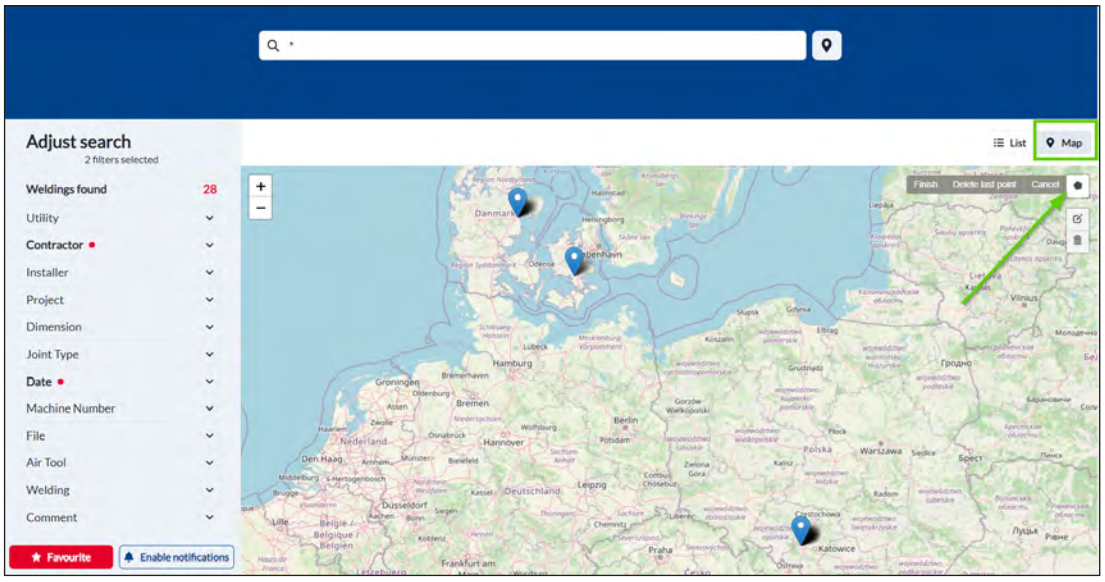
It is possible to extend each search criterion on basis of the criterion on detailed.

By pressing ”Favourite” the search is automatically established on Dashboard. See p. 5.3.7



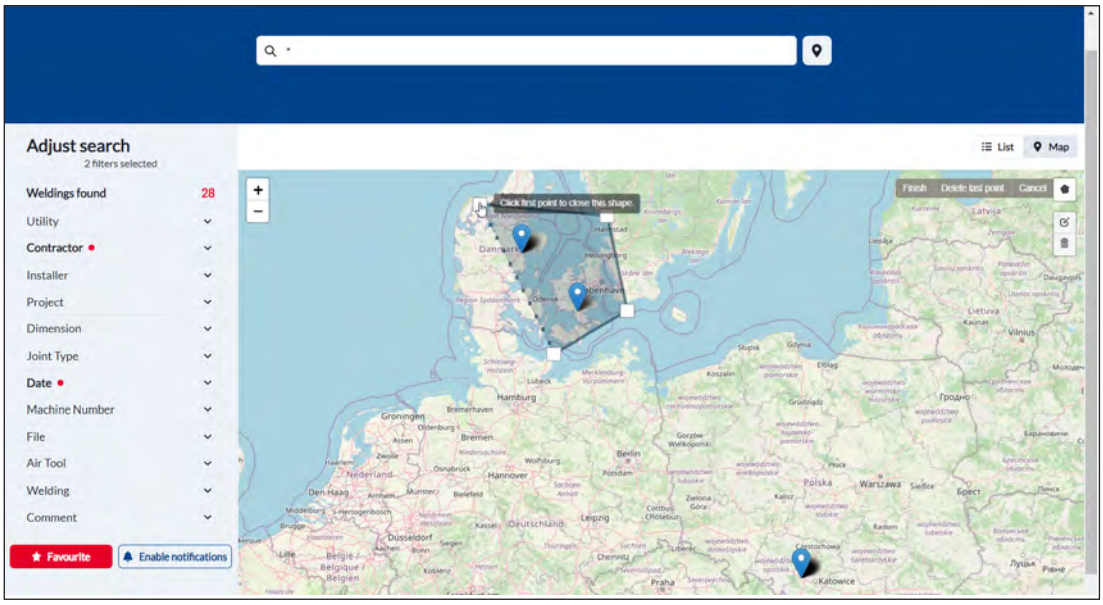
Extended search via MAP

6. Press ”MAP” and a map with the position of the casing joints appears.

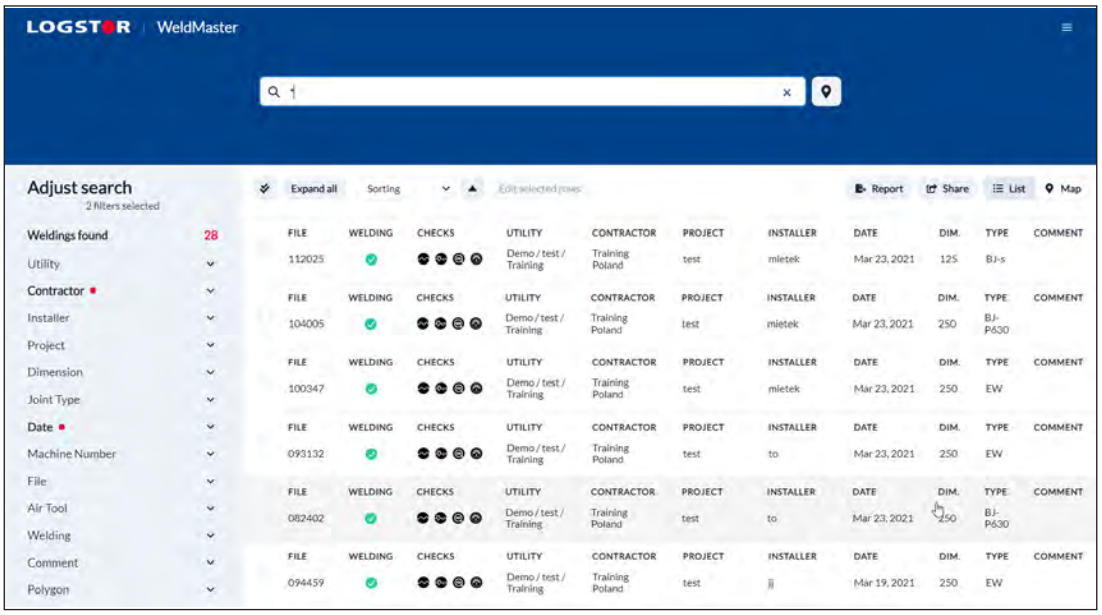


Extended search via MAP

7. By clicking on the polygon you can outline the area, for which you want casing joint documentation.
8. Now press ”List” and the welds appear.



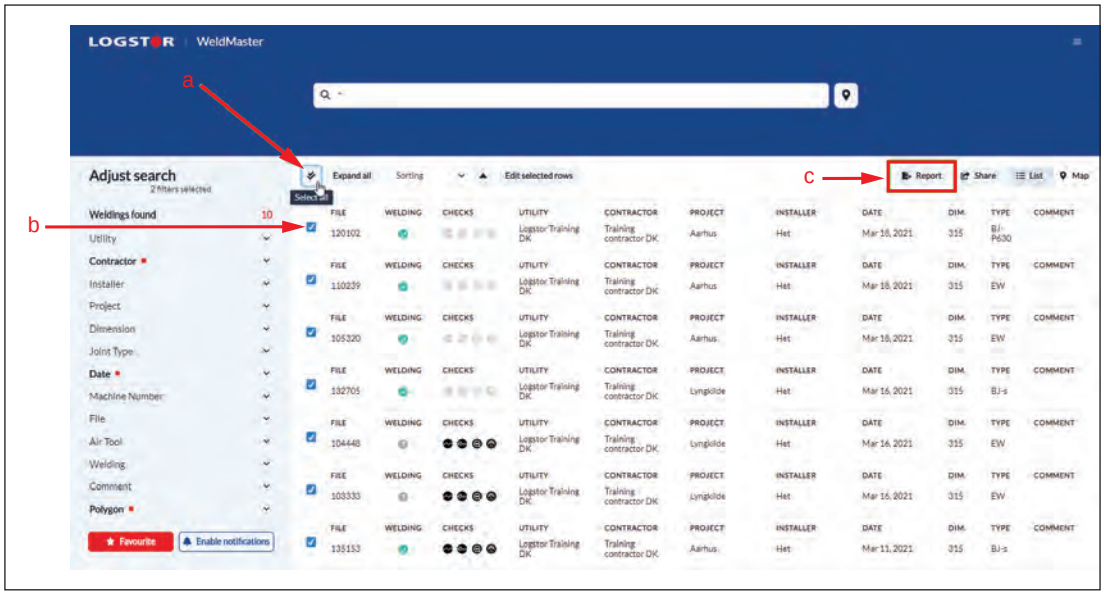
9. Results of the extended search appear.



Documentation in report

10. On the basis of the chosen search a report on the welds you want to report can be generated. You can choose all welds by clicking on ”Select all” (a) or you can pick out single welds by clicking on them (b).

Now you can click on the icon ”Report” (c) to define the contents of the report.



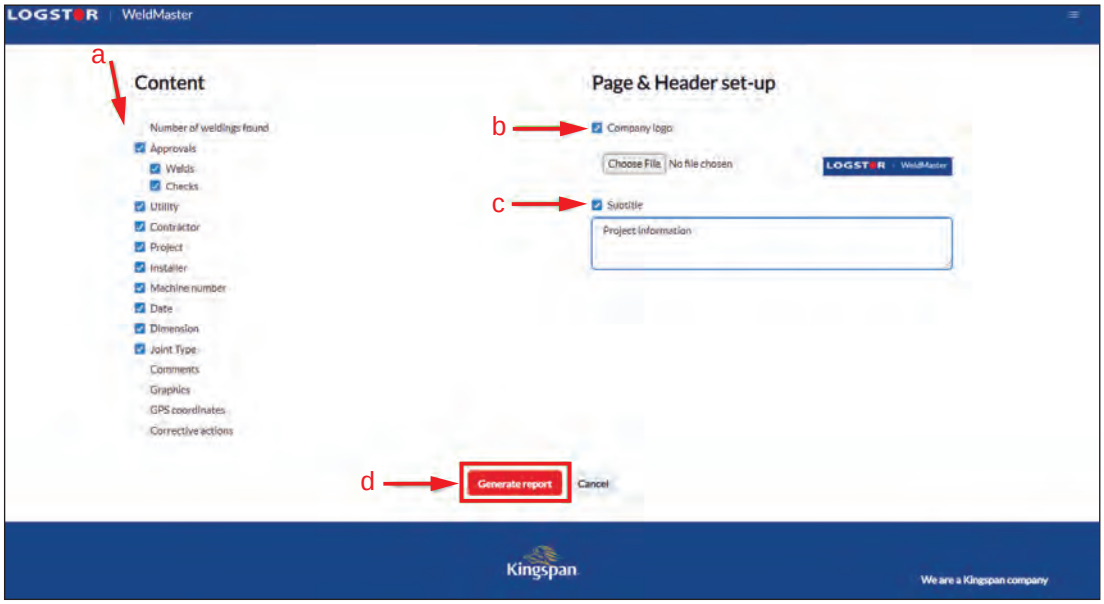
Reporting

11. Under ”Content” you can define the contents of the report you want to generate (a).

    It is possible to apply your own logo to the report by clicking on ”Company logo” (b).

    The title of the report is defined by clicking on ”Subtitle” (c).

    To print the report click ”Generate report” (d).



Example of a repport

Troubleshooting

Error with Motorola PDA	Possible cause	Solution	User error
Red & blue lamp does not illuminate	The welding machine has not been switched on	Switch on the welding machine	Machine
Red & blue lamp does not illuminate	1 phase (L3) or zero is missing	Check supply cable/generator	Machine
"Phase Error" when starting the weld	1 phase (L1 or L2) is missing	Check supply cable/generator	Machine
"Welder is not ready" when starting the weld	2 phases (L1 and L2) are missing. The fans are not in operation	Check supply cable/generator	Machine
"E14-No sense cable"	Red sense cable disrupted/loose connection	Check connections. Replace weld cable	Machine
Welder starts but then writes: Sending:=> No Cable:=> Ready:=>	Emergency stop switch set fault!	Emergency stop: activate=> release, activate=> release etc. 5-6 times	Machine
Wrong resistance and temperature displayed	Too high ohmic value = Burned wire at BandJoint STD. Black sense cable = approx. 100°C too high a temperature	Check connections/Replace casing joint	Machine
"Temperature too low!" "Cannot start welder"	Very low ohmic value = Short circuit	Check connections/Replace casing joint	Machine
PDA very slow at start and program loading	Many files in folders. Low battery	Mark welds as completed and upload them manually. Charge the battery for 12 hours, reset PDA ("1+9+power").	PDA
"E6-Termoswitch"	The temperature is too high (>40°C)	Ensure free ventilation, cool the inverter	Machine
PDA writes "E9-No cable"	No casing joint/welding strip	Connect the casing joint, check connections	Machine
PDA writes "E9-No cable"	The casing joint short-circuited during last weld, main board may have burned out	Send to service	Machine
PDA writes "E14-No sense cable", "E9-No cable", "zero set", "S2-ready" when starting the weld	Faulty inverter/print	Send to service	Machine
Log On not possible	Local tele operator shall approve the SIM card Wrong user name or password	Awat signal - enter information correctly	Log On
Log On not possible	Server at LOGSTOR not in operation. No connection on location (no coverage)	Try again later	Log On
"0-No Bluetooth connect"	Crane operation/geometric equipment interfers	Wait or move equipment	Bluetooth
"0-No Bluetooth connect"	Low battery on repeater	Charge PDA for 12 h, reset PDA or send to service	Bluetooth
"0-No Bluetooth connect"	<10% power, PDA in power save mode and shuts down bluetooth	Charge PDA and wait.	Bluetooth
PDA boot screen freezes	Flat battery or software error	Charge PDA for 12 h, reset PDA or send to service	PDA
Database 0.0	Faulty software	Contact support	PDA
Miscellaneous		Contact support/Send to service with error description	

Trailer equipment - Preface

Preface

Equipment for installing weld joints can be leased or bought from LOGSTOR's installation department.

The complete equipment is supplied in a lockable trailer with a towing option suited to a 50 mm towing hook.

- After signing for the receipt the lessee is responsible for the trailer, incl. equipment, cf. the lease agreement.
- The lessee is responsible for maintaining the equipment, cf. this weld joint manual.
- The lessee is responsible for the proper use of the equipment, cf. this weld joint manual.

The equipment must be returned in the same condition in which it was received.
The lessee will be invoiced for any defects on or damage to the trailer and equipment.

Consumables as listed in below inventory will not be invoiced.

This standard trailer is delivered with the equipment specified in the equipment list.
Optionals are paid for separately.

The trailer is intended for normal, accessible roads.
If the trailer is to be used under other conditions, the necessary measures must be taken to protect it.

Only staff certified by LOGSTOR may use the equipment.

As mentioned under installation, it is essential to the quality of the installed weld joints that the parameters are observed. This is possible only if the equipment is maintained and used in accordance with the instructions.

Trailer equipment - Standard

Trailer standard equipment

The trailer contains:

Pos.	No..	Pc.	
1		1	Generator
2		1	Air compressor
3		1	400V cable, 25 m
4		4	230V cable, 25 m
5		1	Weld Joint Manual
6		4	12 m connecting hose, high pressure
7		1	Jigsaw
8		1	Air blow gun

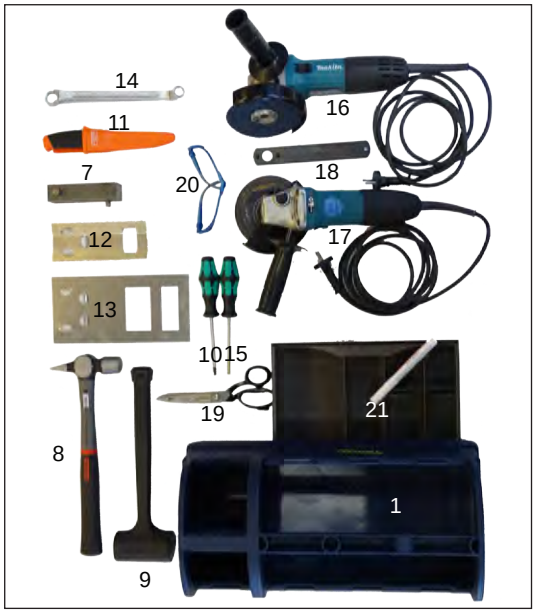
Consumables:

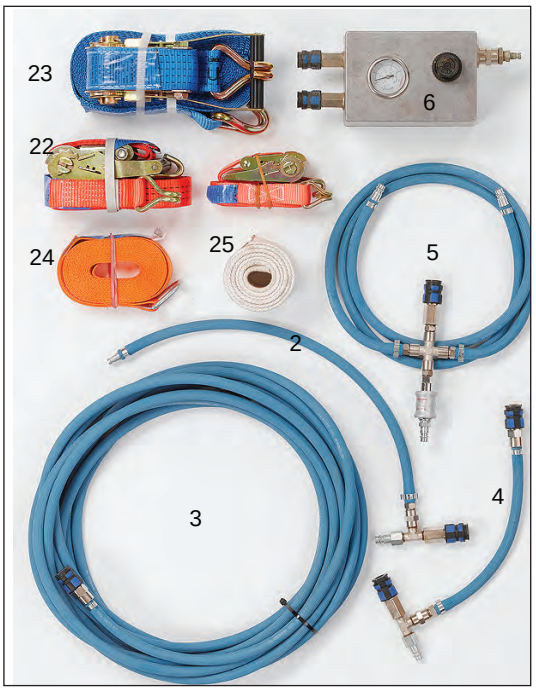
Pos.	No.	Pc.	
9		1	Motor oil, 10 l
10		1	Compressor oil, 0.5 l
11		1	Oil and fuel filter set
12		1	Saw
13		5	Blades for saw
14		5	Grinding wheels, 125 mm
15		5	Fibre discs
16		1	Gas cartridge for solder iron
17		12	Gloves
18		1	Soap for pressure test, 1 l
19		1	Cleaning cloth ”3M”
20		6	Tape
21		1	1 set of couplings
22		1	Unitape
23		25	Plug 35 mm, low 3-1
24		25	Plug 43 mm, low 4-1 (35751)
25		25	Venting plugs, BJ and EW
26		25	Adjusting screws
27		25	Insulator feet, 20 mm
28		1	Bag of cloths
29		1	Alcohol, 1 l/cloth
30		12	Insalator feet, long
31		50	Wire holders

Trailer equipment - Tool tray contents

Tool tray contents for BandJoint

Pos. No.	Pc.	
1	1	Tool tray, PE
2	1	Short coupling hose
3	1	WM air hose
4	3	Short coupling hose for longitudinal pressure rail
5	2	Y-air hose for pressure band
6	2	Compressed air reducer with double outlet
7	1	Impact cushion
8	1	Hammer
9	1	Synthetic hammer
10	1	Hexagon screwdriver (umbraco)
11	1	Knife
12	1	Marking template ≥ 225
13	1	Marking template ≤200
14	1	Ring spanner, 13/17
15	1	Screw driver
16	1	Grinder (with fiber disc)
17	1	Grinder (for cutting)
18	1	Pin spanner for grinder
19	1	Scissors
20	1	Protective glasses
21	3	White marker pen
22	2	Strap, 25 mm
23	2	Strap, 35 mm
24	2	Strap, 50 mm
25	4	Hose for pressure band
26	4	12 m air hose, low pressure





Trailer equipment - Tool tray contents

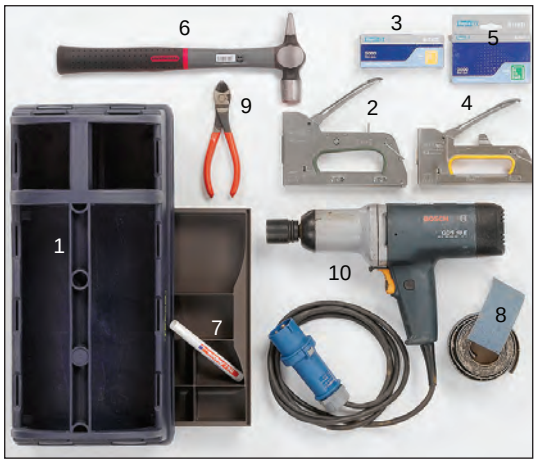
Tool tray contents for BandJoint ø 900 - 1400 mm

Pos. No.	Pc.	
1	1	Tool tray, PE
2	1	Impact wrench
3	1	Top for Impact wrench
4	1	Ring spanner 10/13
5	1	Umbraco spanner “4”
6	1	Cotter pin for shaft 3.2 mm
7	5	Washer Ø8
8	5	Bolt M6 *20 Umbraco
9	5	M6 Hexagon nut
10	5	M6 Flange hexagon nut
11	5	M8 Hexagon nut

Trailer equipment - Tool tray contents

Tool tray contents for EWjoint

Pos. No.	Pc.	
1	1	Tool tray, PE
2	1	Rapid R23
3	1	4 mm staples for Rapid R23
4	1	Rapid R34
5	1	6 mm staples for Rapid R34
6	1	Hammer
7	1	Whiter marker pen
8	2 m	Sanding belt
9	1	Diagonal cutter
10	1	Bolt spanner



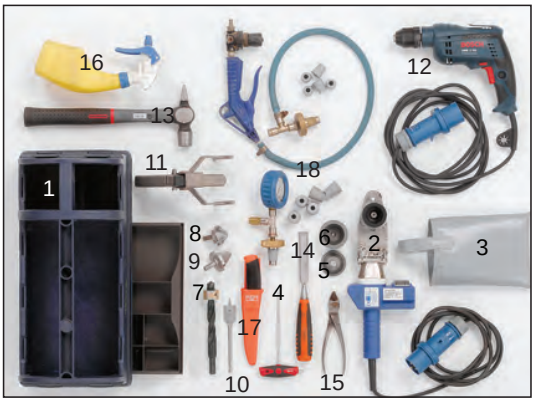
Tool tray contents for surveillance

Pos. No.	Pc.	
1	1	Tool tray, PE
2	1	Crimping tool
3	1	Solder iron, gas
4	1	Megger, MIT 320-RS
5	1	Diagonal cutter
6	1	Installation wire
7	1	Crimp connector
8	1	Solder tin with grease
9	1	Cleaning cloth “3M”

Trailer equipment - Plug box contents and function

Contents of general plug box

Pos. No.	Pc.	
1	1	Tool box PE
2	1	Plug welder
3	1	Plug welder casing
4	1	Allen T-key, 4 mm
5	1	Cone, Ø 35, for plug welder
6	1	Cone, Ø 43, for plug welder
7	1	Drill with stop, 17.5 mm
8	1	Plug drill, 35 mm
9	1	Plug drill, 43 mm
10	1	Flat drill, 24 mm
11	1	Retaining tool for weld plug
12	1	Drilling machine
13	1	Hammer
14	1	Chisel 20 mm
15	1	Diagonal cutter
16	1	Spray bottle, soap water
17	1	Knife
18	1	Pressure testing equipment



Contents of special plug box

Pos. No.	Pc.	
1.	1	Spray bottle
2.	1	Hammer
3.	1	20 mm chisel
4.	1	17.5 mm drill with stop
5.	1	Closed plug welder
6.	1	Pressure test equipment
7.	1	50 mm plug drill
8.	1	43 mm plug drill
9.	1	35 mm plug drill
10.	1	Diagonal cutter
11.	1	Knife
12.	1	Retaining tool for weld plug
13.	1	Drilling machine
14.	1	Plug welder which opens

Function of plug box

Plug welder control is installed in the plug box. Connect the two plug welders in the box, as required.

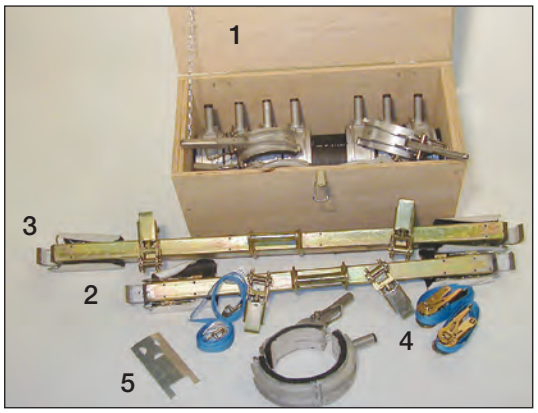
Read the plug welder temperature on the display. The control is locked and adjusted to 250°C.

Trailer equipment - Pressure rails and bands

Pressure rails and bands for BandJoint Ø90 – 200 mm

Three types of pressure bands are available with specific dimensions.

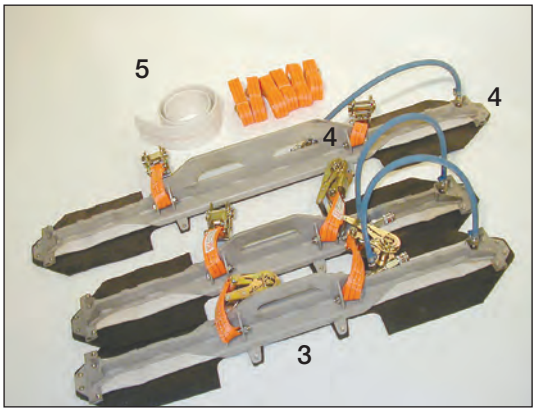
1. Circumferential band in transport box with room for 8 units of the same dimension.
   To be ordered according to dimension.
2. 4 standard pressure rails
3. 1 pressure rail, long
4. 8 lashing belts 25 mm, length 1 m
5. 1 marking template



Trailer equipment - Pressure rails and bands

Pressure rails and bands for BandJoint Ø225 – 800 mm

1. 2 sets of circumferential bands, to be ordered according to dimension.
2. 2 hoses for pressure bands, to be ordered according to dimension.
3. 2 longitudinal pressure rails, standand
4. 1 longitudinal pressure rail, long
5. 1 hose for pressure rail



Trailer equipment - Installation tools for BandJoint ø900-1400 mm

Preparations

1. Nylon band and hose in the chosen dimension.

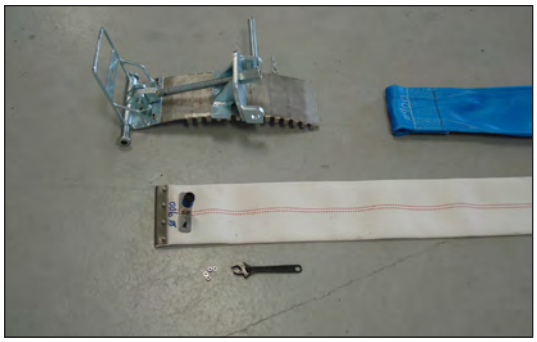
   Lay the nylon band with the folded edge downwards.

   Lay the coupling and the strapping bolt upwards.

   Place a strapping unit for the nylon band and a strapping unit for the hose at each end.

Preinstallation of strapping unit for nylon band

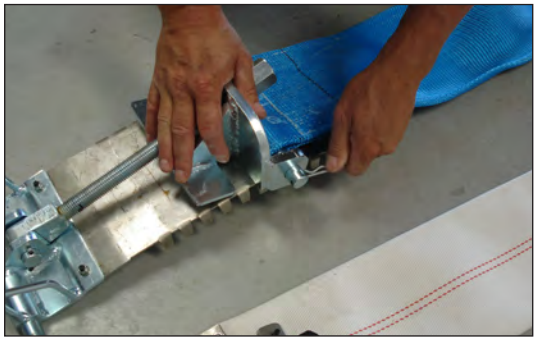
2. Strapping unit for nylon band.



3. Prior to installation form a hole in the nylon band by means of the guide pin.

   Equip the nylon band with a ø 20 mm axis.

4. Fix this end of the nylon band and secure it with a split pin.



Trailer equipment - Installation tools for BandJoint ø900-1400 mm

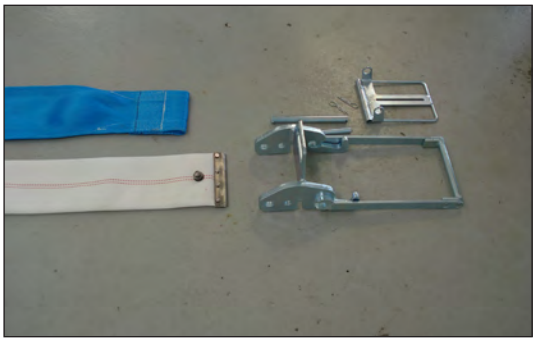
Preinstallation of strapping unit for nylon band *continued*

5. Equip the hose with ø 6 mm bolts.

6. Tighten the M6 nuts.

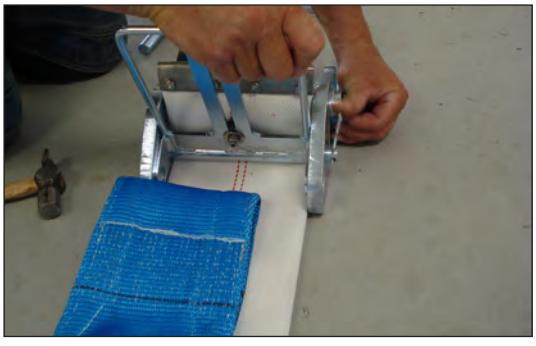
Preinstallation of strapping unit for hose

7. Strapping unit for hose/locking handle.



8. Install the hose in the guide and secure it with a M8 nut.

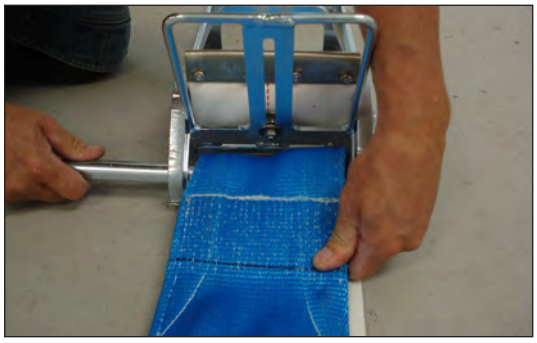
9. Equip the hose guide with a ø 16 mm axis and secure it with a split pin.



Trailer equipment - Installation tools for BandJoint ø900-1400 mm

Preinstallation of strapping unit for hose, ***continued***

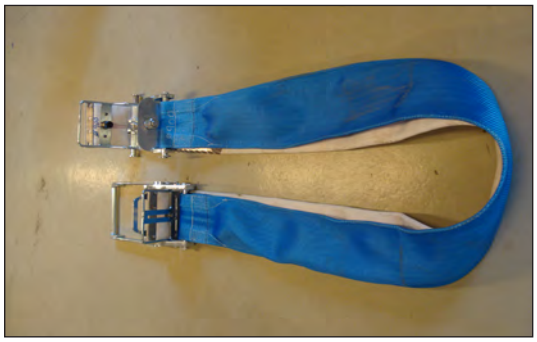
10. Equip the nylon band with a ø 20 mm axis.



11. Secure the axis with a split pin.

Finished installation

The installation of the nylon band and the hose is now complete.



Trailer equipment - Installation tools for EWJoint

Installation tools for fixation of welding strip for EWJoint

For casing thickness 3-5 mm (ø90-ø400):
- Gun (Rapid R23)
  9050 0000 031 050
- Staple (Rapid No. 13-4 mm)
  9050 0000 031 053

For casing thickness ≥ 5 mm (≥ ø450):
- Gun (Rapid R34)
  9050 0000 031 051
- Staple (Rapid No. 140-6 mm)
  9050 0000 031 052

EW band

Pressure band to install EWJoint in dimensions ø90-1400 mm.

One size per dimension.

EW tightening clamp

Tightening clamp for EW band.

Small for ø90-280 mm

Big for ø200-1400 mm

Trailer equipment - Replacing hoses on the pressure band

Replacing hoses on the pressure band

The fire hoses in the circumferential and longitudinal pressure bands can be replaced in case of leakage.

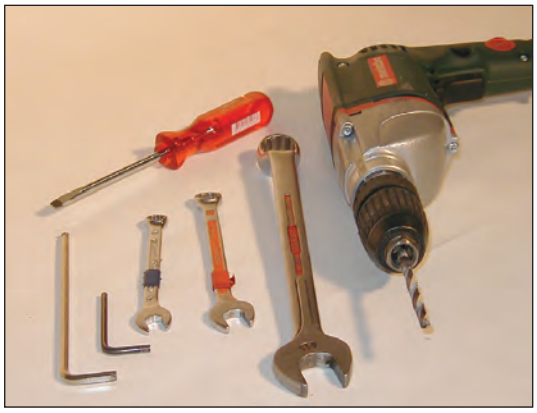
Two spare hoses for replacement are supplied with the circumferential pressure bands.

For the longitudinal pressure bands, one spare hose is supplied which fits the long pressure rail.

Shorten the hose, if it is to be used for the short pressure bands.

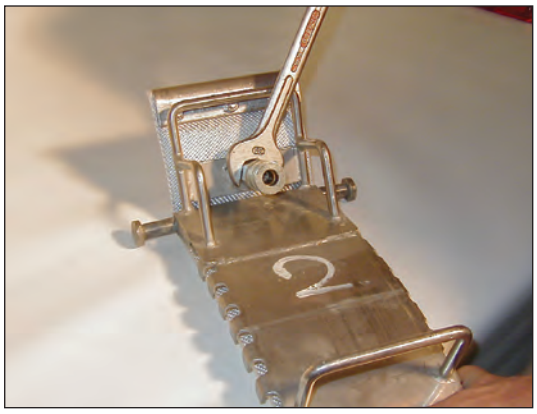
Tools required for replacement

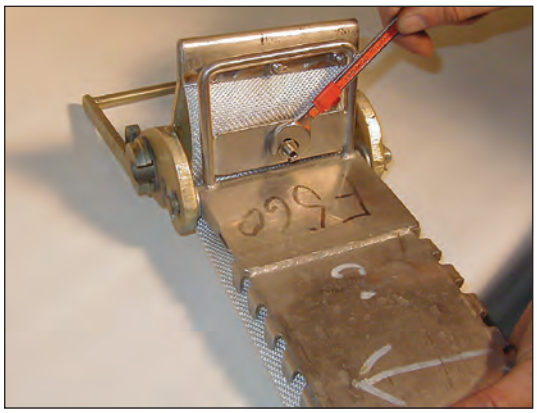
Drilling machine, including 6 mm drill
10-13-20 mm ring spanner
Screwdriver
4 and 6 mm Allen keys



Removing the hose

Remove the compressed-air coupling from the pressure band, and, at the opposite end, the bolt that retains the hose in the stainless band.

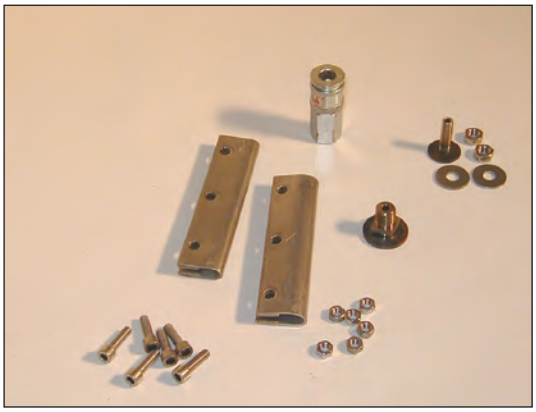




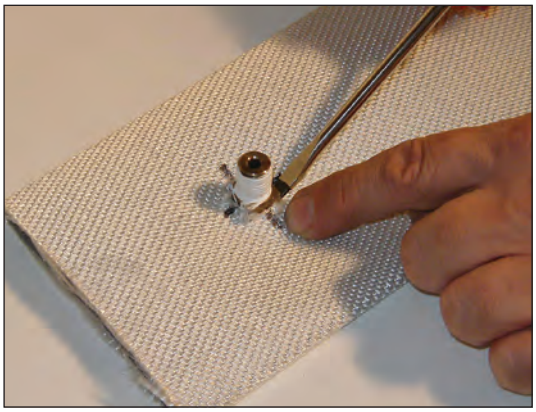
Trailer equipment - Replacing hoses on the pressure band

Removing the hose, ***continued***

Remove the barrier at each end of the hose. Remove the compressed-air outlet and bolt from the leaky hose.



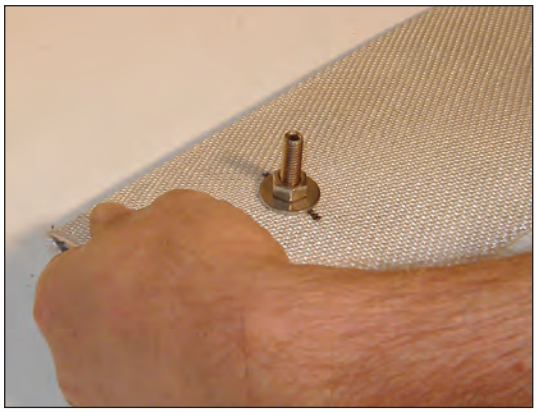
The spare hose has holes for the compressed-air outlet and a bolt at the opposite end of the hose.
Tape the outlet using Teflon tape from the toolbox of spare parts.
Take care to press the hose over the quadrangle when inserting the outlet.



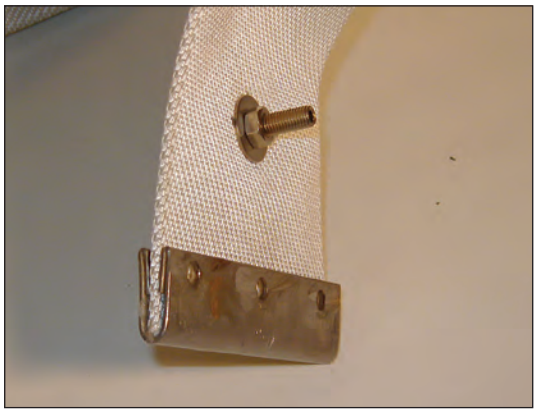
Trailer equipment - Replacing hoses on the pressure band

Removing the hose, ***continued***

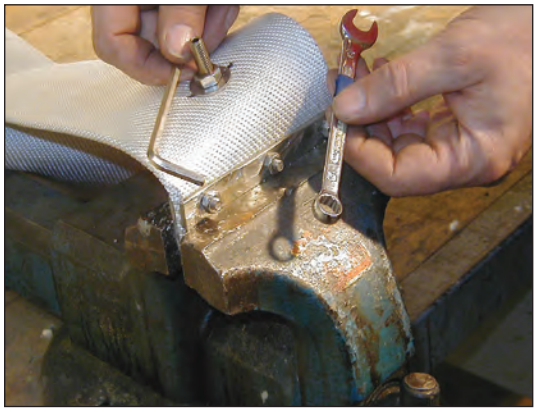
Similarly, place the bolt at the opposite end of the hose and tighten it with a washer and a nut.



Then press the hose down into the barrier, until it can get no further.



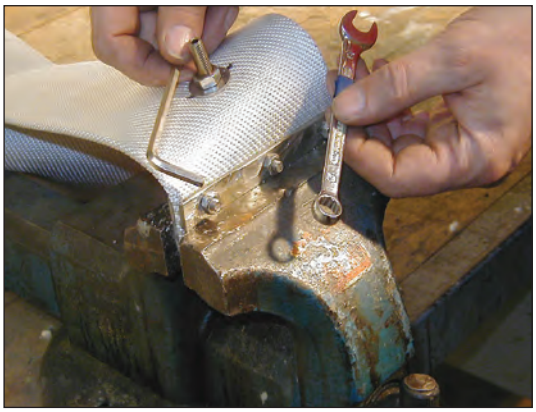
Drill holes for the three bolts in the hose using the drilling machine.
This is best done by tightening the barrier in a vice.



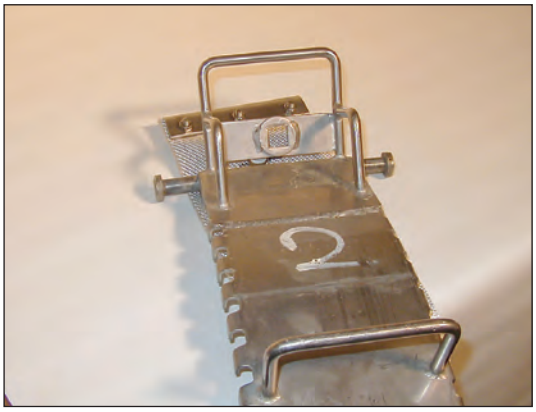
Trailer equipment - Replacing hoses on the pressure band

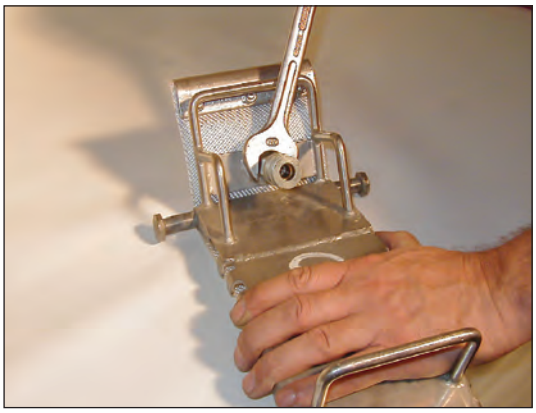
Removing the hose, *continued*

Mount and tighten the bolts using a ring spanner and an Allen key.

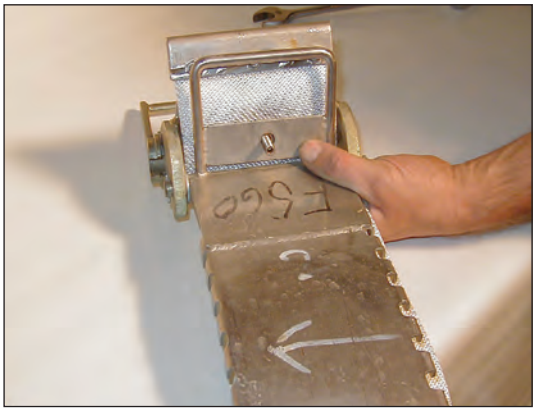


Then install the hose in the stainless steel band.
Press the compressed-air outlet through the quadrangular hole at the handle and tighten it by installing the coupling.



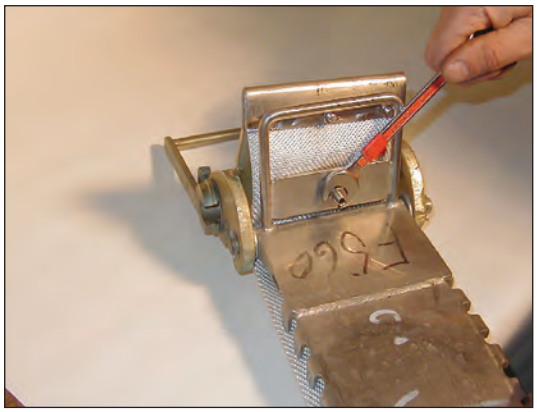


At the opposite end, mount the bolt in the round hole and tighten it.



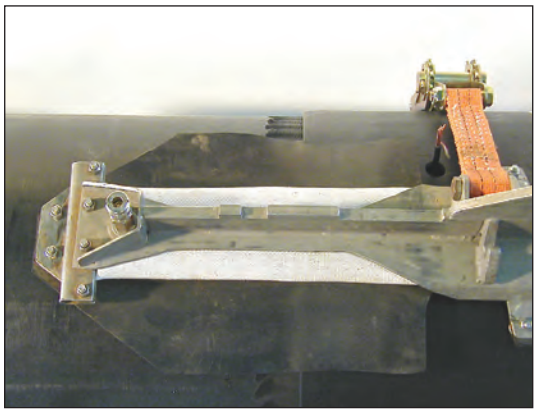
Trailer equipment - Replacing hoses on the pressure band

Removing the hose, *continued*



Pressure-test the band by installing it on the pipe and applying compressed air from the reduction box.
The hose in the longitudinal pressure band can be replaced in the same way.

First, remove the rubber plate below the hose.
Remove the compressed-air coupling and then the four screws in the barrier.
Install the new hose as mentioned under circumferential pressure bands.
Pressure-test the pressure rail by installing it with two circumferential bands on a pipe.



Trailer equipment - Technical data

Generator

Make:	Genset	Genset	Genset
Type:	MG23 US-P	MG22 SS-L	MG20 SS-L
Voltage:	3 x 400/230 VAC	3 x 400/230 VAC	3 x 400/230 VAC
Frequency:	50 Hz	50 Hz	50 Hz
Prime power:	19.5 kVA	18 kVA	16 kVA

Diesel engnie

Make:	Perkins	Lombardini	Lombardini
Type:	404D-22G	LDW2204CHD	LDW2204CHD
Power:	28 HK	22 HK	22 HK
Cooling:	Water cooled	Water cooled	Water cooled
Consumption:	4 l/h	4 l/h	4 l/h

Control panel

2-3 pcs. 3-pole CEE socket 230V – 16A
1 pc. 3–pole SUKO socket 230 V – 16A
2 pcs. 5-pole CEE socket 400V – 16A

Safety

Generator and control panel are made in accordance with VDE 0530 and EN 60 204-1. According to the Danish regulation No. 1082 of 12/07/2016 §60:

If a temporary electric installation exist for more than 3 months, the installation shall be subject to inspection by an authorised electrical contrator every 3 months under existing law.

Note! Regulation No. 1082 is only valid in Denmark. If the unit is outside Denmark see DS/EN 60364.62.2. It is recommended to maintain the periodical inspection every 3 months.

Dry-powder extinguisher and eye wash are included in the trailer.
The box contains the manual.
If required, earth rod is available as additional equipment.

Inspecting and calibrating tools

Product	Maintenance	Calibration/inspection	Comments
Trailer	Weld Joint Manual sec. 6		
Generator	Weld Joint Manual sec. 6		
Air compressor	Weld Joint Manual sec. 6		
Pressure tool	Weld Joint Manual sec. 6		
WeldMaster		Every 2nd year	Calibration label on equipment
Megger, insulation tester		Every year	Calibration label on equipment
Manometer, air gauge		Every 2nd year	Calibration label on equipment
Heat iron for plug welding		Every year	Calibration label on equipment

Trailer equipment - Operation of GenSet generator

1 Daily operation

- Oil level of motor (Shell Rimula R4 SAE 15/40W)
- Water level of cooler and frost protection
- Add diesel oil. (Diesel container with a capacity of approx. 50 l)
- Leaks and waste
- Driving light of the trailer
- Tyre pressure and wear
- Function of the inertia brake
- Damages on trailer and supportive parts/girders etc.

2 Weekly check

- Possibly demineralised water on the accumulator
- Oil level of compressor (Shell Corena P68)
- Drain condensed water from the pressure tank
- Check cooler for external dirt

3 Start-up

- Disconnect all power
- Preheat the motor by turning the key in the dashboard
- After preheating the motor can start
- Shortly after check voltage and frequency
- After 2-3 min. connect power load

4 Stop

- Disconnect all power
- Let the engine cool for 2-3 min. prior to stop

5 Maintenance

Oil filter change: (200 hours' interval. See label on generator)

- Oil drain is carried out with a hot engine
- Remove the screw plug and collect the old oil
- Screw off the old filter and check that the gasket follows
- Screw on the screw plug again
- Install the new filter (available in the trailer)
- Add Shell Remula R4 SAE 15/40 up to the max. marking on the oil level indicator
- Start the engine and stop it after 2-3 min. – check the oil level again

Cleaning:

Dust and oil waste are fire hazards and shall therefore be removed regularly

Trailer equipment - Operational failures

1 Motor is not running	- No light in the signal lamps, battery discharged. Charge or replace it - Diesel container empty. Add more diesel - Emergency stop button, if any, activated - Motor surveillance active (low oil pressure, water, overheating) - Miscellaneous, contact the Service Department
2 Motor runs unevenly	- Air filter clogged. Clean or replace it - Fuel filter clogged. Clean or replace it - Air in the fuel system. Vent - Fuel filter stops again and again. Drain diesel, clean container and refill it with diesel oil of a good quality - Regulator or fuel pump defect, call service
3 Voltage frequency unstable	- Motor does not run evenly, see item 2 - The generator is overloaded, reduce the consumption - Instrument defect, replace it as soon as possible
4 No voltage for the equipment	- HPFI relay triggered. Connect the relay. Possible resistive fault in cables/equipment - Circuit breaker triggered, too high consumption (reduce) - Defect cables, replace them with others - Shorted equipment, replace with another - Missing phases, contact the Service Department

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