

ProMinder Standard Heating System Installation Instructions

IMPORTANT GUIDELINES

Please read this instruction leaflet thoroughly before commencing installation.

- ✓ Ensure that that all the electrical installation is carried out by a fully qualified electrician and conforms to the appropriate Building Regulations and current IEEE Wiring Regulations.
- ✓ Ensure the heating system is protected via a suitable RCD device (30mA) protected circuit either locally or at the distribution board.
- ✓ Ensure the electrical supply can carry sufficient current to power the heating system.
- ✓ Install the heating cable in accordance with the manufacturer's recommended installation guidelines.
- ✓ Ensure that all connections to the heating cable are sufficiently tight.
- ✓ Ensure the temperature probe is placed in an area which will be subject to ambient conditions.
- ✓ Ensure any cable glands used in the controller are of sufficient IP rating.
- ✓ Test the heating cable before attaching to the controller with a multimeter and insulation tester.
- ⚠ Do not supply power to the system until the cable has been completely unreeled and securely fastened in place.
- ⚠ Do not install the temperature sensor close to other heat sources.
- ⚠ Do not install the heating system until all pipe work has been completed and signed off in accordance with specifications.

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ProMinder Standard Monitored Heat Controller

The Thermocable FE Ltd ProMinder Standard Monitored Heat Controller is typically used for frost protection of piping where the effectiveness of the heating system must be guaranteed. Up to two heating circuits may be connected to a single controller such that if the primary heating circuit fails the controller will automatically switch to the secondary heating circuit. The ambient temperature is monitored via a separate temperature probe. The ProMinder Standard controller continuously monitors both heating cables for integrity regardless of the ambient temperature conditions. It has been designed to have no electro-mechanical parts (moving parts) in order to provide the maximum life-time in the field. Two versions are available: a low power version and high power version to provide monitoring from 20W to 2kw/3kw (self-regulating/fixed-wattage).



ProMinder Technical Data (Heating wire & Controller)

Technical Data (Controller)

| | |
|-----------------------------------|--|
| Operating Voltage: | 220/240Vac 50/60Hz |
| Approvals: | CE Marked, RoHS Compliant |
| Power Rating | |
| Low Power Version: | 20W – 300W (Fixed Wattage & Self-Regulating) |
| High Power Version: | 300W – 2000W (Self-Regulating) 300W – 3000W (Fixed Wattage) |
| Ambient Temperature Range: | -20°C — +60°C (-4°F — +140°F) |
| IP Rating: | IP65 |
| Material: | Polycarbonate |
| Dimensions: | 182mm(W) x 180mm(H) x 90mm(D) 7.1"(W) x 7"(H) x 3.5"(D) |
| Wall mount fixing centres: | 167mm x 165mm Min No 6 x 1 1/2" screw (3.5mm x 38mm) |
| Terminal Blocks: | 24AWG to 14AWG max CSA 2.5mm ² |
| Outputs: | 2x Heating Circuit @ max. 16A 1x Opto-isolated Fault output max. 30V @ 25mA |
| Inputs: | 1x Ambient Temperature Sensor Probe 1x Mains Supply |

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ProMinder Minimum & Maximum cable lengths for Self-Regulating and Constant Wattage heating cables

In order to ensure correct working of the ProMinder Standard Heating System the length of cable attached to each output must be between the minimum and maximum lengths shown in the table below. Also note, if two heating cables are to be used they must be of the same type i.e. both Self Regulating or both Constant wattage.

| Self Regulating Heating Cable | | | Constant wattage Heating cable | | |
|-------------------------------|---------------------|---------------------|--------------------------------|---------------------|---------------------|
| Rated Watts per m | Min Length (metres) | Max length (metres) | Rated Watts per m | Min Length (metres) | Max length (metres) |
| 8 | 2.5 | 37.5 | 5 | 4.0 | 60.0 |
| 10 | 2.0 | 30.0 | 8 | 2.5 | 37.5 |
| 16 | 1.3 | 18.8 | 10 | 2.0 | 30.0 |
| 20 | 1.0 | 15.0 | 12 | 1.7 | 25.0 |
| 25 | 0.8 | 12.0 | 16 | 1.3 | 18.8 |
| 30 | 0.7 | 10.0 | 20 | 1.0 | 15.0 |
| 40 | 0.5 | 7.5 | 30 | 0.7 | 10.0 |
| 50 | 0.4 | 6.0 | 40 | 0.5 | 7.5 |
| 8 | 38 | 250 | 5 | 60 | 600 |
| 10 | 30 | 200 | 8 | 38 | 375 |
| 16 | 19 | 125 | 10 | 30 | 300 |
| 20 | 15 | 100 | 12 | 25 | 250 |
| 25 | 12 | 80 | 16 | 19 | 188 |
| 30 | 10 | 67 | 20 | 15 | 150 |
| 40 | 8 | 50 | 30 | 10 | 100 |
| 50 | 6 | 40 | 40 | 8 | 75 |
| | | | 50 | 6 | 60 |
| | | | 60 | 5 | 50 |

Low Power Version

High Power Version

Table 1. Minimum & Maximum Lengths for Self-Regulating and Constant wattage Heating cables

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ProMinder Standard Control Unit - PCB Connections

Figure 1 shows the typical connections to the PCB for the ProMinder Standard control unit.

Connect the mains AC to the AC connector in the bottom right hand of the PCB. Up to 2 heating circuits can be connected to the N1, N2 and H1, H2 terminals. N1 and H1 are the primary circuit, N2 and H2 are the secondary circuit. The Temperature probe connection is not polarity sensitive and is located on the bottom left hand side of the PCB.

Ensure cable glands of the correct size (M20/M25/M32/M40) and IP rating (\geq IP65) are used where the cables enter the enclosure. (Such as Lapp Cable Skintop® STR-M 5311 1120 Gray or STR-M 5311 1320 Black)

Select the correct DIP switch settings before powering up the controller.



An external connection to a BMS or SCADA system can be made using the opto-isolated fault output. This is useful for triggering a remote alarm/trouble signal and is polarity sensitive. Note: the opto-isolated fault output has max. 30V 25mA rating and is intended to switch end-of-line components for BMS systems etc.



DO NOT CONNECT MAINS TO THE FAULT TERMINAL

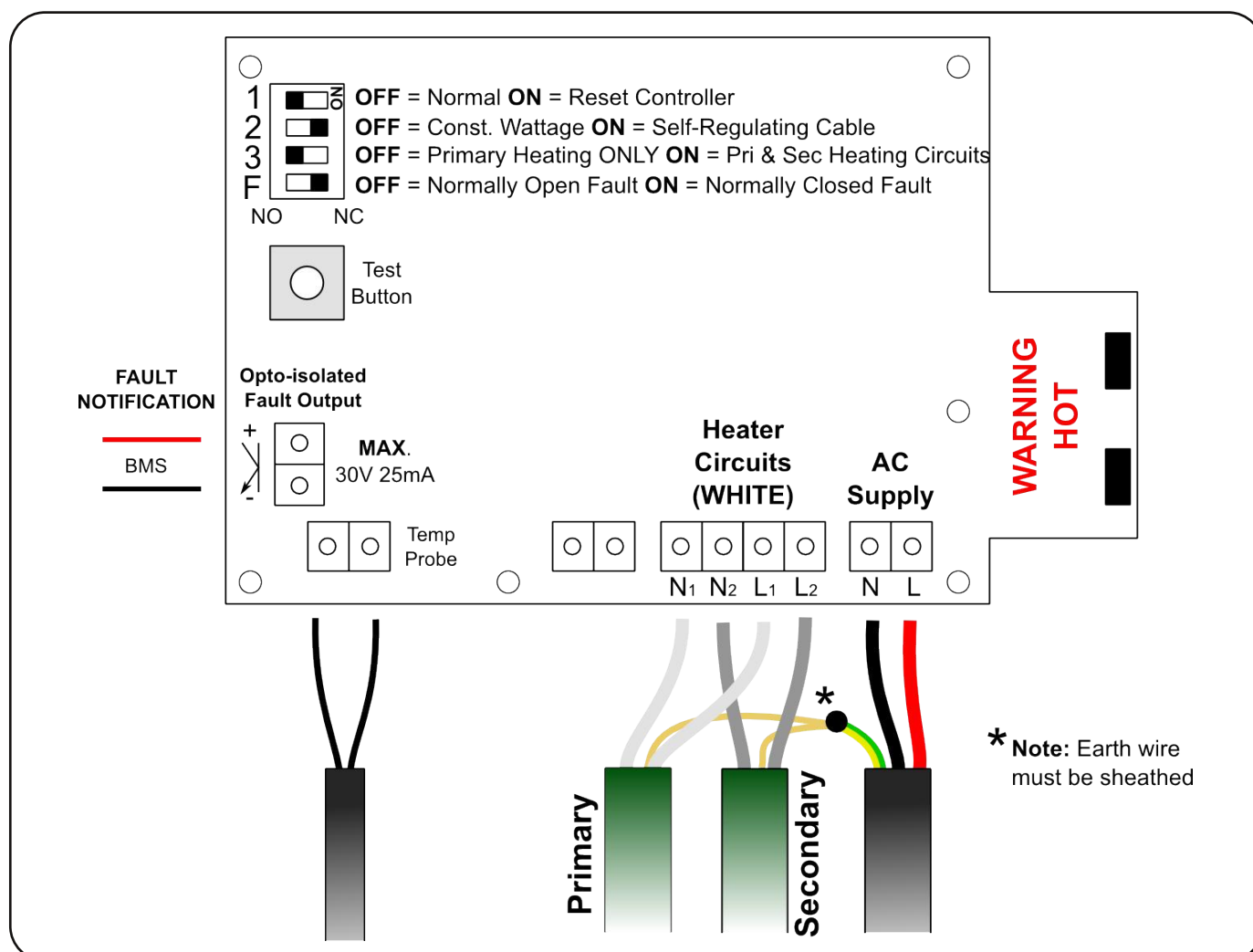


Figure 1. Typical PCB Connections for ProMinder Standard Heat Controller

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ProMinder Standard Control Unit - INSTALLATION

The ProMinder Standard Control Unit monitors and provides power to one or two heating circuits. Two separate switching circuits ensure frost protection even in the event one heater circuit fails, however, the ProMinder Standard control unit is suitable for use with a single heating circuit. The control unit constantly monitors both circuits for a fault condition. When a fault occurs on a heating circuit the controller automatically switches to the other heater circuit. An indicator light activates on the controller displaying which circuit has a fault and the fault output changes state to remotely trigger a BMS/SCADA system if required. Both (if a secondary heating circuit is installed) heating circuits are monitored twice a day regardless of ambient temperature for a fault.

Select how many heating circuits are connected to the ProMinder Standard controller by switching DIP switch 3 (see figure 1). ON indicates a primary and secondary heating circuit is connected, OFF selects ONLY a primary heating circuit – the secondary heating circuit is permanently off and not monitored.



INITIAL SETUP

If this is the first time the controller is being used, DIP switch 1 should be left in the off position. If the controller requires resetting or is being used with different heating cables, switch DIP switch 1 ON then power up the controller. This will erase any stored settings. Once complete the 3 fault lights will flash in sync. The controller should then be switched off, DIP switch 1 restored to the off position and the controller can be powered up again.

When the controller is powered up for the first time or the erase procedure has been carried out (see above), the unit will power up, light the Power indicator and flash the PRIMARY fault light and SECONDARY fault light (if two heating circuits are selected).

Press and hold the TEST switch for at least 3 seconds or until the fault lights go out. The PRIMARY and then SECONDARY (if two heating circuits are selected) heating indicators will light in sequence for approximately 30s each if on fixed wattage cable and approximately 9 minutes each if on self-regulating cable. The controller measures the power of each heater and uses this value as a reference for future readings to ensure both heating circuits are operating correctly.

If the two heating circuits match and are operating correctly the unit will continue to normal operation. If there is a fault for some reason the primary and secondary fault lights will flash alternatively. Check the connections and resistance of each heater.

The opto-isolated fault output can be set to be normally off or normally conducting. The F marks which DIP switch corresponds to the fault output setting. When the switch is in the NC position the fault output is normally conducting and vice versa.

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ProMinder Standard Control Unit - OPERATION

In normal operation above approximately +5°C the power light will flash briefly. Every 12 hours the controller will power up both circuits separately indicated by the PRI HEAT and SEC HEAT light. This indicates the controller is checking the integrity of the heating circuits. On fixed-wattage heating cable each circuit will power on for approximately 1 minute. On self-regulating cable each circuit will power on for approximately 10 minutes. If either heating circuit is faulty the corresponding PRI FAULT or SEC FAULT indicators will light and the fault output will change state.

When the temperature drops below approximately +5°C, if OK, the primary heater circuit will come on and the controller will flash the PRI HEAT light when power is being delivered. If the primary heater circuit is faulty, the secondary heater circuit will be used and the SEC HEAT light will flash (if two heating circuits have been installed).

If at any time a fault occurs with the temperature probe, the PROBE FAULT light will light permanently and the primary heating circuit will switch on automatically (if working otherwise the secondary heating circuit will switch on).

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ProMinder Standard Control Unit - OPERATION

Table 1 shows the different possible light outputs for the ProMinder Standard Control Unit. Make note whether the lights appear immediately after switch on or during normal operation (the green power light flashing) as this will aid troubleshooting.

Table 1. ProMinder Standard Control Unit Light Descriptions

| Description | Lights | | | | | | |
|----------------------------|--|--------------|--------------|--------------|--------------|--------------|--------------|
| | Pri Fault | Pri Heat | Sec Heat | Sec Fault | Power | Probe Fault | |
| IMMEDIATELY AFTER POWER UP | Check DIP switches set correctly if immediately after switch on PROBE FAULT light flashing. | ○ | ○ | ○ | ○ | ○ | ● (flashing) |
| | Controller memory erased (when powered up with DIP Switch 1 in the ON position) | ● (flashing) | ○ | ○ | ● (flashing) | ○ | ● (flashing) |
| | No settings stored in memory. Press and hold the TEST button for 3s to store the current heating circuit conditions in memory. (SEC FAULT light will only flash if DIP Switch 3 is ON) | ● (flashing) | ○ | ○ | ● (flashing) | ○ | ○ |
| | Problem with either heating circuit. Power off and check connections & heater resistance | ● | ○ | ○ | ● | ○ | ○ |
| IN NORMAL OPERATION | NORMAL OPERATION (above +4 deg C) | ○ | ○ | ○ | ○ | ● (flashing) | ○ |
| | NORMAL OPERATION Power to Primary Heater (below +4 deg C) | ○ | ● (flashing) | ○ | ○ | ● (flashing) | ○ |
| | NORMAL OPERATION Power to Secondary Heater (Primary Heater in fault) (below +4 deg C) | ● (flashing) | ○ | ● (flashing) | ○ | ● (flashing) | ○ |
| | NORMAL OPERATION Power to Primary Heater (Secondary Heater in fault) (below +4 deg C) | ○ | ● (flashing) | ○ | ● (flashing) | ● (flashing) | ○ |
| | Temperature Probe Fault (Primary or Secondary heating circuit will automatically switch on) | ○ | ● (flashing) | ○ | ○ | ● (flashing) | ● |

KEY

- - OFF
- - ON PERMANENTLY
- (flashing) - FLASHING