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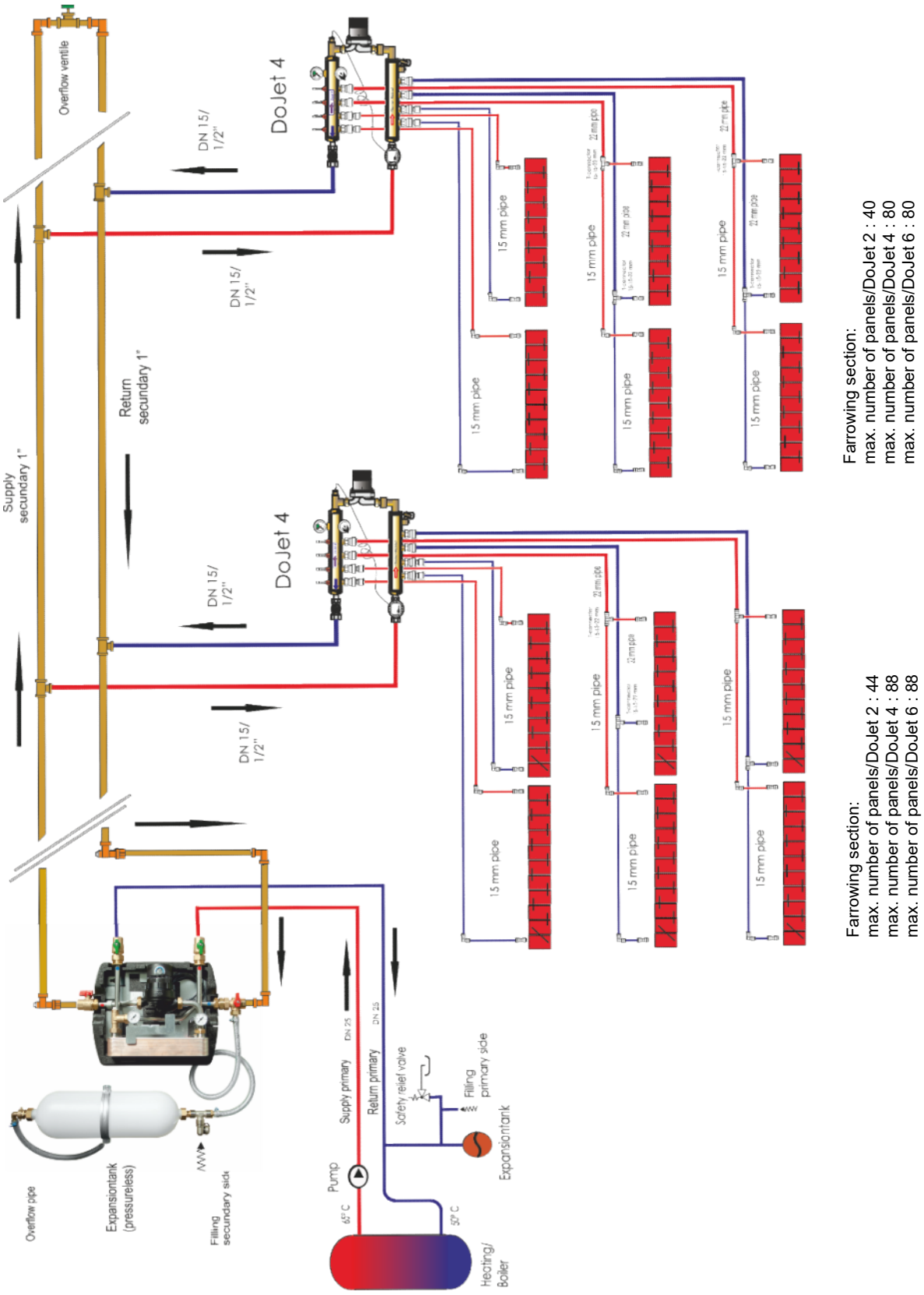
General system details

- → 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.
- → The Thermo W system is operated in its own circuit and is separated from the heating system by a heat exchanger.
- → Only use MIK heat exchangers and 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**.
- → Thermo W panels are not gas diffusion-resistant. 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.
- → Only use corrosion-resistant material in the entire circuit system.
- → The expansion tank of the WTP 30 (open expansion tank) is to be installed at the highest point of the system.
- → When using the WTP 30 (open expansion tank) there must be a minimum of 30 cm space left to the ceiling to allow for manual filling.
- → The WTP 30 can optionally function as a closed system heat exchanger. In this case, a membrane expansion tank as well as a safety valve must be installed in the secondary circuit.
- → The circular pipeline to the DoJet regulation unit must have a diameter of a minimum of 28 mm (1”) (irrespective of the number of regulation units within the overall system).
- → Allow for a manual air extraction vent at the highest point in the circular pipeline.
- → Allow for sufficient air extraction vents in the circular pipeline as they will facilitate commissioning and air extraction of the system.
- → Insulate all supply pipes to avoid possible losses in temperature.
- → Only fill the circulation system 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 DoJet.
- → The operating pressure should not exceed 0.7 bar.
- → The maximum allowable surface temperature of the Thermo W amounts to 50°C (122°F).

MIK Thermo W System (Overview)



Technical Data - system components

Thermo W 400x600 warm water panel

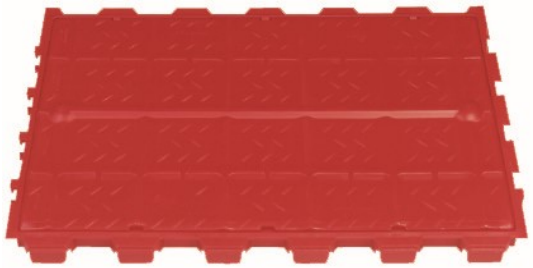


Illustration 2: Thermo W with non-slip surface

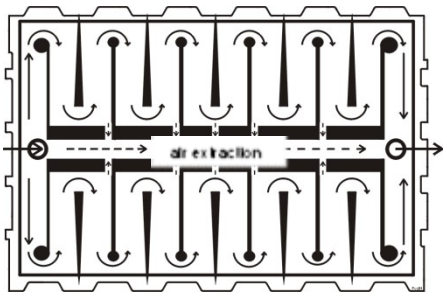


Illustration 3: Flow chart

Usable area:	400 mm x 600 mm (15 3/4” x 23 5/8”)
Material in the outer casing:	polypropylene, not gas diffusion-resistant
Max. heat consumption:	approx. 90 Watt (307 BTU) at 18°C (65°F) room temperature
Average heat consumption:	approx. 60 Watt (204.6 BTU) (in operation, with animals in crates/pens)
Water volume:	approx. 3 l
Operating pressure:	no pressure
Max. operating pressure:	0.7 bar
Min. temperature primary flow:	75°C (167°F) (heater → heat exchanger)
Min. temperature secondary flow:	65°C (149°F) (heat exchanger → regulation units)
Max. temperature Thermo flow:	50°C (122°F)
Connection:	plastic pipe connecting system Ø15 mm or Ø 22 mm

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

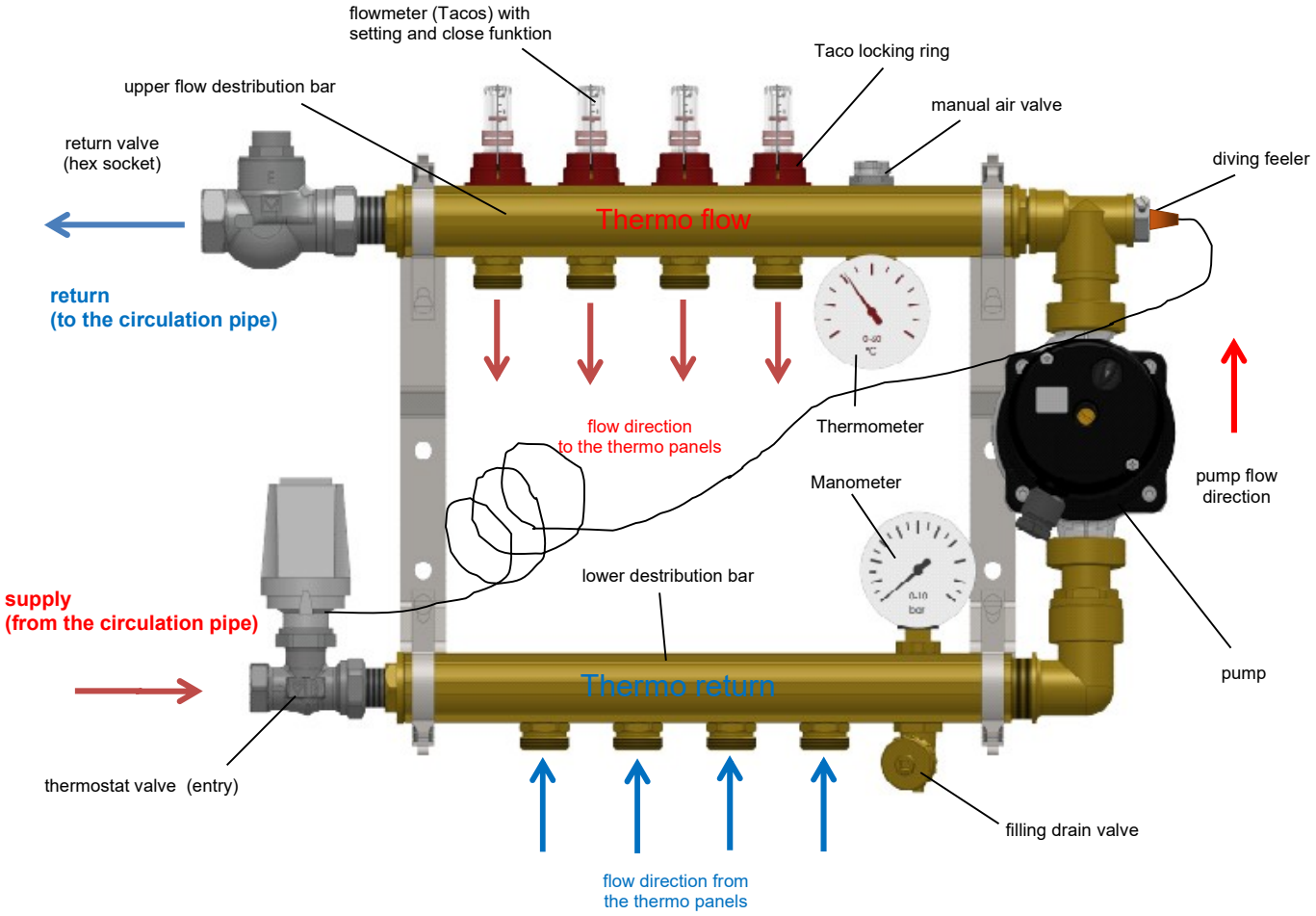
Number of Thermo W * 90 Watts (307 BTU) (max. power consumption) = energy input *(including 20% margin for possible line losses etc.)*

Example:

$$(100 \text{ Thermo W} * 90 \text{ Watt}) + \frac{100 \text{ Thermo W} * 90 \text{ Watts} * 20}{100} = 10{,}800 \text{ Watts}$$

(9,000 Watt Thermo W + 1,800 Watt safety margin)

DoJet regulation unit



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 varies:

Nursery crates/pens:

DoJet 2:	2 circuits @ max. 22 Thermo W = max. 44	Thermo W/regulation unit
DoJet 4:	4 circuits @ max. 22 Thermo W = max. 88	Thermo W/regulation unit
DoJet 6:	6 circuits @ max. 88	Thermo W/regulation unit

Farrowing crates/pens:

DoJet 2:	2 circuits @ max. 20 Thermo W = max. 40	Thermo W/regulation unit
DoJet 4:	4 circuits @ max. 20 Thermo W = max. 80	Thermo W/regulation unit
DoJet 6	6 circuits @ max. 80	Thermo W/regulation unit

Pump:	TYP HEP Optimo 15-6.0 E 130
Power consumption:	4-50 Watt
Electric voltage:	230 V 50/60 Hz
Max. supply pressure:	60 kPa
Max. supply flow rate:	3,5 m^3/h

WTP 30 E heat exchanger with insulation box

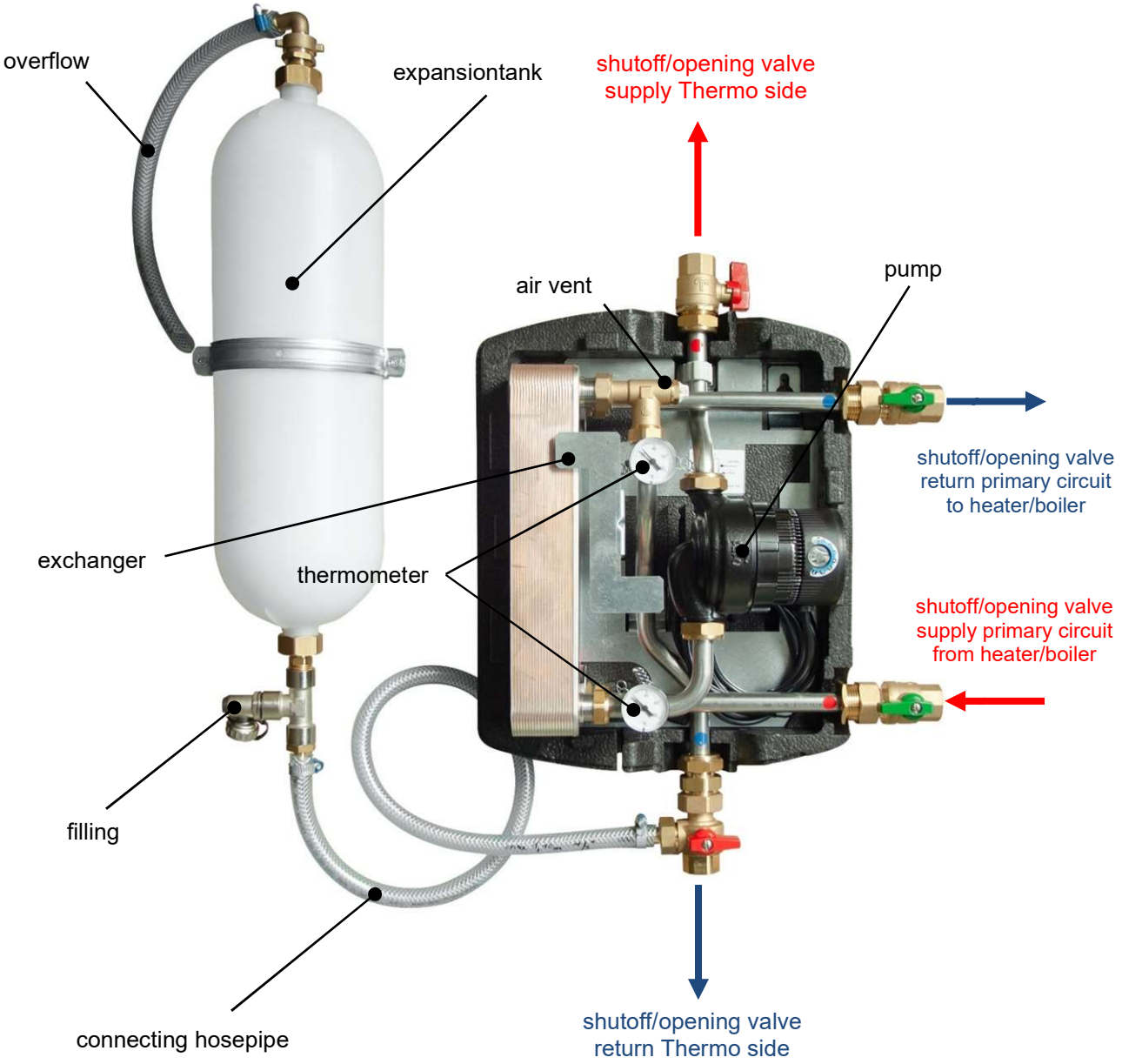


Fig. 5: heat exchanger WTP 30 E

For correct positioning of the expansion tank, please note the system overview at page 3!

Assembly instructions

MIK Thermo W heating panels are integrated with flush surfaces into the slatted flooring and anchored seamlessly onto the beams (5 mm strength). Thermo W are thus combinable with all MIK plastic panels. It is possible to subsequently build them into existing pens.

Installation 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 crate/pen:
MIK recommends 3 Thermo W to be fitted per crate/pen, providing even weaker animals with sufficient space. The nest being placed away from where the sow stands.

Piglet rearing:
In the piglet rearing pen it is recommended they are laid in strips or as an island with slotted panels surrounding them.

Supply groups

Supply groups can be configured as follows (illustrations 6 and 7), whereby the Thermo W can be connected to each other in rows:

1. 15 mm pipe: per circuit max. 11 Thermo W

2. 22 mm pipe: 1st circuit with max. 11 Thermo W *(reduction from 22 mm to 15 mm)*
   2nd circuit with max. 11 Thermo W *(15 mm pipe)*

   → max. 22 Thermo W

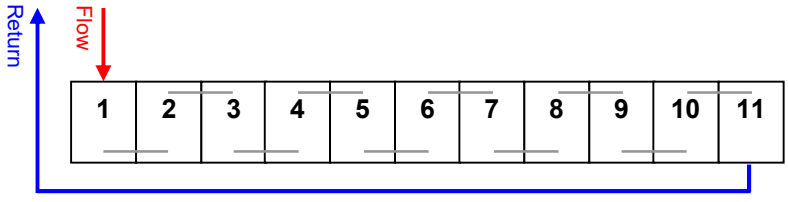


Illustration 6: Connection of max. 11 Thermo W with 15 mm pipe

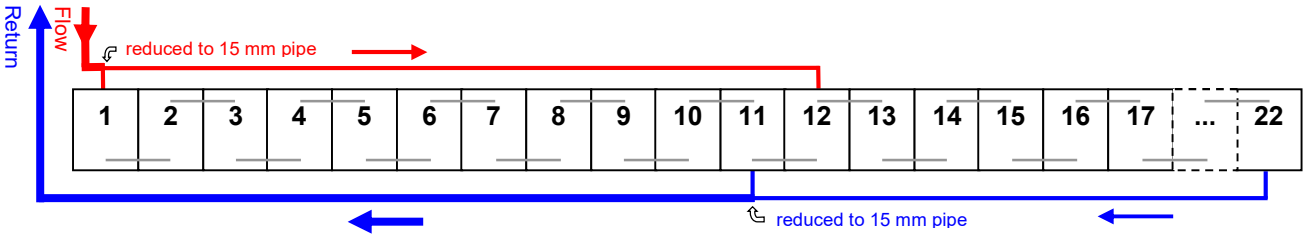


Illustration 7: Connection of max. 22 Thermo W reducing from 22 mm to 15 mm pipe

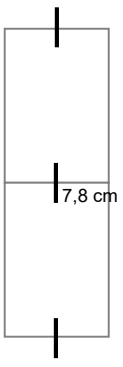
Connecting Thermo W

- → 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.
- → Do not twist the pipes when pushing them into the fittings, so that the rubber seal is not damaged.
- → Do not use any kind of lubricant when joining fitting and pipes as this could attack the rubber seal.
- → Make sure that 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.

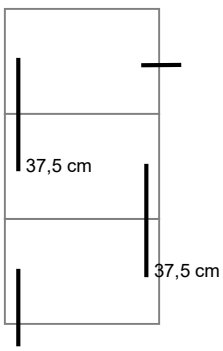
Standard pipe lengths for connecting Thermo W

These pipe lengths are the same for each piping system and can be cut to length before starting to do the installation:

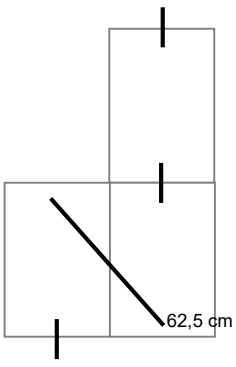
Piping	Pipe length
End to end (Illustration 8)	7.8 cm (approx. 3”)
Side by side (Illustration 9)	37.5 cm (approx. 14 3/4")
Diagonal (Illustration 10)	62.5 cm (approx. 24 2/3”)
Off-diagonal (Illustration 11)	67.5 cm (approx. 26 5/8”)



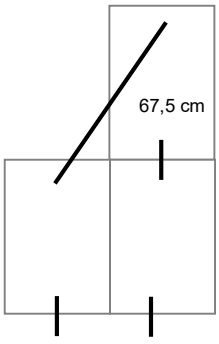
Illust. 8



Illust. 9



Illust. 10



Illust. 11

Securing the red pipe

Connecting the Thermo W takes place beneath the slatted flooring, after the Thermo W have been placed in the crates/pens (illustration 12). The supply pipes are mounted on the wall, or likewise, can be fixed with cable ties beneath the slatted flooring (illustration 13).

Illustration 12: Connecting the Thermo W with the push-fit connection system

Illustration 13: Supply pipes in the channel

Ducting through walls and foundations

The supply pipes from the DoJet regulation unit to the Thermo W groups are generally fed through the compartment wall into the slurry channel. In order to avoid damage the pipes must be protected going through the wall by use of appropriate ducting (i.e. pvc sewer pipe).

All pipelines in the compartment are fed centrally from the compartment to the passageway where the DoJet regulation unit is installed. The pipes leading to the DoJet outside of the compartment should be protected from damage by a covering.

Insulation instructions

In order to guarantee an optimal supply of heat to the Thermo W in the compartment, insulation of all the supply/return pipelines is necessary. Make sure that all pipelines leading up to the compartments are sufficiently insulated. **Faulty insulation can cause up to 40% heat loss** (illustrations 14 and 15).

Illustration 14: Wrong - insulation lacking in the entire piping system

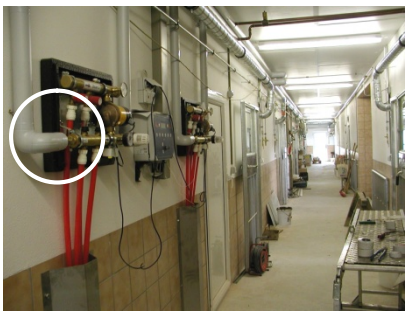


Illustration 15: Correct - all pipes in the system were sufficiently insulated

Commissioning

1.	Connect the Thermo W in circuits according to the connection diagram, made available to you by your distributor.	
2.	Shut all valves on the DoJet regulation unit: Thermostat valve (1) ⇨ (if applicable) thermostat head to be replaced by a grey isolation cap and shut. Return valve (2) ⇨ Allen key. Flow to the Thermo W ⇨ Shut flow (3) meters in upper distribution manifold by turning red lock ring in clockwise direction. Connect water hose to fill/drain valve (8) in lower distribution manifold.	Illust. 3
3.	Select and fix flow and return of each Thermo circuit. Cut return pipes and connect them to the DoJet. Flow pipes are not yet to be connected with the DoJet.	
4.	Fill the groups individually with the water hose via filling/drain valve (8), until the water comes out of the flow pipe 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 flow pipes (exclusively with the pipe cutter) according to length and connect them with the DoJet. Close fill valve (8).	
6.	Open the overflow valve ((2) in overview on page 3) in the ring line to bleed the system completely!	Illust. 1
7.	In the case of there being manually operated bleed 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 bleed vent resp. through the expansion tank of the WTP 30.	
9.	After filling and bleeding the ring line, shut the manual bleed vents and switch on the ring line pump.	
10.	Open the flow (1) and return (2) valves on the manifolds of the first DoJet of the ring circuit. The flow and return pipes fill with water. As soon as all the air has dissipated into the ring circuit you can start the DoJet pump.	Illust. 3
11.	You can now begin to open the individual circuits on the DoJet by opening the flow meters red lock ring anti-clockwise.	
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 allowing any air to escape via the upper distribution manifold into the ring circuit.	
13.	If necessary add water through the filler at the WTP 30. When operating with pressure, please consider the max. operating pressure of 0.7 bar!	
14.	Repeat steps 11 to 13 with each DoJet installed in the circuit until all the air has been completely removed.	

15.	The water now circulates without air bubbles through the ring circuit and the DoJet regulation units.	
16.	Commission the rest of the Thermo W circuits on each DoJet in the ring circuit as per point 11 above.	
17.	After completing the commissioning of all the circuits, set the overflow valve to a minimum flow rate.	Illust. 1
18.	Change the grey isolation cap at the thermostat valve (2) of the DoJet for the thermostat head with the remote sensor. Push 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
19.	Turn pump on the highest setting. Set the flow meters (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.	Illust. 3

Temperature setting

Variations of the temperature of the Thermo W depend on the lying positions adopted by the piglets. As the temperature needs of the piglets cannot be determined by the age of the animals, the lying positions of the animals must be observed and the temperatures set accordingly (illustration 16).

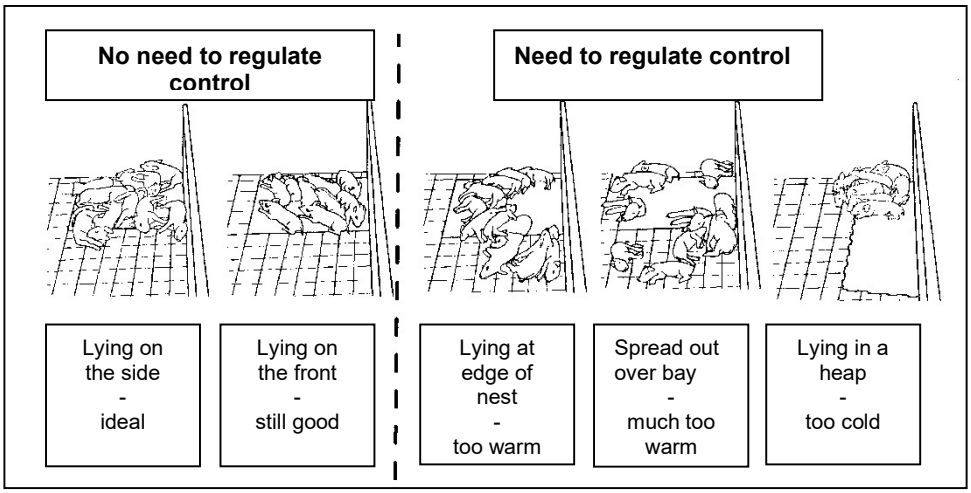


Illustration 16: Prone positions of piglets and need for heat control at different temperatures

At birth the surface temperature of the Thermo W is recommended to be between approx. 38° - 41° C (100°F - 106°F). 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.

The maximum temperature of 42°C at the DoJet is not reached	1. Check whether the installation of the system was according to the MIK overview on page 3. 2. Make sure that the Thermostat flow valve (1) is completely open. 3. Check that the flow meters are properly adjusted and the flow is sufficient. 4. Make sure the dimensions of the supply ring circuit pipe are sufficient (min. Ø 28 mm or DN 25). Also check supply pipes to DoJet coming from ring circuit are of sufficient dimension (min. Ø 18 mm or DN 15). 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 return and thermostat valves for fouling and sedimentation.
Individual circuits not getting warm	1. Make sure that the flow meters of the respective circuits are fully 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 circuit pipes were ever mixed. Flow and return of a group are to be installed in the same position on flow and return manifolds.

Loss of pressure in the system	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 DoJets during commissioning: shut off all circuits on the flow (1) and returns (2). You must use the grey isolation cap on the flow valve as this is the only way to ensure a complete closing of that valve! After that, 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 further DoJets as necessary. 3. Never isolate individual DoJet regulation units by shut off valves on the flow and return of the ring circuit after the animals have been taken out. 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. 4. Ensure that all flow valves on upper manifold are open. Should the flows be restricted, then the pump may switch to a lower flow level. This can be seen on the display on the pump cover. A restricted flow will display only 3 - 5 Hz.

Pump fault	1. 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. 2. 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 while having loosened the large screw in the middle of the pump cover. **Caution: Danger of Burns! Refer to pump manual. Warning: Running dry leads to premature abrasions and destruction of the pump!** 3. Check return valve and flow meters to ensure that they are not shut or are fully open. Should the flows be restricted, then the pump may switch to a lower flow level. This can be seen on the display on the pump cover. A restricted flow will display only 3 - 5 Hz. 4. Check to see if the pump is blocked. If there is no flow when all valves are open, the pump may be blocked. - Shut off the electrical supply: pull out the plug or switch off the main fuse. - Shut the return (2) of the DoJet with an Allen key. - The flow of the DoJet must likewise be completely shut off: to do this, replace the thermostat head with the grey shut-off cap. - Close all the Thermo circuits via the flow meters to minimize water loss in the system. - Release the pump motor from the pump housing (Allen screws). - It is possible there is a blockage of the motor at the impeller or at the rotor. 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. Remove calcium deposits with standard household calcium remover.

- The rotor/impeller should now be able to be turned by hand. If the rotor/impeller 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.
- After cleaning the rotor/impeller the functioning can be checked on a level surface (with the motor facing down). **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. If the pump does not run, it must be replaced.
- 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 via fill/drain valve (8).
- Turn on the electricity and re-commission the pump. Remove any remaining air by repeatedly switching on and off. Follow instruction points 10 - 19 of "commissioning" instructions.
- Open the Thermo circuits.

Guarantee

MIK International grants a manufacturer's guarantee of 2 years from the delivery date. During this time MIK International 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 than 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

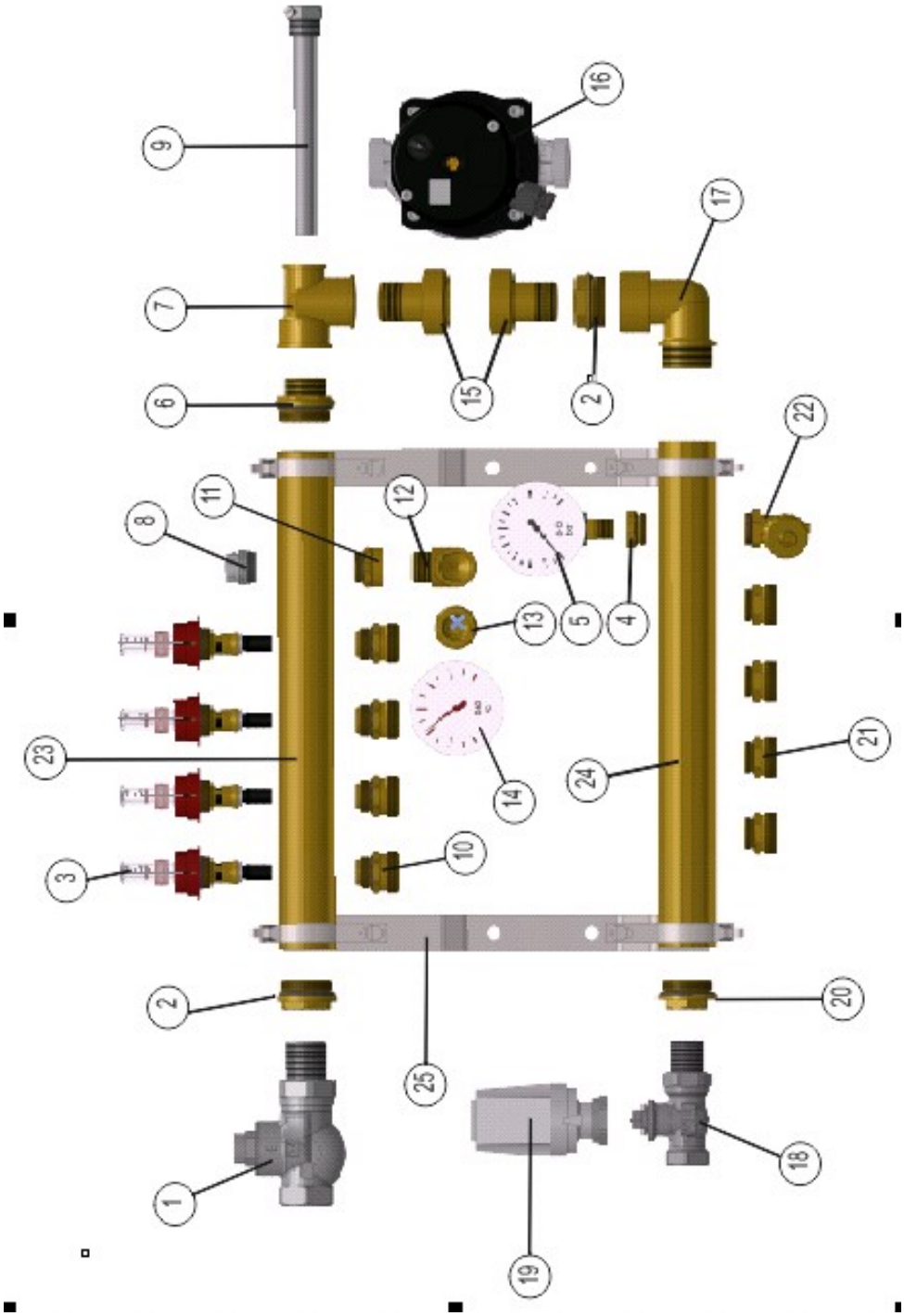
→ Combination with components of other manufacturers

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

Our general business conditions apply and can be found at www.mik-online.com or can be requested from MIK International.

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 4 exploded view



Attachment - DoJet replacement part list

Fig.	Art.-No.	Name
1	03600	Check valve ¾“ID x ¾“OD HERZ RL-1-E
2	03601	Reducing bush brass 1“ x ¾“
3	03602	Flow meter ½“ E
4	03603	Reducing bush brass ½“ x ¼“
5	03604	Manometer 0-10 bar E
6	03605	Reducing nipple MS E
7	03606	T-piece brass E
8	03758	Air vent valve ½“
9	03608	Immersion sleeve MS nickel plated E
10	03608	Reducing nipple MS SW 24 E
11	03610	Reducing nipple MS SW 30 E
12	03611	Elbow E
13	03612	Immersion sleeve ½“ x 40 mm E
14	03613	Thermometer 0-60°C
15	03614	Pump fitting ¾“ x 1“ coupling, flat seal
16	03845	Pump
17	03615	Elbow 1“ x 1“ E
18	03616	Thermostat valve ½“ x ½“ straight passage
19	03617	Thermostat head with remote sensor HERZ E
20	03618	Reducing bush brass 1“ x ½“
21	03619	Reducing nipple ½“ x ¾“ x 22 mm
22	03620	Fill/drain valve brass E ½“

Comments/Notes