

Assembly instructions for LK PressPex and PressPex Eco

GENERAL

All water contact parts of LK PressPex are manufactured from dezincification-resistant brass.



NOTE!

When installed in radiator systems, fittings are to be protected against direct contact with concrete since this may contain ammonia residues. Therefore, use the LK Fitting Protection or similar.



The type-approval for LK PressPex and LK PressPex Eco applies only to joining of LK PE-X and LK PAL Universal Pipes.

LK PressPex couplings are also type-approved for PEM pipes in dimensions 16, 20, 25 and 32 mm with pipe dimensions according to Table 1. The couplings must not be placed in the ground. This range includes both PressPex couplings for universal (gray plastic ring) and PV (red plastic ring) which corresponds to the dimension of the PEM pipe.

Table 1.

Pipe dimension	Refers to couplings for pipe dimensions	Colour on the plastic ring (coupling)
16	16 x 2,0	Grey
20	20 x 2,0	Red
25	25 x 2,3	Red
32	32 x 3,0	Grey

LK PressPex is designed for use in tap water, heating and cooling systems. The fitting must not be lubricated. The installation must be carried out in accordance with Industry Regulations *Säker Vatteninstallation (safe water installation)*.

Pressure and temperature range:

- LK Press Fittings are approved for the same pressure and temperature ranges as the LK Universal Pipes, that is 1,0 MPa at +95°C.
- When using a PressPex fitting with brass flat end (EN 12164, CW602N), the flat end is joined according to the fitting manufacturer’s instructions.
- For LK >B<Press and LK Conex, there are clear instructions under respective product group’s assembly instructions.



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LOCATION OF JOINTS



NOTE!

Joints for tap water **should be** mounted housed in a LK Manifold Cabinet UNI with leakage indication towards an area with floor drain or waterproof flooring.



NOTE!

Joints **should be** located in rooms with waterproof flooring so that they are interchangeable and any leaking water can easily be detected.

If the LK Manifold Cabinet UNI cannot be used

- If LK Manifold Cabinet UNI cannot be used, the areas for pipe fittings in enclosures, installation shafts or fitting cabinets **should have** waterproof bases (minimum height 50 mm) and be fitted with leakage indication with sufficient capacity that is, a minimum of 20 mm internal diameter.
- The outlet of the leakage indication should be in a room with floor drain or waterproof flooring. The outlet should not be located closer than 60 mm from the waterproofing of the floor or the adjacent wall.
- Installation shafts with room for fittings or fitting cabinets should have a service opening large enough for repairs or replacement of all joints.
- The service opening should not be located in wet zone 1 if the hatch is not tested and approved against the waterproofing of the wall (NOT provided by LK Systems).

PE-X pipe-in-pipe system (RiR)

RiR, with components included according to Installation solutions NT VVS 129, is tested and approved according to NT VVS 129 and Sintef Test Method for conduits. Read more:

www.lksystems.se/en (support/documentation/LK Universal/assembly instructions)

LEAKAGE INDICATION PRESS FITTINGS

Starting 1 July 2012 Sweden's plumbing safety regulations requires that press fittings must have leakage indication. An unpressed fitting must leak in a tightness test. According to the industry regulations press fittings are tested as follows:

- A radial press fitting with internal or external seal must be designed in such a way that an unpressed fitting leaks in a tightness test. The requirement applies to all dimensions of radial press fittings with internal or external seal.
- Dimensions up to and including 75 must be tested and approved by an accredited testing organization in accordance with section 12.14 of DVGW Arbeitsblatt 534.

All LK Systems press fittings from dimension 16 mm up to 75 mm are approved and meet the above requirements. See also the section *Tightness testing*.



NOTE!

Press fittings and systems that meet the requirements are displayed on www.saker-vatten.se



NOTE!

Only press machines with compression forces as specified in the section **Press tools** may be used.

Different makes of press jaws

Different makes of press jaws can be used provided they are designed for the LK PressPex fitting. This is shown by the letter/number combination indicated on the jaws.



A.	Fitting housing of dezincification-resistant brass.
B.	Grey plastic ring ensuring that the aluminium layer in the LK PAL Universal Pipe does not come in contact with the brass material in the fitting. The plastic ring has an opening for visual inspection to ensure that the pipe end has been pushed entirely to the bottom of the fitting.
C.	Press socket of stainless steel.
D.	O-ring 1, located under 1st press groove.
E.	O-ring 2, located between 1st and 2nd press groove.

MARKING AND MATERIAL

- All LK PressPex fittings are designed for LK PE-X and LK PAL Universal Pipes, and they are fitted with a stainless steel press socket and a grey plastic ring.
- The housing of LK PressPex fittings is made of nickel-plated dezincification-resistant brass up to dimension 32. Fitting dimensions larger than 32 mm are made of unplated dezincification-resistant brass.
- The support sleeve of the fitting has EPDM O-rings.
- The dimension is specified on the packaging, e.g. AX25, indicating that the fitting is designed for LK PE-X or LK PAL Universal Pipes with a dimension of 25×3.5.



NOTE!

The pipe dimension for which the fitting is designed is stamped on the housing of the fitting, or on the press socket, e.g. LK 25. This is followed by a code for the year of manufacture and a batch number for traceability.



Marking of LK PressPex fittings.

RANGE

LK PressPex is a complete fitting system for LK PE-X and LK PAL Universal pipes. The system includes T-pieces, elbows, straight fittings, reducers, transition fittings for transition other pipe materials, etc. The full PressPex range is presented in the LK Universal product catalogue, read more at the link. www.lksystems.se/en (Products/LK Universal/products/press fittings/fittings)

PRESS TOOLS

- A press machine with suitable jaws is always required for joining press fittings. Press machines are available with battery or AC power adapter.
- LK’s press machines are all hydraulic with a compression force between 32kN to 40kN throughout the compression process.
- LK Minipress is designed specifically to be lightweight, and therefore has an axial force of only 15kN or 19kN and customized mini jaws with largest dimension of 32 mm or 40 mm.
- All batteries are environmentally friendly Li-ion type.



NOTE!

Correct compression force is an absolute requirement for proper pressing. Other makes of press machines can be used provided that the compression forces can achieve 32–40kN and that they are compatible with the press jaws.



Machines used in a tough working environment
 Press machines are used in a tough working environment. Therefore, it is important that they are serviced and maintained in accordance with the instruction manual supplied. The performance of the machines are always checked in our service workshop. A separate calibration with protocol can also be ordered.

NOTE!
 Always follow the instructions from manufacturer of the press machine and jaws. Always follow the steps in this assembly instruction.



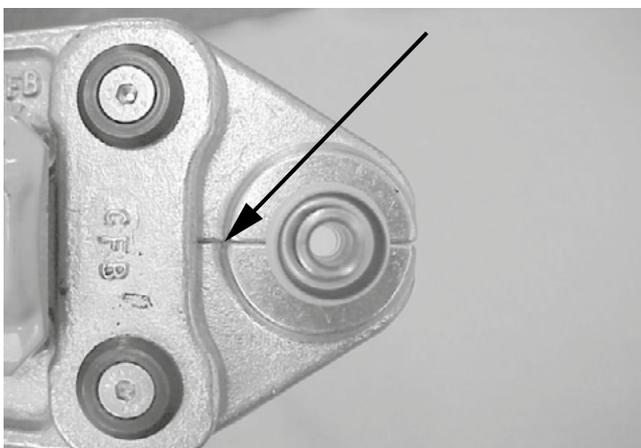
Press machines in different versions.

PRESS JAWS

Press jaws with a specific profile must be used for LK PressPex fittings. There are several makes of press jaws. The correct type is indicated by a code on the jaws according to the manufacturer's instructions. In case of doubt, we recommend using LK's jaws marked LK or profile TH.

Visual check of press jaws

Like all tools, the press jaws should be maintained and calibrated regularly. They should be stored in a dry place and all movable parts must be lubricated.



When fully closed, there should be no visible gap between the jaws. Any gap indicates wear in the movable jaw parts, and jaws need to be replaced.

Safety instructions

For safety instructions and other user instructions, please read the user instructions supplied with the press machine.

ASSEMBLY INSTRUCTIONS

Joining of LK PE-X and PAL Universal Pipes must be carried out according to the following steps.

Step A. Perpendicular cutting

NOTE!
 Sawing tools must not be used for cutting. See LK product range for suitable tools. www.lksystems.se/en (Products/LK Universal/products/tools/cutters).

NOTE!
 LK PE-X Universal Pipe and LK PAL Universal Pipe in smaller dimensions are cut most easily with pipe cutters. Larger dimension LK PAL Universal Pipes should be cut with pipe cutters fitted with cutting wheels for plastic pipes.

1. Cut the pipe perpendicularly.



Cutting performed with a pipe cutter.



Cutting done with a pipe cutter fitted with plastic fitted with cutting wheels for plastic pipes.



Step B. Deburring



NOTE!

The deburring of the pipe ends in **Step B** and the rotating of the fitting in **Step D** are highly essential operations to ensure the O-rings are not displaced or damaged, which will cause leakage in the fitting.



NOTE!

LK PE-X Universal Pipe can be deburred using the same type of pipe reamer used on copper pipes.
LK PAL Universal Pipes must be calibrated and deburred using an LK PressPex Calibration Tool F9.

LK PE-X and PAL Universal Pipes must be deburred inside to prevent damage or displacement of the O-rings, which will inevitably result in a leaking joint. After deburring, the pipes must be cleaned from any shavings.

1. Perform a deburring on the inner side of the pipe-end.
2. Clean the pipe of any shavings after the deburring has been performed.



LK PE-X Universal Pipe can be deburred using the same type of pipe reamer used on copper pipes.



LK PAL Universal Pipes must be calibrated and deburred using an LK PressPex Calibration Tool F9.

Step C. Check the O-rings

1. Check that the fitting is free of dirt and that the O-rings are in position.



Step D. Insert the pipe into the fitting



NOTE!

The deburring of the pipe ends in **Step B** and the rotating of the fitting in **Step D** are highly essential operations to ensure the O-rings are not displaced or damaged, which will cause leakage in the fitting.

1. Push the deburred pipe end into the fitting up to the first O-ring and then, twisting it slightly, push it to the bottom of the fitting.
2. Check through the sight-hole in the grey plastic ring that the pipe is pushed fully into the fitting. In cases where the fitting is installed in a pipe that has been in operation, the pipe must be cleaned internally.

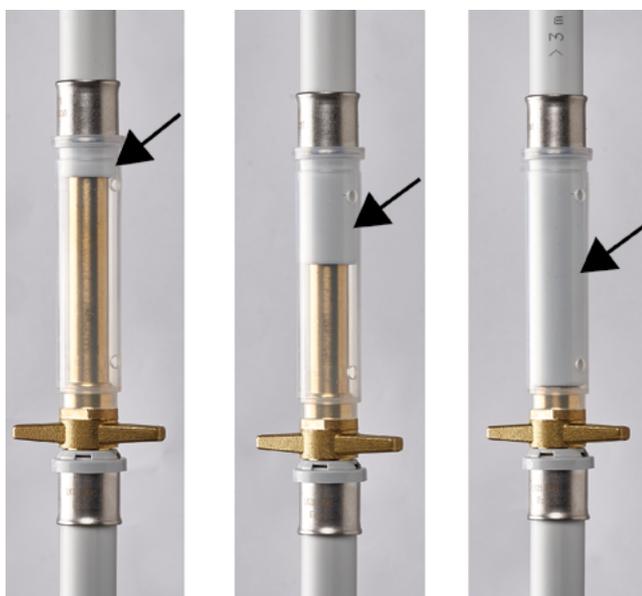


Insertion and twisting of the deburred plastic pipe.



LK PressPex ECO Repair Coupler as an alternative LK PressPex Repair Coupler is used for joining LK PAL pipes, as well as LK PE-X Universal pipes. The coupling is equipped with a handle that facilitates insertion and adjustment of the pipe to the correct insertion depth.

When the pipe is inserted it is visible through the transparent casing on the coupler. The pipe should be clearly visible before any compression is performed. See the examples in the illustration. In those cases where the coupler is installed on pipes that are in use, make sure the pipes are properly cleaned on the inside before the coupler is installed.



LK PressPex ECO Repair Coupler with a transparent casing.

Step E. The insertion depth

1. Mark the insert depth. This makes it simple to check and ensure that the pipe has not slipped out of the fitting before carrying out compression.



The insertion depth is marked with a pen.

Step F. Automatic compression



NOTE!

The press jaws must be perpendicular to the fitting during the compression to ensure a correct joint.



NOTE!

Machines with manual return must be checked to ensure that the press jaws are fully compressed before the return movement commences. Any gap at the front of the jaws may be due to solid residue between the jaws; this will prevent proper compression. The jaws will return automatically once full press force has been achieved.

1. Check that the press jaws have been cleaned and the lock pin is fully inserted into the machine's bracket.
2. Position the press tool correctly and start the automatic compression.



Compression with press jaws.

3. Compression joints must be checked to ensure they have been correctly compressed by inspecting and certifying that all fittings are marked. This should be incorporated in the self-test report.



Any gap at the front of the jaws may be due to solid residue between the jaws; this will prevent proper compression.

TIGHTNESS TESTING

Tightness test of press fittings

In order to check that a press fitting is compressed, a tightness test must be performed before the final pressure test.

1. Pressurize the pipe to a test pressure of 3 bar for at least 30 minutes. All joints must be inspected. The pressure may not drop during the test period.



NOTE!

This tightness test does not replace the mandatory pressure and tightness test described below.

Tap water and heating pipes

1. In pressure and tightness testing of pipes carrying water, the pipe must be slowly filled with water up to the test pressure. The tap water system must be tested *using water of drinking water quality*.
2. The pipes must be completely full of water and must have been air bled. In order to facilitate bleeding, the pipe should be filled from its lowest point.
3. The temperature difference between the current room temperature and the water temperature may not exceed 10°C.

After pressure and tightness testing of the tap water system with water, the system should be *operational within seven days or completely drained of water* in order to reduce the risk of bacterial growth.

Guidance

During tightness testing all joints should be inspected for “invisible leaks”. This inspection is important because such leaks cannot always be identified by the manometer on the pressure equipment.

Pressure and tightness testing of plastic pipe systems and pipe systems involving a mix of plastic and metal pipes

Step A. Pressurise the system for 30 minutes

1. Pressurise the pipe system to a test pressure of $1.43 \times$ the calculation pressure for at least 30 minutes. The test pressure must be 14.3 bar for tap water systems and 8.6 bar for heating systems.
2. The test pressure shall be maintained for 30 minutes.

Step B. A fast reduction of the test pressure

1. After 30 minutes, reduce the test pressure quickly to 7.5 bar for tap water systems and 4.5 bar for heating systems.
2. This pressure must be maintained for at least 90 minutes. The pressure should normally increase slightly during the test period. The entire pipe system must be inspected.

Pressure and tightness testing with air

Pressure and tightness testing with air or another gas must be *performed in accordance with the requirements of AFS 2006*.

Tightness testing with air, low pressure

A method developed by VVS Företagen (The Swedish Association of Plumbing and HVAC Contractors) and Säker Vatten AB

If there is a risk for freezing or bacterial growth before a piping system is put into operation, it is impractical to perform the tightness test with water. Industry Regulations Säker Vatteninstallation displays on its website www.sakervatten.se how a simplified tightness test with air can be performed.



NOTE!

This method may under no circumstances be carried out with a higher test pressure than 1.1 bar and it does NOT replace the mandatory tightness test.

LK Universal System, with type-approved products, is ideal for this procedure. LK's type-approvals can be used as certificates showing the products are tested for pressure resistance. LK Floor Heating Pipes (6 or 10 bar) can also be used for this method together with LK Floor Heating Manifolds as they are manufactured for a pressure of 6 bar. Manufacturer certificates are obtainable from LK Systems AB.

Carefully follow the instructions in the *Säker Vatteninstallation* document "Förenklad täthetskontroll med luft för vissa rörsystem" (Simplified tightness test with air for certain piping systems). Use testing protocols that can be downloaded at www.sakervatten.se.

**NOTE!**

After finishing the tightness test, the system must immediately be depressurized.

EXCESS MATERIAL / RECYCLING

- LK does not take back any packaging material or excess material except for materials in unopened and undamaged packaging.
- No components in the LK Universal System are classified as hazardous waste.
- Residual material from LK PE-X and LK PAL Universal Pipes is treated as combustible waste.

Existing tap water and heating systems

Guidance

- Existing *tap water systems* should be pressure and tightness tested with the existing water pressure of the tap water system.
- *Existing heating systems* should be pressure and tightness tested with the existing operating pressure of the heating system.

Checklist

1. Appoint a qualified person who will lead the work and set up testing protocol.
2. Ensure that the installation, and all the fasteners, fixings, pipe supports, etc., are able to withstand the loads of the system.
3. Freezing risks must be eliminated.
4. All joints must be visible and dry.
5. Instrumentation must function properly.

