# ModuSat®XR CHHC

## Combined Heating, Domestic Hot Water & Cooling

## ModuSat® XR Combined Heating, Domestic Hot Water and Cooling Interface

**The ModuSat® combined heating and cooling unit provides heating, cooling and the instantaneous production of hot water. Designed to simplify apartment installations where cooling and heating is required; the CHHC unit features a small footprint that minimises required cupboard space, with easy access for service and maintenance.**

The heating, domestic hot water and cooling plate heat exchangers are housed within a single cased unit with high quality fully insulated separation between the hot and chilled zones. The unit can be provided in either floor standing or wall mounted orientations making them suitable for a wide range of installation configurations.

### Heating

The heating circuit consists of a plate heat exchanger (PHE), safety relief valve, manometer, flow and return temperature sensors, PWM pump and expansion vessel. The heating circulation pump and expansion vessel. The heating circuit flow temperature is controlled by the modulation of the primary flow rate with the integrated PICV actuator. Weather compensation is applies to the set Heating temperature using SmartTalk®2-way communication. Suitable for radiators, underfloor heating or fan coil units.

### 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.

- **Mobile billing app** for smart phones and tablets
- **ViewSmart room controller** with optlonal upgrade to provide ENE3 compliant smart metering
- **Excellent thermal efficiency** achieved using the latest technology and efficient brazed stainless steel PHE's
- **Fast and Responsive Hot Water** The unit delivers fast and responsive domestic hot water performance, providing high levels of user comfort & convenience
- **Fully Programmable Hot Water** "Keep-warm" function, for energy saving
- **Electronically controlled PICVs** for primary flow rate for primary flow rate modulation to match the demand, differential pressure control and energy shut off
- **Integrated Heat Meters for Heating & Cooling -** MID approved and class 2 accuracy (BS EN 1434)

### Cooling

The Cooling circuit consists of a plate heat exchanger (PHE), safety relief valve, manometer, flow and return temperature sensors, modulating pump and expansion vessel. The cooling circuit flow temperature is controlled by the modulation of the primary flow rate with the integrated PICV actuator.

The ModuSat®CHHC is available with a number of plate size options to meet a range of cooling, heating and DHW requirements and is supplied complete with a ViewSmart room controller.

## Features & Benefits

- Units suitable for single and multi-family homes
- Compact Design with minimum space required for installation
- Fully insulated
- Integrated PaySmart technology ready for pre-payment billing upgrade.
- Option of floor standing or wall mounted unit
- External filling loop (Optional
- SmartTalk two-way communication
- Remote monitoring, alarms, and diagnostics
- Time and temperature controlled Keep Warm function
- Includes inbuilt TCP/IP technology to operate on an |Ethernet network if required
- Capable of reading an electricity and pulsed meter (Option for ENE3)
- Flushing bypass kit enables the primary side of the system to be flushed and cleaned without damage to the unit
- WRAS Approved

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# Circuit Diagram

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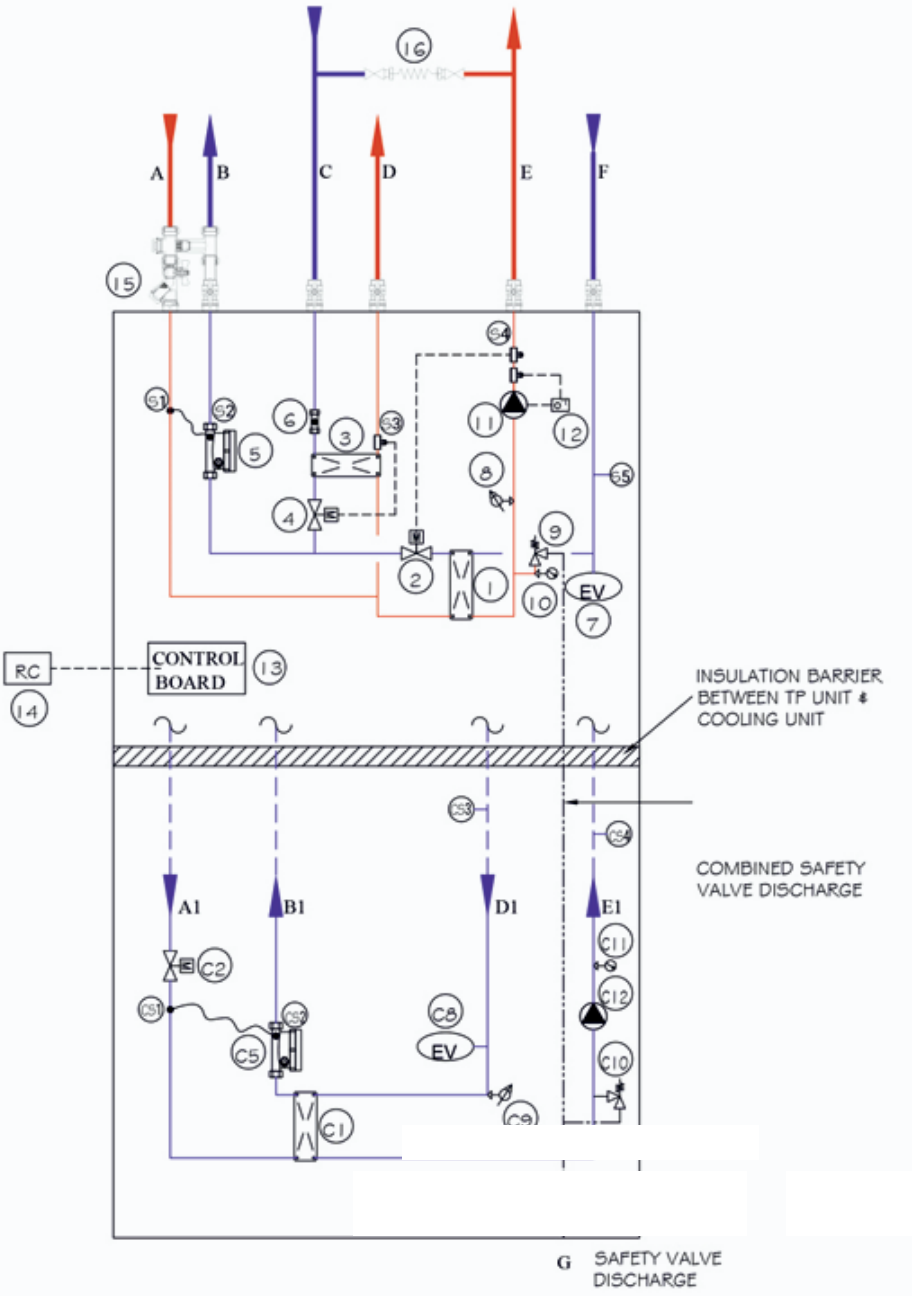
### Typical Floor Standing or Wall Mounted CHHC Unit with Top Connections




## Components

**TP Unit (HTG/DHW)**
**a** Primary/ DH flow
**b** Primary/ DH 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

**Cooling Unit**
**A1** Primary flow
**B1** Primary return
**D1** Secondary Return
**E1** Secondary Flow

**Primary Cooling Circuit**
**C1** Cooling PHE
**C2** Cooling Pressure Independent Control Valve with actuator
**C5** Cooling meter

**Secondary Cooling Circuit**
**C8** Cooling expansion vessel
**C9** Pressure sensor
**C10** Safety relief valve
**C11** Pressure gauge
**C12** Cooling circulation pump

**Controls**
**CS1** Primary flow temperature
**CS2** Primary return temperature
**CS3** Secondary I Apartment
**CS4** Secondary / Apartment flow

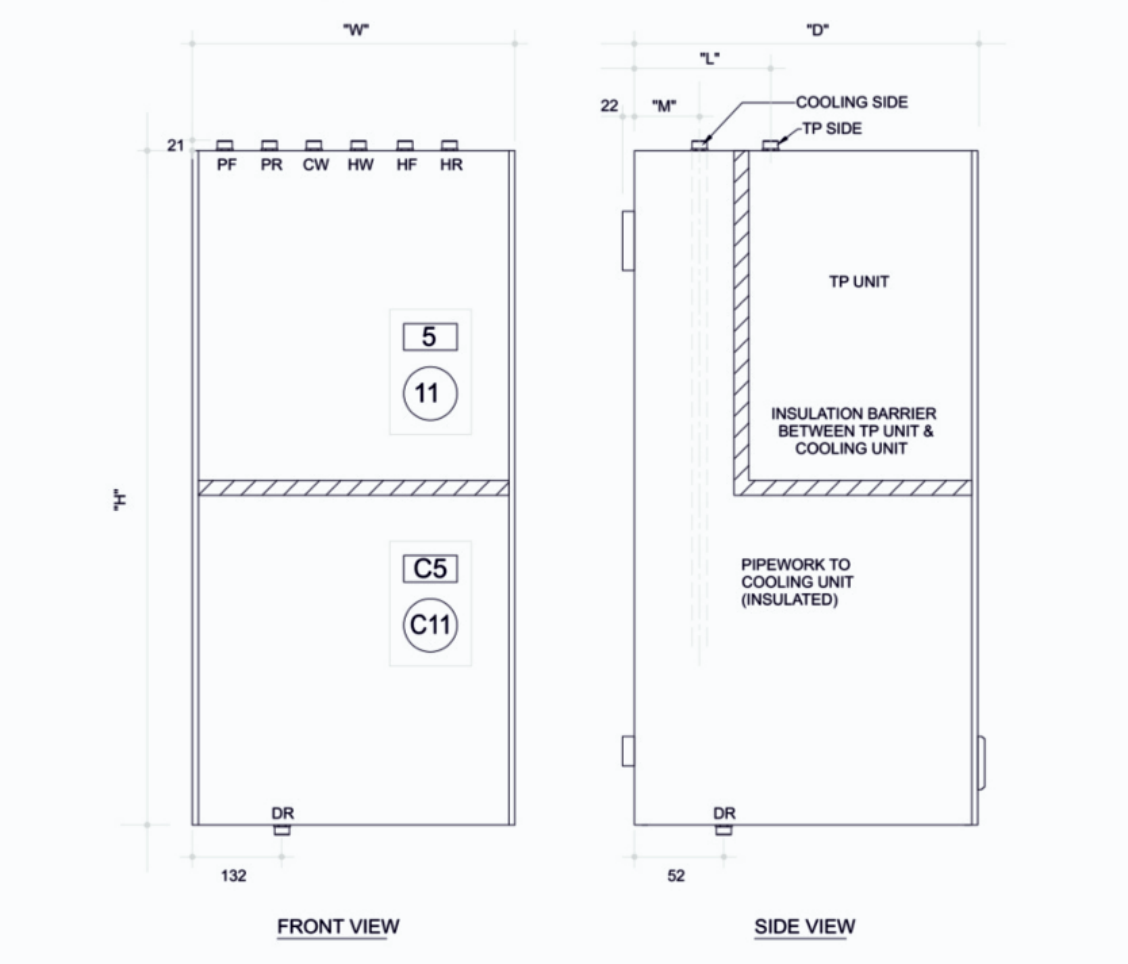
## Components

**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

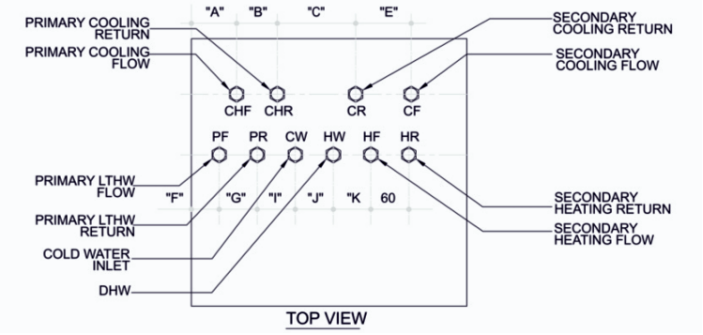
**Heating Secondary Side Circuit**
**7** Heating expansion vessel
**8** Low pressure switch
**9** Safety relief valve
**10** Pressure gauge
**11** Heating circulation pump
**12** Safety thermostat (Optional)

**Controls and other items**
**13** Electronic control board
**14** ViewSmart Controller
**15** Flushing by-pass
**16** Filling loop (External)




## Dimensions (in mm)

| CHHC Type | CHHC Model Example | A | B, C, E | F | G, I, J | K | L | M | N | O | P | W | H | D | MagiCAD Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type A** | 30-10A-R40 | 154 | 60 | 121 | 60 | 120 | 60 | 152 | 52 | 136 | 53 | 550 | 1180 | 420 | CHHCI |
| **Type B** | 55-10R-R70 | 94 | 90 | 121 | 60 | 120 | 60 | 152 | 52 | 136 | 53 | 550 | 1180 | 420 | CHHC2 |
| **Type C** | 55-20R-B40 | 69 | 90 | 121 | 60 | 120 | 60 | 152 | 52 | 111 | 53 | 550 | 1250 | 420 | CHHC.3 |
| **Type D** | 70-20A-B70 | 79 | 120 | 121 | 60 | 120 | 60 | 182 | 67 | 409 | 53 | 600 | 13.3 | 440 | CHHC4 |
| **Type E** | 100-10A-R40 | 154 | 60 | 82 | 90 | 60 | 60 | 152 | 52 | 136 | 53 | 550 | 1180 | 420 | CHHC5 |
| **Type F** | 100-10A-R70 | 94 | 90 | 82 | 90 | 60 | 60 | 152 | 52 | 136 | 53 | 550 | 1180 | 420 | CHHC6 |
| **Type G** | 100-20R-B40 | 69 | 90 | 82 | 90 | 60 | 60 | 152 | 52 | 111 | 53 | 550 | 1250 | 420 | CHHC7 |
| **Type H** | 100-20A-B70 | 79 | 120 | 112 | 90 | 60 | 60 | 182 | 67 | 409 | 53 | 600 | 1330 | 440 | CHHC8 |




## Connections

| CHHC Type | CHHC Mode Example | PR, PR, CW, HW | HF, HR | CHF, CHR, CF, CR | DR |
|---|---|---|---|---|---|
| **Type 1** | 30-R1-40 | 3/4" | 3/4" | 3/4" | 1/2" |
| **Type 2** | 55-20R-R70 | 3/4" | 3/4" | 1" | 1/2" |
| **Type 3** | 70-40R-B40 | 3/4" | 3/4" | 1" | 1/2" |
| **Type 4** | 70-20A-B70 | 3/4" | 3/4" | 11/4" | 1/2" |
| **Type 5** | 100-10A-R40 | 1/2" | 3/4" | 3/4" | 1/2" |
| **Type 6** | 100-10A-R70 | 1/2" | 3/4" | 1" | 1/2" |
| **Type 7** | 100-20R-B40 | 1/2" | 3/4" | 1" | 1/2" |
| **Type 8** | 100-60R-B70 | 1/2" | 3/4" | 11/4" | 1/2" |

# Technical Details

# ModuSat® XR CHHC®

## Combined Heating, Domestic Hot Water & Cooling

| ModuSat Selection | ModuSat CHHC 30-10A-R40 | ModuSat CHHC 55-20R-R70 | ModuSat CHHC 70-40R-B40 | ModuSat CHHC 100-60R-B70 |
|---|---|---|---|---|
| DHW Performance (kW) | 45 | 55 | 65 | 100 |
| DHW flow rate (kg/s) | 0.269 | 0.329 | 0.389 | 0.598 |
| DHW flow/cold inlet temp (°C) | 50/10 | 50/10 | 50/10 | 50/10 |
| Primary flow/return temp (°C) | 70/18.8 | 70/18.2 | 70/16.4 | 70/18.0 |
| Primary flow (kg/s) | 0.210 | 0.254 | 0.290 | 0.460 |
| Primary pressure drop (KPa) | 50 | 50 | 52 | 50 |
| Heating Performance (kW) | 5 | 10 | 15 | 20 |
| HTG flow rate (kg/s) | 0.120 | 0.120 | 0.179 | 0.239 |
| HTG flow/return temp (°C) | 45/35 | 60/40 | 60/40 | 60/40 |
| Primary flow/return temp (°C) | 70/37.8 | 70/43.1 | 70/42.5 | 70/42.3 |
| Primary flow (kg/s) | 0.037 | 0.089 | 0.130 | 70/42.3 |
| Residual pump head (kPa) | 58 | 52 | 54 | 46 |
| Cooling Performance | 4 | 9 | 14 | 23 |
| CHW flow rate (kg/s) | 0.159 | 0.359 | 0.558 | 0.917 |
| Cooling flow/return temp (°C) | 8/14 | 8/14 | 8/14 | 8/14 |
| Primary flow/return temp ('C) | 6/12.8 | 6/12.6 | 6/12.4 | 6/12.5 |
| Primary flow (kg/s) | 0.141 | 0.327 | 0.521 | 0.841 |
| Residual pump head (kPa) | 55 | 54 | 51 | 80 |
| Primary Pressure drop (kPa) | 50 | 50 | 50 | 51 |

### Technical Features

- Maximum operating pressure: 16 bar
- Power supply voltage: 220/240 Volt (AC) 50 Hz
- Max supply temperature (Primary): 85 °C
- Min DCW static pressure: 1 bar
- Heating expansion vessel: 8L
- Cooling expansion vessel: 8L
- Max allowable primary pressure drop: 4 bar

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