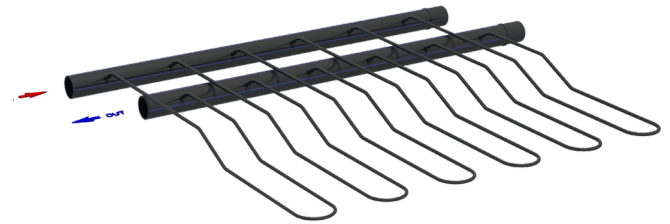


# Manifolds and pipes for snow melting

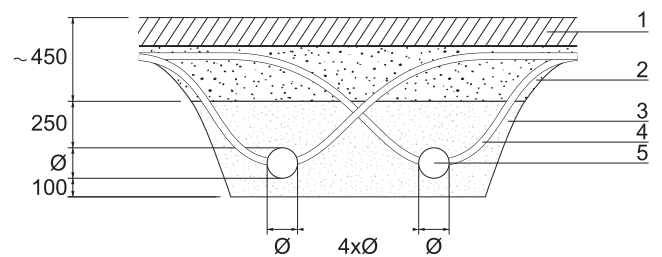
## LK SNOW MELTING MANIFOLD

LK Snow melting manifold is manufactured of PEX pipes P.N 10 with welded loop connections DN 25 for LK Snow melting pipes 25 x 2.3. The snow melting manifold is customized on the basis of the specific project requirements Long manifolds are supplied in sections, which are welded with an electric welding sleeve. Connection of heating pipes to snow melting manifold is normally done with an electric welding sleeve as the manifold is usually placed under the ground. An electric welding sleeve is a more robust coupling than metal couplings, as the couplings have to be placed under the ground. Connection to the supply pipe is done either with an electric welding sleeve or with a flange connection.



## LK SNOW MELTING MANIFOLDS PLACED UNDER THE GROUND

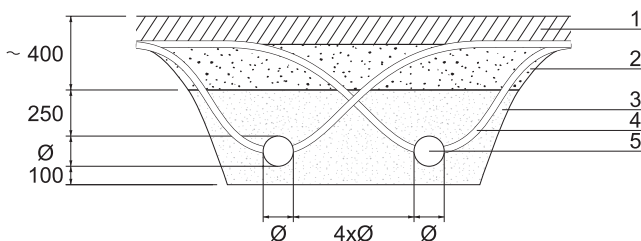
In cases where the manifold have to be placed under the ground, this is done in a pipe trench with flat sides and a rounded the corner, to facilitate the installation of snow melting pipes. The pipe trench must be so deep that the edge of the manifold is 500 mm below the complete carriageway or 400 mm below the complete footpath. When the snow melting coils are mounted and pressurised, fill the pipe gravel with sand carefully packed with water.



Pipe trench for snow melting manifold in the carriageway with snow melting pipes placed under the base course.

1. Asphalt covering.
2. Base course crushed gravel 0-18 or 0-30.
3. Sand 0 - 8.
4. Snow melting heating pipes, see heading *Covering of LK Snow melting pipes* for more information.
5. Snow melting Manifold.

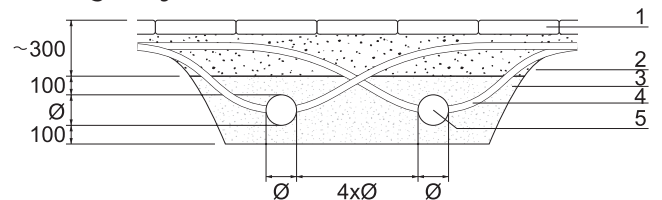
## Pipe trench for snow melting manifold in the carriageway



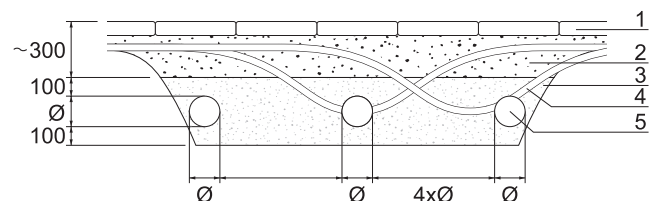
Pipe trench for snow melting manifold in the carriageway with snow melting pipes placed in the asphalt covering.

1. Asphalt covering.
2. Base course crushed gravel 0-18 or 0-30
3. Sand 0 - 8.
4. Snow melting pipes, see heading *Covering of LK Snow melting pipes* for more information.
5. Snow melting Manifold.

## Pipe trench for snow melting manifold in the carriageway



Pipe trench for snow melting manifold in the carriageway



Pipe trench for snow melting manifold in the carriageway, laying according to the Tichelmann system

The dimensions 160 – 200 MM are laid with a gap of 400 mm.

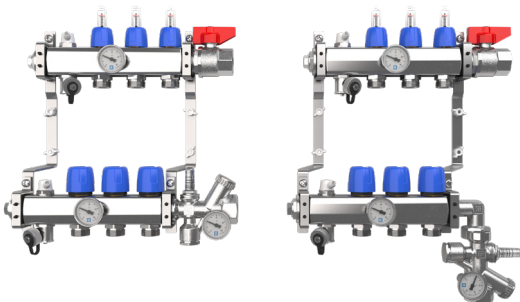
1. Concrete slabs.
2. Base course crushed gravel 0-18 or 0-30.
3. Sand 0 - 8.
4. Snow melting pipes, see heading *Covering of LK Snow melting pipes* for more information.
5. Snow melting manifold.

### LK Snow melting manifold placed indoors

In some cases, it is appropriate to place LK Snow melting manifold indoors, on the wall or under the floor. Normally, as small c/c distance as possible between the manifold loop connections, is aimed at so that the manifold can get a short construction length.

### LK MANIFOLD RF

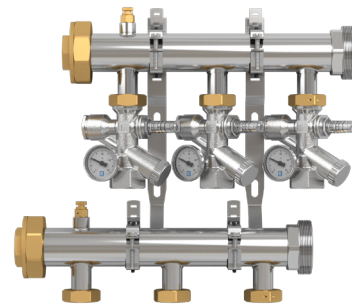
LK Manifold RF, which is placed indoors, is used when the snow melting system consists of a smaller area (max 150 m<sup>2</sup>). To the manifold LK heating pipe of the dimension 20 x 2 is connected. For pipe connection to LK Manifold RF, there are clamping couplings for LK Heating Pipe, dimension 20 mm, and press couplings for dimension 20 mm. Read the appropriate parts of the unattached instruction that comes with the manifold.



*LK Manifold RF with affixed adjustment valves LK OptiFlow EVO II straight and angled design respectively.*

### LK MANIFOLD QMAX 2"

LK Manifold Qmax 2" is suitable to use in systems up to 300 m<sup>2</sup>. Qmax manifold should be placed indoors or in an outdoors installation covered by LK Manifold Cover Qmax. To the manifold LK heating pipe 25 x 2.3 is connected or LK heating pipe 20 x 2 is connected. Coils from one and the same manifold must be equally long to get an optimum heat distribution without the need to install throttle valves. In case the coils cannot be kept equally long, the manifold must be supplemented with OptiFlow EVO II mounted for each coil.



*LK Manifold Qmax 2" with affixed adjustment valves LK OptiFlow Evo II for each snow melting loop.*

### LK SNOW MELTING PIPES

LK snow melting pipes are rolled out in the direction of the ground manifold and the pipes are laid and fixed at c/c distance according to the drawing.

To fix the pipes, LK Clip Rail is used, which also gives an exact c/c distance. LK LK Clip Rail is laid with a relative distance of 1 – 1.5 m.

LK LK Clip Rail is fixed to the insulation with the help of LK pipe hook. The clip rail is screwed, pushed or nailed.

The clip rail is fixed with the help of a tent peg designed reinforcement bar that is pushed into the ground. (The reinforcement bar is not included in the LK range)

The least allowed blocking radius is 200 mm for pipes 25 x 2.3 and 150 mm for pipes 20 x 2. The designed c/c distance is often smaller than the minimum bending radius, which results in overlapping

loops in the turning area. Snow melting pipes 20 x 2 are used in small and congested areas. Before the installation work begins, the pipe ends are taped again so that no sand or dirt enter the pipes.

### Work process for laying LK Snow melting pipes

Check that there are no irregularities under the layer and that the surface is cleaned from objects that can damage the pipes. Reel out the coils and fix them with a c/c distance according to the drawing.

Fill the coils with antifreeze heating medium and de-air as well as test pressure according to the instruction. When the test pressure is complete and there is no leakage, the coils are covered as per the directions. When the covering of asphalt gravel is laid, cold water under pressure must circulate in the coils.

When laying the slabs, normal working pressure must be established. When the coils are laid in the hot asphalt in the carriageway, cold water must circulate under backpressure when laying the top coat.

Connection to the distribution network is made with the flanged connection or electric welding sleeve.

### Covering of LK Snow melting pipes

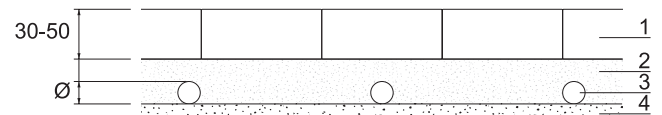
Setting sand must be used for covering heating coils under the footpaths.

When the carriageway is a heated, the coils are covered with asphalt gravel with max 16 mm stone size, natural grain. During the laying, the temperature must not exceed 120°C. The temperature must be controlled at each load. The temperature meter is mounted on a stick which is pressed in the middle of the load, where the area cools down quickly during transport.

Note! Cold water must be poured/circulated through the pipes when the asphalt is laid out. Ensure that the water pressure/flow is sufficient so that the volume of the entire pie is cooled down by the cold water. Mount the throttle valve at the end where the water is poured so that a

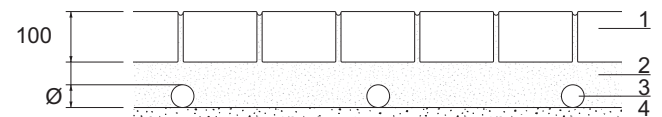
back pressure is obtained. The water temperature must not exceed the normal cold water temperature to ensure sufficient cooling.

On stairs, the coils are cast in the step concrete. Coils must remain under the water pressure during the casting.



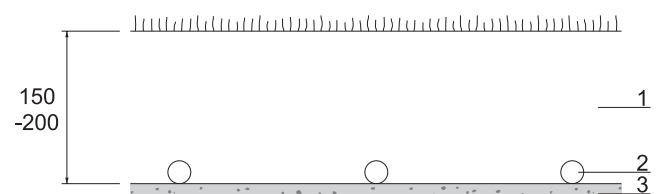
*Snow melting pipes laid under ground stone of concrete.*

1. Ground stone of concrete.
2. Setting sand, min 30 mm over the pipe's back.
3. Snow melting pipes.
4. Base course, natural gravel 0 - 30.



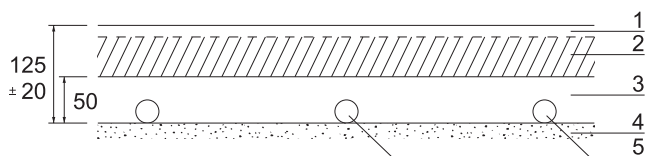
*Snow melting pipes laid under paving stone.*

1. Paving stone.
2. Setting sand, min 30 mm over the pipe's back.
3. Snow melting pipes.
4. Base course, natural gravel 0 - 30.



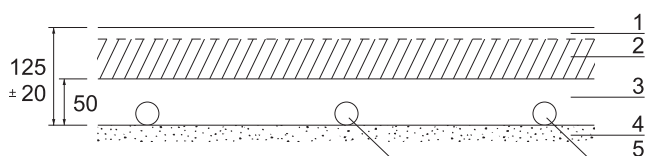
*Snow melting pipes laid under the grass surface.*

1. Seed bed.
2. Snow melting pipes.
3. Drain gravel.



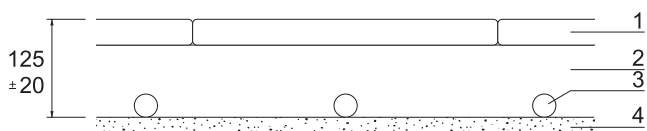
Asphalt layer, loops laid under the asphalt.

1. Wearing course asphalt.
2. Protective course asphalt.
3. Loop layer asphalt.
4. Base course, natural gravel 0 - 30.
5. Snow melting pipes.



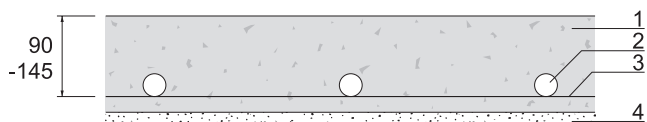
Asphalt layer, loops laid under the gravel.

1. Wearing course asphalt.
2. Protective layer asphalt.
3. Loop layer crushed gravel 0-8.
4. Base course, natural gravel 0 - 30.
5. Snow melting pipes.



Concrete slabs, coils laid under the setting sand.

1. Concrete slabs.
2. Setting sand or crushed gravel 0-4.
3. Snow melting pipes.
4. Base course, natural gravel 0 - 30.

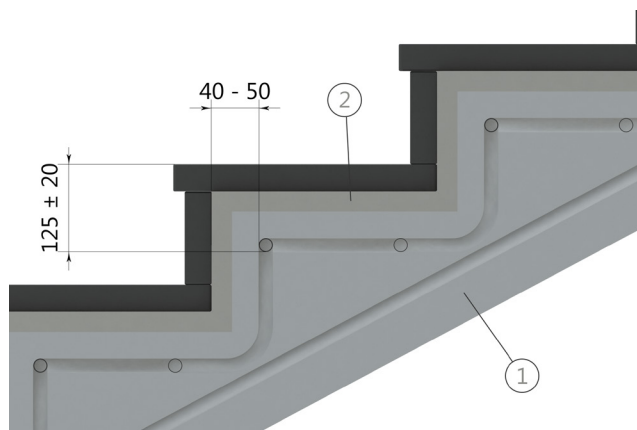


The concrete surface of the snow melting pipes is tied to the reinforcement

1. Concrete slab.
2. Snow melting pipes.
3. Reinforcement.
4. Base course, natural gravel 0 - 30.

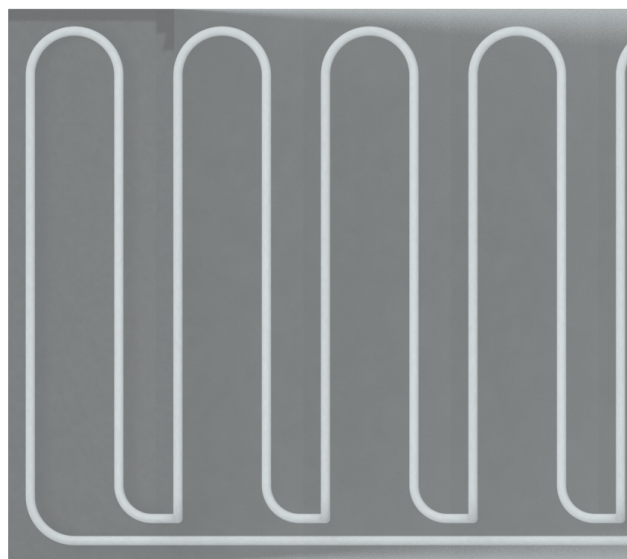
## STAIRS

In stairs, the loops are cast in the step concrete.



Pipe laying in stairs, section

1. Concrete.
2. Snow melting pipes.

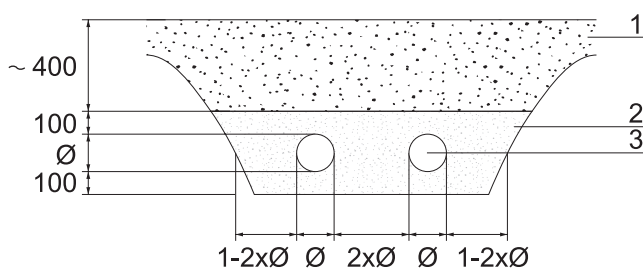


Pipe laying in stairs, view above.

## SUPPLY PIPES

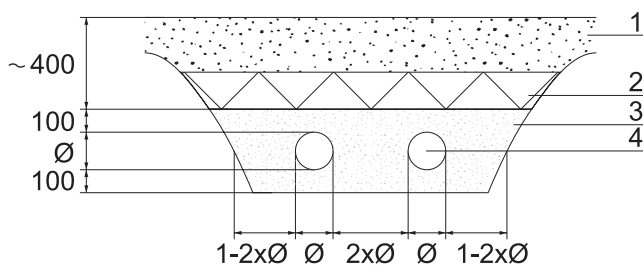
In case the supply pipes to the manifold are laid under the ground, it is suitable to use PEH PN10 pipes. The pipes are then joined with an electric welding sleeve, by which a supplier pipe that is insensitive to corrosive impact is obtained. The pipe trench must be so deep that the supply of pipe's edge is 500 mm below the carriageway or 400 mm below the complete footpath. When the snow melting loops are mounted and pressurized, fill the pipe trench with sand carefully packed with water.

### Pipe trench for supply pipe



*Pipe trench for supply pipe, without insulation.*

1. Base course, natural gravel 0 - 50.
2. Sand 0 - 8.
3. Supply pipe.



*Pipe trench for supply pipe, With insulation.*

1. Base course, natural gravel 0 - 50.
2. Insulation.
3. Sand 0 - 8.
4. Supply pipe.

## FILLING OF HEATING MEDIUM AND PRESSURE TESTING

Pressure testing should be conducted in accordance with the National Board of Occupational safety and Health regulations in AFS 2006:8 (Amendment AFS 2011:15).

Antifreeze heating medium is filled during de-airing.

Tightness testing should be carried out with 9 bars water pressure. The pressure should be maintained for 30 min, and there after be reduced to 4.5 bar. This pressure must remain for at least 90 minutes without the pressure being lowered. However, slight variations in the pressure may arise due to changes in the temperature by the medium and surroundings, as well as due to the elasticity of the plastic pipe.