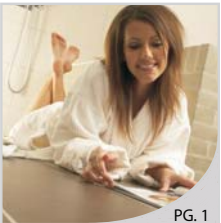


BRINGING WARMTH TO LIFE

Danfoss



Electric Floor Heating



PG. 1

Electric Snow Melting



PG. 9

Roof & Gutter De-Icing



PG. 21

Pipe Freeze Protection



PG. 25

Thermal Storage

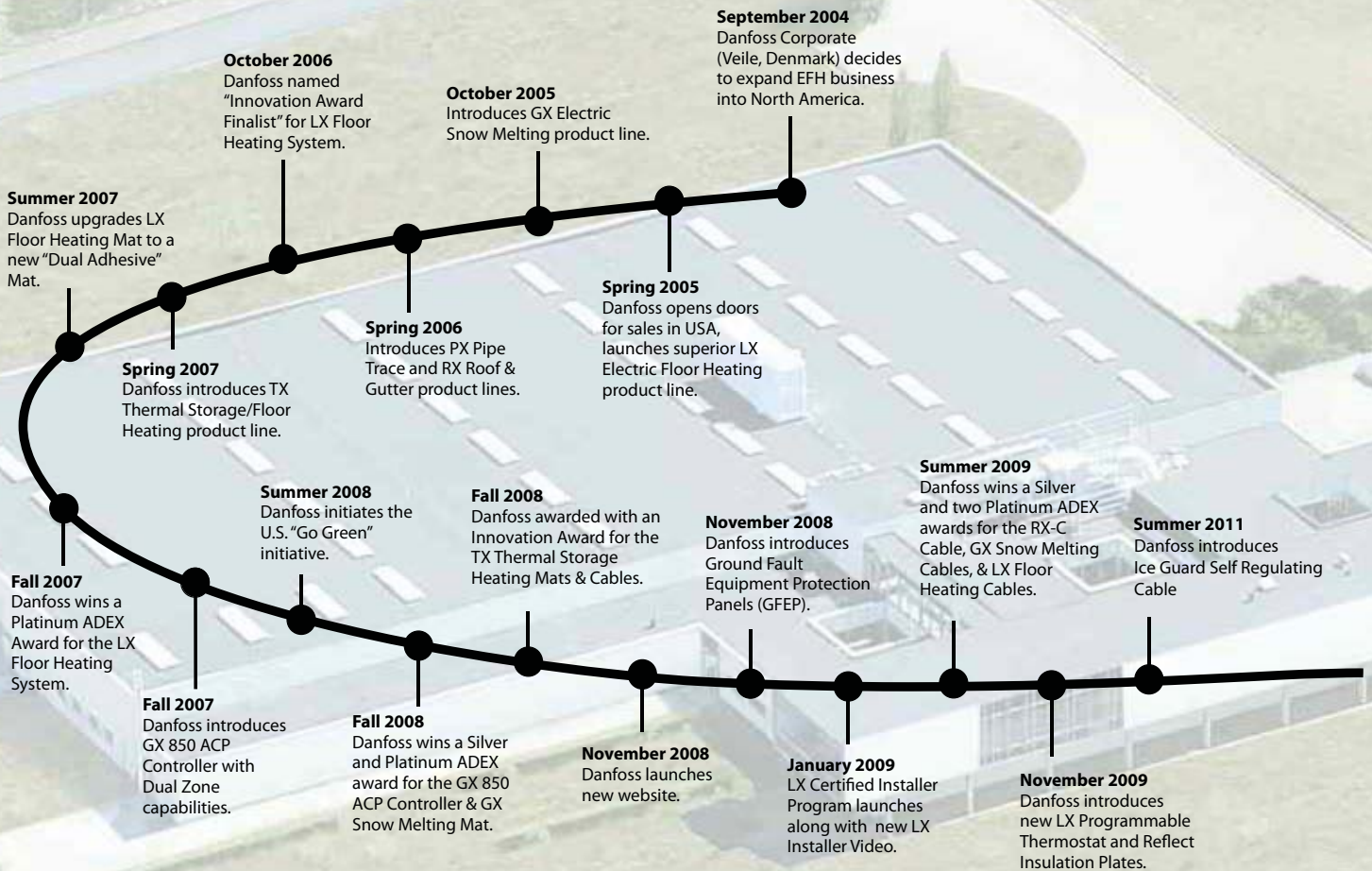


PG. 31

Danfoss Electric Heating Products
2012 CATALOG

A Brief History of...

Danfoss



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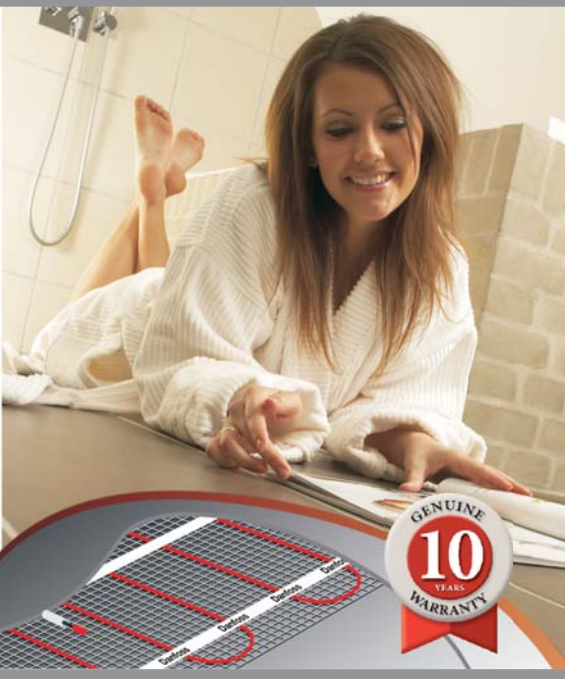
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Danfoss LX Electric Floor Heating

Dual Self-Adhesive Mats

Danfoss LX Electric Floor Heating System (Self-Adhesive Mat & Thermostat) is an affordable luxury that brings warmth to life. It's a proven technology that is safe, reliable and energy efficient. The unique adhesive system SAVES 70% ON INSTALLATION TIME!

- Pre-applied heating cable means even heat every time
- Dual-adhesive backing, no fastening required
- Single point connection
- Twin conductor cable
- Eliminates EMF's (electromagnetic fields)
- Customize mat on the job site
- Minimal thickness-only adds 3/16" height to the floor
- Safety approved for wet locations
- Even heat every time
- No fastening required
- Genuine ten year non-prorated warranty, includes labor and materials



Easy to Install!



Unroll the self-adhesive mat onto the floor



Cut the mesh to turn
Never Cut the RED Cable



Install tile / floor coverings

Please visit our YouTube channel for step by step installation instructions:
www.youtube.com/danfossLX

| Technical Data | LX Mats |
|-------------------------|--|
| Mat Construction: | Thermoplastic polymer coated fiberglass, self adhesive backing |
| Cable Construction: | Twin Conductor |
| Cable Diameter: | 3/16" (4.8mm) |
| Rated Voltage: | 120V, 208V, 240V |
| Max. Rated Temperature: | 212°F (100°C) |
| Conductor Insulation: | Teflon™ FEP |
| Outer Insulation: | PVC |



Installs in minutes!



Visit www.LXinstaller.com to learn about the Danfoss Installer Certification program

LX Thermostat

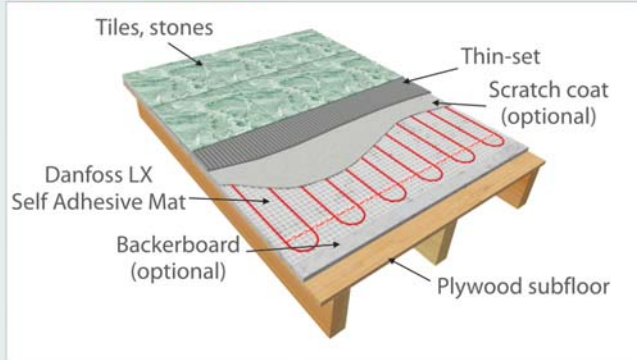
LX Floor Heating Mats

Please take into consideration the locations of sinks, tubs, toilets and objects on the floor when measuring the floor area

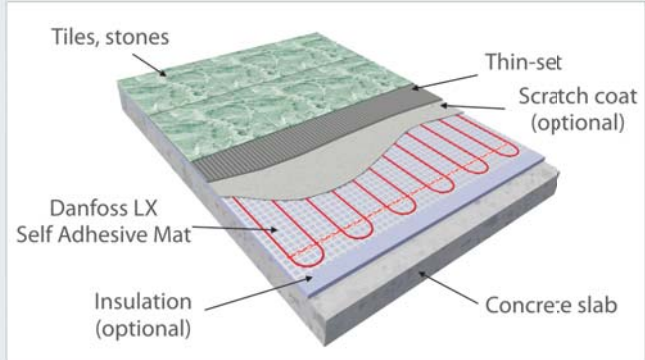
Danfoss LX Electric Floor Heating

Typical Applications

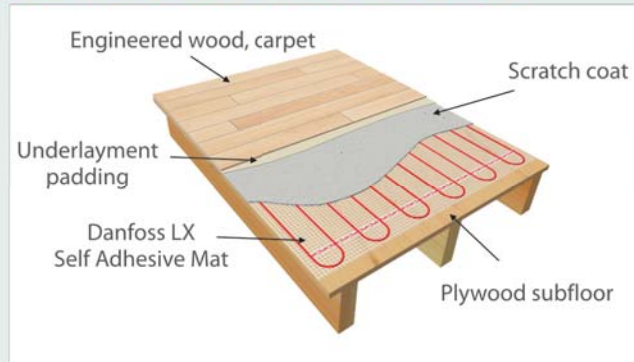
PLYWOOD SUBFLOOR



CONCRETE SUBFLOOR



ENGINEERED WOOD, LAMINATE OR CARPET



| Ordering Information | | LX Mats | | 120V, 240V | | |
|----------------------|----------|---------------|-------------------|------------|------|--------------------|
| Part No. | | Length (feet) | Coverage (sq.ft.) | Amps | | Watts (12W/sq.ft.) |
| 120V | 240V | | | 120V | 240V | |
| 088L3150 | - | 5.0 | 10 | 1.0 | - | 120 |
| 088L3151 | - | 7.5 | 15 | 1.5 | - | 180 |
| 088L3152 | - | 10.0 | 20 | 2.0 | - | 240 |
| 088L3153 | - | 12.5 | 25 | 2.5 | - | 300 |
| 088L3154 | - | 15.0 | 30 | 3.0 | - | 360 |
| 088L3155 | 088L3175 | 17.5 | 35 | 3.5 | 1.8 | 420 |
| 088L3156 | 088L3176 | 20.0 | 40 | 4.0 | 2.0 | 480 |
| 088L3158 | 088L3177 | 25.0 | 50 | 4.9 | 2.5 | 600 |
| 088L3160 | 088L3178 | 30.0 | 60 | 6.0 | 3.0 | 720 |
| - | 088L3179 | 35.0 | 70 | - | 3.5 | 850 |
| - | 088L3180 | 40.0 | 80 | - | 4.0 | 960 |
| - | 088L3181 | 45.0 | 90 | - | 4.5 | 1,080 |
| - | 088L3182 | 50.0 | 100 | - | 5.0 | 1,200 |
| - | 088L3183 | 55.0 | 110 | - | 5.5 | 1,320 |
| - | 088L3184 | 60.0 | 120 | - | 6.0 | 1,440 |
| - | 088L3185 | 72.5 | 145 | - | 7.3 | 1,740 |



Notes:

- All mats are 2 feet in width
- Power leads are 10 feet in length
- Watt output of the 240V mats are reduced by 25% when operated at 208V (9W/sq.ft.)
- Floor sensor conduit is included
- Contactor or Power Module is required for loads exceeding 15 amps on a single thermostat (see pg.6 for details)

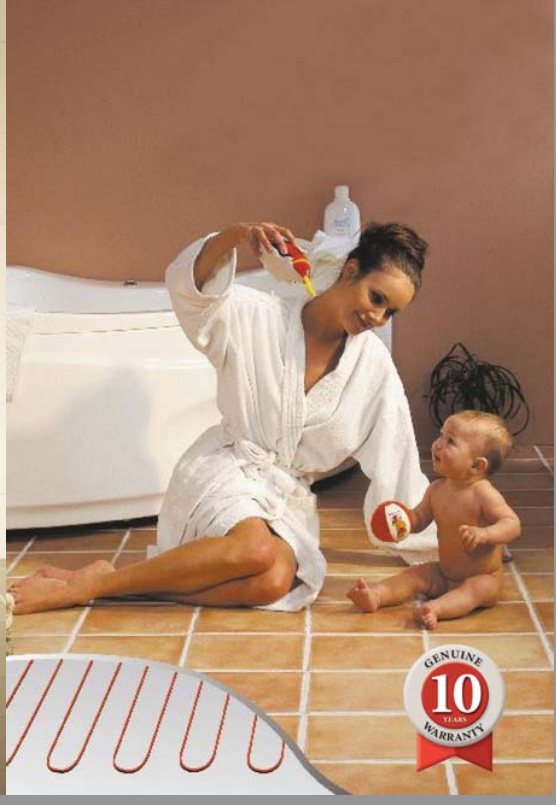
Controls - See PG. 5
Accessories- See PG. 6

Danfoss LX Electric Floor Heating

Electric Floor Heating Cables

Danfoss LX Electric Floor Heating Cable Systems combine the highest comfort levels with the maximum energy efficiency. Our Electric Floor Heating Cable Systems offer the following features:

- Single point connection
- Twin conductor cable
- Eliminates EMF's (electromagnetic fields)
- Safety approved for wet locations
- Flexible installation
- Durable construction
- Genuine ten year non-prorated warranty, includes labor and materials



Installation



Attach the Danfoss cable strapping to the sub floor (3' - 4' apart)



Place the LX cable in the tabs (3" standard spacing)



Clip the LX Cable in place

| Technical Data | LX Cables |
|-------------------------|------------------|
| Cable Construction: | Twin Conductor |
| Cable Diameter: | 3/16" (4.8mm) |
| Rated Voltage: | 120V, 208V, 240V |
| Max. Rated temperature: | 212°F (100°C) |
| Conductor Insulation: | Teflon™ FEP |
| Outer Insulation: | PVC |



Flexible installation!



Please visit our YouTube channel for step by step installation instructions:
www.youtube.com/danfossLX

Please take into consideration the locations of sinks, tubs, toilets and objects on the floor when measuring the floor area

Danfoss LX Electric Floor Heating

Electric Floor Heating Cables

| Ordering Information | | LX Cables | | | 120V | | |
|----------------------|---------------|------------------------------------|---------------------|------------|------|----------------|---------------------------------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | | Amps | Watts (3W/ft.) | LX Strapping included: feet (m) |
| | | 2" spacing | Standard 3" spacing | 4" spacing | | | |
| 088L3140 | 40 | 5 | 10 | 15 | 1.0 | 120 | 15 (4.6) |
| 088L3141 | 60 | 10 | 15 | 20 | 1.5 | 180 | 15 (4.6) |
| 088L3142 | 80 | 15 | 20 | 25 | 2.0 | 240 | 30 (9.1) |
| 088L3143 | 120 | 20 | 30 | 40 | 3.0 | 360 | 30 (9.1) |
| 088L3144 | 160 | 25 | 40 | 55 | 4.0 | 480 | 75 (22.9) |
| 088L3145 | 200 | 35 | 50 | 65 | 5.0 | 600 | 75 (22.9) |
| 088L3146 | 240 | 40 | 60 | 80 | 6.3 | 750 | 75 (22.9) |
| 088L3147 | 280 | 45 | 70 | 95 | 7.2 | 860 | 75 (22.9) |
| 088L3148 | 315 | 50 | 80 | 105 | 8.0 | 960 | 75 (22.9) |



| Ordering Information | | LX Cables | | | 240V | | |
|----------------------|---------------|------------------------------------|---------------------|------------|------|----------------|---------------------------------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | | Amps | Watts (3W/ft.) | LX Strapping included: feet (m) |
| | | 2" spacing | Standard 3" spacing | 4" spacing | | | |
| 088L3080 | 80 | 15 | 20 | 25 | 1.0 | 245 | 30 (9.1) |
| 088L3081 | 120 | 20 | 30 | 40 | 1.5 | 365 | 30 (9.1) |
| 088L3082 | 160 | 25 | 40 | 55 | 2.0 | 480 | 75 (22.9) |
| 088L3083 | 200 | 35 | 50 | 65 | 2.5 | 605 | 75 (22.9) |
| 088L3084 | 240 | 40 | 60 | 80 | 3.0 | 725 | 75 (22.9) |
| 088L3085 | 280 | 45 | 70 | 95 | 3.5 | 840 | 75 (22.9) |
| 088L3086 | 320 | 55 | 80 | 105 | 4.0 | 965 | 75 (22.9) |
| 088L3087 | 360 | 60 | 90 | 120 | 4.5 | 1080 | 105 (32.0) |
| 088L3088 | 400 | 65 | 100 | 135 | 5.0 | 1200 | 105 (32.0) |
| 088L3089 | 440 | 75 | 110 | 145 | 5.5 | 1330 | 150 (45.7) |
| 088L3090 | 480 | 80 | 120 | 160 | 6.5 | 1445 | 150 (45.7) |
| 088L3091 | 570 | 95 | 140 | 190 | 7.1 | 1710 | 150 (45.7) |
| 088L3092 | 630 | 105 | 160 | 210 | 8.0 | 1915 | 150 (45.7) |

Notes:

- Cable strapping is supplied with product. Additional cable strapping can be ordered separately (See pg. 6)
- 2" centers provide 18W/sq.ft.
- 3" centers provide 12W/sq.ft.
- 4" centers provide 9W/sq.ft.
- Watt output of the 240V cable is reduced by 25% when operated at 208V (approximately 2W/ft.)
- Power leads are 10 feet in length
- Floor sensor conduit is not included (Part # 19809099)
- Contactor or Power Module is required for loads exceeding 15 amps on a single thermostat (See Pg. 6)

**Controls - See PG. 5
Accessories- See PG. 6**

Danfoss LX Electric Floor Heating



Non-Programmable



Electric Floor Heating Thermostats

The Danfoss LX Thermostat raises the bar for aesthetic appeal while offering industry-leading functionality. The LX electronic thermostat offers optimum comfort and numerous user friendly features:

- Large backlit display for easy programming
- Includes Class-A GFCI for safety (approved for wet locations)
- Simple to program with intuitive on-screen menus
- Monitor energy consumption
- Dual voltage capability (can operate at either 120V or 240V)
- Four event, seven day ENERGY SAVINGS programming
- Easily upgrade older model LX thermostats

| Technical Data | LX Thermostats |
|--|--|
| Temperature Range: | 40°F to 104°F 5°C to 40°C |
| GFCI: | Class A (5mA trip level) |
| Supply Voltage: | 120V - 240V max., 50/60Hz |
| Max. Load: | 15A max (resistive load) |
| Max. Power: | 1,800W at 120VAC 3,600W at 240VAC |
| Programmable Thermostat Dimensions (HxWxD): | 4.80" x 3.00" x 1.00" 123mm x 74mm x 25mm |
| Manual Thermostat Dimensions (HxWxD): | 4.65" x 2.90" x 1.90" 118mm x 74mm x 48mm |



| Ordering Information | LX Thermostats | 120V - 240V |
|----------------------|--|-------------|
| Part No. | Description | |
| 088L5130 | LX Programmable Thermostat with Floor Sensor | |
| 088L5132 | LX Programmable Thermostat with Air Sensor (and floor temperature limiter) | |
| 088L5133 | LX Non-Programmable Thermostat with Floor Sensor | |

Note: All Thermostats include a Floor Sensor with a 10 foot lead.

Danfoss LX Electric Floor Heating

LX Power Module

The LX Series Power Module makes it easy to connect more heating mats or cables to the same thermostat without the need for contactor panels.

- An easy control solution for large areas
- Receives on/off command from the main thermostat
- Each Power Module adds 15A switching capability
- Up to 5 Power Modules can be added to the thermostat
- Includes Class-A GFCI for safety (approved for wet locations)
- For use with Programmable LX thermostat only



| Ordering Information | | Power Module / Contactor | | |
|----------------------|-----------------------------|--------------------------|--------------|-------------------|
| Part No. | Description | Max. Amps | Coil Voltage | No. of Contactors |
| 088L5135 | Power Module with GFCI | 15 | N/A | 1 |
| 088L3450 | Single Contactor, 600V max. | 40 | 120 | 1 |
| 088L3451 | Single Contactor, 600V max. | 40 | 208-240 | 1 |

Contactor or LX Power Module is required for loads exceeding 15 Amps on a single thermostat
All contactors are complete with NEMA 1 enclosure

Cable Strapping



Part # 088L1050/51

Little Buzzer



Part # 088L0028

Electric Floor Heating Accessories

| Ordering Information | | LX Accessories |
|----------------------|---|----------------|
| Part No. | Description | |
| 088L1050 | Cable Strapping (15 ft/4.5 m) | |
| 088L1054 | Cable Strapping (75 ft/22.9 m) | |
| 088L3008 | Replacement floor sensor for LX Thermostat | |
| 088L0014 | LX Repair Kit (includes: crimp connectors, repair wire, heat shrink, tubes) | |
| 19809099 | Sensor Conduit (8 ft) | |
| 088L0028 | Little Buzzer (continuity alarm) | |

Sensor Conduit



Part # 19809099

Little Buzzer - Continuity Alarm (088L0028)

Simplify your installation process by using the Little Buzzer by Danfoss.

The Little Buzzer is designed to monitor Danfoss Heating Mats or Cables during installation and will sound an alarm if the heating element is cut or damaged. This allows an easy repair before the floor covering is laid. The Little Buzzer is battery powered with a set of batteries included.

NOTE: A continuity alarm does not replace the need for measuring and verifying the Ohm resistance three times throughout the installation process. Failure to do so may result in voiding the warranty.

LX Repair Kit



Part # 088L0014

Floor Sensor



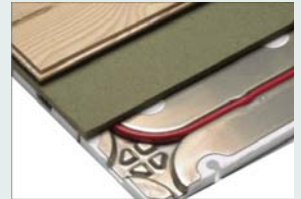
Part # 088L3008

Danfoss Reflect Electric Floor Heating

Reflect Insulation Plates

Reflect Insulation Plates are a revolutionary designed product that eliminates the need for a top coat on floating floors. When combined with Danfoss LX Heating Cables, Reflect provides the perfect solution for quick and easy installation of electric floor heating under engineered wood or laminate floors. The combination of an insulating sub floor and a heat conducting surface ensures optimum heat is delivered up through the floor.

- Best solution available for heating under laminate and engineered wood flooring
- Saves time, no mixing of thin set or mud required
- Reflective plates heat quickly and evenly for maximum comfort
- High R-value insulation helps to reduce energy consumption
- Ideal for concrete floors and basement renovations



1

Lay out Reflect Plates



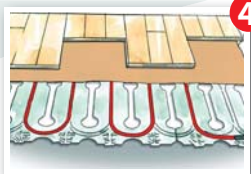
2

Clip plates together, cut plates with jigsaw if necessary



3

Install heating cable in grooves, pressing gently



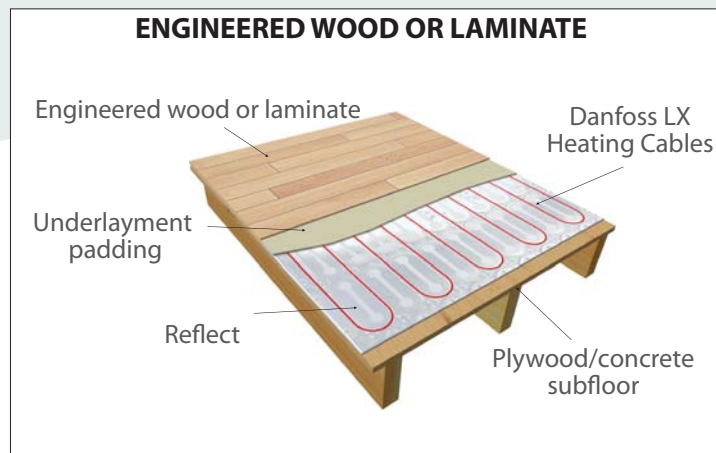
4

Lay underlayment padding and then the floor covering

| Technical Data | Reflect |
|-----------------------|--|
| Construction: | Expanded polystyrene with aluminum surface |
| Size: | 19.75" x 39.50" (501mm x 1003mm) |
| Height: | 0.5" (12.7mm) |
| Insulation: | Expanded polystyrene (EPS) |
| Deformation Strength: | 734 lbs/sq.ft. |
| R-Value: | 1.5 |
| Groove Spacing: | 4" (center to center) |

| Ordering Information | Reflect | | |
|----------------------|---------------------------|-------------------------|--------------------------|
| Part No. | Description | No. of plates (per box) | Approx. sq.ft. (per box) |
| 088L0095 | Reflect Insulation Plates | 10 | 50 |
| 088L0096 | Reflect Insulation Plates | 4 | 20 |

LX Cable sold separately - see page 8 for Typical Selection Chart



Danfoss *Reflect* Electric Floor Heating

Typical Selection Chart

| Ordering Information | LX Cable & Reflect | 120V |
|----------------------|--------------------|-----------------------------|
| Coverage (sq.ft.)* | LX Cable | Reflect Required |
| 15 | 088L3140 | 1 x 088L0096 |
| 20 | 088L3141 | 1 x 088L0096 |
| 25 | 088L8142 | 2 x 088L0096 |
| 40 | 088L3143 | 2 x 088L0096 |
| 55 | 088L3144 | 1 x 088L0095 |
| 65 | 088L3145 | 1 x 088L0095 + 1 x 088L0096 |
| 80 | 088L3146 | 4 x 088L0096 |
| 95 | 088L3147 | 1 x 088L0095 + 2 x 088L0096 |
| 105 | 088L3148 | 2 x 088L0095 |

*Based on 4" center to center spacing
All plates are approximately 20" (508mm) in width
LX Cable sold separately - see page 4 for ordering information

| Ordering information | LX Cable & Reflect | 240V |
|----------------------|--------------------|-----------------------------|
| Coverage (sq.ft.)* | LX Cable | Reflect Required |
| 25 | 088L3080 | 2 x 088L0096 |
| 40 | 088L3081 | 2 x 088L0096 |
| 55 | 088L3082 | 1 x 088L0095 |
| 65 | 088L3083 | 1 x 088L0095 + 1 x 088L0096 |
| 80 | 088L3084 | 4 x 088L0096 |
| 95 | 088L3085 | 1 x 088L0095 + 2 x 088L0096 |
| 105 | 088L3086 | 2 x 088L0095 |
| 120 | 088L3087 | 2 x 088L0095 + 1 x 088L0096 |
| 135 | 088L3088 | 1 x 088L0095 + 4 x 088L0096 |
| 145 | 088L3089 | 2 x 088L0095 + 2 x 088L0096 |
| 160 | 088L3090 | 3 x 088L0095 |
| 190 | 088L3091 | 2 x 088L0095 + 4 x 088L0096 |
| 210 | 088L3092 | 4 x 088L0095 |

*Based on 4" center to center spacing
All plates are approximately 20" (508mm) in width
LX Cable sold separately - see page 4 for ordering information

Danfoss GX Electric Snow Melting

Electric Snow Melting Mats & Cables

Installing a Danfoss GX Snow Melting System provides a permanent solution to the problems caused by cold weather. The GX Snow Melting System is an on demand system that will provide you with improved safety by providing instantaneous relief from snow build up and ice forming. There is no need for costly snow melting chemicals that can damage interior and exterior flooring finishes. The GX Snow Melting System allows you to improve your bottom line by reducing the labor and machinery costs associated with clearing snow and ice.

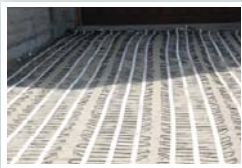
- Twin conductor cables
- Single point connection
- Flexible and simple to install
- Durable construction
- Operates silently, efficiently and safely
- Ideal for driveways, parking lots, sidewalks, stairs, ramps, bridges and many other applications
- For use in concrete, asphalt and under pavers
- Eliminates EMF's (electromagnetic fields)
- GX Heating Mats significantly reduce installation time and labor
- Genuine ten year non-prorated warranty, includes labor and materials



Installation



Prepare the area. Insulation below and on the sides of the slab are recommended



Lay out the GX Mats or Cables

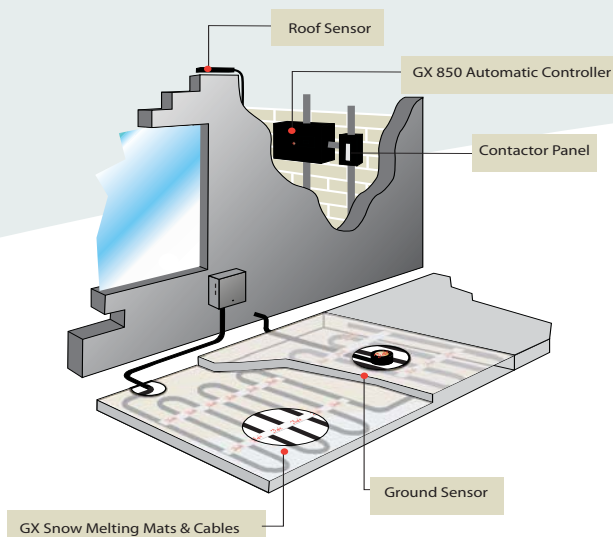


Install ground sensors at opposite ends of the area

| Technical Data | GX Mats & Cables |
|-------------------------|-------------------------------|
| Cable Construction: | Twin Conductor |
| Cable Diameter: | 1/4" (6mm) |
| Rated Voltage: | 208, 240, 277, 347, 480, 600V |
| Max. Rated Temperature: | 220°F (105°C) |
| Conductor Insulation: | Teflon™ FEP |
| Outer Insulation: | PVC |

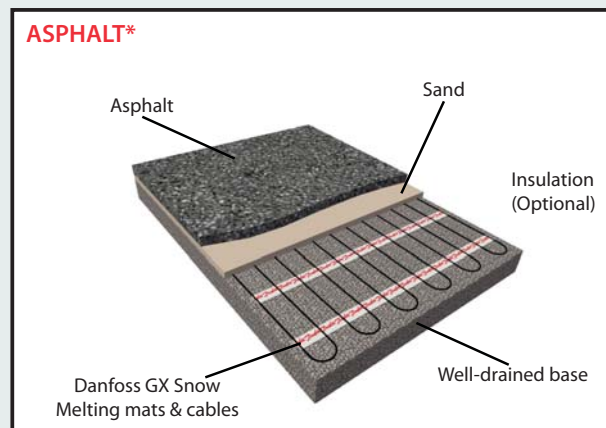
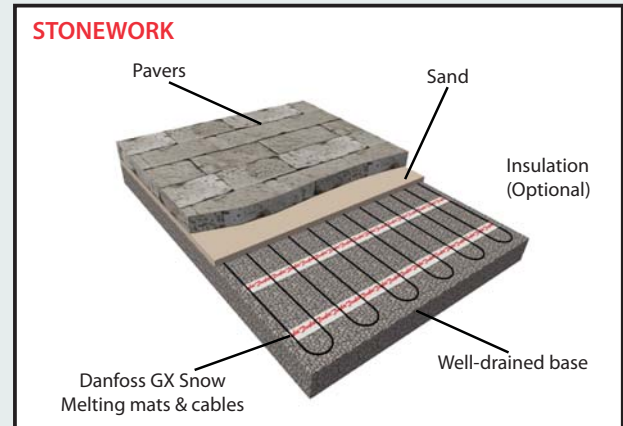
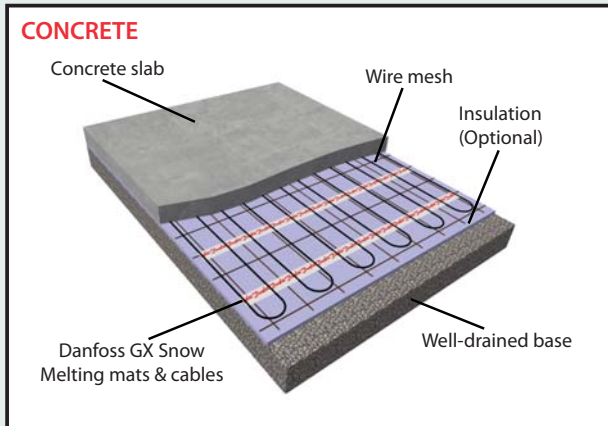


SYSTEM COMPONENTS



Danfoss GX Electric Snow Melting

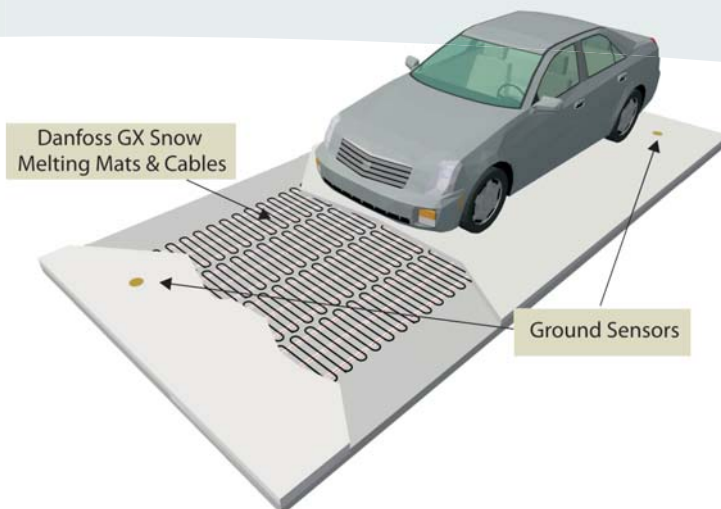
Typical Applications



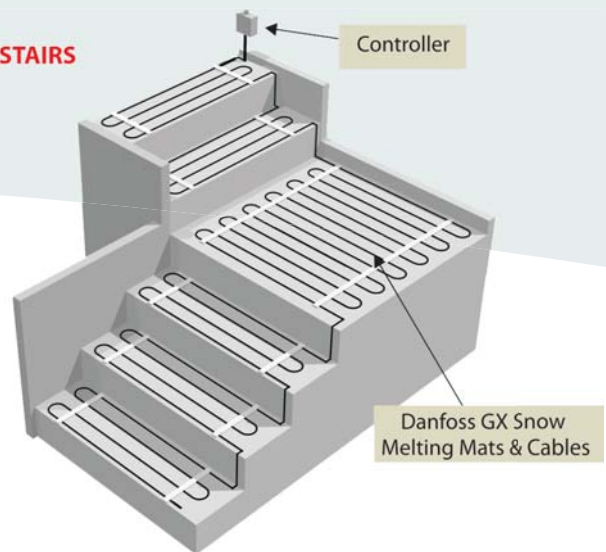
***Notes:**

- Cables can be embedded in sand or concrete (1.0" / 25.4mm) for extra protection
- If using sand or concrete with asphalt, allow asphalt to cool to 265° F (130° C) before pouring directly on mats/cables
- If using without sand or concrete allow asphalt to cool to 220°F (105° C) before pouring directly on mats/cables

DRIVEWAY



STAIRS



Danfoss GX

Electric Snow Melting

Electric Snow Melting Mats



| Ordering Information | | GX Mats | | 208V |
|----------------------|---------------|-------------------|--------------------|------|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (50W/sq.ft.) | Amps |
| 088L3222 | 6.5 | 15 | 640 | 3.1 |
| 088L3223 | 10.0 | 20 | 1100 | 5.3 |
| 088L3224 | 12.5 | 25 | 1280 | 6.2 |
| 088L3225 | 15.0 | 30 | 1550 | 7.4 |
| 088L3226 | 17.5 | 35 | 1730 | 8.3 |
| 088L3227 | 20.0 | 40 | 1900 | 9.2 |
| 088L3228 | 22.5 | 45 | 2100 | 10.1 |
| 088L3229 | 25.0 | 50 | 2400 | 11.5 |
| 088L3230 | 30.0 | 60 | 3050 | 14.7 |
| 088L3231 | 35.0 | 70 | 3400 | 16.4 |
| 088L3232 | 40.0 | 80 | 3800 | 18.3 |
| 088L3233 | 45.0 | 90 | 4230 | 20.3 |
| 088L3234 | 50.0 | 100 | 5000 | 24.1 |

| Ordering Information | | GX Mats | | 240V |
|----------------------|---------------|-------------------|--------------------|------|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (50W/sq.ft.) | Amps |
| 088L3201 | 7.5 | 15 | 750 | 3.1 |
| 088L3202 | 10.0 | 20 | 1000 | 4.2 |
| 088L3203 | 12.5 | 25 | 1250 | 5.2 |
| 088L3204 | 15.0 | 30 | 1500 | 6.3 |
| 088L3205 | 17.5 | 35 | 1750 | 7.3 |
| 088L3206 | 20.0 | 40 | 2000 | 8.3 |
| 088L3207 | 22.5 | 45 | 2250 | 9.4 |
| 088L3208 | 25.0 | 50 | 2500 | 10.4 |
| 088L3209 | 30.0 | 60 | 3000 | 12.5 |
| 088L3210 | 35.0 | 70 | 3500 | 14.6 |
| 088L3211 | 40.0 | 80 | 4000 | 16.7 |
| 088L3212 | 45.0 | 90 | 4500 | 18.8 |
| 088L3213 | 50.0 | 100 | 5000 | 20.8 |
| 088L3214 | 57.5 | 115 | 5750 | 24.0 |
| 088L3215 | 65.0 | 130 | 6500 | 27.1 |

Notes:

- All mats are 2 feet wide
- Power leads are 20 feet in length
- Watt output of the 240V mat is reduced by 25% when operated at 208V (Approximately 37.5 W/sq.ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX

Electric Snow Melting

Electric Snow Melting Mats

| Ordering Information | | GX Mats | | 240V (37W/sq.ft) | |
|----------------------|------------------|----------------------|-----------------------|---------------------|--|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (37W/sq.ft.) | Amps | |
| 088L3300 | 16.5 | 35 | 1235 | 5.1 | |
| 088L3301 | 20.0 | 40 | 1480 | 6.2 | |
| 088L3302 | 45.0 | 90 | 3495 | 14.6 | |
| 088L3303 | 60.0 | 120 | 4505 | 18.8 | |
| 088L3304 | 77.5 | 155 | 5715 | 23.8 | |

| Ordering Information | | GX Mats | | 277V | |
|----------------------|------------------|----------------------|-----------------------|------|--|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (50W/sq.ft.) | Amps | |
| 088L3250 | 15.0 | 30 | 1370 | 4.9 | |
| 088L3251 | 17.5 | 35 | 1690 | 6.1 | |
| 088L3252 | 20.0 | 40 | 2080 | 7.5 | |
| 088L3253 | 22.5 | 45 | 2350 | 8.5 | |
| 088L3254 | 25.0 | 50 | 2675 | 9.7 | |
| 088L3255 | 30.0 | 60 | 2800 | 10.1 | |
| 088L3256 | 35.0 | 70 | 3440 | 12.4 | |
| 088L3257 | 40.0 | 80 | 4080 | 14.7 | |
| 088L3258 | 45.0 | 90 | 4680 | 16.9 | |
| 088L3259 | 52.5 | 105 | 5100 | 18.4 | |
| 088L3260 | 57.5 | 115 | 5850 | 21.1 | |



Notes:

- All mats are 2 feet wide
- Power leads are 20 feet in length
- Watt output of the 277V mat is reduced by 25% when operated at 240V (Approximately 37.5 W/ sq.ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX

Electric Snow Melting

Electric Snow Melting Mats



| Ordering Information | | GX Mats | | 480V |
|----------------------|---------------|-------------------|--------------------|------|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (50W/sq.ft.) | Amps |
| 088L3270 | 10.0 | 20 | 1000 | 2.1 |
| 088L3271 | 15.0 | 30 | 1500 | 3.1 |
| 088L3272 | 20.0 | 40 | 2000 | 4.2 |
| 088L3273 | 25.0 | 50 | 2500 | 5.2 |
| 088L3274 | 30.0 | 60 | 3000 | 6.3 |
| 088L3275 | 35.0 | 70 | 3500 | 7.3 |
| 088L3276 | 40.0 | 80 | 4000 | 8.3 |
| 088L3277 | 45.0 | 90 | 4500 | 9.4 |
| 088L3278 | 50.0 | 100 | 5000 | 10.4 |
| 088L3279 | 60.0 | 120 | 6000 | 12.5 |
| 088L3280 | 70.0 | 140 | 7000 | 14.6 |
| 088L3281 | 80.0 | 160 | 8000 | 16.7 |

| Ordering Information | | GX Mats | | 600V |
|----------------------|---------------|-------------------|--------------------|------|
| Part No. | Length (feet) | Coverage (sq.ft.) | Watts (50W/sq.ft.) | Amps |
| 088L3290 | 12.5 | 25 | 1250 | 2.1 |
| 088L3291 | 17.5 | 35 | 1845 | 3.1 |
| 088L3292 | 25.0 | 50 | 2485 | 4.1 |
| 088L3293 | 30.0 | 60 | 3075 | 5.1 |
| 088L3294 | 37.5 | 75 | 3715 | 6.2 |
| 088L3295 | 45.0 | 90 | 4455 | 7.4 |
| 088L3296 | 50.0 | 100 | 5050 | 8.4 |
| 088L3297 | 57.5 | 115 | 5685 | 9.5 |
| 088L3298 | 62.5 | 125 | 6280 | 10.5 |
| 088L3299 | 75.0 | 150 | 7505 | 12.5 |

Notes:

- All mats are 2 feet wide
- Power leads are 20 feet in length
- Watt output of the 600V mat is reduced by 35% when operated at 480V (Approximately 32.5 W/sq.ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX

Electric Snow Melting

Electric Snow Melting Cables

| Ordering Information | | GX Cables | | 208V | |
|----------------------|---------------|------------------------------------|------------|-----------------|------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | Watts (12W/ft.) | Amps |
| | | Standard 3" Spacing | 4" Spacing | | |
| 088L3120 | 35 | 5 | 10 | 420 | 2.0 |
| 088L3121 | 50 | 10 | 15 | 600 | 2.9 |
| 088L3122 | 70 | 15 | 25 | 840 | 4.0 |
| 088L3123 | 85 | 20 | 30 | 1020 | 4.9 |
| 088L3124 | 105 | 25 | 35 | 1260 | 6.1 |
| 088L3125 | 125 | 30 | 45 | 1500 | 7.2 |
| 088L3126 | 145 | 35 | 50 | 1740 | 8.4 |
| 088L3127 | 160 | 40 | 55 | 1920 | 9.2 |
| 088L3128 | 180 | 45 | 60 | 2160 | 10.4 |
| 088L3129 | 210 | 50 | 70 | 2520 | 12.1 |
| 088L3130 | 245 | 60 | 85 | 2940 | 14.1 |
| 088L3131 | 280 | 65 | 95 | 3360 | 16.2 |
| 088L3132 | 320 | 75 | 110 | 3810 | 18.5 |
| 088L3133 | 355 | 85 | 120 | 4260 | 20.5 |
| 088L3134 | 410 | 100 | 140 | 4920 | 23.7 |
| 088L3135 | 460 | 110 | 160 | 5520 | 26.5 |



| Ordering Information | | GX Cables | | 240V | |
|----------------------|---------------|------------------------------------|------------|-----------------|------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | Watts (12W/ft.) | Amps |
| | | Standard 3" Spacing | 4" Spacing | | |
| 088L3100 | 40 | 10 | 15 | 480 | 2.0 |
| 088L3101 | 60 | 15 | 20 | 720 | 3.0 |
| 088L3102 | 80 | 20 | 25 | 960 | 4.0 |
| 088L3103 | 100 | 25 | 35 | 1200 | 5.0 |
| 088L3104 | 120 | 30 | 40 | 1440 | 6.0 |
| 088L3105 | 145 | 35 | 50 | 1740 | 7.3 |
| 088L3106 | 165 | 40 | 55 | 1980 | 8.3 |
| 088L3107 | 185 | 45 | 65 | 2220 | 9.3 |
| 088L3108 | 205 | 50 | 70 | 2460 | 10.3 |
| 088L3109 | 245 | 60 | 85 | 2940 | 12.3 |
| 088L3110 | 285 | 70 | 100 | 3420 | 14.3 |
| 088L3111 | 325 | 80 | 110 | 3900 | 16.3 |
| 088L3112 | 370 | 90 | 125 | 4440 | 18.5 |
| 088L3113 | 410 | 105 | 140 | 4920 | 20.5 |
| 088L3114 | 475 | 120 | 165 | 5700 | 23.8 |
| 088L3115 | 535 | 135 | 185 | 6420 | 26.8 |

Notes:

- Power leads are 20 feet in length
- 3" centers provides 50W/sq.ft.
- 4" centers provides 35W/sq.ft.
- Watt output of the 240V mat is reduced by 25% when operated at 208V (Approximately 9 W/ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX Electric Snow Melting

Electric Snow Melting Cables



| Ordering Information | | GX Cables | | 277V | |
|----------------------|---------------|------------------------------------|------------|-----------------|------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | Watts (12W/ft.) | Amps |
| | | Standard 3" Spacing | 4" Spacing | | |
| 088L3060 | 50 | 10 | 15 | 540 | 1.9 |
| 088L3061 | 70 | 15 | 25 | 850 | 3.1 |
| 088L3062 | 95 | 20 | 30 | 1120 | 4.0 |
| 088L3063 | 115 | 25 | 40 | 1440 | 5.2 |
| 088L3064 | 140 | 35 | 50 | 1700 | 6.1 |
| 088L3065 | 170 | 40 | 60 | 2015 | 7.3 |
| 088L3066 | 190 | 45 | 65 | 2340 | 8.4 |
| 088L3067 | 215 | 50 | 75 | 2600 | 9.4 |
| 088L3068 | 240 | 55 | 80 | 2860 | 10.3 |
| 088L3069 | 285 | 65 | 95 | 3450 | 12.4 |
| 088L3070 | 330 | 80 | 115 | 4030 | 14.5 |
| 088L3071 | 375 | 90 | 125 | 4610 | 16.6 |
| 088L3072 | 425 | 100 | 145 | 5140 | 18.6 |
| 088L3073 | 475 | 115 | 160 | 5770 | 20.8 |
| 088L3074 | 545 | 130 | 185 | 6615 | 23.8 |

Notes:

- Power leads are 20 feet in length
- 3" centers provides 50W/sq.ft.
- 4" centers provides 35W/sq.ft.
- Watt output of the 277V mat is reduced by 25% when operated at 240V (Approximately 9 W/ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX

Electric Snow Melting

Electric Snow Melting Cables

| Ordering Information | | GX Cables | | 480V | |
|----------------------|---------------|------------------------------------|------------|-----------------|------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | Watts (12W/ft.) | Amps |
| | | Standard 3" Spacing | 4" Spacing | | |
| 088L3640 | 80 | 20 | 25 | 995 | 2.1 |
| 088L3644 | 200 | 50 | 70 | 2460 | 5.1 |
| 088L3646 | 330 | 85 | 110 | 4030 | 8.4 |
| 088L3648 | 490 | 125 | 160 | 5990 | 12.5 |
| 088L3650 | 735 | 185 | 240 | 8650 | 18.6 |
| 088L3652 | 820 | 205 | 270 | 10010 | 20.9 |
| 088L3654 | 940 | 235 | 310 | 11475 | 23.9 |



| Ordering Information | | GX Cables | | 600V | |
|----------------------|---------------|------------------------------------|------------|-----------------|------|
| Part No. | Length (feet) | Approximate Heat Coverage (sq.ft.) | | Watts (12W/ft.) | Amps |
| | | Standard 3" Spacing | 4" Spacing | | |
| 088L3620 | 100 | 25 | 35 | 1240 | 2.1 |
| 088L3621 | 150 | 40 | 50 | 1855 | 3.1 |
| 088L3622 | 250 | 65 | 85 | 3080 | 5.1 |
| 088L3623 | 300 | 75 | 100 | 3690 | 6.2 |
| 088L3624 | 360 | 90 | 120 | 4425 | 7.4 |
| 088L3625 | 415 | 105 | 135 | 5040 | 8.4 |
| 088L3626 | 465 | 115 | 155 | 5650 | 9.4 |
| 088L3627 | 515 | 130 | 170 | 6265 | 10.4 |
| 088L3628 | 615 | 155 | 205 | 7485 | 12.5 |
| 088L3629 | 714 | 175 | 235 | 8705 | 14.5 |

Notes:

- Power leads are 20 feet in length
- 3" centers provides 50W/sq.ft.
- 4" centers provides 35W/sq.ft.
- Watt output of the 600V mat is reduced by 35% when operated at 480V (Approximately 7.5W/ft.)

Controls - See PG. 17
Accessories- See PG. 20

Danfoss GX Electric Snow Melting

Electric Snow Melt Controllers

GX 850 Dual Zone Automatic Control Panel

The AWARD WINNING Danfoss GX Dual Zone Automatic Control Panel (ACP) is the most optimal solution for keeping any area free of ice and snow. The GX 850 acts on information received from sensors which register both temperature and moisture, then calculates the information ensuring that the heat will only be turned on when snow and/or ice is present. The result is optimal performance with maximum energy savings and minimum operating costs.

GX 850 ACP



Part # 088L3411

Ground Sensors



Part # 088L3051

Roof Sensor



Part # 088L3052

- User interface allows total control of snow melting system set points
- Set to maximum melting, or maximum energy savings or anywhere in between
- Dual zone feature allows for energy savings and lower amperage draw
- Digital sensors provide precise feedback on snow and ice conditions
- Fault finding program detects and alarms on faults
- Can be field upgraded to take advantage of new features
- Integrate four separate sensors
- Two year warranty



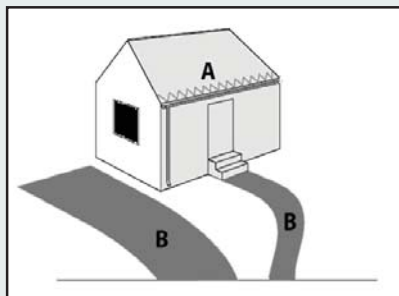
| Technical Data | GX850 ACP |
|---------------------------|--|
| Control Voltage: | 600V max |
| Max. Heating Load: | 50A |
| Max. Ambient Temperature: | 15°F to 100°F (-10°C to +40°C) |
| Enclosure Type: | NEMA 4X |
| Mounting: | Wall mounted, indoors |
| Dimensions (H x W x D): | 10.5" x 13.5" x 7.5" (267mm x 343mm x 191mm) |

Requires ground and / or roof sensors
Systems larger than 50A will require the use of timer / contactor panels used in conjunction with the GX850 (see page 18)

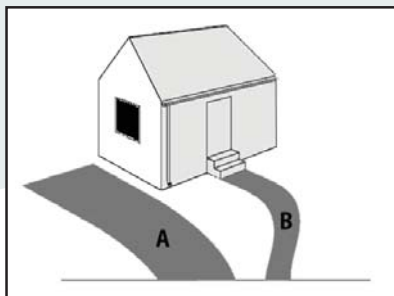


DUAL ZONE EXAMPLES

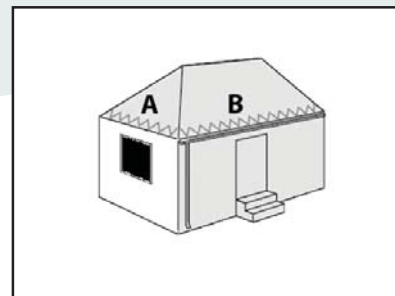
Roof & Ground Zones



Two Ground Zones



Two Roof Zones



Ordering
Information PG. 19

Danfoss GX

Electric Snow Melting

Electric Snow Melt Controllers

DS-2B/DS-5 Snow Melt Controllers

The DS-2B/DS-5 Snow Melt Controllers are designed for pavement snow melt applications. They can be used as a stand alone controller or as a sensor for larger control systems.

- Housed in a weatherproof enclosure
- Senses both moisture and temperatures
- Adjustable temperature trigger point
- Adjustable delay off drying time
- Manual override capable
- Selectable low temperature cutoff
- Remote control and monitor capabilities
- Easy to install
- Two year warranty



| Technical Data | DS-2B | DS-5 |
|---------------------------|---|---------------|
| Power Control Voltage: | 120V/240V field selectable | |
| Max. Heating Load: | 30A | 60A (2 x 30A) |
| Max. Ambient Temperature: | -40°F to +185°F (-40°C to +85°C) | |
| Enclosure Type: | NEMA 3R | |
| Mounting: | Wall/pole mounted, outdoors | |
| Dimensions (H x W x D): | 4.75" x 7.00" x 2.75" (121 mm x 178mm x 70mm) | |



| Ordering Information | GX Controls | |
|----------------------|--|-------------|
| Part No. | Description | Voltage |
| 088L3035 | DS-2B Snow Melt Controller (30A) | 120V, 240V |
| 088L3037 | DS-5 Snow Melt Controller (60A) | 120V, 240V |
| 088L3036 | DS-8 Snow Melt Controller (30A) | 120V, 240V |
| 088L3411 | GX850 Dual Zone Automatic Control Panel (ACP)* | 208V - 600V |

*Requires ground and / or roof sensors (see page 20 for ordering information)

*Control voltage 120V

DS-5 Controller



Part # 088L3037

DS-8 Controller



Part # 088L3036

GX 850 ACP



Part # 088L3411

Danfoss GX

Electric Snow Melting

Electric Snow Melting Panels

Contactor & Timer Panels



The Danfoss Contactor and Timer panels are primarily designed for snow and ice melting applications. All panels are pre-wired and UL listed complete with a NEMA 1 enclosure, wiring diagram, terminal connection block, timer (timer panels), and two or four 3-pole contactors. Timer panels can be used stand alone or in conjunction with an automatic controller. Contactor panels must be used in conjunction with an automatic controller.

- Low Cost
- Easy to install
- NEMA 1, UL listed panel box
- Heat on indicator light
- Pre-wired terminal connections
- Two year warranty

| Technical Data | Contactor / Timer Panels |
|-------------------------|--|
| Power Voltage Range: | 208V - 600V |
| Max. Heating Load: | 100A/200A |
| Control Voltage: | 120V |
| Enclosure Type: | NEMA 1 |
| Mounting: | Wall mounted, indoors |
| Dimensions (H x W x D): | 10" x 10" x 4" (254mm x 254mm x 102mm) 12" x 12" x 6" (305mm x 305mm x 152mm) |
| Timer Override: | 4 Hours |



GFEP (Ground Fault Equipment Protection) Contactor Panels



Simplify your installation with the GFEP Panels. Danfoss GFEP panels have built-in ground fault equipment protection, minimizing the risk of faults and eliminating extra wiring installation steps and costs. The panel can be activated by a Danfoss GX 850 ACP, DS controller or any other type of controller.

- Easy to install
- NEMA 1, UL listed enclosure
- Integrated 30mA GFEP (Optional)
- A LED trip indicator (internal)
- A LED heat on indicator
- Pre-wired terminal connections
- 120V on/off remote heat indicator
- Two year warranty

| Technical Data | GFEP Panels |
|------------------------|--|
| Power Voltage Range: | 208V - 600V |
| Max. Heating Load: | 100A/200A |
| Control Voltage: | 120V |
| Enclosure Type: | NEMA1 |
| Mounting: | Wall mounted, indoors |
| Dimensions (H x W x D) | 12" x 12" x 6" (305mm x 305mm x 152mm) 16" x 16" x 6" (406mm x 406mm x 152mm) |
| GFEP: | 30mA trip |



Danfoss GX

Electric Snow Melting

GX Timer / Contactor Panels

| Ordering Information | | GX Timer / Contactor Panels | | |
|----------------------|--|-----------------------------|--------------|-------------------|
| Part No. | Description | Max. Amps | Coil Voltage | No. of Contactors |
| 088L3450 | Single Contactor, 600V | 40 | 120 | 1 |
| 088L3451 | Single Contactor, 600V | 40 | 208-240 | 1 |
| 088L3456 | Single Contactor, 600V | 60 | 120 | 1 |
| 088L3457 | Single Contactor, 600V | 60 | 208-240 | 1 |
| 088L3440 | GX Timer Panel with 4hr Timer, 100A, 600V | 100 | 120 | 2 |
| 088L3441 | GX Contactor Panel without Timer, 100A, 600V | 100 | 120 | 2 |
| 088L3442 | GX Timer Panel with 4hr Timer, 200A, 600V | 200 | 120 | 4 |
| 088L3443 | GX Contactor Panel without Timer, 200A, 600V | 200 | 120 | 4 |
| 088L3444 | GX Contactor Panel with Timer and GFEP, 100A | 100 | 120 | 2 |
| 088L3445 | GX Contactor Panel with GFEP, 100A | 100 | 120 | 2 |
| 088L3446 | GX Contactor Panel with Timer and GFEP, 200A | 200 | 120 | 4 |
| 088L3447 | GX Contactor Panel with GFEP, 200A | 200 | 120 | 4 |

All contactors are complete with NEMA 1 enclosure
 100A contactor / timer panels consist of two, 3P, 50A contactors
 200A contactor / timer panels consist of four, 3P, 50A contactors

Single Contactor



Electric Snow Melting Accessories

| Ordering Information | | GX Accessories |
|----------------------|--|----------------|
| Part No. | Description | |
| 088L1050 | Cable Strapping (15 ft. / 4.5m) | |
| 088L1054 | Cable Strapping (75 ft. / 22.9m) | |
| 088L3051 | Ground Sensor (Two per package, includes 50 ft. / 15m lead wire) | |
| 088L3052 | Roof Sensor (includes 50 ft. / 15m lead wire) | |
| 088L3405 | Nameplate (per NEC 426-13) | |
| 088L0010 | GX Repair Kit (includes: crimp connectors, heat shrink tubes, repair wire) | |
| 088L3038 | CDP-2 Remote Control & Display for Snow Sensors* | |
| 088L3039 | CS-1 Remote Control / Monitor Pigtail for CDP-2 | |
| 89999997 | Extended Power leads, factory spliced, 5 ft increments ** | |

*CDP-2 installation requires use of CS-1 pigtails
 *CDP-2 can be used with DS-2B and DS-5 controllers
 **Allow 6-8 weeks delivery time

Cable Strapping



Ground Sensors



CDP-2 Remote Control



GX Repair Kit



Nameplate



Roof Sensor





Danfoss RX Roof & Gutter De-Icing

Roof and Gutter De-Icing Cables

Danfoss RX Cables provide the protection needed to prevent ice dams and build-up from damaging RESIDENTIAL buildings, roofs, and gutters. Danfoss RX constant watt heating cables ensure maximum energy efficiency and are designed for use with metal or asphalt roofing. Durable and high-quality materials provide excellent moisture, corrosion and impact protection. Simply plug the RX cables directly to the power receptacle

- Professional grade cable and AC Plug
- 100% aluminum foil screen
- Electrical Shock Resistant (ESR)
- High grade heating element
- Durable and high-quality materials provide excellent moisture, corrosion and impact protection
- Tough UV rated cable will withstand the harshest conditions
- Kit comes complete with necessary shingle and spacer clips
- Two year warranty

| Technical Data | RX Cables |
|-------------------------|-------------------------------|
| Cable Construction: | Twin Conductor, constant watt |
| Cable Diameter: | 1/4" (6mm) |
| Rated Voltage: | 120V |
| Max. Rated Temperature: | 220°F (105°C) |
| Conductor Insulation: | Teflon™ FEP |
| Outer Insulation: | PVC |



| Ordering Information | | RX Cables | | | 120V | |
|----------------------|-------------|-----------|------|-------------------------------|------------------------------|--|
| Part No. | Length (ft) | Watts | Amps | Shingle Clips Included in Kit | Spacer Clips Included in Kit | |
| 088L3500 | 30 | 170 | 1.4 | 25 | 10 | |
| 088L3502 | 65 | 310 | 2.6 | 25 | 10 | |
| 088L3503 | 80 | 390 | 3.3 | 50 | 10 | |
| 088L3504 | 100 | 450 | 3.8 | 50 | 10 | |
| 088L3505 | 120 | 535 | 4.5 | 75 | 10 | |
| 088L3508 | 170 | 760 | 6.3 | 100 | 10 | |
| 088L3510 | 230 | 1080 | 9.0 | 100 | 10 | |
| 088L3511 | 265 | 1220 | 10.2 | 125 | 10 | |

KIT INCLUDES

- 120V, heating cable with grounded plug
- spacer clips
- shingle clips
- instruction manual
- 6ft. power lead

For Product Selector
See PG. 22

Controls - See PG. 23
Accessories- See PG. 24

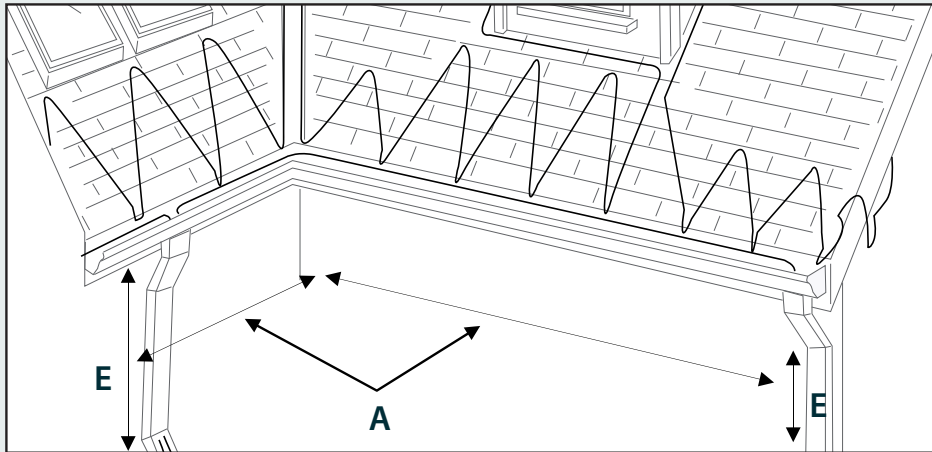
Danfoss RX Roof & Gutter De-Icing

Roof & Gutter De-Icing Cables

Product Selector for a Basic Roof

1. Total length (ft) of roof line (A) X 5 = RL
2. Total length (ft) of all down spouts (E) X 2 = DS
3. Add RL + DS = estimated length (ft) of cable required

**see manual for more complicated roof lines



Commercial Roof & Gutter De-Icing Cables

Danfoss RX-C Roof and Gutter De-icing Self-regulating cables provide the protection needed to prevent ice dams and build-up from damaging COMMERCIAL buildings, roof, and gutters. RX-C Roof and Gutter De-icing Cables are UV-rated.

| Technical Data | RX-C Cables |
|------------------------|---|
| Cable Construction: | Self Regulating |
| Cable Diameter: | 0.45" x 0.216" (11.5mm x 5.5mm) |
| Rated Voltage: | 120V, 208V-277V |
| Max Rated Temperature: | 150°F (65°C) powered 185°F (85°C) un-powered |
| Nominal Power Output: | 5W/ft @ 50°F (10°C 15W/m) |
| Output in Ice or Snow: | 12W/ft @ 32°F (0°C 40W/m) |
| Conductor Insulation: | PEX/TPE |
| Outer Insulation: | TPE |



| Ordering Information | RX-C Cables | | |
|----------------------|------------------------|-------|----------------------|
| Part No. | Length (ft) | Volts | Output @ 50°F (10°C) |
| 088L1422 | 250 ft. spool | 120 | 5W/ft |
| 088L1472 | 1000 ft. spool | 120 | 5W/ft |
| 088L1432 | 250 ft. spool | 240 | 5W/ft |
| 088L1473 | 1000 ft. spool | 240 | 5W/ft |
| 088L1462 | Cut to order / by ft.* | 120 | 5W/ft |
| 088L1463 | Cut to order / by ft.* | 240 | 5W/ft |

See Maximum Total Cable Length on page 28

*Minimum Order is 25 ft.



Controls - See PG. 23
Accessories- See PG. 24

Danfoss RX

Roof & Gutter De-Icing

Roof & Gutter De-Icing Controls

DS-8 Snow Melt Controller



The DS-8 is designed for roof and gutter, snow and ice melting applications. The sealed, low voltage, remote mount precipitation sensor can be mounted in a down spout, on the back of a gutter, under the drip edge, up to 10 feet away, while keeping the main controller in a more convenient and protected location.

- Housed in a weatherproof enclosure
- Senses both moisture and temperature
- Adjustable temperature trigger point
- Adjustable delay off drying time (30-90 mins)
- Manual override capable
- Bright on/off triggered LED status indicator
- Remote control capabilities
- Two year warranty

| Technical Data | DS-8 |
|---------------------------|--|
| Power Control Voltage: | 120V,240V field selectable |
| Max. Heating Load: | 30A @ 240V |
| Max. Ambient Temperature: | -40°F to +185°F (-40°C to +85°C) |
| Enclosure Type: | NEMA 3R |
| Mounting: | Wall/pole mount, outdoors |
| Dimensions (H x W x D): | 4.75" x 7.00" x 2.75" (120mm x 178mm x 70mm) |



Weatherproof Thermostat

The Weatherproof thermostat is designed for temperature control applications and serves as an operational control only.



- Automatic activation-reduced operational costs
- Remote bulb temperature sensing
- Large, readily visible dial
- Wall mounted
- Water-tight enclosure
- Two year warranty

| Technical Data | Weatherproof Thermostats |
|---------------------------|---|
| Voltage: | 120V - 277V |
| Max. Heating Load | 25A @ 120V - 240V, 22A @ 277V |
| Max. Ambient Temperature: | 0°F to +120°F (-18°C to + 49°C) |
| Enclosure Type: | NEMA 4X |
| Mounting: | Wall mounted |
| Dimensions (W x H x D): | 3.06" x 6.38" x 2.50" (78mm x 162mm x 63mm) |
| Capillary Length: | 60" (1524mm) |



| Ordering Information | RX Controls |
|----------------------|---|
| Part No. | Description |
| 088L3036 | DS-8 Controller with Remote Snow and Ice Sensor |
| 088L3422 | Weatherproof with Water-tight Enclosure |

Danfoss RX Roof & Gutter De-Icing

Roof & Gutter De-Icing Accessories

| Ordering Information | RX Accessories |
|----------------------|--|
| Part No. | Description |
| 088L0024 | RX-C Roof Clips Type A (25 / bag) |
| 088L3002 | Down Spout Edge Protection Plate (1 / bag) |
| 088L3003 | RX-C Roof Clips Type B (20 / bag) |
| 088L3004 | RX Kit Spacer Clips (10 / bag) |
| 088L3005 | RX Kit Shingle Clips (25 / Bag) |
| 088L3038 | CDP-2 Remote Control & Display Panel for DS-8* |
| 088L3039 | CS-1 Remote Control / Monitor Pigtail for CDP-2 |
| 088L0006 | Power Connection Kit, cable to power lead, includes one end seal |
| 088L0008 | Splice / Tee Kit, includes one end seal |
| 088L1457 | End Seal Kit, includes 5 end seals |
| 088L0023 | Power Connection Kit, cable to box, includes one end seal |

*CDP-2 installation requires use of CS-1 Pigtail (Part # 088L3039)

RX-C Roof Clips Type A



RX-C Roof Clips Type B



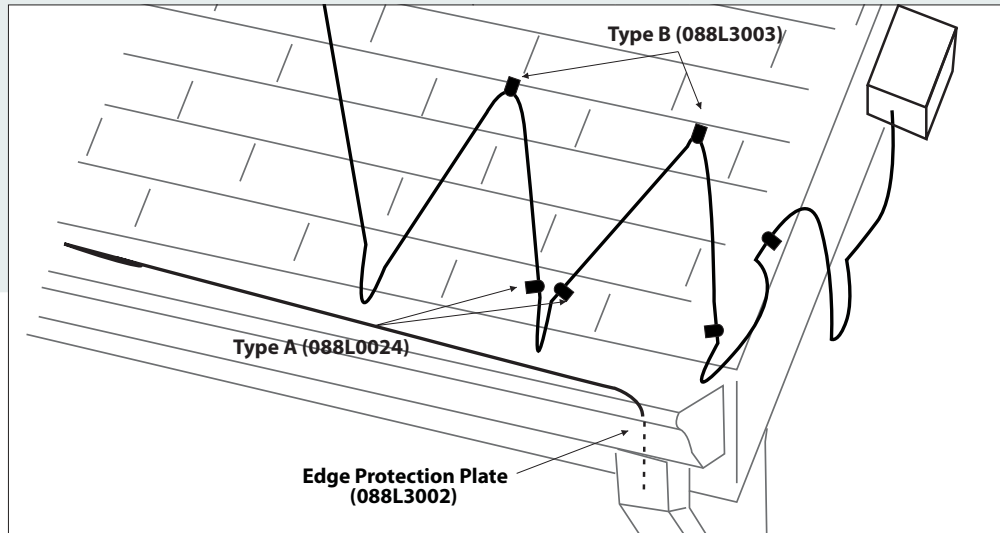
RX Kit Spacer Clips



RX Kit Shingle Clips



Typical Installation with Plastic Clips



Power Connection Kit
(Cable to Lead)



Power Connection Kit
(Cable to Box)



RX End Seal Kit (5pcs)



CDP-2 Remote Control



RX Downspout Edge
Protection Plate



Danfoss PX Self-Regulating Cables

Pipe Freeze Protection

The Danfoss PX Series of SELF-REGULATING Parallel Circuit Heating Cables provide the solution to basic FREEZE PROTECTION applications. The self regulating Danfoss PX series ensures maximum energy efficiency by producing heat only when and where it is needed as it adjusts the power output to the varying conditions along the length of the pipe.

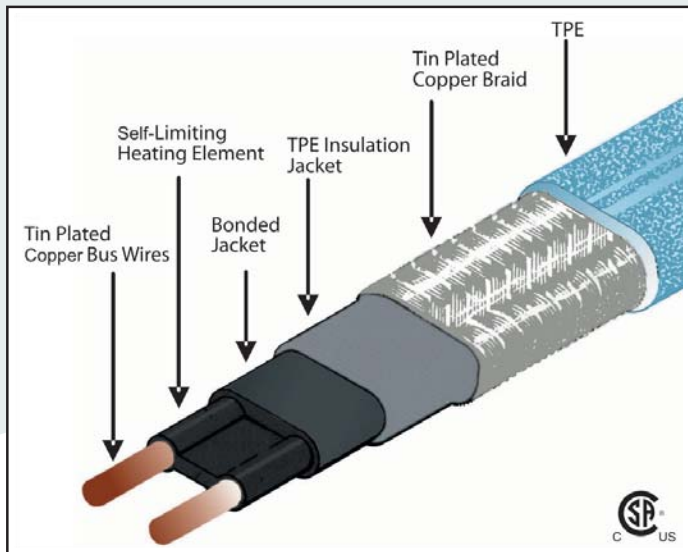
- Cable can be overlapped without creating hot spots or causing a burn out
- Cable can be cut and spliced in the field, simplifying the installation process and reducing waste
- Rugged 16 AWG bus cable with longer runs
- Wide variety of heat outputs available
- Limited 10 year warranty



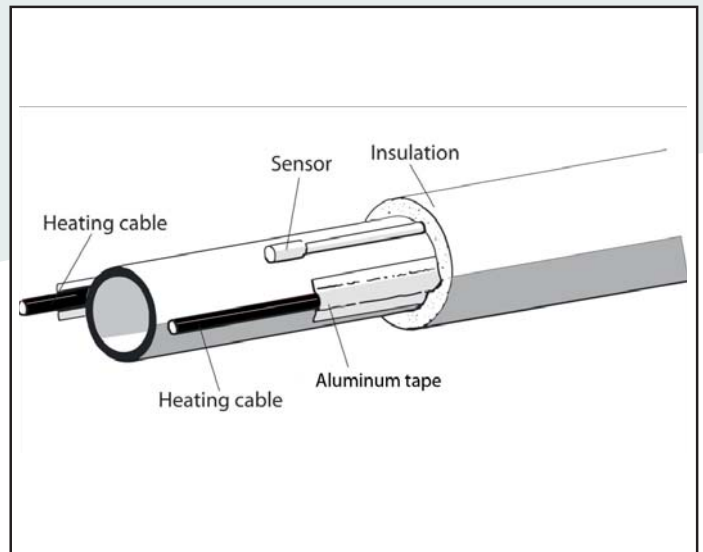
| Technical Data | PX Cables |
|--------------------------|--|
| Available Power Outputs: | 3, 5, 8, 10 W/ft at 240 VAC and 120 VAC at 50°F (+10°) (10, 15, 25, 33)W/m at 240 VAC and 120 VAC at 50°F (+10°C) |
| Cable Diameter: | 0.45" x 0.216" (11.5mm x 5.5mm) |
| Rated Voltage: | 120V - 277V Max. |
| Minimum Bending Radius: | 1" (25mm) |
| Max. Rated Temperature: | 150°F (65°C) Powered 185°F (85°C) Un-powered |
| Bus Wire Type: | 16 AWG (1.25mm ²) Tinned Copper |



Danfoss PX Cables



Typical Applications



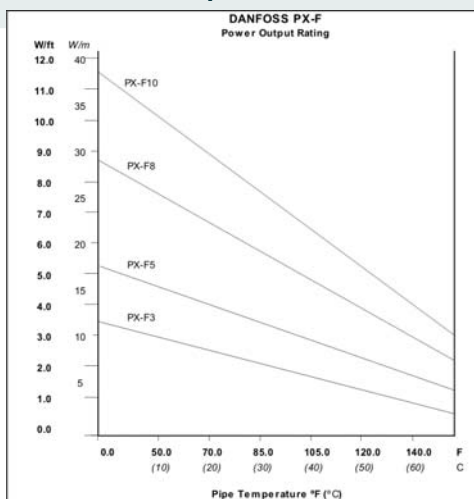
Danfoss PX Self-Regulating Cables

Pipe Freeze Protection

| Ordering Information | | PX Cables by the Spool | |
|----------------------|---------|------------------------|-------------------|
| Part No. | Voltage | Output at 50°F (10°C) | Spool Size (feet) |
| 088L1402 | 120V | 3W/ft | 250 |
| 088L1470 | 120V | 3W/ft | 1,000 |
| 088L1412 | 240V | 3W/ft | 250 |
| 088L1471 | 240V | 3W/ft | 1,000 |
| 088L1422 | 120V | 5W/ft | 250 |
| 088L1472 | 120V | 5W/ft | 1,000 |
| 088L1432 | 240V | 5W/ft | 250 |
| 088L1473 | 240V | 5W/ft | 1,000 |
| 088L1516 | 120V | 8W/ft | 250 |
| 088L1517 | 120V | 8W/ft | 1,000 |
| 088L1518 | 240V | 8W/ft | 250 |
| 088L1520 | 120V | 10W/ft | 250 |
| 088L1519 | 240V | 8W/ft | 1,000 |
| 088L1521 | 120V | 10W/ft | 1,000 |
| 088L1522 | 240V | 10W/ft | 250 |
| 088L1523 | 240V | 10W/ft | 1,000 |

| Ordering Information | | PX Cables Cut to Length | |
|----------------------|-----------------------|-------------------------|--|
| Part No. | Output at 50°F (10°C) | Voltage | |
| 088L1460 | 3W/ft | 120V | |
| 088L1461 | 3W/ft | 240V | |
| 088L1462 | 5W/ft | 120V | |
| 088L1463 | 5W/ft | 240V | |
| 088L1469 | 8W/ft | 120V | |
| 088L1468 | 8W/ft | 240V | |
| 088L1479 | 10W/ft | 120V | |
| 088L1478 | 10W/ft | 240V | |

Danfoss PX Output Curves



Voltage Conversion Table W/ft (W/m) @50°F (10°C)

| CABLE | 208V | 240V | 277V |
|--------|------------|-------------|-------------|
| PX-F3 | 2.5 (8.5) | 3.0 (10.0) | 3.5 (12.5) |
| PX-F5 | 4.0 (13.5) | 5.0 (15.0) | 5.5 (17.5) |
| PX-F8 | 7.0 (23.0) | 8.0 (25.5) | 8.5 (27.5) |
| PX-F10 | 9.5 (31.5) | 10.0 (33.0) | 10.5 (35.0) |

Controls - See PG. 28
Accessories- See PG. 28

Danfoss PX Self-Regulating Cables

Pipe Freeze Protection



| PX Cable Selection Chart | | | | | 120V | |
|--------------------------|-----------|---------|---------|---------|---------|-------|
| Insulation Thickness | 1/2" Min. | | 1" Min. | | 2" Min. | |
| Pipe Material | Metal | PVC | Metal | PVC | Metal | PVC |
| Pipe Diameter (Inches) | | | | | | |
| 1/2 | 3W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 3/4 | 3W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 1 | 5W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 1 1/4 | 5W/ft | 8W/ft | 3W/ft | 5W/ft | 3W/ft | 3W/ft |
| 1 1/2 | 5W/ft | 8W/ft | 3W/ft | 5W/ft | 3W/ft | 3W/ft |
| 2 | 5W/ft | 8W/ft | 5W/ft | 5W/ft | 3W/ft | 3W/ft |
| 2 1/2 | 8W/ft | 10W/ft | 5W/ft | 5W/ft | 3W/ft | 3W/ft |
| 3 | 8W/ft | 10W/ft | 5W/ft | 5W/ft | 3W/ft | 5W/ft |
| 4 | 10W/ft | 10W/ft* | 5W/ft | 8W/ft | 3W/ft | 5W/ft |
| 6 | 10W/ft* | 10W/ft* | 8W/ft | 10W/ft | 5W/ft | 5W/ft |
| 8 | - | - | 10W/ft | 10W/ft* | 5W/ft | 8W/ft |

Chart based on minimum ambient temperature -22°F (-30°C)
*Requires 2 runs

| PX Cable Selection Chart | | | | | 240V | |
|--------------------------|-----------|---------|---------|---------|---------|-------|
| Insulation Thickness | 1/2" Min. | | 1" Min. | | 2" Min. | |
| Pipe Material | Metal | PVC | Metal | PVC | Metal | PVC |
| Pipe Diameter (Inches) | | | | | | |
| 1/2 | 3W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 3/4 | 3W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 1 | 5W/ft | 5W/ft | 3W/ft | 3W/ft | 3W/ft | 3W/ft |
| 1 1/4 | 5W/ft | 8W/ft | 3W/ft | 5W/ft | 3W/ft | 3W/ft |
| 1 1/2 | 5W/ft | 8W/ft | 3W/ft | 5W/ft | 3W/ft | 3W/ft |
| 2 | 5W/ft | 8W/ft | 5W/ft | 5W/ft | 3W/ft | 3W/ft |
| 2 1/2 | 8W/ft | 10W/ft | 5W/ft | 5W/ft | 3W/ft | 3W/ft |
| 3 | 8W/ft | 10W/ft | 5W/ft | 5W/ft | 3W/ft | 5W/ft |
| 4 | 10W/ft | 10W/ft* | 5W/ft | 8W/ft | 3W/ft | 5W/ft |
| 6 | 10W/ft* | 10W/ft* | 8W/ft | 10W/ft | 5W/ft | 5W/ft |
| 8 | - | - | 10W/ft | 10W/ft* | 5W/ft | 8W/ft |

Chart based on minimum ambient temperature -22°F (-30°C)
*Requires 2 runs

Controls - See PG. 28
Accessories- See PG. 28

Danfoss PX Self-Regulating Cables

Pipe Freeze Protection

| Maximum Total Cable Length ft (m) | | | | | | | | | |
|-----------------------------------|---------------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|
| Start-up Temp. | 120 VAC | | | | 240 VAC | | | | |
| | Breaker Size | 15A | 20A | 30A | 40A | 15A | 20A | 30A | 40A |
| PX-F3 50°F (+10°C) | | 315 (95) | | | | 672 (205) | | | |
| | 5°F (-15°C) | 266 (69) | 295 (90) | 312 (95) | | 460 (140) | 610 (186) | 640 (195) | |
| | -15°F (-25°C) | 197 (60) | 266 (81) | 312 (95) | | 400 (123) | 541 (165) | 640 (195) | |
| PX-F5* 50°F (+10°C) | | 197 (67) | 262 (80) | | | 475 (145) | 532 (162) | | |
| | 5°F (-15°C) | 148 (45) | 200 (61) | 262 (80) | | 300 (93) | 410 (125) | 525 (160) | |
| | -15°F (-25°C) | 131 (40) | 177 (54) | 262 (80) | | 265 (82) | 365 (111) | 525 (160) | |
| PX-F8* 50°F (+10°C) | | 141 (43) | 190 (58) | 206 (63) | | 285 (88) | 384 (117) | 413 (126) | |
| | 5°F (-15°C) | 96 (30) | 128 (39) | 190 (58) | 203 (62) | 197 (60) | 246 (75) | 384 (117) | 410 (125) |
| | -15°F (-25°C) | 88 (27) | 108 (33) | 167 (51) | 203 (62) | 164 (50) | 230 (70) | 345 (105) | 410 (125) |
| PX-F10* 50°F (+10°C) | | 108 (33) | 148 (45) | 177 (54) | | 230 (70) | 295 (90) | 354 (108) | |
| | 5°F (-15°C) | 82 (25) | 108 (33) | 150 (46) | 174 (53) | 165 (50) | 213 (65) | 312 (95) | 345 (105) |
| | -15°F (-25°C) | 72 (22) | 98 (30) | 141 (43) | 174 (53) | 148 (45) | 190 (58) | 279 (85) | 345 (105) |

*RX-C Cable

Pipe Freeze Protection Weatherproof Thermostat

The Weatherproof Thermostat is designed for temperature control applications and serves as operational control only.

- Automatic activation - reduced operational costs
- Remote bulb temperature sensing
- Large, readily visible dial
- Wall mounted
- Water-tight enclosure



| Ordering Information | | PX Controls |
|----------------------|--|-------------|
| Part No. | Description | Voltage |
| 088L3422 | Weatherproof thermostat with water-tight enclosure | 120V - 277V |

For technical data on Weatherproof Thermostat (see page 23)

| Ordering Information | | PX Accessories |
|----------------------|--|----------------|
| Part No. | Description | |
| 088L0006 | Power Connection Kit, Cable to power lead, includes one end seal | |
| 088L0008 | Splice / Tee Kit, one end seal | |
| 088L1457 | End Seal Kit, includes 5 end seals | |
| 088L0009 | Aluminum Application Tape (75 ft.) | |
| 088L0023 | Power Connection Kit, cable to box, includes on end seal | |
| 088L0412 | Warning Labels, 10 pcs. | |

Warning Labels



Part # 088L0412

RX End Seal Kit (5pcs)



Part # 088L1457

Aluminum Tape



Part # 088L0009

Splice / Tee Kit



Part # 088L0008

Power Connection Kit
(Cable to Lead)



Part # 088L0006

Power Connection Kit
(Cable to Box)



Part # 088L0023

Danfoss Ice Guard Self-Regulating Cables



Freeze Protection

The Danfoss Ice Guard (SRIG) heating cable provides an easy to use solution for a variety of pipe freeze and roof and gutter applications. The heat output of the conductive core material increases and decreases when it is needed as it adjusts the power output to the varying conditions along the length of the pipe. This ensures maximum energy efficiency by producing heat only when and where it is needed.

- Cable can be overlapped without creating hot spots or causing a burn out
- 6 foot long power lead
- Pre-terminated with a plug and end seal
- Rugged 16 AWG bus cable with longer runs
- Limited 10 year warranty

Technical Data

Ice Guard (SRIG) Cables

| | |
|--------------------------|---|
| Available Power Outputs: | 5W / ft. at 240VAC and 120VAC at 50°F (+10°C) |
| Power Lead: | 6ft. long |
| Cable Diameter: | 0.45" x 0.216" (11.5mm x 5.5mm) |
| Rated Voltage: | 120V - 277V Max. |
| Minimum Bending Radius: | 1" (25mm) |
| Max. Rated Temperature: | 150°F (65°C) Powered 185°F (85°C) Un-powered |
| Bus Wire Type: | 16 AWG, (1.25mm ²), Tinned Copper |



Ordering Information

Ice Guard (SRIG) Cable

120V

| Part No. | Length (ft.) | Output @ 50°F |
|----------|--------------|---------------|
| 088L1480 | 6 ft | 5W/ft |
| 088L1481 | 12 ft | 5W/ft |
| 088L1482 | 18 ft | 5W/ft |
| 088L1483 | 24 ft | 5W/ft |
| 088L1484 | 50 ft | 5W/ft |
| 088L1485 | 75 ft | 5W/ft |
| 088L1486 | 100ft | 5W/ft |

Ordering Information

Ice Guard (SRIG) Cable

240V

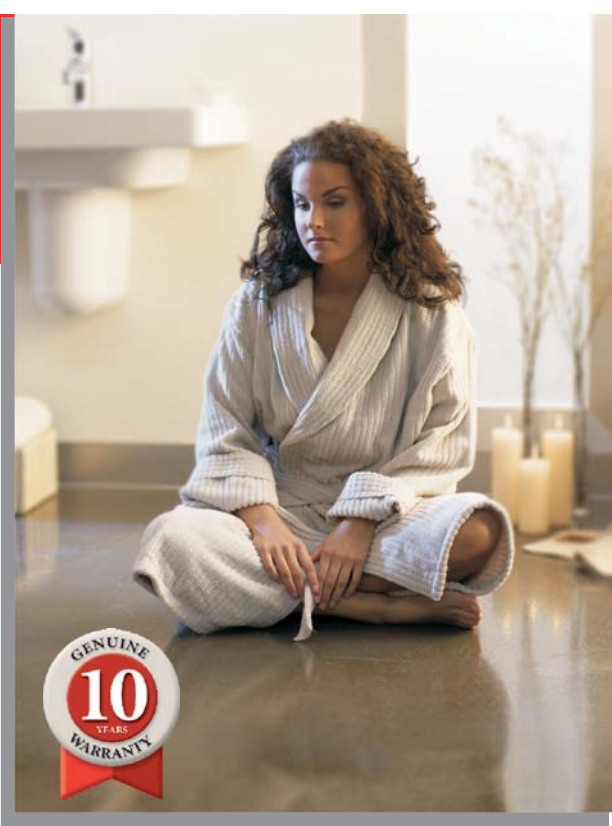
| Part No. | Length (ft.) | Output @ 50°F |
|----------|--------------|---------------|
| 088L1490 | 6 ft | 5W/ft |
| 088L1491 | 12 ft | 5W/ft |
| 088L1492 | 18 ft | 5W/ft |
| 088L1493 | 24 ft | 5W/ft |
| 088L1494 | 50 ft | 5W/ft |
| 088L1495 | 75 ft | 5W/ft |
| 088L1496 | 100ft | 5W/ft |

Danfoss TX_{FH} Electric Floor Heating

Electric Floor Heating Cables

Danfoss TX_{FH} Cables are a thick floor heating solution. Thick cables have a larger diameter than the Danfoss LX Floor heating cables, allowing them to be lower in COST, higher in HEAT OUTPUT and more DURABLE. They are installed in mud beds below the flooring materials and are most often used in new construction where overall material cost is a primary concern.

- Extremely durable
- High output means less cable required
- Single point connection
- Twin conductor cable
- Eliminates EMF's (electromagnetic fields)
- Safety approved for wet locations
- Genuine ten year non-prorated warranty, includes labor and material



| Technical Data | | TX _{FH} Floor Heating Cables |
|-------------------------|----------------------|---------------------------------------|
| Cable Construction: | Twin Conductor | |
| Cable Diameter: | 1/4" (6mm) | |
| Rated Voltage: | 240V | |
| Max. Rated Temperature: | 220°F (105°C) | |
| Conductor Insulation: | Teflon™ FEP and XLPE | |
| Outer Insulation: | PVC | |



| Technical Data | | TX _{FH} Floor Heating Cables | | | 240V | |
|----------------|--------------|---------------------------------------|------------|------------|----------------|------|
| Part No. | Length (ft.) | Approximate Heat Coverage (sq. ft.) | | | Watts (6W/ft.) | Amps |
| | | 4" Spacing | 5" Spacing | 6" Spacing | | |
| 088L3700 | 60 | 20 | 25 | 30 | 344 | 1.4 |
| 088L3701 | 90 | 30 | 35 | 45 | 515 | 2.1 |
| 088L3702 | 115 | 40 | 50 | 60 | 683 | 2.8 |
| 088L3703 | 145 | 50 | 60 | 75 | 852 | 3.6 |
| 088L3704 | 175 | 60 | 75 | 90 | 1026 | 4.3 |
| 088L3705 | 210 | 70 | 90 | 105 | 1226 | 5.1 |
| 088L3706 | 240 | 80 | 100 | 120 | 1395 | 5.8 |
| 088L3707 | 300 | 100 | 125 | 150 | 1735 | 7.2 |
| 088L3708 | 355 | 120 | 150 | 180 | 2072 | 8.6 |
| 088L3710 | 415 | 140 | 170 | 205 | 2410 | 10.0 |
| 088L3711 | 470 | 155 | 195 | 235 | 2756 | 11.5 |
| 088L3712 | 530 | 175 | 220 | 265 | 3097 | 12.9 |
| 088L3713 | 595 | 200 | 250 | 295 | 3470 | 14.5 |
| 088L3714 | 680 | 225 | 285 | 340 | 3972 | 16.6 |

Cable Notes:

- Power leads are 10 feet in length
- 4" centers provide approximately 17W/sq.ft.
- 5" centers provide approximately 14W/sq.ft.
- 6" centers provide approximately 12W/sq.ft.
- Watt output of the 240V cable is reduced by 25% when operated at 208V (approximately 4.5W/ft.)

Controls - See PG. 32
Accessories- See PG. 32

Danfoss TX_{SH} Thermal Storage Heating

Thermal Storage Heating Mats & Cables

Danfoss TX_{SH} (Storage Heating System) heating mats and cables are energized to warm a thermal mass below the floor surface. Danfoss TX_{SH} is the ideal way to take advantage of local on-peak and off-peak energy prices. When the power system is in off-peak times, energy rates are lower. When on peak times resume, the Danfoss TX_{SH} system shuts off and the heat stored in the floor gently emanates across the floor surface for hours. The Danfoss TX_{SH} system provides an energy efficient and cost effective method of heating, in a clean and silent manner.

- Twin conductor cable
- Single point connection
- Easy and flexible installation
- Durable construction
- Eliminates EMF's (electromagnetic fields)
- Silent, efficient, automatic and safe
- Lower capital and operational costs
- Genuine ten year non-prorated warranty, includes labor and material



Technical Data TX_{SH} Storage / Slab Heating Cables

| | |
|-------------------------|-----------------|
| Cable Construction: | Twin Conductor |
| Cable Diameter: | 1/4" (6mm) |
| Rated Voltage: | 240V |
| Max. Rated Temperature: | 220°F (105°C) |
| Conductor Insulation: | Teflon™ FEP |
| Outer Insulation: | PVC |



Technical Data TX_{SH} Storage / Slab Heating Cables 240V

| Part No. | Length (ft.) | Approximate Heat Coverage (sq. ft.) | | | Watts (9W/ft.) | Amps |
|----------|--------------|-------------------------------------|------------|------------|----------------|------|
| | | 4" Spacing | 5" Spacing | 6" Spacing | | |
| 088L3723 | 115 | 40 | 50 | 60 | 1083 | 4.5 |
| 088L3729 | 190 | 60 | 80 | 95 | 1762 | 7.3 |
| 088L3733 | 240 | 80 | 100 | 120 | 2150 | 9.0 |
| 088L3735 | 285 | 95 | 120 | 145 | 2595 | 10.8 |
| 088L3737 | 330 | 110 | 140 | 165 | 3031 | 12.6 |
| 088L3739 | 375 | 125 | 160 | 185 | 3469 | 14.5 |
| 088L3741 | 425 | 140 | 175 | 210 | 3865 | 16.1 |
| 088L3743 | 475 | 155 | 200 | 235 | 4364 | 18.2 |
| 088L3745 | 545 | 180 | 225 | 270 | 5009 | 20.9 |

Cables Notes:

- Power leads are 10 feet in length
- 4" centers provide approximately 27W/sq.ft.
- 5" centers provide approximately 22W/sq.ft.
- 6" centers provide approximately 18W/sq.ft.
- Watt output of the 240V cable is reduced by 25% when operated at 208V (approximately 4.5W/ft.)

Mat Notes:

- Power leads are 10 feet in length
- All mats are 2 feet in width
- Watt output of the 240V cable is reduced by 25% when operated at 208V (approximately 15W/sq.ft.)

Technical Data TX_{SH} Storage / Slab Heating Mats 240V

| Part No. | Length (ft) | Coverage (sq. ft.) | Watts (20W/sq.ft.) | Amps |
|----------|-------------|--------------------|----------------------|------|
| 088L3310 | 12.5 | 25 | 550 | 2.3 |
| 088L3312 | 30.0 | 60 | 1200 | 5.0 |
| 088L3314 | 52.5 | 105 | 2260 | 9.4 |
| 088L3316 | 80.0 | 160 | 3385 | 14.1 |
| 088L3318 | 92.5 | 185 | 3610 | 15.0 |
| 088L3320 | 117.5 | 235 | 4760 | 20.0 |

Controls - See PG. 32
Accessories- See PG. 32

Danfoss TX Thermal Storage Heating

TX Controls

| Ordering Information | | TX _{FH} Controls | 120V - 240V |
|----------------------|---|---------------------------|-------------|
| Part No. | Description | | |
| 088L5130 | Programmable Thermostat with Floor Sensor | | |
| 088L5132 | Programmable Thermostat with Air Sensor (and floor temperature limiter) | | |
| 088L5133 | Non-Programmable Thermostat with Floor Sensor | | |

Floor sensing thermostats include a Floor Sensor with a 10 foot lead
For more information see page 5

| Ordering Information | | TX _{SH} Controls |
|----------------------|---|---------------------------|
| Part No. | Description | |
| 088L5132 | Programmable Thermostat with Air Sensor (and floor Temperature limiter) | |

For more information see page 5

| Ordering Information | | Timer / Contactor Panel | | |
|----------------------|-------------------------------------|-------------------------|--------------|-------------------|
| Part No. | Description | Max. Amps | Coil Voltage | No. of Contactors |
| 088L5135 | Power Module with GFCI | 15 | N/A | 1 |
| 088L3450 | Single Contactor, 600V | 40 | 120 | 1 |
| 088L3451 | Single Contactor, 600V | 40 | 208 - 240 | 1 |
| 088L3456 | Single Contactor, 600V | 60 | 120 | 1 |
| 088L3457 | Single Contactor, 600V | 60 | 208 - 240 | 1 |
| 088L3441 | Contactor Panel without Timer, 600V | 100 | 120 | 2 |
| 088L3443 | Contactor Panel without Timer, 600V | 200 | 120 | 4 |

Contactor or Power Module is required for loads exceeding 15 Amps on single thermostat
All contactors are complete with NEMA 1 enclosure
100A contactor panels consist of two 3P, 50A contactors
200A contactor panels consist of four 3P, 50A contactors
See page 18 for technical data and dimensions

TX Accessories

| Ordering Information | | TX Accessories |
|----------------------|---|----------------|
| Part No. | Description | |
| 088L0010 | TX Repair Kit (Includes: Crimp connector, repair wire, heat shrink tubes) | |
| 088L0028 | Little Buzzer - Continuity Alarm | |
| 088L1050 | Cable Strapping (15ft. / 4.5m) | |
| 088L1054 | Cable Strapping (75ft / 22.8m) | |
| 088L3008 | Replacement Floor Sensor for Thermostat | |
| 19809099 | Sensor Conduit (8ft / 2.4m) | |

Little Buzzer



Sensor Conduit



Floor Sensor



TX Repair Kit



Power Module



Single Contactor



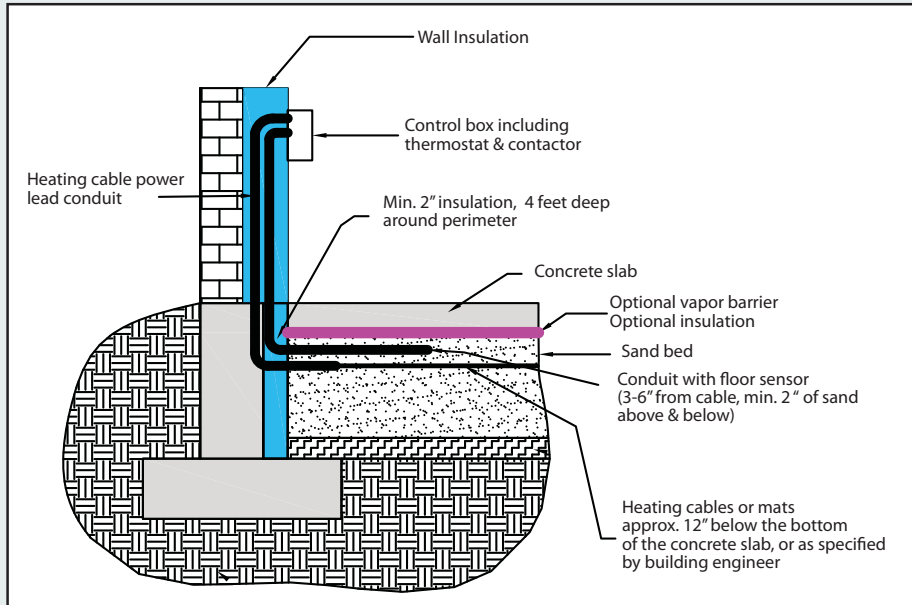
Cable Strapping



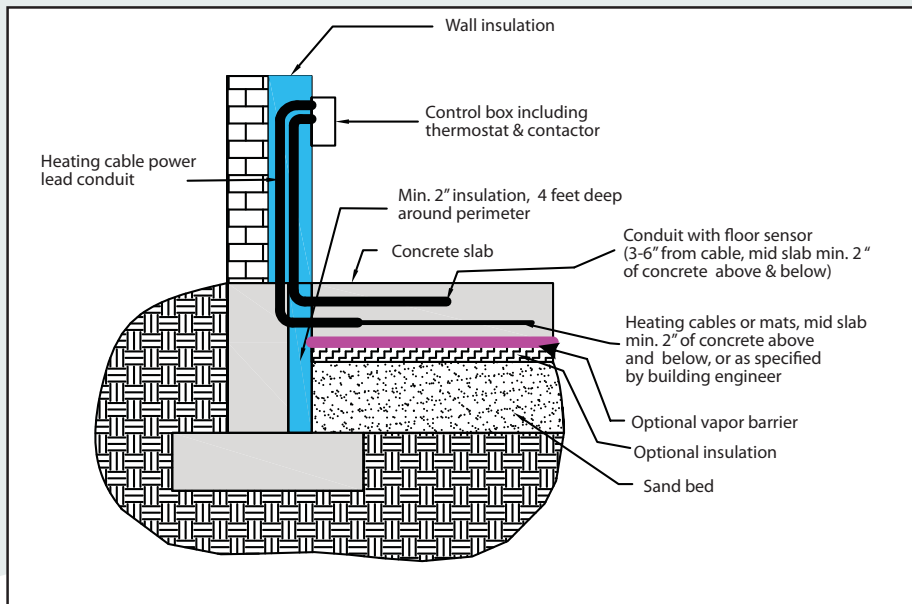
Danfoss TX Thermal Storage Heating

Thermal Storage Heating Mats & Cables Typical Applications

SAND BED INSTALLATION



CONCRETE INSTALLATION



Common Conversion Factors

| To Convert | Multiply By | To Obtain |
|---------------------------------|-------------|---------------------------------|
| Kilowatt/hours (kWh) | 3,412 | British ther. units/hr (Btuh) |
| Kilowatt (kW) | 3,412 | British thermal units (Btu) |
| Meter (m) | 3.281 | Feet (ft) |
| Meter (m) | 39.37 | Inches (in.) |
| Square feet (ft ²) | 0.0929 | Square meters (m ²) |
| Square meters (m ²) | 10.76 | Square feet (ft ²) |
| Inches (in.) | 2.54 | Centimeters (cm) |
| Inches (in.) | 25.4 | Millimeters (mm) |

$$\text{Cable spacing (inch)} = \frac{\text{Area (sq.ft.)} \times 12}{\text{Cable length (ft)}}$$

$$\begin{aligned} \text{Fahrenheit to Celsius } & \circ\text{F} = 1.8 \times \circ\text{C} + 32 \\ \text{Celsius to Fahrenheit } & \circ\text{C} = 5/9 \times (\circ\text{F} - 32) \end{aligned}$$

| | | | | | | | | | | | | | | | | | | | |
|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| °C | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| °F | -22 | -13 | -4 | 5 | 14 | 23 | 32 | 41 | 50 | 59 | 68 | 77 | 86 | 95 | 104 | 113 | 122 | 131 | 140 |

Ohm's Law

Ohm's law states that current in a resistance varies in direct proportion to voltage applied and inversely proportional to resistance.

$$I = V/R$$

V = voltage in volts (V)

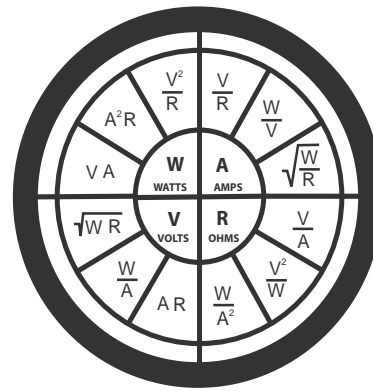
I = current in amps (A)

R = resistance in ohms (R)

The 3 most common mathematical expressions are:

$$V = I \times R \quad I = V/R \quad R = V/I$$

An unknown electrical value can be obtained by using any two known values in one of the variations of Ohm's Law shown in the circle.



Percentage of Rated Wattage for Different Applied Voltages

| Applied Voltage | Rated Voltage | | | | | | |
|-----------------|---------------|------|------|------|------|------|------|
| | 120V | 208V | 240V | 277V | 347V | 480V | 600V |
| 120V | 100% | 33% | 25% | 19% | 12% | 6% | 4% |
| 208V | | 100% | 75% | 56% | 36% | 19% | 12% |
| 240V | | | 100% | 75% | 48% | 25% | 16% |
| 277V | | | | 100% | 64% | 33% | 21% |
| 347V | | | | | 100% | 52% | 33% |
| 480V | | | | | | 100% | 64% |
| 600V | | | | | | | 100% |

Typical 3-Phase Wiring Diagrams & Equations for Resistive Heaters

VP = Phase Voltage

VL = Line Voltage

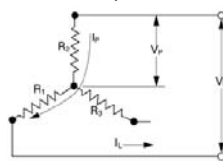
IP = Phase Current

IL = Line Current

R = R1 + R2 = R3 = Resistance of each branch

W = Wattage

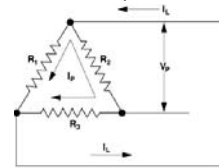
3-Phase Wye (Balanced Load)



Equations for Wye Only

$$\begin{aligned} I_p &= I_L \\ V_p &= V_L / 1.73 \\ W_{WYE} &= V_p^2 / R = 3(V_p^2) / R \\ W_{WYE} &= 1.73 V_L I_L \end{aligned}$$

3-Phase Delta (Balanced Load)



Equations for Delta Only

$$\begin{aligned} I_p &= I_L / 1.73 \\ V_p &= V_L \\ W_{DELTA} &= 3(V_p^2) / R \\ W_{WYE} &= 1.73 V_L I_L \end{aligned}$$



SUMMARY CONDITIONS FOR SALE AND WARRANTY

The acceptance of the order confirmation by the purchaser includes the acceptance of our "General Conditions of Sale and Warranty" as the only ruling condition. No modification of these conditions will be recognized by Danfoss. Any express or implied condition, statement or warranty, statutory or otherwise - not stated herein is excluded.

1. INCOTERMS

The international rules for the interpretation of trade terms "Incoterms" shall apply to the commercial terms used herein.

2. CONFIRMATION OF ORDER

Danfoss shall not be deemed to have accepted an order until written confirmation of the order from Danfoss is dispatched to the prospective purchaser. Quotations, pro forma invoices and the like, shall be subject to confirmation by Danfoss.

3. TERMS OF DELIVERY

At Danfoss' option, the goods can be delivered from any of the Danfoss factories, subsidiaries, or affiliated companies in or outside Canada. Failing special instructions, the goods will be dispatched in the way which Danfoss deems best without guaranteeing this to be the cheapest way of transport.

4. PRICE REGULATIONS

Danfoss reserves the right to adjust accepted prices in the event of alterations in rates of exchange, variations in costs of materials, changes in wages, interference on the part of the Government or similar conditions over which Danfoss has no control.

5. PACKING

Disposable packing is included in the price and will not be credited if returned. Reusable packing is not included in the price and shall be returned in accordance with Danfoss' instructions at purchaser's expense.

6. RISK

From the moment of delivery the purchaser shall bear all risks for the goods, and Danfoss shall not be responsible for loss and damage incurred during the transportation. If so desired by the purchaser, Danfoss will at the cost of and on behalf of the purchaser, effect marine insurance in English all risk conditions from warehouse to warehouse, at the c.i.f. value of the goods plus 10% and, likewise, Danfoss will effect war risk insurance.

7. TERMS OF PAYMENT

Where payment is not received when due, an interest rate of 10% per annum over and above the actual total back charge will be payable. This rate of interest will also be used in cases where an extension of the period of credit has been granted. The purchaser shall not be allowed to retain payments, or to settle debts by setting off same against possible counterclaims, disputed by Danfoss, or to reduce the invoiced price.

8. TRANSFER OF OWNERSHIP

Until full payment for the goods has been received by Danfoss, the goods shall remain the property of Danfoss and shall not be pawned or pledged in any way.

9. TIME OF DELIVERY

Time of delivery is stated approximately. Danfoss shall not be liable for any delay due to causes beyond Danfoss' control, including

but not restricted to strikes, lockouts, labour disturbances or the like, or in consequence of extraordinary measures on the part of government, hindrances to transportation including ice or other transport difficulties, delayed, incomplete or defective delivery of material ordered in due time from sub-suppliers, failing supply of electricity and similar obstacles to production, fire or workshop accidents at own factories or at sub-suppliers.

10. INFORMATION

The information and technical data contained in catalogues, leaflets and other written material constitutes an approximate guide only. No responsibility for errors or wrong interpretation can be placed on Danfoss. The purchaser cannot claim any rights based on this material. Such reservation shall also apply to suggestions, advice and other services rendered to customers, including installation and servicing instruction for the product delivered.

11. ALTERATIONS

Danfoss reserves the right to make alterations to their products without notice, also to products already placed on order.

12. WARRANTY

Danfoss warrants its products to be free of defects in material and workmanship for a period of time from the shipment to the original purchaser, assuming proper installation, proper maintenance, and normal operating conditions. Unless otherwise stated, Danfoss' obligation under this warranty shall be limited to repairing at its factory any part or parts thereof which shall be returned to its factory with transportation charges prepaid, and which upon examination shall appear to Danfoss' satisfaction to have been defective. Danfoss does not cover the cost of removal, freight, delivery and re-installment of the product. Correction of such defects by repair or replacement shall constitute fulfilment of all obligations to purchaser under this warranty. There is no other express warranty. Danfoss shall not be liable for incidental, consequential, or special damages arising from or in connection with the product use or performance. Danfoss assumes no liability of expenses of repairs made outside of its factory except by express written contract. This warranty supersedes all prior warranties.

Further information regarding the specific warranty details and period for each Danfoss product line can be found online and in the instruction manual and/or warranty card included with the product."

13. SECONDARY DAMAGES

Danfoss shall not be held responsible for any indirect or consequential damage e.g. damages to person or property, consequential loss, including loss of production, loss of profit, loss on goods in store or the like, which might arise out of defects and/or delay in delivery of the products sold, irrespective of the cause, including faulty manufacture, design of material.

14. NOTICE OF CLAIMS

Any claim or complaint as to defects and/or delay in delivery of the products shall be submitted in writing by the purchaser to Danfoss immediately.



GENERAL CONDITIONS FOR SALE AND WARRANTY

Minimum Order:

Handling charges of \$25 will be added to all orders less than \$100 net.

Freight:

All prices are FOB point of shipment.
Lowest cost transportation allowed on orders of \$1500 net or more
Partial shipment less than \$1500 net will not be freight allowed.

Payment Terms:

Net 30 days.
All orders subject to credit approval.
Interest rate of 1% per month applies to late payment.

Returns:

Returns accepted only with Returned Goods Authorization (RGA) obtained from Customer Service.

Return authorization must be received prior to return.

Subject to 25% restocking charge.

Goods returned must be new, in original packaging, unused and in resalable condition and are subject to inspection at Danfoss. Goods failing inspection will be returned collect with no credit issued.

No returns on special order items.

Danfoss reserves the right to limit returns.

Any Returns received without a Returned Goods Authorization Number will be returned to sender collect.

See General Terms of Sale and Warranty for complete Summary of Terms.

GO GREEN WITH DANFOSS



PART OF THE SOLUTION

International cooperation is key to reducing CO₂ emissions, an effective response to the global climate challenge also depends on innovation and intelligent technologies that both conserve natural resources and save money.

The task before us is to take these proven, energy-efficient technologies and apply them to solutions that can immediately reduce CO₂ emissions and save energy. The money these technologies save can then be invested in more long-term development of new, green energy sources.

At Danfoss, we offer more than 75 years experience in energy-efficient technologies. We are applying that core knowledge to traditional energy solutions as well as projects that use renewable energy sources, including wind and solar. At the same time, targeted investments in innovation and new development projects will continue to support the company's position as a leader in the green economy.

For more information on Danfoss' commitment to the environment, please visit:

www.danfoss.com/solutionsready



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