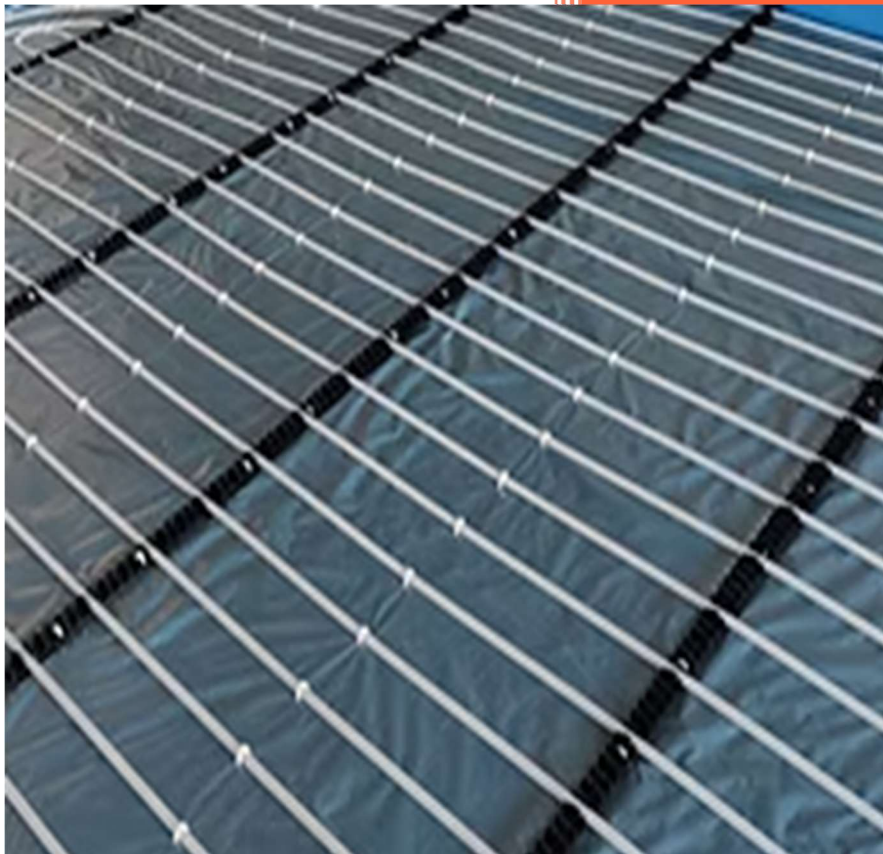


2026

Clip Rail Underfloor Heating System Installation Guide for Screeded Floor Applications



Designed to Heat. Built to Last

Tekwarm

01/07/2026

INSTALLATION GUIDE FOR SCREEDED FLOOR APPLICATIONS

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SCREEDED FLOOR APPLICATIONS

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1. INTRODUCTION

The Tekwarm Clip Rail Underfloor Heating System is designed for use within screeded floor constructions where warm water underfloor heating pipework is secured into pre-fixed clip rails before the screed is installed.

The clip rail system provides a clean, accurate and repeatable method of pipe installation, helping installers maintain consistent pipe spacing across the floor area. It is suitable for domestic and commercial projects where a screeded UFH system is required.

The system is typically installed over insulation with a separating membrane and edge expansion strip, before being covered with a suitable sand/cement, flowing, cementitious, anhydrite or proprietary screed.

The system typically includes:

- Tekwarm underfloor heating pipe
- Tekwarm clip rail
- Fixings or adhesive backing for clip rail, depending on rail type
- Floor insulation
- Slip membrane / separating membrane
- Edge expansion strip
- Manifold assembly
- Pipe conduit / protection sleeves
- Fixing tools and accessories
- Pressure testing equipment

This guide covers the key stages of installation, including substrate checks, manifold positioning, insulation and membrane installation, fixing of clip rails, pipe laying, connection to the manifold, filling and pressure testing before screeding.

This guide should be read alongside the Tekwarm UFH design, manifold schedule, screed manufacturer's guidance, floor finish requirements and all relevant British Standards.

2. IMPORTANT NOTES BEFORE STARTING

Before installation begins, check that:

- The Tekwarm UFH design has been reviewed and understood.
- The manifold location has been agreed.
- Pipe centres, loop lengths and room zones match the supplied design.
- The correct pipe diameter has been supplied.
- The correct clip rail type has been supplied.
- The correct insulation depth and grade have been installed or allowed for.

- The screed type and depth have been confirmed.
- Expansion joints, movement joints and doorway thresholds have been reviewed.
- The substrate is clean, level and suitable to receive the system.
- All other trades have completed works that may affect the floor build-up.
- The area is weather-tight before installation begins.

Do not install the UFH system if the floor build-up is unsuitable, the insulation is unstable or the membrane cannot be laid flat. Clip rail gives you neat pipe spacing, but it cannot rescue a poor substrate.

3. HEALTH AND SAFETY

Installation should only be carried out by competent persons.

Always wear appropriate PPE, including:

- Safety boots
- Gloves
- Eye protection
- Knee protection
- High-visibility clothing where required
- Dust protection where cutting insulation or preparing substrates

Keep work areas clean and free from trip hazards. UFH pipework, clip rails, manifold pipe tails and loose materials can create trip risks during installation.

Avoid unnecessary traffic over installed pipework. Where access is required, use suitable temporary protection or crawl boards.

4. TOOLS AND EQUIPMENT REQUIRED

Typical tools and equipment required include:

- Pipe decoiler
- Pipe cutter suitable for UFH pipe
- Tape measure
- Marker pen
- Drill and fixings where mechanically fixing clip rail
- Staple gun or suitable fixing method where applicable
- Utility knife
- Insulation saw or knife
- Tape for membrane laps where required
- Spanners / manifold connection tools
- Pressure test pump
- Hose connections
- Water supply for filling
- Spirit level or laser level
- Temporary pipe protection sleeves/conduit

The exact tools required will depend on the clip rail type, substrate, insulation, membrane arrangement and site conditions.

5. SUBSTRATE CHECKS AND PREPARATION

Before installing insulation, membrane, clip rails or pipework, the substrate must be inspected.

The substrate should be:

- Structurally sound
- Clean and free from debris
- Free from sharp projections
- Flat and level enough to fully support the insulation
- Free from standing water
- Suitable for the proposed floor build-up
- Capable of supporting the finished floor loading

Remove all loose material, mortar droppings, plaster, timber offcuts, fixings, sharp objects and general site debris.

Any services crossing the floor should be positioned, protected and agreed before the UFH installation begins.

Insulation boards must be fully supported. Voids beneath insulation can lead to movement, screed weakness, rocking boards, cracking or future floor failure.

Where the floor is uneven or unsuitable, consult the main contractor, builder, architect or structural designer before proceeding.

6. SETTING OUT THE INSTALLATION

Before installing clip rails or pipework, review the Tekwarm UFH layout drawing.

Check:

- Room names and zones
- Manifold position
- Flow and return routes
- Pipe spacing / centres
- Loop lengths
- Pipe direction
- Doorways and thresholds
- Expansion joint locations
- Areas where pipe should not be installed
- Fixed furniture, kitchen islands, sanitaryware or service zones
- Position of thermostats and floor sensors where required

The installer should mark out key room zones, manifold routes and any no-pipe areas before fixing the clip rail.

Pipe should generally not be installed beneath fixed units, kitchen islands, baths, shower trays, toilets, fitted wardrobes or areas where permanent fixtures may trap heat or restrict access, unless specifically allowed within the Tekwarm design.

7. MANIFOLD POSITIONING AND MOUNTING

The manifold should be installed in the agreed location shown on the Tekwarm design.

The manifold should be:

- Accessible for commissioning, servicing and maintenance
- Positioned to allow neat pipe routing
- Located where all loops can return without excessive pipe congestion
- Mounted level
- Securely fixed to a suitable wall, cabinet or support frame
- Protected from impact and site damage
- Positioned high enough to allow pipe connections and suitable bending radii

Avoid positioning the manifold behind fixed kitchen units, in inaccessible cupboards or in areas where future access will be restricted.

Mount the manifold brackets securely. Fit the manifold to the brackets and check that it is level.

Allow sufficient space below the manifold for pipework to rise neatly into the connections without tight bends or kinks.

Clearly identify flow and return bars before connecting pipework.

8. EDGE EXPANSION STRIP

Install edge expansion strip around the full perimeter of the heated floor area before screeding.

Edge expansion strip should be installed:

- Around walls
- Around columns
- Around upstands
- At door thresholds where required
- Around fixed penetrations
- Against all vertical elements that the screed may contact

The edge strip allows for screed expansion and helps reduce thermal bridging and acoustic transfer at the perimeter.

The edge strip should be continuous and should extend above the proposed screed height. Excess can be trimmed after screeding and before floor finishes are installed.

Do not omit the edge strip.

9. INSULATION INSTALLATION

Install the specified floor insulation in accordance with the project specification.

Insulation boards should be:

- Correct thickness and type
- Suitable for the applied load
- Tightly butted together
- Laid flat
- Fully supported
- Free from rocking or movement
- Staggered where appropriate
- Cut neatly around services and penetrations
- Protected from damage during installation

Boards should be installed with minimal gaps. Any significant gaps should be filled using suitable insulation material or compatible foam, depending on the floor specification and project requirements.

Do not leave unsupported board edges or open voids between boards.

Where multiple insulation layers are used, joints should be staggered between layers wherever possible.

The insulation must be suitable to receive the clip rail fixing method. Where rails are mechanically fixed, the insulation must provide adequate support for the fixing. Where rails are adhesive-backed, the surface must be clean, dry and suitable for adhesion.

10. SLIP MEMBRANE / SEPARATING LAYER

Install a suitable polythene membrane or separating layer over the insulation unless the system design or screed manufacturer states otherwise.

The membrane helps:

- Prevent screed loss between insulation joints
- Create a separating layer
- Reduce the risk of liquid screed passing into gaps
- Protect the insulation
- Assist with clean screed placement

Laps should be formed in accordance with the project specification. As a practical guide, laps are commonly overlapped and taped to prevent screed leakage.

The membrane should be pulled flat and should not be heavily creased, folded or loose beneath the clip rail.

At perimeters, the membrane should turn up behind or against the edge strip where required to form a tray effect, especially when using liquid or flowing screeds.

Check with the screed manufacturer for specific membrane requirements, particularly when using flowing screeds, calcium sulphate screeds or proprietary fast-drying systems.

11. CLIP RAIL INSTALLATION

Tekwarm clip rails are installed to secure the UFH pipe at the specified centres.

Before fixing the rails, check:

- The rail spacing matches the Tekwarm UFH design
- Rails are positioned to allow the pipe to follow the intended route
- Rails are straight and secure
- The membrane is flat beneath the rails
- Rails do not obstruct movement joints or service zones
- There is enough room at perimeters for pipe bends
- Manifold routes have been allowed for

Clip rails should usually be laid at regular intervals across the room to support the pipe and maintain consistent spacing.

The exact spacing between rails will depend on the pipe diameter, pipe centres, room shape and installation requirements. Rails should be close enough to prevent pipe movement, lifting or floating during screeding.

Rails should be fixed using the appropriate method for the system and floor build-up. This may include:

- Mechanical fixings into suitable insulation
- Staples or compatible fixings
- Adhesive backing where supplied
- Additional tape or fixing support where required

Where adhesive-backed rails are used, the surface must be clean and dry. Adhesive-backed systems may not perform correctly on dusty, damp, loose or contaminated surfaces.

Where mechanically fixing, ensure fixings are secure but do not damage the insulation, membrane or any services below.

Clip rails should be aligned carefully so that the pipe can be clipped neatly and consistently. Poor rail alignment can lead to uneven pipe runs and unnecessary stress in the pipe.

12. PIPE HANDLING AND STORAGE

Tekwarm UFH pipe should be handled carefully.

Before installation:

- Store pipe on a clean, dry surface.
- Keep pipe in its packaging until required.
- Protect pipe from sharp objects.
- Do not drag pipe across rough surfaces.
- Do not install damaged, kinked, crushed or heavily scratched pipe.
- Do not expose pipe to unnecessary heat or naked flames.
- Use a pipe decoiler to prevent twisting.

Pipe should be installed in continuous loops from the manifold and back to the manifold. Do not join pipework within the screed unless specifically approved by Tekwarm and the project design team.

Any damaged pipe should be replaced.

13. LAYING PIPEWORK INTO THE CLIP RAIL

Start each loop at the manifold.

Connect the pipe to the correct manifold port or leave sufficient pipe length for connection, depending on the preferred installation method.

Lay the pipe in accordance with the Tekwarm UFH design drawing.

Pipe should be laid:

- At the specified pipe centres
- In the correct room or zone
- Without kinks
- Without twisting
- With smooth bends
- With adequate spacing from walls and fixed elements
- Without crossing other heating pipes unnecessarily
- With flow and return routes kept neat at the manifold
- Firmly clipped into the Tekwarm clip rail

Push the pipe fully into the clip rail so that it is held securely. The pipe should sit evenly in the rail and should not spring out or lift.

Where the pipe changes direction, ensure the bend radius is not too tight. Additional support or fixing may be needed around bends, corners and loop returns.

Common pipe layouts include spiral, serpentine or a combination of both, depending on the room design and heat output requirement.

Where possible, spiral layouts help provide a more even floor temperature because flow and return pipes run adjacent to one another.

Pipe bends must not be tighter than the minimum bend radius recommended for the pipe. If a bend becomes kinked, replace the affected section or seek technical advice.

14. MAINTAINING PIPE SPACING

The clip rail system is designed to help maintain consistent pipe centres.

Do not alter pipe centres without approval. Changing pipe spacing can affect:

- Heat output
- Floor surface temperature
- System balancing

- Comfort levels
- Flow rates
- Loop pressure loss
- Boiler or heat pump efficiency

The pipe should be checked as installation progresses to ensure it follows the correct spacing and layout.

Pay particular attention to:

- Perimeters
- Doorways
- Manifold routes
- Bay edges
- Areas with obstacles
- Rooms with irregular shapes
- Long straight runs
- Loop returns

Where pipe spacing needs to change due to site conditions, seek approval before proceeding.

15. PIPE SPACING AND NO-PIPE ZONES

Pipe spacing must follow the Tekwarm design.

Pipe should not normally be installed within areas where fixings may later penetrate the floor, unless clearly identified and protected.

No-pipe zones may include:

- Kitchen islands
- Fixed cupboards
- Shower trays
- Baths
- Toilets
- Stair bases
- Floor-mounted partitions
- Service penetrations
- Areas requiring future floor fixings

Mark or photograph pipe positions before screeding. This is especially useful around kitchens, islands, thresholds, stair bases, partitions and service zones.

A photographic record should be kept with the project handover information.

16. DOORWAYS, THRESHOLDS AND MOVEMENT JOINTS

Take care when routing pipework through doorways and across movement joint locations.

Where pipe passes through a movement joint, doorway or screed bay joint, it should be protected using suitable conduit or sleeve.

The sleeve should allow movement between screed bays and reduce the risk of stress being transferred directly into the pipe.

Avoid placing tight pipe bends directly within doorways or movement joints.

Do not run multiple loops tightly through the same narrow point unless this has been considered within the design.

Where the screed contractor has specified movement joint locations, these must be reviewed before pipe installation.

Clip rails should not be fixed across movement joints unless specifically approved. The pipe should be allowed to pass through the joint within suitable protection.

17. MANIFOLD CONNECTIONS

Once each loop has been installed, return the pipe to the correct manifold connection.

Cut the pipe cleanly and square using a suitable pipe cutter.

Connect each loop to the correct manifold port using the appropriate Tekwarm manifold connection set.

Ensure:

- Pipe ends are clean and undamaged
- Connections are fully inserted
- Compression fittings are tightened correctly
- Flow and return are connected to the correct bars
- Each loop is clearly labelled
- Loop references match the Tekwarm design drawing
- Pipework below the manifold is neat and protected
- Pipe bends into the manifold are smooth and not stressed

Do not overtighten manifold connections. Follow the manifold fitting guidance.

Each loop should be clearly labelled with the room name or circuit number.

18. FILLING THE SYSTEM

Before pressure testing, the system must be filled with water and air must be removed from each circuit.

Typical filling procedure:

- Close the manifold isolation valves from the primary heating system.
- Connect a water supply to the manifold fill point.
- Connect a hose from the drain point to a suitable drain.
- Open one UFH loop at a time.

- Flush water through the loop until air is removed and water runs clear.
- Close the completed loop.
- Repeat for each loop.
- Once all loops are filled and vented, open all loops ready for pressure testing.

The system must be fully vented. Air left in the pipework can affect the pressure test and later system performance.

Pressure testing should be carried out hydraulically using water unless otherwise stated by the project specification or Tekwarm guidance.

19. PRESSURE TESTING BEFORE SCREEDING

The Tekwarm UFH system must be pressure tested before screed is installed.

Pressure testing confirms the integrity of the pipework and manifold connections before they are covered.

A typical pressure testing process is:

- Ensure all pipe loops are connected to the manifold.
- Ensure all loop valves are open.
- Ensure the manifold is isolated from the primary heating system.
- Connect a suitable hydraulic pressure test pump.
- Fill and fully vent all loops.
- Increase the pressure gradually.
- Check all manifold connections and visible pipework.
- Maintain the required test pressure for the required test period.
- Record the test pressure, duration, date and installer details.
- Inspect for any pressure loss or visible leaks.
- Do not screed until the system has passed the pressure test.

The Tekwarm UFH system should be hydraulically pressure tested before screeding. Unless project-specific guidance states otherwise, the system should be tested to 4 bar and checked for pressure stability and visible leaks. The system should remain under suitable pressure during screed installation, in line with Tekwarm and screed manufacturer guidance.

Where there is a risk of freezing, do not leave the system filled with untreated water unless suitable frost protection measures are in place.

Do not proceed with screeding if the pressure test has failed or if unexplained pressure loss is observed.

20. PRESSURE TEST RECORD

A pressure test record should be completed before screeding.

Recommended information to record:

- Project name

- Plot / area / room reference
- Installer name
- Date of test
- Manifold reference
- Number of loops tested
- Pipe diameter
- Test pressure
- Test duration
- Start pressure
- End pressure
- Ambient temperature
- Any pressure loss
- Confirmation of visual inspection
- Installer signature
- Client / site representative signature where required

A copy of the pressure test record should be retained as part of the project handover file.

21. PRE-SCREED INSPECTION CHECKLIST

Before screed is installed, check:

- Substrate prepared and suitable
- Insulation fully supported
- Insulation joints tight
- Membrane installed and lapped
- Edge strip installed to all perimeters
- Clip rails fixed securely
- Clip rail spacing checked
- Pipework installed to design
- Pipe centres checked
- Pipe fully clipped into rails
- No kinks or damaged pipe
- Loops connected to manifold
- Loops labelled correctly
- Movement joints reviewed
- Pipe sleeves installed where required
- Manifold secure and protected
- System filled and vented
- Pressure test completed and recorded
- System left under pressure for screeding
- Photos taken of pipe layout
- Screed contractor briefed

The screed contractor should be made aware that UFH pipework is installed and should take care to avoid damaging the pipework during screed placement.

22. SCREEDING OVER THE TEKWARM CLIP RAIL SYSTEM

Screeding should only begin once the UFH system has passed the pressure test.

The screed should be installed by a competent screeding contractor in accordance with:

- Screed manufacturer's instructions
- Project specification
- UFH design requirements
- Relevant British Standards
- Required drying and commissioning procedures

The UFH system should generally remain under suitable pressure during screeding. This helps identify accidental damage during installation and keeps the pipework stable.

Care should be taken to fully encapsulate the pipework with screed and avoid voids around the pipe.

Good screed compaction and coverage are important for:

- Heat transfer
- Floor strength
- Pipe protection
- Long-term system performance
- Reduction of voids around the pipework

For flowing screeds, check that the pipework and clip rails are secure enough to resist pipe flotation during placement. Any loose rails or pipe movement should be corrected before screeding.

Do not use the UFH system to force-dry the screed unless the screed has cured sufficiently and the correct commissioning process has been followed.

23. AFTER SCREEDING

After screeding:

- Protect the floor from rapid drying.
- Prevent draughts, direct heat and forced drying unless approved.
- Do not traffic the floor before the screed has gained sufficient strength.
- Follow the screed manufacturer's curing and drying instructions.
- Keep the UFH system isolated from normal operation until commissioning is allowed.
- Do not commission the heating too early.

The initial heat-up cycle should be carried out in accordance with the screed manufacturer's guidance, UFH design requirements and relevant standards.

The heating should be introduced gradually. Sudden heating can cause thermal shock, cracking, curling or floor finish failure.

24. FLOOR FINISH CONSIDERATIONS

Before installing floor finishes, check:

- Screed moisture content
- Screed surface condition
- Required drying times
- UFH commissioning records
- Floor finish manufacturer's requirements
- Adhesive compatibility
- Maximum floor surface temperature
- Need for primers, smoothing compounds or DPMs
- Presence of laitance on flowing screeds
- Requirement for sanding or mechanical preparation

Resilient floor finishes, timber, laminate, vinyl, carpet and tiles all have different requirements.

The floor finish installer must confirm that the screed is dry and suitable before installing the final covering.

25. COMMON INSTALLATION MISTAKES TO AVOID

Avoid the following:

- Installing over an uneven or contaminated substrate
- Using insulation that is not fully supported
- Leaving gaps between insulation boards
- Failing to install edge expansion strip
- Failing to lap or tape membrane where required
- Fixing clip rails poorly
- Installing clip rails too far apart
- Using adhesive-backed rails on dusty or damp surfaces
- Changing pipe centres without approval
- Kinking the pipe
- Failing to clip pipe fully into the rail
- Installing pipe below fixed furniture without design approval
- Failing to sleeve pipe at movement joints
- Leaving loops unlabelled
- Not filling and venting properly
- Failing to pressure test before screeding
- Not leaving the system under pressure during screeding
- Using the UFH system to dry the screed too early
- Allowing other trades to damage exposed pipework

Most UFH problems are born before the screed even arrives. Get the preparation, rails, pipe spacing and pressure test right.

26. TEKWARM CLIP RAIL INSTALLATION SEQUENCE

1. Review the Tekwarm UFH design.
2. Confirm manifold position.
3. Check the substrate is clean, level and suitable.
4. Install edge expansion strip.
5. Lay the specified insulation.
6. Install the separating membrane.
7. Mount and secure the manifold.
8. Set out pipe routes and no-pipe zones.
9. Fix Tekwarm clip rails in accordance with the design.
10. Check clip rail spacing and alignment.
11. Lay pipework from the manifold.
12. Clip pipe securely into the Tekwarm clip rails.
13. Sleeve pipe at movement joints and thresholds where required.
14. Return pipe loops to the manifold.
15. Cut, connect and label each loop.
16. Fill and flush each loop individually.
17. Vent all air from the system.
18. Hydraulically pressure test the system.
19. Record the test results.
20. Leave the system under suitable pressure.
21. Photograph the completed pipe layout.
22. Proceed with screeding once approved.

27. INSTALLER HANDOVER CHECKLIST

The installer should provide the following information at handover:

- ✓ UFH design drawing
- ✓ Manifold schedule
- ✓ Pipe layout photographs
- ✓ Loop identification records
- ✓ Pressure test certificate
- ✓ Commissioning guidance
- ✓ Screed installation date
- ✓ Screed type and depth if known
- ✓ Any deviations from design
- ✓ Any areas requiring special attention

28. DISCLAIMER

This guide is provided as general installation guidance for Tekwarm Castellated Panel UFH systems with self-adhesive backing. It does not replace project-specific design, manufacturer instructions, screed supplier guidance, structural advice or statutory requirements.

All installations must be carried out by competent persons and in accordance with the Tekwarm design, relevant British Standards, Building Regulations, screed manufacturer guidance and floor finish manufacturer requirements.³¹

Where site conditions differ from the design or specification, works should stop and advice should be sought before proceeding.



Tekwarm / TekGroup accepts no responsibility for failures caused by incorrect installation, unsuitable substrates, unapproved design changes, poor adhesion due to unsuitable receiving surfaces, incorrect panel restraint, panel uplift, screed passing beneath panels, incorrect screed installation, premature heating, inadequate drying, incompatible floor finishes or failure to follow relevant manufacturer guidance.