



LK Room Temperature Control Arc

Assembly instructions

The assembly instructions cover all products that form part of the LK Room Temperature Control Arc system.



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DESIGN

LK's underfloor heating system can be supplemented with LK Room Temperature Control Arc. The system is part of LINK by LK, which includes LK System's connected products.

FUNCTION

LK ArcHub is used for controlling up to 12 underfloor heating circuits via an LK Actuator 24V. LK ArcHub has 12 screw-free terminals for connecting a maximum of 12 actuators. There are also 4 screw-free terminals for wired 24VDC and BUS communication (support for parallel and serial cabling).

Communication is via either wired or wireless signal transfer from a room thermostat or sensor to a central unit. LK ArcHub controls the temperature in various zones by opening or closing the actuators. The purpose of a room thermostat and sensor is to counter the effects of external factors, such as a change of weather, lighting, sunlight and the number of people in a room. To ensure optimum function, the room thermostat and sensor should be placed on an interior wall about 1.5 metres above the floor. Avoid places that may affect room thermostat and sensor function, such as direct sunlight or the effects of ventilation.

LK ArcHub is fitted with a built-in gateway and connected by a network cable (not included) to a router or wireless network via the property's 2.4 GHz WiFi. For wireless network connection, add an LK ArcTenna OnWall or LK ArcTenna InWall. LK Systems AB is not responsible for the wireless network in the property or support for router settings or WiFi communication. LK Room Temperature Control Arc supports automatic software updating (OTA) when connected to the internet.

Room thermostat LK ArcTune and temperature sensor LK ArcSense can be connected to LK ArcHub in three different ways:

1. Wired connection for all room sensors, e.g. in series or individually to LK ArcHub.
2. Mixed wired and wireless connection. For wireless communication, wireless room sensors are connected either to a wired room sensor or directly to an LK ArcHub (requires the addition of an LK ArcTenna InWall or LK ArcTenna OnWall).
3. Only wireless connection via Bluetooth requires an LK ArcHub supplemented by an LK ArcTenna InWall or LK ArcTenna OnWall.

LK ArcTune and LK ArcSense can be supplemented by LK ArcFrame and LK ArcByWire for wired communication or LK ArcBatteries for wireless communication.



Risk of chemical burns! Do not place button cell batteries in your mouth!

LK ArcTune and LK ArcSense may contain two button cell batteries.

If the button cell batteries are swallowed, they can cause serious internal burns in just 2 hours and can lead to death. Store both new and used button cell batteries in a safe place out of the reach of children and pets. If the battery compartment cannot be closed properly, stop using the product and store it in a safe place. If button cell batteries may have been swallowed or placed inside any part of the body, seek immediate medical help.



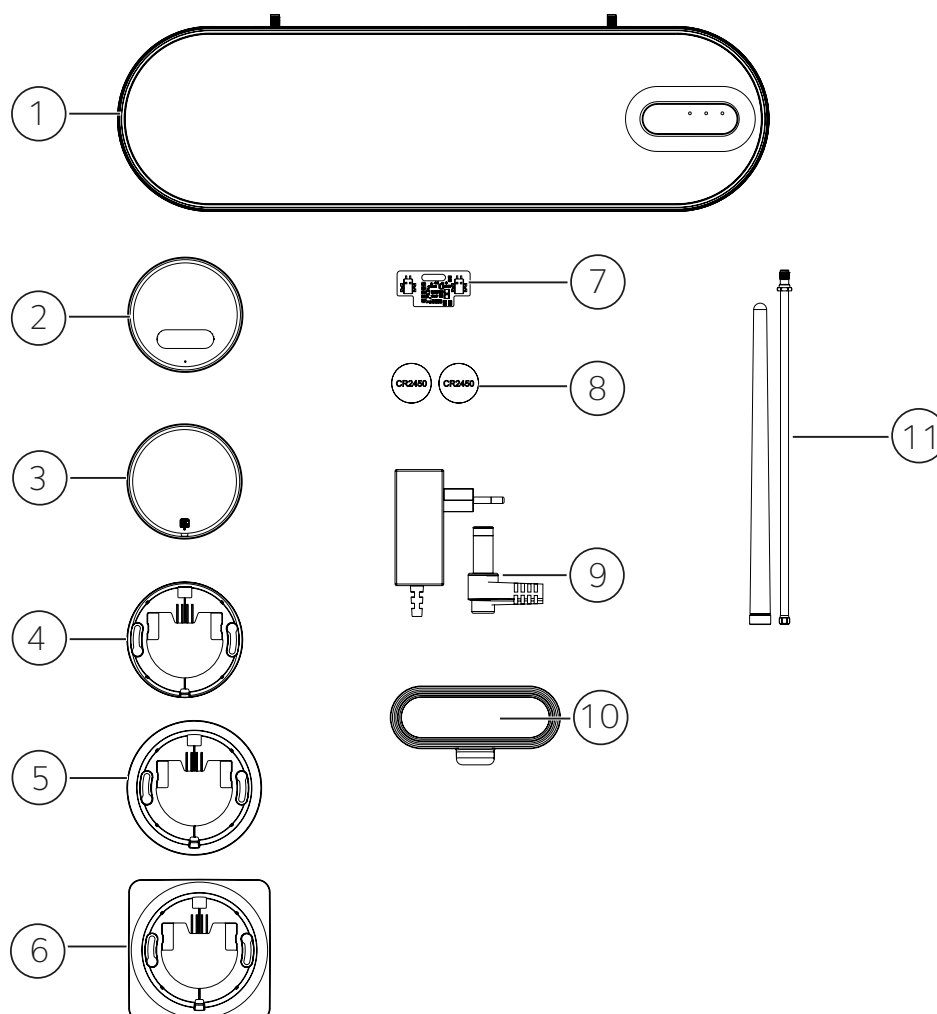
Risk of unintended charging of button cell batteries!

Remove the button cell batteries from LK ArcTune/LK ArcSense before installing LK ArcByWire.

Otherwise LK ArcByWire may cause unintended charging of the button cell batteries.

Store the button cell batteries in a safe place out of the reach of children and pets.

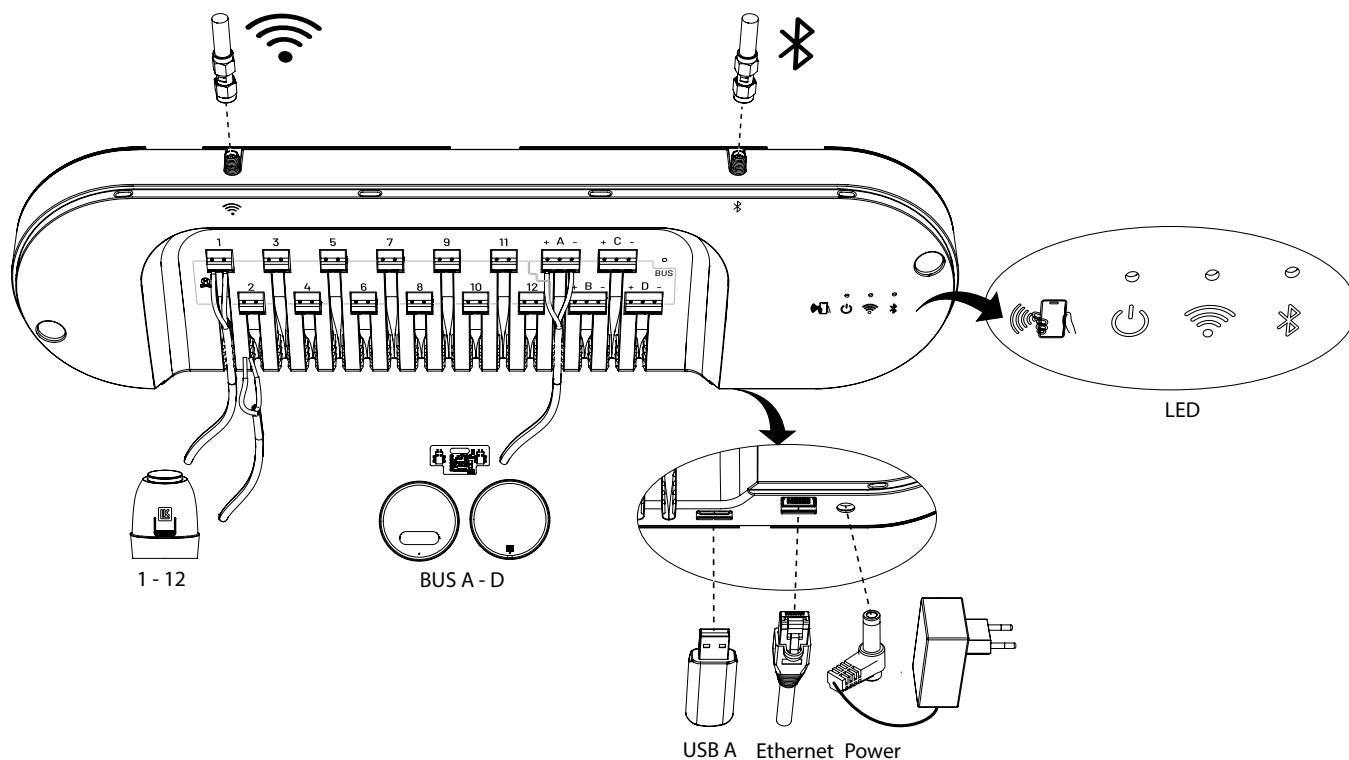
OVERVIEW DIAGRAM – LK ROOM TEMPERATURE CONTROL ARC INCLUDES THE FOLLOWING PRODUCTS



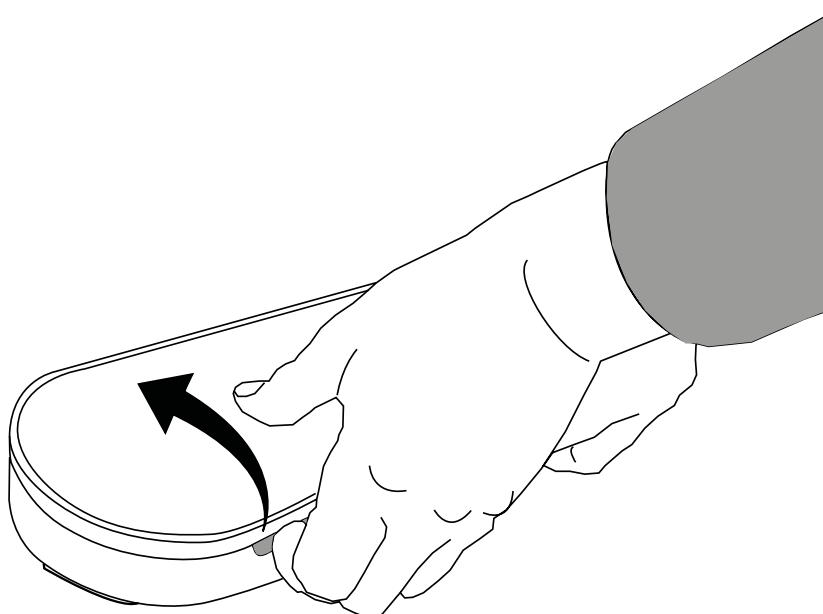
1. LK ArcHub. Central unit for up to 12 actuators.
2. LK ArcTune, thermostat with touch buttons for adjusting desired values. Support for wired or wireless communication (supplemented with LK ArcByWire and LK ArcBatteries).
3. LK ArcSense, temperature sensor for automatic or app-controlled adjustment of desired values.
4. LK ArcFrame, Neat. A discrete wall bracket with a narrow edge.
5. LK ArcFrame, Round. Designed to cover one electrical box.
6. LK ArcFrame, Square. Designed to cover one electrical box.
7. LK ArcByWire. Wired communication board with screw-free terminals for communication with LK ArcHub and for connection to LK ArcByWire (serial/parallel connection).
8. LK ArcBatteries, 2 x CR2450 lithium batteries.
9. Power adapter for LK ArcHub.
10. LK ArcTenna OnWall, compatible with WiFi 2.4 GHz and Bluetooth.
11. LK ArcTenna InWall, compatible with WiFi 2.4 GHz and Bluetooth.



OVERVIEW DIAGRAM – LK ARCHUB



REMOVING THE COVER FROM LK ARCHUB



PREPARATIONS PRIOR TO INSTALLATION

Regulation control panel, circuit flows and the system's documentation

- All the circuit flows must be adjusted in accordance with the system's documentation.
- The regulation control panel's heat curve can be adjusted in line with the requirements of the heating system and climate zone.
- A control zone consists of one room sensor that can control one or more underfloor heating circuits via actuators.
- Once the thermostats have been set up in the rooms, avoid direct impact from other sources, such as sunlight, lighting, ventilation, etc.

Connection

LK Room Temperature Control Arc has both offline and online functionality.

Offline

Connection to the internet during installation is required to use the system in offline mode for configuration and automatic registration with LK Systems. This can be done using the MyLK app. The central unit will then act completely independently without being connected to the internet and serves all underfloor heating control locally.

Online

The central unit must be connected to the internet for configuration and automatic registration with LK Systems. This can be done using the MyLK app. The central unit will then act completely independently and manage all underfloor heating control locally. The user can monitor and adjust the room comfort level remotely using the MyLK app.

The system will be updated to the latest version of the software automatically.

The following are needed to install LK Room Temperature Control Arc:

- The MyLK app – download and install it from an app store. The MyLK app is free to download.
- A smartphone with NFC function. Check whether your smartphone has NFC function in the phone's settings. The exact location of the NFC function may vary depending on the model and version. See the manual that accompanies your smartphone. Activate the NFC function before installing LK Room Temperature Control Arc.
- Internet connection.

Connection to the internet is possible in three different ways:

1. Wired connection requires an ethernet cable and a router with an internet connection.
2. Property WiFi, 2.4GHz WiFi with good coverage and LK ArcHub installed.
3. Internet sharing via mobile network (operator and mobile network, e.g. 4G). Check that internet sharing 2.4GHz for WiFi is available. How to activate the function varies depending on the model and version of your smartphone. See the manual for your model to find the right setting.
4. The password for the Wi-Fi must not contain any special characters or any special scandinavian (or other) letters like, å ,ä , ö.



If there is no internet access in the installation location

Smartphones have a function for WiFi sharing that is often called *mobile hotspot**. This can be used to grant LK ArcHub access to the internet during the installation process. Activate the function on the smartphone. The function may be found under different settings, depending on the model and version. See the manual for the model.

** Hotspot is a place with public WLAN coverage. Go to the smart phone's mobile-hotspot-connection settings to connect to the internet. The smart phone can then act as a router for other devices with Wi-Fi functionality, e.g. LK ArcHub, which must be connected.*

The MyLK app



MyLK app.



QR code for the MyLK app.

NOT INCLUDED IN THE DELIVERY

- BUS cable
- Ethernet cable
- Screws for LK ArcFrame



POSITION OF LK ARCHUB IN THE MANIFOLD CABINET IN RELATION TO LK ARCTENNA

NOTE!

Consider the placement of the ArcHub, the placement of the antennas, and the length of the antenna cables.

A. Concrete, wall studs, or insulation prevent installation in the wall cavity. Install the LK ArcTenna OnWall on the surface of the wall. The LK ArcHub must be positioned so that the antenna cable can be attached to the antenna connectors on the top of the LK ArcHub. The antenna cables are 270 mm long.

B. The inner wall must have a cavity for the installation of the LK ArcTenna InWall. The cavity must be at least 200 mm high to accommodate the antennas, preferably more.

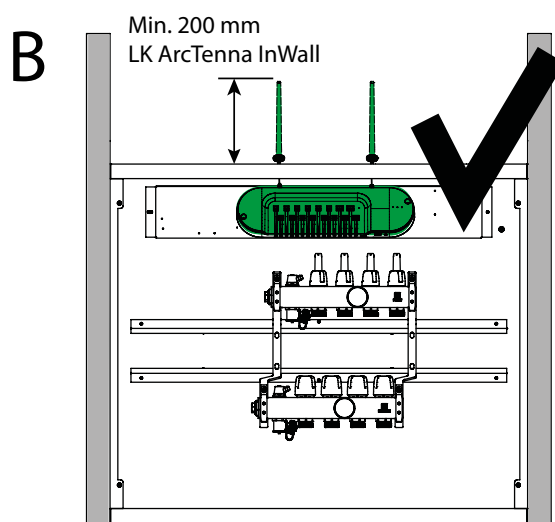
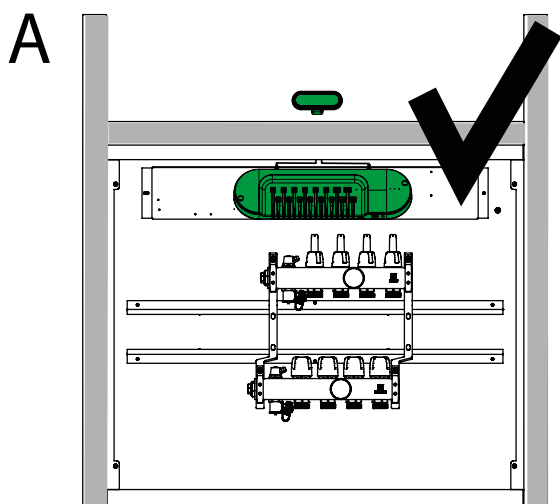


NOTE!

LK ArcHub's position can be adjusted to the right or left if the cabinet is less than 1050 cm wide. Drill a hole in the panel where LK ArcHub is to be placed. Take into account the position of the electrical socket in the manifold cabinet.

EXCEPTION!

In a manifold cabinet with a width of 1050 cm, the cable length of LK ArcTenna limits where LK ArcHub can be placed. Take into account the position of the electrical socket in the manifold cabinet.

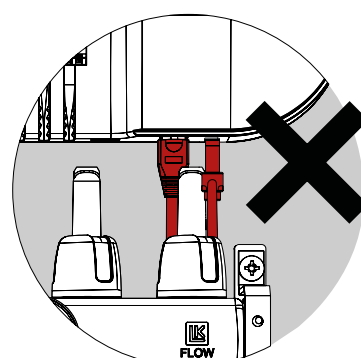
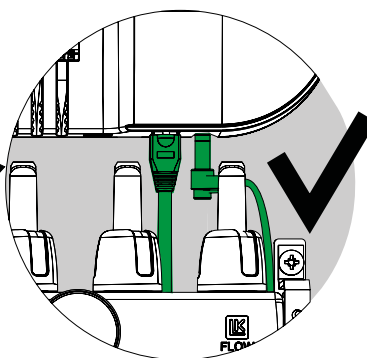
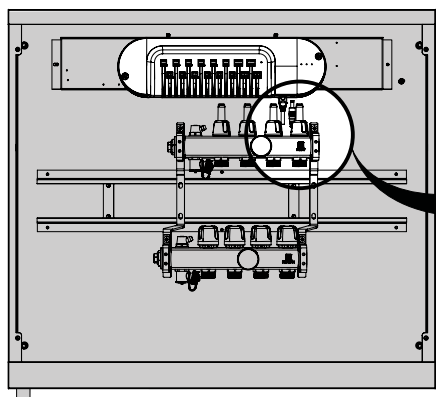


POSITION OF LK ARCHUB IN RELATION TO THE FLOW INDICATORS



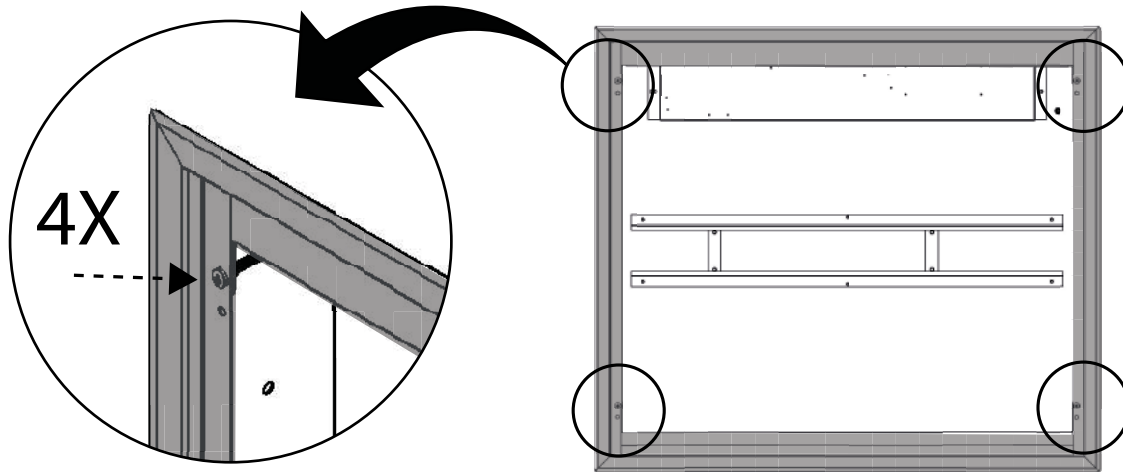
NOTE!

LK ArcHub's position needs adjusting so that the ethernet cable and power cable for LK ArcHub are not crushed by the flow indicators on the manifold's upper feed. The ethernet cable is only used for wired installation.

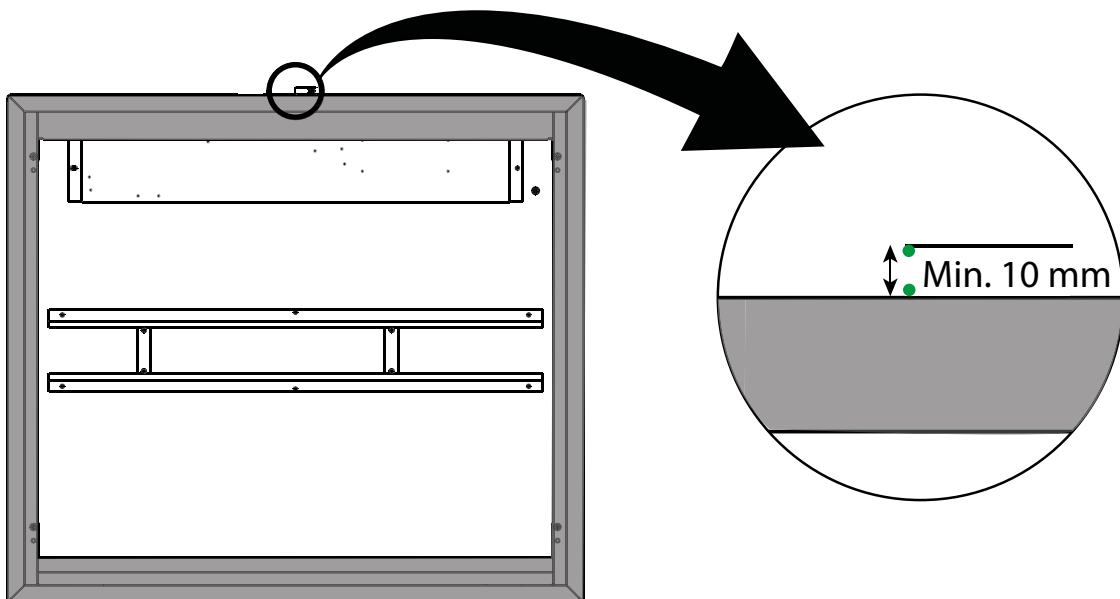


INSTALLATION – LK FRAME INB AND LK ARCTENNA ONWALL ON PLASTER, CONCRETE, TILES

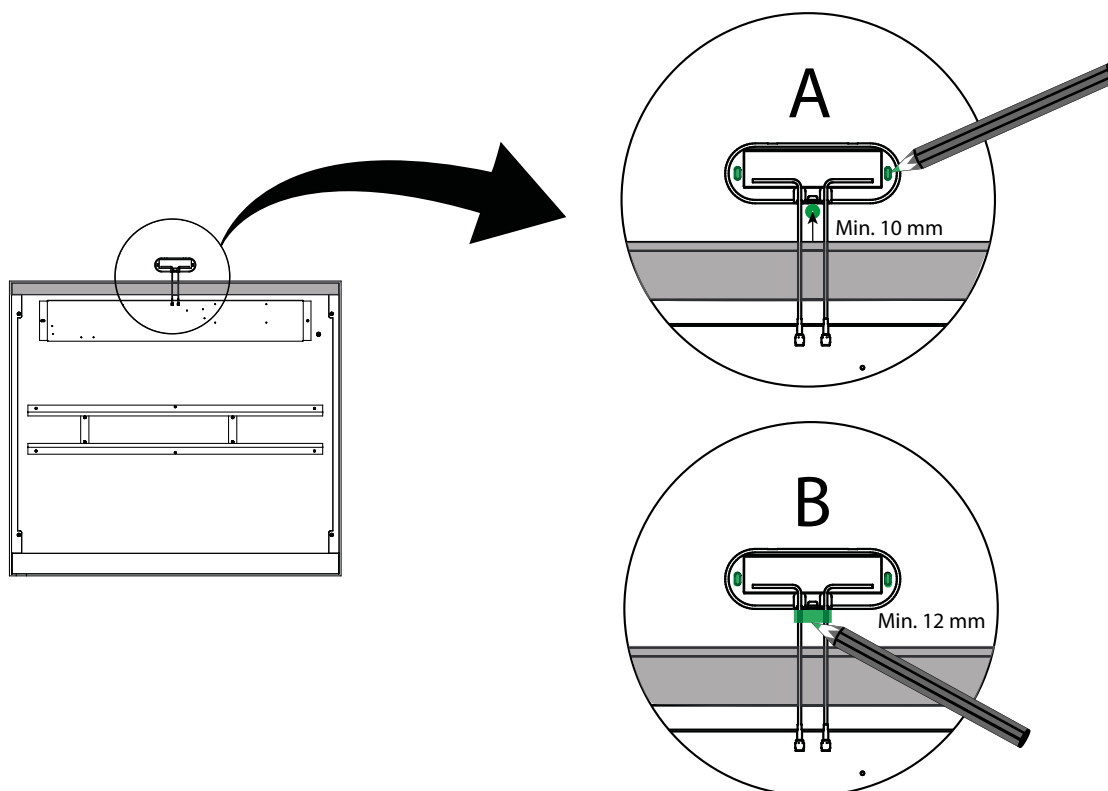
Step 1. Install LK Frame INB (4 screws) on the manifold cabinet.



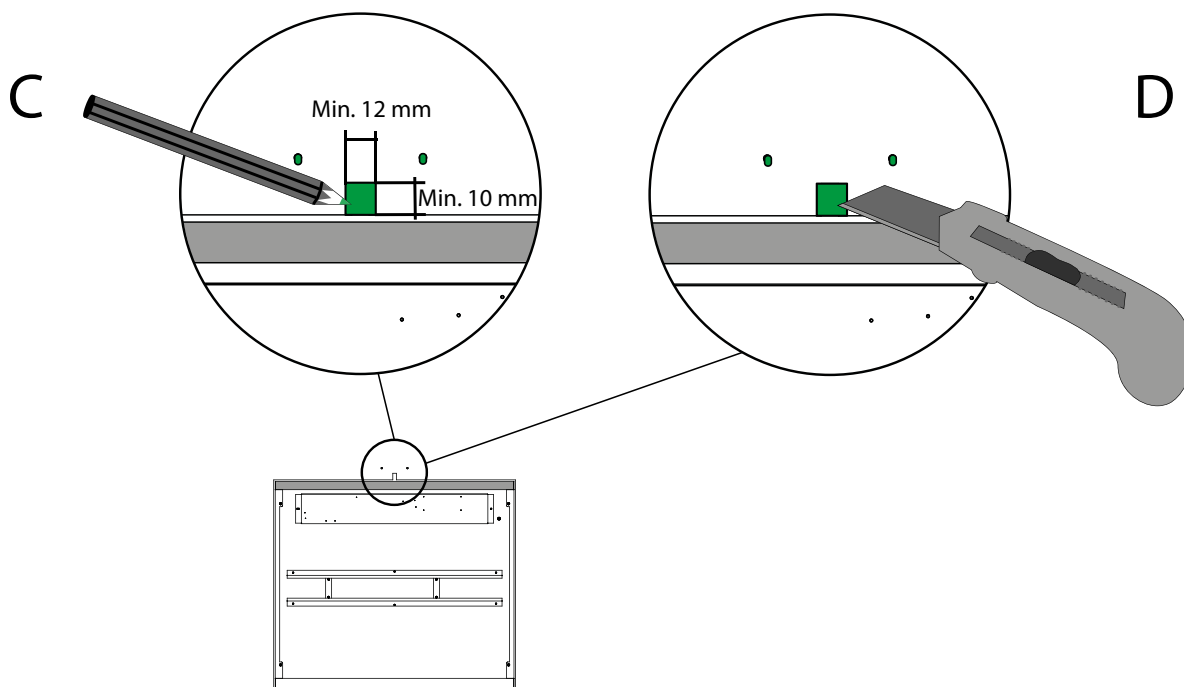
Step 2. Make a mark on the wall where LK Frame INB ends. Then remove the frame again. Add a mark at least 10 mm above the first mark.



- Step 3. A. Hold the back of LK ArcTenna OnWall up against the wall. The lower edge of the back must be at least 10 mm above the frame of LK Frame INB. Use a spirit level to check that the back is sitting straight.
- B. Mark the position of the holes for the screws on the back. Then mark the lower edge of the back between the cables. Make the marks at least 12 mm apart. The back can also be attached using double-sided tape.



- Step 4. Use a spirit level. C. Mark out a rectangle. D. Remove the wall material with a suitable tool to make room for the antenna cables

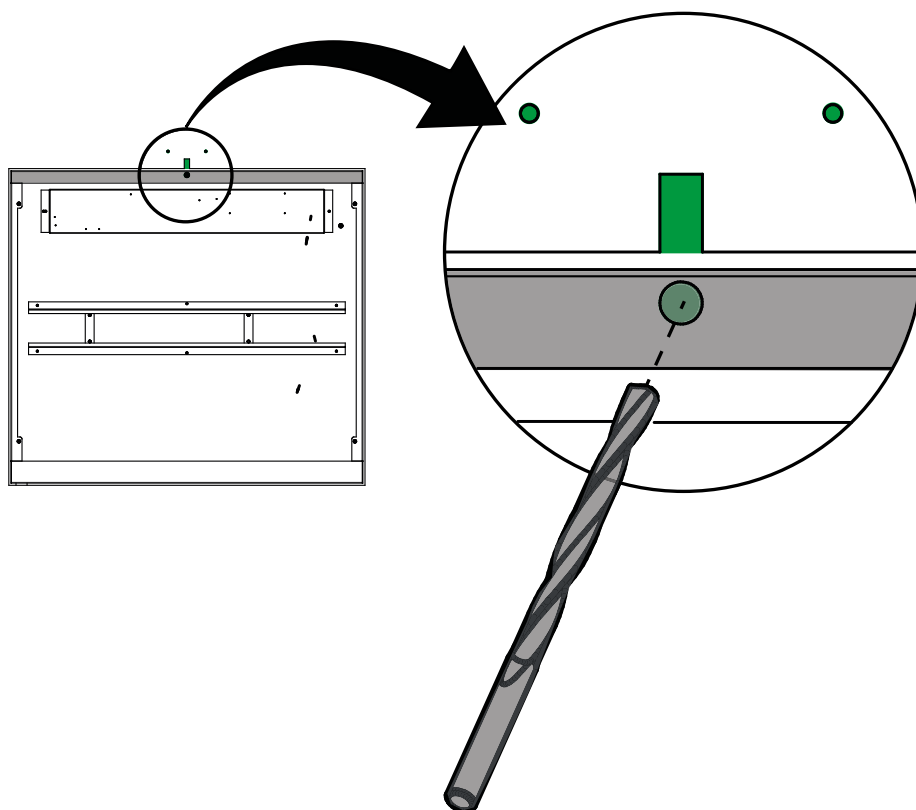


Step 5. Drill a 12 mm hole in the top of the cabinet below the cutout. Use a file to remove any burrs.

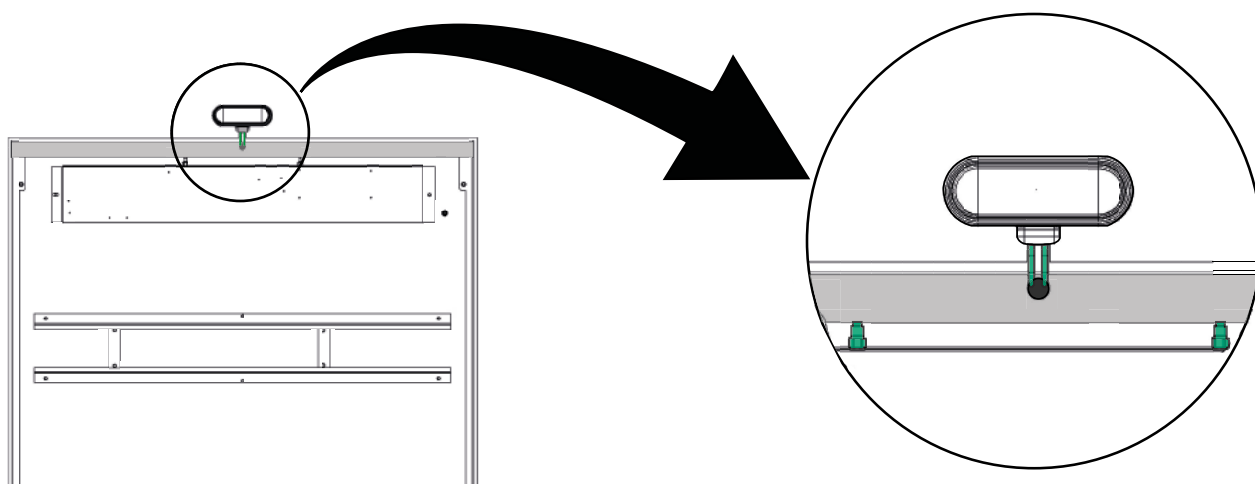


EXCEPTION!

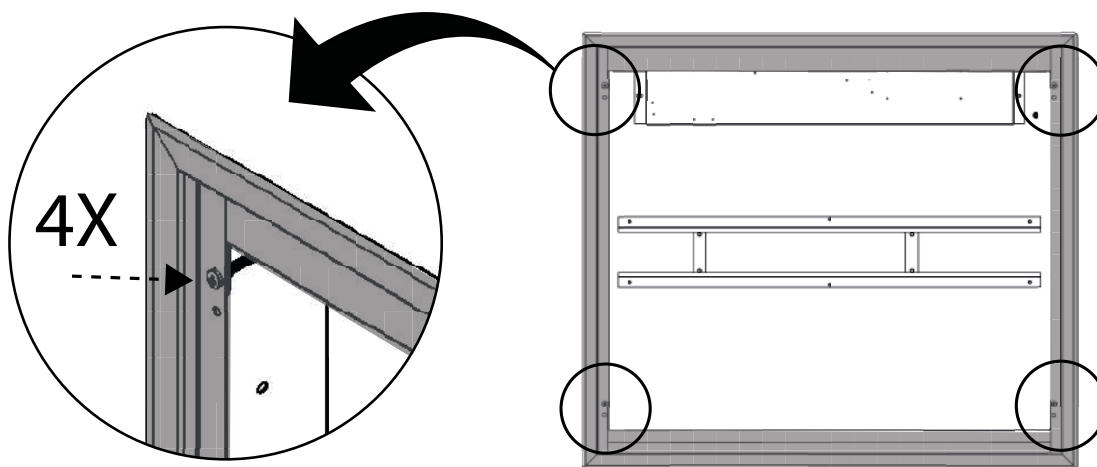
If double plasterboards are used, it is not necessary to drill a hole into the cabinet.
There is enough space to pull the antenna cable(s) into the cabinet without needing to drill a hole.



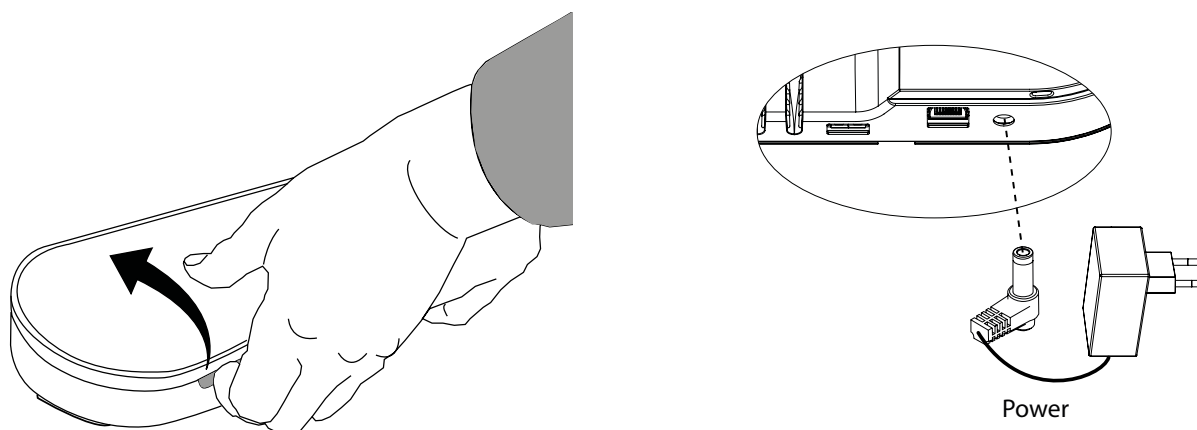
Step 6. Thread LK ArcTenna OnWall's cables through the hole (one at a time). Then screw the back of LK ArcTenna OnWall to the wall. Place the cover on LK ArcTenna OnWall.



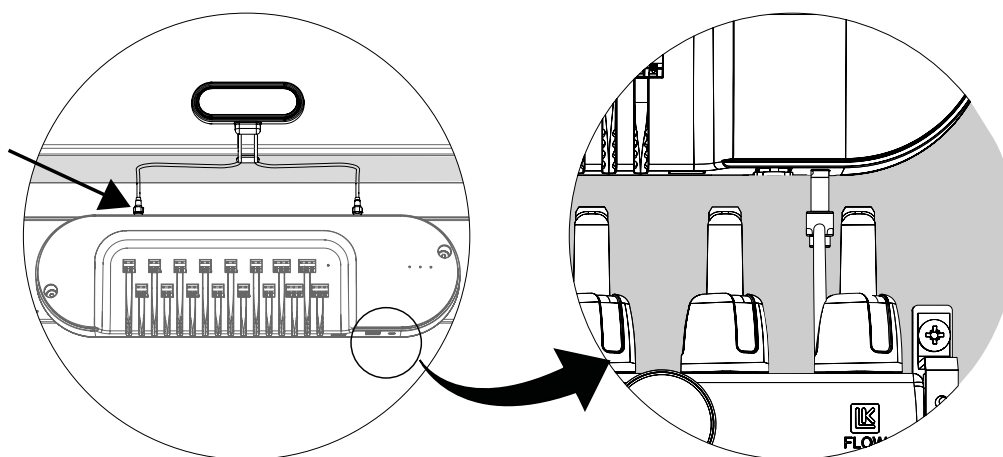
Step 7. Reattach LK Frame INB.



Step 8. Remove the cover from LK ArcHub. Connect the power cable to LK ArcHub.
Hold LK ArcHub in front of the cabinet.

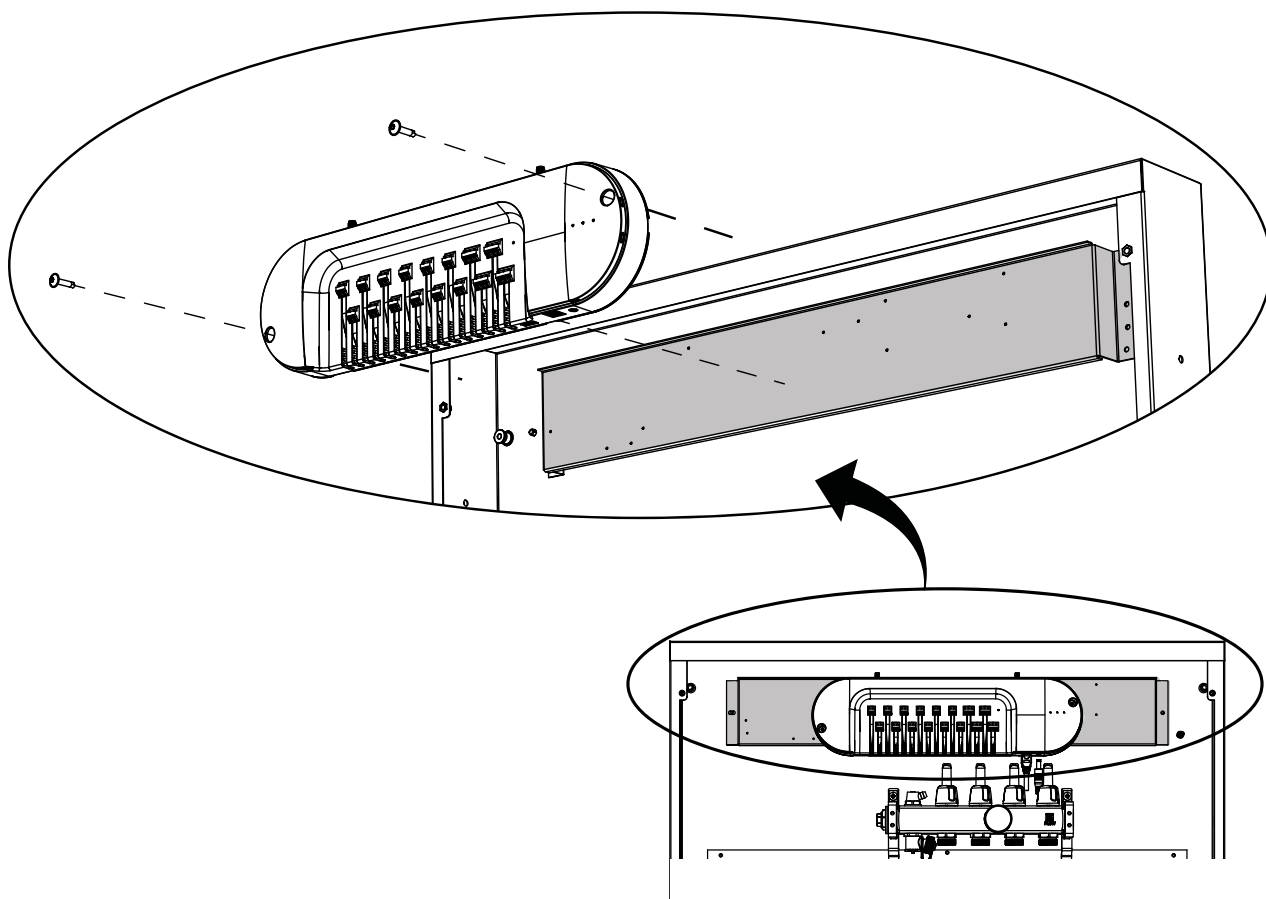


Step 9. Screw the antenna cables to LK ArcHub's antenna brackets so that LK ArcHub and LK ArcTenna OnWall are interconnected. Adjust the position of LK ArcHub until there is space for the power cable behind the flow indicators.



Step 10. Install LK ArcHub in the manifold cabinet.

Step 11. Connect the thermostats to LK ArcHub. See Connection – LK ArcHub.



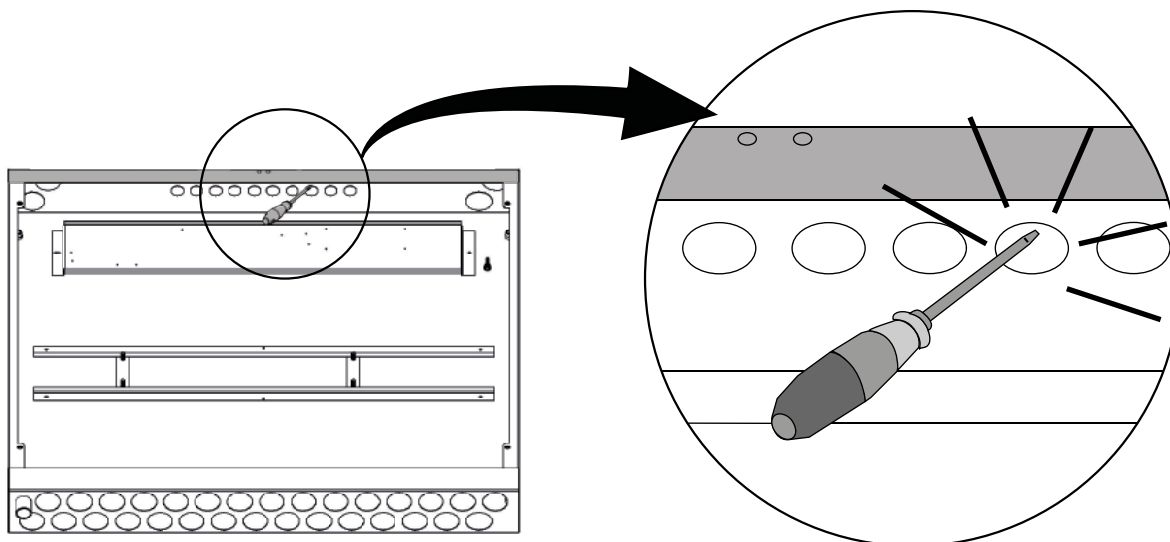
INSTALLATION – LK ARCTENNA INWALL

Step 1. Then knock-out two holes for the antenna rods.



NOTE!

If the manifold cabinet is already installed, knock out the holes from inside the cabinet.
If the manifold cabinet is waiting to be installed, knock out the holes from the top of the cabinet.

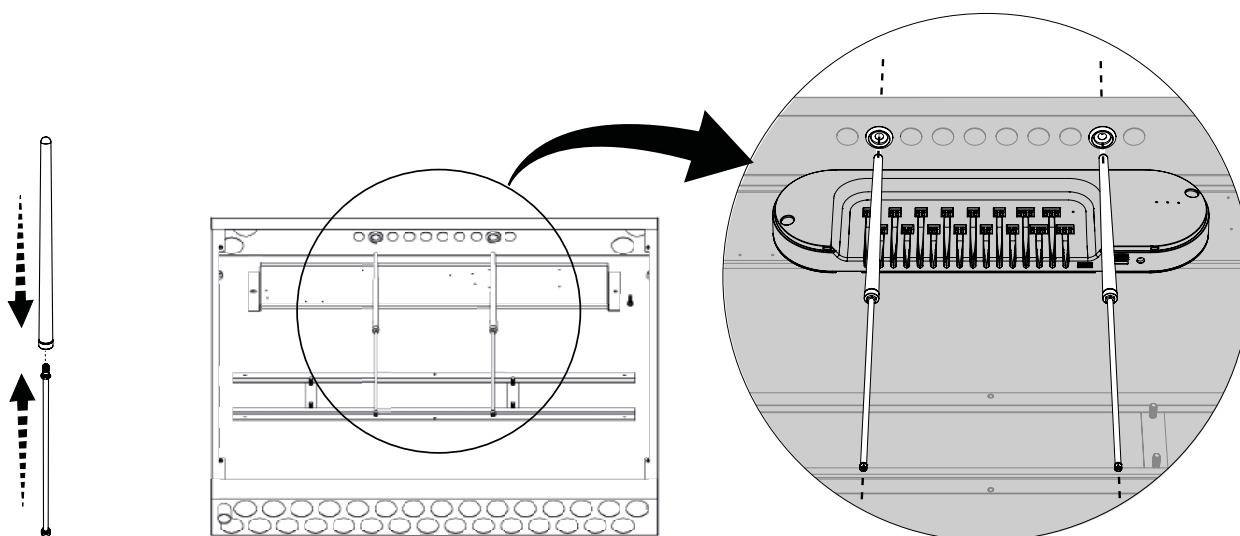


Step 2. Screw the antenna cables to the antennas. Insert the antennas into the knock-out holes.

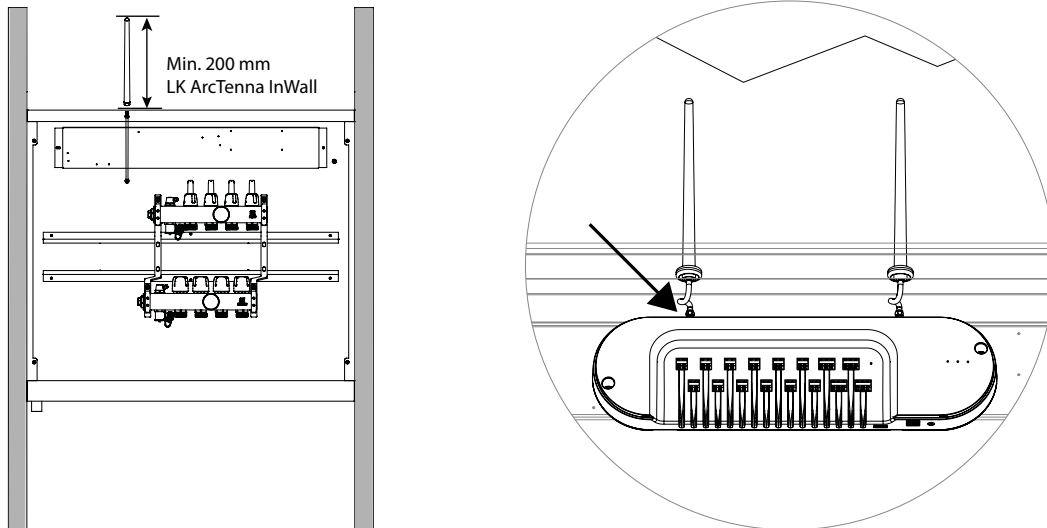


NOTE!

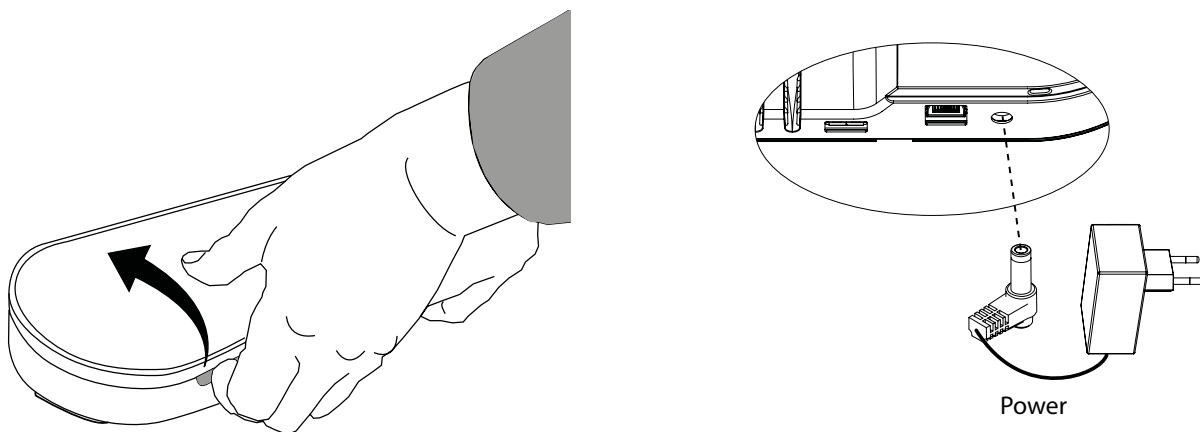
Install the cable bushings in the knock-out holes before the antennas are threaded through the holes.
See the assembly instructions for the manifold cabinet.



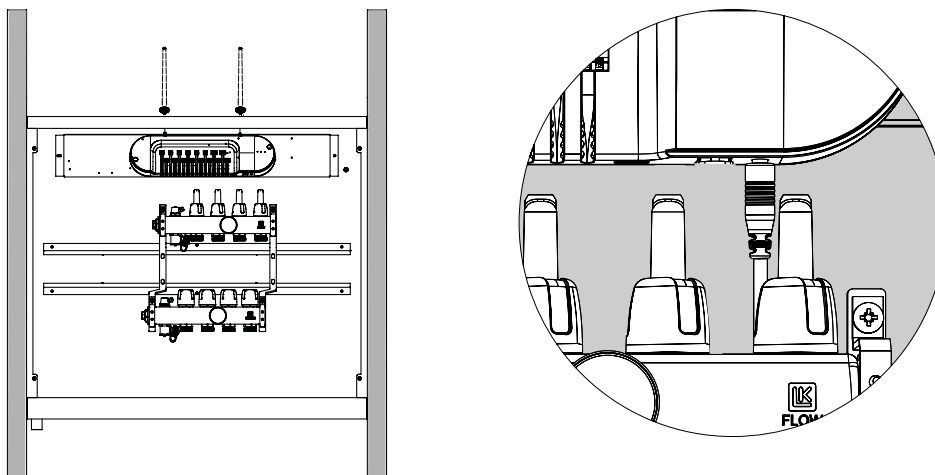
Step 3. Hold LK ArcHub in front of the cabinet. Screw the antennas cables to LK ArcHub's antenna brackets so that LK ArcHub and LK ArcTenna InWall are interconnected.



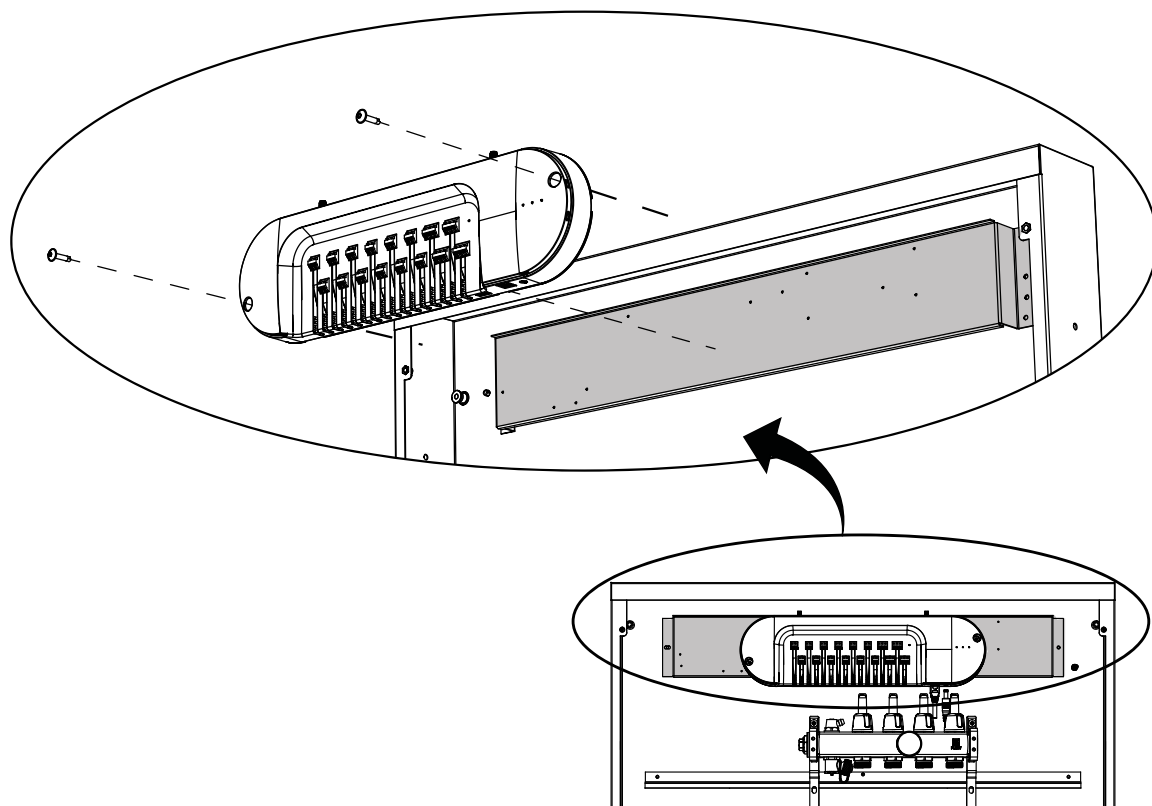
Step 4. Remove the cover from LK ArcHub. Connect the power cable to LK ArcHub. Hold LK ArcHub in front of the cabinet.



Step 5. Adjust the position of LK ArcHub until there is space for the power cable behind the flow indicators.



Step 6. Install LK ArcHub in the manifold cabinet. Connect the thermostats to LK ArcHub. See Connection – LK ArcHub

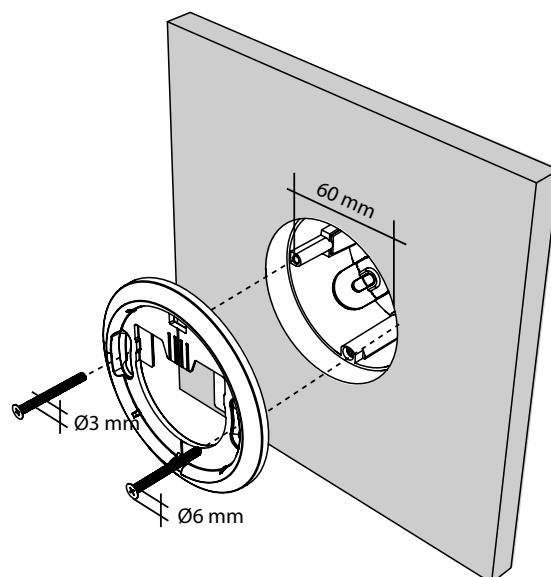
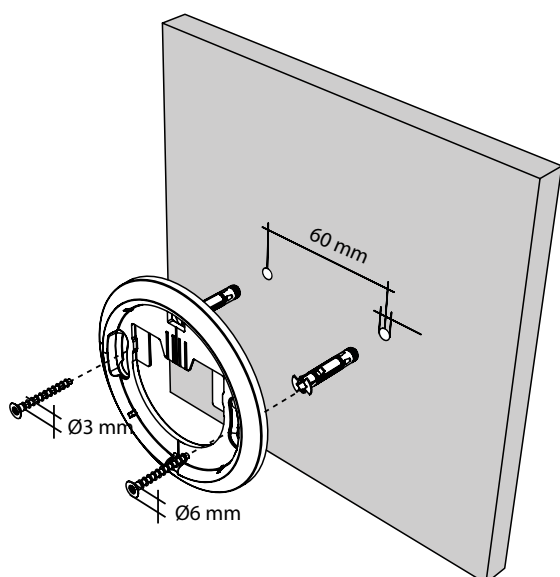


INSTALLATION – LK ARCFRAMEs WITH OR WITHOUT WALL BOX



NOTE!

Use countersunk screws. Screws not included. LK ArcFrame Neat does not cover the wall box.



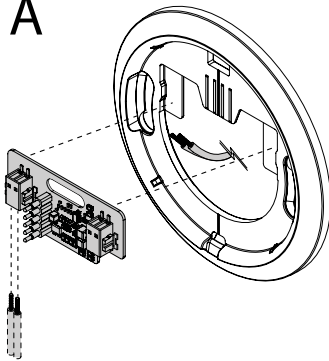
INSTALLATION – LK ArcByWire



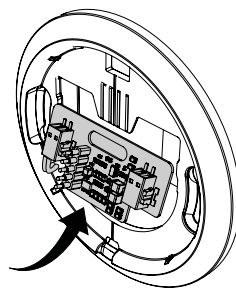
NOTE!

Make sure that the ArcByWire clicks firmly into the wall bracket. If necessary, apply some light pressure with a slotted screwdriver. 2 pieces of 0.5 mm² cables (Max. 0.5 mm²).

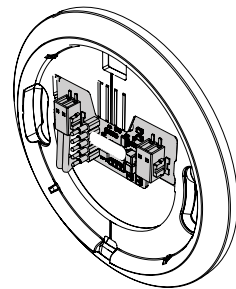
A



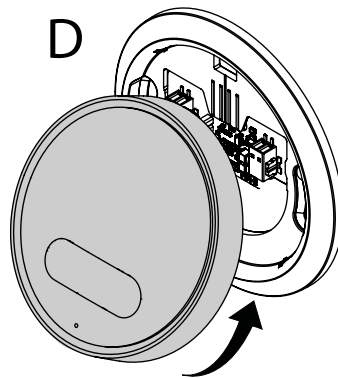
B



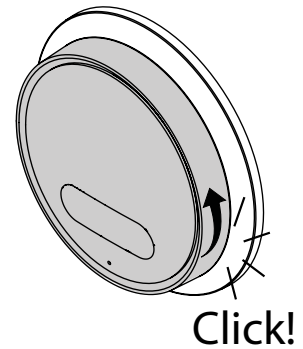
C



D

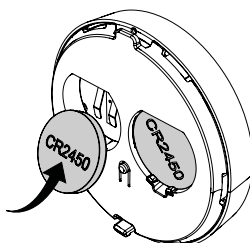


E

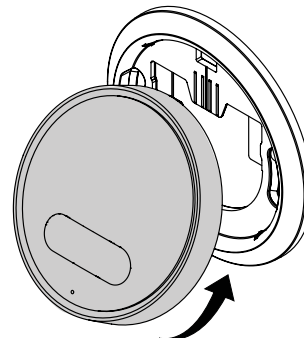
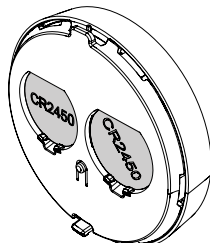


INSTALLATION – LK ArcBATTERIES

A



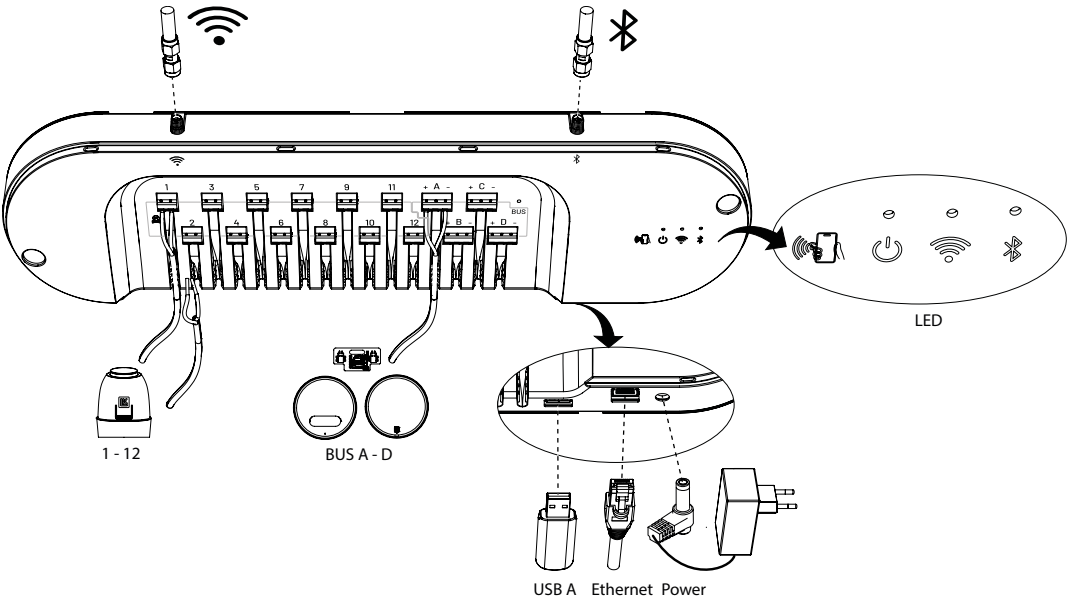
B



Click!



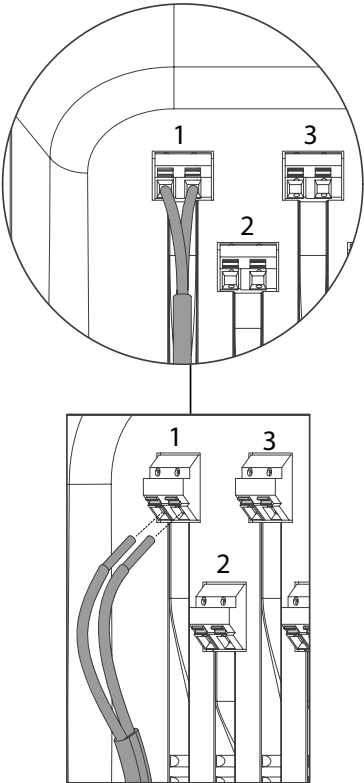
CONNECTION – LK ArcHub



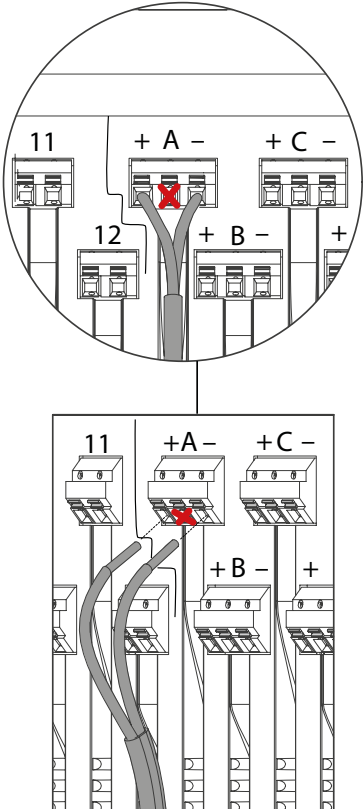
Wired connection between actuators and terminals 1–12 and wired connection between BUS A–D and LK ArcByWire.

 <p>NOTE! Max. one actuator per terminal. Any polarity.</p>	 <p>NOTE! Do not connect in the middle (NC), (the red X on the illustration).</p>
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1 - 12



BUS A - D



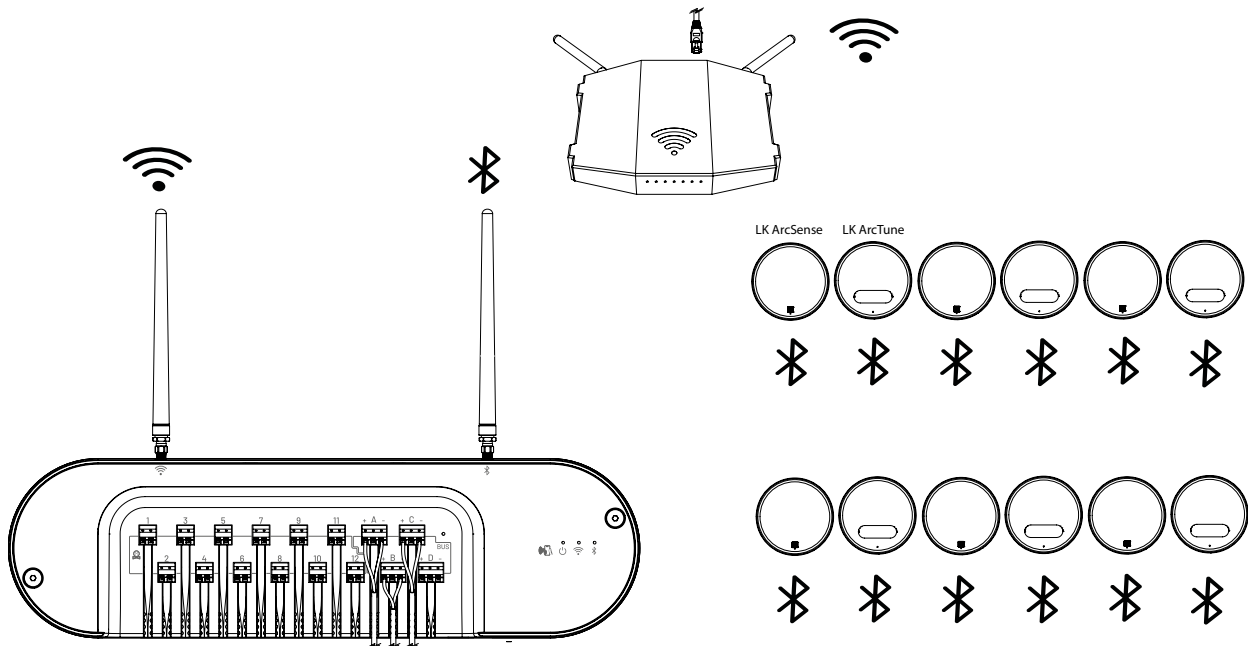
EXAMPLES OF DIFFERENT TYPES OF CONNECTIONS



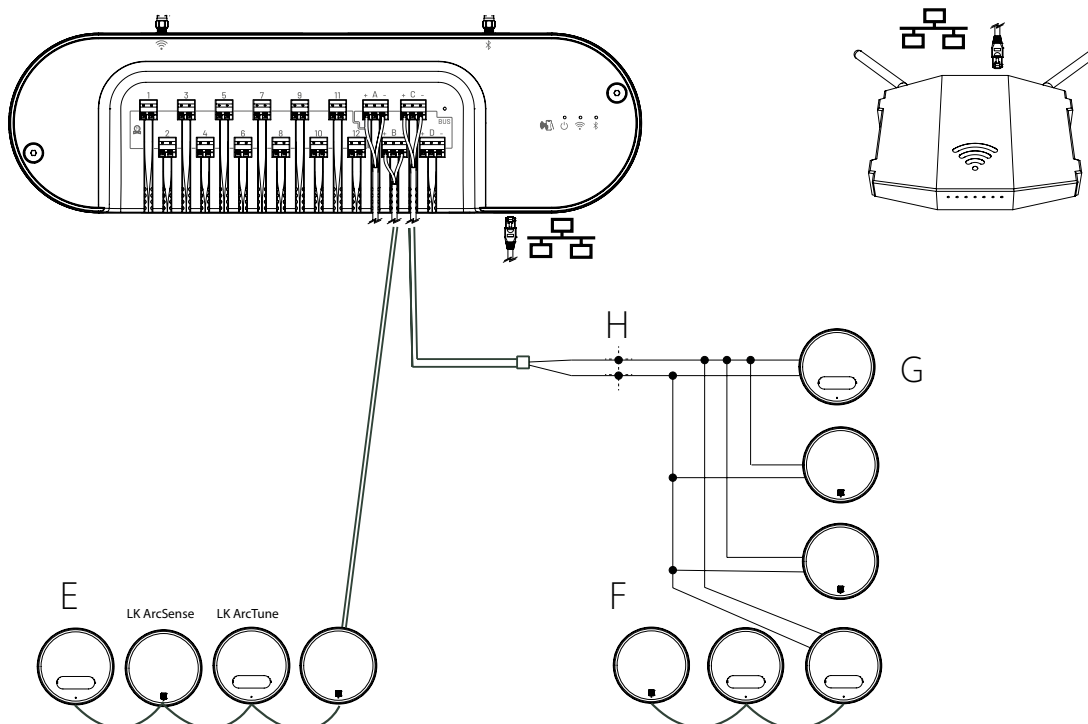
NOTE!

The wired examples on the connection variants are not connected to any specific BUS terminal but can be constructed from all four BUS terminals. A total of 12 LK ArcTune or LK ArcSense can be installed in any mix.

Example 1. Wireless connection.

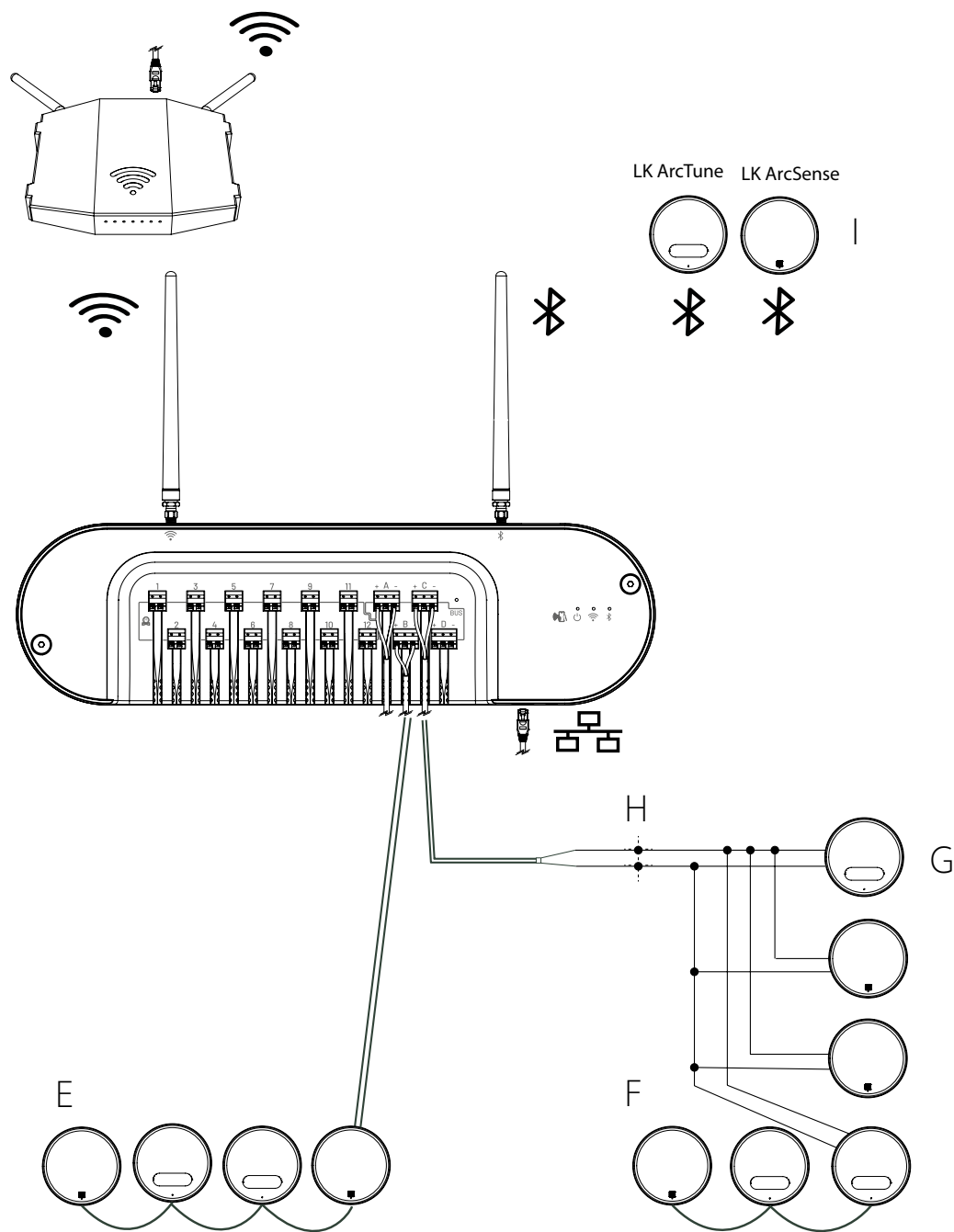


Example 2. Wired connection. E = Serial, F= Parallel and serial, G = Parallel. Terminal not from LK.

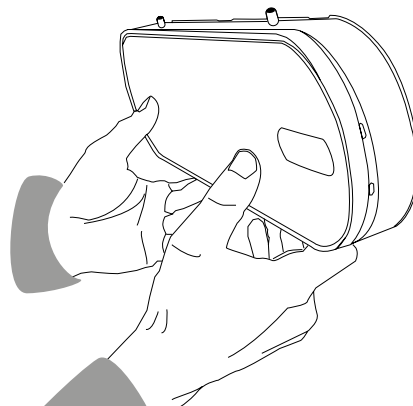
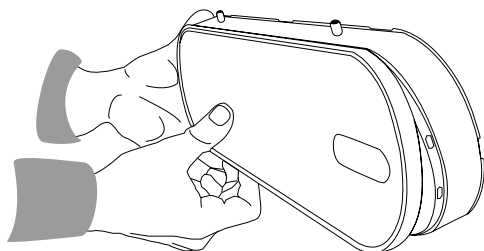


Example 3. A combination of wireless and wired installation.

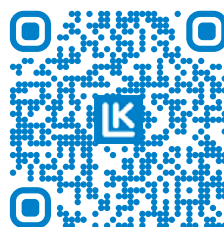
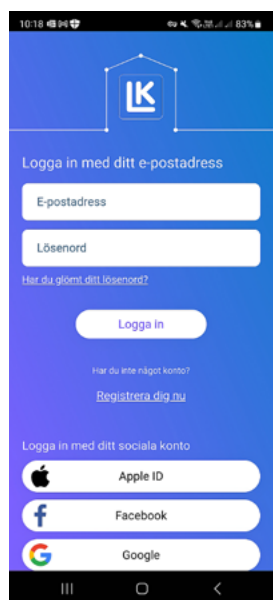
E = Serial, F= Parallel and serial, G = Parallel. H = Terminal not from LK. I. Wireless.



REPLACING THE COVER ON LK ARCHUB



CONNECTION TO A WIRELESS NETWORK



The login page in the MyLK app.

MyLK app.

QR code for the MyLK app.

Installation and configuration

Ensure that you have a smartphone with NFC function and a local internet connection or a smartphone that can share its internet connection via a **mobile hotspot***.

1. Download and install the MyLK app from the App Store or Google Play Store.
2. Launch the MyLK app, create an account and log in.
3. Create a property
4. Select **Start new installation** and follow the instructions in the MyLK app.

If you are a professional installing the system, hand it over digitally to the customer once installation is complete. Instructions are available in the MyLK app.

* Hotspot is a place with public WLAN coverage. Go to the smart phone's mobile-hotspot-connection settings to connect to the internet. The smart phone can then act as a router for other devices with Wi-Fi functionality, e.g. LK ArchHub, which must be connected.



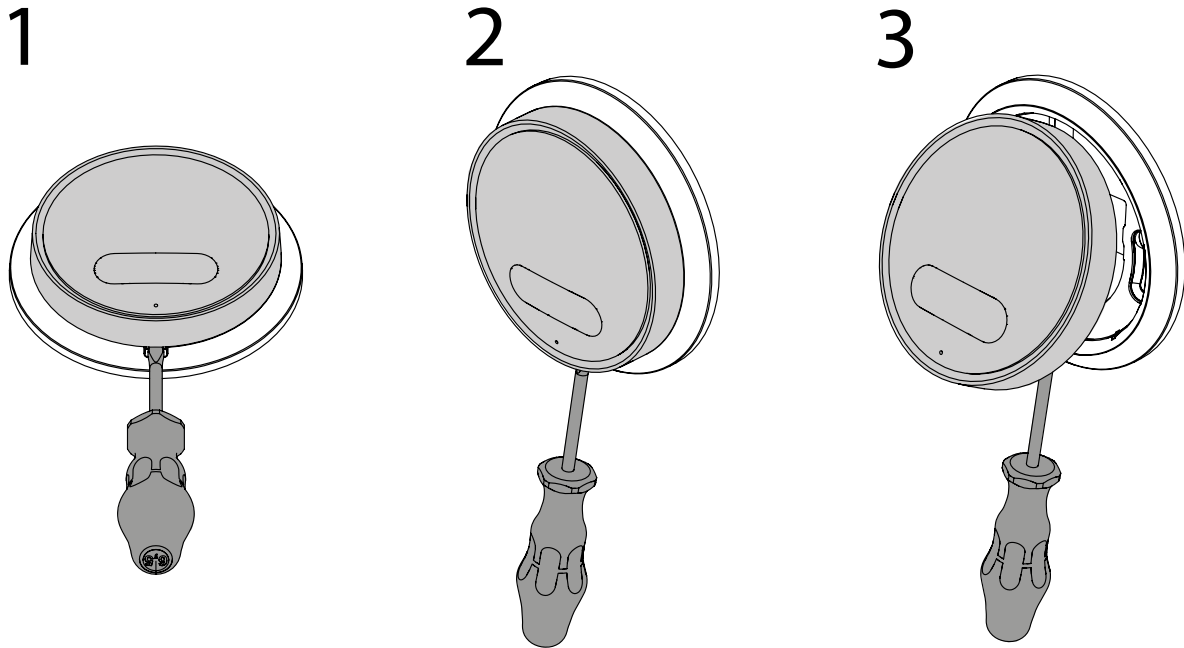
LEDs ON LK ARCHUB

Product	Event	LK ArcHub				LK ArcSense/LK ArcTune		Causes error code
					Type	LED	Type	
LK ArcHub	Power On	Green			Steady			No
LK ArcHub	LK ArcHub connecting to LK during start	White			Steady			
LK ArcHub	Other errors. Restart the unit. If the error remains, contact LK.	Red			Steady			No
LK ArcHub	Actuator not ready	Yellow			Steady			No
LK ArcHub	No connection or attempt to connect		Off		Off			No
LK ArcHub	WiFi connecting		Lightblue		Flashing			No
LK ArcHub	Ethernet connecting		Purple		Flashing			No
LK ArcHub	Connecting to LK		Green		Flashing			No
LK ArcHub	Connected to LK		Green		Steady			
LK ArcHub	Wifi error when connecting (Wrong Password or Wireless Network/WiFi (SSID))		Red		Steady			No
LK ArcHub	No thermostat/sensor connected			Turned off	Off			No
LK ArcHub	All thermostats/sensors connected			Green	Steady			No
LK ArcHub	At least one BLE device is not connected (BLE= Bluetooth Low Energy)			Dark blue	Flashing			No
LK ArcHub	At least one rs485 device is not connected			Yellow	Flashing			No
LK ArcHub	At least one BUS BLE device not connected. (BLE via BUS room sensor that acts as a range extender)			Purple	Flashing			No
LK ArcHub	At least one BUS BLE device is not connected			Lightblue	Flashing			No
ArcSense/ArcTune	Unit started (batteries inserted)					White	Morse: ARC	No
ArcSense/ArcTune	Error. Restart the unit. If the error remains, contact LK.					Red	Pulsing	No
ArcSense/ArcTune	NFC beeping when not paired (hyper mode active)					Lightblue	Pulsing	No
ArcSense/ArcTune	NFC beeping when paired (hyper mode active)					Green	Pulses for 10 sec.	No
ArcSense/ArcTune	Pairing successful/complete					Green	Pulses for 10 sec.	No
General	Batteries almost dead in a unit					Yellow	Pulsing	Yes
General	No unit connected					Purple	Pulsing	Yes
ArcSense/ArcTune	Actual temperature					White	Steady for 10 sec. Dims	No
ArcSense/ArcTune	Target temperature					White	Pulses for 10 sec.	No
ArcTune	Plus and minus- button					White	Steady for 10 sec. Dims	No
ArcTune	Snowflake (13°C)					White		
ArcTune	Fire (27°C)					White		
LK ArcHub	If ArcHub's LEDs flash in a different way than described above, an update of the device is in progress.							

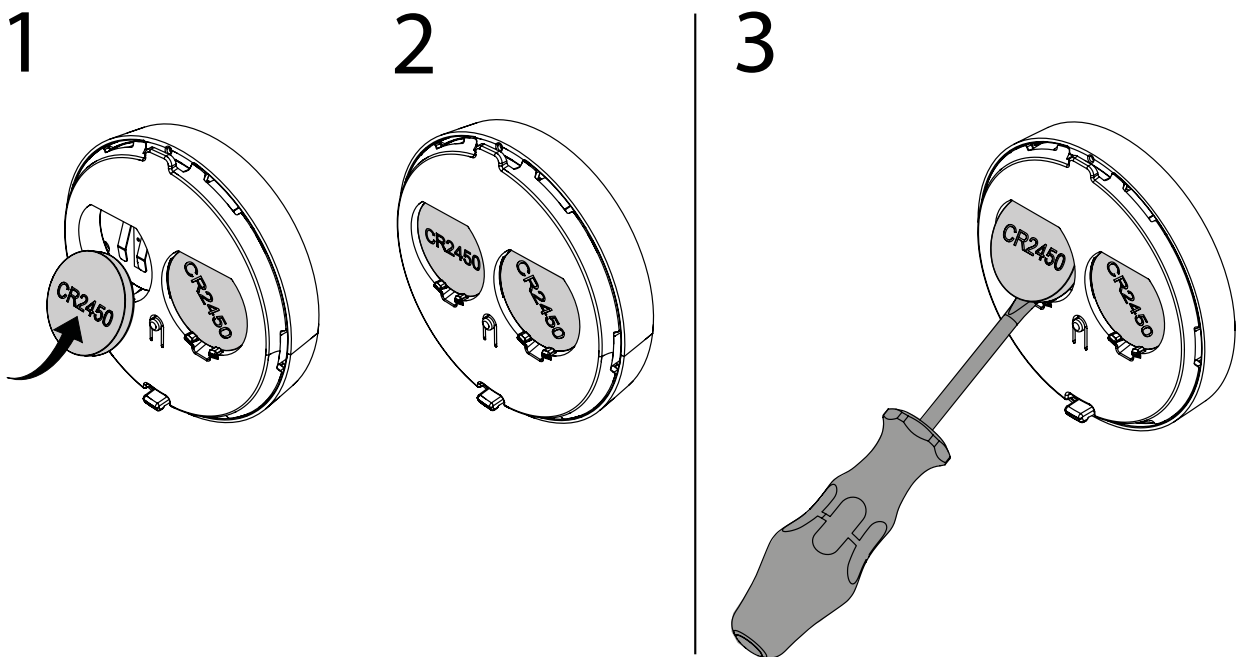


MAINTENANCE

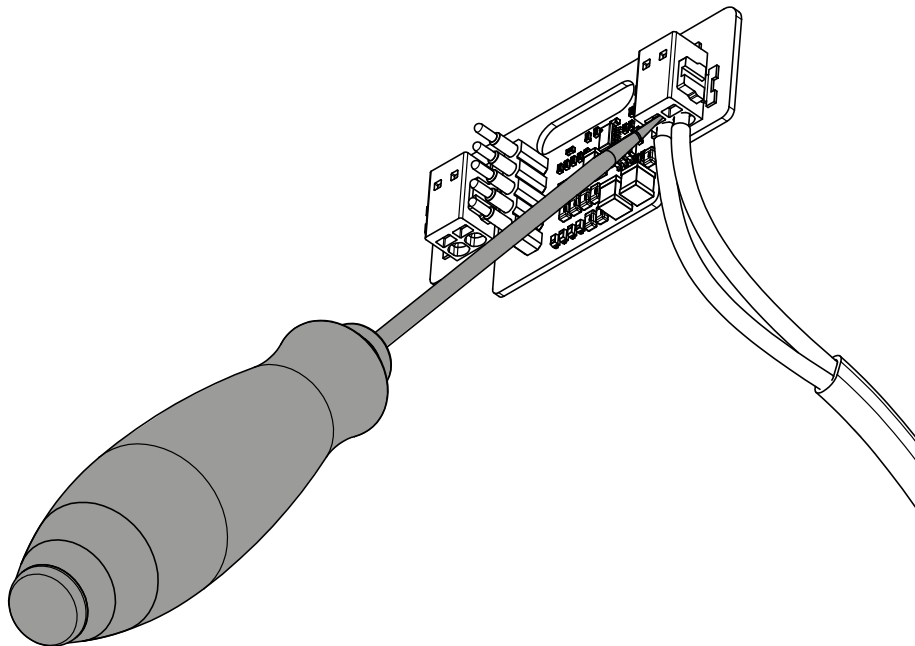
Dismantling – LK ArcTune or LK ArcSense



1-2. Insert batteries. 3. Remove batteries. - LK ArcBatteries in LK ArcTune/LK ArcSense



Disconnect the cable from LK ArcByWire



OPERATION AND SERVICE

Launch the MyLK app. Check, adjust and monitor the operation of the units by following the instructions in the app.

Adjusting the settings in the MyLK app

The units are connected to LK ArcHub using the settings in the MyLK app.
The MyLK app is regularly updated with new functions.

- Check that you are using the latest version of the app.
- Check that there are no ongoing service disruptions. Visit www.lksystems.se
- Download the installation instructions for LK Room Temperature Control Arc.
- Launch the MyLK app and log in to adjust the units.

Reset the WiFi settings

Launch the MyLK app and follow the instructions for resetting the WiFi.

Adjusting the temperature on LK ArcTune manually

1. Press the plus or minus sign to wake up the display. LK ArcTune shows the current temperature on the display.
2. Press the plus or minus sign again to set the required temperature. Each press changes the temperature by one degree. The new value flashes while the change is being made.
3. Once the required temperature has been set, the display will flash for a few seconds. It then sends the temperature to the central unit and the display will gradually fade.

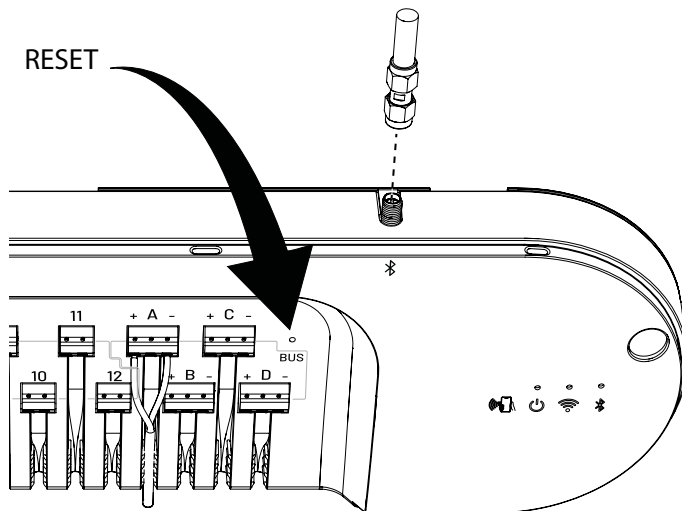


Factory reset of LK ArcHub

**NOTE!**

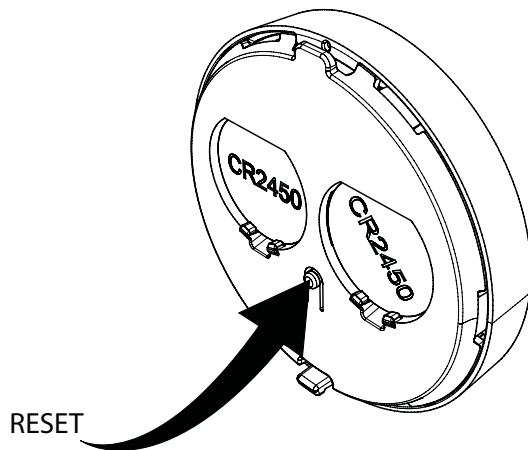
Factory reset is only used when your ArcHub is to be moved to another property. If you have any questions, contact LK.

- **Factory reset via LK ArcHub.** Insert a paper clip into the hole on the reset button and hold it there for 10 seconds. Wait approximately three minutes. The unit will then be reset and the LEDs will be lit again.



Factory reset of LK ArcTune/LK ArcSense.

- Press and hold the reset button for a few seconds.



Troubleshooting

- Is the power cable plugged into the wall socket?
- Is the ethernet cable connected to LK ArcHub?
- Is there a router connect to LK ArcHub's ethernet cable?
- Are the actuators and LK ArcHub's terminals correctly connected?
- Is LK ArcByWire correctly connected to terminals A-D?
- Have no more than 12 LK ArcTune and LK ArcSense been used?
- Is LK ArcTenna connected?
- Has the MyLK app been updated?
- Is the WiFi connection working?
- Are LK ArcBatteries in the thermostat/sensor working?
- Are all installed units visible in the app?

Cleaning

LK Room Temperature Control Arc can be carefully wiped with a damp cloth. The cloth must not be soaking wet. Use a mild detergent, such as washing-up liquid or a cleaning solution suitable for computers.

Defective product

If any product in LK Room Temperature Control Arc is defective, contact your local supplier for assistance. If any parts need replacing, only LK spare parts may be used. Visit www.lksystems.se

TECHNICAL DATA

Area of use	House, terraced house, other buildings
Storage temperature	5 °C ... 55 °C
Environment	Indoors
Operating temperature	0°C ... 55°C
Temperature accuracy:	±0.5°C
Humidity range	0-100 % RF
Temperature/room sensor accuracy	Measures temperatures down to an accuracy of 0.5°C.
Temperature/room sensor regulatory area	14°C - 26°C
Humidity precision	± 5 %
Enclosure class LK ArcHub, LK ArcTune	IP2X
Wireless frequency	2.4 GHz WiFi (802.11bgn), Bluetooth (802.11bgn)
Maximum radio frequency power	Bluetooth: 10 dBm, WiFi: 10 dBm
Data resolution	LK ArcHub measures temperature and air humidity every 30 minutes and sends the information to the cloud every 24 hours.
BUS standard	BUS communication protocol, 2 wires, intended only for LK Arc. Range of physical cable, max length 1000 m per BUS loop from LK ArcHub to the last thermostat (not between each unit).
Suitable cable for LK ArcByWire	2 pieces of 0.5 mm ² cables (Max. 0.5 mm ²).
Replaceable batteries	CR 2450 button cell batteries (up to 5 years)
Battery service life	Up to 5 years
Warranty	2 years
Färgkod LK ArcTune/ LK ArcSense Black	NCS S9000-N
Färgkod LK ArcTune/LK ArcSense White	NCS 0500-N



WARRANTY AND THE MYLK APP

Product warranty

Product warranty as per current market agreement.

Software update and app support.

LK supplies software updates and app support for at least 5 years from the manufacturing dates of the product.

ENERGY DECLARATION

Energy declaration in accordance with EU 811/2013

Temperature regulator class	IV
Temperature regulator's contribution to the seasonal mean efficiency of room heating	2%

NOTE

Completely interference-free operation cannot always be guaranteed with the technology available today, which allows free use of the frequency band. Every installation should therefore be tested individually. If LK Room Temperature Control Arc loses contact with its internet connection, LK Room Temperature Control Arc will still work and remains in operation. Contact with the MyLK app is temporarily interrupted, and it will then not receive information from the units until contact with the internet is re-established.

ENVIRONMENT

LK Systems is affiliated with El-Kretsen for collecting and recycling electronics and batteries. Used batteries should be sorted as batteries or small batteries and deposited for battery recycling. When the system has reached the end of its life, it should be sorted as electronics or other electronics and deposited at a recycling centre.

WARRANTY

LK Systems AB is responsible for faults in products that appear within two years from the delivery of the product to the buyer. If LK is responsible for the fault in the product, LK has the right to replace the product with either a new or repaired product. The liability period for replacement or repair of a product or spare part does not exceed the liability period for the original product.

CE APPROVAL

LK Room Temperature Control Arc has been tested and approved by a third party.

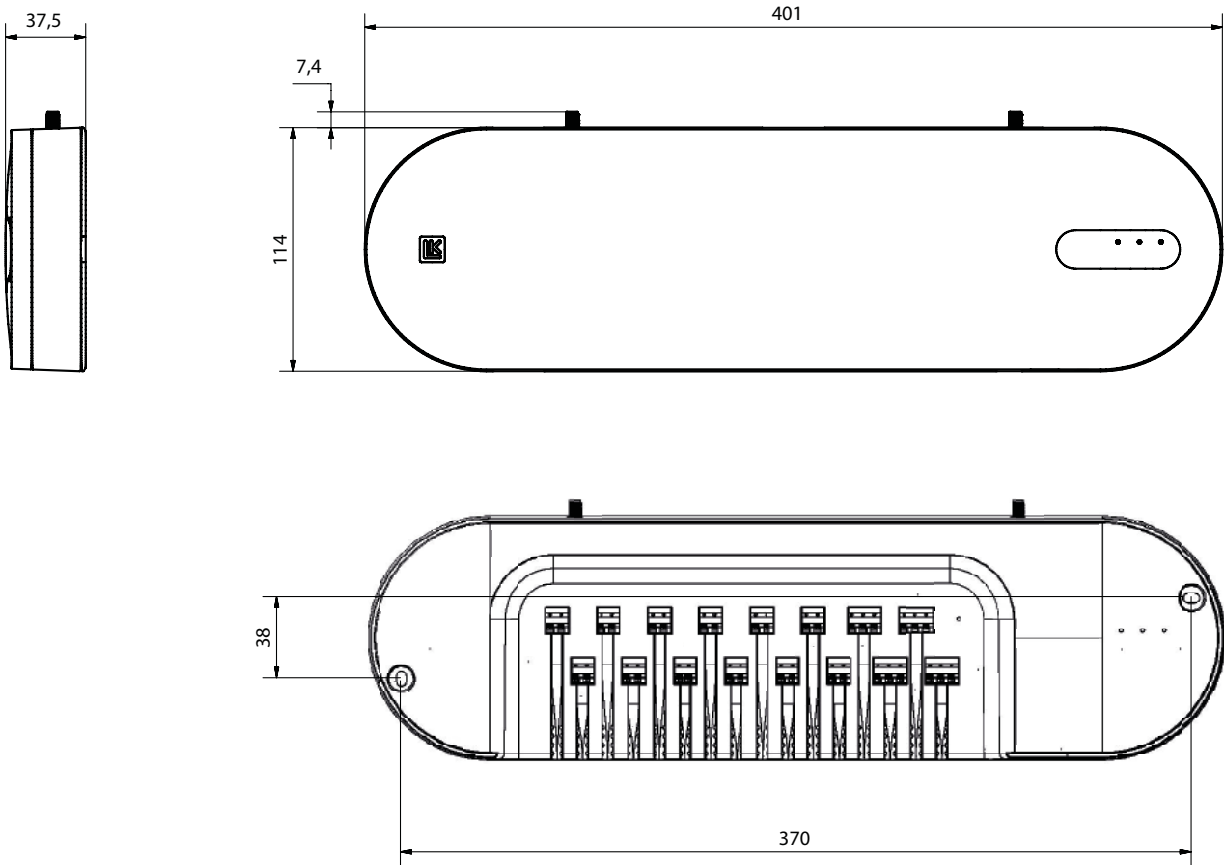
EU Declaration of Conformity, Radio Equipment:

Hereby, LK Systems declares that the radio equipment type LK ArcTune and LK ArcSense is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at: www.lksystems.se/en/documents/EC_DoC_ARC_En.pdf

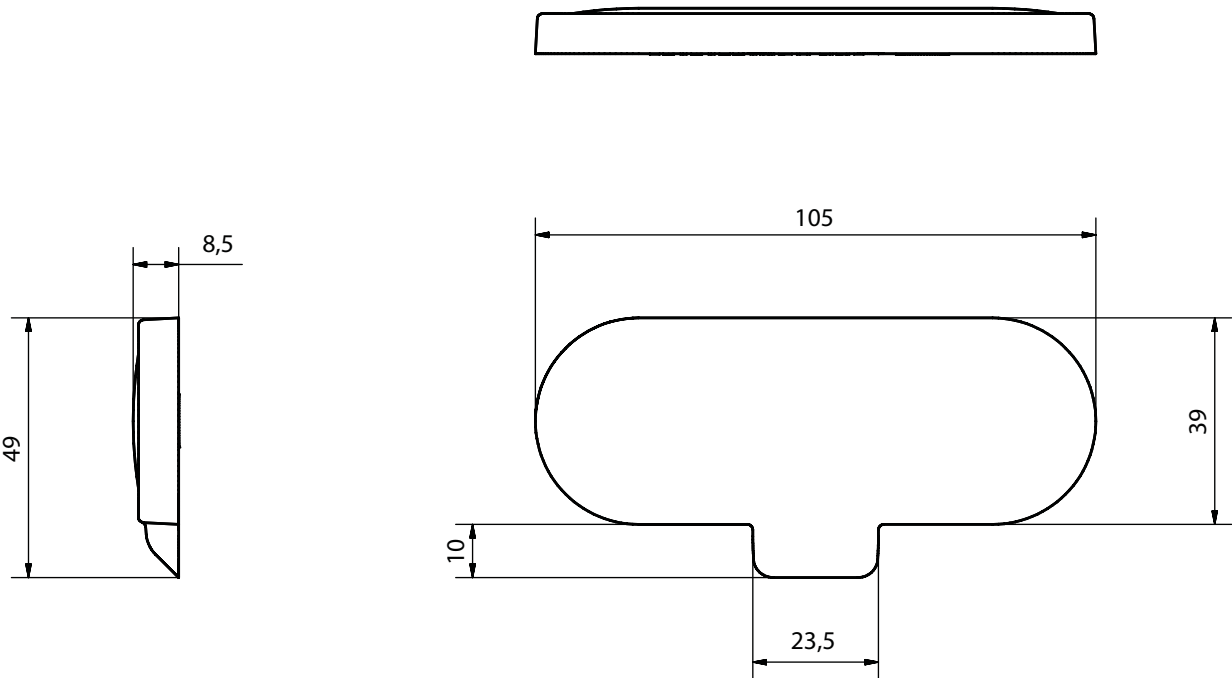


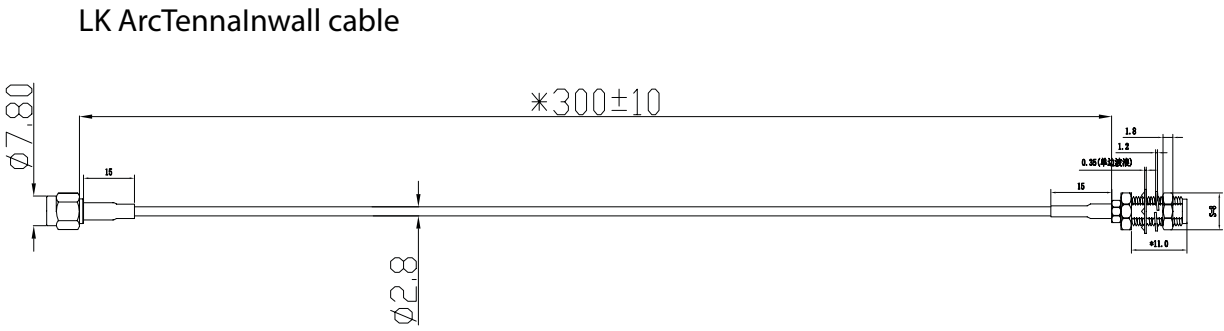
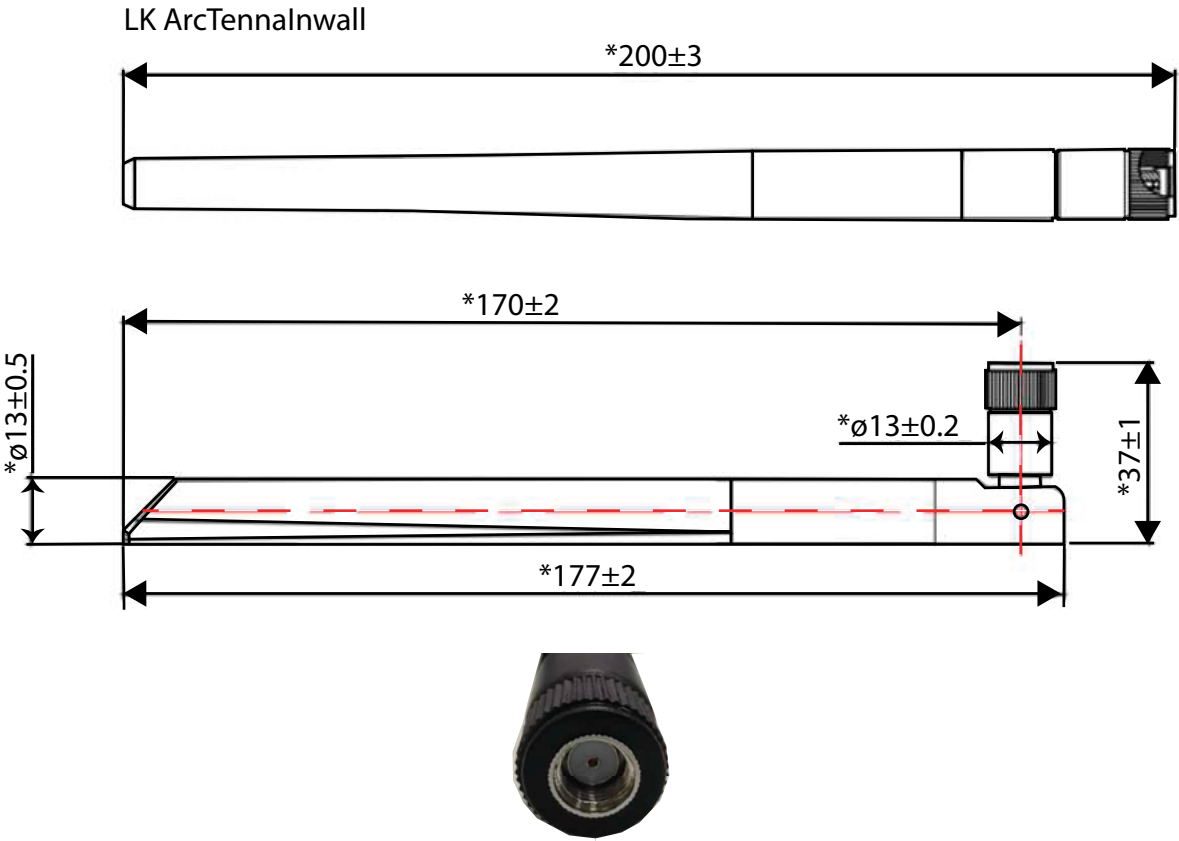
DIMENSION DRAWINGS

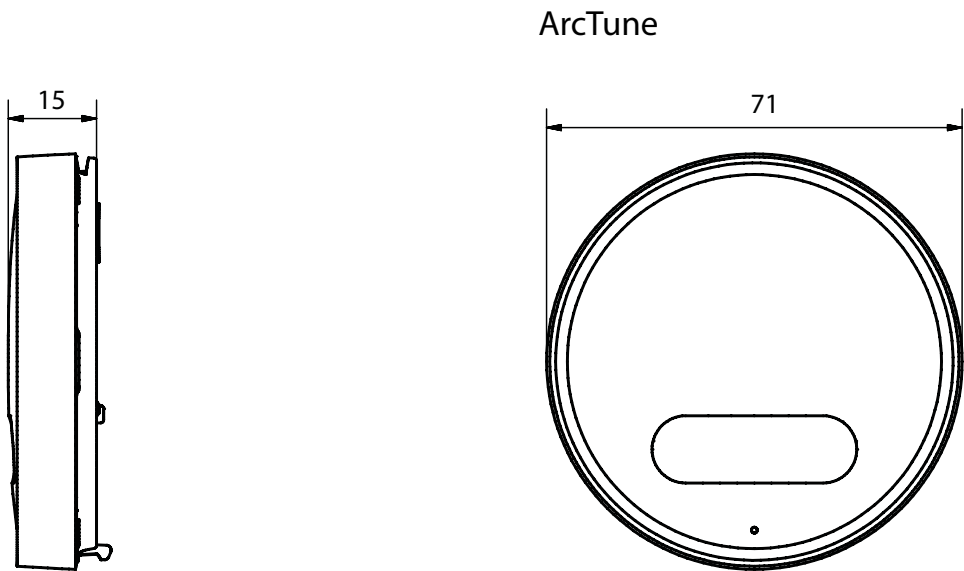
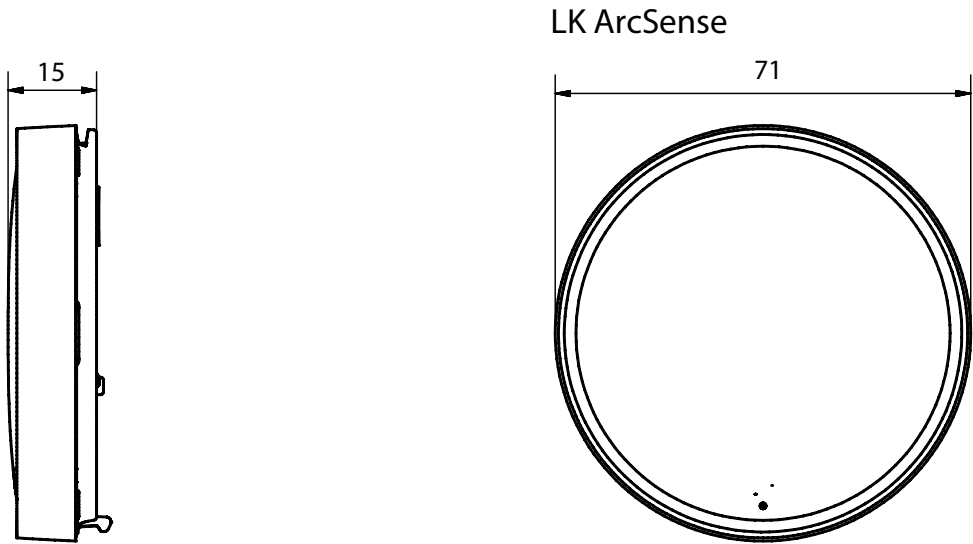
LK ArcHub



LK ArcTennaOnWall







LK ArcFrames

