HIU Performance Specification

The contractor shall install a wall mounted ModuSat XR-ECO® (or equal and approved) twin plate heat interface unit (HIU), which will provide heating and hot water fed by LTHW from a communal or district heat network. The unit will provide a complete remote surveillance and billing solution wired back to a centralised data logger via a TCP/IP Ethernet, facilitating SmartTalk® unique 2-way communication and dynamic heat network performance analysis via a cloud-based server.

The HIUs will comprise of 2 plate heat exchangers; one for heating and another for the instantaneous production of domestic hot water. The plates provide a hydraulic break between the primary and secondary circuits with a circulation pump on the heating circuit, and the plates shall be selected for the project specific requirements and ensure turbulent flow during peak conditions to safeguard the efficiency and longevity of the plates.

The plates along with all other HIU components will be contained in white enamel coated insulated steel casing. The plate heat exchangers will be factory fitted with a dual insulation jacket made from EPP.

The fully assembled HIU must be factory pressure tested with water to 16 bar sustained for 10 minutes on the primary and DHW circuits, and 3 bar on the heating circuit. After this pressure test the HIUs must be dried out with air to avoid any stagnant water being contained within the unit. For the purpose of traceability the test result needs to be retained in a database that associates the date of the test, the test results with serial numbers of the HIU, the control board and the heat meter.

# The mandatory features of the unit are: -

* BESA tested with a maximum high temperature test VWART of 29°C
* Maximum heat loss during keep warm (BESA test 4a and 4b) of 60W
* Pre-payment ready without the need for any additional hardware being fitted
* MID approved, Class 2 Ultrasonic heat meter with a nominal flow rate of 1.5 m3/h
* SmartTalk® remote communication to allow troubleshooting and continuous heat network performance analysis via a cloud-based server
* Variable speed pump with dT control to ensure optimal network return temperatures
* Two Pressure Independent Control Valves (PICVs) to provide flow regulation, differential pressure control and energy flow control (One for heating and one for domestic hot water)
* Modulation of PICVs to control flow through the plate heat exchanger and provides the ability to adjust the heating and domestic hot water outlet temperatures
* Flow sensor on the potable water inlet to ensure fast hot water response time and optimised PICV modulation
* Two stage low pressure electronic switch with pressure sensor on secondary heating side that shuts down the pump and sends an alarm to the room unit and data logger. (At 0.7 bar an alarm is sent to the ViewSmart room controller, and at 0.5 bar the pump shuts down to prevent system damage and no heating is provided.) Also allows remote monitoring of system pressure
* Braze-welded stainless-steel plate heat exchangers for heating and hot water production
* Dual insulation jacket on the plate heat exchangers
* Fully insulated pipework and casing as standard
* Domestic hot water priority control
* Optional external mains cold water meter (connected to the control board within the HIU for combined billing)
* Ability to pick up pulse form electricity meter to display electricity usage via room controller
* Optional overheat protection on the heating flow temperature to provide additional protection for sensitive floor finishes where underfloor heating is installed if required.
* Built in firmware routine for remotely managing the underfloor slab curing process
* Strainer on primary flow inlet
* Inbuilt heating circuit expansion vessel and pressure relief valve
* External filling loop to ensure accessibility without opening the case of the HIU
* To provide optimum heating and hot water performance at heat network primary flow temperatures as low as 55°C
* Water flow monitoring of the primary heating circuit
* Primary flow and return temperature measurements
* Operation of full priority on DHW production
* Timed keep warm control, which allows the resident to set up a schedule ensuring fast hot water response time at peak times, but also allows the keep warm function to switch off and for the plate to cool down when the resident is out or asleep, reducing energy consumption and cost

Fitted externally from the unit, an ambient programmable room controller (ViewSmart) enables the end user to control the timing and temperatures and to read the energy consumption.

# ViewSmart Room Controller Key Functionality

* Simple to use controller with backlit display
* Fault alarm shown on display
* Holiday settings
* Summer and winter operation programming
* Programming of heating schedules and the hot water keep warm function
* Enable apartment heating to function with weather compensation in conjunction with data received from only one outdoor sensor via the master panel in plant room
* Ability to read the heat meter, water meter, cooling meter, and electricity meter where fitted
* Ability to view remaining credit and heating and/or cooling cost (where PaySmart® is used)
* Ability to upgrade to an optional ENE3 compliant model for BREEAM credits via software upgrade
* 2 zone control option for Part L 2010 Building Regulations compliance (Requires two ViewSmart room controllers, one for each zone and external 2 port valves)
* Night set back facility
* Allow for remote reading of the ambient temperature of the individual apartments and to remotely check the programmed heating time schedules

**Controls and Surveillance**

# Data Logger

All units will be connected via a hard-wired Ethernet TCP/IP network to communicate with the data logger. The data logger is a centralised unit for reading and management of the units and is used for adjustment and heat metering for heating and DHW production systems. After appropriate setting and configuration, the data logger enables dialogue with each of the individual units, making possible the following:

Unique Two-Way Communication

* The download of consumption data for individual utilities
* Remote fault diagnosis
* Site wide heat network performance analysis
* Remote warranty validation (commissioning) of units
* Remote HIU configuration including max flow rate; heating / hot water temperature set points; and maximum secondary return temperature
* To send firmware updates to units and to room controllers
* Remote system management
* To modify metering unit configuration parameters
* To read individual unit status
* To make motorised element of the unit function (pumps, valves, etc.)
* Provision of end user remote assistance
* To run network diversity test

# Remote Monitoring & Billing

A bulk meter is to be installed where the heat network exits the plantroom and where the heat network enters a new building (if applicable). All bulk meters are to be installed on the same network and communicate back to the same data logger as all HIUs, to ensure a holistic approach to the heat network performance analysis capability.

The equipment shall enable the end user to view and download energy readings, consumption figures and credit details and send alarms to alert of any potential heating or hot water issues.

The equipment shall have the function for automated meter readings to be sent to the dedicated Metering & Billing provider in a .csv file on a daily basis.

The system shall also have the facility to include the Pay As You Go (PAYG) technology, which enables the end user to pay for their energy in advance via PayZone, Direct Debit, Online or Telephone, should this be required. The pre-payment facility is to be supplied without the addition of any external wiring, valves or ancillary equipment being required.

All HIUs and bulk meter data will communicate via the data logger with the SmartTalk Cloud System Monitoring Platform which aggregates the individual unit parameters into an analytical platform, allowing real-time and continuous readings of temperatures and flows to identify and localize inefficiencies and quantify effects of remotely changing sets of parameters/global variables to improve heat network performance.

# Remote Commissioning & Warranty Validation

Remote commissioning and warranty validation of unit’s will be carried out by the supplier in line with the site programme and completion / handover dates, with 10% of the remotely commissioned units checked by an engineer on site.

The units are to have a 2-year parts and labour warranty starting at practical completion. Enhanced warranty options should be available at an additional cost which should include continuous heat network performance analysis to ensure any potential underperforming HIUs or discrepancy between the aggregated HIU performance data and bulk meter data are identified and rectified within a timely manner. The contractor will use this facility at the end of their after care period to prove that the heat network is performing as per the design intentions.