

Evinox ModuSat XR (Eco)

Twin Plate Heat Interface Unit

Installation Manual



Contents

1. GENERAL INFORMATION	4
1.1 Application	4
1.2 Symbols	4
1.3 Warning.....	4
1.4 Safety instructions	5
1.5 Maintenance requirements	5
2. TECHNICAL FEATURES	6
2.1 Typical ModuSat® XR & XR-ECO Unit.....	6
2.2 Function and operation	6
2.3 Typical Schematic (All Top Connections)	7
2.4 Technical Parameters	8
2.5 Connection Configurations	9
2.6 Typical Dimensions (connection configurations shown)	10
3. INSTALLATION	14
3.1 Handling	14
3.2 Positioning.....	14
3.3 Hydraulic connections	15
3.4 Wall fixing.....	15
3.5 Use of Pre-installation Rig	15
3.6 Evinox Flushing By-pass Kit.....	17
3.7 Flushing Primary Circuit.....	17
3.8 First fill of the HIU	18
3.9 HIU Flushing.....	18
3.10 First fill of apartment heating system.....	19
4. Water treatment	19
4.1 Water Quality Guidelines	20
4.2 Dosing Secondary System	20
4.3 Warranty due to Water Quality	21
5. Electrical Connections.....	22
5.1 Removing the Front panel	22
5.2 ModuSat® Wiring Connections	23
5.2.1 RJ45 Connections	23
5.3 ModuSat® Connection Board	24
5.4 Typical ModuSat® Electric Wiring Diagram with 2 Zone Control (2 Evinox ViewSmart Room Controllers)	25
5.5 ViewSmart Room controller connections	26
5.6 SmartTalk® system wiring.....	27
6. SETTING INTO OPERATION / COMMISSIONING	28
6.1 Pre-commissioning checklist.....	28
6.2 Pressure independent control valve.....	29
6.2.1 Pump	30
6.3 Available Pump Head	31
6.4 Initial Commissioning Procedure.....	32




7. HIU SERVICING AND INSPECTION	33
8. WARRANTY	34
9. WRAS APPROVAL	36

1. GENERAL INFORMATION

1.1 Application

The Evinox ModuSat® XR heat interface unit provides instantaneous domestic hot water and indirect space heating when connected to a district or communal heating system. The Evinox ModuSat® XR unit requires electrical supply to function.

1.2 Symbols





	IMPORTANT NOTE REGARDING CORRECT INSTALLATION
	WARNING REGARDING PERSONAL SAFETY
	WARNING OF DANGER OF ELECTRIC SHOCK

1.3 Warning

- ☐ **Follow the instructions.** These instructions must be read and observed carefully before installing and operating the ModuSat® heat interface unit. Failure to read and follow the instructions provided within this document may cause a safety hazard and/or failure of the equipment.
- ☐ **Qualified personnel only.** The Evinox heat interface unit must be installed, commissioned and maintained by qualified and competent personnel in accordance with this document as well as national regulations and standards.
- ☐ **Warning of transport damage.** Always check to ensure that the ModuSat® heat interface unit has not been damaged during transport.
- ☐ **Warranty.** Any modifications or adjustments carried out without Evinox Energy official authorisation will invalidate the warranty and absolve Evinox Energy from any liability.
- ☐ **Product modifications.** Evinox Energy reserves the right to make changes or modifications to the products without prior notice.

1.4 Safety instructions

The Evinox heat interface unit must be installed, commissioned and maintained by qualified and competent personnel in accordance with this document as well as national regulations and standards.

	High temperatures. Take necessary precautions when working on the unit as high operating temperatures may cause severe skin burns.
	Risk of Electric shock. Disconnect the electricity supply before starting any works on the unit.
	Qualified personnel. Electrical installation must only be carried out by qualified personnel.
	In the case of water leak. <ul style="list-style-type: none"><input type="checkbox"/> Take caution of hot water<input type="checkbox"/> Slowly close the isolation valves at the top of the unit<input type="checkbox"/> Contact Evinox Energy

1.5 Maintenance requirements

We recommend the unit is checked at least every 24 months by an authorised maintenance engineer. If the unit is subject to excessively heavy usage or non domestic installations (for example in a light commercial environment), we recommend having it checked more than every 24 months.

2. TECHNICAL FEATURES

2.1 *Typical ModuSat® XR & XR-ECO Unit*



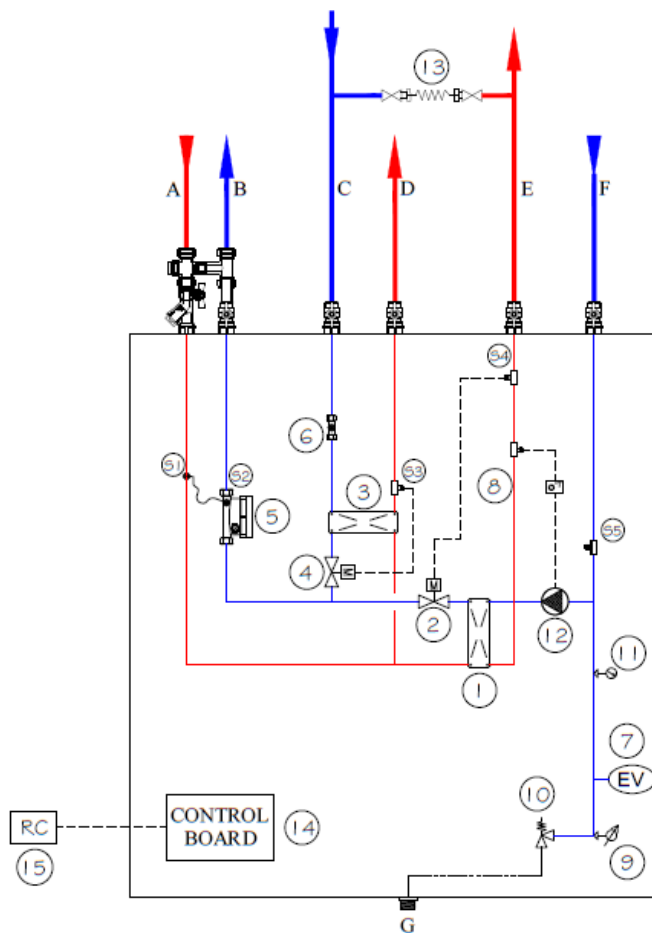
Note: The product may look different from the image shown.

2.2 *Function and operation*

- ☐ **District or communal heating system** – the primary thermal energy is used to produce domestic hot water and heating.
- ☐ **Domestic hot water (DHW)** - the DHW is prepared via a plate heat exchanger and is activated when flow is registered through the flow sensor located on the cold water inlet. The electronically controlled Pressure Independent Control Valve (PICV) modulates the primary flow rate to maintain the DHW temperature. This unit operates with the DHW taking priority over HTG – when the hot water is used it will temporarily cut the heating operation. Once the hot water outlets are closed the heating operation will be resumed.
- ☐ **Heating (HTG)** – when the space heating demand is requested by the end user controller, the heating operation is started. The electronically controlled PICV is used to modulate the primary flow rate to match the heating demand. The unit has an integrated heating circulation pump which is switched on when the heating is on and modulates based on secondary heating delta T.
- ☐ **Keep Warm Facility** – when the heat interface unit is set in the Comfort mode, the DHW plate heat exchanger is kept warm by opening the domestic hot water PICV to pulse the primary heating through the plate in order to maintain a set temperature. This is in order to ensure a fast DHW response time.

2.3 Typical Schematic (All Top Connections)

ModuSat XR (ECO)



Note: Other connection arrangements are available see page 10 for details.

Components

- A Primary / LTHW flow
- B Primary / LTHW return
- C Secondary / Domestic cold water Inlet
- D Secondary / Domestic hot water outlet
- E Secondary / Apartment heating flow
- F Secondary / Apartment heating return
- G Connection for safety discharge

Primary Circuit Side

- 1 Insulated plate heat exchanger (Heating)
- 2 Heating Pressure Independent Control Valve with actuator
- 3 Insulated plate heat exchanger (Domestic Hot Water)
- 4 DHW Pressure Independent Control Valve with actuator
- 5 Heat meter

DHW Secondary Side Circuit

- 6 Flow sensor

Heating Secondary Side Circuit

- 7 Heating expansion vessel
- 8 Safety UFH thermostat (optional)
- 9 Pressure sensor
- 10 Safety relief discharge
- 11 Pressure gauge
- 12 Heating circulation pump

Controls & Other Items

- 13 Filling loop (External)
- 14 Electronic control board
- 15 ViewSmart room control unit
- 16 Flushing bypass kit

S1, S2 – temperature sensors as a part of the heat meters

S3 – DHW temperature sensor

S4, S5 – heating flow and return temperature sensors

2.4 Technical Parameters

Electrical

	XR 30/55-/70... XR-ECO 30/55-77...	XR 100-XX
Electric supply	220 / 240 Volt (AC)	
Frequency	50 Hz	
Current absorption	0,6 Amps	

Hydraulic connections

		XR 30/55-/70... XR-ECO 30/55-77...	XR 100-XX
Primary circuit supply	A	3/4 " BSP	1 " BSP
Primary circuit return	B	3/4 " BSP	1 " BSP
DCW inlet	C	3/4 " BSP	1 " BSP
DHW supply	D	3/4 " BSP	1 " BSP
Apartment circuit supply	E	3/4 " BSP	3/4 " BSP
Apartment circuit return	F	3/4 " BSP	3/4 " BSP
Drain	G	1/2 " Compression	1/2 " Compression

Hydraulic characteristics

	XR 30/55-/70... XR-ECO 30/55-77...	XR 100-XX
Pipework material	Copper	
Plate heat exchanger material	Stainless steel 316L	
Operating medium	Water	
Primary circuit max pressure	16 bar	
Primary minimum differential pressure	50 kPa* (0.5 bar) *may vary depending on the required output	
Primary maximum differential pressure	400 kPa (4 bar)	
Apartment heating circuit recommended cold fill pressure	1.0 bar	
Apartment heating maximum pressure	3 bar	
Apartment heating expansion vessel	8 L	
DHW max pressure	10 bar	
DCW min pressure	1 bar	
Max supply temperature (Primary)	85°C	

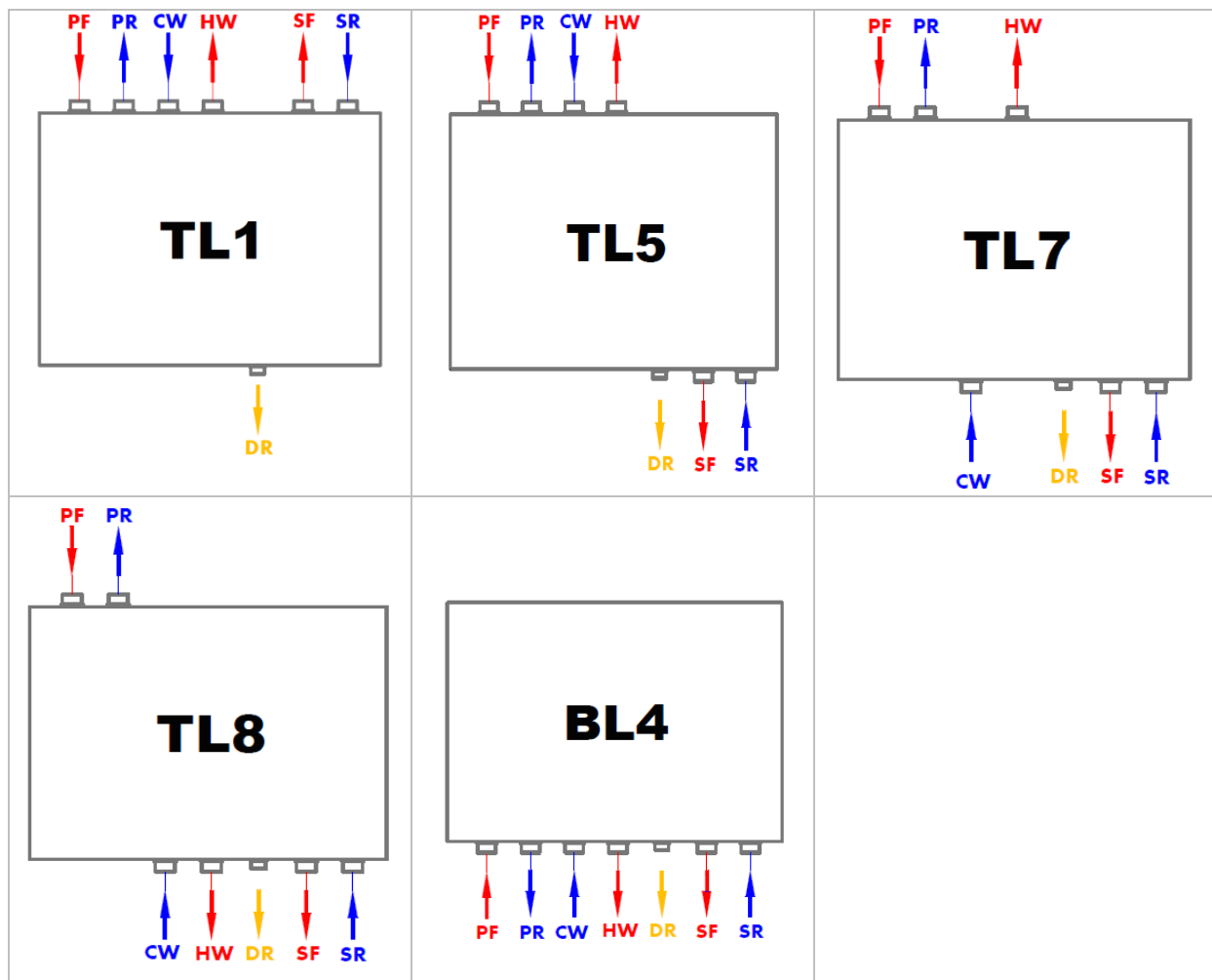
Mass

	Dry	Wet
XR ECO TP-30-10R	34.5 kg	36.5 kg
XR ECO TP-55-10R	35 kg	37.5 kg
XR ECO TP-70-10A	37 kg	39.5 kg
XR TP-100-10A	43 kg	47.5 kg

For other models please contact Evinox.

2.5 Connection Configurations

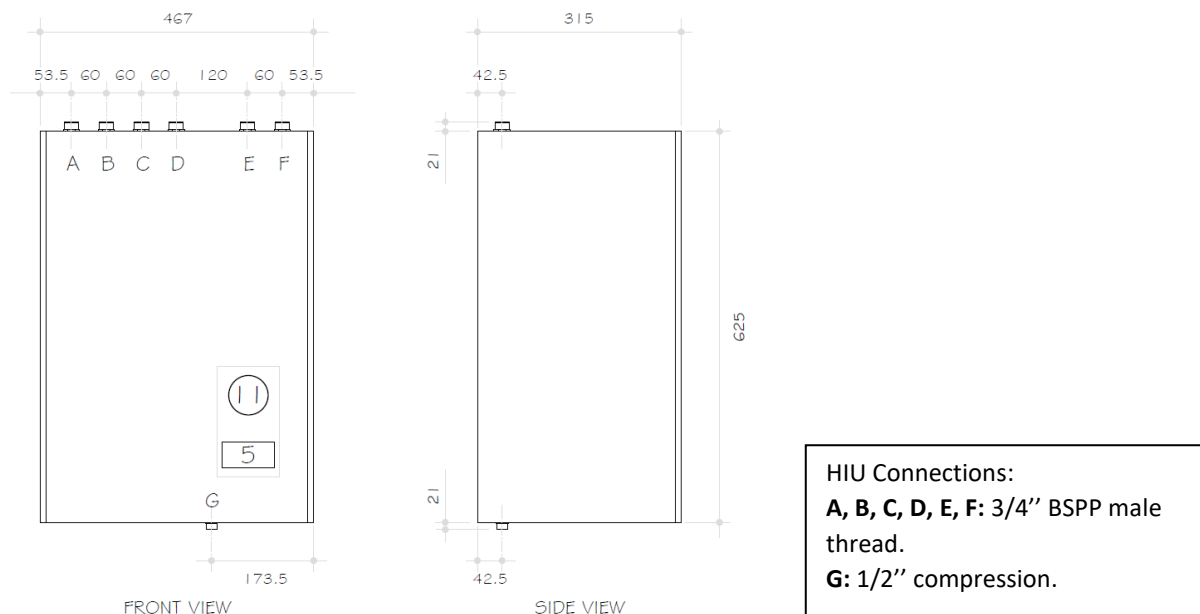
The ModuSat® XR heat interface unit comes with a variety of connection combinations to ease the installation and the aesthetics of the installation. Please find the options below.



PF – Primary flow (in) **CW** – Cold water (in) **SF** – Secondary heating flow (out)
PR – Primary return (out) **HW** – Hot water (out) **SR** – Secondary heating return (in)
DR – Secondary heating drain (safety relief discharge)

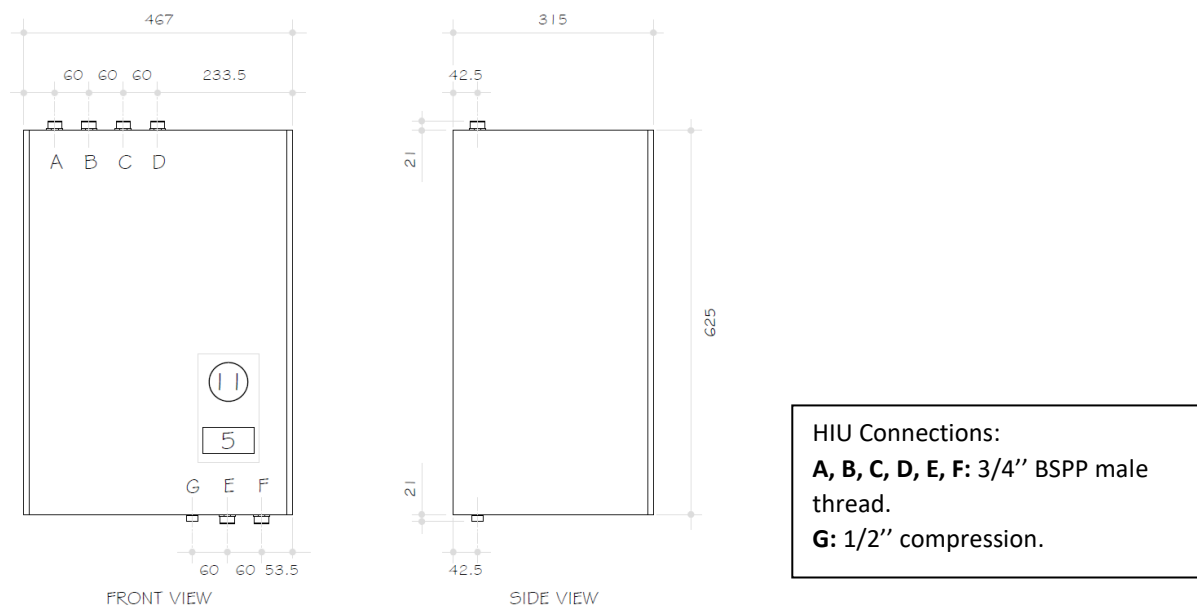
2.6 Typical Dimensions (connection configurations shown)

TL1 – ModuSat® XR Twin Plate 30/55/70-... & XR-ECO 30/55/70-... All Top Connections



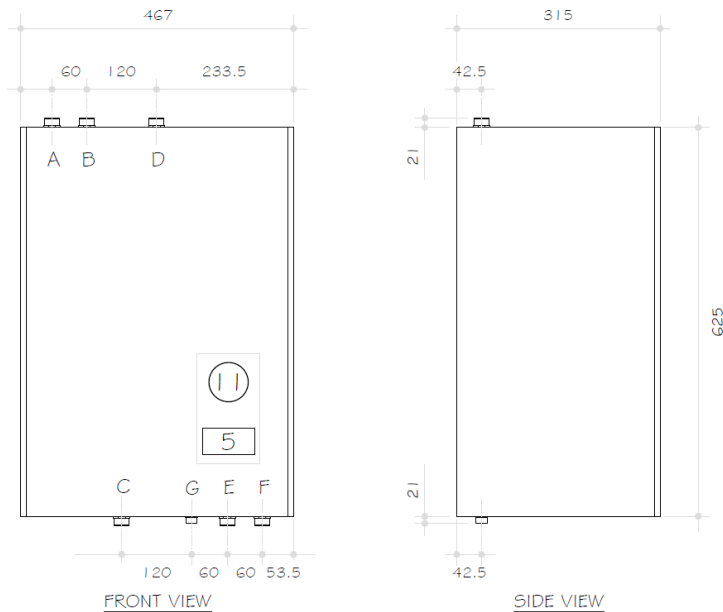
Minimum space requirements for access and servicing: Top: 190 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain.
Please Note: Flushing bypass to be installed on primary connections A & B.

TL5 – ModuSat® XR Twin Plate 30/55/70-... & XR-ECO 30/55/70-... Primary Flow & Return, Cold Water & DHW at the Top. Secondary Heating Flow & Return at the Bottom



Minimum space requirements for access and servicing: Top: 190 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain and a strainer valve.
Please Note: Flushing bypass to be installed on primary connections A & B.

TL7 – ModuSat® XR Twin Plate 30/55/70-... & XR-ECO 30/55/70-... Primary Flow & Return and DHW Connections Top. Cold Water Inlet and Secondary Heating Flow & Return Connections at the Bottom



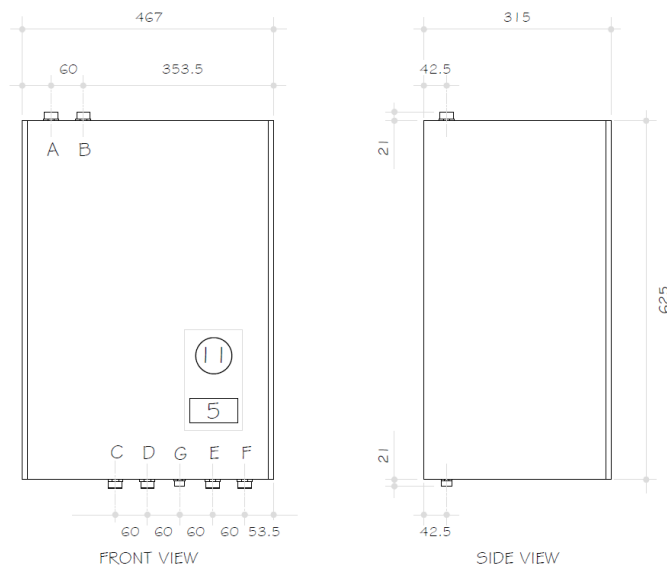
HIU Connections:
A, B, C, D, E, F: 3/4" BSPP male thread.
G: 1/2" compression.



Minimum space requirements for access and servicing: Top: 190 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain and a strainer valve.

Please Note: Flushing bypass to be installed on primary connections A & B.

TL8 – ModuSat® XR Twin Plate 30/55/70-... & XR-ECO 30/55/70-... Primary Top, Other Connections at Bottom



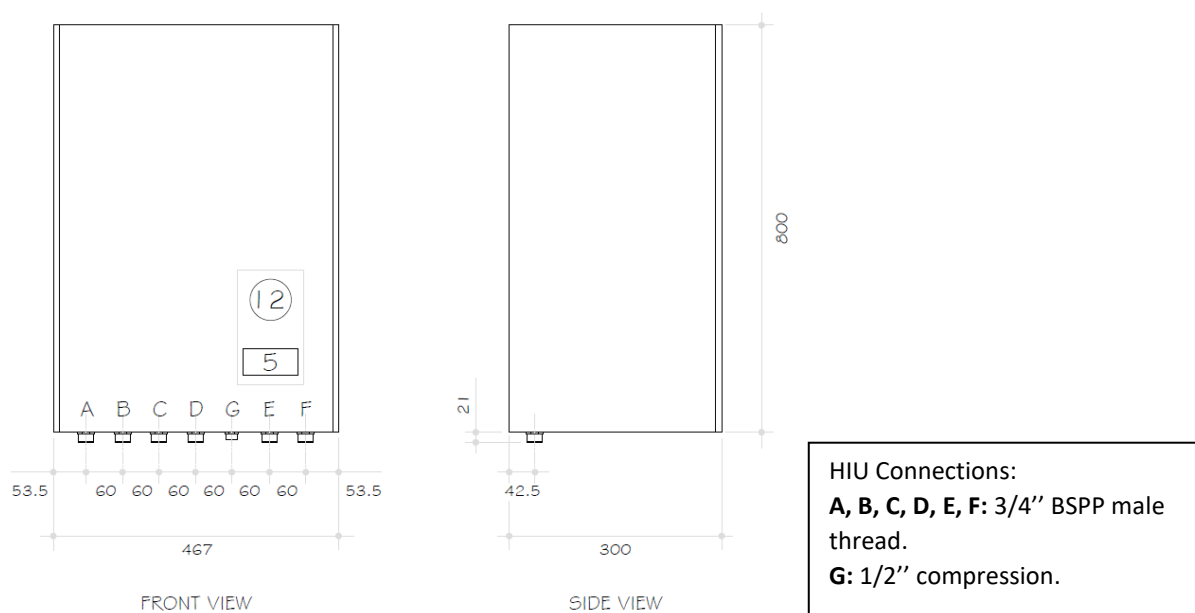
HIU Connections:
A, B, C, D, E, F: 3/4" BSPP male thread.
G: 1/2" compression.



Minimum space requirements for access and servicing: Top: 190 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain and a strainer valve.

Please Note: Flushing bypass to be installed on primary connections A & B.

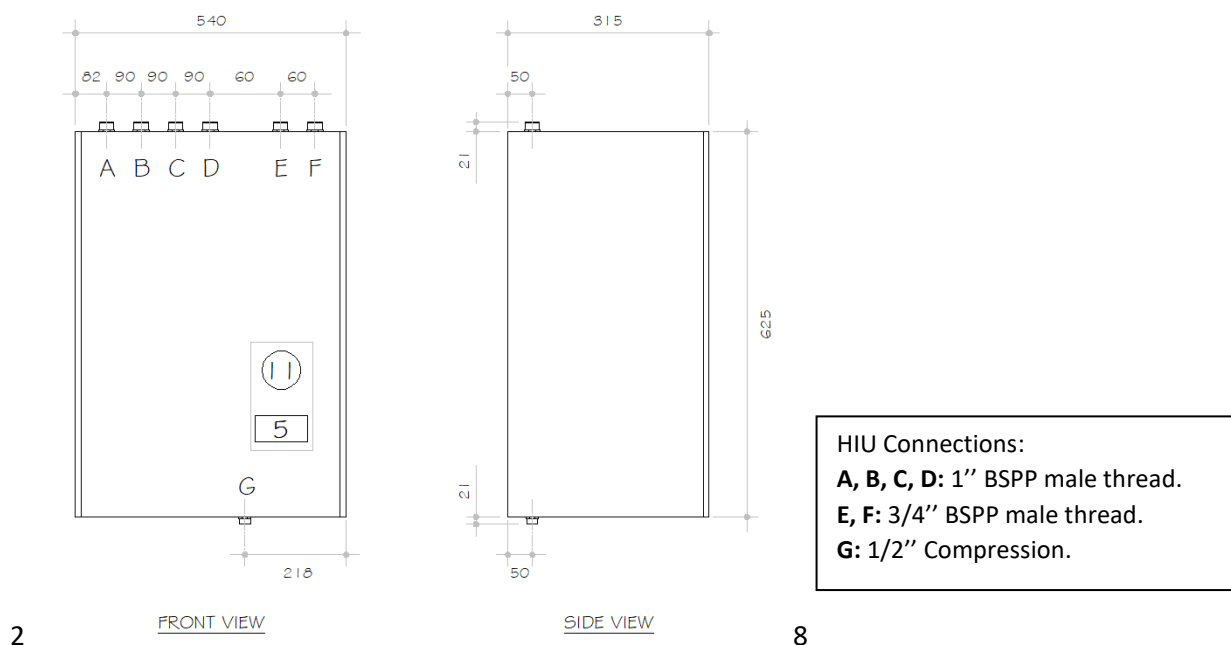
BL4 – ModuSat® XR Twin Plate 30/55/70-... & XR-ECO 30/55/70 All Connections at the Bottom



Minimum space requirements for access and servicing: Bottom: 190 mm (To allow for H-type flushing by pass) or more if required for connecting the drain and a strainer valve, Front: 700 mm, Side: 50 mm.

Please Note: Flushing bypass to be installed on primary connections A & B.

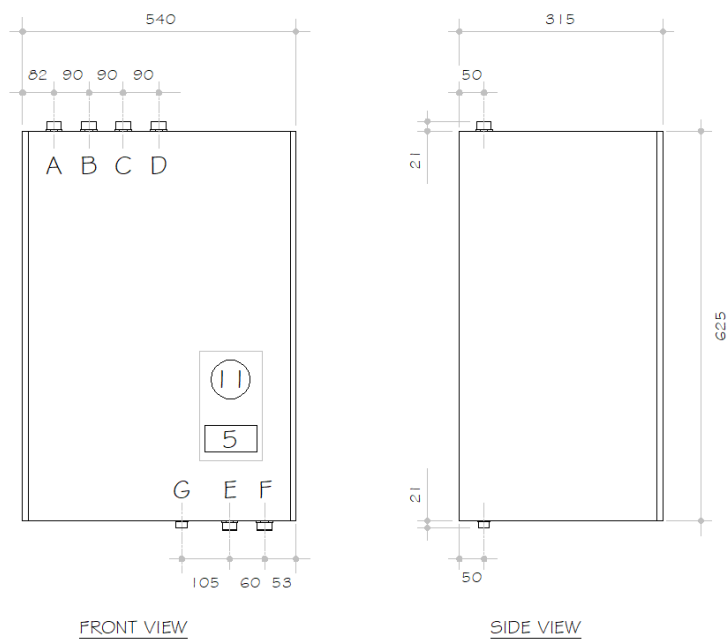
TL1 - XR 100-XX All Top Connections



Minimum space requirements for access and servicing: Top: 250 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain.

Please Note: Flushing bypass to be installed on primary connections A & B.

TL5 - XR 100-XX All Top Connections But Heating Flow & Return Bottom



HIU Connections:

A, B, C, D: 1" BSPP male thread.

E, F: 3/4" BSPP male thread.

G: 1/2" Compression.



Minimum space requirements for access and servicing: Top: 250 mm (To allow for H-type flushing by pass), Front: 700 mm, Side: 50 mm, Bottom: Sufficient space to connect the drain and a strainer valve.

Please Note: Flushing bypass to be installed on primary connections A & B.

3. INSTALLATION

The Evinox heat interface unit must be installed, commissioned and maintained by qualified and competent personnel in accordance with this document as well as national regulations and standards.

3.1 Handling

- ☐ The unit should be moved into position before lifting still within its packaging to prevent any damage whilst being positioned. Only once it is safely situated, the unit should be removed from its packaging and lifted into position.
- ☐ The ModuSat® unit may have been transported and handled many times prior to the installation, therefore it is vitally important that all unions and connections are checked and tightened as required. In case of damage please contact Evinox Energy on 01372 722277 immediately.
- ☐ Packaging materials must be disposed in accordance with the requirements of the construction site or the property.

**Lifting.**

Take care when lifting this appliance. It is recommended that at least two people perform the lifting.

**Leave caps over the connections.**

Ensure that the protective cover (caps) over the ModuSat® pipe connections are kept in place to prevent ingress of any debris.

3.2 Positioning

The heat interface unit should be installed in a sheltered environment and is not suitable for outdoor installation. It is recommended that the surrounding environment conditions do not exceed 40 °C with the relative humidity from 15% to 85%.

Note: As the unit contains water to operate, it is recommended not to place electrical devices, such as control boards and other devices, underneath the unit in the case of a water leak. The manufacturer cannot accept any responsibility for goods damaged in such a way.

**Maintenance space.**

It should be ensured that a sufficient space around the unit is provided to allow the future maintenance and servicing of the unit. The removal of the front panel should not be restricted. Refer to Section 2.6 for space requirements.

3.3 Hydraulic connections



Connection arrangement.

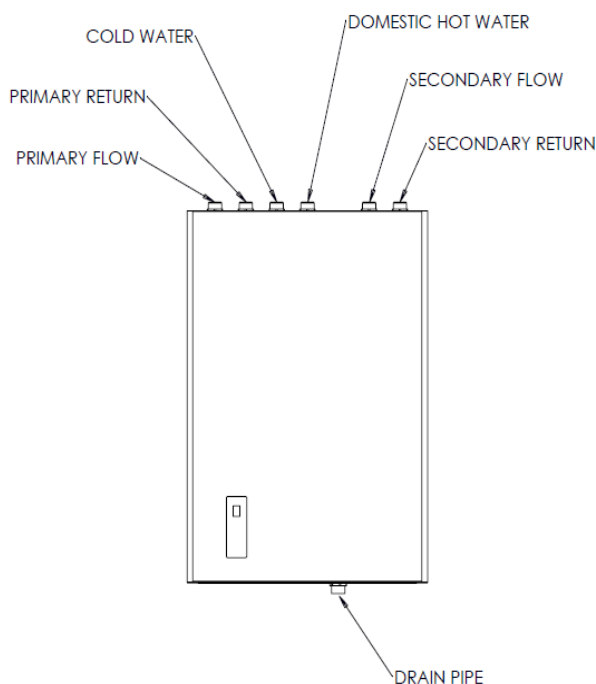
Ensure that the hydraulic connections of the pipework piped up to the unit are correct and follows the hydraulic schematic. The manufacturer cannot accept any responsibility for any damage caused to the unit due to crossed connections.

Any Evinox engineer callout/visit due to this issue will be chargeable.

The ModuSat® heat interface unit is designed to be wall mounted with the typical primary connections and domestic water hydraulic connections as shown below. (Other configurations are available; please refer to section 2.5 of this manual for details).

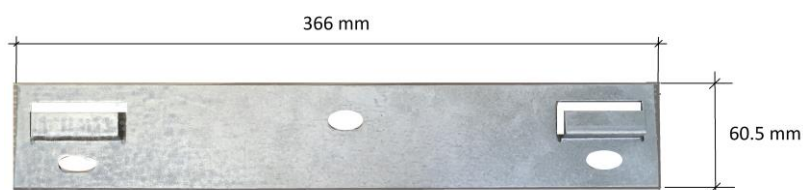
The Evinox Energy flushing by-pass valve kit should be installed prior to connecting the unit and the valves left in an isolated position.

The whole system should be cleaned and flushed before installing the heat interface unit to ensure the ModuSat® unit is not damaged.



3.4 Wall fixing

The ModuSat® unit is designed to be wall mounted. There are drillings on the back plate of the unit that ensure mounting with the wall mounting bracket (show below).



Wall fixing

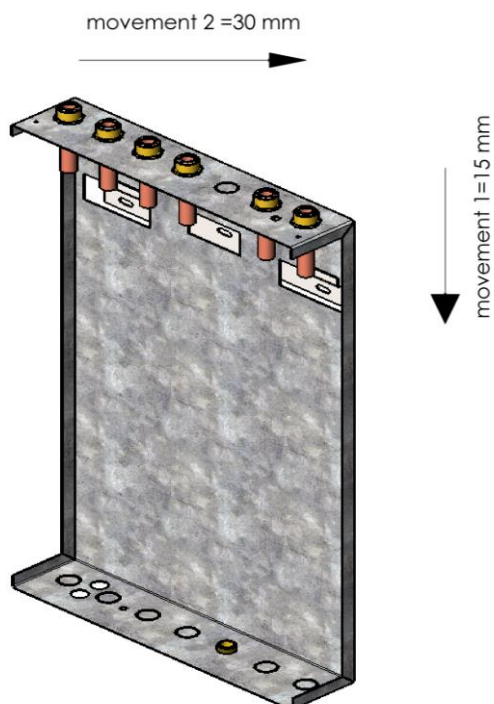
Installer must ensure that appropriate fixings are used.

3.5 Use of Pre-installation Rig

A pre-installation rig is available upon request. It consists of a steel HIU back panel. This will enable the installer to arrange the piping entering and leaving the unit during first fix prior to the unit being delivered / installed. The configuration of the pre-installation rig will be as per the unit being supplied and the project requirements. Once the pipework is complete, the rig can be removed and used in another apartment.

HOW TO INSTALL PRE-INSTALLATION RIG

FIRST STEP
SETTLEMENT
BETWEEN PIPES



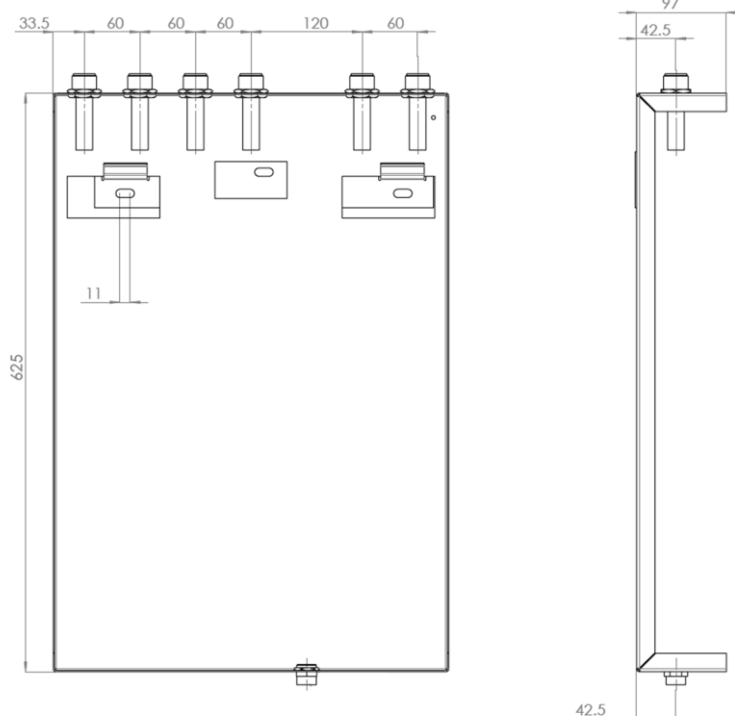
STEP1: Securely fix the mounting bracket to the wall in the required position. Hang the ModuSat® XR Pre-Installation Rig on the wall fixing bracket. Then slide down and across to the right, as indicated in diagram.

STEP2: Fit the Evinox Energy Flushing Bypass & Valve Kit to the rig and then make final connections to the pipework running to the ModuSat®.

STEP3: Shut off isolation valves, pressure test pipework and then disconnect the valve unions.

STEP4: To remove the pre-installation rig slide the rig to the left taking all connections off centre, slowly lift and remove.

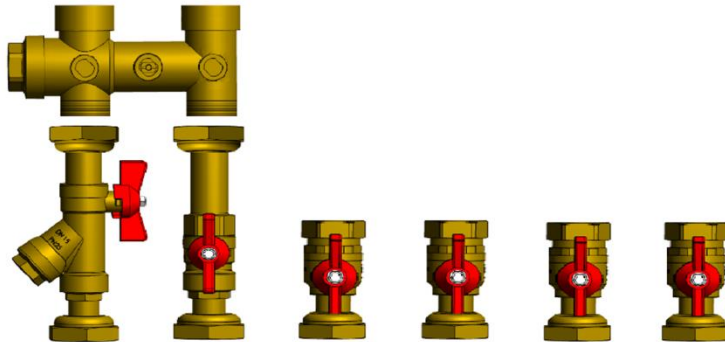
Pre-installation Rig Typical Dimensions for ModuSat XR ECO TP-30/55/70-...



3.6 Evinox Flushing By-pass Kit

Evinox flushing by-pass kit allows for isolation of the HIU from the network during cleaning and flushing the system. The kit includes an H shape by-pass with built in extended isolation valve, 2 strainers and 4 isolation valves.

Evinox FLUSH-KIT-TP1-SS for ModuSat® TP



	<p>Close valves Before connecting flushing by-pass kit to the HIU ensure all isolation valves are closed. Valves can be opened after LTHW system has been flushed.</p>
	<p>Heating strainer In HIUs with the bottom connections, strainer cannot be installed in vertical position with the water flow going up.</p>

3.7 Flushing Primary Circuit



The whole primary system should be cleaned and flushed in accordance to BG29/2012 before filling ModuSat® heat interface unit.

To open the by-pass:

- ☐ Ensure both isolation valves are in the closed position as shown in the picture.
- ☐ Use a suitable screwdriver or other tool to twist the screw on the H-shape by-pass valve into the open position.
- ☐ Close the bypass after flushing is complete.

	<p>Provide isolation valves and a strainer. If Evinox valve kit is not used, it must be ensured that there are isolation valves provided. Strainers on the primary and secondary heating inlets are required to ensure the components in the unit are protected from debris and sediments.</p>
	<p>Tighten the connections. When connecting the ModuSat® heat interface unit, ensure that all the connections are tightened to avoid any leaks.</p>

3.8 First fill of the HIU



Clean and flush the system before connecting the unit.

Filling the system should be performed only after the system has been fully flushed and cleaned. Poor water quality may cause failure of the operation of the unit.



Water quality.

It is recommended that the flushing and cleaning of the primary circuit, domestic water circuit and secondary heating circuit is performed by a qualified person in accordance with current standards, regulations and BSRIA guidelines.



In the case of a water leak.

- ☐ Take caution of hot water
- ☐ Slowly close the isolation valves at the top or bottom of the unit
- ☐ Contact Evinox Energy



The ModuSat® pump should not be used for flushing.

The pump is integral to the unit and should not be used for flushing and cleaning the system. Failure to meet this requirement will invalidate the warranty.

Filling the primary circuit



Please take care when filling the ModuSat® unit.

- ☐ Make sure that the by-pass valve is in closed position
- ☐ Slowly open the isolation valves on the primary circuit.
- ☐ Visually check that there are no leaks. Tighten the connections of the valve kit if necessary.
- ☐ If there is a leak internal to the unit, ensure the isolation valves are left in a closed position.

3.9 HIU Flushing



Clean and flush LTHW system before flushing through the HIU

Filling the system should be performed only after the system has been fully flushed and clean. Poor water quality may cause failure of the operation of the unit.

3.10 First fill of apartment heating system

The ModuSat® unit is fitted with a pressure gauge that is mounted in the front panel. This gauge reading should be used when filling the secondary circuit. An external filling loop should be used for filling the secondary circuit with the mains cold water.






- ☐ Open the isolation valves on the filling loop.
- ☐ Cold fill should be done to about 1 bar. Pressure will depend on the head of the system (difference between the lowest and highest point).
- ☐ Once the required pressure is reached, close the filling loop ball valve, vent the system and if required repeat it again.
- ☐ Disconnect filling loop.

4. Water treatment

The quality and cleanliness of the water within both the primary and secondary circuits is vitally important to prevent damage to the ModuSat® components, and to ensure that the efficiency and service life of the unit is maintained.

It is therefore necessary to fully flush and treat both primary and secondary circuits using suitable water treatment chemicals.

	Water treatment in accordance to these instructions. Please confirm with the water treatment consultants that the chemicals used and cleaning method statement complies with the requirements set out in this section.
	Water quality may damage the unit. Poor water quality may damage the components used in the unit and invalidate the warranty. The manufacturer cannot take responsibility for any damage of the unit caused by poor water quality.
	Chemical cleaning and dosing. Chemical cleaning and dosing of the system should be in line with the current regulations, standards and guidelines. Which are, but are not limited to: <ul style="list-style-type: none"><input type="checkbox"/> BSRIA Application Guide BG29/2012<input type="checkbox"/> BS7593:2006<input type="checkbox"/> Requirements of Thames Water Utilities<input type="checkbox"/> The Water Industry Act 1991, Section 119<input type="checkbox"/> HSE The Control of Legionella 1991<input type="checkbox"/> HSC Approved Code of Practice and Guidance HSG274, Part 2


4.1 Water Quality Guidelines

	Recommended
Hardness (TH)	Up to 150 mg/l (as CaCO ₃)
Chlorides (Cl ⁻)	Up to 150 mg/l
PH	7.5 – 9.0
Resistivity	> 2000 Ohm/cm
Sulphate (SO ₄ ²⁻)	Up to 70 mg/l
Conductivity	200 crs
TDS	0-200 ppm
Free carbon dioxide (CO ₂)	Up to 5 mg/l
Manganese (Mn)	Up to 0.1 mg/l
Iron (Fe)	Up to 0.2 mg/l (or 5ppm)
Copper	Up to 1 mg/l

- ☐ TH - Total hardness is caused by calcium and magnesium.
- ☐ pH – this measures the alkalinity of the water, neutral alkalinity is pH7. Heating systems require an alkaline pH. Lower pH will increase the corrosion risk.
- ☐ TDS – dissolved solids in the system and is a measure of the cleanliness of the water (satisfactory level should be within TDS of 10% of the mains water) .
- ☐ Conductivity – this is the measure of the ability of water to pass an electrical current.
- ☐ Free copper – the level of copper in the system.
- ☐ Total Iron and Manganese – this measures iron concentration in mg/litre. These are strong oxidants and may increase the risk for corrosion.

Typical Water Quality Guidelines




Visual inspection should be carried out ensuring that the water is clear, bright and free from particulate matter. The system must be fully vented, pressurised and dosed with anti-corrosion and anti-bacterial growth inhibitor.

	High DHW temperature may cause scaling. High operating temperatures on the domestic hot water circuit may lead to scaled DHW plate heat exchanger. It is recommended to set the DHW temperature to maximum of 55°C especially in hard water areas.
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4.2 Dosing Secondary System

Once the system is cleaned and flushed the inhibitors should be added to the secondary side to prevent the corrosion or bacteria growth.

A suitable long term corrosion inhibitor and inhibitor for preventing the bacteria should be introduced in a proportion of the system volume.

	Excessive filling of the secondary circuit with untreated water may lead to scale build up and corrosion. This may damage the ModuSat® unit or reduce the performance.
	Please confirm with the water treatment consultants that the chemicals used and cleaning method statement complies with the requirements set out in this section.
	Evinox Energy do not take responsibility for approving inhibitors used for dosing the system.

4.3 *Warranty due to Water Quality*






The warranty of the ModuSat® unit is strictly related to the instructions and procedures indicated in this manual and the warranty does not cover any damage caused by scale and/or corrosion resulting from poor water quality.

The components and materials used in the system assembly should also be checked to ensure they do not contribute to dissolved oxygen that can cause corrosion.

Also:-

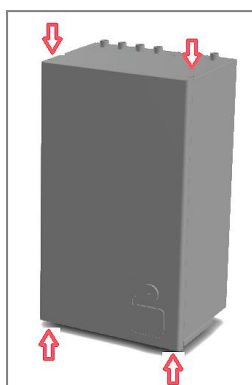
- ☐ Ensure there are no depression pockets in the system
- ☐ Remove gas permeable parts and materials
- ☐ Ensure the expansion vessels are properly sized and the pre-charge pressure valve to guarantee positive pressure, with respect to the ambient pressure, throughout the circuits.

5. Electrical Connections

	Risk of Electric shock. Disconnect the electric supply before starting any works on the unit.
	Qualified personnel. Electrical installation must only be carried out by technical personnel.
	Overvoltage or lightning. The ModuSat® unit has no protection against lightning or other overvoltage shocks.
	Power supply via un-switched fused connection. The ModuSat® requires a 220/240V (AC) 50Hz mains supply connection through an un-switched fused connection fitted with a 3 Amp fuse (to BS1632). Extension cords, multiple plugs, and other adapters must not be used. The device must be earthed.
	Follow the instructions Any damage caused by an incorrect connection will invalidate the warranty. Evinox Energy cannot accept any responsibility for incorrect wiring.

The ModuSat® wiring board is located within the ModuSat® itself under a removable metal cover. To access the connection board, the full front case cover should be removed. The connection board is found at the top of the unit to your right. To take off the cover the retaining screw should be removed and the cover lifted off.

5.1 Removing the Front panel

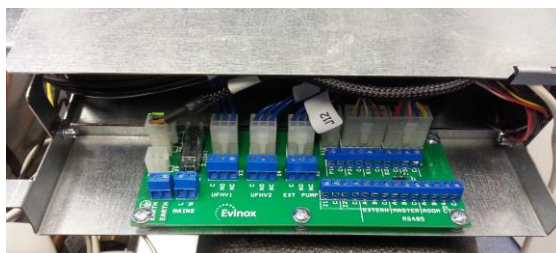


To access the wiring board, the front panel must be removed.

- ☐ The front panel is fixed with four screws – two at the top of the unit and two at the bottom as shown opposite.
- ☐ Untighten the screws and remove the panel pushing it upwards first and then remove it towards yourself.
- ☐ The panel is powder coated stainless steel. Take care when removing and placing the front panel to ensure the surface is not damaged.
- ☐ After the works are finished, place the panel on the unit and tighten the screws.

5.2 ModuSat® Wiring Connections

The ModuSat® wiring board is located within the ModuSat® itself behind the metal cover



To access the connection board, take off the cover. The retaining screw should be removed and the cover lifted off. The connection board also has two screws which will need to be removed and the board can be pulled out from its position. The board is now accessible and all required connections can be made simply using the clearly labelled screw down terminal connections. Guides for the various connection applications and requirements are detailed in the wiring principle drawings shown on pages 24-26.



The Control Board

The control board is located behind the connection board. The control board cover must not be removed. Doing so may invalidate the warranty.

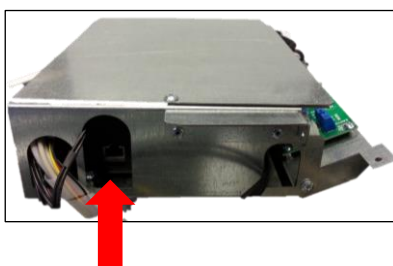


Connection Terminations

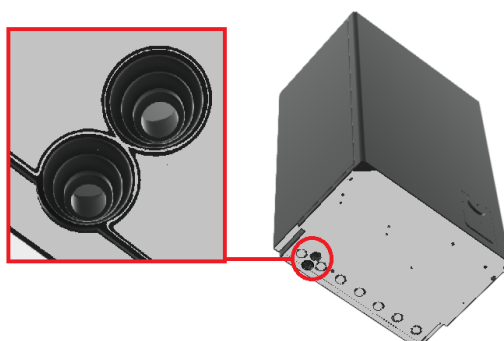
Evinox Energy strongly recommend in accordance with best practice that all wiring connections to the board, especially the BUS and room controller are terminated using 'bootlace ferrule' connectors. These connectors ensure a good connection and that the whole cross sectional area of the wiring is intact.

5.2.1 RJ45 Connections

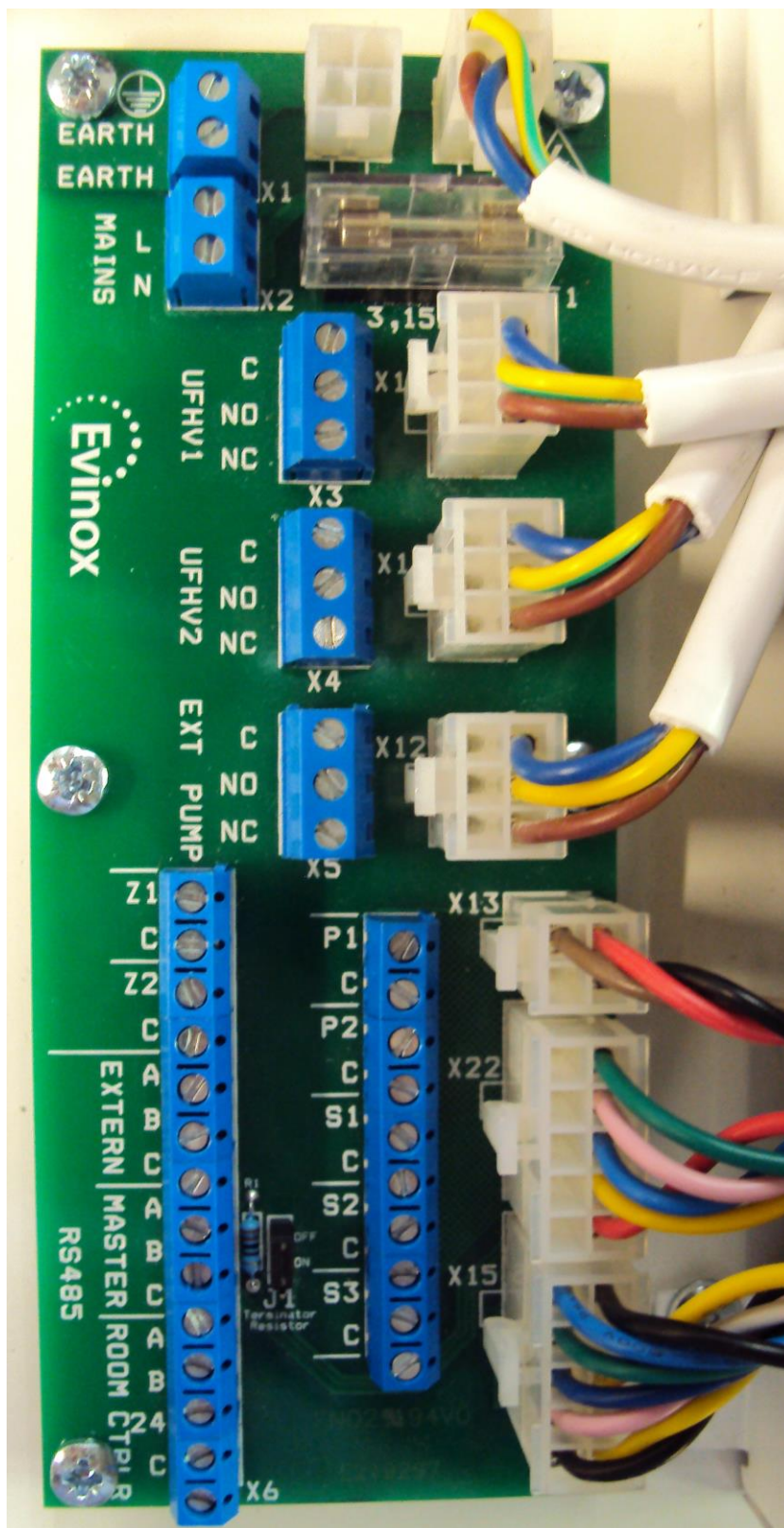
If the TCP/IP network is used, instead of the BUS termination the RJ45 can be connected to the control board. The RJ connection can be found at the side of the control board as shown below with the red arrow.



Cable glands are fitted at the bottom of the ModuSat® case as shown in below:



5.3 ModuSat® Connection Board






Please Note: When connecting external valves or pumps to the ModuSat control board, it must be ensured that each connection does not exceed 1amp @ 220/240V (AC).

5.4 Typical ModuSat® Electric Wiring Diagram with 2 Zone Control (2 Evinox ViewSmart Room Controllers)

See drawing – STD-MOD-BMS

5.5 ViewSmart Room controller connections

The Room controller is a white ABS box with a graphic display. If ViewSmart is not installed on the unit, it should be installed in the main living area of the dwelling. It must be connected to the connection board within the ModuSat® (please refer to the electrical diagram). The cable must not be installed adjacent to other 220/240 Volt (AC) lines.

	Power Supply for ViewSmart The ModuSat® room controller's power is supplied by the ModuSat® board and does not require batteries or additional power cabling.
	External Valve and Pump Requirements When connecting external valves or pumps to the control board of the ModuSat® it must be ensured that each connection does not exceed 1amp @ 220/240V (AC).
	Cable Requirement ViewSmart should be connected to ModuSat® connection board with 4 core x 0.33 mm ² screened cable



Dimensions:

H = 80 mm

L = 130 mm

D = 22 mm

To open the cover to access connections:



Step 1

To open the cover to access connections, use a screwdriver in the tab at the bottom as shown below.



Step 2

Once the tab has been released the cover can be hinged up to access connection



Step 3

Connection terminal with room controller

5.6 *SmartTalk*® system wiring




Typical Modbus system architecture

See drawing - STD-MOD-2013-BUS 1 - E

Typical TCP/IP system architecture

See drawing - STD-MOD-2015-TCP-IP-3

6. SETTING INTO OPERATION / COMMISSIONING

	Evinox Commissioning Engineers The unit should be commissioned by Evinox Energy commissioning engineers to validate the warranty unless otherwise specified by Evinox Energy.
	System Checklist Prior Commissioning It is important that the system is fully ready for the works to be carried out.
	Report to Evinox If there is a problem with the unit, isolate it from the hydraulic connections and the power (if necessary) and report to Evinox Energy.

6.1 Pre-commissioning checklist

	Pre-requisite of Commissioning	Check
1	Primary network and plant room fully operational and complete (including water treatment) in line with these instructions	<input type="checkbox"/>
2	Secondary system fully operational including water treatment in line with these instructions	<input type="checkbox"/>
3	The ModuSat® unit is installed as per the hydraulic connections in line with these instructions	<input type="checkbox"/>
4	Electric connections and supply is complete and all controls functional in line with these instructions	<input type="checkbox"/>
5	Evinox SmartTalk system installed, tested and operational (including the broadband connection)	<input type="checkbox"/>
6	Apartment reference and postal address schedule issued to Evinox	<input type="checkbox"/>

6.2 Pressure independent control valve

	DHW PICV (TP-30/55/70)	DHW PICV (TP-100)	HTG PICV
Maximum flow rate	1600 l/h +/- 10%	3609 l/h +/- 10%	575 l/h +/- 10%
Start up ΔP	25 kPa	25 kPa	25 kPa
Max differential ΔP	400 kPa	400 kPa	400 kPa
Valve size	DN20	DN25	DN15
Thread	G 1"	G 1 1/4"	G 3/4"
Actuator Stroke	2.5 mm	5.5 mm	2.5 mm
Actuator control signal	0-10V	0-10V	0-10V
Mechanical pre-setting	Not available	Available	Available

Heating PICV set points (if required)



Pre-set	Flow l/h	Pre-set	Flow l/h
0.5		2.2	324
0.6	100	2.4	351
0.8	128	2.6	379
1.0	156	2.8	407
1.2	184	3.0	445
1.4	212	3.2	463
1.6	240	3.4	491
1.8	268	3.6	519
2.0	296	3.8	547
2.2	324	4.0	575



Valve Tolerances

The maximum flow rate will vary depending on the varying differential pressure across the units and the resulting flow rate may differ from the value shown above. The valve should be set to 125% above the design flow rate. The project specific set-point (if required) can be confirmed by Evinox Energy.



Tighten Actuator Connections

Ensure that the actuators are tightened to ensure the operation of the unit.

6.2.1 Pump



Evinox ModuSat® unit has an integral Wilo Pulse-width modulation (PWM) circulation pump.

Please note: When the unit is switched over to heating mode the pump will run for 2 mins prior to the heating PICV opening, this is not a fault in the unit but a normal control function as the HIU assesses the current heating circuit flow temperature.

Pump LED – Description of Status

LED	Indicators	Diagnosis	Status	Remedy
Solid green	Pump in operation	Pump runs according to its setting	Normal operation	
Blinks quick green	PWM model:	Pump in standby	Normal operation	
Blinks red/green	Pump in function but stopped	Pump restarts by itself after the fault is disappeared	1. Low voltage $U < 160\text{ V}$ or High voltage $> 253\text{ V}$	1. Check voltage supply $195\text{ V} < U < 253\text{ V}$
			2. Module overheating: temperature inside motor too high	2. Check water and ambient temperature
Blinks red	Pump out of function	Pump stopped (blocked)	Pump does not restart by itself due to a permanent failure	Change pump
LED off	No power	No power to pump	1. Pump is not connected to power supply	1. Check cable connection
			2. LED is damaged	2. Check if pump is running
			3. Electronics are damaged	Change pump

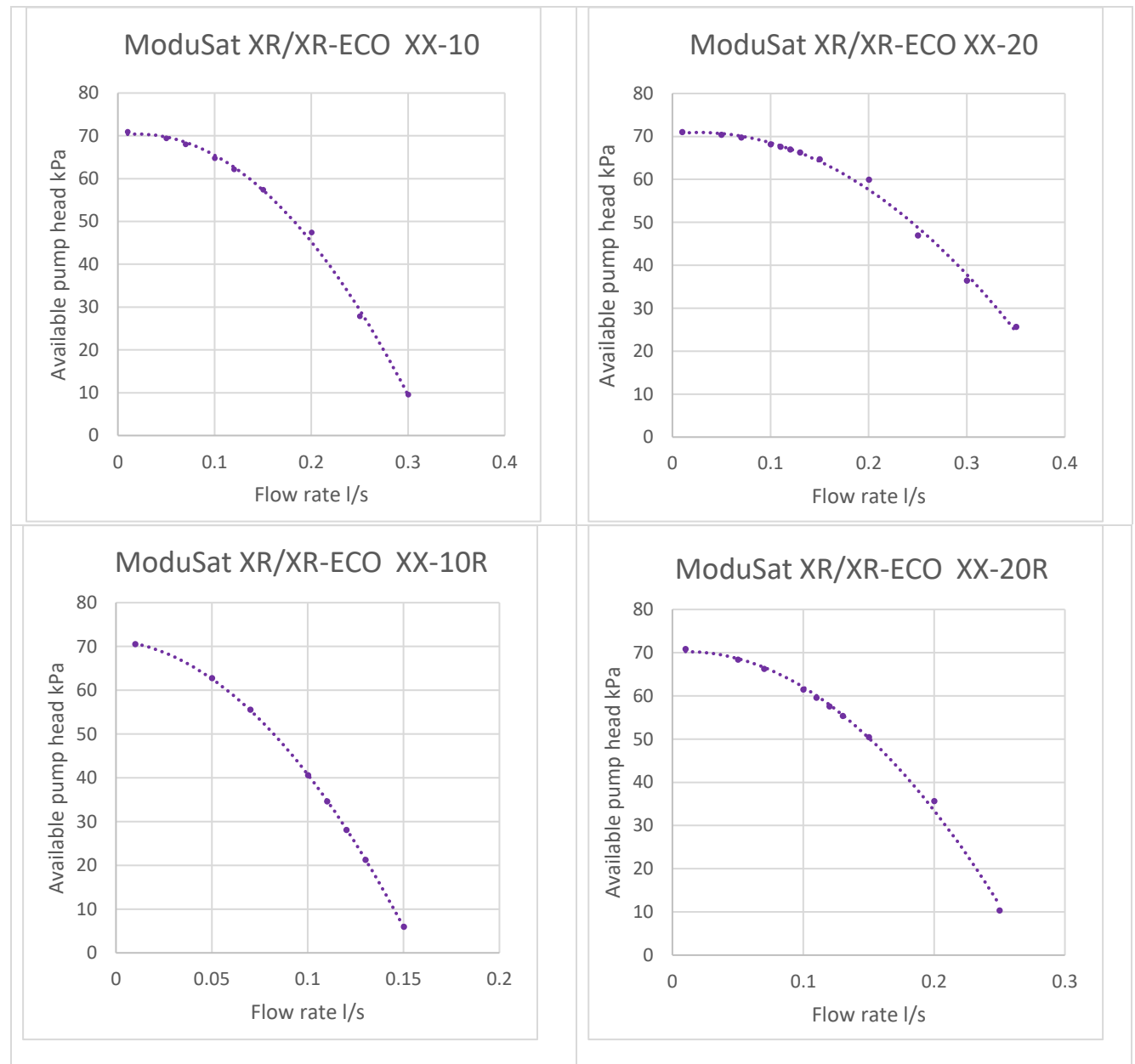
6.3 Available Pump Head



Available Pump Head

Ensure that the available pump head meets the requirements of the secondary system.




The below graphs show the available pump head for different ModuSat® models depending on the secondary flow rate. The secondary apartment pressure drop (excluding the unit) should not exceed the value shown.



6.4 Initial Commissioning Procedure

The following will be checked when commissioning the unit. The method may vary depending on the project.

	Evinox Energy Commissioning Checklist	Check
1	Check if the unit is connected correctly to the hydraulic circuits. Confirm that the unit is correctly connected to the electrical supply.	<input type="checkbox"/>
2	Set the unit into operation by installing firmware, checking if all the components are functional.	<input type="checkbox"/>
3	Confirm the unit performs hot water and heating function. If Evinox ViewSmart Room Controller is used this will include ViewSmart functionality check.	<input type="checkbox"/>
4	Ensure the unit has an ID number, record serial numbers of the control board and the heat meter.	<input type="checkbox"/>

	Evinox Technical Personnel Evinox Technical Personnel who will visit the project during the course of the installation and at completion to arrange for final commissioning and calibration, do so to assist the contractor and install team to deal with any questions and queries. They do not perform the role of quality control or inspector of the installation or provide approval for the works carried out.
	Booking Commissioning All commissioning must be booked 6 weeks in advance and will be carried out to a pre-agreed programme that will be confirmed with the client prior to commissioning.
	Warranty Evinox Energy Commissioning is required for warranty validation.

7. HIU SERVICING AND INSPECTION

HIU inspection should be carried out every 2 years in line with the current regulations, standards and guidelines. Which is, but not limited to *BSRIA Heat Interface Unit Guide BG62/2015*

	Evinox Energy HIU Servicing and Inspection Checklist	Check
1	No leaks associated with HIU	<input type="checkbox"/>
2	Visual inspection of primary isolation valves	<input type="checkbox"/>
3	Strainer valves clean where accessible	<input type="checkbox"/>
4	Primary differential pressure above required minimum	<input type="checkbox"/>
5	Thermal insulation intact	<input type="checkbox"/>
6	Secondary heating system pressure within nominal range	<input type="checkbox"/>
7	Control valves respond to demand for both heating and hot water	<input type="checkbox"/>
8	Heating pump is functional	<input type="checkbox"/>
9	Primary supply temperature as commissioned	<input type="checkbox"/>
10	Heat meter registers demand	<input type="checkbox"/>
11	Appliance can be read remotely (where applicable)	<input type="checkbox"/>
12	Consumer satisfied with heating and hot water performance	<input type="checkbox"/>
13	Take primary water sample	<input type="checkbox"/>

8. WARRANTY

The warranty is valid if good practice has been strictly observed during installation and in use. Evinox Energy is not liable for equipment breakdown and damage to persons and objects caused by:

- Transportation damage
- Installation in which the instructions and good practice were not complied with
- Improper use of the device, abnormal use conditions, tampering by unauthorised personnel or inadequate maintenance; corrosion and/or sludge accumulation; lack of electrical energy; absence of suitable drainage; exceeding operating limits, electrical and water system faults
- Frost damage
- Wear due to normal use
- Malfunctioning of system controls and or safety systems
- Corrosion due to oxygenation poor water quality or roaming currents
- The pump being run against a closed system.

From commissioning, ModuSat® XR appliances have a warranty against all manufacturing faults and material defects for a period of:

- 5 years for the stainless-steel plate heat exchangers
- 2 years for parts and labour. Note: where Evinox Energy do not carry out the commissioning the two-year warranty will cover parts only with no labour cover.

The ModuSat® XR warranty will always start from the commissioning date providing this date is within six months of the date of invoice to allow for project completion. If the ModuSat® XR is commissioned outside the 6-month extension date, the warranty will reduce accordingly.

This warranty is strictly limited to the supply, free of charge, of parts acknowledged as being defective after inspection by our technical department. Any costs arising from this inspection will be charged if the part is deemed not to be defective. The defective parts must be returned otherwise the replacement part will be charged for.

Failure to comply with the relevant installation requirements of the Building Regulations, Local Water Byelaws and Building Standards will invalidate any warranty claim.

The ModuSat® XR must be fitted with the ModuSat® Flushing by-pass isolation valve kit for ease of servicing and undertaking warranty work. Warranty calls that include draining the system will be chargeable if isolation valves have not been fitted.

It is imperative that the level of corrosion protector within the system is kept within industry guidelines at all times. Special attention should be given to ensure that, after any decoration or building works where radiators might be removed, the system is replenished with chemicals. Non-use of inhibitor will invalidate the warranty.

We will record details of the unit and commence the warranty when we commission the ModuSat® XR units.

Any warranty claims that are a result of user error, poor installation or lack of servicing will be chargeable. Please note that all replacement parts provided under warranty are subject to factory inspection to determine cause of failure. Replacement parts are chargeable until passed as faulty by

Evinox Energy, when a credit will be provided. Any parts that have failed as a result of poor servicing or misuse will not be covered by our warranty.

Any modifications to the appliance will invalidate the warranty.

Installation of the Evinox Energy unit should only be carried out by suitably skilled and qualified personnel. If failure occurs due to poor or faulty installation work, this will invalidate the warranty.

Your Evinox Energy appliance is one of the most reliable and technically advanced products available on the market, however, it is imperative that it is installed, commissioned and serviced in accordance with Evinox Energy installation and servicing manuals to ensure long life, reliability and efficiency.

Exclusions to the Warranty

The following are not covered by the warranty:

- Electric degradation of parts resulting from connection and installation on electricity supply whose voltage measured at the entry of the apparatus would be lower by 15 % or higher of 10 % than the nominal voltage of 230 volts
- Degradation of parts arising from external elements affecting the ModuSat® Unit i.e. (effect of storm, moisture, freezing, etc.)
- All consecutive incidents resulting from a failure to check the safety components (pressure relief valve etc.)
- Scaling, nor its consequences
- Corrosions due to chloride concentrations in domestic hot water higher than 60 mg/l
- The wear of the safety relief valve
- Cost of postage for returned parts.

9. WRAS APPROVAL



This certifies that

EVINOX ENERGY LTD

has had the undermentioned product(s) examined, tested and certified as being of an appropriate quality and standard as required in the Water Supply (Water Fittings) Regulations and Scottish Water Byelaws, subject to scheme requirements being met when installed.

Model Numbers

MODUSAT SPDHW XR-ECO, MODUSAT TP XR-ECO & MODUSAT CHHC XR-ECO RANGE OF MODULAR COMBINED HEATING INTERFACE UNITS

The certificate by itself is not evidence of a valid WRAS Approval. Confirmation of the current status of an approval must be obtained from the WRAS Approvals Directory (www.wras.co.uk/directory)

The product so mentioned will be valid until the end of:

July 2025

Certificate No.

2007348

A handwritten signature in blue ink, appearing to read 'Ian Hughes', written over a horizontal line.

**Ian Hughes,
WRAS Approvals Manager**

NOTES

1. Electric wiring of MODUSAT and VIEWSMART

The MODUSAT connection board is inside the unit shall be connected to the ViewSmart by means of a 4x0.33 sq mm + shield cable (BELDEN 8723) having a max. length of 25m.

2. Shield Termination

The Screening on the bus communication cable (RS Part no 528-2106). Connect together and put in terminal 'C'. This screening must be connected to earth at the amplifier at the start of the run. The screening must not be connected to anything at the end of the run. This will enable any electrical disturbance to travel one direction down the screening to earth.

3. External Pumps & Valves

Pumps & valves must have a localised power supply. Switched neutral connection to be fitted with 1 amp in-line fuse on live cable.

4. Termination

Bootlace ferrules to be used for connections to the connection board and ViewSmart.

5. Heating

When Evinox ViewSmart is used, Z1-C and Z2-C connections not needed. Z1-C and Z2-C only to be used for 3rd party controller to enable heating. Other configurations are available.

6. Zone valves and second ViewSmart controller

Zone valves and a second ViewSmart controller are only needed when two zone are used. Current Part L1A Building Regulations stipulate that all new heating systems in dwellings that are not open plan and with area greater than 150 m² must include at least two heating zones, each controlled by a thermostat and zone valve.

7. Keep Warm Facility and DHW cylinder schedules

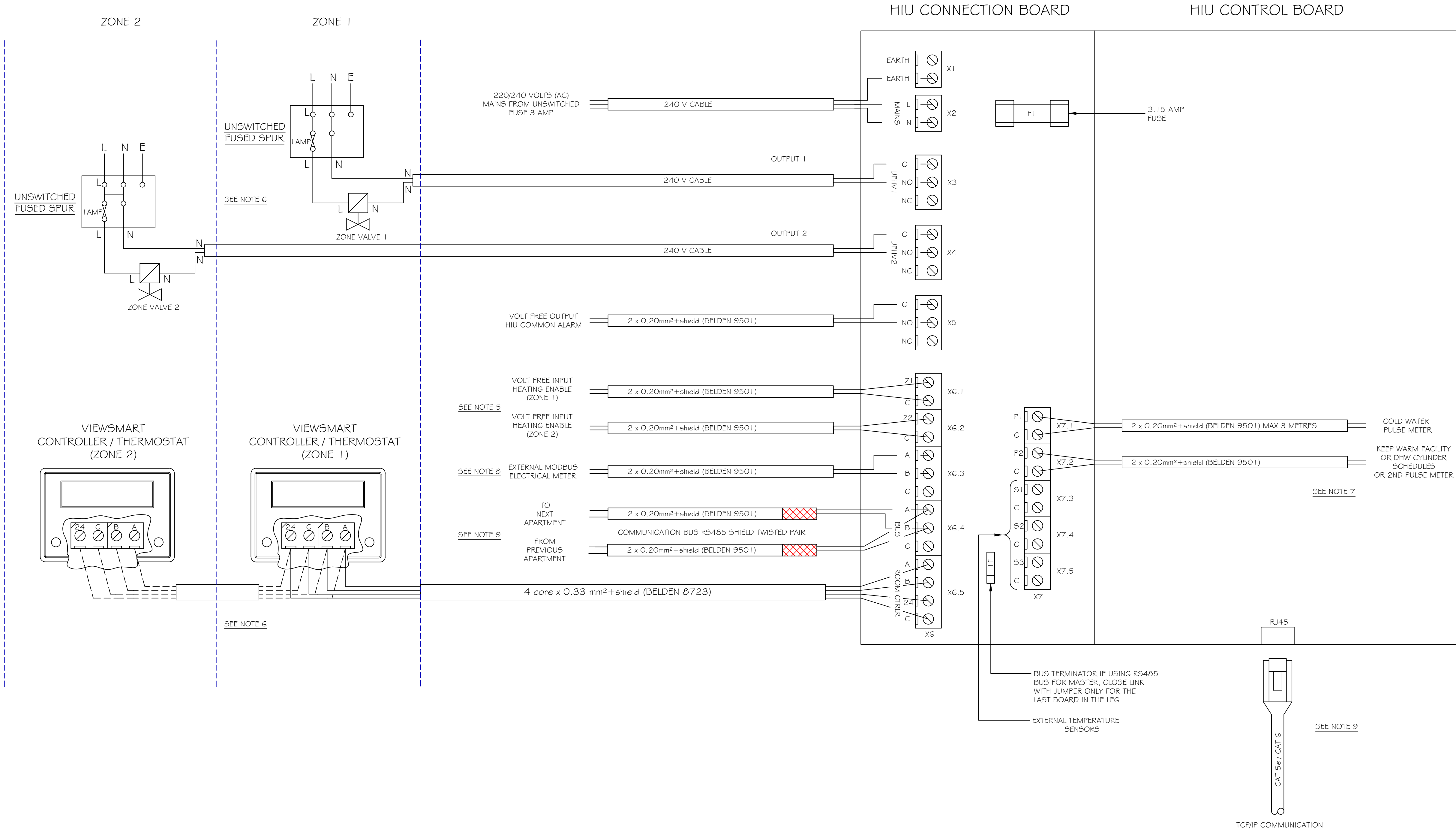
When Evinox ViewSmart is used, P2-C connection is not needed for KWF control. P2-C only to be used for 3rd party controller to enable Keep Warm Facility or DHW cylinder schedules. P2-C can also be used for 2nd pulse meter.

8. Electricity Meter


Electricity consumption displayed on the ViewSmart. Extra credits towards BREAAM.

9. RS-485 or TCP/IP Communication

Depending on the project specification RS-485 or TCP/IP communication protocol can be used.



REV	DATE	REVISION



Evinox Energy Ltd.
Barwell Business Park
Leatherhead Road
Chessington
London KT9 2NY
Tel: 44 (0) 1372 722 277
Fax: 44 (0) 1372 744 477
www.evinox.co.uk

CLIENT
PROJECT

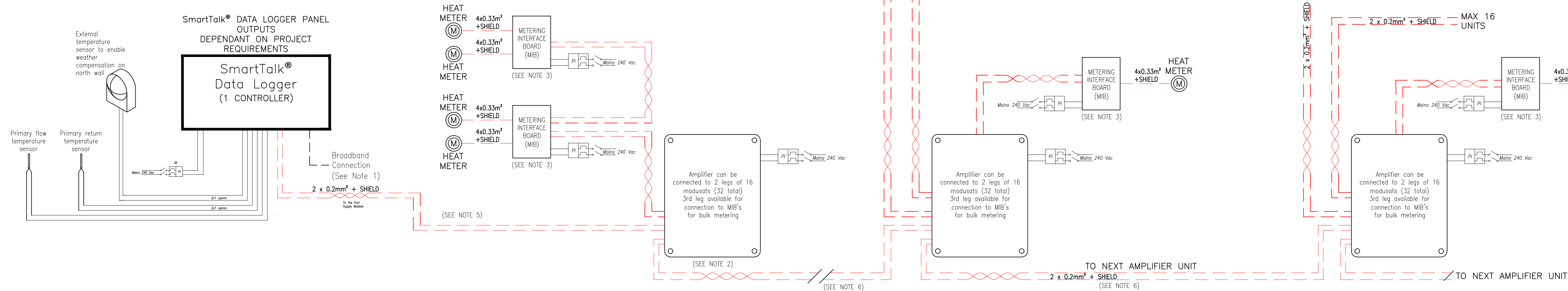
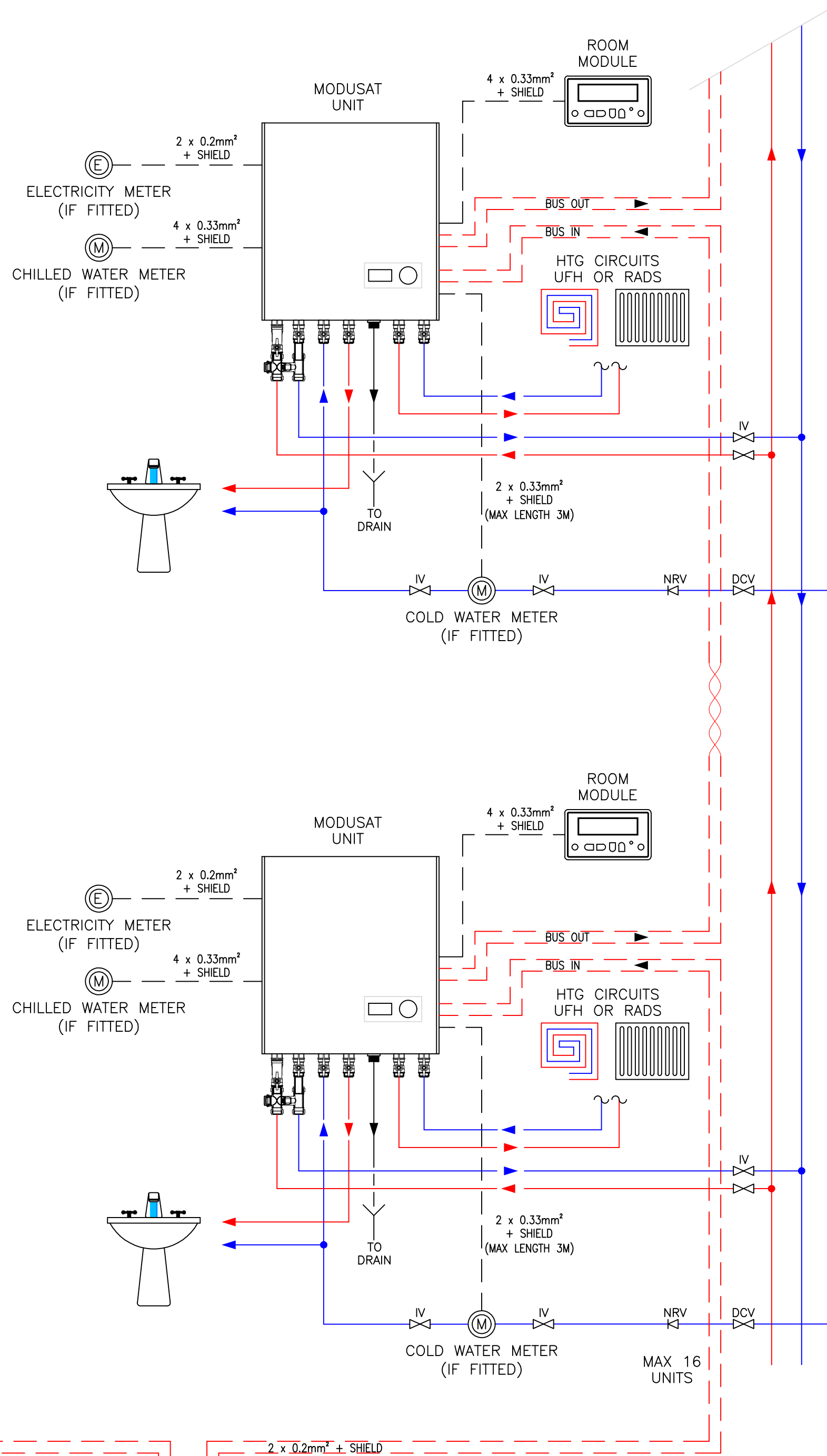
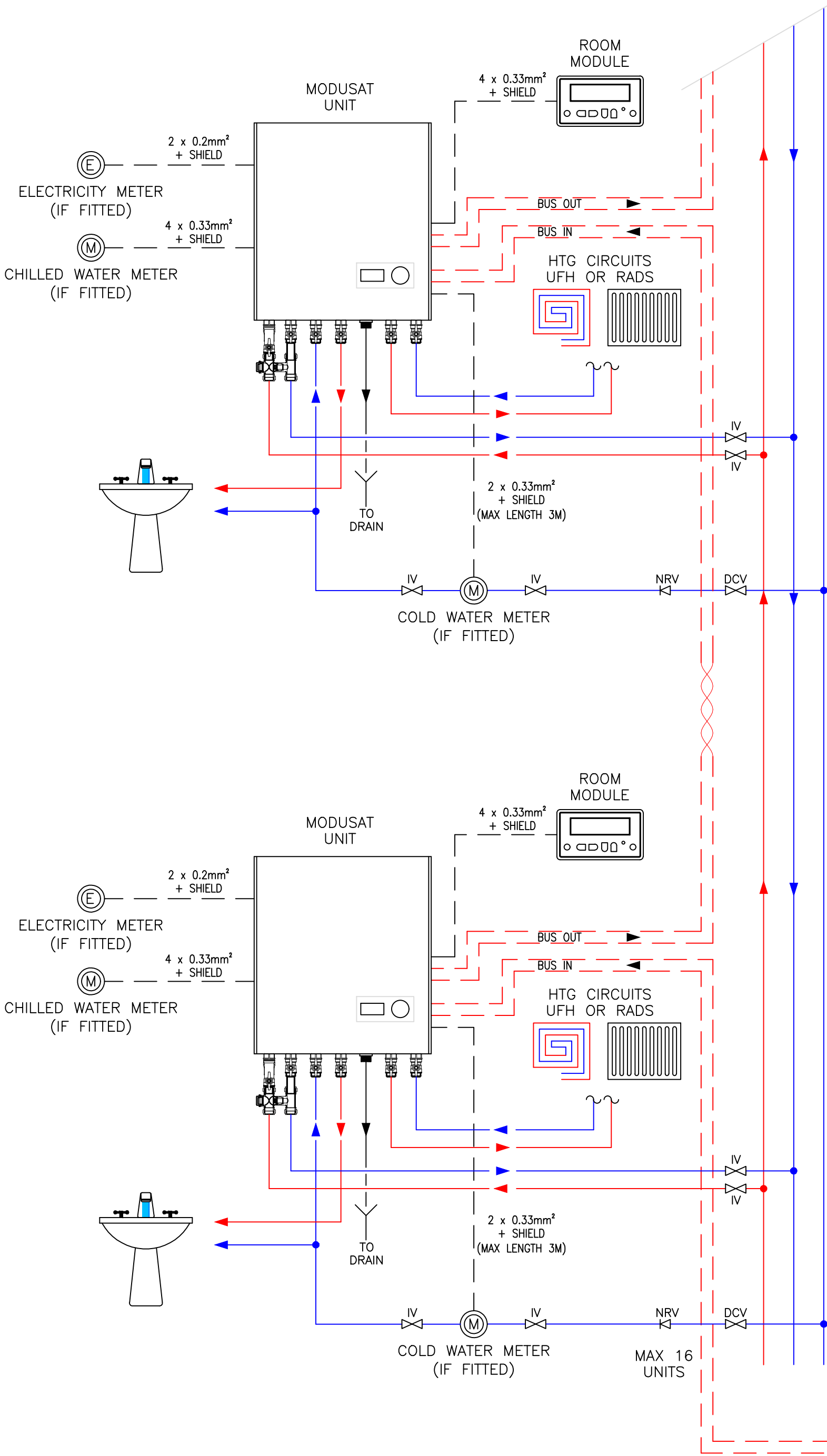
TITLE TYPICAL WIRING CONNECTION ARRANGEMENT WITH TWO ROOM CONTROLLERS
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DRAWN AK	CHECKED PL	DATE SEP 2018	SCALE N.T.S.
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DRAWING No	STD/MOD/BMS
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NOTES

1. STATIC IP ADDRESS (MINIMUM 1GB DATA PER MONTH).
2. AMPLIFIER FOR PLANT ROOM BULK METERING AS REQUIRED.
3. EACH MIB IS ABLE TO CONNECT TO TWO HEAT METERS.
MAX HEAT METER CABLE LENGTH 10M
4. MAXIMUM CABLE LENGTH FROM AMPLIFIER TO THE LAST MODUSAT HIU 500M
5. MAXIMUM CABLE LENGTH FROM MASTER CONTROLLER TO THE FIRST AMPLIFIER 100M
6. MAXIMUM CABLE LENGTH BETWEEN AMPLIFIERS 500M



E	10/09/19	AMENDED HIU PIPEWORK CONFIGURATION
D	25/5/16	MASTER -> SmartTalk® DATA LOGGER
C	14/12/15	MIB'S & HEAT METERS INDICATED ADDITIONAL NOTES ADDED
B	5/5/15	METERS, CABLE SPECIFICATIONS ADDED
A	18/6/13	ADDITIONAL TEMPERATURE SENSOR ADDED
REV	DATE	REVISION

EVINOX ENERGY

Evinox Energy Ltd.
Barwell Business Park
Leatherhead Road
Chessington
London KT9 2NY
Tel: 44 (0) 1372 722 277
Fax: 44 (0) 1372 744 477
www.evinox.co.uk

CLIENT
PROJECT

TITLE
**MODUSAT SmartTalk DATA LOGGER
AND SUPPLY UNIT BUS PRINCIPLE
SYSTEM ARCHITECTURE**

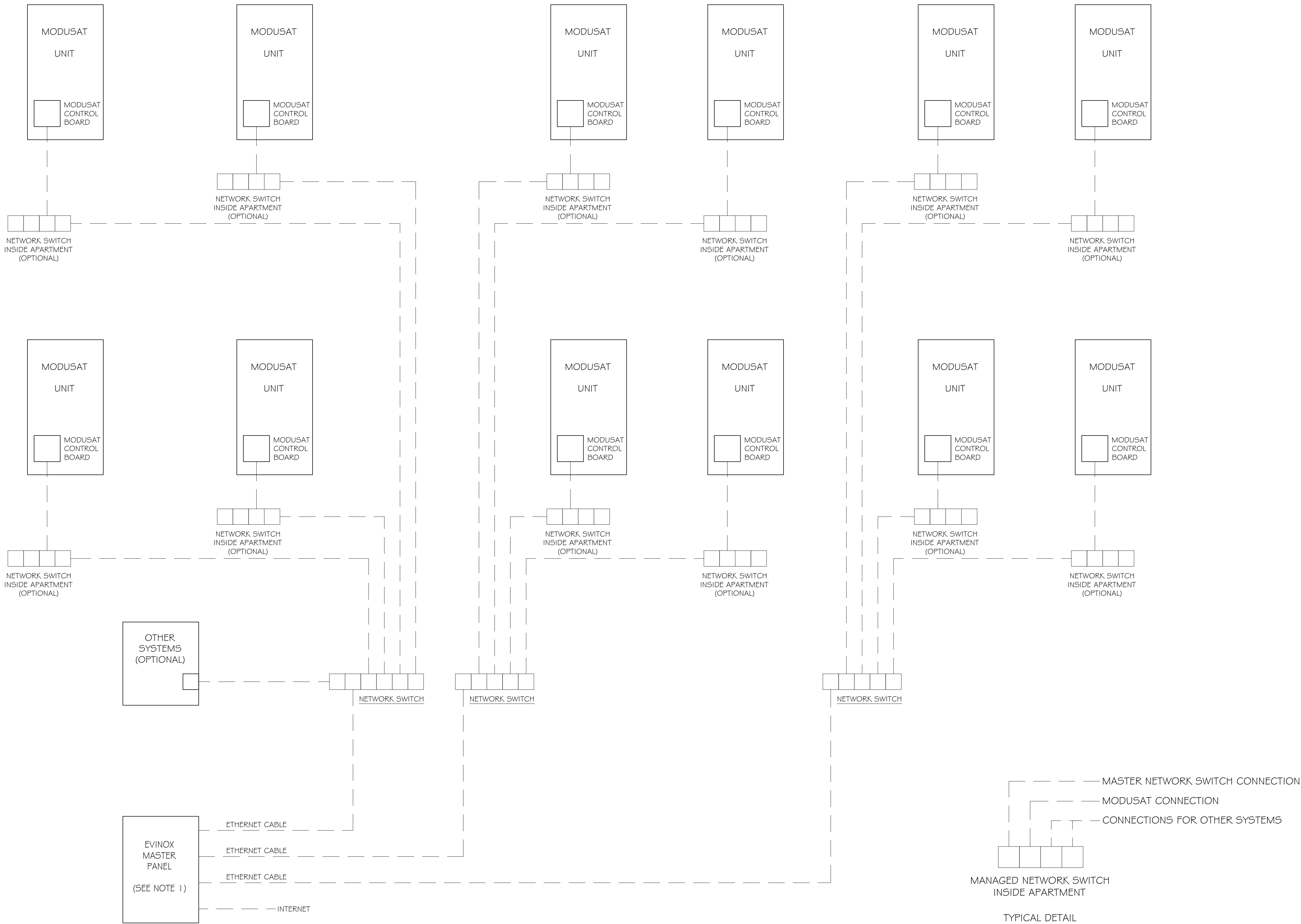
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DRAWING No
STD/MOD/2013/BUS 1

E

NOTES

1. PLEASE REFER TO DRAWING No
STD-MOD-2015-TCP/IP-MC FOR
MASTER PANEL DETAILS.



REV	DATE	REVISION

EVINOX ENERGY

Evinox Ltd.
Unit B, Blenheim House
1 Blenheim Road
Epsom
Surrey KT19 9AP
Tel: 44 (0) 1372 722 277
Fax: 44 (0) 1372 744 477
www.evinox.co.uk

CLIENT

PROJECT

TITLE
TYPICAL TCP / IP NETWORK
FOR MODUSAT SYSTEM

DRAWN	CHECKED	DATE	SCALE
BJW	SS	JAN. 2015	N.T.S.

DRAWING No
STD-MOD-2015-TCP/IP-3