

### ModuSat® XR Twin Plate Heat Interface Units

Heat interface unit for indirect heating and instantaneous domestic hot water (DHW) with electronic PID control using Pressure Independent Control Valves (PICVs) with modulating actuators achieving a low primary return temperature as well as providing differential pressure control and flow rate regulation.

### Application

The ModuSat® XR unit is the complete solution for instantaneous hot water and space heating production in communal and district heating systems.

Designed to operate with Evinox SmartTalk® two-way communication system for remote metering and diagnostics.

The ModuSat® XR is a compact wall mounted unit that fits perfectly in an apartment utility room or kitchen cupboard.

### Heating

The heating circuit flow temperature is controlled by the modulation of the primary flow rate with the integrated PICV actuator, whilst the integrated pump modulates the secondary flow based on the design dT ensuring low secondary and primary return temperatures.

Weather compensation is applied to the set heating flow temperature using SmartTalk® 2-way communication ensuring maximum system efficiency. Suitable for radiators, underfloor heating and fan coil units.

## CHOOSE THE SMART HIU WITH HIDDEN EXTRAS

Smart, Lower Cost Communication Network Connection



Lower Output Models Perfectly Placed for CIBSE ADE Code of Practice



New Internal Layout Configured for Simple Installation and Maintenance



Supplied with SmartTalk® Pro Web Interface for Remote Control and Diagnostics



### Domestic Hot Water

Domestic hot water is heated via a separate plate heat exchanger and the temperature is regulated by the modulation of primary flow rate with the integrated PICV actuator.



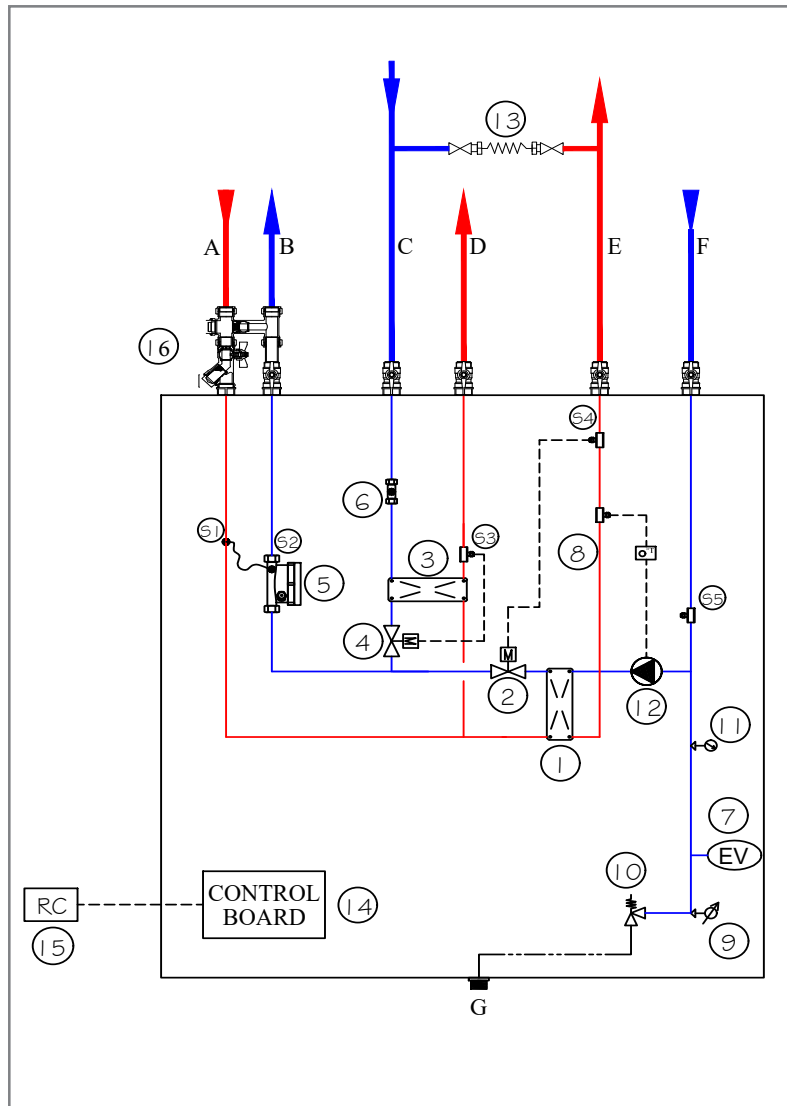
Compact Dimensions - Unit Size Reduced by 27%\*

# Technical Specification

Technical Information	ModuSat® XR/XR-ECO Twin Plate 30/55/70	ModuSat® XR Twin Plate 100
<b>Primary Heating Circuit</b>		
Maximum Flow Temperature	85°C	
Maximum Operating Pressure	Up to 16 bar Max	
Maximum Differential Pressure Rating	Up to 4 bar	
Min Differential Pressure	50kPa	
<b>Domestic Hot Water</b>		
Plate Heat Exchanger	High efficiency stainless steel brazed plate heat exchanger	
Differential Pressure/Flow Rate/Energy control	Pressure Independent Control Valve (PICV), electronic actuator and PID control	
Domestic Hot Water output	Dependent on model and plate selection. See performance table on page 6	
Operating Pressure	1 bar min cold water static pressure	
DHW response time	Average 8 sec to 45°C (BESA tests 5a, 5b)	
<b>Space Heating</b>		
Plate Heat Exchanger	High efficiency stainless steel brazed plate heat exchanger	
Differential Pressure/Flow Rate/Energy control	Pressure Independent Control Valve (PICV), electronic actuator and PID control	
Space Heating output	Dependent on model and plate selection. See performance table on page 7	
Operating Pressure	1 - 2.5 bar	
SH Flow Temperature	Dependent on model and plate selection. See performance table on page 7	
Safety Valve Rating	3 bar	
Expansion Vessel	8L	
Pump	Energy class A, Wilo PWM	
Pressure Gauge	Included	
<b>Enclosure</b>		
Dry Weight	34.1kg	37kg
Wet Weight	36.8kg	42kg
Pipework Insulation	Thickness: 9mm / Thermal Conductivity: 0.039 W/(M*K)	
Plate Heat Exchanger Insulation	Thickness: 29mm / Thermal Conductivity: 0.040 W/(M*K)	
Full Casing Insulation (optional)	Thickness: 5mm / Thermal Conductivity: 0.051 W/(M*K)	
Cover	White powder coated steel	
<b>Accessories and Options</b>		
Flushing bypass/isolation valves	¾" (Supplied separately)	1" (Supplied separately)
Strainer	Included within flushing bypass kit (primary heating flow)	
Filling loop	Supplied separately	
Pre-Installation Rig for First Fix	Available upon request (1 supplied free prior to unit supply)	
Heating Controller/Programmer	Evinox ViewSmart controller. Supplied separately	
Energy Display Device	ENE3 upgrade to ViewSmart Energy Display Device. (Optional)	
Pre-Payment Credit Display	PaySmart upgrade to ViewSmart controller. (Optional) No additional hardware required. Requires HIU's to be connected to communications network.	
<b>Advanced Functions</b>		
Keep Warm Facility	Time and temperature controlled	
Remote Diagnostics and Maintenance	Via SmartTalk® Pro - available separately. (Optional) Requires HIU's to be connected to communications network.	
Additional Features	Anti-jam, floor drying routine, alarm signal from leak detection system (volt free contact), and secondary delta T control.	
<b>Metering and Billing</b>		
Evinox Heat Meter	Ultrasonic, MID approved and class 2 accuracy (BS EN 1434). Available in two protocols: RS485 ModBus or M-Bus	
Energy Shut-Off Valve	Not required. PICV's act as shut off valve for PAYG systems	
Pre-Payment System Enabled	Integrated. Requires ViewSmart with appropriate upgrade	
Additional Meters	Up to 3 meters can be connected – CHW (ModBus), Cold Water (Pulse) and Electricity (ModBus)	
<b>Connectivity</b>		
Communications Connection Options	Modbus TCP/IP (meter information) open protocol RS485 - TCP/IP proprietary Evinox protocol for PAYG and Remote maintenance	
<b>Regulations and Certification</b>		
WRAS	WRAS Approved Components (Full product WRAS approval pending)	
CE	CE Marked Unit	
BESA (British Engineering Services Association) UK Standard for Heat Interface Units	Results published on BESA website - www.thebesa.com/ukhiu (Model Tested: MTP4R-1R-TL1/1B)	
<b>Electrical</b>		
Power supply voltage	220/240V 50Hz	

# Circuit diagrams

## Typical ModuSat® XR 30/55/70/100 Twin Plate



### Components

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

### Primary Side Circuit

- 1 Insulated plate heat exchanger (Heating)
- 2 HTG 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

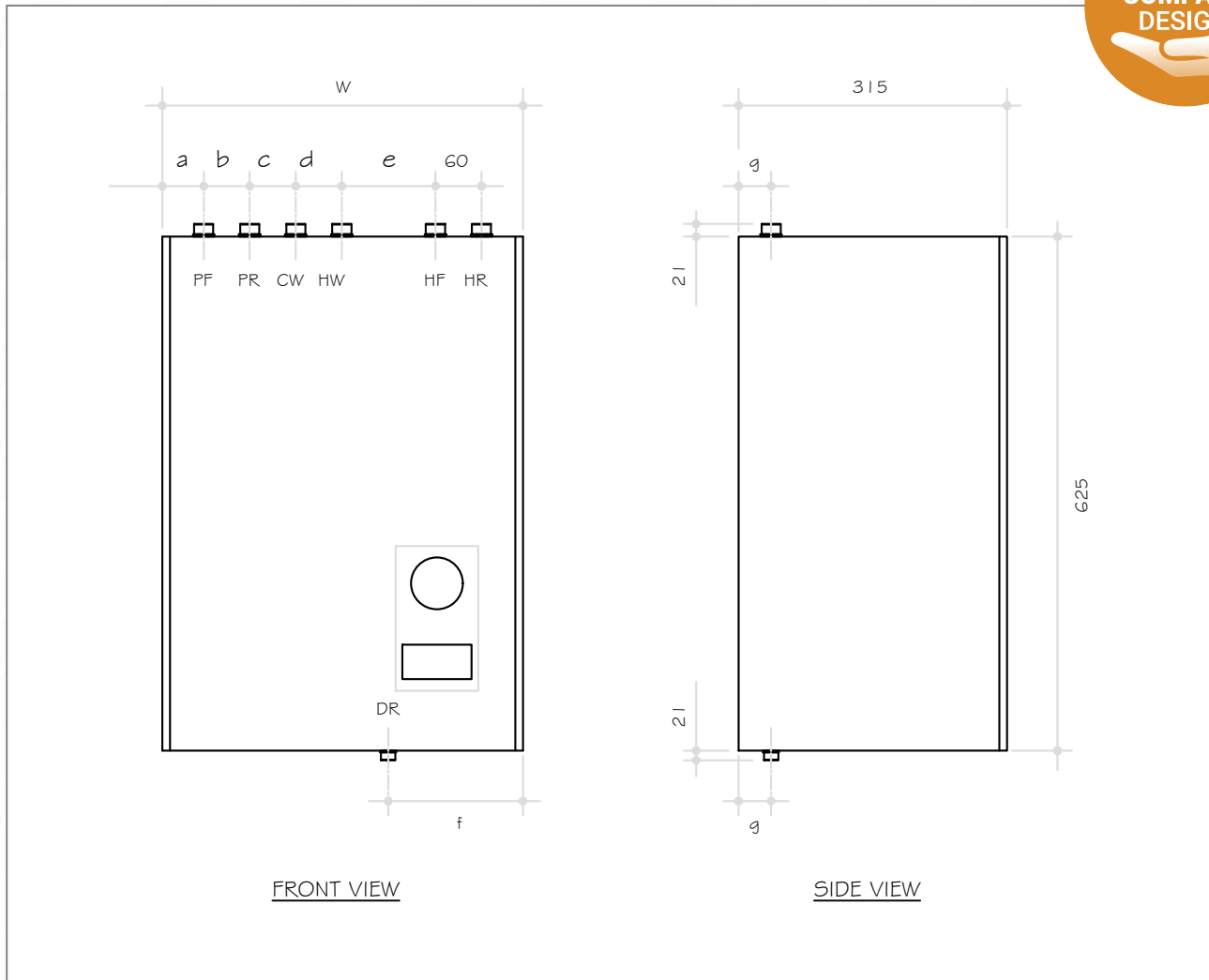
- 7 Heating expansion vessel
- 8 Safety UFH thermostat (optional)
- 9 Pressure sensor
- 10 Safety relief valve
- 11 Pressure gauge
- 12 Heating circulation pump

### Controls & Other Items

- 13 Filling loop (External)
- 14 Electronic control board
- 15 ViewSmart room controller
- 16 Flushing by-pass kit (Optional)

# Dimensions

## Typical ModuSat® XR 30/55/70/100 Twin Plate - Top Connections



All dimensions shown in mm.

ModuSat® XR & XR-ECO	Connections			Dimensions					
	PF, PR, CW, HW	HF, HR	DR	W	a	b,c,d	e	f	g
30 - XX / 55 - XX / 70 - XX	3/4"	3/4"	1/2"	467	53.5	60	120	172	42.5
100 - XX	1"	3/4"	1/2"	540	92	90	60	219	50

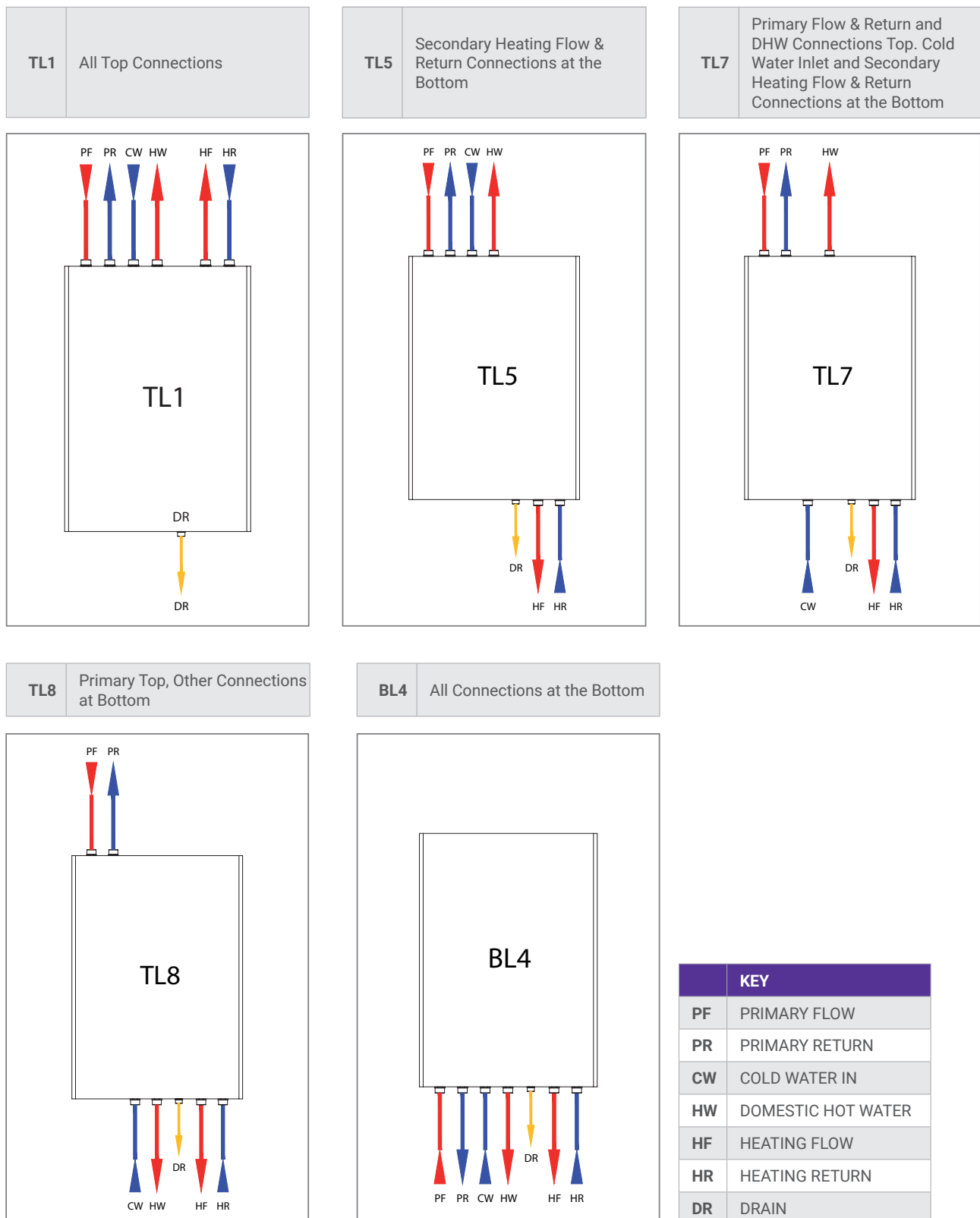
Other connection options are available. See Page 5 for further details.

CONNECTIONS KEY	
PF	PRIMARY FLOW
PR	PRIMARY RETURN
CW	COLD WATER IN
HW	DOMESTIC HOT WATER
HF	HEATING FLOW
HR	HEATING RETURN
DR	DRAIN

# Pipework Connection Options

ModuSat® XR Twin Plate units are supplied with five different pipework connection options as standard.

Using an HIU with pipework connections suited to project installation requirements can save an average of £50 per HIU on plumbing materials and labour costs, and also reduces the time required for installation.



DHW Plate Heat Exchanger Model

HTG Plate Heat Exchanger Model

# Technical Details

ModuSat® XR-ECO models are designed to provide excellent heating and hot water performance at heat network primary flow temperatures as low as 60°C or even 55°C.

## Performances at 10/50°C

	ModuSat® XR-ECO Twin Plate 30-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	17.8	18.8	19.8	21.5	24.2
Power (kW)	55	45	40	35	27
DHW flow (l/min)	19.7	16.1	14.3	12.5	9.7
Primary pressure drop** (kPa)	50	50	51	52	50

	ModuSat® XR-ECO Twin Plate 55-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	17.1	17.9	18.8	20.4	23.2
Power (kW)	65	52	46	40	32
DHW flow (l/min)	23.3	18.7	16.5	14.3	11.5
Primary pressure drop** (kPa)	51	50	50	50	50

	ModuSat® XR-ECO Twin Plate 70-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	15.6	16.4	17.1	18.5	20.8
Power (kW)	75	64	57	50	40
DHW flow (l/min)	26.9	23.0	20.5	17.9	14.3
Primary pressure drop** (kPa)	50				

	ModuSat® XR-ECO Twin Plate 100-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	17.0	18.0	18.7	20.3	23.1
Power (kW)	120	100	85	75	60
DHW flow (l/min)	43.1	35.9	30.5	26.9	21.5
Primary pressure drop** (kPa)	50	51	50	50	50

## Performances at 10/55°C

	ModuSat® XR-ECO Twin Plate 30-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	19.5	21.2	23.0	25.1	
Power (kW)	55	43	37	25	
DHW flow (l/min)	17.5	13.7	11.8	8.0	
Primary pressure drop** (kPa)	52	50			

	ModuSat® XR-ECO Twin Plate 55-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	18.4	20.1	21.8	24.9	
Power (kW)	62	50	43	34	
DHW flow (l/min)	19.8	16.0	13.7	10.9	
Primary pressure drop** (kPa)	50				

	ModuSat® XR-ECO Twin Plate 70-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	16.7	18.3	19.8	22.7	
Power (kW)	75	62	55	45	
DHW flow (l/min)	23.9	19.8	17.5	14.3	
Primary pressure drop** (kPa)	50		51		

	ModuSat® XR-ECO Twin Plate 100-XX				
Primary flow (°C)	80	70	65	60	55
Primary Return* (°C)	18.3	20.2	21.8	24.9	
Power (kW)	115	95	80	65	
DHW flow (l/min)	36.7	30.3	25.5	20.7	
Primary pressure drop** (kPa)	50				

\*Industry best practice guides, such as the London Heat Network Manual and CIBSE/ADE Heat Networks Code of Practice (CP1) recommend a primary return temperature of less than 25°C from domestic hot water production at design load.

ModuSat XR/XR-ECO units deliver return temperatures significantly below this across a wide range of primary system operating conditions, from as low as 55°C (Please refer to figures listed for "Primary return °C" in all tables above).

\*\*Pressure drop produced by all internal components of the ModuSat; including heat meter and PICV.



ModuSat® XR-ECO

# Technical Details

DHW Plate Heat Exchanger Model

HTG Plate Heat Exchanger Model

## Typical Domestic Hot Water Performances - ModuSat® XR/XR- 30/55/70

### Performances at 10/50°C

	ModuSat® XR Twin Plate 30-XX		
Primary flow (°C)	80	70	65
Primary Return* (°C)	24.6	25.1	25.0
Power (kW)	45	40	30
DHW flow (l/min)	19.8	14.3	10.7
Primary pressure drop** (kPa)	50		

### Performances at 10/55°C

	ModuSat® XR Twin Plate 30-XX		
Primary flow (°C)	80	70	65
Primary Return* (°C)	24.6	24.8	24.9
Power (kW)	40	25	17
DHW flow (l/min)	12.8	8.0	5.40
Primary pressure drop** (kPa)	50		

	ModuSat® XR Twin Plate 55-XX		
Primary flow (°C)	80	70	65
Primary Return* (°C)	23.8	24.9	24.9
Power (kW)	70	55	42
DHW flow (l/min)	25.1	19.7	15.1
Primary pressure drop** (kPa)	50		

	ModuSat® XR Twin Plate 55-XX		
Primary flow (°C)	80	70	65
Primary Return* (°C)	24.9	24.8	25.0
Power (kW)	58	35	24
DHW flow (l/min)	18.5	11.2	7.7
Primary pressure drop** (kPa)	50		

\*Industry best practice guides, such as the London Heat Network Manual and CIBSE/ADE Heat Networks Code of Practice (CP1) recommend a primary return temperature of less than 25°C from domestic hot water production at design load. ModuSat XR units deliver return temperatures significantly below this across a wide range of primary system operating conditions, from as low as 55°C (Please refer to figures listed for "Primary return °C" in all tables above).

\*\*Pressure drop produced by all internal components of the ModuSat; including heat meter and PICV.

## Typical Heating Performances - ModuSat® XR & XR-ECO 30/55/70/100

### Underfloor Heating Systems

	ModuSat® XR/XR-ECO XX-10A					ModuSat® XR/XR-ECO XX-20A				
Primary flow (°C)	80	70	65	60	55	80	70	65	60	55
Primary Return (°C)	38.1	38.3	38.4	38.6	39.0	37.5	37.3	37.3	37.6	38.2
Power (kW)	8	8	7	6	5	12	11	10	10	10
Heating (°C)	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35	45 / 35
Heating flow (l/s)	0.19	0.19	0.17	0.14	0.12	0.24	0.26	0.24	0.24	0.24
Residual pump head (kPa)	43.8	43.8	48.8	53.2	57.0	43.9	38.7	43.9	43.9	43.9

### Radiator Systems

	ModuSat® XR/XR-ECO XX-10R			ModuSat® XR/XR-ECO XX-20R		
Primary flow (°C)	80	70	65	80	70	65
Primary Return (°C)	43.0	43.8	44.6	42.6	43.2	44.3
Power (kW)	7	5	3	14	11	8
Heating (°C)	60 / 40	60 / 40	60 / 40	60 / 40	60 / 40	60 / 40
Heating flow (l/s)	0.084	0.060	0.036	0.17	0.13	0.10
Residual pump head (kPa)	44.1	54.5	61.4	40.5	49.9	57.2

Typical performance figures for the heating and hot water are shown above. Other selections are available to suit project requirements. ModuSat XR typical performances comply with best practice recommendations from the CIBSE/ADE CP1 and BSRIA Guide BG62/2015.

# Other Equipment & Services

Below you will find an overview of other Evinox equipment and services that complement ModuSat® Heat Interface Unit systems.

## ViewSmart Room Controller

Provides full control of the heating and hot water system, including time schedule programming and temperature set-point control.

Also available as an optional ENE3 Energy Display Device model, which offers credits toward the Code for Sustainable Homes.



## SmartTalk® Data Logger

Provides a convenient central point for connection of all ModuSat® heat interface units, which deliver's instant downloads of consumption data for billing purposes. Available for connection to Ethernet/Fibre Optic, M-Bus and RS485 networks. Amplifiers/Level Convertors are supplied for RS485/M-Bus networks.

### Supplied with Open Protocol Data Options -

- Automated Email of Meter Readings with Client Access via Web Portal
- Evinox Billing Services
- ModBus TCP Output to BMS
- API for Connection to Other Billing Interfaces

## SmartTalk® Remote Control & Support

In-built SmartTalk® technology in every ModuSat® HIU provides remote monitoring, control, alarms and diagnostics over the internet. Units can also be commissioned remotely, which saves time on site and reduces costs.

ModuSat® units are supplied with FREE access to SmartTalk® Pro, our web portal that enables contractors to investigate and often resolve issues without sending an engineer to site.

*Note: Requires connection to an operational Ethernet, Fibre Optic or RS485 network.*



## ModuSat® HIU Service & Maintenance Options

	During Warranty Period (First 2 Years)		Following the Expiry of the ModuSat HIU Warranty (Standard or Enhanced)	
	Standard Warranty	Enhanced Warranty	Service & Maintenance Plan 1 Year	Service & Maintenance Plan 2 Year
Telephone Support Cover	8am – 5pm, Mon - Fri	6am – 10pm, 7 days/week	6am – 10pm, 7 days/week	6am – 10pm, 7 days/week
SmartTalk® Remote Diagnostics and Support	Included*	Included*	Included*	Included*
Minimum Guaranteed On-site Response	48 hours	24 hours	24 hours	24 hours
Replacement Parts and Labour Cover	2 years	2 years	1 year	2 years
Physical Service Inspection	Not included	Included	Not included	Included