SOLFEX
UNDERFLOOR HEATING

Underfloor Heating Cable
Installation Manual

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Contents

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Important Safeguards and Warnings

⚠ WARNING: Shock and fire hazard

If the SOLFEX Heating Cable system is damaged or not installed properly, fire or shock could occur resulting in serious personal injuries or damage to property. You must carefully follow the warnings and instructions contained in this manual.

- The SOLFEX thermostat must be used.
- It is important that this equipment is installed only by qualified electricians who are familiar with the proper sizing, installation, construction and operation of floor warming system and the hazards involved. The installation must comply with all national and local electrical codes. If you are unfamiliar with these requirements, contact an electrician.
- The heating cable is designed for under floor heating purposes only. Be sure that the floor is not penetrated by nails, screws, or similar devices that can cause damage on first installation or during subsequent floor repairs in the future.
- If the SOLFEX Heating Cable system is damaged, it must be replaced. Do not attempt to splice or repair any part of the system

1 General Information

1.1 Use of the Manual

This manual describes the SOLFEX Heating Cable system; how to design the room, select the product, and install the system. It is important to thoroughly review the SOLFEX Thermostat Installation and Operation manual prior to installation.

For additional information regarding any aspect of the SOLFEX Heating Cable system, contact:

SOLFEX Ltd
Unit 16,
Carnival Park,
Carnival Way,
Basildon,
Essex,
SS14 3AD

Tel: **01268744249**
Fax: **01268 200137**
Email: **sales@solfexufh.co.uk**

1.2 Safety Guidelines

The safety and reliability of any floor heating system depends on proper design, installation, and testing. Incorrect installation or mishandling of the product can cause damage to the heating cable, system components and property, and can create a risk of fire or shock. The guidelines and instructions contained in this guide are important. Follow them carefully to minimize these risks and to ensure that the SOLFEX Heating Cable system performs reliably.

Pay special attention to the following:

- Instructions marked Important
- Safety warnings identified as ⚠ WARNING

1.3 Remember to measure resistance

The resistance should be measured between the two conductors, blue and brown. Compare this resistance reading to the resistance specified in the Product Selection "Table 1". The value should be within -5% ~+10%. If you get a different reading, contact SOLFEX on 01268 744 249
Also, measure the resistance between the blue, brown and shielding/earth wire. Both should read infinity. If you get a different reading, contact SOLFEX at 01268 744 249
Please refer to "5 Commissioning" for instructions on how to measure the resistance.

Important: measure the resistance four times during the installation process

Remember to always measure, verify and record the actual resistance throughout the installation process (out of the box, after installation, after thin set cement or self-leveler application and after installation of floor tiles).

1.4 15-year Limited Warranty

For a period of fifteen (15) years from the date of purchase SOLFEX warrants that the SOLFEX Heating Cable heaing cable is free from defects in material, design and workmanship. The extended warranty is only valid if the warranty form has been properly completed and submitted online at www.SOLFEX.co.uk/ufhwarranty and the installation is in accordance with the installation instructions.

2 SOLFEX Heating Cable System

2.1 SOLFEX Heating Cable Specifications

Cable Construction	Twin conductor
Rated Voltage	230V
Output	12W/m & 18W/m
Heating Element Size	12.5-150.0m (12W/m) & 7.5-154.2m (18W/m)
Bending radius	25mm
Cable Diameter:	3.6mm
Conductor Insulation	fluoropolymer
Outer Insulation:	PVC
Max. Ambient Temp.	30°C
Min. Installation Temp.	5°C
Cold lead	2-wire plus ground braid; 2.5m length

2.2 SOLFEX Thermostat Specifications

Functions:	On/Off control, digital display, 5/2 day 7-dayprogrammable or 24hr mode
Supply Voltage :	120/240 V ±15%, 50/60 Hz
Maximum switching current :	16 Amp
Temperature control range :	5 to 35°C
Ambient range :	0 to 45°C
Floor temperature sensor :	2-wire, 3.0m lead wire (can be extended upto 20m) NTC Thermistor 10K @ 25C

2.3 SOLFEX underwood heater typical installations and applications

Alternative method: self-leveling cement is recommended for large surfaces and the following floor materials: engineered wood, laminate, floating floors, vinyl, linoleum and carpet.

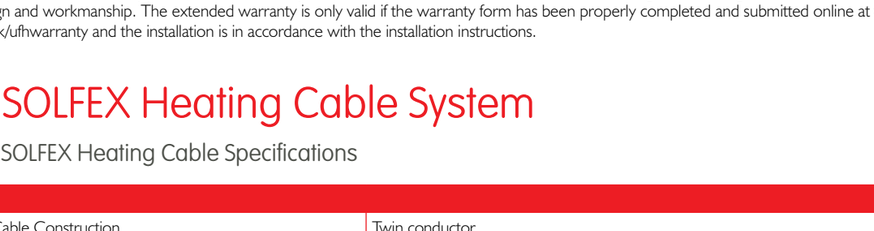

Figure 1: Directly on plywood

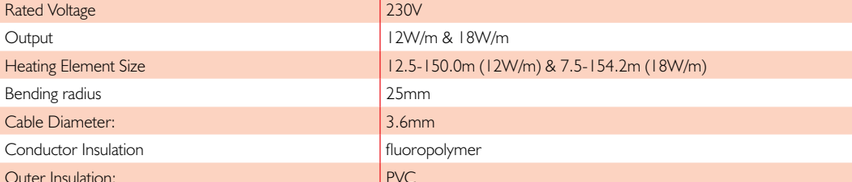

Figure 2: Directly on concrete

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⚠ Warning

Consult the manufacturer for information on special installation requirements for wood, laminate and vinyl or linoleum flooring

Important

- Read the instructions carefully before installing SOLFEX Heating Cable system.
- Remember to measure the resistance four times.
- Do not install SOLFEX Heating Cable in walls or ceilings.
- The cable must be embedded in mortar, thinset, concrete or similar material.
- The minimum installation temperature is 5°C.
- The heating cable cannot be cut to length, crossed over itself, or installed too close.
- It is recommended to use copper wire only.
- Remember to check that the supply voltage matches the voltage of the SOLFEX Heating Cable.
- Remember to place the labels as written in this instruction.
- Only for indoor installation.
- Metal structures or materials used for the support of or on which the SOLFEX Heating Cable is installed must be grounded in accordance with CSA Standard C22.1, section 10 and the NEC.

Please consult the factory for any other questions or advice.

3 Floor Heating Design and Product Selection

3.1 Design the Installation

Step 1: Measure the heated area
Determine the heated area of the floor where there are no permanent fixtures or furniture such as showers, toilets, vanities, or cabinets. Measure the heated area of the floor.

For example, in Figure 3, the area of the bathroom is 8.75m^2. When you subtract the area of the vanity, shower and toilet, the total heated area is only 6.8m^2 .

Step 2: Determine the power supply voltage
Make sure the supply voltage is 230 V.

Important

Operating the 230V cable at 220V will reduce 8.5% output, at 240V will add 8.9% output.

Step 3: Plan the design
Determine the optimum floor heating Cable layout for your heated area to ensure coverage. Select a spot for the thermostat in the wall above the heated area where it can be reached by the 2.5m cold lead on the SOLFEX Heating Cable, and the 3m floor temperature sensor. Please refer to Figure 4.

Important

The predetermined SOLFEX Heating Cable spacing must be maintained to ensure proper floor heating. Do not change the SOLFEX Heating Cable heating cable spacing when you lay out the cable or the floor may have cold spots.

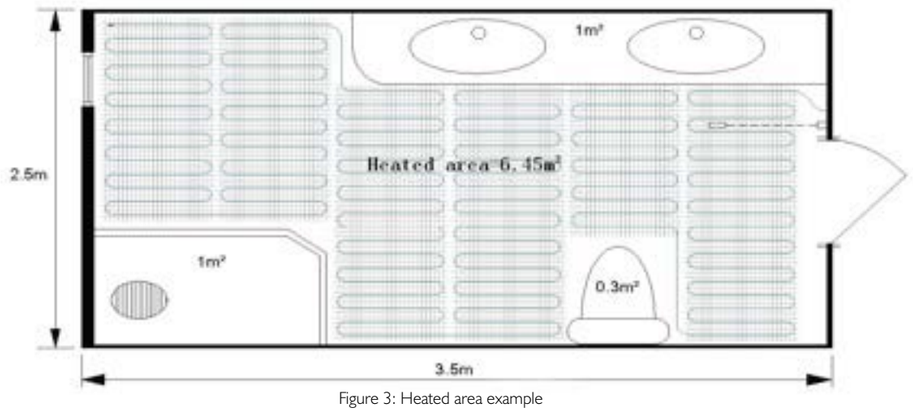

Figure 3: Heated area example

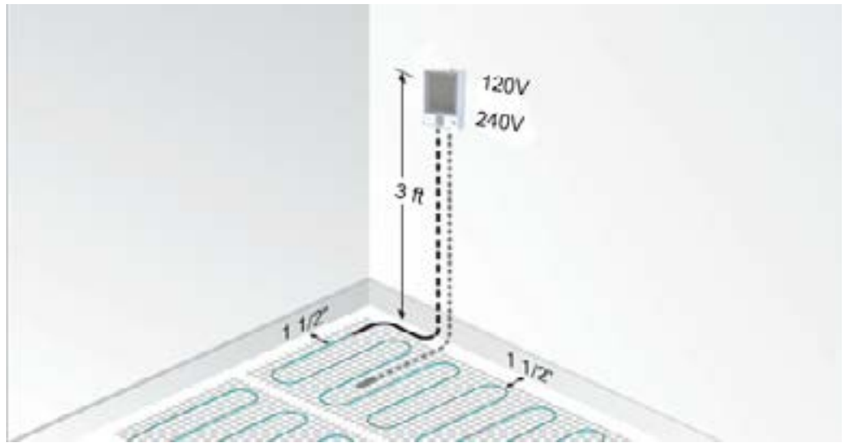

Figure 4: Typical cold lead and floor temperature sensor

3.2 Confirm Your Product Selection

Confirm that your SOLFEX Heating Cable is no larger than the heated area. Following the example from Figure 3, if the heated area is 6.8m^2, and you if prefer 150W/m^2, then 6.8*150=1020W, select SOLFEX Heating Cable/12-900 system.

Table 1: SOLFEX Heating Cable Product Selection

Product Code	Length (m)	Resistance (Ohms)	Watts	Amps
UFH-ELEC-ROLL-150	12.5	352.7	150	0.7
UFH-ELEC-ROLL-225	18.8	235.1	225	1.0
UFH-ELEC-ROLL-300	25.0	176.3	300	1.3
UFH-ELEC-ROLL-375	31.3	141.1	375	1.6
UFH-ELEC-ROLL-450	37.5	117.6	450	2.0
UFH-ELEC-ROLL-525	43.8	100.8	525	2.3
UFH-ELEC-ROLL-600	50.0	88.2	600	2.6
UFH-ELEC-ROLL-675	56.3	78.4	675	2.9
UFH-ELEC-ROLL-750	62.5	70.5	750	3.3
UFH-ELEC-ROLL-900	75.0	58.8	900	3.9
UFH-ELEC-ROLL-1050	87.5	50.4	1050	4.6
UFH-ELEC-ROLL-1200	100.0	44.1	1200	5.2
UFH-ELEC-ROLL-1350	112.5	39.2	1350	5.9
UFH-ELEC-ROLL-1500	125.0	35.3	1500	6.5
UFH-ELEC-ROLL-1800	150.0	29.4	1800	7.8

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4 Installation

Important: Tools and materials required

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

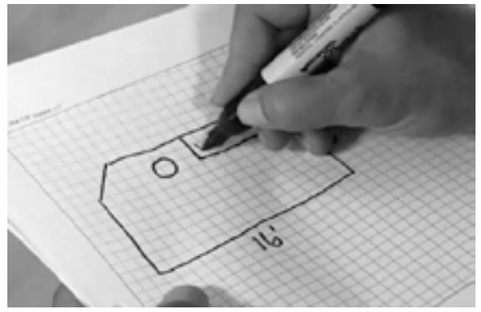
- Scissors
- Utility knife
- Wire strippers
- Tape measure
- Screwdriver
- Multimeter

You will also need the appropriate tools and materials to install your particular floor. These will likely include products like self-leveling mortar, thin-set mortar, backer board, tile, a notched trowel, and any other tools for your specific floor.

Follow these steps to ensure a successful SOLFEX Heating Cable installation.

Step 1: PLAN LAYOUT

Make a sketch layout or a floor plan of the room; include all permanent furnishings such as toilets, bathtubs, appliances, cabinets, etc. Indicate all dimensions required to determine the available floor area and the position of the SOLFEX thermostat.



Important

SOLFEX recommends that the installation is documented with photos to note the location of connections and the sensor.

Step 2: TRANSFER LAYOUT TO FLOOR

Draw an outline of the layout on the room floor including a foot print of all furnishings that are not yet installed. Unroll the first few feet of the SOLFEX Heating Cable. The starting point of the cable must be placed within 2.5m from the thermostat. Using your floor plan determine your desired spacing of cable and strapping (recommended 0.5-1m apart).

Important

Minimum distance between the cables must be 50mm or greater. Mark the position of the connection point between the power lead and the purple SOLFEX Heating Cable heating cable. This connection must be concealed in thinset or self-leveling cement. When using a floor temperature sensing thermostat, mark the sensor position in the middle of 2 heating cables, about 25cm away from the wall (within the heated area), as close as possible to the thermostat.

Step 3: INSTALL SENSOR

Install the sensor now, either in conduit tube, or directly to the subfloor. It is recommended that the sensor be installed in conduit tube. This will allow the sensor to be easily replaced in the unlikely event of failure.

The sensor and/or tube needs to be installed between the thermostat wall box and the sensor position. The conduit tube must be partially countersunk into the subfloor. Cut a channel approximately 2cm deep × 2cm wide in the floor and wall up to the thermostat for the sensor conduit. The conduit has to go from the thermostat and minimum of 25cm away from the wall towards the middle of the floor.

Important

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

Step 5: MEASURE THE RESISTANCE (THE FIRST TIME)

Use a digital ohm meter to measure the resistance of the SOLFEX Heating Cable and compare it to "Table1". Record the measured resistance on the warranty card. Documenting the resistance at each stage of installation is required for warranty purposes. Also, measure the resistance between the blue, brown and shielding/ ground wire. Both should read infinity.

Please refer to "5 Commissioning" for instructions on how to measure the resistance.

Step 6: BEGIN LAYING THE SOLFEX HEATING CABLE

Place the cable so that the connection point and the temperature sensor are in their intended positions and bring the power lead cable to the thermostat or connection box. Begin laying the SOLFEX Heating Cable according to the layout developed in Step 1.

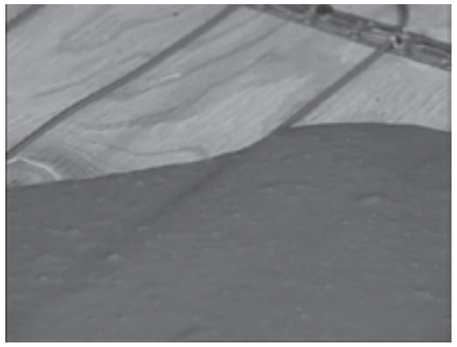
DO NOT CUT OR SHORTEN THE PURPLE HEATING CABLE!

Do not expose it to any mechanical stress. Avoid walking on the heating cable. Wear only shoes with soft soles. Use the duct tape to secure the cable to the subfloor.

ENSURE THAT THE SENSOR CONDUIT HAS BEEN PROPERLY INSTALLED BEFORE PROCEEDING (refer to Step 3).

It is highly recommended to take photographs of the installed SOLFEX Heating Cable before installing the flooring.

Step 7: MEASURE THE RESISTANCE (THE SECOND TIME)



Please refer to Step 5.

Step 8: EMBED THE FLOOR HEATING CABLE IN MORTAR

For tiling applications, proceed with the installation of the tiles by covering the heating cables with a layer of thinset cement as directed by the tile manufacturer. Ensure that the thinset mortar covers the entire heating cable as the tiles are installed. For engineered wood or laminate floor coverings, it is recommended to consult the flooring manufacturer for maximum temperature allowance (use a thermostat with a floor temperature limiter). Ensure that all moisture in the self-leveling cement has been fully eliminated in accordance with the drying times recommended by the cement manufacturer (consult the manufacturer for exact drying time).

Important

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

Step 9: MEASURE THE RESISTANCE (THE THIRD TIME)

Please refer to Step 5.

Step 10: INSTALL THE TILE

To install the 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.

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Step 11: CONNECT POWER SUPPLY AND THERMOSTAT

The connection of the power supply and the SOLFEX thermostat must be done by a qualified electrician in accordance with the National Electrical Code (NEC) and the Canadian Electrical Code (CEC). The electrician should connect the floor sensor to the thermostat, take the final resistance reading and record it on the warranty card, see Step 13.
Note: You need to mark the appropriate circuit breaker reference label indicating which branch circuit supplies the circuits to those electric space heating cables.

Step 12: MEASURE THE RESISTANCE (THE FOURTH TIME)

Please refer to Step 5.

Step 14: RECORD INFORMATION AND AFFIX LABELS

It is important for the homeowner to register the warranty certificate immediately after installing the system (cable and thermostat). Failure to do so could void the manufacturer's warranty. The warranty is subject to the guarantee conditions listed on the warranty certificate.
Keep a copy of the warranty card for your reference.

Step 15: ENJOY THE COMFORT OF SOLFEX HEATING CABLE

The SOLFEX Heating Cable 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.

5 Commissioning

Important

For the extended 15-year limited warranty to apply, you must perform these tests, record the results on the warranty card, and retain a copy of the record. You must perform the Insulation Resistance Test, the Heating Cable Resistance Test, and the Sensor Resistance Test four times (Please refer to Section 4) during the installation process.

5.1 Insulation Resistance Test

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

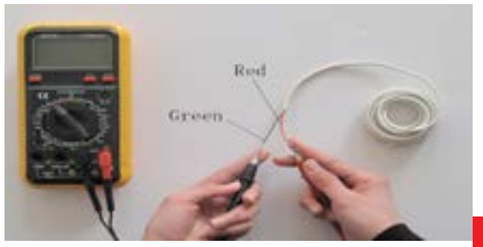
1. Connect the ground wire to the black lead and both power wires to the red lead of the multimeter.
2. Make sure the meter reads "Open" or "OL." If you get a different reading, contact SOLFEX at 01268 744 249.
3. Record these readings on the warranty card.

5.2 Heating Cable Resistance Test

This test measures the resistance of the SOLFEX Heating Cable and is used to determine circuit integrity.

1. Set your multimeter to the 200 or 2000 ohm range.
2. Connect the multimeter leads to the brown and blue cold lead wires.
3. Compare this resistance reading to the resistance specified in the Product Selection "Table 1". The value should be within -5% ~+10%. If you get a different reading, contact SOLFEX at 01268 744 249
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 multimeter to the 200K ohm range.
2. Connect the mutimeter leads to the red and green lead wires.
3. Make sure the meter reads between 9-25K ohms. If you get a different reading, contact SOLFEX at 01268 744 249.
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	Ensure that there are not too many cables or other appliances connected on the same circuit. The SOLFEX Heating Cable 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 SOLFEX Thermostat Installation and Operation Manual
	Thermostat not turned on	Refer to Section 4 of this manual, and the SOLFEX Thermostat Installation and Operation Manual
	Cable not connected to SOLFEX thermostat	Refer to SOLFEX Thermostat Installation and Operation Manual
	Floor temperature sensor not connected	Refer to SOLFEX Thermostat Installation and Operation Manual
	Faulty sensor	Contact SOLFEX on 01268 744 249
Floor warm all the time	Clock not set correctly	Refer to SOLFEX Thermostat Installation and Operation Manual
Floor not warm enough	SOLFEX thermostat setting not set correctly	Refer to SOLFEX Thermostat Installation and Operation Manual
Installation instructions not available		Download the latest version of SOLFEX underwood heater system Installation Instructions from www.solfexufh.co.uk

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Extended Warranty

For a period of fifteen (15) years from the date of purchase SOLFEX warrants that the SOLFEX Heating Cable heating cable is free from defects in material, design and workmanship. The extended warranty is only valid if the warranty form has been properly completed and submitted online at www.solfexufh.co.uk/warranty and the installation is in accordance with the installation instructions.

The defective SOLFEX Heating Cable heating cable has to be inspected by or submitted to SOLFEX or an authorized SOLFEX Heating Cable dealer. Failure to comply with all of the foregoing will void this extended warranty. SOLFEX will, when the customer has documented that a defect in the SOLFEX Heating Cable was present at the date of delivery, repair or supply a new SOLFEX Heating Cable at SOLFEX' option. All claims shall be made within the extended warranty period. SOLFEX shall not be liable for any claims made later than ten years from date of purchase.

SOLFEX shall not be liable for any consequential and secondary costs or damages linked to the defect or replacement of the SOLFEX Heating Cable. This warranty covers product replacement only and does not cover any sub base, floor finishes and any costs associated in replacing these.

THE FOREGOING WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ON THE PART OF SOLFEX. SOLFEX DISCLAIMS ANY WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOLFEX NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON, FIRM OR CORPORATION TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH SALE OR PRODUCT. SOLFEX 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

Contact the company's Customer Service department and provide the following information:

1. Nature of the manufacturing defect
2. Date of purchase and, if already installed, date of installation
3. If installed, name of electrician and flooring installer
4. Resistance readings taken by installer
5. Proof of purchase and serial number from product label

Our Customer Service department will provide you with an authorization number and advise you on the next steps to complete your warranty claim.

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

SOLFEX can accept no responsibility for possible errors in catalogs, brochures, other printed materials, and website information. SOLFEX reserves the right to alter its products without notice. This also applies to products already on order provided that such alteration can be made without subsequent changes being necessary in specifications already agreed upon.

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