Underfloor Heating

GENERAL:

An electrical underfloor heating system shall be installed to provide a comfortable room and floor temperature by comfort heating; or total or direct heating; or accumulating heating, all as shown on the design plans. The manufacturer shall be DEVI™ by Danfoss. Full details can be seen in the DEVI application manual for indoor cable underfloor heating systems.

The system shall be complete with pre-terminated constant wattage heating cables in the form of a mat or in fixed lengths, controlled with a dedicated energy saving thermostat and associated sensors, all as indicated in the specification.

All system components shall be covered by an Environmental Product Declaration (EPD) to transparently report and document the environmental impact based on a product life-cycle assessment (LCA), CE marked and certified according to the relevant IEC (EN) codes.

BIM families shall be provided.

[SELECT ONE OR MORE OPTIONS]

[1] UNDERFLOOR HEATING MATS:

An underfloor heating mat system shall be installed as shown on the design plans, manufacturer DEVI™ by Danfoss.

The heating mats indicated on the design plans to be embedded in the tile adhesive layer shall be low profile and consist of a thin heating cable on a self-adhesive glass fibre mesh that shall stick firmly to the sub floor to enable a trouble-free installation. The mat shall be PVC free and the overall thickness shall be no more than 4mm, including the mat base. The heating cable shall be a twin conductor type, to ensure negligible electromagnetic field generation and pre-terminated by the manufacturer with a thin power supply cable. The heating mats shall be available in a wide range of ready to install specific sizes (0.5-12m^2), with heat outputs (70-200W/m^2) and have continuous full screening throughout. The heating mat, manufacturer DEVI™ by Danfoss, shall be

[SELECT ONE OR MORE OPTIONS]

DEVImat™ 70/100/150/200T

DEVIcomfort™ 100/150T

The heating mats indicated on the design plans to be embedded in concrete shall consist of a robust, twin conductor heating cable, pre-terminated by the manufacturer with a solid conductor power supply cable. The mats shall be available in a wide range of sizes (1.1-15.6m^2), heat outputs (100-175W/m^2) and be continuously full screened throughout, known as DTCE 100/150/175T, manufacturer DEVI™ by Danfoss and shall be covered by minimum 50mm concrete.

The mats shall be covered by an Environmental Product Declaration (EPD) and tested to demonstrate compliance with IEC EN 60335-1 and IEC EN 60335-2-96, the concrete embedded mats to comply with IEC EN 60800-2009

[2] UNDERFLOOR HEATING CABLES:

An underfloor heating cable system shall be installed as shown on the design plans, manufacturer DEVI™ by Danfoss,

The robust heating cables shall be designed specifically for installation in concrete and twin conductor type, to ensure negligible electromagnetic field generation. The cables shall be supplied in fixed lengths (7-410m), pre-terminated by the manufacturer, with continuous full screening throughout and available in a wide range of heat outputs (6-20 W/m).

All underfloor heating cables shall be designed specifically for the harsh installation environment and direct burial in concrete. All covered by an Environmental Product Declaration (EPD), CE marked and tested to demonstrate compliance with IEC EN 60800:2009 class M2.

[SELECT ONE OR MORE OPTIONS]

[1] Twin conductor, fixed length, constant wattage heating cables (DEVIflex™ 6/10/18T):

The heating cable shall be the twin conductor DEVIflex™ 6/10/18T, manufacturer DEVI™ by Danfoss, with a power output of output 6/10/18W/m. To simplify the installation, it is available in various fixed lengths and supplied pre-terminated with a 2.3m cold lead. Designed specifically for direct burying in concrete, it is covered by an Environmental Product Declaration (EPD), CE marked and tested to demonstrate compliance with IEC EN 60800:2009 class M2.

[2] Twin conductor, fixed length, constant wattage heating cables (DEVIcomfort™ 10T):

The heating cable shall be the twin conductor DEVIcomfort™ 10T, manufacturer DEVI™ by Danfoss, with a power output of output 10W/m. To simplify the installation, it is available in various fixed lengths and supplied pre-terminated with a 4m cold lead. Designed specifically for direct burying in concrete, it is covered by an Environmental Product Declaration (EPD), CE marked and tested to demonstrate compliance with IEC EN 60800:2009 class M2

ENERGY EFFICIENT, CONTROL SYSTEM

[SELECT ONE OR MORE OPTIONS]:

[1] intelligent programmable smart home thermostat (DEVIreg™ Display Connect):

All underfloor heating circuits shall be controlled by a programmable digital timer thermostat, known as DEVIreg™ Smart, manufacturer DEVI™ by Danfoss.

The thermostat shall be covered by an Environmental Product Declaration (EPD).

The thermostat shall have Zigbee 3.0 connectivity, capability to be paired with up to 200 mobile devices. The DEVIreg™ Display Connect programmable timer thermostat, offering both Bluetooth and Zigbee connectivity. It provides versatile options for control modes, fits wide range of frame design for seamless integration and compatible with most sensor types, fully compliant with Eco Design Lot 20 standards for energy-efficient heating management. The thermostat features a dial and display feature enabling intuitive control.DEVIreg™ Display Connect is fast and intuitive to setup using the wizard in the Bluetooth app. It has an energy saving program - including an optimum start (pre-heat) control ensuring the desired temperature. The thermostat is designed for fixed installation only. Due to the special designed 2-part construction it fits a wide range of frames. The thermostat is available in two colours. The thermostat can be used on its own or with the Devi Connect Hub.

[2] Programmable digital timer thermostat (DEVIreg™ Smart):

All underfloor heating circuits shall be controlled by a programmable digital timer thermostat, known as DEVIreg™ Smart, manufacturer DEVI™ by Danfoss.

The thermostat shall be covered by an Environmental Product Declaration (EPD).

The thermostat shall have WiFi connectivity, capability to be paired with up to ten mobile devices and communicate with two mobiles simultaneously and be remotely controllable all through the multiuser DEVIsmart™ App. The App shall have the capability to control up to 100 thermostats, with the possibility of ten ten Apps connected to a single thermostat and two Apps simultaneously controlling a single thermostat at the same time. The thermostat shall be capable of precise room temperature control using adaptive pulse width modulation (PWM) regulation and have 7/30 day / lifetime energy consumption readouts. The thermostat shall be designed with intuitive touchscreen operation and

include an App wizard to enable fast set up. The unit shall mount into a standard wall box and have a special two part construction fit so that it can fit a wide range of frames and sensors. It shall be dual sensor operated and available in four colours.

[3] Programmable digital timer thermostat (DEVIreg™ Touch)

All underfloor heating circuits shall be controlled by a programmable digital timer thermostat, known as DEVIreg™ Touch, manufacturer DEVI™ by Danfoss.

The thermostat shall be covered by an Environmental Product Declaration (EPD).

The thermostat shall have a large touch screen display, built in set up wizard, adaptive pulse width modulation (PWM) regulation, optional code set up and an energy saving program. The unit shall flush mount into a standard wall box and have a two-part construction so that it can fit a wide range of frames and sensors. It shall be dual sensor operated and available in four colours.

[4] Programmable digital timer thermostat (DEVIreg™ Room)

All underfloor heating circuits shall be controlled by a programmable digital timer thermostat, known as DEVIreg™ Room manufacturer DEVI™ by Danfoss.

The thermostat shall be covered by an Environmental Product Declaration (EPD).

The thermostat shall be fast to set up using buttons below the screen. It shall have pulse width modulation (PWM) regulation, open window detection, energy saving program and dual sensor operated. The unit shall mount into a standard wall box and have an integrated frame.

All thermostats shall be covered by an Environmental Product Declaration (EPD) and tested to demonstrate compliance with comply with IEC EN 60730-1; 60730-2-9 (thermostat); 300 328 (WiFi)

EXECUTION:

Underfloor Heating System:

Design:

The manufacturer or operations partner shall be able to provide heat loss calculations and the corresponding design of the underfloor heating system, electrical schedules and circuit breaker protection, operating currents and loads, system layout and schematic drawings indicating power connections; controller configuration list and wiring diagrams.

Installation:

All underfloor heating systems shall be installed, tested and commissioned in strict accordance with the design plans and the DEVI application manual for underfloor heating systems. Installation shall be closely coordinated with the responsible sub-contractors.

[SELECT ONE OPTION]

[1] The system shall be installed, tested and commissioned by specialist installers trained by the manufacturer

[2] The system shall be installed, tested and commissioned under periodic supervision by the manufacturer or specialist installation partner

Electrical connection:

All connections between the electrical supply, thermostats and underfloor heating circuits by an approved electrical contractor. Circuit breaker protection MCB (BS EN 60898 type C) and RCD (30 mA sensitivity, tripping within 100ms).