IQWATT Inc., CANADA

12 W/ft²

IQ FLOOR MAT

INSTALLATION MANUAL

THE THIN SELF-ADHESIVE HEATING MAT

iQWATT

CONTENTS

IMPORTANT SAFEGUARDS AND WARNINGS

WARNING: Shock and Fire Hazard

If the IQ FLOOR MAT System is damaged or installed improperly, fire or shock could result. Serious personal injury or damage could be incurred. You must carefully follow the warnings and instructions in this manual.
Individuals involved in the installation must have ground-fault protection.
Qualified electricians who are familiar with the planning, materials, installation, construction and operation of this floor heating system and with the hazards involved must install the system.
All national (Canadian Electrical Code or NEC), provincial, state and local electrical codes must be complied with for this installation. If you are unfamiliar with these requirements, contact your electrician.
The IQ THERMOSTAT provides ground-wire protection and must be used. The thermostat is to be installed as directed in the IQ THERMOSTAT Instruction Manual.
The IQ FLOOR MAT System is designed solely for under floor heating. Make sure that the floor is not penetrated by nails, screws, or similar objects that can cause damage on the initial installation or during later potential floor repairs.
Never cut or splice the heating cable, cold lead wire or temperature sensor; cross any length of these components over another; or space the heating cable closer than recommended.
Do not attempt any repair on your own.

- Instructions marked Important
- Safety warnings identified as WARNING

1 GENERAL INFORMATION

You must review the IQ FLOOR MAT Installation Manual and the instruction manual of the IQ THERMOSTAT, purchased separately, before you proceed with the installation. Proper functioning and the effectiveness of the warranties depend on it.

1.1 SAFETY GUIDELINES

The safety and reliability of this floor heating system is based on proper design, layout, product selection, installation and testing. Incorrect installation

or mishandling of the product can cause damage to the heating cable, system components and property. Mishandling creates the risk of fire or electrical shock.
Mats are to be placed on wood, wood with backer-board, or concrete floors that are stable, solid and without cracks. The mats will then covered with thin-set cement or mortar, and then by tile, stone or other finishing floor material indicated as appropriate by the manufacturer for this exact purpose. Carpet and vinyl are prohibited from use as floor finishing materials.
The temperature sensor must be placed directly below the tile, stone or other floor finishing material and between cable runs.

1.2 MEASURE RESISTANCE

Testing in order to show that the system is operating as it has been designed to operate, or "commissioning", is composed of three different electrical tests done four times throughout the installation process.
Testing for resistance has three parts.

1. Insulation Resistance Test: measure resistance between the white and black wires, or conductors, and the shielding or ground wire.
2. Heating Cable Resistance Test: resistance reading between the two conductors, white and black wires, is compared to that specified in Table 1, the IQ FLOOR MAT Specifications, and Table 2, the IQ THERMOSTAT Specifications. The value should be within ±10%. If you get a different reading, do not proceed.
3. Sensor Resistance Test: verify the resistance and integrity of the floor sensor that comes with the IQ THERMOSTAT.

Please refer to "5 Commissioning" for instructions on measuring resistance.

Important: measure the resistance four times during the installation process and record results on the commissioning report and the Warranty Card

The four times are:

(1) When the product comes of the box (4, step 5);
(2) After the mat has been laid (4, step7);
(3) After the thin-set cement or mortar has been applied and dried (4, step 9);
(4) After the tile, stone or other flooring material has been laid (4, step 12).

1.3 25-YEAR LIMITED WARRANTY

For a period of twenty-five (25) years from the date of purchase IQWATT warrants that the IQ FLOOR MAT heating cable, cord and mat are free from defects in material, design and workmanship. The warranty is only valid if the Warranty Card has been properly completed and registered with IQWATT (see Warranty for complete details).

2 IQ FLOOR MAT SYSTEM

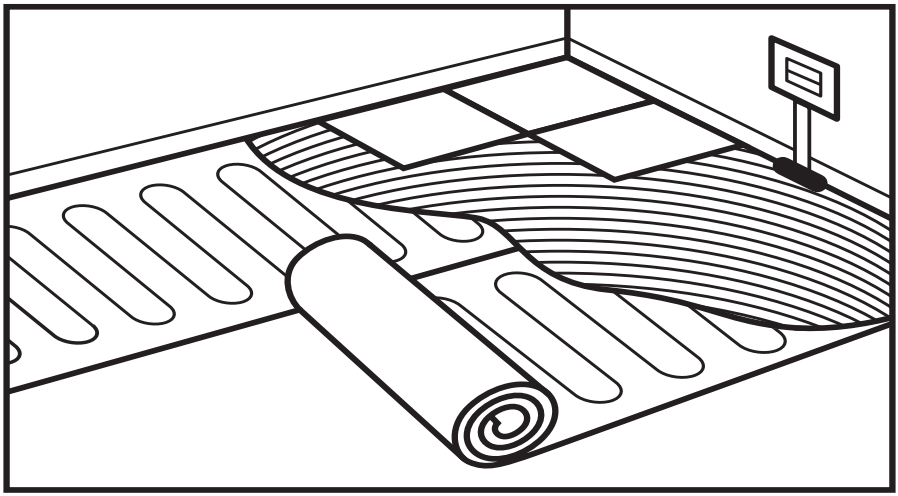
2.1 IQ FLOOR MAT SPECIFICATIONS

Cable Construction:	Twin conductor
Rated Voltage:	120V,240V
Output:	12W/ft² (130W/m²)±10%
Cable spacing:	3" (76.2mm)
Cable Diameter:	1/8"-1/6" (3.2mm-4.2mm)
Conductor Insulation:	fluoropolymer
Outer Insulation:	fluoropolymer or TPE
Max. Ambient Temp.:	85°F(30°C)
Min. Installation Temp.:	40°F(5°C)
Cold lead:	2-wire 16 AWG plus ground braid; 10ft (3m) length

2.2 THERMOSTAT SPECIFICATIONS

Functions:	On/Off control, digital display, built-in GFCI
Supply Voltage :	120/240 V ±10%, 50/60 Hz
Maximum switching current :	15 Amp
Temperature control range :	41 to 104°F (5 to 40°C)
Ambient range :	32 to 77°F (0 to 25°C)
Floor temperature sensor :	2-wire, 10-foot lead wire

2.3 IQ FLOOR MAT TYPICAL INSTALLATIONS AND APPLICATIONS



Warning

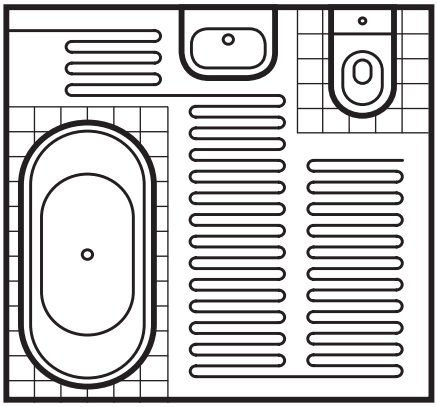
Consult the manufacturer for information on special installation requirements for the type of floor finishing material chosen for use in this exact situation. Carpet and vinyl flooring are prohibited from use.

Important

- Review the instructions carefully before installing IQ FLOOR MAT system.
- Resistance must be measured four times during the installation process.
- Do not install IQ FLOOR MAT in walls or ceilings.
- Indoor use the exclusive environment for this product.
- The mat, with cable, must be embedded in mortar, thin-set, concrete or similar material. Then, it may be covered by porcelain or ceramic tile, marble, stone, or other flooring materials approved by the manufacture for this exact use.
- The minimum installation room temperature is 40°F(5°C).
- The heating cable cannot be cut to length, crossed over itself, or installed closer than 3" to another cable (cable centre to cable centre), cable run or wall.
- Only copper wire is recommended for use.
- Recheck that the supply voltage matches the voltage of the IQ FLOOR MAT.
- Any supporting metal structures or materials used in conjunction with the IQ FLOOR MAT must be grounded, in accordance with CSA Standard C22.1, section 10 and the NEC.

3 FLOOR HEATING DESIGN AND PRODUCT SELECTION

3.1 DESIGN THE INSTALLATION.



Step 1: Measure the heated area

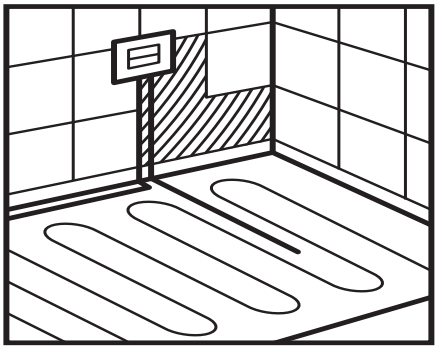
Determine the area of the floor to be heated. This is where there are no permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. Measure dimensions of the heated area of the floor.
For example, in Figure 3, the area of the bathroom is 96 ft^2. When you subtract the area of the vanity, shower and toilet, the total heated area is only 74 ft^2.

Step 2: Determine the power supply voltage

The available supply voltages include 120 V, 208 V or 240 V.

Important

Operating the 240V cable at 208V reduces the power output to approximately 9W/sq.ft. (25% reduction)



Step 3: Plan the design

Determine the optimum floor heating mat layout for your heated area, in order to ensure coverage. Select a spot for the thermostat, in the wall above the heated area, where it can be reached by the 10-foot cold lead of the IQ FLOOR MAT and the 10-foot floor temperature sensor.

Important

The predetermined IQ FLOOR MAT spacing must be maintained to ensure proper floor heating (minimum 3", cable centre to cable centre). Do not change the IQ FLOOR MAT heating cable spacing when you lay out the mat to prevent cold spots on the floor. Cable may be detached from mat and carefully laid when necessary.

3.2 CONFIRM YOUR PRODUCT SELECTION

Confirm that your IQ FLOOR MAT is no larger than the heated area. Following the example from Step 1, if the heated area is 74 ft^2, select the 70 ft^2 IQ FLOOR MAT system.

TABLE 1:120V PRODUCT SELECTION

Model Number	Dimensions		Heated Area (sq ft)	Output (W)	Amperage (A)	Resistance (Ohm)
	Width (in)	Length (ft)				
IQ FLOOR MAT-120-10	20	6	10	120	1.0	120
IQ FLOOR MAT-180-15		9	15	180	1.5	80
IQ FLOOR MAT-240-20		12	20	240	2.0	60
IQ FLOOR MAT-300-25		15	25	300	2.5	48
IQ FLOOR MAT-360-30		18	30	360	3.0	40
IQ FLOOR MAT-420-35		21	35	420	3.5	34.3
IQ FLOOR MAT-480-40		24	40	480	4.0	30
IQ FLOOR MAT-600-50		30	50	600	5.0	24
IQ FLOOR MAT-720-60		36	60	720	6.0	20
IQ FLOOR MAT-840-70		42	70	840	7.0	17.1
IQ FLOOR MAT-960-80		48	80	960	8.0	15
IQ FLOOR MAT-1080-90		55	90	1080	9.0	13.3
IQ FLOOR MAT-1200-100		61	100	1200	10.0	12

TABLE 2:240V PRODUCT SELECTION

Model Number	Dimensions		Heated Area (sq ft)	Output (W)	Amper-age (A)	Resistance (Ohm)
	Width (in)	Length (ft)				
IQ FLOOR MAT-240-20	20	12	20	240	1.0	240
IQ FLOOR MAT-360-30		18	30	360	1.5	160
IQ FLOOR MAT-420-35		21	35	420	1.8	137.1
IQ FLOOR MAT-480-40		24	40	480	2.0	120
IQ FLOOR MAT-600-50		30	50	600	2.5	96
IQ FLOOR MAT-720-60		36	60	720	3.0	80
IQ FLOOR MAT-840-70		42	70	840	3.5	68.6
IQ FLOOR MAT-960-80		48	80	960	4.0	60
IQ FLOOR MAT-1080-90		55	90	1080	4.5	53.3
IQ FLOOR MAT-1200-100		61	100	1200	5.0	48
IQ FLOOR MAT-1320-110		67	110	1324	5.5	43.6
IQ FLOOR MAT-1440-120		73	120	1440	6.0	40
IQ FLOOR MAT-1740-145		88	145	1740	7.3	33.1
IQ FLOOR MAT-1920-160		97	160	1920	8.0	30

4 INSTALLATION

Important: Tools and materials required

You will require the following items to install and test the floor heating system:

- Scissors
- Utility knife
- Wire strippers
- Tape measure
- Screwdriver
- Multi meter

You will also need appropriate tools and materials to install your particular finishing flooring. These will likely include more self-leveling cement or mortar, thin-set cement or mortar, finishing floor materials including tile or stone, and tools like a notched trowel recommended by the manufacture of your specific floor product.

Follow these steps to ensure a successful IQ FLOOR MAT installation.

Step 1: PLAN LAYOUT

As indicated in 3.1, sketch a layout or floor plan of the room measured. Include all permanent furnishings such as toilets, bathtubs, appliances and cabinetry. Mark the dimensions needed to determine the floor area and the position of the IQ THERMOSTAT.

Important

It is highly recommended that you photograph the installation and note the location of connections, including the sensor, for accurate record-keeping.

Step 2: TRANSFER LAYOUT TO FLOOR

Transfer the layout sketch to the room floor. Include the "foot print" of all furnishings not yet installed. Clean floor. Unroll the first few feet of the IQ FLOOR MAT. Place the starting point of the cable within 10 ft. of the thermostat. Roll mat again.

Important

Mark the position of the connection point between the power lead and the heating cable. This connection will be covered in self-leveling cement or quickset. When putting the thermostat sensor in place, mark the sensor position in the middle of two heating cables, about 10 in. away from any wall within the heated area, and as close as possible to the thermostat.

Step 3: INSTALL SENSOR

Install the sensor now, either in conduit, or directly to the subfloor. It is recommended that the sensor be installed in conduit, for easy replacement of the sensor in the unlikely event of failure.
The sensor and conduit need to be installed between the thermostat wall box and the chosen sensor position: consult your IQ THERMOSTAT Instruction Manual as you proceed. The conduit should be partially countersunk into the subfloor. Cut a channel approximately 5/16" deep × 5/16" wide in the floor and wall up to the thermostat for the sensor conduit. The conduit with the sensor wire inside goes down from the thermostat to the chosen sensor position towards the middle of the room.

Important

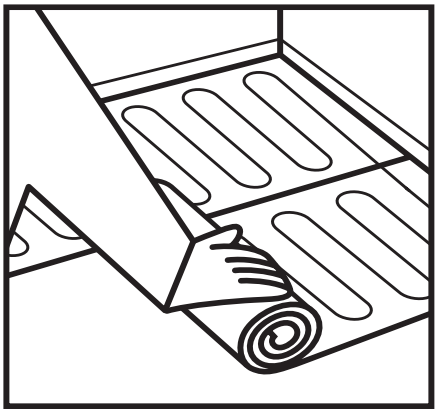
The sensor conduit must be centered in the cable loop (between the two heating wires).
Use duct tape to close the end of the conduit so that thin-set can't penetrate the conduit.
Use duct tape to hold the sensor conduit into the groove to prevent it from floating up when the cement, mortar or thin-set is poured.
If the sensor is to be installed directly into a mortar or cement, use duct tape to secure to subfloor.

Step 4: PREPARE SUBFLOOR SURFACE

Clean and vacuum the floor thoroughly and remove dust and debris from the floor that may damage the heating cable.
Ensure that the subfloor is secure and stable. Carefully fill in all cracks to prevent any potential damage to the new tiles resulting from shifts in the subfloor. Thermal insulation for the subfloor is always an option.

Step 5: MEASURE THE RESISTANCE (THE FIRST TIME)

First, use a digital ohm meter to measure the resistance of the IQ FLOOR MAT (see 5 Commissioning) and compare it to "Table1 or Table 2". Next, measure the resistance between the white, black and shielding/ground wire. Both should read infinity. Record the measured resistance on the Warranty Card. Documenting the resistance at each stage of installation is required for warranty. Also, test for sensor resistance.

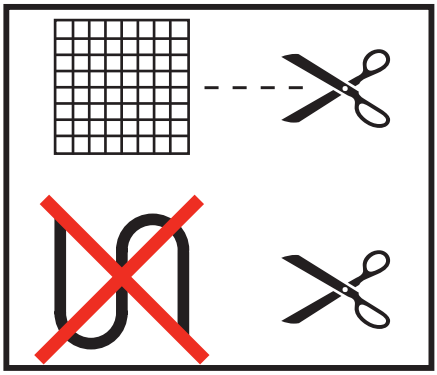


Step 6: BEGIN LAYING THE IQ FLOOR MAT

The adhesive on the bottom of the mat will prevent the mat from moving during installation. It may be moved several times before it loses its adhesiveness. Start by placing the mat with the connection point and the temperature sensor in their intended positions. Bring the power cable to the thermostat or connection box (see IQ THERMOSTAT Instructions).

Begin unrolling the IQ FLOOR MAT evenly across the floor, in the areas to be heated previously marked. When you reach the next wall, cut the mesh, turn the mat, and start rolling it in the desired direction. When approaching obstacles (toilets, cabinets, etc.) carefully remove some of the heating cable from the mat and guide the cable around the obstacle. In these cases you may carefully trim or cut away pieces of the mat. Then, use a glue gun or a thin strip of tape to secure the loose cable to the floor.

Important



NEVER CUT OR SHORTEN THE HEATING CABLE, OR CROSS CABLE OVER ITSELF.
MAINTAIN CABLE SPACING OF A MINIMUM OF 3", AND KEEP CABLE A MINIMUM OF 3" AWAY FROM ANY WALL WITHIN THE HEATED AREA.

Ensure that the IQ FLOOR MAT is in full contact with the subfloor at all times.
Avoid walking on the heating mat: If this is not possible, wear soft-soled shoes. It is recommended that you take a photo of the layout at this time.

Step 7: MEASURE THE RESISTANCE (THE SECOND TIME)

See 5, Commissioning.

Step 8: INSTALLING FINISHING FLOORING

CHECK AGAIN THAT THE SENSOR HAS BEEN PROPERLY INSTALLED (see Step 3).

Cover the heating cables with a layer of thin-set cement. Ensure that the thin-set cement or mortar covers the entire height of the heating cable. For engineered wood or laminate flooring, it is recommended that you contact the flooring manufacturer. (For these wooden floors, a minimum of 3/16 in. of self-leveling cement over the heating cable is usually required). Ensure that all moisture in the self-leveling cement has been fully eliminated. Minimum room temperature is usually 40F (5C°). Consult the manufacturer for exact drying time.

Important

The system must not be turned on until the thin-set cement has fully dried. A minimum of two weeks is recommended.

Step 9: MEASURE THE RESISTANCE (THE THIRD TIME)

See 5, Commissioning.

Step 10: FOR TILE INSTALLATION

To install tile, apply a layer of acrylic or latex modified thin-set using the ridged side of your trowel. Tile and grout the floor using best industry practices and in accordance with instructions provided by the manufacturer of the tile.

FOR INSTALLATION OF OTHER FLOORING MAYERIALS

It is required that you consult the manufacturer for the use of the floor finishing material for this exact use. Carpet and vinyl are prohibited for use.

Step 11: CONNECT POWER SUPPLY AND THERMOSTAT

The connection of the power supply and the IQ THERMOSTAT must be done by a qualified electrician in accordance with the Canadian Electrical Code (CEC) or the National Electrical Code (NEC). The electrician must connect the floor sensor to the thermostat before taking final resistance readings and recording them, as well as the previous three resistance readings, on the Warranty Card (see Step 13).
Note: You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the power to those electric heating cables.
Your IQ THERMOSTAT Instruction Manual must be consulted.

Step 12: MEASURE THE RESISTANCE (THE FOURTH TIME)

See 5, Commissioning.

Step 13: RECORD INFORMATION AND AFFIX LABELS

The homeowner must complete online or mail in the Warranty Card immediately after installing the IQ FLOOR MAT and IQ THERMOSTAT. Failure to do this voids the warranty. The warranty is subject to the conditions listed on the Warranty Card.
Put labels on the breaker in your electrical panel to show which circuit is dedicated to your IQ FLOOR MAT connection.
Keep a copy of the Warranty Card and all documentation related to the IQ FLOOR MAT and the IQ THERMOSTAT.

Step 14: ENJOY THE COMFORT OF IQ FLOOR MAT

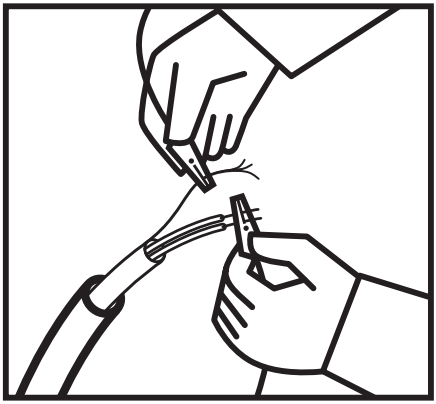
The IQ FLOOR MAT heating system is now ready to use. Increase the floor temperature gradually and adjust it until it reaches a comfortable level, depending on the type of room and your personal preferences. Be assured that your durable system will provide you with economical, reliable, comfortable heating.

5 COMMISSIONING

Important

For the extended 25-year limited warranty to apply, you must perform these tests, record the results on the Warranty Card, and retain a copy of the record.
As described, you must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times during the installation process (see **1.2**)

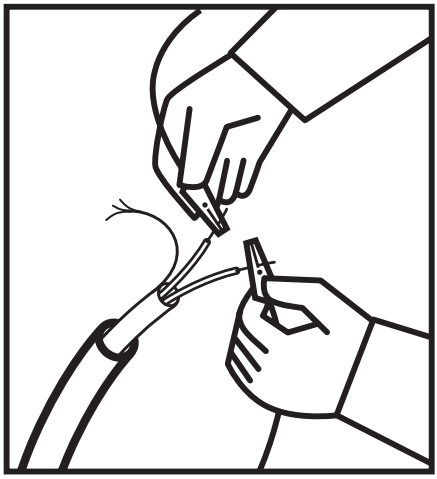
5.1 INSULATION RESISTANCE TEST



This test ensures that the insulating jackets of the mat are not damaged. A low value indicates the cable has been damaged and must be replaced.

1. Connect the ground wire to the black lead and both power wires to the red lead of the multi meter.
2. Make sure the meter reads "Open" or "OL." If you get a different reading, do not proceed.
3. Record these readings on the Warranty Card.

5.2 HEATING CABLE RESISTANCE TEST



This test measures the resistance of the IQ FLOOR MAT and is used to determine circuit integrity.

1. Set your multi meter to the 200 or 200 ohm range.
2. Connect the multi meter leads to the black and white cold lead wires.
3. Compare this resistance reading to the resistance specified in the Product Selection "Table 1 or Table 2". The value should be within ±10%. If you get a different reading, do not proceed.
4. Record these readings on the Warranty Card.

5.3 SENSOR RESISTANCE TEST

This test measures the resistance of the floor sensor and is used to verify the sensor integrity.

1. Set your multi meter to the 200K ohm range.
2. Connect the multi meter leads to the red and green lead wires.
3. Make sure the meter reads between 9-25K ohms. If you get a different reading, do not proceed.
4. Record these readings on the Warranty Card.

6 TROUBLESHOOTING

Symptom	Probable Causes	Corrective Action
Floor doesn't heat	No voltage.	Check circuit breaker.
	Circuit breaker tripped.	Check circuit breaker. Ensure that there are not too many mats or other appliances connected to the same circuit. The IQ FLOOR MAT may require a dedicated circuit. See the Product Selection "Table 1 or Table 2" of this manual.
	Ground-fault tripped in the thermostat.	Refer to IQ THERMOSTAT Instruction Manual.
	Thermostat not turned on.	Refer to Section 4 of this manual, and the IQ THERMOSTAT Instruction Manual.
	Cable not connected to the thermostat.	Refer to IQ THERMOSTAT Instruction Manual.
	Floor temperature sensor not connected.	Refer to IQ THERMOSTAT Instruction Manual.
	Faulty sensor.	Contact IQWATT representative.
Floor warm all the time	Clock not set correctly.	Refer to IQ THERMOSTAT Instruction Manual.
Floor not warm enough	IQ THERMOSTAT setting not set correctly.	Refer to IQ THERMOSTAT Instruction Manual.
Installation instructions not available		Download the latest version of the IQ FLOOR MAT Instruction Manual from www. IQWATT.ca.

WARRANTY - IQ FLOOR MAT

For a period of twenty-five (25) years from the date of purchase IQWATT warrants that the IQ FLOOR MAT heating cable, cords and mat will be free from defects in material, design and workmanship. The warranty is only valid if the Warranty Card has been filled in on the website or mailed in to an IQWATT location when the installation of the IQ FLOOR MAT system has been completed. For the purchaser's convenience, an image or copy of the proof of purchase can be submitted with the Warranty Card. A copy of the Warranty Card, along with the Installation Manual and proof of purchase, should be retained by the purchaser. It is mandatory that the installation be completed as instructed in the Installation Manual, as well as in accordance with the Canadian Electrical Code or NEC and with provincial or state and local regulations.

In the rare event of a purchaser experiencing a problem with the IQ FLOOR MAT cable, cord or mat, an IQWATT representative must be contacted. After verifying the proof of purchase, date of installation if completed, the attending electrician, the recorded resistance readings, the product, and the nature of the defect, the representative will determine whether the product should be delivered to an IQWATT location, with charges being the responsibility of the purchaser. A replacement product will be sent to the purchaser by IQWATT when the defect is identified.

IQWATT shall not be liable for any consequential and secondary costs or damages linked to any defect or replacement of the IQ FLOOR MAT.

THE FOREGOING WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ON THE PART OF IQ FLOOR MAT. IQWATT DISCLAIMS ANY WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IQWATT NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON, FIRM OR CORPORATION TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH SALE OR PRODUCT. IQWATT SHALL NOT BE HELD RESPONSIBLE FOR DAMAGE TO PERSON OR PROPERTY, CONSEQUENTIAL LOSS, LOSS OF PROFIT, LOSSES ON GOODS IN STORE, OR THE LIKE WHICH MIGHT ARISE OUT OF THE FAILURE OF THE EQUIPMENT DELIVERED, IRRESPECTIVE OF THE CAUSE (INCLUDING FAULTY MANUFACTURE).

How to claim this warranty

1. Contact a company representative. Information on the product and its installation will have been registered with IQWATT.
2. Provide information on the nature of the manufacturing defect, and confirm proof of purchase, date of installation, name of electrician, resistance readings taken, and product model.
3. The IQWATT representative will determine whether the product should be submitted for a warranty claim.
4. In the event that a product is determined to be defective a replacement product will be sent by IQWATT to the purchaser when a defect is confirmed.

Disclaimer:

This warranty gives you specific legal rights and you may also have some legal rights, which may vary from province to province or state to state. IQWATT hereby disclaims, and it is as a condition of the sale, that there are no implied warranties. Some provinces and states do not allow limitations on an implied warranty so the above limitation may not apply to you.

WARRANTY - IQ THERMOSTAT

IQWATT warrants that the IQ THERMOSTAT will be free of defects for a period of three (3) years from the date of purchase. In the rare event that the thermostat experiences a failure IQWATT will supply a replacement IQ THERMOSTAT in a timely manner.

How to claim the IQ THERMOSTAT warranty

1. Contact an IQWATT representative.
2. Send the defective product to an IQWATT administrative facility.
3. IQWATT will send the purchaser a replacement IQ THERMOSTAT.

iQWATT
Electrical Heating Systems
www.iqwatt.ca
info@iqwatt.ca

WARRANTY CARD

Name of purchaser _____

Address of purchaser _____

Location of installation _____

Date of completion of installation _____

Product purchased _____ Date of purchase /___ /___ /_____/

Proof of purchase (optional) _____

Name of electrician completing electrical resistance tests

_____

Record of Commissioning:

	First test	Second test	Third test
Result of cable resistance test (out of box)			
Result of sensor resistance test (after the mat has been laid)			
Result of sensor resistance test (after the thin-set or mortar has been applied and dried)			
Result of sensor resistance test (after the finishing flooring material has been laid)			

Steps for using the Warranty

In the rare event of a failure of the IQ FLOOR MAT system, the following steps must be taken.

1. The purchaser must first contact an IQWATT representative at www.iqwatt.ca, to discuss the problem.
2. At the representative's discretion, the defective product will be submitted to the IQWATT facility by the purchaser, who will assume any delivery charges.
3. If not already registered with IQWATT with the original Warranty Card, proof of purchase must be presented.
4. A replacement product will be delivered to the purchaser when a defect in the original product is confirmed.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