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General System Information

- The Thermo W system is a special piglet nest heater and not a space heater, the heat is conducted to the animals by bodily contact.
- Only use MIK regulation units, to be sure of a safe operation of the equipment. **If there are any combinations with third party products, any claims under the guarantee will be excluded.**
- In the case of self assembly, an approval test must be carried out before commissioning by a contracted installation company. The size of the expansion tank is to be decided by a licensed installer.
- The circular pipeline to the DoJet regulation unit must have a width of a minimum of DN 25 (irrespective of the number of regulation units within the overall system).
- It is advisable to operate the circuit with a flow-temperature of 65°C and a return-temperature of 50°C.
- Allow for an air extraction vent in the return of the circular pipeline, likewise at its highest position (manual or automatic).
- Insulate all supply pipes to avoid possible losses in temperature (see page 11).
- Included in the delivery of the regulation unit there is insulation for the distribution manifold. . Please use (see page 5).
- Only fill the circulation systems with tap water. Spring water can contain a lot of iron as well as floating particles, which could lead to sedimentary corrosion of the valves and could damage the entire function of the heating system.
- To prevent damages caused in hard water the calcium carbonate concentration of the filling water must not be higher than 60mg/l CaCO₃. This is correspondingly with a water hardness of 8°dH or an analyses parameter of 1.5mmol/l calcium (Ca²⁺).
- The water used for filling must not be colder than 10°C and must not have anti-freeze or chemically similar active inhibitors (e.g. hydrazine or similar) added to it. It must not contain any amounts of chlorine, fluorine or any other additives which react aggressively against metals and seals.
- The operating pressure should not exceed 2.0 Bar.
- The maximum allowable surface temperature of the Thermo W amounts to 50°C.

Technical data – System components

Thermo W warm water panel



Illustration 2: Thermo W with non-slip surface

Model	Thermo W 500x1200	Thermo W 600x1200
Usable area	500 mm x 1200 mm	600 mm x 1200 mm
Material in the outer casing	Polypropylene	
max. Power consumption (at 20°C room temp. / 40°C surface temp.)	approx. 196 W	approx. 228 W
Average consumption in farrowing	approx. 165 W	approx. 192 W
Average consumption in nursery	approx. 63 W	approx. 73 W
Water volume	approx. 25 l	approx. 30 l
Water volume heating pipe	approx. 1 l	
Operating pressure	≤ 2.0 bar	
Max. working over pressure	3.0 bar	
Max. flow temperature	50°C	
Connection	Plastic pipe connecting system Ø15 mm	

Calculation of the total energy input (e.g. for the design of the heating source):

Number of Thermo W * max. power consumption * 1.2 = energy input

(including 20% margin for possible line losses etc.)

Example for Thermo W 500x1200:

*100 Thermo W * 196 Watt * 1.2 = 2,520 Watt*

(19,600 Watt Thermo W + 3,920 Watt safety margin)

DoJet regulation unit

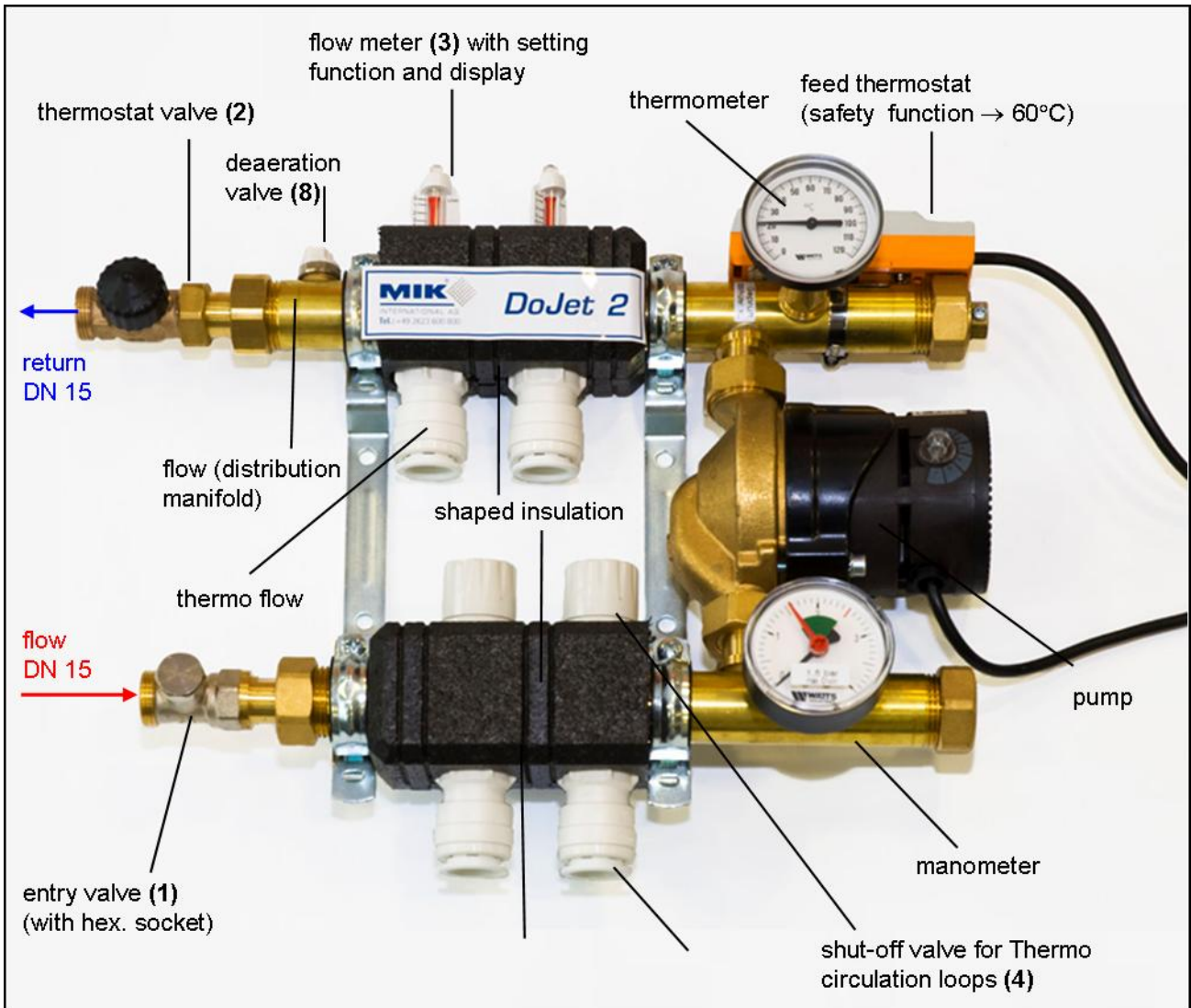


Illustration 3: DoJet 2 regulation unit with energy efficiency pump (exploded view see page 17)

Since for piglet raising lower surface temperatures are required than for the farrowing, the maximum number of heating panels to be connected per heating circuit is various:

Nursery crates:

- DoJet 2: 2 circuits @ max. 10 Thermo W = max. 20 Thermo W/regulation unit
- DoJet 4: 4 circuits @ max. 10 Thermo W = max. 40 Thermo W/regulation unit
- DoJet 4 + ES: 6 circuits @ max. 10 Thermo W ⇒ **max. 40 Thermo W/** regulation unit
(N.B. see for this, Chapter “DoJet expansion set” on page 16!)

Farrowing crates:

- DoJet 2: 2 circuits @ max. 8 Thermo W = max. 16 Thermo W/regulation unit
- DoJet 4: 4 circuits @ max. 8 Thermo W = max. 32 Thermo W/regulation unit
- DoJet 4 + ES: 6 circuits @ max. 8 Thermo W ⇒ **max. 32 Thermo W/** regulation unit
(N.B. see for this, Chapter “DoJet expansion set” on page 16!)

Assembly instructions

General laying instructions

MIK Thermo W heating panels are integrated with flush surfaces into the slatted flooring and anchored seamlessly by means of the delivered hooked edge support on to the joists (5 mm thick). Thermo W are thus combinable in roW with all MIK plastic gratings. It is possible to subsequently build them into existing MIK bays.

Laying can be done side by side or end to end. To guarantee a hygienic surface and optimum usage, there should be a gap of 10 cm to the compartment wall.

Farrowing bay:

MIK recommends one Thermo W to be fitted per bay (standard). The nest being placed apart from where the soW stand.

Piglet rearing:

In the piglet rearing pen it is recommended they are laid in strips or as an island with all round perforation.

Supply groups

Supply groups can be configured as follow (Illustrations 6 and 7), whereby the Thermo W can be connected to each other in roW:

1. 15 mm pipe: per circuit max. 4 Thermo W for farrowing bays, likewise 5 Thermo W for piglet rearing bays
2. 22 mm pipe: per circuit max. 2 x 4 Thermo W for farrowing bays, likewise 5 Thermo W for piglet rearing bays per sub-circuit

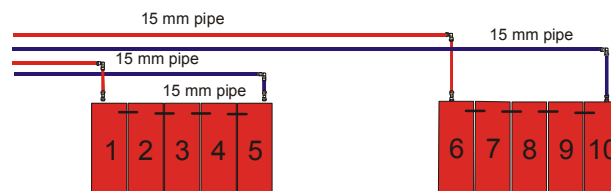


Illustration 4a: connection of max. 10 Thermo W to 2 circuits with 15 mm pipe

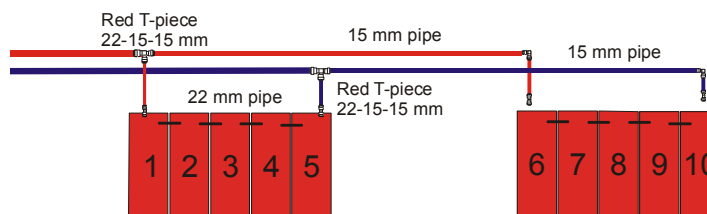


Illustration 4b: connection of max. 10 Thermo W to one circuit reducing from 22 mm to 15 mm pipe

Connecting Thermo W

- Connections are made by the push-fit connection system.
- Neither welding nor gluing are necessary, all connections are just push-fit connections and can be loosened without tools.
- **Pipes should only be shortened with a MIK pipe cutter**, in order to guarantee a straight and smooth cut for a leak-proof installation.
- Don't twist the pipes when slotting them into the fittings, so that the rubber seal is not damaged.
- Do not use any kind of lubricant when joining fittings and pipes as this could attack the rubber seal.
- Make sure the pipe is free of grooves.
- Do not use any hemp or teflon tape.
- Please do not use any chemicals for cleaning the pipes and Thermo W surfaces. This applies especially to nitro-cellulose thinners and products which contain this or similar substances.

Standard pipe lengths for connecting Thermo W

When laying Thermo W, there are several variations. The variations repeat themselves often, so it makes sense, before starting to do the laying, to count the incidental standard connections and to cut the connecting pipes to length. The following pipe lengths are dependent on the arrangement of variations. The measurements are taken from the middle – mid way between pipe connections. The absolute length of run is produced from specified measurement minus 2 cm.

Specifications for 500/600 overall width:

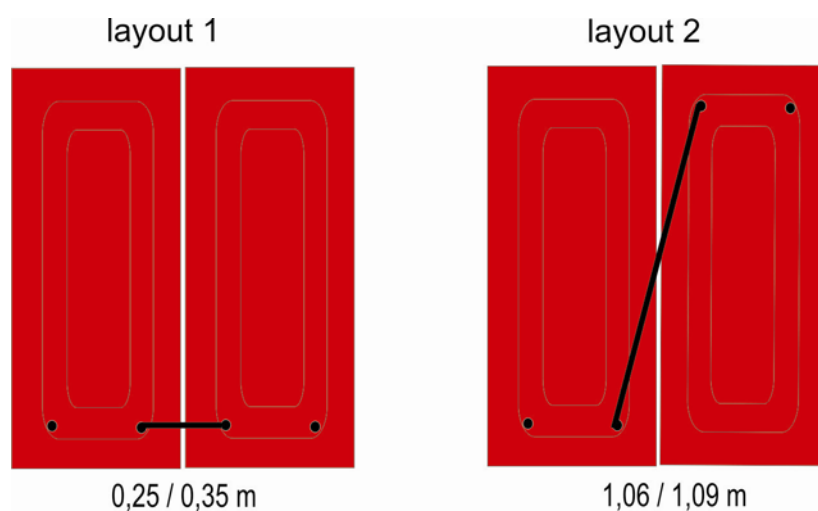


Illustration 5a: different layouts side by side

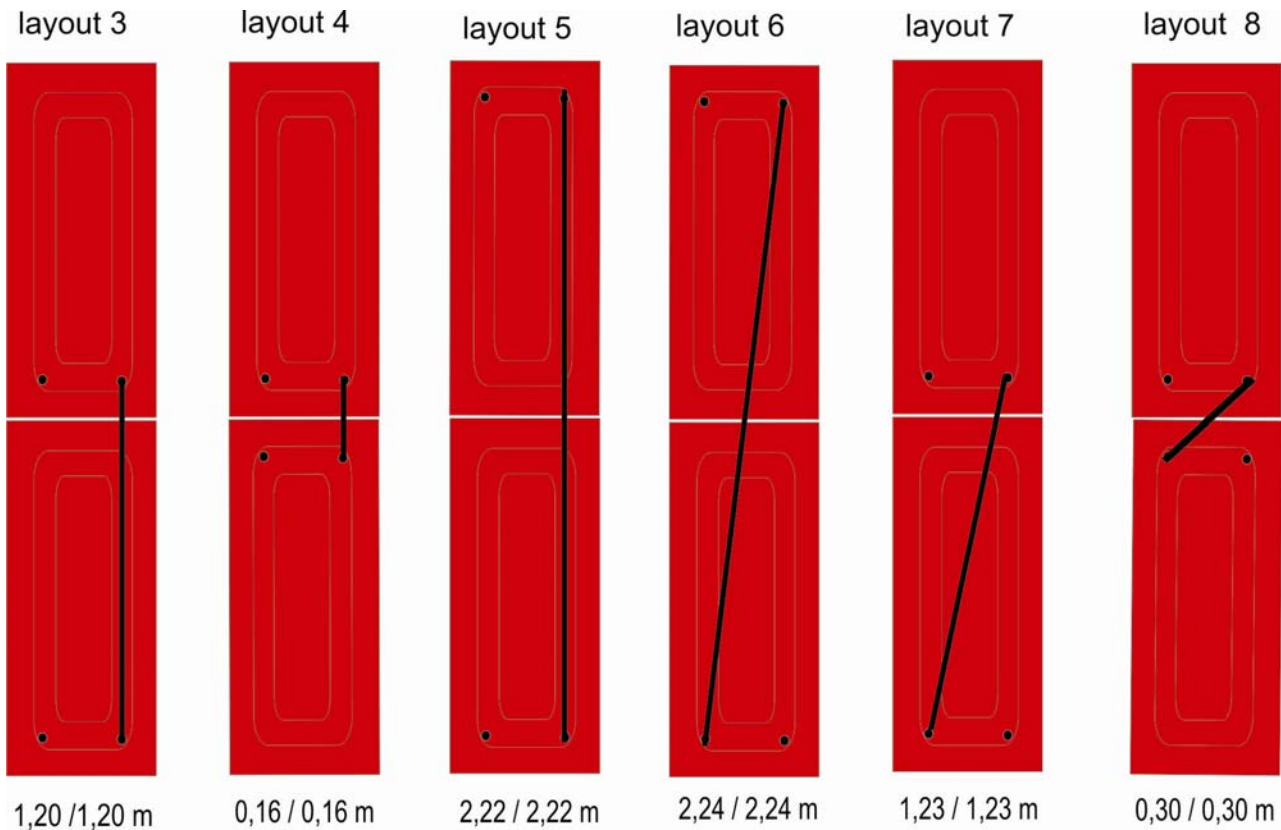


Abb. 5b: different layouts end to end

Using the hooked edge support

The hooked edge supports are included in the delivery of the Thermo W. It is recommended that MIK Thermo W should be exclusively laid on the hooked edge supports to ensure a safe bearing. The mounting of the hooked edge supports follows the laying of the slatted flooring. They are fitted into the continuous interlocking flooring system at the planned location of the Thermo W with the hooked edge support on the joist. The design of the hooked edge support determines automatically the exact position of the heating panel with the help of its centering tongues. There are 3 hooked edge supports provided for each side. According to the MIK slatted flooring system there are two different types of hooked edge supports. The fitting takes place within the continuous interlocking flooring system so that no gaps appear. Three hooked edge supports in a row amount to 1.2 meters. With the laying of 2 or several Thermo W in a row, a gap of approx. 10 mm will appear between any 2 heating panels. This is intended and serves as an expansion gap or as a cleaning gap. The width of this gap is according to the legal ordinance that regulates animal protection – Ordinance concerning the keeping of farm animals.



Illustration 6: hooked edge - carrier for Thermo W



Illustration 7: carrier mounted on support beams

Pressure-less filling of the Thermo W



1. initial situation



2. open locking screw with included tool



3. lift the panel with the tool



4. use tool as pedestal holding up the panel



5. fill panel pressure-less with water hose



6. refasten locking screw



7. carefully set down panel



8. ready to start the heating system!

Illustration 8: Pressure-less filling of the Thermo W

Securing the red pipe

Connecting the Thermo W takes place beneath the slatted flooring, after the Thermo W have been placed in the bays (illustration 8). The supply pipes are mounted on the wall, or likewise, can be fixed with cable ties beneath the slatted flooring (illustration 9).

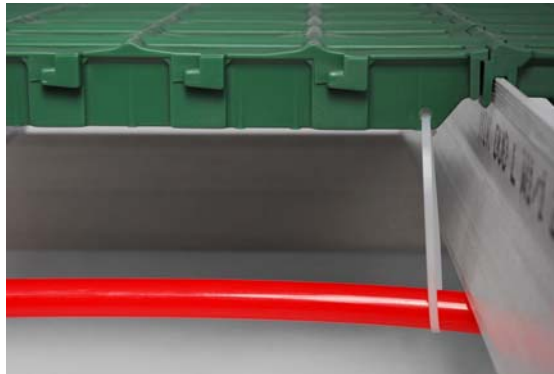


Illustration 9: Hanging the red pipes to the slatted flooring.

Ducting through walls and foundations

The supply pipes to the Thermo W groups are led from the DoJet regulation unit outside of the compartment through the wall in the slurry canal. In order to avoid damage the pipes must be protected going through the wall, for example through an empty pipe used for that purpose.

All pipelines in the compartment are led centrally from the compartment in the duct area to the DoJet regulation unit. The pipes leading to the DoJet outside of the compartment should be protected by a covering.

Insulation instructions

In order to guarantee an optimum supply of heat to the Thermo W in the compartment, insulation of the approaching pipelines is necessary. Make sure that all pipelines leading up to the compartments are correspondingly insulated. Faulty insulation can cause **up to a 40% loss of heat** (Illustrations 10a/b).



Illustration 10a: Wrong – insulation lacking on the entire piping system



Illustration 10b: Correct – all pipes in the system were sufficiently insulated

Commissioning

1.	Connect the Thermo W in circuits according to the connecting diagram, made available to you by your distributor.	
2.	Shut all valves on the DoJet regulation unit : Entry valve (1) ⇒ Allen key Thermostat valve (2) ⇒ (if applicable) thermostat head to be replaced by a black isolation cap and shut Flow to the Thermo W ⇒ Shut flow (3) meter in upper distribution manifold (by means of air venting key) Return from the Thermo W ⇒ shut white shut-off valves (4) on the lower distribution manifold.	Illust. 3
3.	Select and fix flow and return of each Thermo circuit. Pipes are not yet to be connected with the DoJet.	
4.	Fill the groups individually with the water hose, until the water comes out of the return with no bubbles in it (this can take several minutes for each circuit!) Carry out a visual check of the push joints for leak tightness on each circuit.	
5.	Cut the pairs of pipes (exclusively with the pip cutter) according to length and connect them with the DoJet.	
6.	Open the overflow valve in the ring line to bleed the system completely!	Illust. 1
7.	In the case of there being manually operated bleeding vents built into the ring line, these should be opened.	
8.	Fill the system through the return of the ring line. The air escapes through the bleeding vent.	
9.	After filling and bleeding the ring line, shut the manual bleeding vents and switch on the pump found in the ring line.	
10.	Open the flow (1) and return (2) valves on the first DoJet as well as the bleeding valve (8) on the upper distribution manifold. The flow and return pipes fill themselves with water. As soon as water comes out of the bleeding valve, shut it off.	Illust. 3
11.	Plug in the pump of the first DoJet and connect to the electricity supply.	
12.	Keep switching the pump of the DoJet on and off (by pulling the mains plug out and putting it in again) and at the same time allow the displaced air to escape through the bleeding valve (8) in the upper distribution manifold (flow pipe).	
13.	If necessary add water through the filler in the return of the heating equipment (max. operating pressure 2.0 bar).	
14.	Repeat steps 12 and 13 with each DoJet installed in the circuit until all the air has been completely removed.	
15.	The water now circulates without bubbles through the circuit and the DoJet regulation unit.	

16.	<p>Commission the Thermo W circuits individually at the first DoJet in the ring line:</p> <ul style="list-style-type: none"> ⇒ Commission the first Thermo W circuit by opening the isolating valves in the upper (3) and lower (4) distribution manifolds. ⇒ Unplug the pump every 30 seconds, allow the air to accumulate (in the upper distribution manifold) and activate the bleeding valve (8). ⇒ If the circuit is running free of air, shut it again (3) + (4). ⇒ Repeat the process of commissioning with the next circuit. 	Illust. 3
17.	Commission all the other circuits at each DoJet as described in point 16.	
18.	Set the overflow valve to a minimum flow rate, after completing the commissioning of all the circuits.	Illust. 1
19.	Change the black isolation cap at the thermostat valve (2) of the DoJet for the thermostat head with the remote sensor. Stick the remote sensor as far as it will go into the immersion sleeve, which is found on the right side of the upper distribution manifold. The system is now ready for operation.	Illust. 3
20.	Open the circuits on the regulation unit (4).	Illust. 3
21.	Set the flow meter (3) to the hydraulic calibration of the pipe runs. The float of the flow meter must level itself out to the same level with all circuits (3-6 l/min).	Illust. 3

Setting the temperature

Variations of the temperature of the Thermo W depend on the prone positions adopted by the piglets. As the temperature needs of the piglets cannot be determined by the age of the animals, the prone positions of the animals must be observed and the temperatures set accordingly. (Illustration 11)..

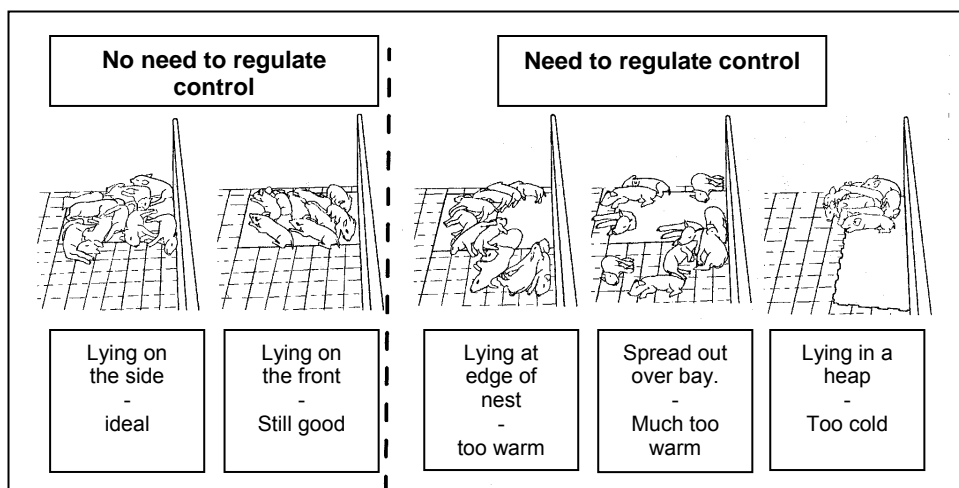


Illustration 11: Prone positions of piglets and need for heat control at different temperatures

At birth the surface temperature of the Thermo W is recommended to be between approx. 38° - 41°C. Piglets should be seen to be either lying down on their sides or on their fronts. In the first one or two days an infra red heating element can additionally be set up over the piglet nest, as the need for warmth for the animals is very great.

Fault analysis

In the following table you will find basic instructions concerning possible causes of faults and failures. Should any faults occur that are not explained or unable to be corrected here, your specialist MIK retailer will be available to you at any time.

<p>The maximum temperature of 45°C at the Do-Jet is not reached</p>	<ol style="list-style-type: none"> 1. Check whether the installation of the system was according to the MIK overview on page 2. 2. Make sure that the entry valve (supply flow) is completely open. Use an Allen key to open it! 3. Check that the flow meters are properly adjusted and the flow is sufficient (3 - 6 l/min). 4. Make sure the dimensions of the supply pipe are sufficient (min. Ø 28 mm or likewise DN 25). 5. Check whether all pipelines outside of the compartments are sufficiently insulated. Missing insulation causes heat loss of up to 40%. 6. Make sure the thermostat valve is correctly seated and in the right direction of flow (inspect the head of the thermostat, if need be, and observe what happens to the temperature ⇒ the temperature should climb!) 7. Check the safety feed thermostat – if it is set too low the pump will intermittently cut out. (The factory setting of 60°C must on no account be altered!) 8. Check the entry and thermostat valves for fouling and sedimentation.
<p>Individual circuits not getting warm</p>	<ol style="list-style-type: none"> 1. Make sure the cut off valves in the flow and return of the particular circuits, as well as their flow meters are open. 2. Check that the system is completely free of air. Observe the flow meter of the respective circuit: if the float does not move when it is fully open or if it springs up and down, there is air in the system. 3. Make sure the pump is not making noises. If the pump is making noises other than could be expected from normal working, bleed it immediately. If it has air in it, the pump will run dry and will be damaged. 4. Check whether the particular circuits were ever changed. Flow and return of a group are to be combined in the distribution circuit.
<p>Loss of pressure in the system</p>	<ol style="list-style-type: none"> 1. Check whether a sufficiently large expansion tank has been built into the heating circuit. The size of the expansion tank is calculated by the heating installer. Test that the expansion tank is working properly, if it is not working properly, pressure fluctuations are possible within the system. 2. Test the individual Thermo W circuits during commissioning: shut off all circuits on the flow and returns. After that, open the first circuit and observe the pressure on the manometer. If there is a fall in pressure, you probably have a leak in the circuit. Carry out a visual check to locate the leak. Test as necessary further circuits. 3. Never separate individual DoJet regulation units by cut off valves in the flow and return of the ring line after the animals have been installed. Only shut off the pump of the affected DoJet! With a complete isolation, it is no longer possible for the expansion tank to make necessary pressure adjustments. .

<p>Pump dysfunction</p>	<ol style="list-style-type: none"> 1. Opening the pump or breaking the seal invalidates the guarantee! 2. Check whether the electricity supply to the pump is connected. In a closed electrical circuit the surface of the motor is clearly warmer than the water or the ambient temperature. Warning: as pumps can become very hot, there is a danger of burning! If the pump motor is cold, check the main fuses. If the fuses are intact, it means there is irreparable damage to the motor – the pump must be exchanged. 3. Make sure there is enough water in the pump. The pump works in normal operations almost without developing any noise. If irregular or “squeaking” noises can be heard, there is not enough water in the system. (By applying a screwdriver to the pump housing small operational disturbances can be heard by putting you ear to the handle). Fill up with water and test whether the pump is still able to function or whether it already suffered some damage. Remove any air found in the pump housing, by repeatedly switching the pump on and off. Warning: Running dry leads to premature abrasions and destruction of the pump / -failure! 4. Test to see if the pump is blocked. If nothing comes through, the pump could be blocked. To remove the fault the pump should be opened (Note the guarantee instruction in point 1). <ul style="list-style-type: none"> - Interrupt the electrical supply: pull out the plug or switch off the main fuse. - Shut the flow of the DoJet with an Allen key. - The return of the DoJet must likewise be completely shut off: to do this, replace the thermostat head with the black shut-off cap. - Connect all the Thermo circuits to the flow and the return to minimize water loss in the system. - Release the pump motor from the pump housing (Allen screw). - Warning: The rotor lies loose in the motor! - It is possible there is a blockage of the motor at the running wheel (impeller wheel) or at the rotor (hemispherical segment beneath the dividing wall). Check this by taking the rotor at the impeller wheel out of the motor. If the seal is stuck, loosen it carefully with a screw driver. - Rinse out any dirt found at the rotor or in the impeller wheel with running water. Remove dirt from the hemisphere of the motor with a soft cloth. - N.B.: the ceramic ball (stator) on the motor must not be turned as it serves only as a rotor bearing. - Remove chalk deposits with standard household chalk remover. - After cleaning, put the rotor back in the motor. Warning: don't replace the seal until after putting back the rotor! The rotor should now be able to be turned by hand. If the rotor scrapes when you do this and/or there are recognizable scrape marks on the under side of the rotor and on the dividing wall to the motor, the pump must be exchanged (the rotor bearing is worn out). - After putting in the rotor the functioning can be checked on a level surface (with the motor underneath). Warning: Don't hold the pump in your hand during the function test! Only switch the pump on for a short moment, the rotor should then turn (it does not matter if it jumps out or clatters against the dividing wall between the running wheel and the rotor, this is of no concern.) If the pump does not run, it must be exchanged. - If the function check is positive, fasten the pump motor again to the pump housing. Warning: switch off power. - Open the flow and return of the DoJet and, if necessary, fill it up with water. - Shut off the power and re-commission the pump. Remove any remaining air by repeatedly switching on and off. - Open the Thermo circuit.
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Guarantee

MIK INTERNATIONAL AG grants a manufacturer's guarantee of 2 years from the delivery date. During this time MIK INTERNATIONAL AG guarantees the correct functioning of the system (consisting of MIK Thermo W heating panels and MIK DoJet regulation units) as well as cost free overhaul by the manufacturer in the case of any defect for which we are responsible.

Guarantee claims are excluded amongst other thing, because of:

- Unintended use of the system
- Improper assembly, especially if done by others as franchised contract installation companies.
- Using other regulation units than MIK DoJet regulation units or other system components.
- Unauthorized operation
- Continuing to operate defective pieces of equipment
- Unauthorized alterations to the system.
- Interference by third parties and acts of God
- Improper cleaning
- Combination with components of other manufacturers

Guarantee claims can only be for the above described system. Further claims for compensation are excluded.

Our general business conditions apply and can be looked at under www.mik-online.de or can be requested from MIK INTERNATIONAL AG.

The processing of the warranty claims requires the disassembly and return transportation of the part or parts to the manufacturer. Only complete parts which have been returned can be considered. For return transportation, the returned goods should be put in the original packaging or an equivalent packaging. These tasks will not be performed by MIK and neither will the assembly of the repaired part or parts be undertaken.

Attachment - DoJet expansion sets

Expanding round 2 circuits. – connecting a maximum. of 40 Thermo W

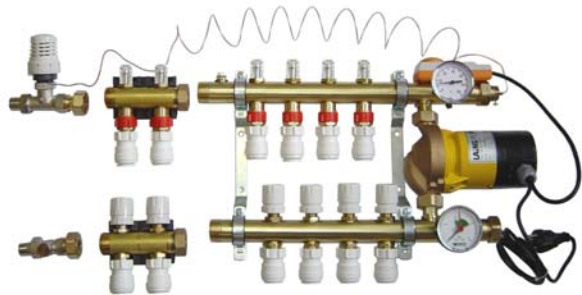
Step 1

Loosen the thermostat valve and the entry valve and remove them both.



Step 2

Now lay the parts of the expansion set between the valves and the distribution manifold according to the photo. Pay careful attention to the correct correlation as well as the placing of the seals.



Step 3

Connect the expansion set with the distribution manifolds and screw the parts tightly together. Make sure of an even alignment of the connections.

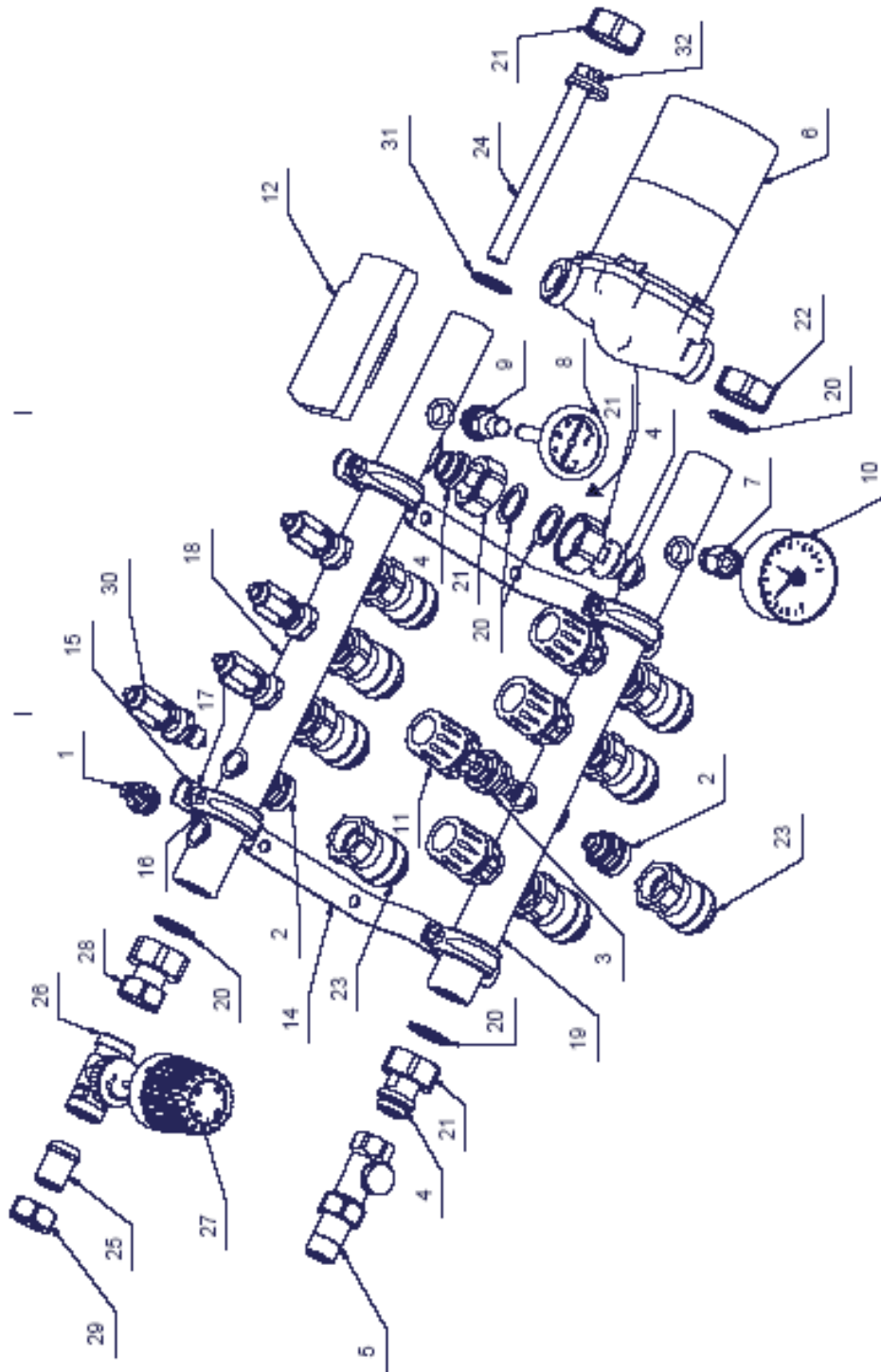


Step 4

Fully reinstate the shaped insulation to the regulation unit to avoid the loss of heat.



Attachment - DoJet 4 exploded view



Attachment - DoJet replacement part list

Fig.	Part No.	Designation
1	03726	Air vent RDT/K10 nickel-plated
2	Not singly obtainable!	Valve underpart DFM38 A
3	03817	Valve with pre-setting 2013
4	Not singly obtainable	Red.-piece
5	03832	Supply flow / entry valve
6	03835	Energy efficiency pump
7	Not singly obtainable	Stop switch 3/8"
8	03818	Thermometer 0 - 120°C
9	Not singly obtainable	Thermometer holder 3/8"
10	03819	Manometer 4 bar 3/8" AG rücks.
11	03821	HRK Hand regulating button.
12	03840	Feed thermostat
-	03834	Shaped insulation HKV, size 4
14	Not singly obtainable	Retaining bracket
15	Not singly obtainable	HLV-clip 1"
16	Not singly obtainable	Clip insert 1"
17	Not singly obtainable	Screw M6x20
18	Not singly obtainable	Flow pipe, size 4
19	Not singly obtainable	Return pipe, size 4
20	03735	Seal AFM 34 30 x 22 x 2 - 1"
21	03828	Lock nut 1" IG
22	Not singly obtainable	End cap
23	02172	Adapter RS * IG, 22mm x 3/4"
24	03829	Immersion sleeve, eccentric
25	Not singly obtainable	Red. bush
26	03714	Thermostat valve 3/4" cone
27	03718	Thermostat head K with remote sensor
28	03764	Flanged socket 1" IG x 3/4" cone
29	Not singly obtainable	Lock nut 3/4" IG
30	03833	Flow meter DFM38-A 0-6 l/min
31	Not singly obtainable	Seal 1" AFM 34 (please use article of fig. 20 instead)
32	Not singly obtainable	Flat headed screw with Phillip's recessed head