

Domestic Hot Water Temperature Maintenance

HYBRID DESIGN

GENERAL:

The domestic hot water supply has been designed as a hybrid system, with recirculation loops only on the main supply pipes. A self-regulating temperature maintenance cable shall be installed on all branch pipe run outs to compensate for the unavoidable heat losses and to maintain pipe temperatures, known as DEVIhotwatt™ system, manufacturer DEVI™ by Danfoss.

The self-regulating temperature maintenance system maintains and optimises domestic hot water pipe temperatures. It compliments the domestic hot water supply by providing the convenience of instant hot water, accurate temperature control and has the option for thermal disinfection.

The system shall be complete with low smoke self-regulating temperature maintenance cables, energy efficient controller and cold applied components for interconnection and termination - as shown on the design plans.

Environmental Product Declarations (EPD) shall be provided for all system components to transparently report and document the environmental impact based on a product life-cycle assessment (LCA).

All system components shall be CE marked and certified according to the relevant IEC (EN) codes

BIM families shall be provided.

SELF-REGULATING TEMPERATURE MAINTENANCE CABLES

The self-regulating temperature maintenance cables shall be designed specifically for the purpose of domestic hot water temperature maintenance and qualified for a useful lifetime in excess of 25 years. The cables shall be CE marked, certified according to the relevant IEC (EN) codes and covered by an Environmental Product Declaration (EPD).

The cables shall consist of a self-regulating conductive polymer core, modified low smoke zero halogen electrical insulation (radiation cross-linked to ensure long life expectancy), tinned copper braid and modified low smoke over jacket (printed with cable type, batch number and metre marks).

The temperature maintenance cables shall be DEVIhotwatt™, manufacturer DEVI™ by Danfoss.

As shown on the design plans, the domestic hot water pipes shall be fitted with

[SELECT ONE OR MORE OPTIONS]:

- [1] DEVIhotwatt™ 55 (B) for 55°C domestic hot water maintenance
- [2] DEVIhotwatt™ 70 (B) for 55°C domestic hot water maintenance with thermal disinfection
- [3] DEVIhotwatt™ 45 (B) for 45°C domestic hot water maintenance

All to be installed within the maximum circuit lengths of

- [1] 188m for DEVIhotwatt™ 55 (B) on 20 A MCB
- [2] 142m for DEVIhotwatt™ 70 (B) on 20 A MCB
- [3] 231m for DEVIhotwatt™ 45 (B) on 16 A MCB

The stated maximum lengths assume a minimum 10°C switch on.

DEVIhotwatt™ is a range of low smoke self-regulating temperature maintenance cables designed specifically for domestic hot water temperature maintenance. Each are covered by an Environmental Product Declaration (EPD), tested to show compliance with IEC EN 62395-2:2013, IEEE 515.1, fulfil the requirements of DGVW and SVGW and are qualified for a useful lifetime more than 25 years.

INTERCONNECTION AND TERMINATION COMPONENTS:

Interconnection and end terminations shall be made with high performance, cold applied insulation displacement connectors and gel filled end seals. All shall be UV resistant, IP66 and 85°C rated and suitable for 2500 V DC insulation resistance test; known as DEVI™-Connecto, manufacturer DEVI™ by Danfoss and covered by an Environmental Product Declaration.

ENERGY EFFICIENT, CONTROL SYSTEM:

Multi circuit, programmable control and monitoring system:

All hot water temperature maintenance circuits shall be controlled with a 4-channel electronic programmable control unit installed on a DIN rail.

The controller shall provide the user with easy set up; definable accuracy; two control modes – hot water temperature maintenance, with or without thermal disinfection; manual thermal disinfection option; four independent channels -each capable of controlling a separate pipe system; two temperature sensors per channel; seven different compatible sensors, including NTC15k (15kOhm at 25°C); BMS control through a Modbus RS485 serial interface.

The controller shall be DEVIreg™Hotwater, manufacturer DEVI™ by Danfoss. Tested to demonstrate compliance with the Low Voltage Directive 2014/35/EU; EMC Directive 2014/30/EU; IEC EN 60730-1 and IEC EN 60730-2-9 and covered by an Environmental Product Declaration.

DESIGN:

The manufacturer or operations partner shall be able to provide design plans and calculations including heat loss and corresponding selection of temperature maintenance cables; electrical schedules providing cable lengths, circuit breakers, circuit start up currents, operating currents and loads, line list summary and single line details; system layout and schematic drawings indicating power connections, tees and end seals; controller configuration and wiring diagrams; BIM families.

EXECUTION:

Temperature Maintenance Cable Installation:

All temperature maintenance cables shall be installed, tested and commissioned in strict accordance with the design plans and the DEVI Domestic Hot Water Application Manual. Thermal insulation installation shall be closely coordinated with the responsible sub-contractors, thickness in accordance with the same manual. Professional grade aluminium tape shall be used on plastic pipes.

[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.

Thermal Insulation:

Insulation selection and thickness shall be strictly in accordance with the design plans.

Electrical Connection:

Connections between the electrical supply, control panel and hot water temperature maintenance circuits shall be installed by an approved electrical contractor and protected by MCB (BS EN 60898 type C or D) and RCD (30 mA sensitivity, tripping within 100ms).