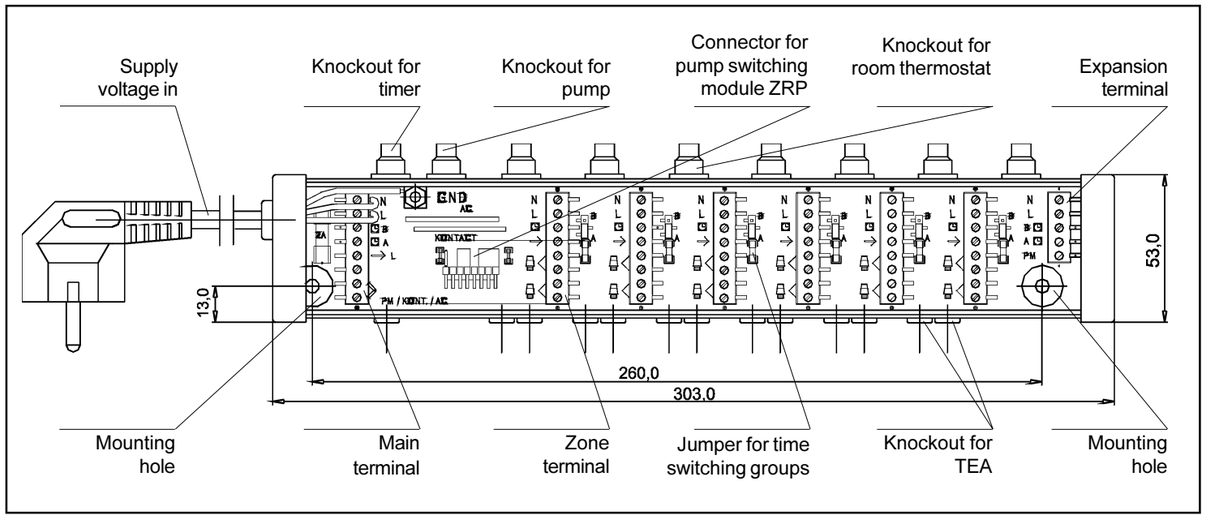
Zone wiring module ZM 12 and pump switching module ZRP



Application
The zone wiring module ZM 12 was developed for use in floor heating systems with single room controls. It is used to wire up to 12 heating loops, which are equipped with thermoelectric drives, to up to 6 room thermostats or room thermostats with timer. An additional pump switching module ZRP can be plugged into the zone wiring module to de-activate the circulator when all the zones are closed. It is both possible to switch the pump on and off with a potential free contact or to run the supply voltage for the pump from the main PC board.

If the zone wiring module is used in conjunction with a Laing MR heating control, the pump switching module ZRP is not required since the pump switching function is integrated in the control.

If more than six zones with 12 drives are necessary, several ZM 12 can be wired in series.

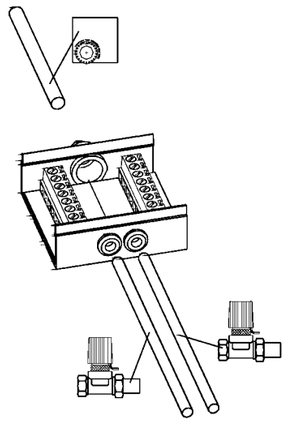
The module is suitable for 230 Volt or 24 Volt AC operation.

With the zone wiring module ZM 12, each one of the 6 zones can arbitrarily be assigned to one of two timers or room thermostats with timers. If used with the Laing control MR 10 or MR 20, the nighttime setback can be controlled directly by the timer function of the control. In this way, each zone for which this function was selected can be set to nighttime setback automatically.

Technical data
Zone wiring module ZM 12

Length	303 mm [without power cord]
Width	53 mm [without knockouts]
Height	22 mm
Supply voltage	230 or 24 Volt AC
Max Amp draw	2 A [slow]
Number of zones	6
Heating loops per zone	2 [expandable with jumper wires to a maximum of 6]
Time switching groups	2 [selected for each zone individually]
Pump switching module output	half wave with 230 or 24 Volt AC [depending on connector position]
Power cord	plug with 1 m cord
Pump switching module	[not necessary if used in conjunction with Laing MR controls]
Supply voltage	230 or 24 volt AC [depending on connector position]
Output	potential free contact or supply voltage [depending on connector position]
Max switching current	2 A inductive

Construction
The ZM 12 consists of a main PC board with all necessary connectors which is housed in a plastic enclosure. The bottom side of the plastic enclosure contains the knockouts for the thermoelectric drives and the pump switching signal, the top contains the knockouts for the room thermostats or room thermostats with timer as well as a possible additional ZM 12, a timer and the circulator.



Each zone has a hot connector **L** going to the thermostat and a connector ➜ coming from the thermostat, a neutral connector **N** for a thermostat with thermal feedback and a connector for nighttime setback of the room thermostat ◔. Furthermore, there are connectors for the wiring of two thermoelectric drives.

Additionally, each zone has a jumper through which it can be assigned to one of two time switching groups.

Important advice concerning electrical installation
Electrical installations may only be performed by properly licensed electricians. Local codes and ordinances need to be observed.

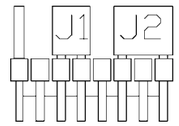
When wiring the ZM 12 the wires need to be routed carefully. The outer insulation must be stripped so that it does not protrude inside the housing. The individual leads must be shortened as necessary. The knockouts must be cut off to suit the diameter of the outer insulation.

Caution: Unplug the module before opening the enclosure.

Mounting
First remove the cover. To do so, remove the screw of the right side cover and pull off the right side cover to the right. Then, lift the cover approximately halfway and pull it to the right side until the left edge has left the left side cover. Thereafter, pull off the cover completely.

The ZM 12 is mounted with 2 screws through the appropriate holes. Ensure that the unit is mounted on a flat surface and avoid over tightening the screws.

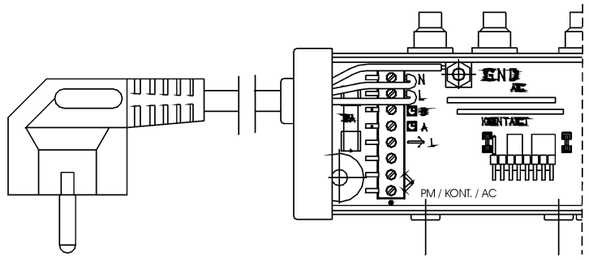
Jumper setting on connector for pump switching module
If no pump switching module ZRP is used, make sure that the two jumpers are located on the connector as shown in the picture. Without these jumpers, the ZM 12 will not operate properly.



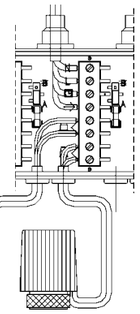
Supply voltage 230 or 24 volt AC
The zone wiring module ZM 12 can be used with 230 or 24 volt AC. The unit is supplied with a cord and plug with grounding for 230 volt AC operation. After plugging it in, 230 volts are available for the thermoelectric drives and the circulator. Naturally, in this case thermoelectric drives and room thermostats suitable for 230 volt operation must be used.

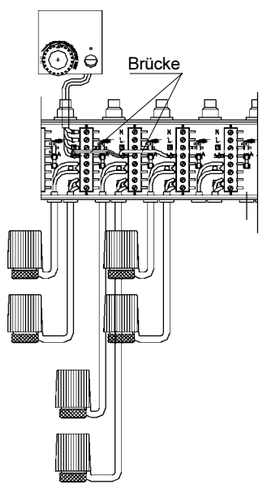
If the zone wiring module ZM 12 is to be used with 24 volt AC, cut off the plug from the supply cord and wire it to a 24 volt power supply. In choosing a power supply, make sure that it has enough capacity for all thermoelectric drives. Grounding is not required in this case.

Wiring of thermoelectric drives
Each zone has connectors for two thermoelectric drives. Wire them in accordance with the picture.



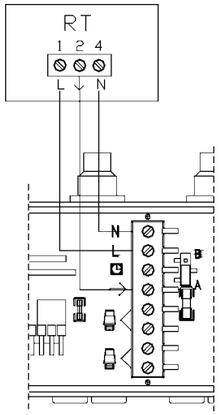
Attaching more than 2 thermoelectric drives to one zone
If more than two thermoelectric drives should be controlled by one room thermostat, several zones can be operated in parallel as shown in the picture below. Use a jumper wire between the switching connector marked -> and the same connector on an adjacent zone. Due to the limited switching capacity of room thermostats or room thermostats with timer a maximum of three zones or 6 thermoelectric drives can be connected in parallel. Make sure that only one room thermostat or room thermostat with timer is connected to such a group of zones.





If room thermostats with nighttime setback capability are used, the jumper of the zone to which the room thermostat is connected determines the time switching group to which the group of zones belongs. This time switching group is in effect for all thermoelectric drives connected to this group.

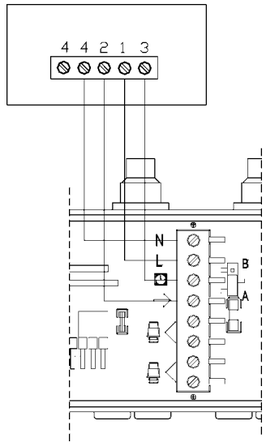
Connection of room thermostat
The Laing room thermostat **RT** is connected to the module as shown in the picture. The switching contact is wired between ➜ and **L**, **N** is used for thermal feedback. Due to the thermal feedback, the room thermostat **RT** can only be used with 230 volts AC. Use appropriate room thermostats for 24 volt operation.



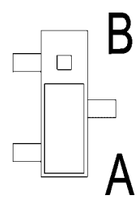
Connection of room thermostats with nighttime setback capability
The connection of the room thermostat **RTR** is done as shown in the picture. In addition to the functions of the **RT**, the **RTR** contains a nighttime setback capability, which is activated by the terminal marked ◔. If voltage is applied to this terminal, the setback function is activated and the room temperature is reduced. Caution: both the nighttime setback and the thermal feedback only operate on 230 volt AC . Use appropriate room thermostats for 24 volt operation.

The nighttime setback can be activated either by time switching group A or B. Set the jumper for time switching groups accordingly.

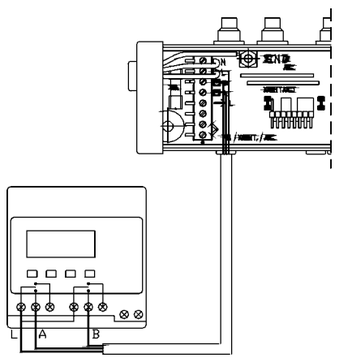
The nighttime setback can also be activated by a room thermostat with timer [not currently available from Laing], which supplies 230 volts to the terminal marked ◔ during nighttime. All zones with the same jumper position [**A** or **B**] will be controlled by this room thermostat if they have a thermostat with nighttime setback capability.



Selecting time switching group
If room thermostats with nighttime setback capability are used, each zone can be assigned to one of two time switching groups. To select, move the jumper on the right side of the zone connector into position **A** or **B**. [in position A, the jumper connects the lower pin to the middle one, in position B it connects the upper pin to the middle one]



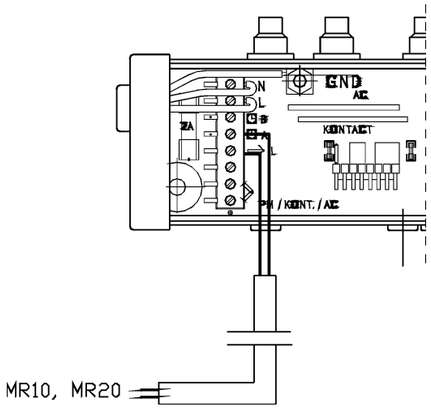
Connecting a timer to a time switching group
The nighttime setback of time switching groups **A** or **B** is activated by connecting the terminal marked ◔ or ◔ to the contact marked **L**. As long as this connection is in place, all zones with the jumper in the appropriate place are set to nighttime. The connection can be controlled by a one or two channel timer.



If the ZM 12 module is operated in conjunction with a Laing MR 10 or MR 20 control, the wiring is done according to this picture. Since these controls only have one time setting for nighttime, all zones which are to be controlled by it need to be set to time switching group **A**.

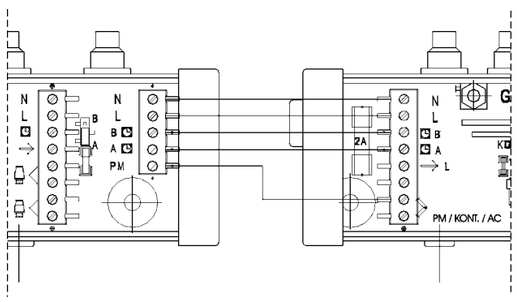
Expanding the ZM 12 by an additional six zones

If more than six zones are required, several ZM 12 can be wired in series. The connection is done as shown in the picture below, whereby the first module [shown on the left side] controls the second and all further ZM 12 modules. This means that the connections described above are done on the main connector of the first ZM 12, and, if necessary, a pump switching module ZRP is installed in the first ZM 12. The circulator and other controls are also connected to the first ZM 12. Subsequent ZM 12 modules are wired as shown, for which the power cord needs to be removed. If no time switching groups are to be used, the connections between the terminals A and B are not necessary.



Pump switching with Laing MR 10 or MR 20 control

If the ZM 12 module is used in conjunction with a Laing MR 10 or MR 20 control, the pump is connected to the MR 10 or MR 20 directly. The pump is shut down whenever the half wave signal of the ZM 12 is dropped because all zones are closed. No pump switching module



ZRP is necessary in this case.

Pump switching module ZRP

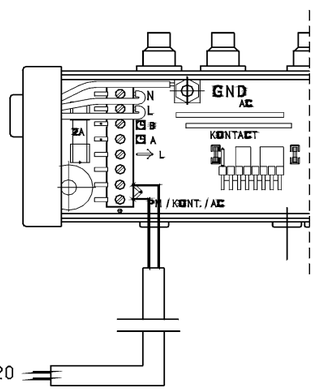
The pump switching module ZRP is offered as an accessory to the ZM 12 module and is placed on the appropriate connector after the jumpers on the connector have been removed. The pump switching module can be placed on the connector in four different ways to differentiate between 230 and 24 volt AC operation and between potential free contact and pump supply voltage. It is very important to install the module in accordance with the configuration selected to avoid damage to the ZRP or unwanted voltage on the switching contacts.

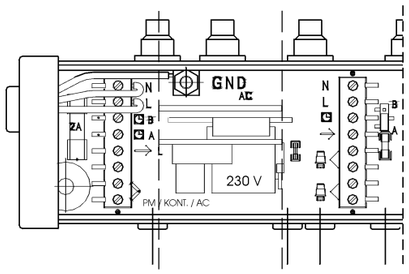
If the pump switching module ZRP is placed on the connector in the left position [the PC board of the ZRP matches the bar marked "AC" on the main PC board], the ZRP supplies voltage to the pump directly.

If the pump switching module ZRP is placed on the connector in the right position [the PC board of the than ZRP matches the bar marked „contact" on the main PC board], the contacts for the circulator are closed on demand, the output is a potential free contact.

When using 24 volt AC, place the ZRP on the connector with the „ 24 volt" marking visible, i.e. facing away from the main PC board.

When using 230 volt AC, place the ZRP on the connector with the „230 volt" marking visible, i.e. facing away from the main PC board.





Pump switching module ZRP for 230 volt AC supply voltage and direct power supply to the pump

Switching a circulator with the pump switching module ZRP supplying voltage

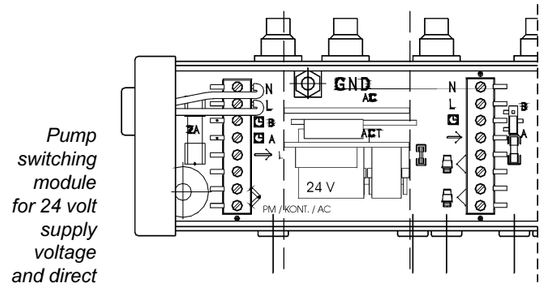
Place the ZRP module on the connector in the left position, as described above, and make sure that the marking which is visible on the ZRP shows the appropriate voltage.

The correct placement of the ZRP module in accordance with the voltage and operating mode selected is extremely important and has to be done carefully.

Thereafter, the pump can be wired directly to the pump contacts, with grounding to GND. No separate terminal box is required and the wiring is reduced to a minimum.

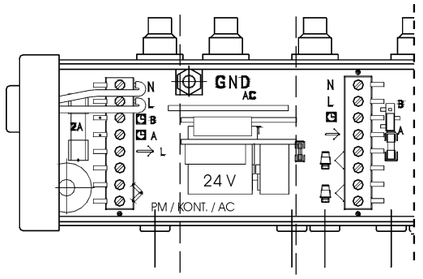
The pump now will be shut down whenever all zones of the ZM 12 and all zones of possible additional ZM 12's are closed. Whenever the first zone reopens, the circulator will start up again.

When using 24 volt AC power supply, keep in mind that the ZRP will only supply this voltage to the pump contacts. Under normal circumstances, when using 24 volt AC the ZRP will be installed in contact mode.

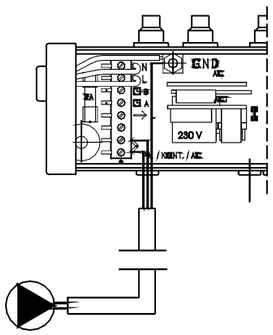


Pump switching module for 24 volt supply voltage and direct power supply to the pump

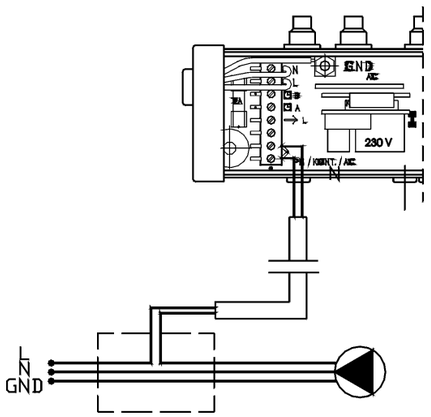
ZRP AC



Pump switching module ZRP for 24 volt AC supply voltage in contact mode



of the pump with direct power supply



Connecting the pump in contact mode

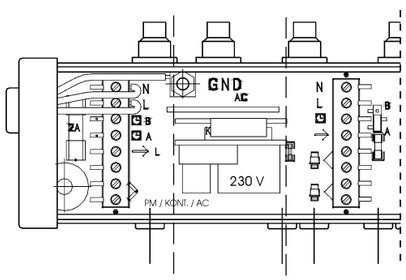
Switching a circulator with the pump switching module ZRP in contact mode

Place the ZRP module on the connector in the right position, as described above, and make sure that the marking which is visible on the ZRP shows the appropriate voltage.

The correct placement of the ZRP module in accordance with the voltage and operating mode selected is extremely important and has to be done carefully.

The contact now will be opened whenever all zones of the ZM 12 and all zones of possible additional ZM 12's are closed. Whenever the first zone reopens, the contact will close again.

The contact has a rating of 230 volts and 2 A max. Therefore it is possible to switch a circulator on and off using this contact.



Pump switching module ZRP for 230 volt AC supply voltage in contact mode

Fuses

To protect the devices connected to the zone wiring module, a 2 A fuse is mounted on the PC board. Ensure that the total current of all devices including the circulator, if direct power supply is used, does not exceed the 2 A. If necessary, the fuse can be replaced with a fuse with 4 A rating.

Protection against voltage spikes

To protect against voltage spikes, the ZM 12 is equipped with a varistor, which will reliably absorb voltage spikes which otherwise could harm the thermoelectric drives.

Startup

Before starting up the ZM 12, confirm that all wires are attached properly and securely. When using the pump switching module ZRP, verify that the visible marking on the ZRP shows the correct operating voltage and that the operating mode is selected correctly.

Thereafter, the supply voltage can be applied and the function can be verified by operating the room thermostats.

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