

Table of Contents

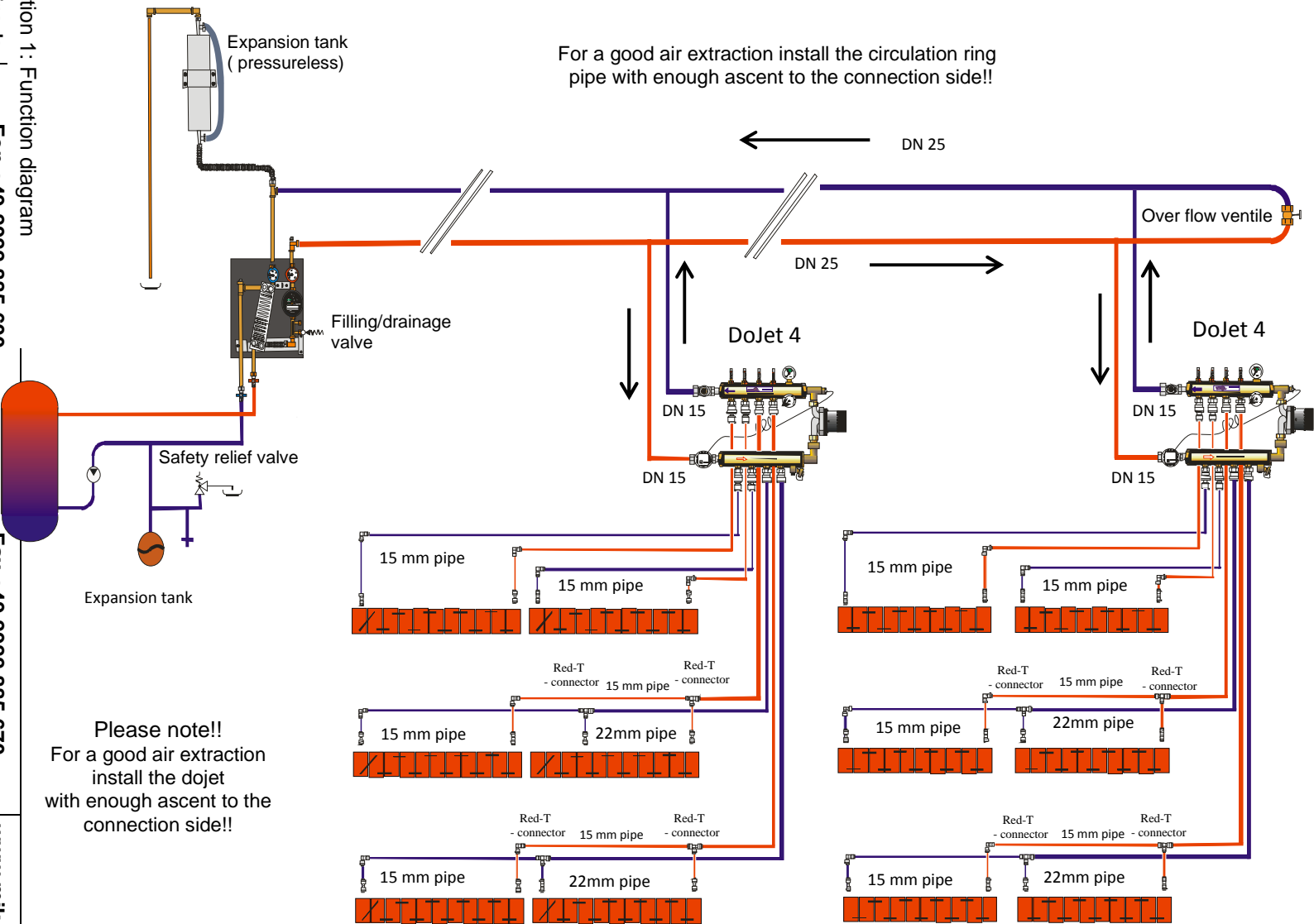
General System Information	Page 2
Technical Data - System Components	Page 4
Installation Instructions	Page 7
Initial Operation	Page 11
Temperature Adjustment	Page 13
Troubleshooting	Page 14
Warranty	Page 18
Appendix - Exploded View DoJet 4	Page 19
List of spare parts	

General System Information

- The Thermo W system is a special litter heating system, not an area heater. Warmth is transferred to the animals through body contact.
- The system is operated in its own circuit and separated from heating installation by means of a heat exchanger.
- Use only MIK heat exchangers and MIK control systems to ensure the system's safe operation. **The use of other products with this system invalidates all warranties.**
- Thermo W panels are not gas diffusion sealed. Self-assembly installations must be checked by an authorised company (technician) before initial operation. The size of the expansion tank must also be determined by an authorised technician.
- Use only corrosion-resistant material throughout the entire circuit.
- The expansion tank for the WTP 30 (open expansion tank) must be installed at the system's highest point.
- When using the WTP 30 (open expansion tank) there must be at least 30 cm space to the cover to allow for manual filling.
- The loop system to the DoJet control system must have a cross-section of at least 28 mm (1") (regardless of the number of control systems in the installation).
- Arrange for a manually operated valve in the return of the loop system.
- Place sufficient air escape valves in the loop system, this will ease the initial operation and system ventilation.
- Insulate the supply lines in the aisles etc. to avoid possible temperature loss.
- Please use the insulation for the distribution manifold that is shipped with the control system.
- Fill the circuit with city water only. Well water can contain high amounts of iron as well as other particles that can form deposits near the valves and impair the function of the DoJet.
- The maximum operating pressure is 0.7 bar.
- The Thermo W's maximum surface temperature is 50°C (122°F).

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 2 /20

MIK Thermo W System (Overview)



For a good air extraction install the circulation ring pipe with enough ascent to the connection side!!

Please note!!
 For a good air extraction
 install the dojet
 with enough ascent to the
 connection side!!

Nursery crates
 max. number of panels/DoJet 2: 44 pcs.
 max. number of panels/DoJet 4: 88 pcs.
 max. number of panels/DoJet 6: 88 pcs.

Farrowing crates
 max. number of panels/DoJet 2: 36 pcs.
 max. number of panels/DoJet 4: 72 pcs.
 max. number of panels/DoJet 6: 72 pcs.

Illustration 1: Function diagram

<p>Erstellt 03.08.14 TE Stand 01</p>	<p>Info@mik-online.de Fon +49 2922 885 600 Fax +49 2922 885 670 Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02.09.2014.doc</p>	<p>www.mik-online.de Seite 3 /20</p>
--	---	---

Technical Data - System Components

Thermo W Warm Water Panel

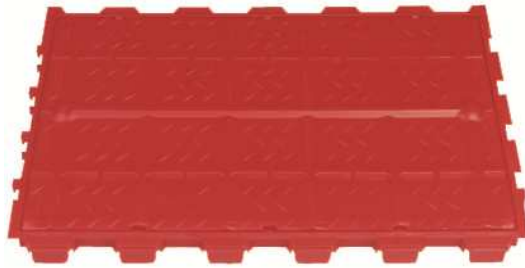


Fig. 2: Thermo W with non-slip surface

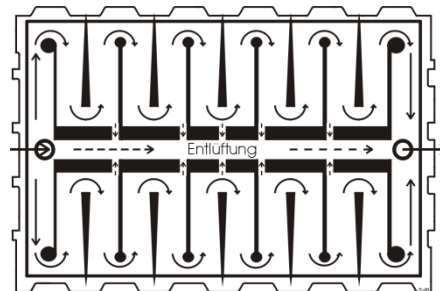


Fig. 3: Flow chart

Pitch range:	400 mm x 600 mm (15 3/4" x 23 5/8")
Material:	Polypropylene, not gas diffusion sealed
Max. heat performance:	ca. 90 Watt (307 BTU) at 18°C (65°F) room temperature
Average performance:	ca. 60 Watt (204.6 BTU) (in operation, with occupied pens)
Water content:	ca. 3 l
Operation pressure:	No pressure
Maximum 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 → control system
Max. Temperature Thermo flow:	50°C (122°F)
Water connection:	Plastic piping connector system Ø15 mm or Ø 22 mm

Energy Use Calculation (e.g. for the heat source design):

Number of Thermo W's * 90 Watts (307 BTU) (max. performance input) = Energy input (*an additional 20% should be planned for possible performance losses etc.*)

Example:

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

(9,000 Watt Thermo W's + 1,800 Watt backup)

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 4 /20

DoJet regulation

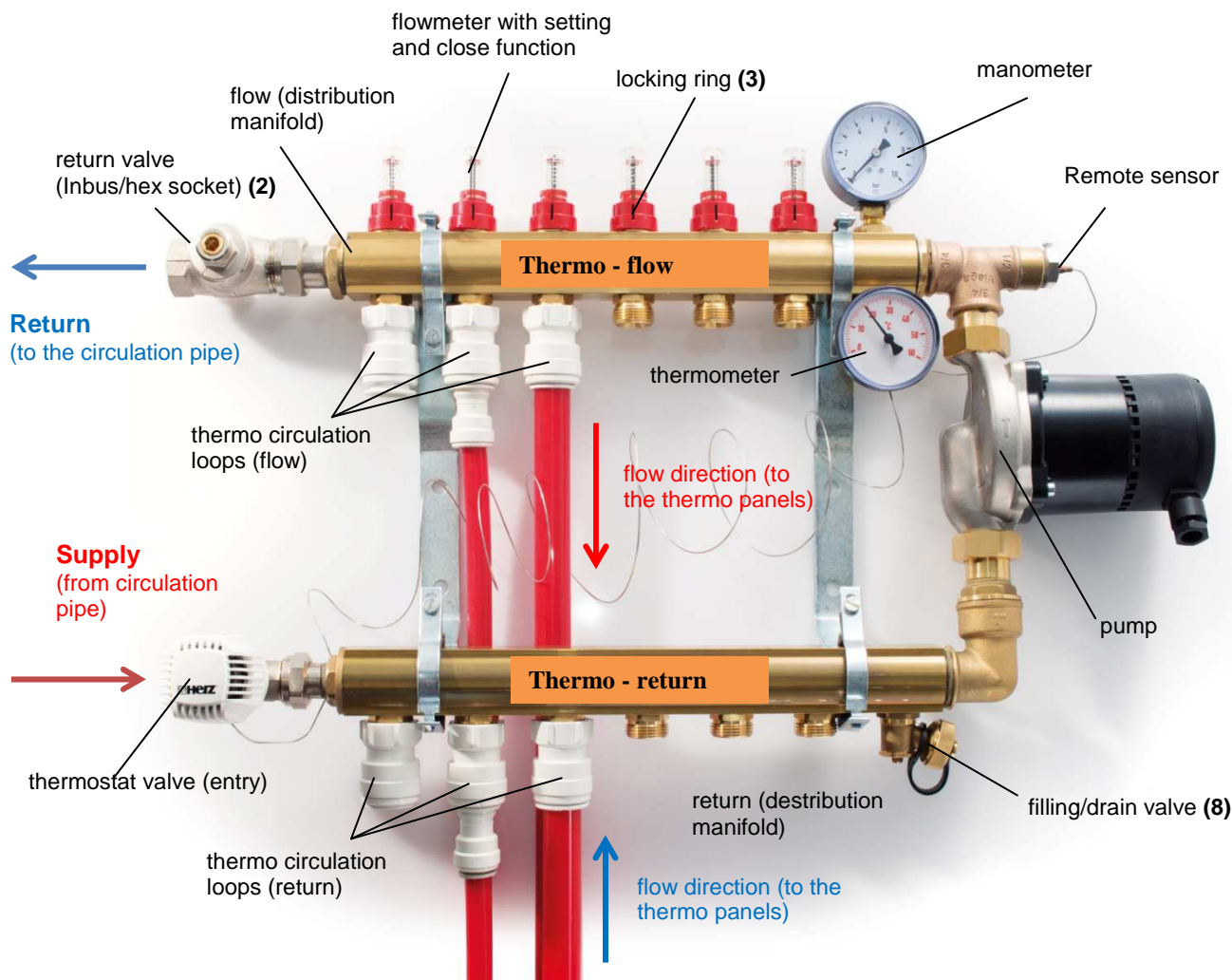


Fig.4: DoJet 6 regulation unit with energy efficiency pump (exploded view see page 17)

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. 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:

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 Plus (N) 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 m³/h

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 5 /20

**WTP 30 heat exchanger
with insulation box**

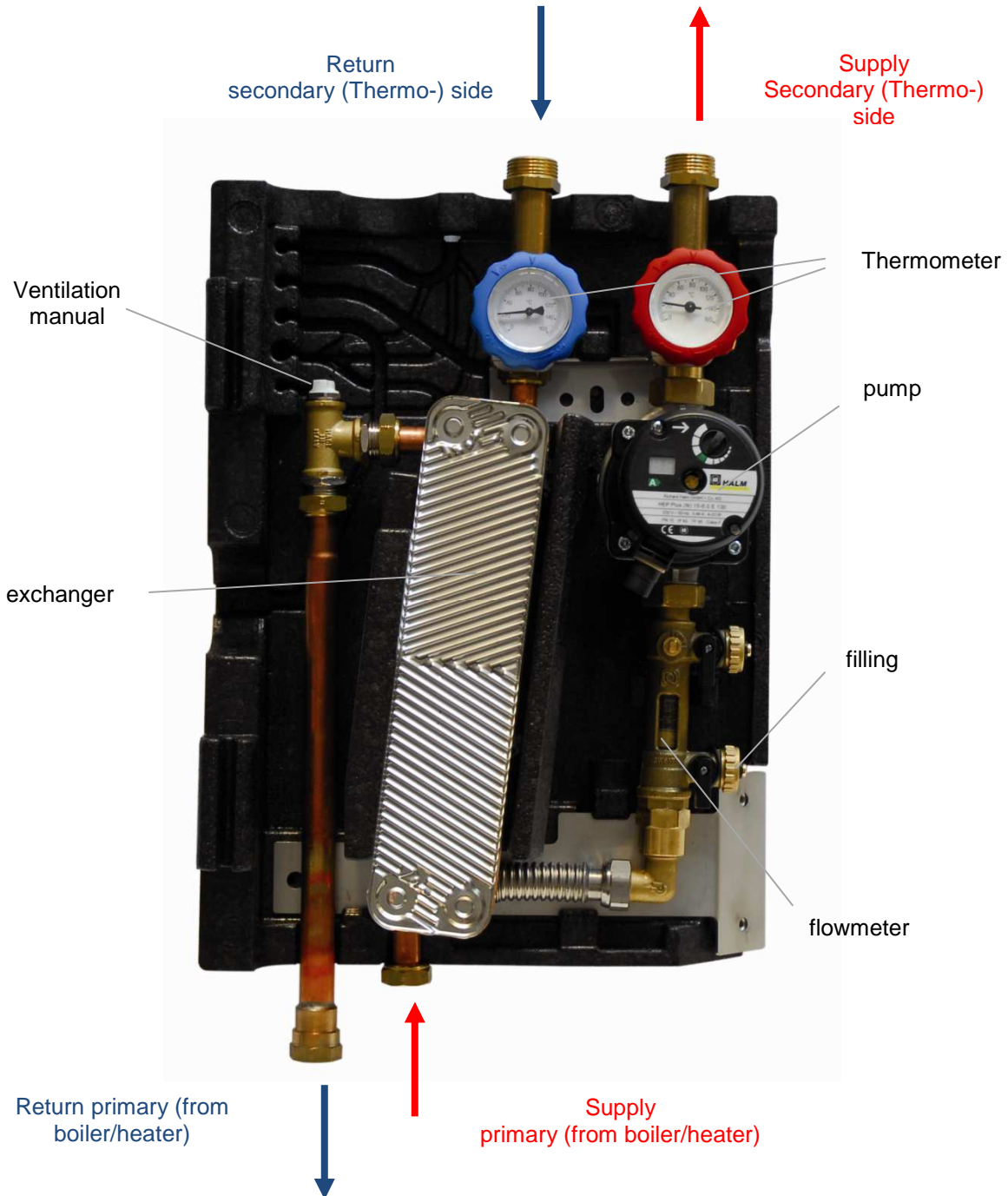


Fig. 5: heat exchanger WTP 30

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

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 6 /20

Installation Instructions General Installation Information

MIK Thermo W Heat Plates will be fully integrated in the slatted floor and seamlessly anchored on each beam (5 mm strength). The Thermo W can be combined with all MIK plastic slats and flexibly placed in the crates. Installation in an existing MIK crate is possible at any time.

The laying can be done one next to the other or one behind the other. The space to the compartment wall should be 10 cm to ensure optimal use and a hygienic surface.

Farrowing crate:

MIK recommends 3 Thermo W's per crate, giving even weaker animals sufficient space. Placement should be done in a quiet area.

Nursery:

The laying should be done in bars, an L or U shape and be surrounded with perforation in nursery crates.

Supply Unit Groups

Supply units groups can be composed as follows (fig. 6 and 7), with the Thermo W's connected together in a row:

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

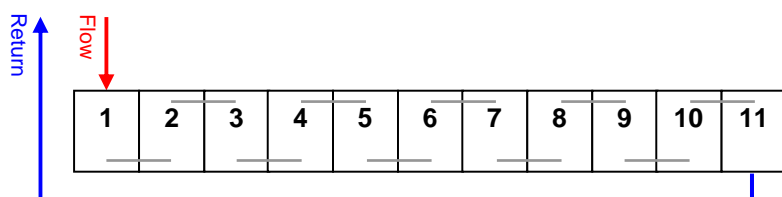


Fig. 6: Connection with max. 11 Thermo W's with 15 mm pipe

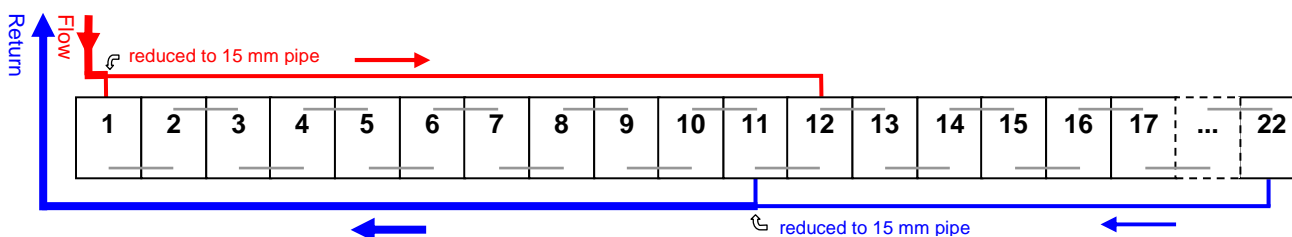


Fig. 7: Connection with max. 22 Thermo W's with reduction from 22 mm to 15 mm pipe

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 7 /20

Thermo W Connection

- The connections are made using a pipe connector system.
- No welding or gluing is necessary. None of the connections made with the connector system require tools to open.
- **Use only the MIK pipe cutters to shorten the pipes** to ensure straight, bur-free connections and a sealed installation.
- To protect the rubber gaskets, do not twist the pipes while connecting to the fittings.
- Do not use any type of lubrication while connecting the fittings or pipes -- this could impair the rubber gaskets.
- Take care that the pipe remains free of grooves.
- Do not use hemp or Teflon straps and / or tape.
- Compatibility must be taken into consideration when using chemicals. This applies especially to nitrogen dilutions and products that contain them.

Standard Piping for the Thermo W Connection

These pipe lengths are consistent for every piping system and should be prepared ahead of time:

Piping	Pipe Length
behind one another (Fig. 8)	7.8 cm (circa 3")
beside one another (Fig. 9)	37.5 cm (circa 14 3/4")
Diagonal (Fig. 10)	62.5 cm (circa 24 2/3")
shifted diagonal (Fig. 11)	67.5 cm (circa 26 5/8")

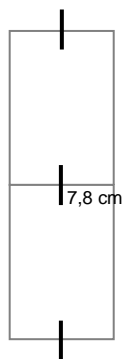


Fig. 8

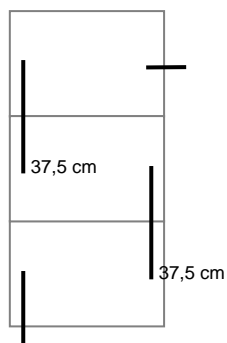


Fig. 9

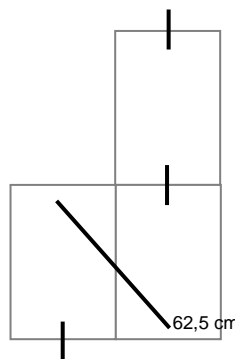


Fig. 10

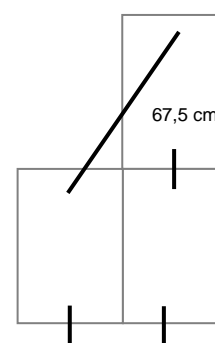


Fig. 11

Affixing the Pipes

The connection of the Thermo W's is done under the slatted floor after the Thermo W's are placed in the crates (fig. 12). The supply lines will be mounted on the wall and can also be attached below the grate using cable ties or hooks (fig 13).



Fig. 12: Thermo W connection with the connector system



Fig. 13: Canal placement

Wall and Foundation Operation

The Thermo W group supply lines are brought from the DoJet control system outside the compartment through the wall in the manure canal. To avoid damages the pipes in the wall ducts need to be protected, for example by using appropriate ductwork.

All pipelines in the compartment lead out of the compartment in the aisle area to the DoJet control system. The pipes outside the compartment leading to the DoJet should be enclosed in a protective cover.

Insulation Advice

It is crucially important to insulate all the pipelines in the aisle area to provide for optimal Thermo W heat supply. Make sure that all the pipe work up to the entrance into the compartment is correctly insulated. **Missing insulation can cause heat loss of up to 40%** (see fig. 14 and 15).



Fig. 14: Wrong - missing insulation at the supply line



Fig. 15: Correct - all the supply lines correctly insulated.

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 9 /20

Initial Operation

1.	Connect the Thermo W's to each other in circuits according to the connection plan provided by your operations partner.	
2.	Connect all valves to the DoJet control system: Flow Valve ⇒ Hexagon socket Return Valve ⇒ Exchange the thermostat knob with the shut-off cap and turn closed Flow to the Thermo W ⇒ Red thumbwheel in the upper distribution beam Return from the Thermo W ⇒ White shut-off cap on lower distribution beam	Fig. 4
3.	Mark and attach the flows and returns for each of the Thermo circuits. Do not connect the pipes with the DoJet yet.	
4.	Fill the groups individually with water from hose until the water flows bubble-free from the return (this can take a few minutes per circuit!). Check to make sure each circuit and connection system are sealed.	
5.	Shorten the pipe work pairs to the appropriate length with the pipe cutters and connect them to the DoJet.	
6.	Open the overflow valve in the loop system completely for the system's ventilation. The unencumbered circulation in the supply line enables fast ventilation.	Fig. 1
7.	Open the installed expanders in the loop system and on the WT 20.2.	
8.	Fill the system via the loop system's return. Air will escape through the expanders.	
9.	Fill the WT 20.2's expansion tank with water up to the red mark on the water level display.	Fig. 5
10.	After filling the loop system close the expanders and turn on the WT 20.2 pump.	
11.	Allow the water to circulate in the loop system. Turn off the pump from time to time (every 45 seconds), allow air to collect and ventilate.	
12.	Open the flow and return valves as well as the expander for the first DoJet in the circuit system. Water will fill the flow and return beams. Close the expander as soon as water flows out of it.	
13.	Turn on the first DoJet pump.	
14.	Turn the pump on and off repeatedly. Allow air to collect and escape through the expander.	
15.	When necessary, add water to the expansion tank or the circuit system's return filling.	
16.	Repeat steps 11 to 15 for every DoJet installed in the circuit.	

17.	The water will circulate bubble-free through the circuit system and the DoJet control system.	
18.	Now the first Thermo W circuits for the first DoJet in the circuit system will be individually put into operation: ⇒ Put the first Thermo W circuit into operation by opening the shut-off valve in the upper and lower distribution beams. ⇒ Turn off the pump every 30 seconds. Allow air to collect (in the upper distribution beam) and use the expanders. ⇒ Close the expander when the circuit runs air-free. ⇒ Repeat the steps of operation listed above with the next circuit.	
19.	Put each circuit attached to each DoJet into operation as described in Step 18.	
20.	When all the circuits have been put into operation, set the overflow valve to a minimal flow rate.	Fig. 1
21.	Exchange the shut-off cap on the DoJet return valve for the thermostat knob. The system is now ready for operation.	Fig. 4
22.	Open the circuits on the control system.	
23.	Set the flow rate volume metre using the red wheels on the pipes (below the upper distribution beam) to balance the sections of pipe. The float gauge in the flow rate volume metre should be between 6 - 8 litres (levels should match for all the circuits).	Fig. 4

Temperature Adjustment

The laying position of the litter determines the Thermo W temperature's control variable. Since the temperature needs of the litter cannot be established according to age, the lying position of the litter must be observed and the temperature adjusted as needed (Fig. 16).

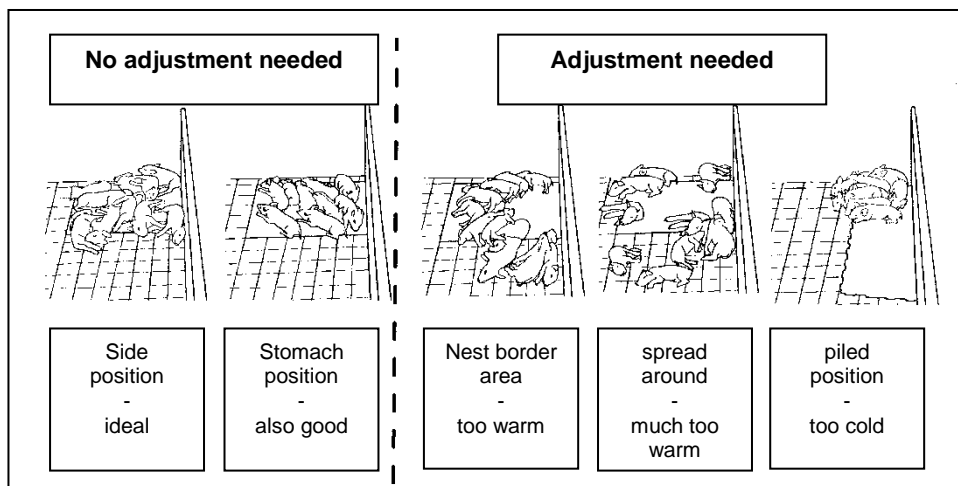


Fig. 16: Litter laying positions and adjustment requirements for various temperatures

At birth, the Thermo W surface temperature is recommended to be about 38° - 41° C (100°F - 106°F). The lying position for the litter should be either a side or stomach position. During the first one to two days an additional infrared heater should be placed above the litter nest as the animals' heat needs at this time are especially high.

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 42°C at the DoJet 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 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.
<p>Individual circuits not getting warm</p>	<ol style="list-style-type: none"> 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 circuits 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 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 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

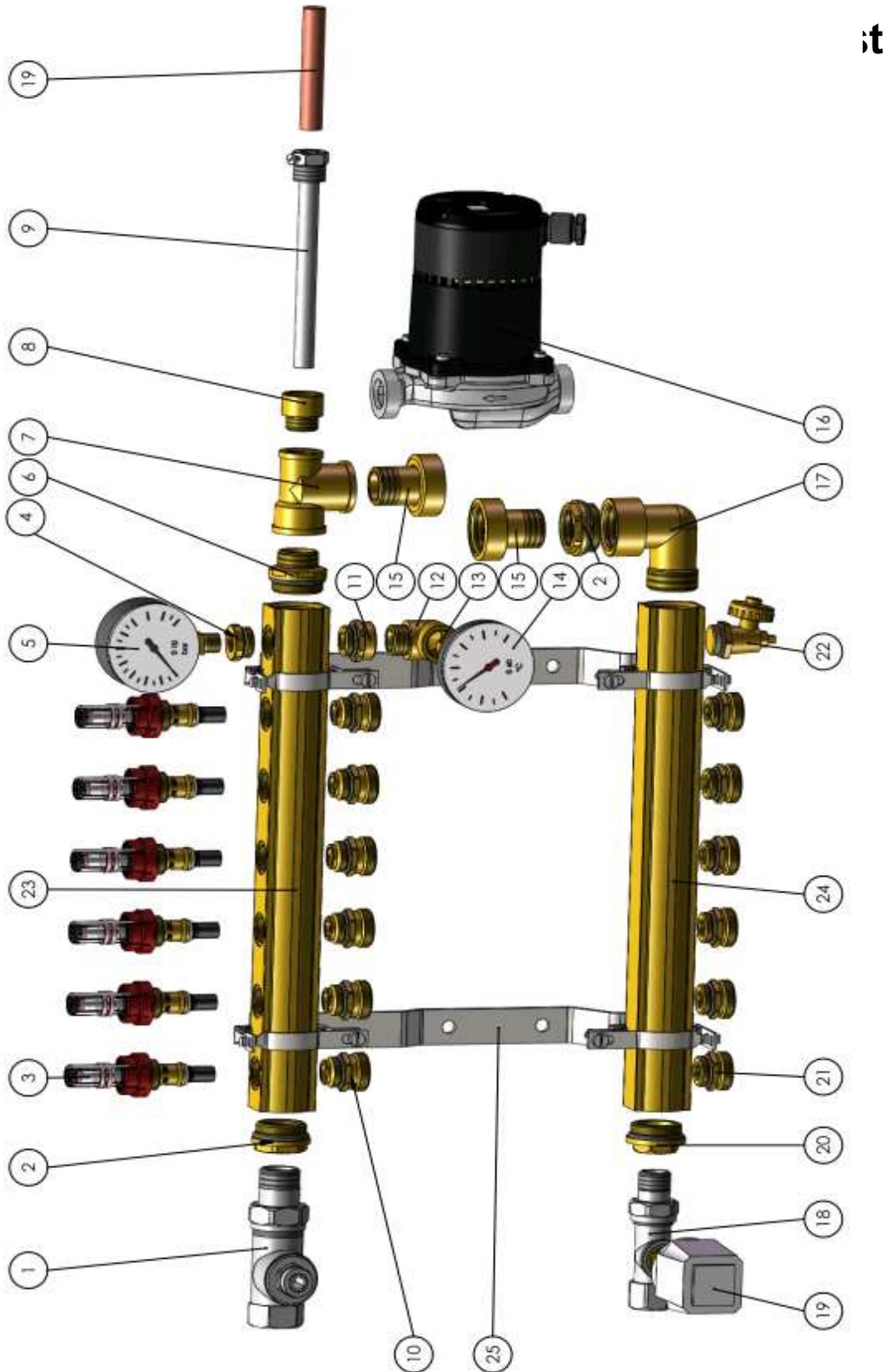
Guarantee claims can only be for the above described system. Further claims for compensation are excluded.

Our general business conditions apply and can be found at www.mik-online.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.

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 17 /20

Appendix - Exploded View DoJet 4



info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 18 /20

Abb.	Art.-Nr.	Bezeichnung
1	03600	Check valve ¾"ID x ¾"OD HERZ RL-1-E
2	03601	Reducing bush brass 1" x ¾"
3	03601	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	03607	Socket E
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"
23	---	not available
24	---	not available
25	---	not available

Comments/Notes

info@mik-online.de	Fon +49 2922 885 600	Fax +49 2922 885 670	www.mik-online.de
Erstellt 03.08.14 TE Stand 01	Q:\Technik\Anleitungen\originale\Versionen aktuell\Bedienungsanleitung Thermo W 400x600 Fertig checked engl 02 09 2014.doc		Seite 20 /20