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Installer guide

Tigris K1

Press-fit Plumbing

Mexichem

Building & Infrastructure

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Introduction
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Tigris K1 is a press-fit plumbing system designed for potable water, sanitary and heating applications. With WRAS, DVGW and KIWA approvals and certification to EN-ISO 21003 and BS 6920:2000, it is ideally suited for installation on commercial projects such as educational establishments, apartment blocks and hotels.

The Tigris K1 system comprises multilayer composite pipe and high quality polyphenylsulphone (PPSU) fittings with a fixed stainless steel sleeve, in sizes (outside diameter) 16mm, 20mm, 25mm, 32mm, 40mm, 50mm, 63mm and 75mm. Fittings are compressed onto the pipe using a battery or mains-powered press-fit tool in an operation that takes a fraction of the time of traditional soldering techniques.

Already widely specified and accorded a design award in Europe, Wavin Tigris K1 is the proven and perfected system for commercial plumbing and heating projects.

Features and Benefits

The Tigris K1 system offers a number of advantages when compared to both traditional materials and similar products:

- Patented hexagonal head shape means low insertion force is required at assembly
- Due to the flexible nature of multilayer pipe, Tigris K1 requires minimal fittings thereby reducing installation time and cost and improving flow rates
- Metal layer in the pipe means it is resistant to oxygen diffusion and dimensionally stable
- Thermal expansion is comparable with copper
- Plastic layers in the pipe mean it is flexible and corrosion resistant
- High resistance to scale build-up and stress-cracking
- High pressure and temperature resistance
- Quick, simple and safe jointing method resulting in installed cost savings when compared to traditional systems
- Defined leak function to reveal unpressed fittings at pressure test
- Proven press-fit technique, with no soldering, welding or thread-cutting required and no costly hot works insurance permits needed.
- Metal layer in pipe can be detected in walls or floors through the use of a detecting device
- Light in weight, particularly in comparison to screwed steel products
- 25 year guarantee

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Storage and handling

The Wavin system components are well protected in the original packaging. Nonetheless, all components (fittings and pipes) should be protected from mechanical and environmental damage.

Impairment due to ultraviolet radiation

Wavin multilayer composite pipes must be protected from direct, intense sunlight and ultraviolet (UV) radiation. This applies both for the storage of the pipes and for finished installation. Storage must therefore not take place in the open air. Suitable measures must be taken to protect finished systems and system components from the effects of UV rays.

Observe press and push-fit fitting assembly instructions

- Always cut the pipe to length at right angles
- Calibrate and chamfer the pipe end all round
- Push the pipe into the fitting to the stop
- Check the press fitting observation window
- Press in the case of the press fittings
- See pages 18 – 27 for detailed installation and assembly information

Potential equalisation

Building and electrical regulations such as VDI 0190 parts 410 and 540 demand potential equalisation between earth wires and “conductive“ water, waste water and heating pipes. As Wavin Hot and Cold Water Systems do not represent conductive pipe systems, they cannot be used for potential equalisation and are accordingly not to be earthed. An approved electrician must check that the installation of Wavin Tigris K1 does not impair the existing electrical protective and earthing measures.

Installation temperature

The installation temperature for Wavin pipe systems should not fall below -10ºC.

The operating temperatures of the new pressing machines with the Li-ion batteries from the Wavin range must be above -15°C nor above 40°C. The optimum processing range for Wavin Tigris K1 system components lies roughly between 5ºC and 25ºC.

Frost protection

When using Wavin Hot and Cold Water Systems with pipe networks that require protection from frost (e.g. cold water networks, brine pipes), we recommend the use of ethylene glycol (to protect from risk of freezing). Ethylene glycol can be used up to a maximum concentration of 35%. This concentration roughly corresponds to frostproofing of -22ºC. Before using alternative frost protection additives, confirm the suitability/ approval with the manufacturer or with Wavin.

Sealing

The assembly of a threaded connection must be in accordance with DIN 30 660. We strongly recommend the use of PTFE / Teflon Tape to seal the connection. Alternatively hemp may be used but only in conjunction with an approved plastic sealing compound such as Fermit. Restrict the amount of hemp as too great a quantity can result in damage to the internal threads and cross-threading. When using hemp make sure that the thread tips remain visible.

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Contact with substances containing solvents

Avoid direct contact of Wavin Hot and Cold Water Systems with solvents or construction materials containing solvents (such as paints, sprays, expanding foams, adhesives).

Note: Specifically chemical sealants (e.g. Loctite) and adhesives (e.g. 2-part adhesives) must not be used. Expanding foams produced on the basis of methacrylate, isocyanate and acrylate must not be used.

Under unfavourable circumstances, aggressive chemicals that are present may cause damage to the plastic material.

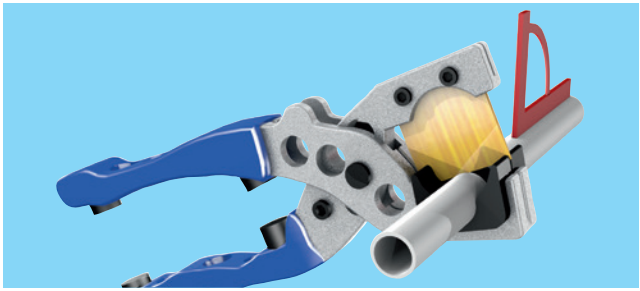
The Wavin systems do not require the use of any chemical substance or additional lubrication during installation.

Statement on continuously operated recirculating systems

Tigris K1 may be suitable for use in continuously operated recirculating systems but operating parameters need to be approved by Wavin technical management.

Contact Wavin Technical on 0844 8565165 to discuss approval. **Definitions** – Continuously operated re-circulating systems or Secondary Hot Water Circulation/Ring main installations. These differ from conventional hot water supply and central heating systems found in domestic properties. Continuously operated re-circulating systems are water-replenished systems which are maintained at a constant high temperature to provide a constant source of hot water and are used to distribute constant hot water to draw off points that may be distant from the heat source or hot water storage vessel. Applications include multi residential properties like care homes and hotels.

Pipe Preparation and Assembly



Step 1: Cut the pipe square

- Pipe cutter for 16mm to 75mm diameter pipe

Step 2: Calibrate and chamfer the pipe

- Dimensions 16 – 25mm: all-round chamfer of depth min. 1mm
- Dimensions 32 – 75mm: all-round chamfer of depth min. 2mm
- Max. battery or drilling machine rotation speed should be 500 rpm
- Remove accumulated shavings from the battery calibrating pin

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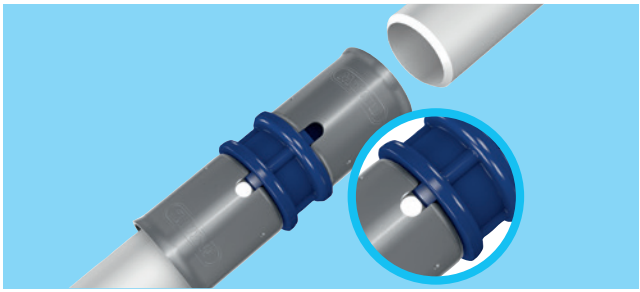


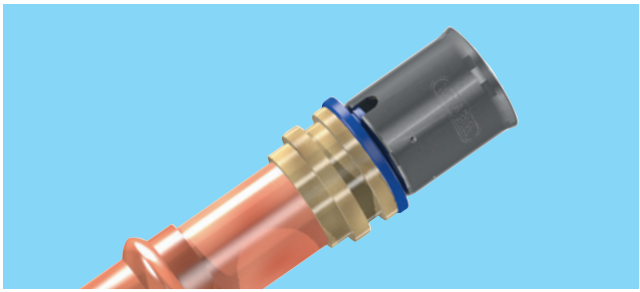
Step 3: Check fitting and insert pipe

- Check the fitting and ‘o’ ring are clean and that all components are seated in the correct position
- Push the pipe into the fitting until it is visible in the window

Step 4: Press the fitting to connect it securely to the pipe

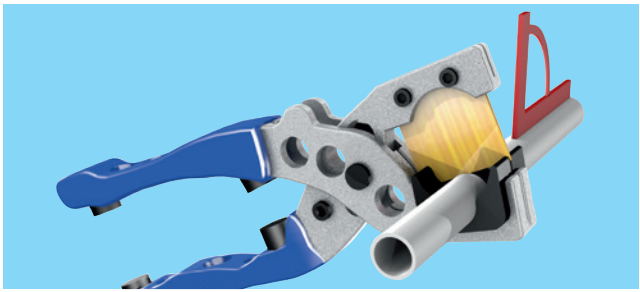
- Fit the correctly sized press-fit jaws to your press-fit tool
- The pressing jaws must be positioned on the inner stop of the press sleeve
- Activate the tool by pressing the trigger. Open the press-fit jaws and remove the pressed fitting
- The pressing process may be executed only once per connection

Assembly Instructions for Tigris K1 Press Transition to Copper



Step 1: Attach the press fitting to the copper pipe

- Slide the press connection into the copper fitting and press according to the specifications of the copper fitting manufacturer. A minimum space of 5mm must be observed between the soldered joint and outer edge of the copper fitting

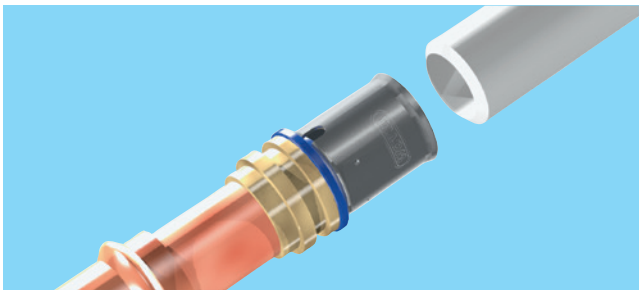


Step 2: Cut pipe

- Cut multilayer composite pipes of dimensions 16 – 25mm to length at right angles with the combination scissors

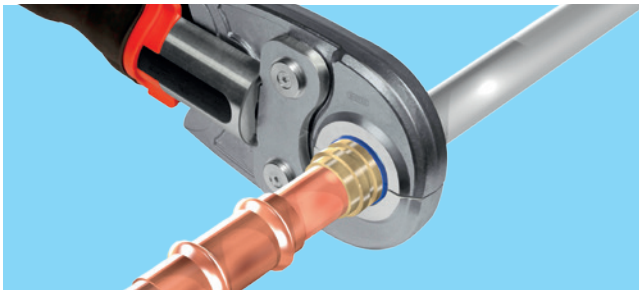
Step 3: Calibrate and chamfer the pipe

- After deburring, an all-round chamfer of at least 1 mm (Da 16 – 25) must be visible
- The maximum rotation speed when using the calibrator on the battery or drilling machine is 500 rpm. After use, remove accumulated shavings from the battery calibrating pin



Step 4: Insert the pipe into the press fitting

- Push the pipe into the fitting to the stop



Step 5: Press the fitting to connect it securely to the pipe

- The pressing jaws must be positioned on the inner stop of the press sleeve
- The pressing process must be executed only once per connection

Attention: DO NOT solder, otherwise the sealing rings on the press transition to copper may be damaged

Bending Wavin multilayer composite pipes

The pipe is easy to bend: by hand, with the aid of the bending spring.

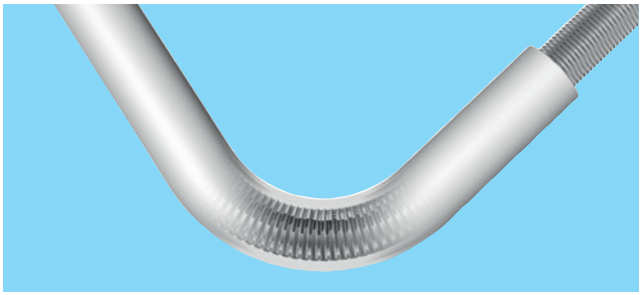


Table 3: Minimum bending radii with and without aids

Measurement Da x s (mm)	Bending radius By hand (mm)	Bending radius Bending spring (mm)
16 x 2.0	5 x ø ≈ 80	4 x ø ≈ 64
20 x 2.25	5 x ø ≈ 100	4 x ø ≈ 80
25 x 2.5	5 x ø ≈ 125	4 x ø ≈ 100
32 x 3.0	–	–
40 x 4.0	–	–
50 x 4.5	–	–
63 x 6.0	–	–
75 x 7.5	–	–

Installation and Fixing

Basics

The mountings used must be adequate for fixing the composite pipe in the respective nominal diameter. Fixing systems with a sound insulation insert are recommended.

The expected length expansion based on maximum temperature feed and line length must be taken into account. A distinction is generally drawn between fixed points and floating points as fixing methods. Fixed points divide the pipeline element into separate sections. In the case of straight pipe routes, a fixed point is to be applied at the mid-point. No fixed points should be applied directly at fittings that are used for a change of direction. Sufficient stability of the fixed points is required in order to effectively absorb the expansion forces occurring. A short distance to the ceiling must be observed.

Vertical lines, e.g. such as risers, can generally be installed only with fixed point clips. Here, fixing should be in front of or behind each storey branch. By contrast, floating point fixings guarantee expansion and movement of the pipeline concerned. For more information about this, please refer to the next chapter.

Consideration of thermally induced length expansion

All pipe materials expand on heating and contract on cooling. In the case of the piping for tap water systems (particularly with heated tap water) and heating pipes, the temperature based length expansion of the materials must always be taken into account.

The temperature difference and pipe length constructed determine the length change. On assembly, the movement possibilities for each direction change must be taken into account.

Irrespective of the pipe size, the coefficient of expansion of Wavin multilayer composite pipes is 0.025 – 0.030mm/m·K.

The length changes of Wavin multilayer composite pipes as expected in operation with different pipe lengths and temperature differences can be determined from the following diagram.

Figure 5: Length changes of Wavin multilayer composite pipes

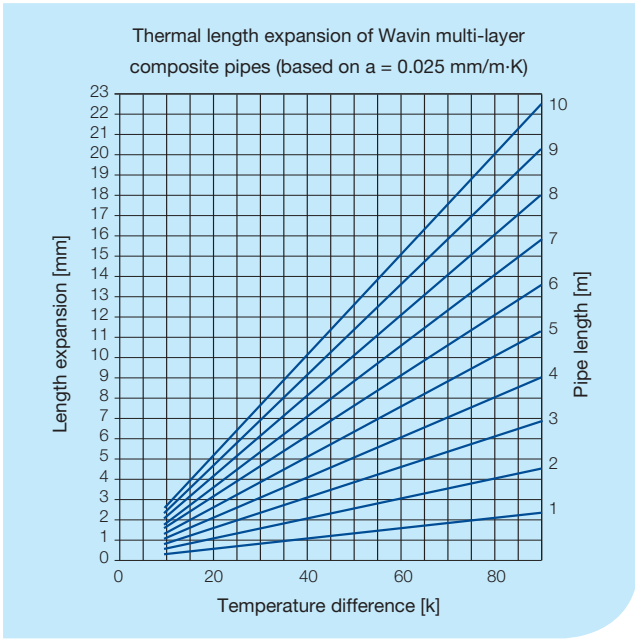


Table 4:

Formula to calculate pipe length changes	
The length changes can likewise be calculated using the following formula:	$\Delta l = a \times l \times \Delta q$ Δl = Length expansion (mm) a = Coefficient of length expansion (mm/m.K) l = Pipeline length (m) Δq = Temperature difference (K)
Sample calculation:	Wavin Tigris K1 hot water pipe
Given:	Pipe length (l) 12m Lowest ambient temperature 10°C Medium temperature 60°C
Sought:	Maximum length expansion under operating conditions $\Delta l = a \times l \times \Delta q$ 60k – 10k = 50k 0.025 mm/m.K x 12m x 50K = 15mm
Result:	Maximum length expansion under operating conditions = 15mm

Absorption of length changes by bending joints

In the case of a change of direction, the thermal length expansion of a pipeline can often be offset within the pipe layout by bending joints and expansion U-bends.

The length of the bending joint can be determined by calculation or taken from the diagram below.

$$L_B = C \sqrt{d \cdot \Delta L}$$

Key:

L_B	= Length of the bending joint	[mm]
d	= External pipe diameter	[mm]
ΔL	= Length change	[mm]
C	= Material-dependent constant for Wavin multilayer composite pipe	(= 30)

Figure 6: Bending joint classification of Wavin multilayer composite pipes

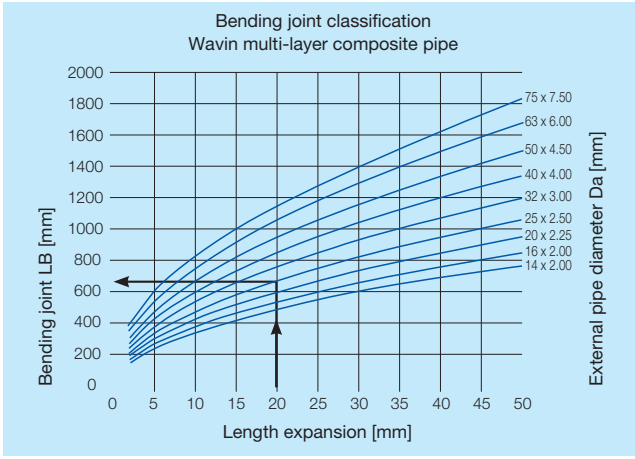
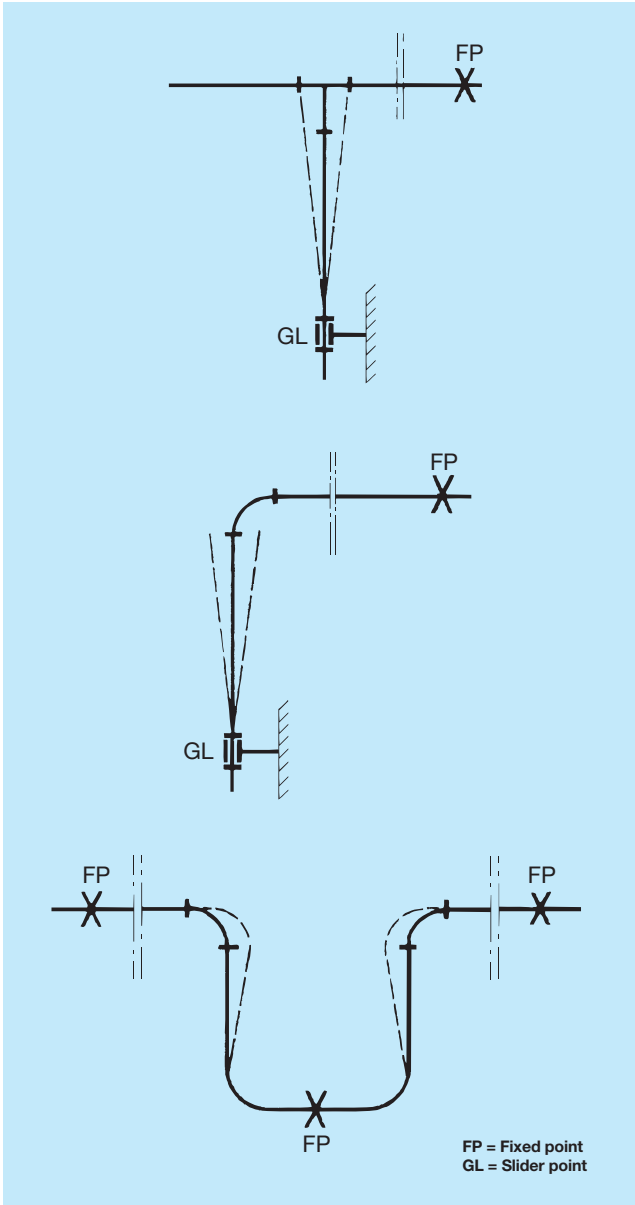


Table 5:

Sample calculation	
Given:	Length change = 20mm Pipe diameter d = 25 x 2.5mm Constant c for Tigris K1 = 30
Sought:	Length of the bending joints L_B
Result:	650mm, from diagram (see Figure 6)

Figure 7: Floating and fixed point mountings



Fixing intervals

Pipelines on a supporting base must be fixed in accordance with DIN 18560 part 2, section 4.1.

The number of fixing components is essentially dependent on the piping in the respective construction project. As the calculation basis with straight piping, a fixing component can be attached at approx. 1 m pipe length. In the areas of diversions, at least two fixing components are to be affixed (before and after the diversion curve).

Because of their dimensional stability, Wavin multilayer composite pipes installed in exposed locations require no supporting aids e.g. such as a supporting shell or support tube. They can be fixed at the intervals specified in the following table.

Table 6: Pipe clamp intervals for Wavin multilayer composite pipes installed in exposed locations

Dimensions (mm)	Fixing interval (m)
16 x 2.0	1.00
20 x 2.25	1.20
25 x 2.5	1.50
32 x 3.0	1.50
40 x 4.0	1.80
50 x 4.5	1.80
63 x 6.0	2.00
75 x 7.5	2.20

The type and intervals of the attachments/fixings are dependent on pressure, temperature, medium and installation situation. The pipe attachments/fixings must be properly designed according to the total mass (pipe weight + weight of the water + weight of the insulation), in accordance with the recognised codes of practice.

Table 7: Pipe masses

Dimensions (mm)	Pipe mass kg/m	Pipe mass + water kg/m	Pipe mass + water + Iso 9mm kg/m	Pipe mass + water + Iso 13mm kg/m
16 x 2.0	0.095	0.202	0.232	0.250
20 x 2.25	0.138	0.330	0.364	0.384
25 x 2.5	0.220	0.558	0.596	0.620
32 x 3.0	0.340	0.942	0.988	1.012
40 x 4.0	0.605	1.605	–	–
50 x 4.5	0.840	2.480	–	–
63 x 6.0	1.340	3.380	–	–
75 x 7.5	2.140	4.967	–	–

Pipes in screed or concrete

Due to the relatively low expansion forces, no compensation measures are required in the case of direct embedding of the pipes. Because of the slight plastic malleability of Wavin multilayer composite pipes, the length changes are absorbed by the pipe wall. Moreover, the respective requirements for heat protection (see the energy saving regulation section in this handbook) and impact noise insulation must be observed.

Pipes in the floor construction

As multilayer composite pipes can move axially within the insulation with little resistance, the expected length changes must be absorbed. Right angle diversions in the insulating layer must be arranged such that length changes that occur in the respective sections are absorbed by the insulation thickness in the curve area.

Wavin Hot and Cold Water Systems already laid in the ground are exposed to many potential impacts on site during the construction phase, from scaffolding, ladders or other objects. Damage to the pipe/fitting or even the insulation must be avoided. Before installing further floor construction, a check should therefore be conducted for damage. Any damage to the pipe insulation should be repaired in all cases in order to avoid the risk of the formation of impact noise bridges or reduced sound insulation (see also the section on sound insulation in this handbook).

Causes of damage in floating screeds are often due to several pipe strings installed under the screed plate.

The following principles should be observed when installing pipe strings in the floor construction:

- Use heat and sound insulated pipelines
- Use sound insulated pipe fixing
- Avoid pipe crossings as much as possible
- Pipeline installation parallel to walls
- Perpendicular junctions of pipelines into neighbouring walls
- Maximum width of the pipe string 120mm
- Minimum distance between pipelines and walls: 200mm in corridors, 500mm in the living area
- Piping through screed expansion joints with corrugated tube or alternatively with 6mm pipe insulation

Pipelines installed under plaster

Depending on the wall construction and masonry strength, there is a risk that the expansion forces from a multilayer composite pipe that is plastered in directly will cause damage to the wall.

Multilayer composite pipes under plaster should therefore be installed with insulation. This pipe insulation must be able to absorb expected length changes due to heat. In the case of pipelines under plaster for which there is no need for heat insulation, we recommend the use of the Wavin multilayer composite pipe in black protective tube (see product range).

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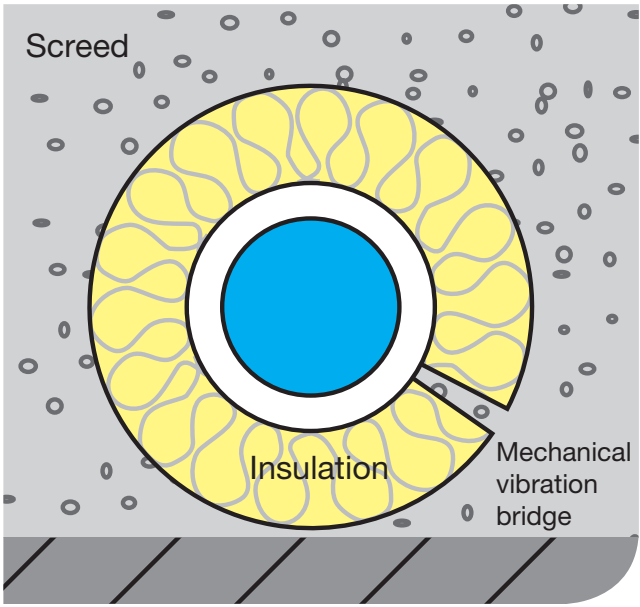
All pipes and fittings installed under plaster must be protected from direct contact with all building materials (such as masonry, plaster, cement, screed, tile adhesive) as detailed above.

Pipelines installed in exposed locations

Pipelines installed in exposed locations (e.g. basement pipes, risers etc) are fixed depending on the structural conditions and the recognised codes of practice. As appropriate, thermal length changes must be taken into account with the arrangement of bending joints in conjunction with fixed points and floating points.

Figure 8: Mechanical vibration transmission through defective pipe insulation



Battery and electrical pressing machines

The guarantee subject to proper use and observance of the required regular checks of the equipment is 12 months from the delivery date or 10,000 presses, whichever is the shorter. The respective operating instructions must be observed for this to apply.

The guarantee applies from the day of dispatch to the buyer. The guarantee does not cover damage caused by improper use or non-observance of the operating instructions. Services under guarantee may only be provided by the manufacturer. Complaints will be considered only if the equipment is presented to the manufacturer undismantled, with no previous interventions.

Checking and maintenance

The reliable function of the pressing machine is dependent on careful handling. This represents an important condition for making permanently secure connections. The equipment requires regular maintenance and care.

Only a clean and functioning pressing system can guarantee a permanently sealed connection. In this context, the pressing jaws should only be changed by a trained and competent worker. For a full list of our service partners please contact our Technical advice team on the number at the bottom of the page.

Attention: DO NOT open the equipment! A damaged seal will invalidate the guarantee. A service must be carried out every 12 months. A major service should be carried out every 10,000 presses or every 3 years whichever is the earlier.

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Wavin Tigris K1 pressing jaws with pressing machines of other manufacturers

The following table shows the compatibility of Wavin Tigris K1 pressing jaws with the pressing machines of other manufacturers. The Wavin pressing jaws have a U shape. When using pressing machines and jaws that are not listed, proof of suitability for the Wavin Tigris K1 systems must be provided in accordance with the relevant national regulations.

The pressing machines must fulfil the following requirements:

- Only the Wavin pressing jaws (U shape) may be used
- The pressing tool must be used and maintained in accordance with the respective manufacturer's guidelines
- The Wavin assembly instructions must be observed
- The "Mini" (16 – 32mm) pressing machine must display a minimum pressing force of 15kN
- The "Battery" (16 – 75mm) pressing machine must display a minimum pressing force of 30kN
- The pin shape of the pressing machine must be suitable for the Wavin pressing jaws

The following table shows the compatibility of Wavin pressing jaws with some pressing machines of other manufacturers.

Table 8: Pressing jaw compatibility

Manufacturer	Description	Notes/ Compatible with
Novopress (Novopress / Geberit / Mapress / Milwaukee branded)	Electrical pressing machines: EFP2 (since 1996 with rotatable head), ECO1, ECO201, EFP201, EFP202 Battery pressing machine: ACO1, ACO201, AFP201, AFP202	Wavin (standard tool) pressing jaws only
Klauke (Klauke / Uponor branded)	Electrical pressing machines: UP50EL, UP75EL, UNP2 Battery pressing machine: UP75, UAP2, UAP3, UAP3L	Wavin (standard tool) pressing jaws only
Ridgid (Ridgid / VanArx Viega branded)	Electrical pressing machines: RP330C/ Pressgun4E, Typ PT3-EH/H, RP300/ Typ PT2 Battery pressing machine: Pressgun 5, RP330B/Pressgun 4B, RP300B/Typ PT3AH	Wavin (standard tool) pressing jaws only

Manufacturer	Description	Notes/ Compatible with
Rems (Rems / Roller branded)	Electrical pressing machines: PowerPress, PowerPress ACC Battery pressing machine: AkkuPress, AkkuPress ACC	Wavin (standard tool) pressing jaws only
Rothenberger	Battery pressing machine: Romax 3000	Wavin (standard tool) pressing jaws only
Novopress (Novopress / Geberit / Mapress / Milwaukee branded)	Battery pressing machine: AFP101, ACO102	Tool is only compatible using Wavin Novopress Mini Jaws
Klauke (Klauke / Uponor branded)	Battery pressing machine: MAP1, MAP2L	Tool is only compatible using Wavin Klauke Mini Jaws

Flushing Wavin Tigris K1 tap water pipes

The flushing of tap water pipes is described in detail in DIN 1988 part 2.

This treatment of the pipe network ensures the quality of the tap water. All pipe sections must be free of contamination and foreign bodies at the time of initial operation. Time delays between flushing and initial operation of the tap water network must be avoided, as complete drainage is not generally carried out after flushing. According to VDI 6023 – hygiene conscious planning, execution, operation and maintenance of tap water systems – system sections that are unused for longer than 4 weeks must be flushed again.

Initial operation and handover

According to DIN 1988-2, the installer of the system must prepare relevant handover and acceptance logs. The system operator must be instructed with respect to the operation of the tap water system created. It is recommended that the instruction being completed is confirmed in writing.

Depending on the scale of the system, the presentation of written operating instructions is advised.

Checking Wavin Tigris K1 (unpressed/unsealed)

This additional test serves as an additional check for unpressed connections. When the function check is carried out with water, the leak from unpressed connections is clearly identifiable.

First a visual check on the connections (pressed/unpressed) should be carried out. A low pressure test with water should then be carried out to further check for any unpressed connections, with conditions as below. The results should be recorded and signed for.

Test procedure

The recommended procedure is outlined below and both tests should be carried out with a low pressure test being followed with a high pressure test.

Low Pressure Leakage Test

The system shall be filled slowly with drinking water to allow air to be expelled from the system. The pressure in the system should be raised (or lowered) to between 0.5 Bar and 1 Bar. The complete installation shall be inspected for leaks at this pressure prior to the high pressure hydraulic test. There shall be no visible leakage of water and the pressure should be maintained for 45 minutes.

High Pressure Hydraulic Test

The installation shall then be tested hydraulically by subjecting the pipes, pipe fittings and connected appliances to a test pressure of not less than 1.5 times the maximum working pressure in accordance with the test procedure below. The maximum working pressure is defined as the maximum pressure that the system will operate at, measured as the incoming mains pressure (usually no more than 3 Bar if a pressure reducing valve is fitted). Maximum incoming mains pressure should not usually exceed 10 Bar.

There shall be no visible leakage of water and the pressure shall be maintained for 45 minutes.

Test Procedure

1. Apply the required test pressure (1.5 times maximum working pressure) by pumping in accordance with fig 9, for a period of at least 15 minutes. Inspect the pipework to identify any visible leaks in the system.
2. Reduce the pressure in the pipework by bleeding water from the system to one third of maximum working pressure.
3. Close the bleed valve. If the pressure remains at or greater than, one third of the maximum working pressure the system is regarded as leak tight. Visually check for leakage and monitor for 45 minutes. The test criteria are met if there is no reduction in pressure.
4. Complete a test record sheet.

Product Details
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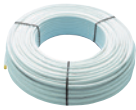
	Description	Nom dia mm	Cat no
	**Pipe**		
	Pipe – Straight Lengths		
	16mm x 2.0mm x 5.0m	16	3061211
	20mm x 2.25mm x 5.0m	20	3061212
	25mm x 2.5mm x 5.0m	25	3061213
	32mm x 3.0mm x 5.0m	32	3041228
	40mm x 4.0mm x 5.0m	40	3004371
	50mm x 4.5mm x 5.0m	50	3004372
	63mm x 6.0mm x 5.0m	63	3028271
	75mm x 7.5mm x 5.0m	75	3053971
	**Pipe – Coils**		
	16mm x 2.0mm x 100.0m	16	3018297
	16mm x 2.0mm x 200.0m	16	3018302
	20mm x 2.25mm x 100.0m	20	3018299
	25mm x 2.5mm x 50.0m	25	3018300
	**Pipe – Coils 9mm Pre-insulated**		
	16mm x 2.0mm x 50.0m	16	3004378
	20mm x 2.25mm x 50.0m	20	3004379
	**Pipe – Coils 13mm Pre-insulated**		
	16mm x 2.0mm x 50m + 13mm	16	3004380
	20mm x 2.25mm x 50m + 13mm	20	3004381
	**Couplers**		
	Straight Coupler	16	3023348
		20	3023359
		25	3023360
		32	3023488
		40	3024665
		50	3027832
		63	3027847
		75	3065639
	**Reducing Coupler**		
	20 x 16mm	20	3023525
	25 x 16mm	25	3023526
	25 x 20mm	25	3023527
	32 x 20mm	32	3023528
	32 x 25mm	32	3023522
	40 x 32mm	40	3023529
	50 x 32mm	50	3027833
	50 x 40mm	50	3027834
	63 x 40mm	63	3027852
	63 x 50mm	63	3027850
	75 x 50mm	75	3065641
	75 x 63mm	75	3065640

Product Details
Tigris K1

	Description	Nom dia mm	Cat no
	**Elbows**		
	Elbow 45°	25	3023498
		32	3023499
		40	3027839
		50	3024668
		63	3027849
		75	3065642
	Elbow 90°	16	3023363
		20	3023364
		25	3023365
		32	3023500
		40	3024666
		50	3024667
		63	3027848
		75	3065643
	Elbow 90° – single male BSP thread		
	16mm x ½"	16	3023542
	20mm x ½"	20	3023543
	20mm x ¾"	20	3023544
	25mm x ¾"	25	3023545
	32mm x 1"	32	3023539
	Elbow 90° – single female BSP thread		
	16mm x ½"	16	3023546
	20mm x ½"	20	3023547
	20mm x ¾"	20	3023548
	25mm x ¾"	25	3023549
	32mm x 1"	32	3023540
	Backplate Elbow – female BSP thread		
	16mm x ½"	16	3023344
	20mm x ½"	20	3023555
	20mm x ¾"	20	3023537
	**Tees**		
	Equal Tee	16	3023345
		20	3023346
		25	3023347
		32	3023521
		40	3024664
		50	3027829
		63	3027853
		75	3065644
	One End Reduced Tee		
	20x20x16mm	20	3023505

	Description	Nom dia mm	Cat no
	**Double End Reduced Tee**		
	16x20x16mm	20	3023504
	20x25x20mm	25	3023510
	25x32x25mm	32	3023515
	**Branch Reduced Tee**		
	20x16x20mm	20	3023506
	25x16x25mm	25	3023508
	25x20x25mm	25	3023511
	32x16x32mm	32	3023513
	32x20x32mm	32	3023514
	32x25x32mm	32	3023516
	40x25x40mm	40	3023518
	40x32x40mm	40	3023519
	50x25x50mm	50	3027830
	50x40x50mm	50	3027831
	63x25x50mm	63	3027856
	63x32x63mm	63	3027855
	63x40x63mm	63	3027854
	75x32x75mm	75	3065647
	75x40x75mm	75	3065646
	75x50x75mm	75	3065645
	**Branch and One End Reduced Tee**		
	20x16x16mm	20	3023507
	25x16x16mm	25	3023509
	25x20x20mm	25	3023512
	32x25x25mm	32	3023517
	40x32x32mm	40	3023520
	**One Sided Female Thread Tee**		
	16mm x ½"	16	3023557
	20mm x ½"	20	3023558
	20mm x ¾"	20	3023559
	25mm x ¾"	25	3023560
	Connectors		
	**Connector – single male BSP thread**		
	16mm x ½"	16	3023495
	20mm x ½"	20	3023496
	20mm x ¾"	20	3023550
	25mm x ¾"	25	3023551
	25mm x 1"	25	3023552
	32mm x 1"	32	3023541
	32mm x 1¼"	32	3023553
	40mm x 1¼"	40	3027836
	50mm x 1 ½"	50	3027837
	63mm x 2"	63	4032685

Product Details
Tigris K1

	Description	Nom dia mm	Cat no
	**Connector – single female BSP thread**		
	16mm x ½"	16	3023494
	20mm x ½"	20	3023361
	20mm x ¾"	20	3023497
	25mm x ¾"	25	3023362
	32mm x 1"	32	3023554
	40mm x 1¼"	40	3027838
	50mm x 1½"	50	4032698
	63mm x 2"	63	4032699
	**Tap Connector – female BSP thread**		
	16mm x ½"	16	4032700
	16mm x ¾"	16	3023489
	20mm x ¾"	20	3023490
	25mm x 1"	25	3023491
	32mm x 1¼"	32	3023492
	40mm x 1½"	40	3023493
	**Radiator Connector – 90° Elbow**		
	16mm	16	4037512
	Accessories and Tools		
	**End Cap**	16	3023561
		20	3023562
		25	3023563
	**Adaptor Fitting to Hep$_2$O**		
	16 x 15mm	16	3052945
	20 x 22mm	20	3052946
	25 x 22mm	25	3052947
	25 x 28mm	25	3052948
	32 x 28mm	32	3052949
	**Transition Fitting to Copper**		
	16 x 15mm	16	4032721
	25 x 22mm	25	4032723
	**Pressure Stopper**	16	4013571
		20	4013572
		25	4013573
	**Bending Spring**	16	4013553
		20	4013559
		25	4013562
	**Pipe Cutter**		
	Pipe cutter – 16-75mm	–	4053508
	Replacement blade for pipe cutter (4053508) 16mm-75mm	–	4053545

	Description	Nom dia mm	Cat no
	**Cordless Pressing Tool – Mini** 16mm-40mm	–	4048906
	**Cordless Pressing Tool** 16mm-75mm	–	4048907
	**Pressing Jaws** – for use with 4048906	16 20 25 32 40	4046556 4046557 4046558 4046559 4046560
	**Pressing Jaws** – for use with 4048907	16 20 25 32 40 50 63 75 75	4046691 4046694 4046695 4046756 4046758 4046759 4035779 4053509* 4053510*
*NOTE: Both parts 4053509 (75mm pressing jaw) and 4053510 (adaptor jaw) will be required to press the largest 75mm diameter fittings			
	**Calibration Mandrel**	16 20 25 32	4999998 4999999 4023364 4023365
	**Calibration Mandrel**	40 50 63 75	4031987 4031988 4035780 4053507
	**Handgrip Calibration Mandrel**	– –	3011162 4036272
	**Calibration Set** 16mm–32mm	–	4013541

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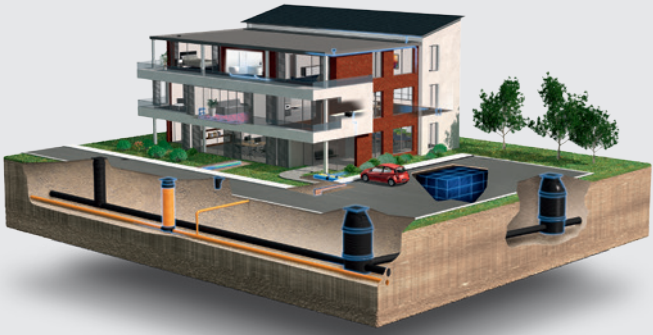

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