

# LK Wired Room Control NO

## DESIGN

LK Wired Room Control NO is used where normally open (NO) actuators are preferred. A set is LK Connection Box NO, LK Room Thermostat NO and LK Actuator NO.

Room thermostats control the temperature in each zone (e.g. room) via a signal through the wire connection to the LK Connection Box NO positioned next to the manifold. The manifold actuators are signalled via the connection box.

## SETTINGS/REQUIREMENTS

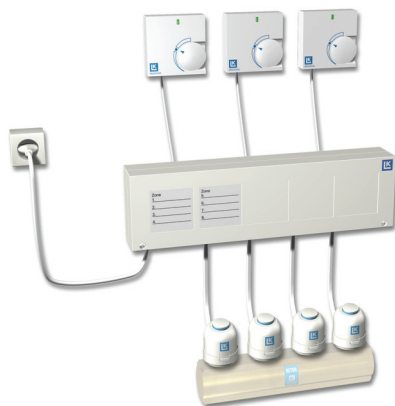
All distribution flows must be adjusted according to the installation guide for the unit. The heat settings for the control unit are regulated according to the requirements of the heat system and the climate zone. A control zone consists of 1 LK Room Thermostat NO that can control one or more under floor heating areas each equipped with an actuator. A maximum of 5 LK Actuators NO can be connected to 1 LK Room Thermostat NO.

## LK CONNECTION BOX NO, 230/24 V AC



*LK Connection Box NO.*

The LK Connection Box NO comes equipped with an integrated 230/24 V AC transformer. The box is used for connecting and powering the LK Room Thermostat NO and LK Actuator NO. The box should be situated close to the manifold to avoid extending the actuator cables. A maximum of 8 LK Room Thermostats NO may be connected to the box and up to 5 LK Actuators NO to each control zone, however the overall total number of actuators per box must not exceed 12. Mark the zones that control the rooms on the unit. This can be done most conveniently on the attached labels. Each control zone is equipped with an LED that indicates when the room thermostat requests heat.



*LK Trådförbunden Rumsreglering NO.*

### Valve exercise program

The connection box has a program to automatically operate the actuators (and manifold valves) daily to prevent seizure.

### Pump connection

The connection box is equipped with an integrated pump relay. The circulation pump stops when all actuators are closed.

The pump restarts when any thermostat calls for heat. There will be a slight delay with starting and stopping. The valve exercise program will also activate the pump.

### Remote switching

The LK Control is a complete unit for outdoor temperature dependent flow temperature control and adapted for LK's shunt programs. If LK Control is used then the volt free pump relay of LK Connection box can be connected to LK Control, connections M and H1. By connecting LK Connection box to the LK Control, gives the function that when all actuators on the manifold is closed, LK Control will close its Control valve (Shunt valve) and stop the pump. LK Control will re open the control valve and restarts the pump when one or several actuators on the manifold open. For more information see assembly instruction for LK Control.

## LK ACTUATOR NO, 24 V AC

LK Actuator NO opens when power is cut. A "status" indicator is located on top of the actuator. When the indicator is "up" the valve is open. The actuators are wired to "actuator terminals" of the corresponding control zone in the control box. Terminals are marked with a symbol for actuators.

The LK Connection Box NO is fitted with two different sized terminals for actuators. The lower terminals are marked zone 5-8, these are intended for zones with one or two (max.) actuators. The upper terminals are marked zone 1-4 and have larger terminals to take up to four actuators per terminal. A total of five LK Actuators NO may be connected to each terminal with the aid of external connector.



*LK Actuator NO.*

## LK ROOM THERMOSTAT NO, 24 V AC

The LK Room Thermostat NO should be installed indoors 1.5 m above floor level. Avoid installation where its function might be affected (e.g. direct sunlight, vents etc.). Lit LED indicates that the room thermostat is requesting heat. Wiring between the LK Room Thermostat NO and the LK Connection Box NO should be carried out using a cable such as a signal cable EKKX 4 x 0.5 mm<sup>2</sup> in which case one wire remains unused. The signal cable is connected to terminals 1, 2 and 4 on the room thermostat and to terminals 1, 2 and 4 in the connection box.



*LK Room Thermostat NO white and LK Room Thermostat Dti NO silver grey.*

When installing in a public area, a room thermostat with a concealed temperature dial may be used namely the LK Room Thermostat Dti. The temperature dial is then placed inside the thermostat cover.

Both LK Room Thermostat NO and LK Room Thermostat Dti NO are available in the colours polar white and silver grey.

### Options

An LK Remote Sensor is used when regulating the floor temperature. The sensor is placed in the floor (refer to special instructions attached to the room thermostat).

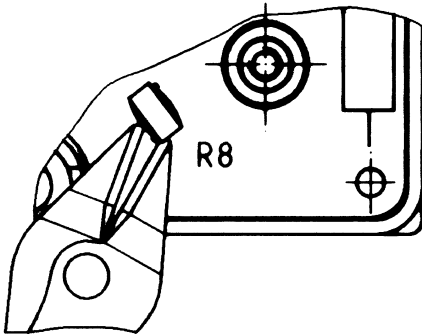
An LK Protection Cover protects against external damage to the LK Room Thermostat NO. The cover is made of transparent Plexiglas.

### LK External Temperature Sensor

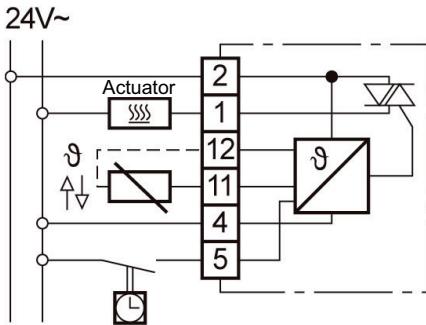
LK External Sensor is intended for usage with LK Room Thermostat NO or LK Room Thermostat Dti NO when the floor temperature is to be adjusted.

Connect the sensor as follows:

1. Remove the internal temperature sensor, as per the figure below:



2. Connect an external temperature sensor to terminal 11 and 12 (refer to circuit diagram).



3. The supplied cable can be extended to the max. cable length of approx. 50 metres. Use at least the same cable area as the sensors when laying.

4. Avoid laying parallel (on cable runs) with power wiring.

The external sensor is placed as instructed below:

#### Embedding in concrete

Place the sensor in a conduit approx. 2 meters into the room before embedding in concrete. Take into consideration that the placement is at a representative point for the area that is going to be adjusted. The end of the sensor is to be placed between two floor heating pipes. Seal the end of the conduit with tape or similar to prevent concrete from getting into the conduit. Try to place the conduit as high as possible since this gives a more optimal adjustment of the floor surface temperature. The external sensor is slipped into the conduit before pouring the concrete and is connected to the room thermostat as instructed above.

#### LK Wood 22, LK XPS or LK Silencio

Mill a slot on the upper side of the board. Place a conduit in the slot, end the conduit right between two heat distribution plates. Take into consideration that the placement is at a representative point for the area that is going to be adjusted. The external sensor is slipped into the conduit before laying the floor and is connected to the room thermostat as instructed above.

#### Floor heating in secondary spaced boarding

Place a conduit right between two heat distribution plates, attach the conduit on the edge of the secondary spaced boarding using a clip for conduits. Take into consideration that the placement is at a representative point for the area that is going to be adjusted. The external sensor is slipped into the conduit before laying the floor and is connected to the room thermostat as instructed above.

#### LK EPS 16

Place a conduit along the long sides of the floor heating installation facing the nearest short end. Saw an approx. 2 meters long slot in the EPS-board and place the conduit in the slot. Take into consideration that the placement is at a representative point for the area that is going to be adjusted. The external sensor is slipped into the conduit before laying the floor and is connected to the room thermostat as instructed above.

### LK Clip Rail 12

Place a conduit along the long sides of the floor heating installation facing the nearest short end. Place the conduit at the short end between two heating pipes and end it approx. 2 meters in. Seal the end of the conduit with tape or similar to prevent concrete from getting into the conduit. The external sensor is slipped into the conduit before pouring the concrete and is connected to the room thermostat as instructed above.

### FUNCTION CONTROL TEST

Once installation is complete a function control test should be carried out.

1. Turn all the thermostats on fully and ensure that all LEDs are lit up on the thermostats and the box. Wait for approx 6 minutes and ensure that the status indicator for the actuators is in its highest position.
2. Turn down all the thermostats to minimum, all the LEDs should be switched off and all the actuators should be closed after approx 6 minutes.

### TROUBLESHOOTING, ROOM CONTROL

#### Connection box

The LED should light up when the thermostat is turned on fully. If the LED does not light up ensure that there is a mains connection and that the fuse for the box is intact.

#### Room thermostat

The LED is lit up when the room thermostat is requesting heat. Ensure that all wires are properly connected. When the room thermostat is turned to min. there should be a 24 V voltage between terminal 1 and 4.

#### Actuator

The top of the actuator is equipped with a status indicator that indicates whether the actuator is open or closed. When the status indicator is at the top the actuator is open and vice versa. Actuation time approx 6 minutes.

### Valve

When the actuator has been disconnected the valve function can be controlled by pressing the spring loaded valve spindle.

### TECHNICAL DATA

#### LK Connection Box NO

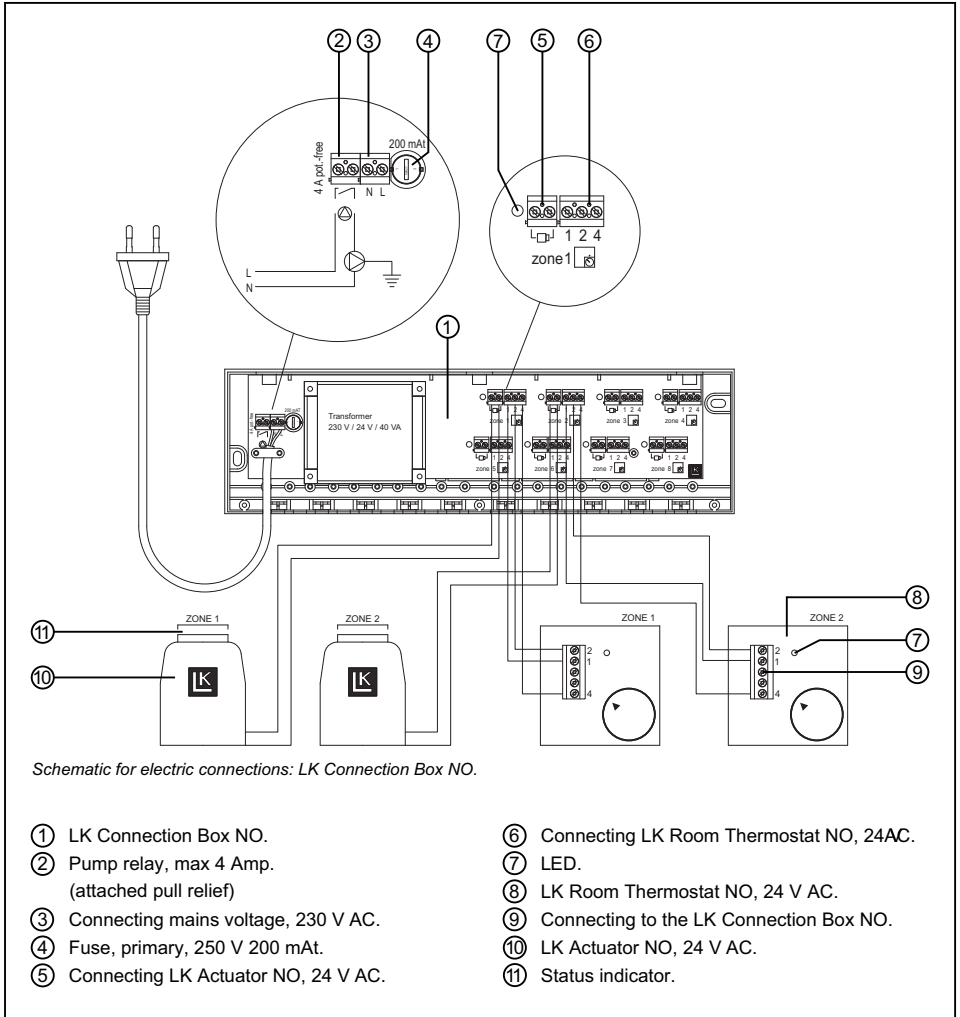
Article no.	241 81 17
Sizes	350 x 100 x 60 mm
Primary voltage	230 V
Secondary voltage	24 V
Power supply unit capacity	40 VA
Cable protection class	IP 20
Protection class	2
Primary fuse	200 mAt according to IEC 127-2/V
Pump relay	4 Amp
Max number of actuators / connection box	12
Max number of actuators / terminals	5
Max number of thermostats / connection box	8

#### LK Actuator NO

Article no.	241 75 91
Sizes	44 x 47 x 53 mm
Voltage	24 V
Rated output	2,0 W
Cable protection class	IP 54
Ambient temperature	0-60 grader

#### LK Room Thermostat NO

LK Room Thermostat NO, white	Article no 241 74 27
LK Room Thermostat NO, silver grey	Article no 241 82 47
LK Room Thermostat Dti NO, white	Article no 241 74 26
LK Room Thermostat Dti NO, silver grey	Article no 241 82 49
Sizes	75 x 75 x 27 mm
Voltage	24 V
Max number of actuators / thermostats	5
Temperature range	5-30 degrees
Cable protection class	IP 30



### SAMPLE CONNECTIONS FOR A ZONE

- Terminal 1 (9) on the room thermostat is connected to terminal 1 (6) on the connection box.
- Terminal 2 (9) on the room thermostat is connected to terminal 2 (6) on the connection box.
- Terminal 4 (9) on the room thermostat is connected to terminal 4 (6) on the connection box.
- The actuator is connected to the terminals on the connection box marked with "actuator symbol" (5).