

Installation Manual
Expansion Module 0100
Version 1.0



EXP-0100

HBX Control Systems Inc.

HBX EXP-0100 EXPANSION MODULE INTRODUCTION

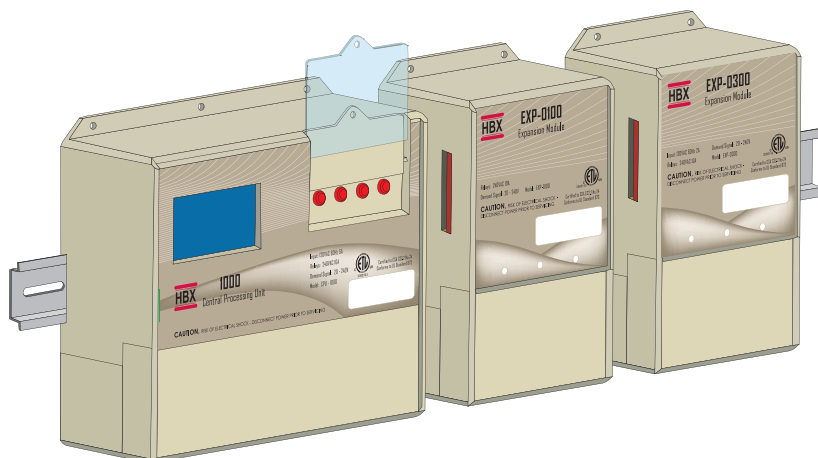
The EXP-0100 Expansion Module is designed to be integrated with the HBX CPU-1000 HVAC Controller, it is not a stand alone control device. The purpose and function of the EXP-0100 is to provide system expansion capabilities. Its primary use is to add additional boiler stages. For example, 1 CPU-1000 + 1 EXP-0100 can provide a total of 4 boiler stages (when configured as a staging control).

If the Control is configured as a mixing control and more than one boiler is required, the program within the CPU-1000 anticipates (defaults) that boiler stages are connected through the Expansion Modules (refer to drawing MIX 1000-05 of this manual). The EXP-0100 has a spare thermistor input with no fixed function. The installer may choose to run the spare thermistor as a; room sensor, setpoint sensor, or a return water temp sensor. The spare demand signal has no dedicated function at the time of print.

The position of setpoint sensors (thermistors) are critical to the correct operation of the Control. Pay special attention to the wiring of setpoint sensors in relation to actuators, pumps, and multiple boiler stage relays. Example shown in Application Drawing MIX 1000-04.

HBX has developed a series of Expansion Modules. At time of product introduction the EXP-0100 (Staging) and EXP-0300 (Pump) Modules are made available. These will be followed by the release of the ZON-0500 (Zone Control), and the MOD-0100 (Modulating Output Module) Module.

A combination of these Modules are designed to tackle a variety of applications, using a maximum of *six Modules in unison with a single CPU-1000 Control Unit. The sequence in which the Modules are connected is very important. Install the Modules that you are utilizing in the following order: CPU-1000, Staging Controls, Pump Controls, Modulating Controls, Zone Controls.

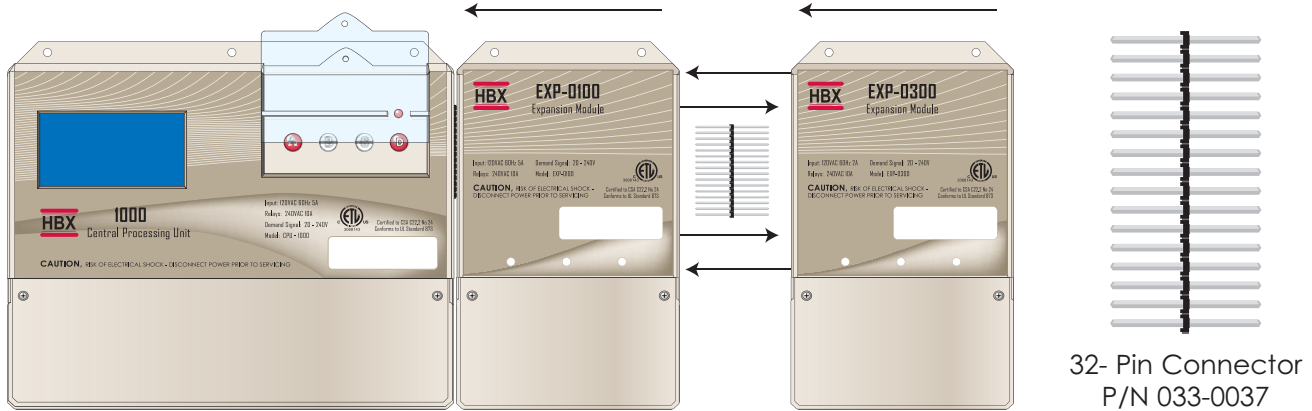


*** More than six Zone Modules can be connected to the CPU-1000 as the Zone Modules are not dependent on the CPU to power the relays.**

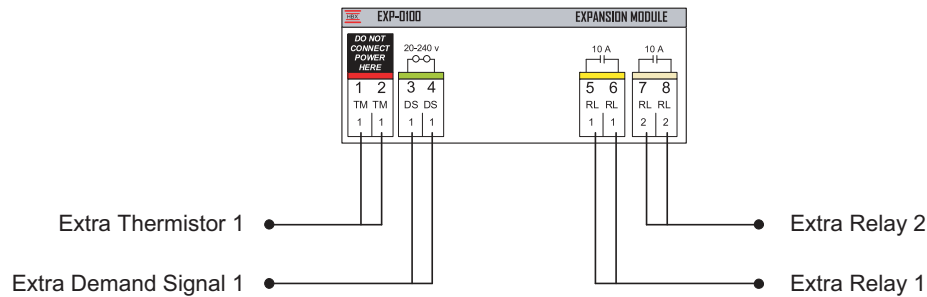
The EXP-0100 is designed to be wall mounted, DIN rail mounted, or installed inside a separate electrical enclosure. The unit should be mounted inside and be protected from falling water and high humidity conditions. With all the covers in place it is designed to protect any individual from accidental electrical shock.

INSTALLATION PROCEDURE

Place the CPU-1000 and desired Expansion Modules on a flat surface. Align the 32-Pin connector into the holes on the Expansion Module and gently push into place. Next slide the CPU-1000 onto the 32-Pin connection by carefully matching up the holes and pins. When installed correctly there is virtually no gap between units. With power applied to the assembly, the first (green) LED should be illuminated on each Expansion Module. This lit, green LED serves as confirmation of both electrical and communications continuity.



TERMINAL DESIGNATIONS



Extra Thermistor 1 - Gives you many choices.
E.g. Room sensor or setpoint sensor.

Extra Demand Signal 1 - Any heat demand signal powered by 20 - 240VAC.
E.g. 24VAC thermostat (future applications).



Thermistor inputs are designed for 10K Ohm thermistors and must never be subjected to any external power supply (voltage or current).

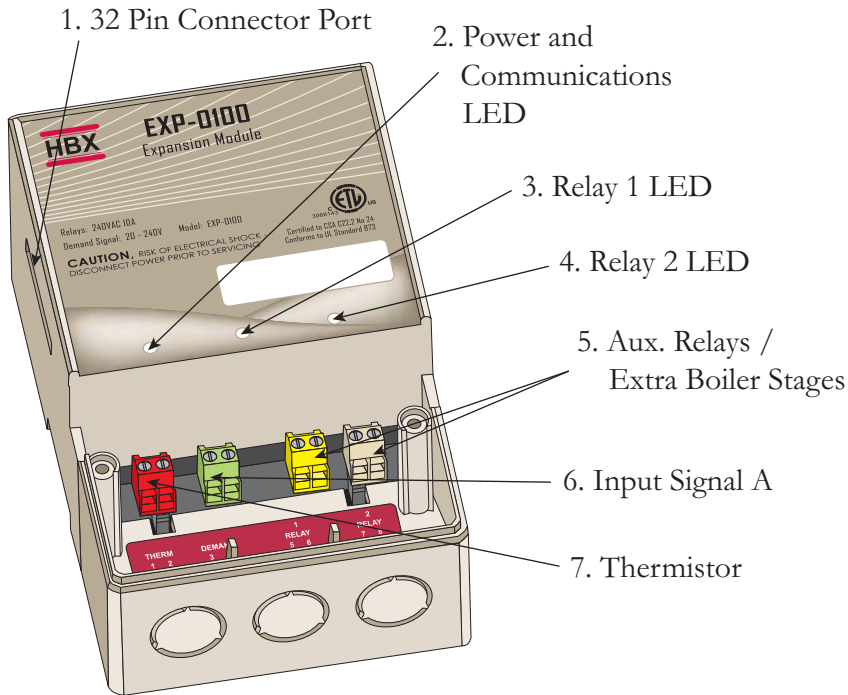
Extra Relay 2 - This relay is the default relay for bringing on multiple boiler stages.
E.g Boiler (stage) 4, 6, 8 etc. depending on the number of Modules connected together.

Extra Relay 1 - This relay is the default relay for bringing on multiple boiler stages.
E.g Boiler (stage) 3, 5, 7, etc. depending on the number of Modules connected together.



Extra Relays 1&2 are dry contacts and rated for a max of 10Amps.

MAIN PARTS AND LABELS



Specifications:

1 x Thermistor Input (10K Ohm)

1 x Misc. Input Signal (20-240VAC)

2 x Aux. Output Relays (240VAC 10Amps)

Weight:

0.408Kg

Dimensions:

100mm W x 170mm H x 70mm D

ETL Listings:

Meets CSA C22.2 No. 24

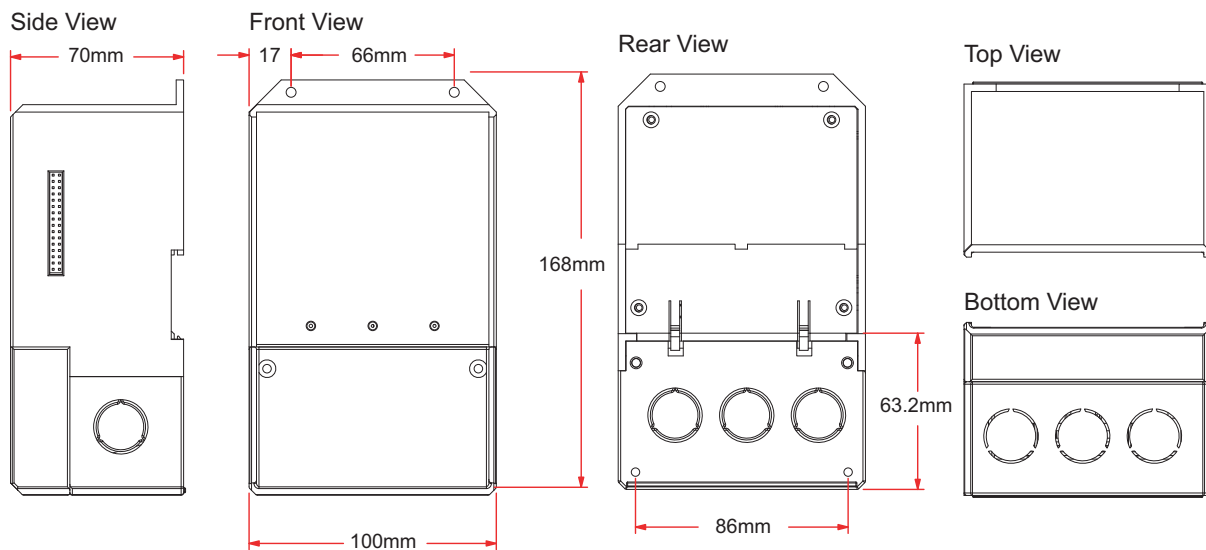
Meets UL Standard 873

ETL Control No. 3068143

Storage:

10°C to 40°C

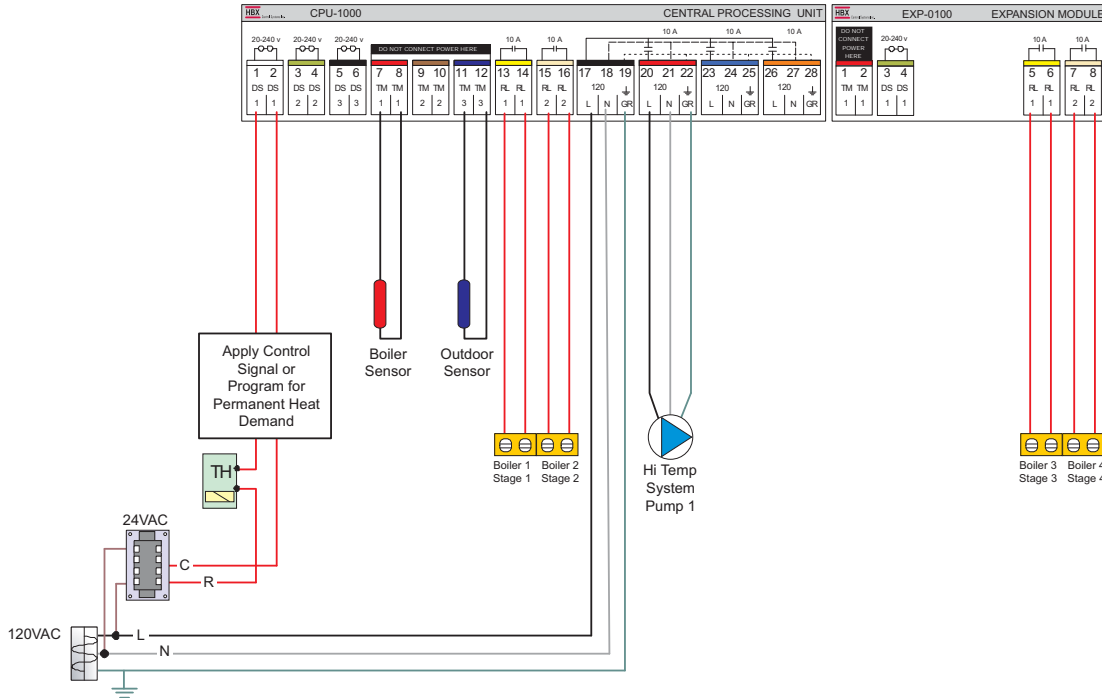
PHYSICAL DIMENSIONS



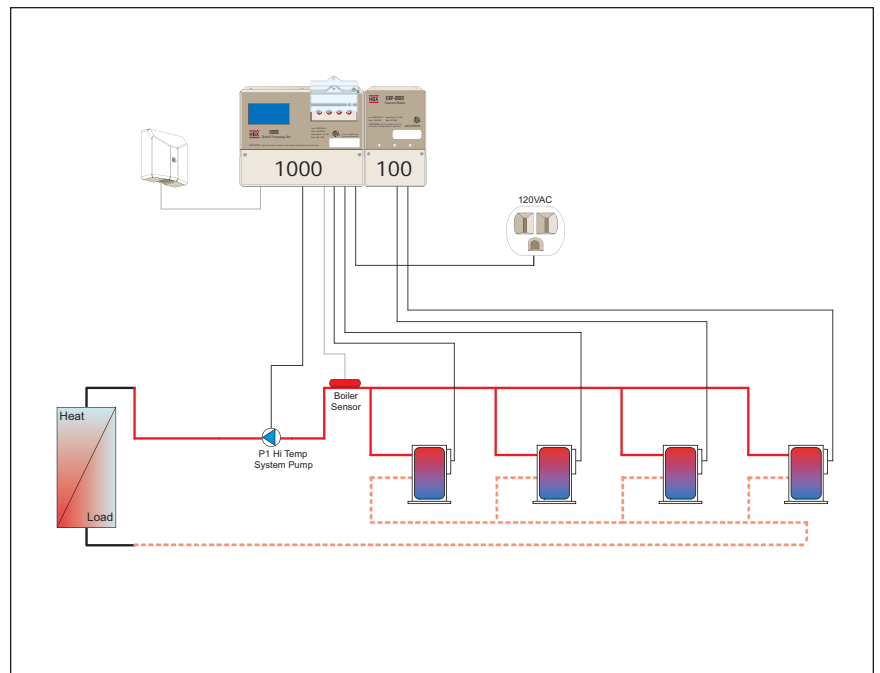
STAGING CONTROL STG 1000-04

- 4 stage boiler control
- One system pump piped reverse return

ELECTRICAL



MECHANICAL



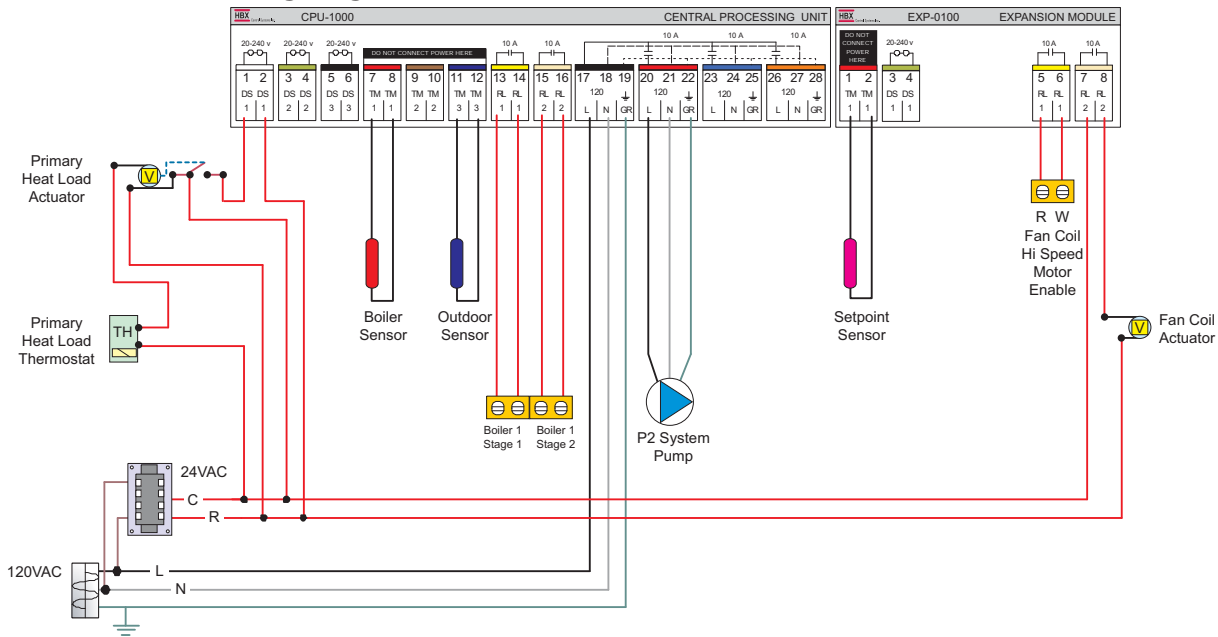
Control Type:
Staging Utilized

Pump Legend:
• P1 - Hi-Temp System Pump

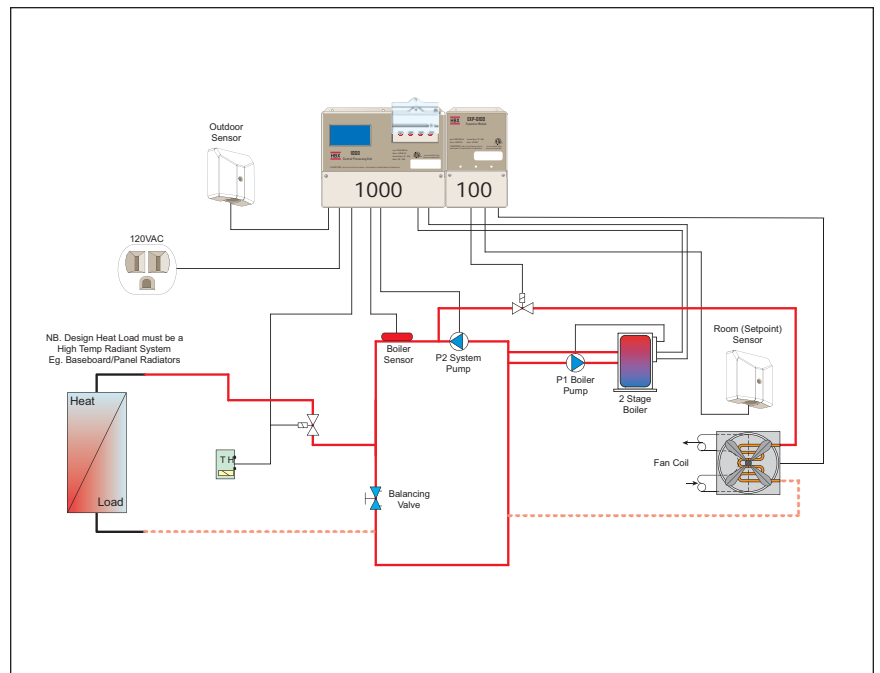
STAGING CONTROL STG 1000-09

- 1x Hi/Lo boiler (2 stage) with 1 main hi-temp system pump
- Boiler pump is being controlled directly from the internal boiler (staging) contacts
- Outdoor reset of boiler target temp is controlled via the outdoor sensor and the boiler sensor on the supply pipe
- An additional setpoint load in the form of a fan coil, fan coil high-speed controlled at the same time as fan coil actuator

ELECTRICAL



MECHANICAL



Control Type:
Staging Utilized

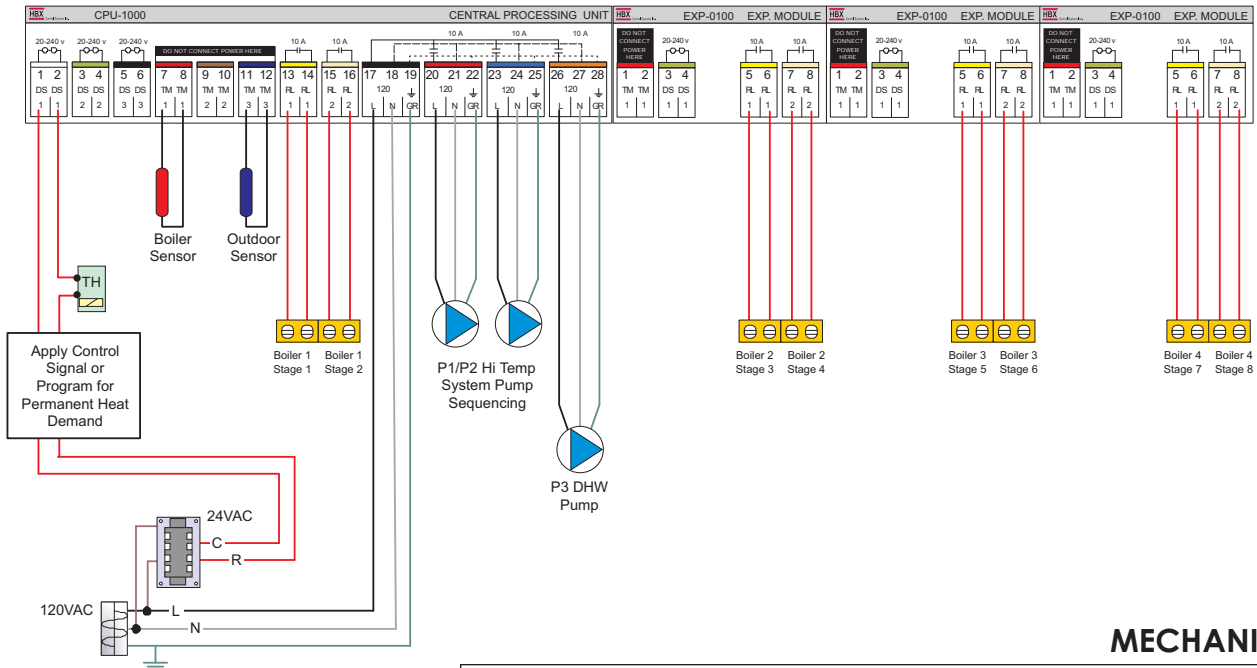
Pump Legend:

- P1 - Boiler Pump
- P2 - System Pump

STAGING CONTROL STG 1000-10

- 4x Hi/Lo fire boilers (8 stages) with 2x hi-temp system pumps controlled on a pump sequencer
- Boiler pumps are being controlled directly from the internal boiler (staging) contacts
- Outdoor reset of boiler target temp is controlled via the outdoor sensor and the boiler sensor on the supply pipe
- Optional DHW shown using DHW pump on DHW priority

ELECTRICAL

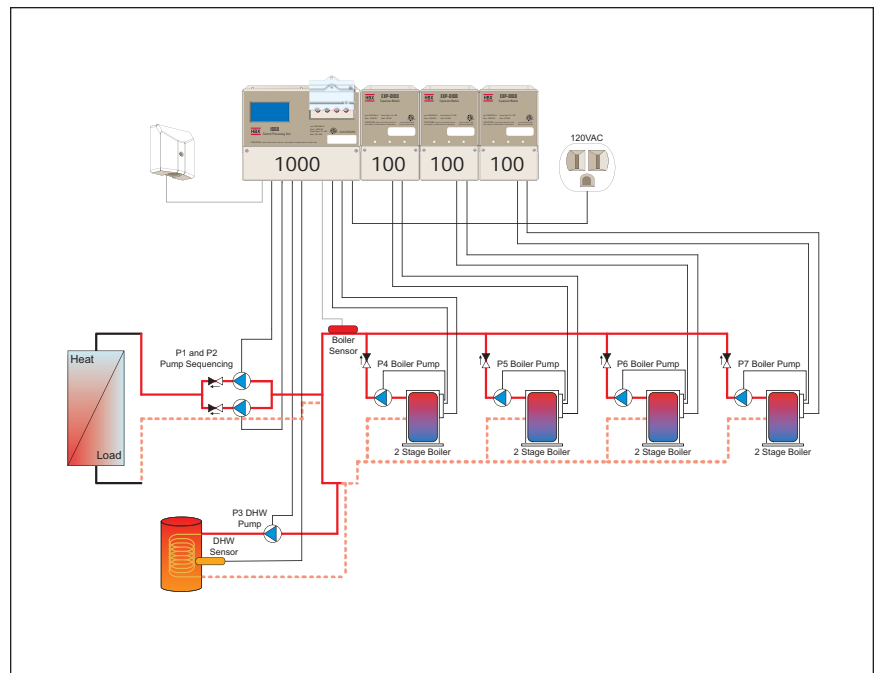


Control Type:
Staging Utilized

Pump Legend:

- P1 + P2 - High Temp System Pumps setup to sequence every 48 hours
- P3 - DHW
- P4-P7 - Boiler Pumps

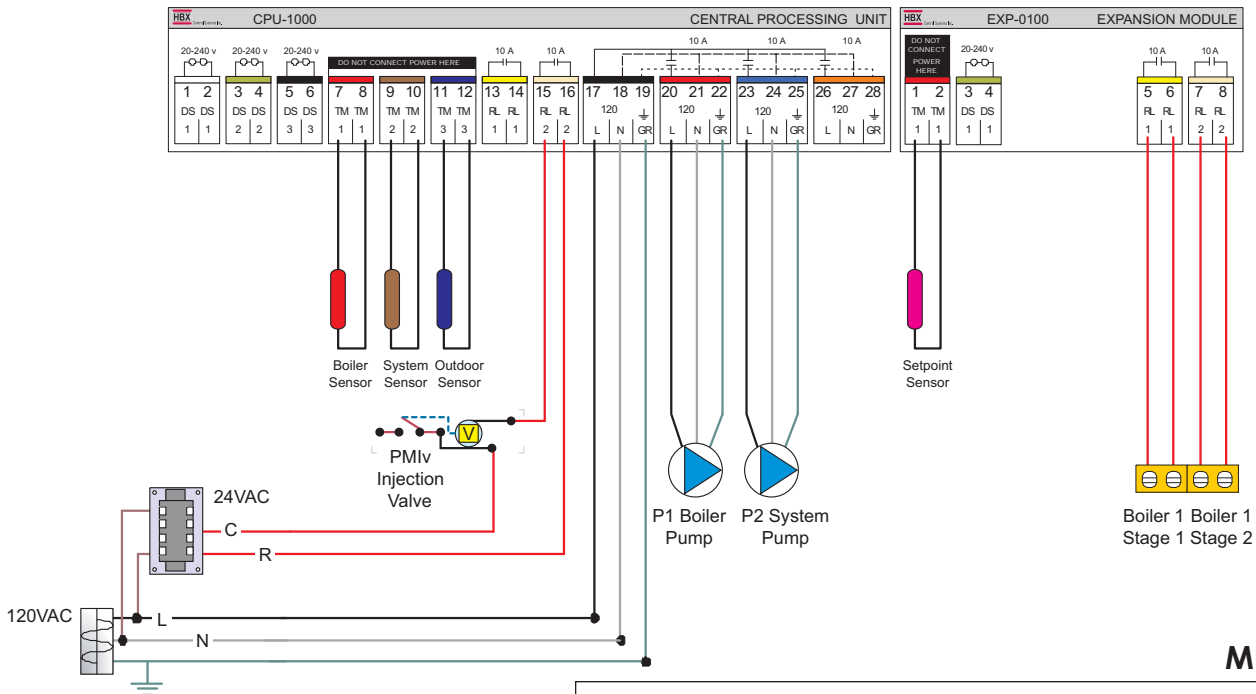
MECHANICAL



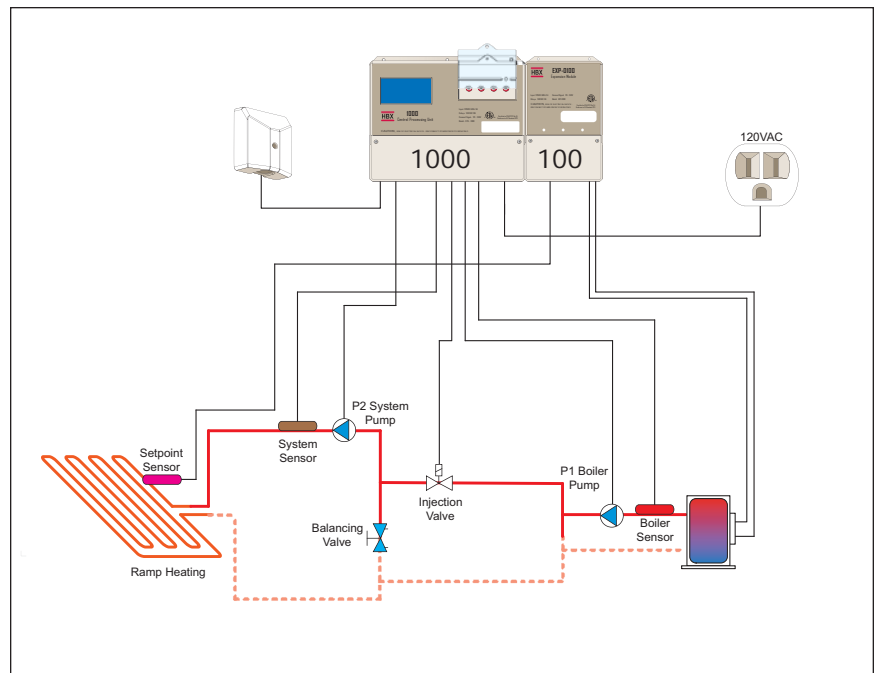
MIXING CONTROL MIX1000-04

- 2 stage boiler, controlling boiler pump and mixed system pump
- Radiant injection valve using PMlv, maintaining a setpoint, Eg. ramp heating
- Outdoor reset of boiler target temp is controlled via the outdoor sensor and the boiler sensor on the supply pipe

ELECTRICAL



MECHANICAL



Control Type:
Mixing Utilized

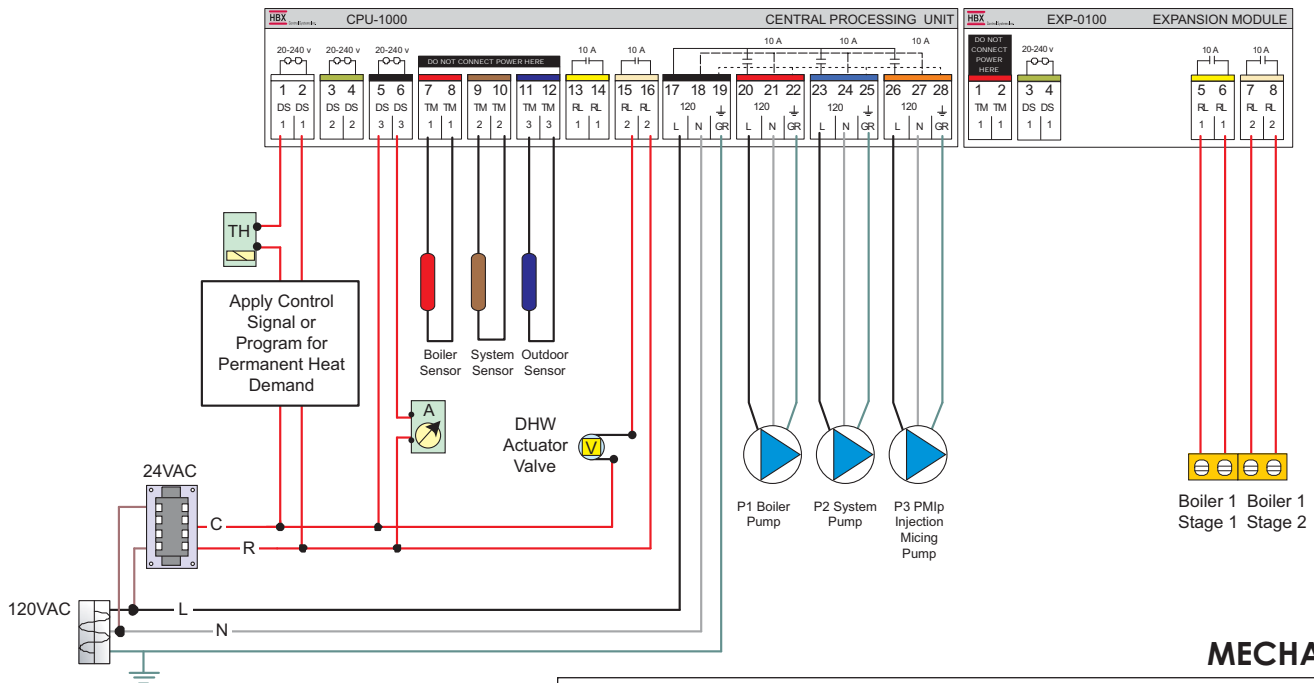
Pump Legend:

- P1 - Boiler Pump
- P2 - System Pump

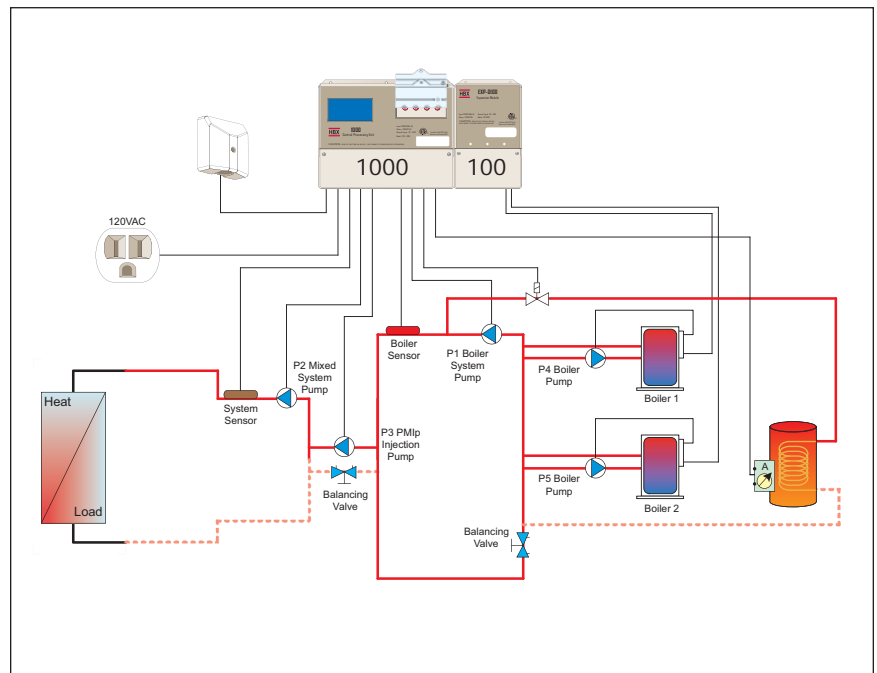
MIXING CONTROL MIX 1000-05

- Mixing systems using more than 1 boiler stage must be connected via 1 or more EXP-0100 units, note boiler contact terminations.
- Setup shows primary/secondary mixing via PMIp (injection pump), plus optional DHW control using an actuator valve (terminals 15 and 16)
- Outdoor reset of boiler target is controlled via the outdoor sensor and boiler sensor with DHW priority

ELECTRICAL



MECHANICAL



Control Type:

Mixing Utilized

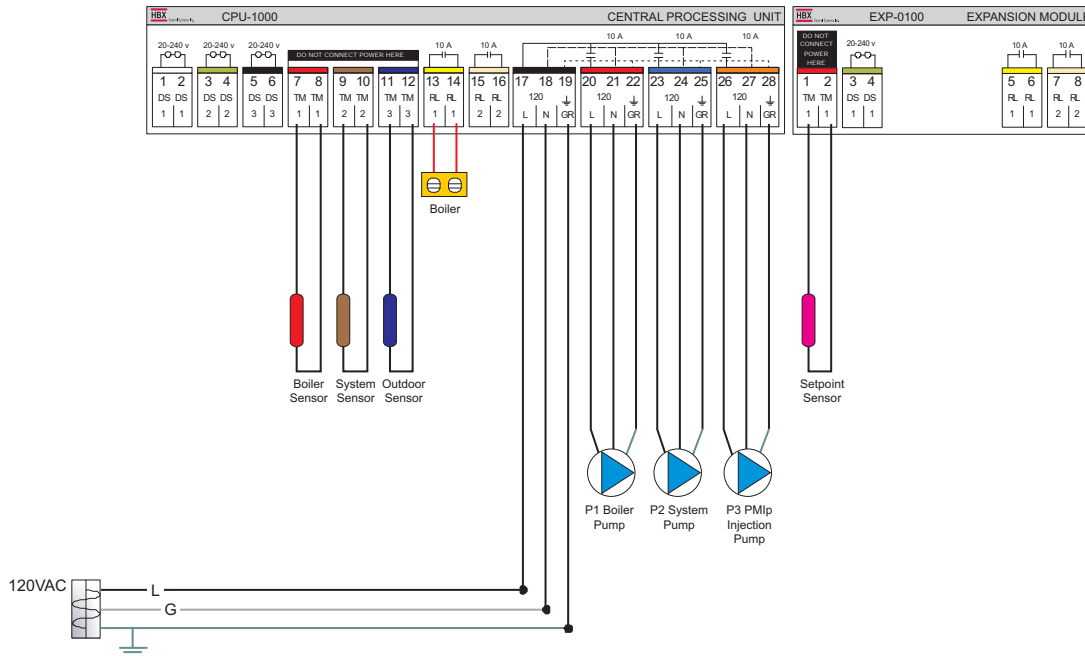
Pump Legend:

- P1 - Boiler System Pump
- P2 - Mixed System Pump
- P3 - Injection Pump, PMIp
- P4-P5 - Boiler Pumps

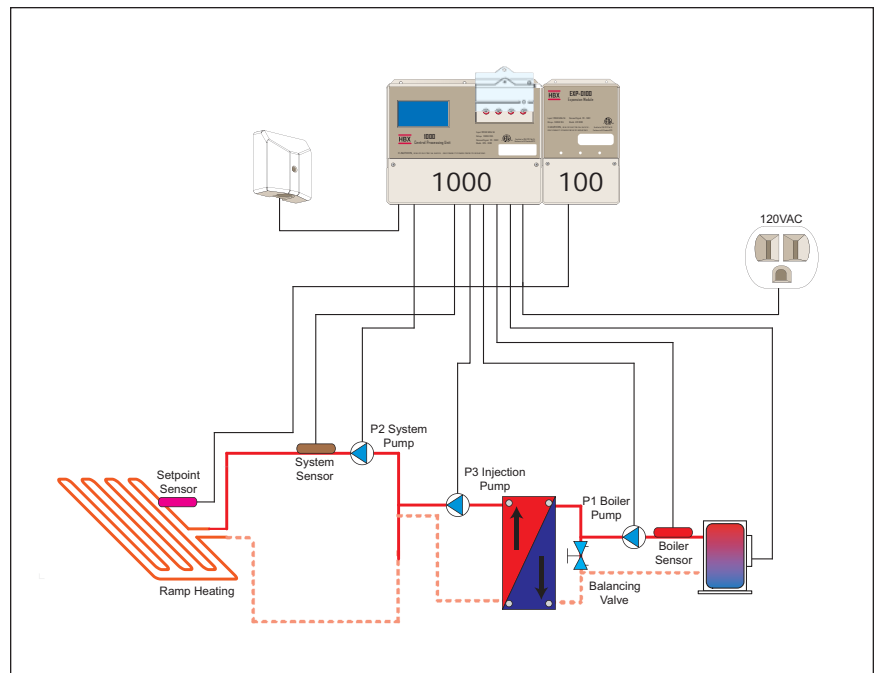
MIXING CONTROL MIX 1000-06

- Single stage boiler, controlling boiler pump and mixed system pump
- Radiant injection pump using PMIp, maintaining a setpoint, Eg. ramp heating
- Outdoor reset of boiler target temp is controlled via the outdoor sensor and the boiler sensor on the supply pipe

ELECTRICAL



MECHANICAL



Control Type:
Mixing Utilized

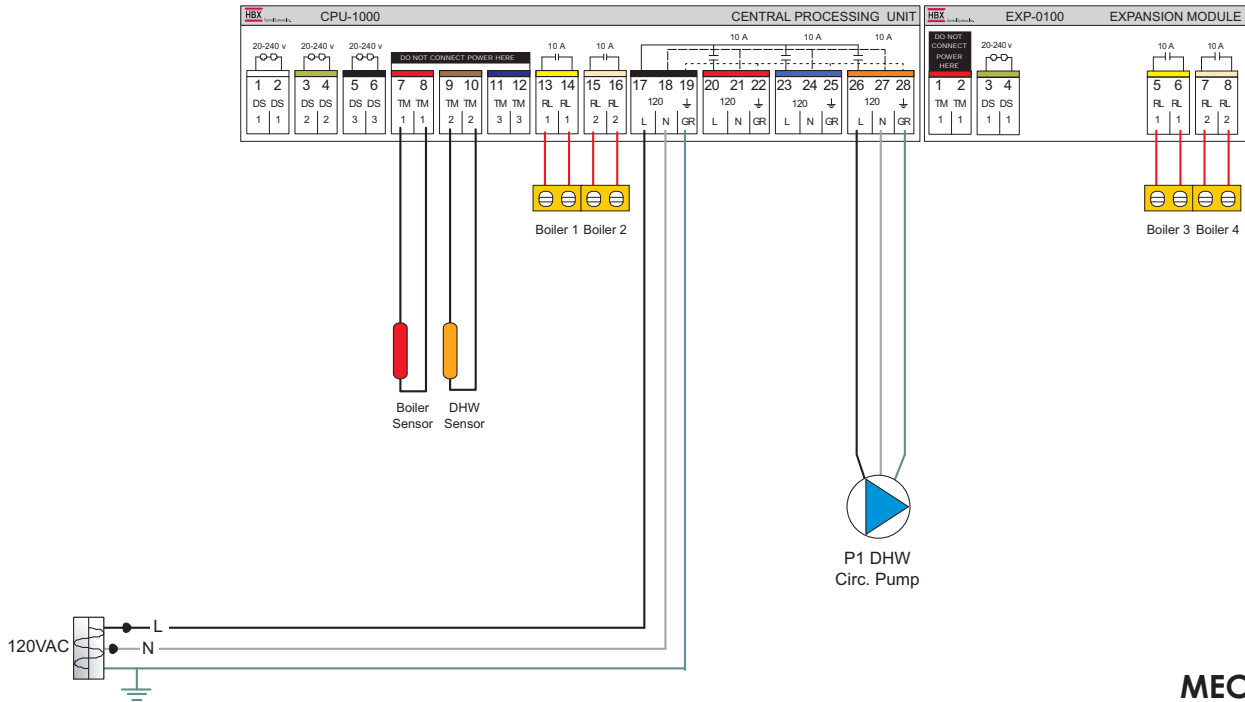
Pump Legend:

- P1 - Boiler Pump
- P2 - System Pump
- P3 - Injection Pump

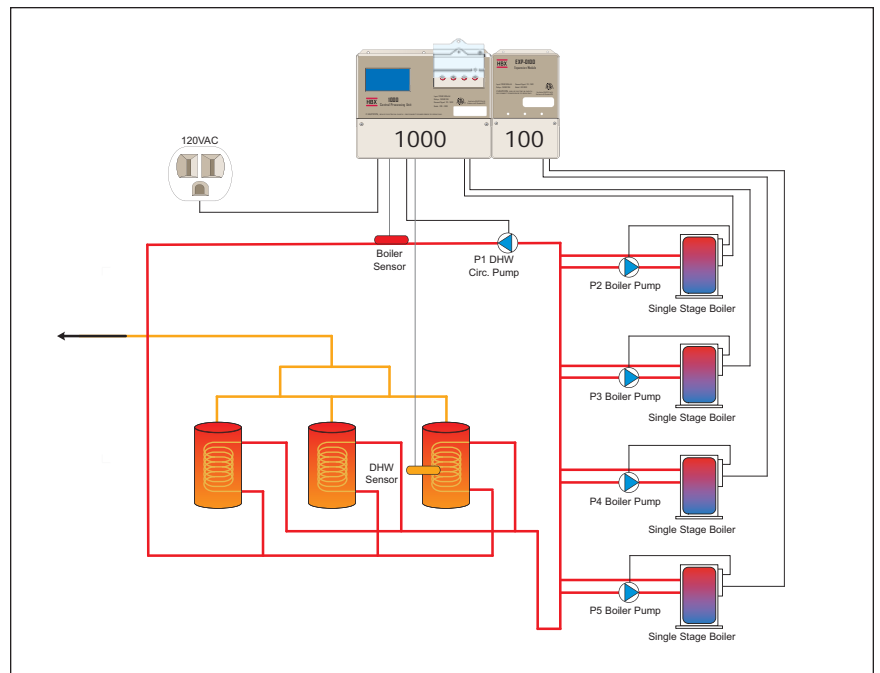
DOMESTIC HOT WATER CONTROL DHW 1000-02

- DHW Control / 4 stage boiler control
- Boiler pumps controlled by boiler
- 1 DHW circulating pump, using 1x EXP-0100
- Single stage boilers

ELECTRICAL



MECHANICAL



Control Type:
DHW Utilized

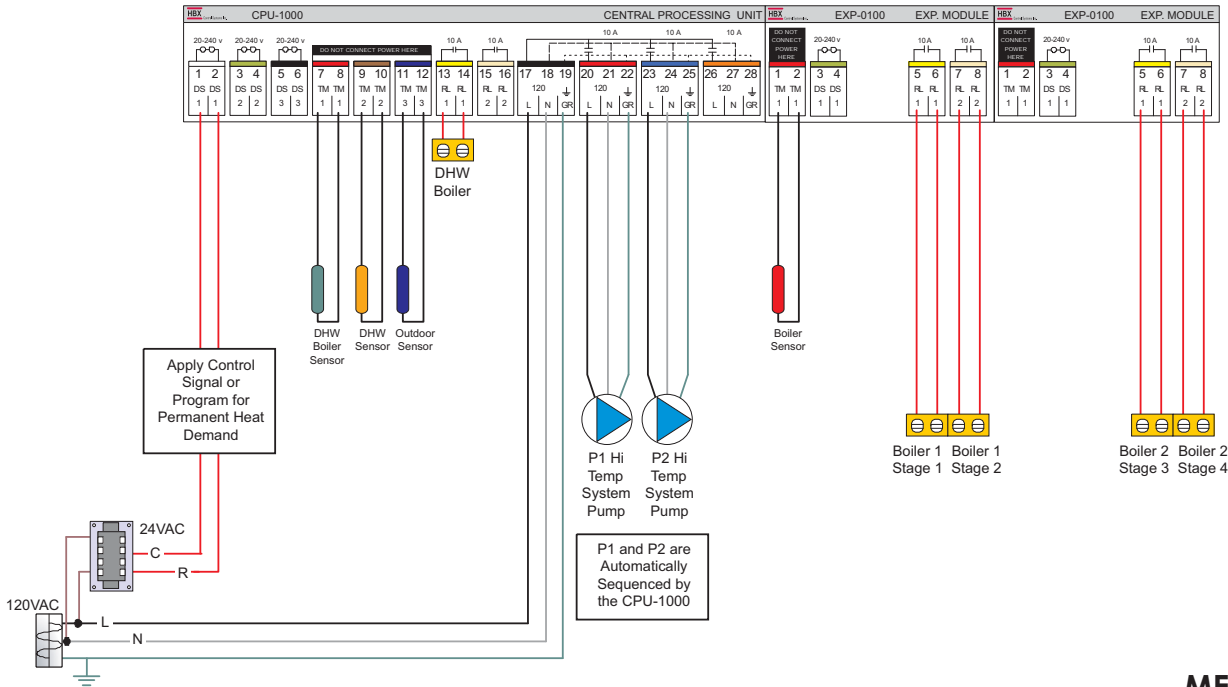
Pump Legend:

- P1 - DHW Circ. Pump
- P2-P5 - Boiler Pumps

DUAL STAGING CONTROL DST 1000-03

- Dual system (multi-purpose)
- 2 Hi/Lo fire heating boilers
- 1 dedicated DHW boiler
- System pumps are sequenced

ELECTRICAL

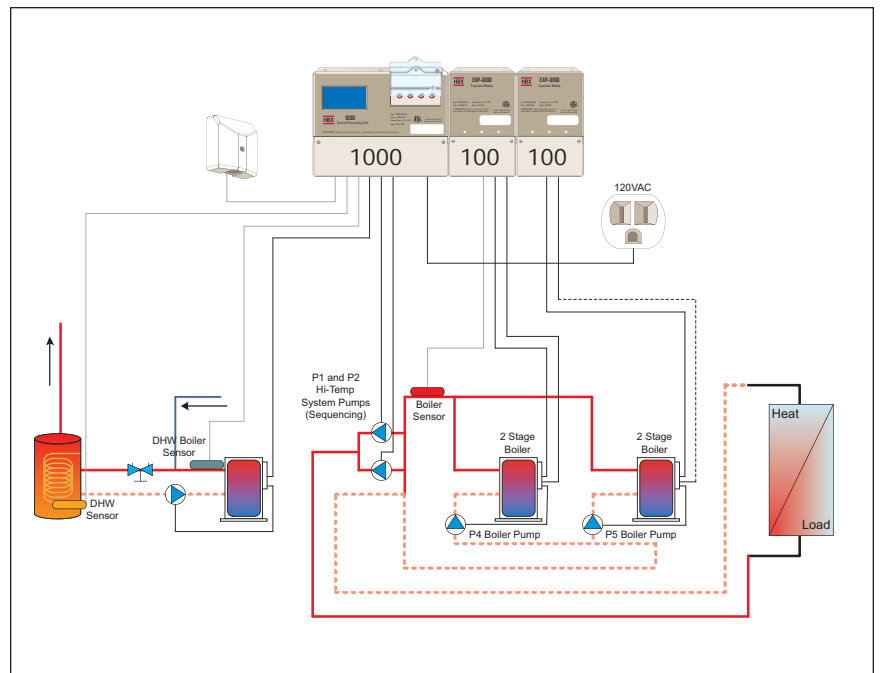


MECHANICAL

Control Type:
Dual System Utilized

Pump Legend:

- P1 - Boiler Pump
- P2 - System Pump
- P3 - Injection Pump
- P4 > P5 Boiler Pumps



Limited Warranty

HBX Controls warrants each of its products to be free from defects in workmanship and materials under normal use and service for a period of 24 months from date of manufacture or 12 months from date of purchase from an HBX Authorized Dealer, if within the above documented period after date of manufacture.

If the product proves to be defective within the applicable warranty period, HBX on its sole discretion will repair or replace said product. Replacement product may be new or refurbished of equivalent or better specifications, relative to the defective product. Replacement product need not be of identical design or model. Any repair or replacement product pursuant to this warranty shall be warranted for not less than 90 days from date of such repair, irrespective of any earlier expiration of original warranty period. When HBX provides replacement, the defective product becomes the property of HBX Controls.

Warranty Service, within the applicable warranty period, may be obtained by contacting your nearest HBX Controls office via the original Authorized Agent and requesting a Return Material Authorization Number (RMA #). Proof of purchase in the form a dated invoice/receipt must be provided to expedite the issuance of a Factory RMA.

After an RMA number has been issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit. The RMA number must be visible on the outside of the package and a copy included inside the package. The package must be mailed or otherwise shipped back to HBX with all costs of mailing/shipping/insurance prepaid by the warranty claimant.

Any package/s returned to HBX without an approved and visible RMA number will be rejected and shipped back to purchaser at purchaser's expense. HBX reserves the right, if deemed necessary, to charge a reasonable levy for costs incurred, additional to mailing or shipping costs.

Limitation of Warranties.

If the HBX product does not operate as warranted above the purchasers sole remedy shall be, at HBX's option, repair or replacement. The foregoing warranties and remedies are exclusive and in lieu of all other warranties, expressed or implied, either in fact or by operation of law, statutory or otherwise, including warranties of merchantability and fitness for a particular purpose/application. HBX neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale, installation maintenance or use of HBX Controls products.

HBX shall not be liable under this warranty; if its testing and examination discloses that the alleged defect in the product does not exist or was caused by the purchasers or third persons misuse, neglect, improper installation or testing, unauthorized attempts to repair or any other cause beyond the range of intended use, or by accident, fire, lightning or other hazard.

Limitation of Liability.

In no event will HBX be liable for any damages, including loss of data, loss of profits, costs of cover or other incidental, consequential or indirect damages arising out of the installation, maintenance, commissioning, performance, failure or interruption of an HBX product, however caused and on any theory of liability. This limitation will apply even if HBX has been advised of the possibility of such damage.

Local Law.

This limited warranty statement gives the purchaser specific legal rights. The purchaser may also have other rights which vary from state to state in the United States, from Province to Province in Canada and from Country to Country elsewhere in the world.

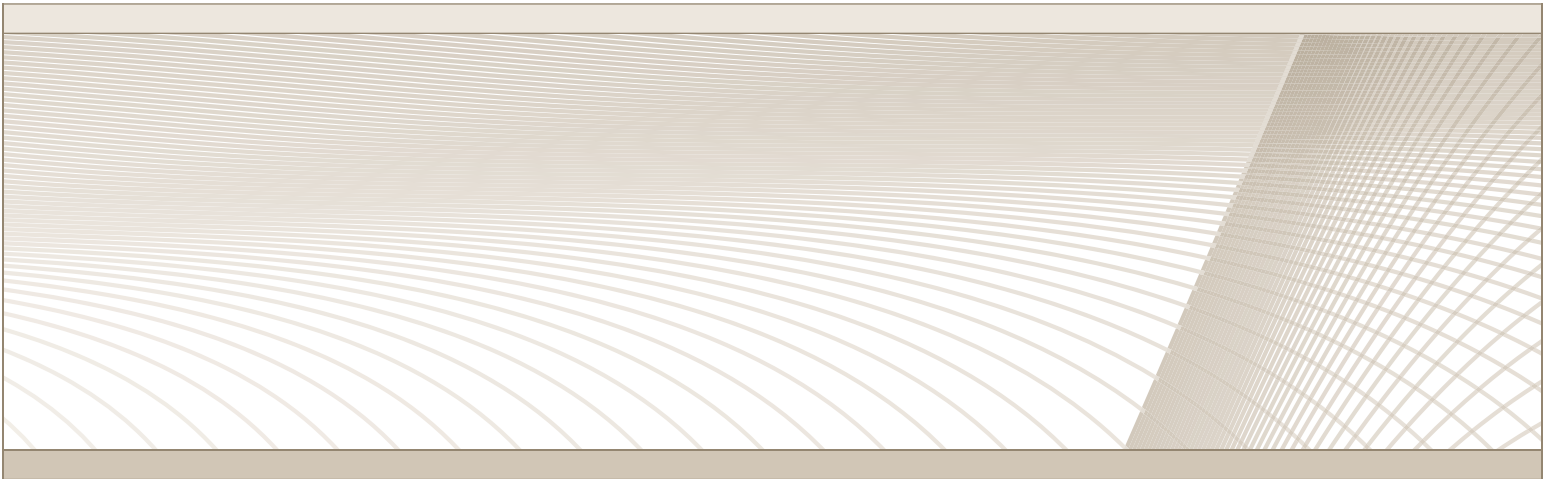
To the extent this Limited Warranty Statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law. Under such local law, certain disclaimers and limitations of this statement may not apply to the purchaser. For example, some states in the United States, as well as some governments outside the United States (including Canadian Provinces), may:

Preclude the disclaimers and limitations in this statement from limiting the statutory rights of a consumer (e.g. United Kingdom);

Otherwise restrict the ability of a manufacturer to enforce such disclaimers or limitations; or

Grant the purchaser additional warranty rights which the manufacturer cannot disclaim, or not allow limitations on the duration of implied warranties.

Phone: +1 (403) 720-0029 Fax: +1 (403) 720-0054
Email: info@hbxcontrols.com Web: www.hbxcontrols.com



HBX Control Systems Inc.
4516 - 112th Avenue SE
Calgary, AB Canada T2C 2K2

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