

Installation Manual
Expansion Module 0300
Version 1.0

The HBX logo consists of the letters 'HBX' in a bold, black, sans-serif font. The letters are centered between two horizontal red bars. The background of the entire page features a decorative pattern of thin, light-colored lines that create a sense of depth and movement, with a grid-like pattern on the left side transitioning into curved lines on the right.

EXP-0300

HBX Control Systems Inc.

HBX EXP-0300 EXPANSION MODULE

INTRODUCTION

The EXP-0300 Expansion Module is designed to be integrated with the HBX CPU-1000 HVAC Controller, it is not a stand alone device. The purpose and function of the EXP-0300 is to provide greater control of pumps in larger mechanical heating systems.

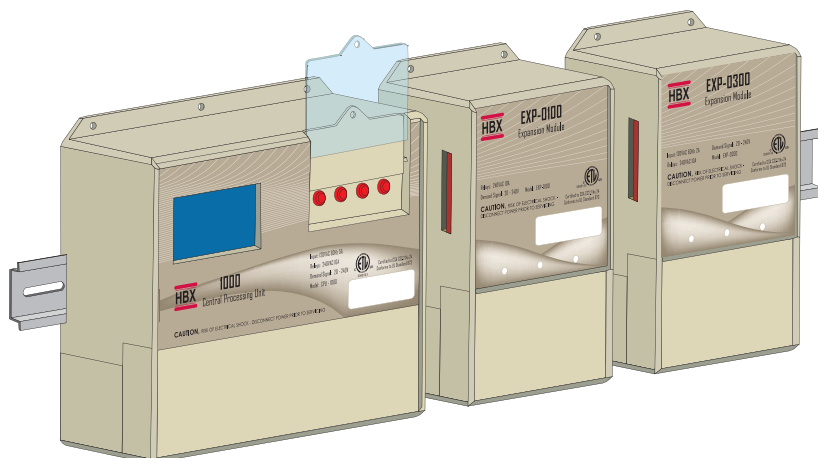
It's primary use is to take control of multiple boiler pumps and allow you to take full advantage of the post purge feature of the Control. For example, 1 CPU-1000 + 1 EXP-0100 + 1 EXP-0300 can provide 2, 2 stage boiler controls with 2 boiler pumps, setup using post purge on the boiler pumps.

The EXP-0300 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 return water temperature sensor. The spare demand signal has no dedicated function at time of print.

In large systems (Eg. 6 and 8 stages of boilers) using additional setpoint loads via setpoint sensors (thermistors), the order and sequence of staging relays (EXP-0100), thermistor terminal location and additional pump relays (EXP-0300) is critical (See Drawings STG 1000-11 and STG 1000-13).

*** If there are an odd number / or unused pump relays (EXP-0300), a setpoint demand will trigger the 1st unassigned 2 or 3 wire relay held in series. Under certain specific circumstances the setpoint sensor will be programmed as setpoint 2 or even 3 in the programming menu.**

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-0100 (Zone Valve) Module, ZON-0200 (Zone Pump) Module, VFD-0100 (Variable Frequency Drive) Module, and the MOD-0100 (Modulating Output Module) Module.

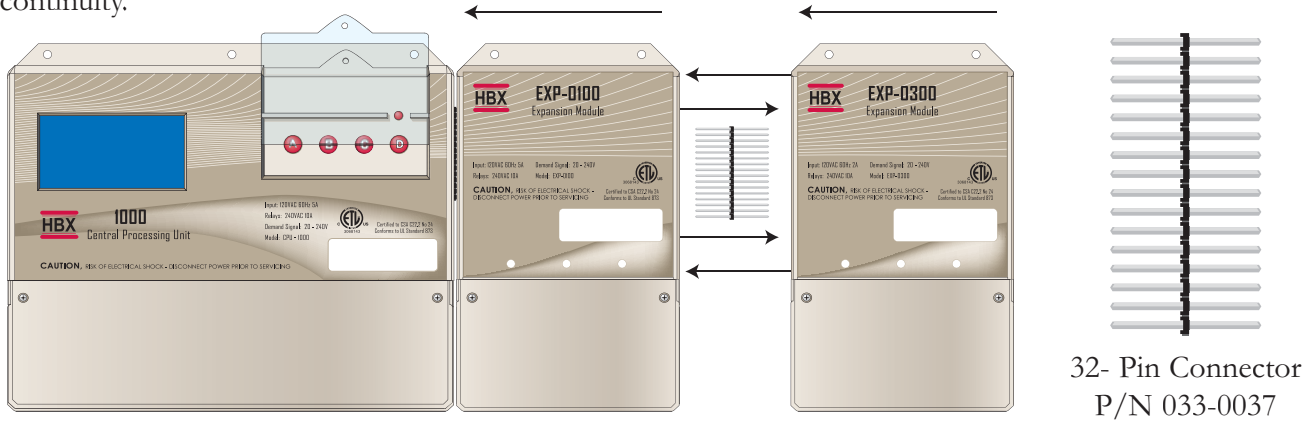


*** More than six Zone Modules can be connected to the CPU-1000 as the Zone Modules are not dependent on the CPU to power the internal relays.**

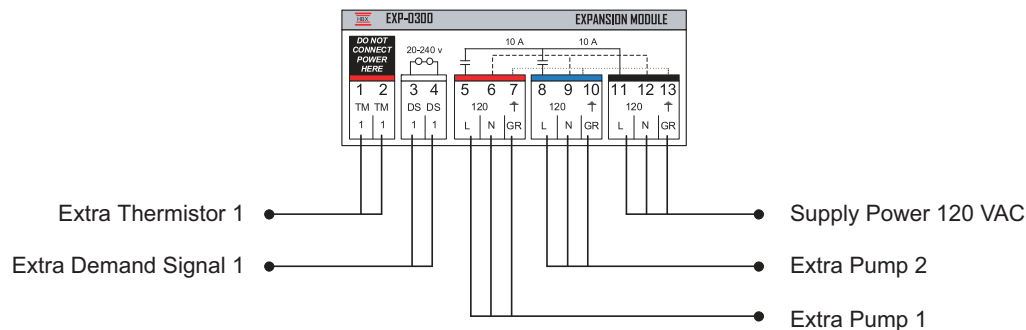
The EXP-0300 is designed to be wall mounted, DIN rail mounted, or installed inside a separate electrical enclosure. The unit should be mounted inside and be protected from falling water and high humidity conditions. With all the covers in place it is designed to protect any individual from accidental 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).



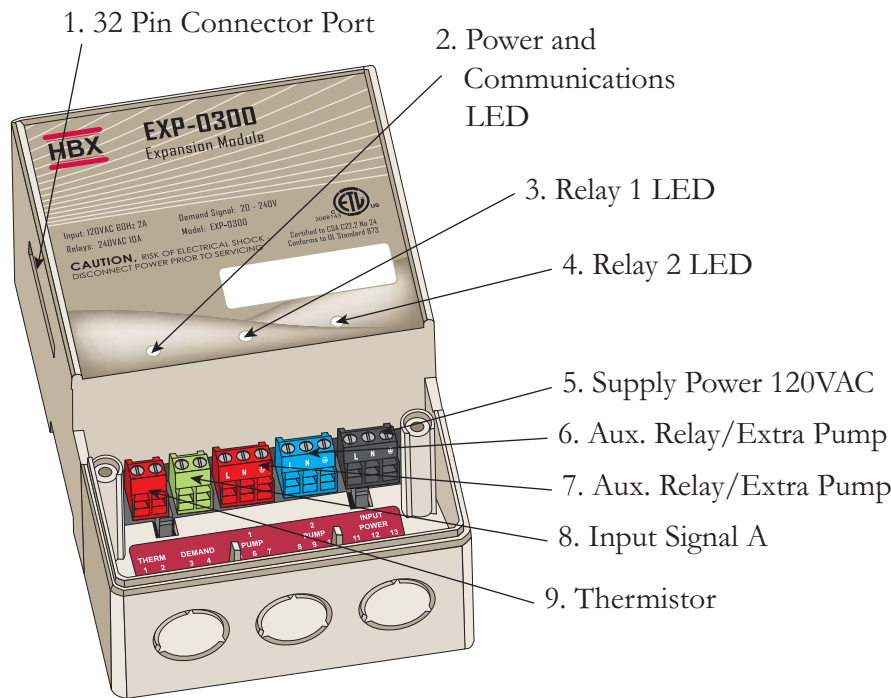
Thermistor inputs are designed for 10K Ohm thermistors and must never be subjected to any external power supply (voltage or current).

Supply Power 120VAC - In order to power the extra pumps, a separate line, neutral and ground must be supplied here and protected by at least a 20Amp breaker.

Extra Pump 2 - This relay is the default relay for pump 2 (Eg. BP2).

Extra Pump 1 - This relay is the default relay for pump 1 (Eg. BP1).

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)

1 x Power Input (120 VAC)

Weight:

0.408Kg

Dimensions:

100mm W x 170mm H x 70mm D

ETL Listings:

Meets CSA C22.2 No. 24

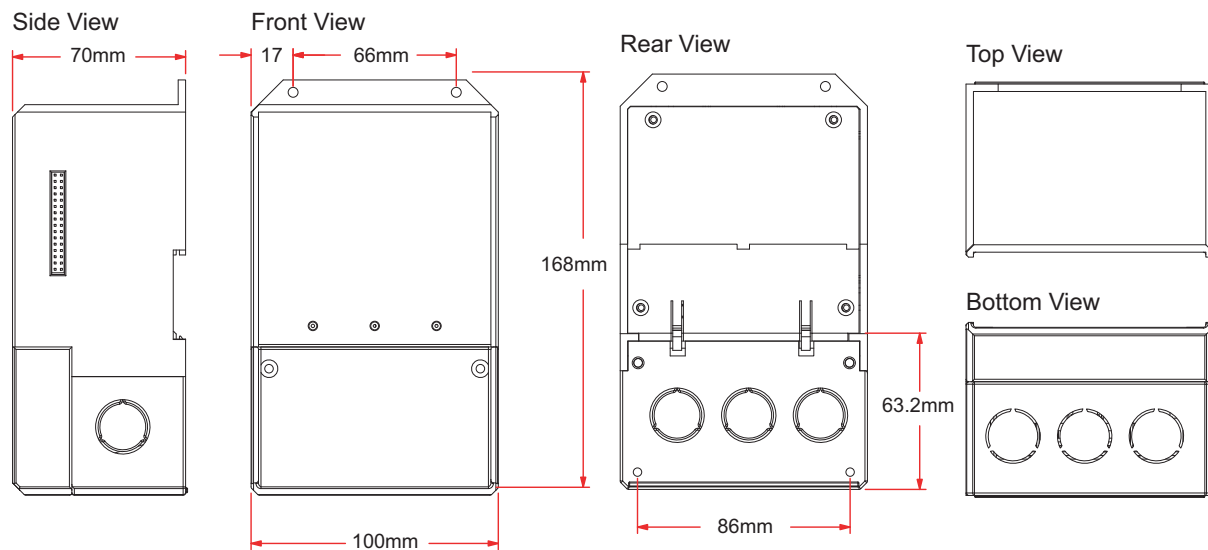
Meets UL Standard 873

ETL Control No. 3068143

Storage:

10°C to 40°C

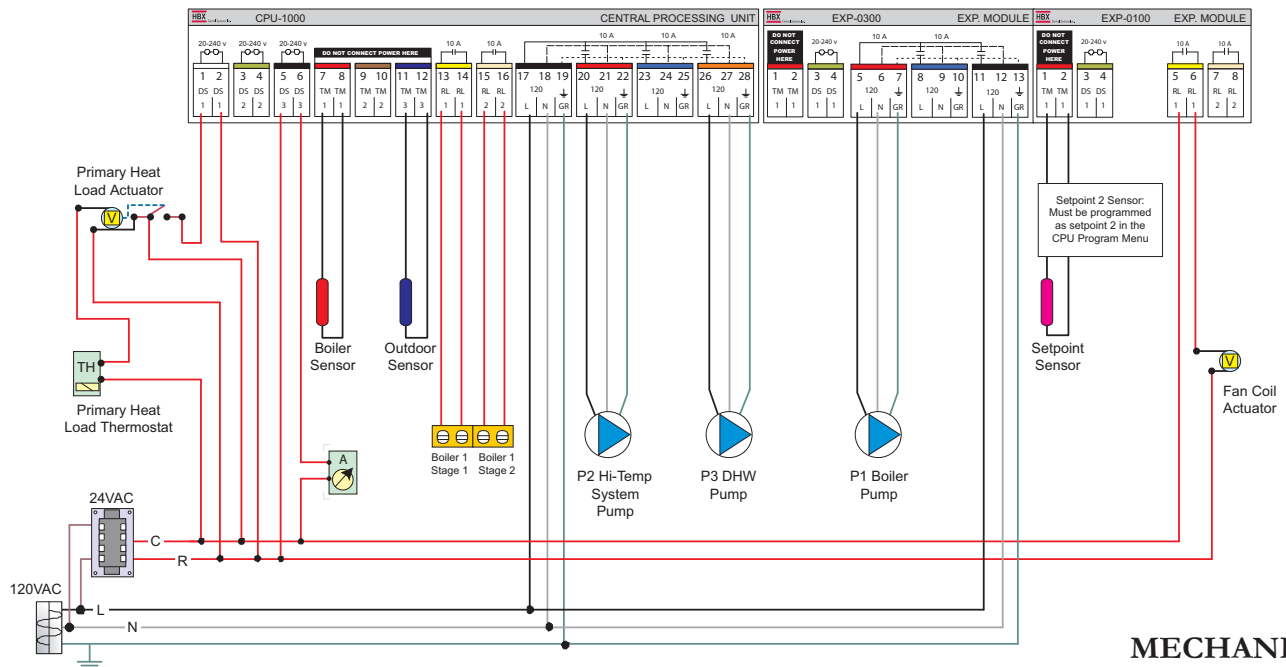
PHYSICAL DIMENSIONS



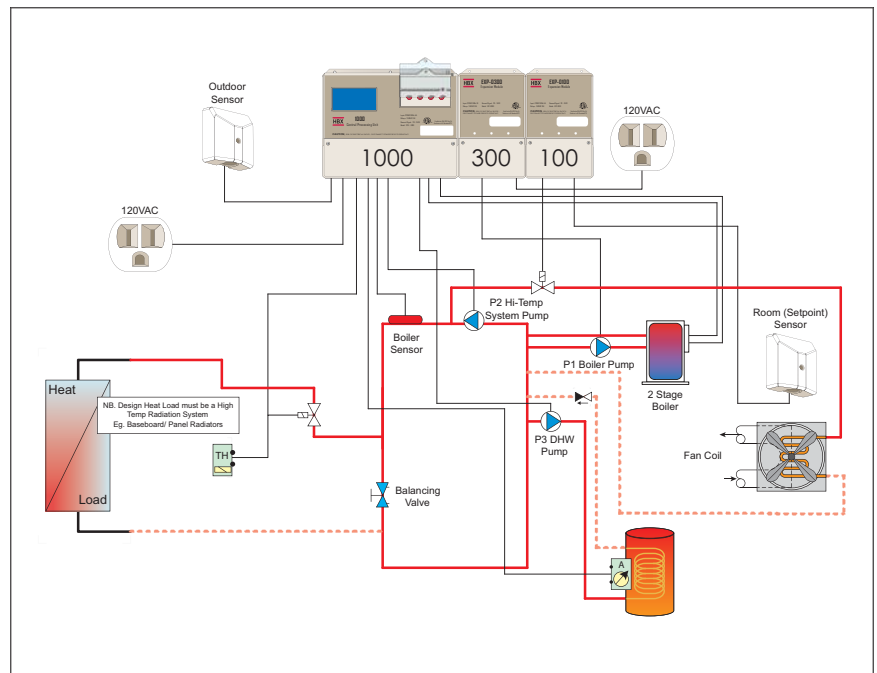
STAGING CONTROL STG 1000-11

- 1 x Hi/Lo fire boiler (2 stages) with a main system pump
- Use of 1 x EXP-0300 to run post purge on the boiler pump
- Optional DHW is shown running a DHW pump through an indirect hot water tank
- 2 hi-temp loads are satisfied and controlled via 24VAC valve actuators
- Outdoor reset of boiler target temp also accomplishes lower temp to each of the hi-temp loads

ELECTRICAL



MECHANICAL



Control Type:
Staging Utilized

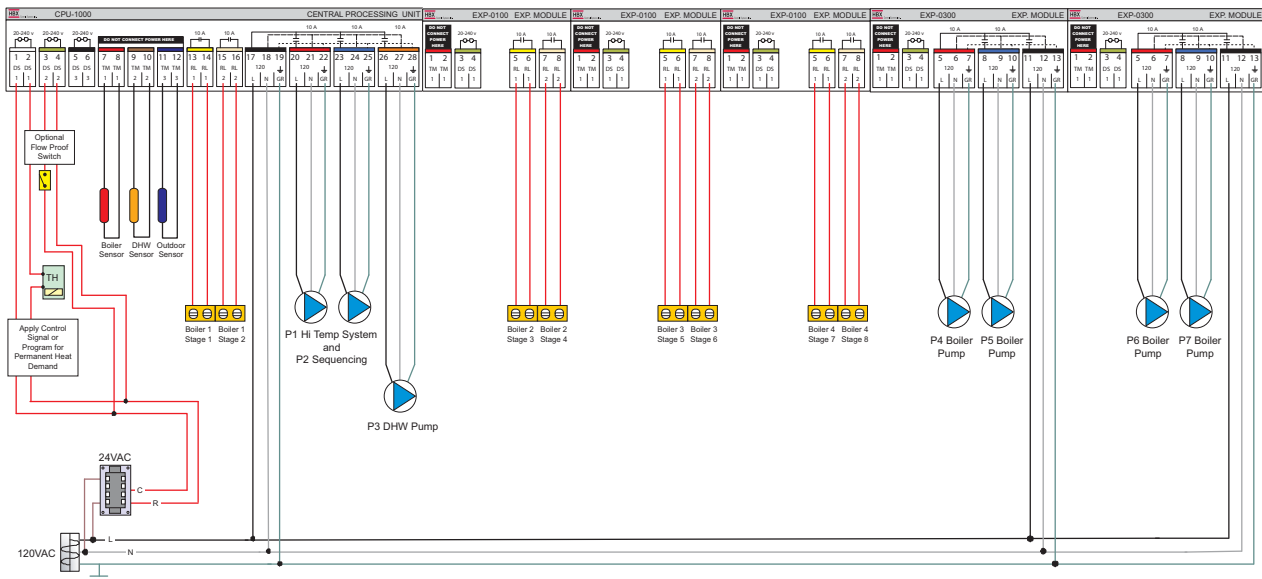
Pump Legend:

- P1 - Boiler Pump
- P2 - Hi-Temp System Pump
- P3 - DHW Pump

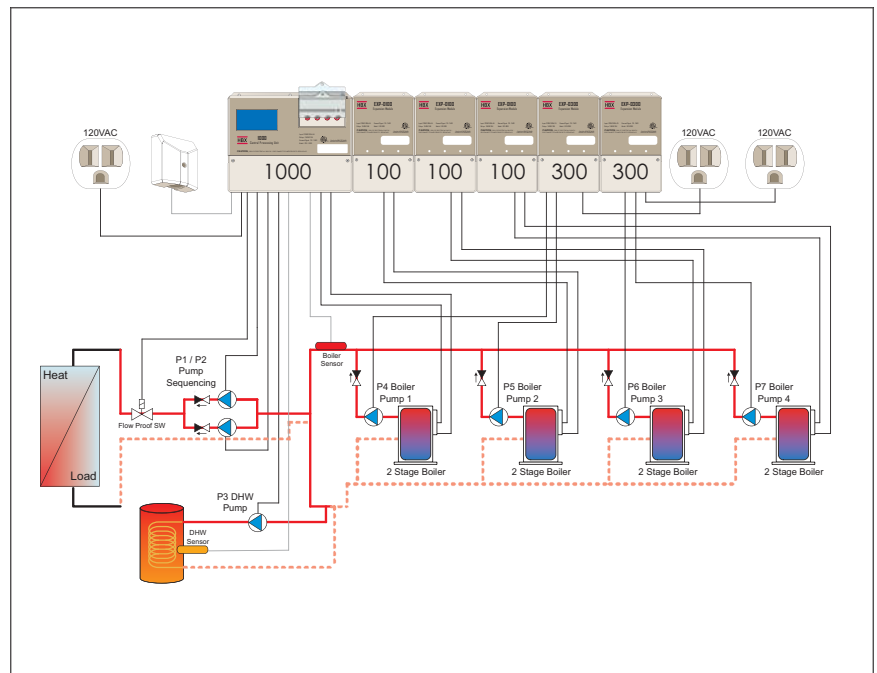
STAGING CONTROL STG 1000-12

- 4 x Hi/Lo fire boilers (8 stages) with 2 system pumps setup for pump sequencing, optional flow proof sensor wired back to the Control
- Stages 3-8 are controlled via the 3 EXP-0100s
- Each boiler pump is also controlled using post purge via the 2 EXP-0300 modules
- Optional DHW is shown using a DHW pump and an indirect hot water tank with priority
- Outdoor reset of boiler target temp is controlled using the outdoor sensor

ELECTRICAL



MECHANICAL



Control Type:
Staging Utilized

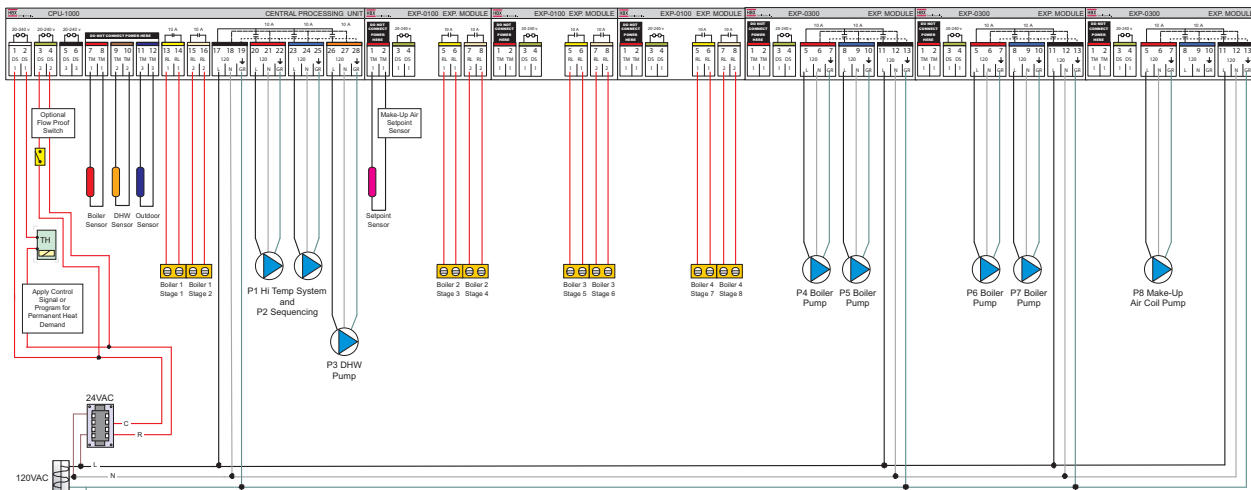
Pump Legend:

- P1-P2 - Setup as Sequencing
- P3 - DHW Pump
- P4-P7 - Boiler Pumps

STAGING CONTROL STG 1000-13

- 4 x Hi/Lo fire boilers (8 stages) with 2 system pumps setup for pump sequencing, optional flow proof sensor wired back to the Control
- Stages 3-8 are controlled via the 3 EXP-0100s
- Each boiler pump is also controlled using post purge via the 2 EXP-0300 Modules
- Optional DHW is shown using a DHW pump and an indirect hot water tank with priority
- Additional setpoint load (make-up air unit) satisfied using pump (P5) through fancoil, via the 3rd EXP-0300
- Outdoor reset of boiler target temp is controlled using the outdoor sensor

ELECTRICAL

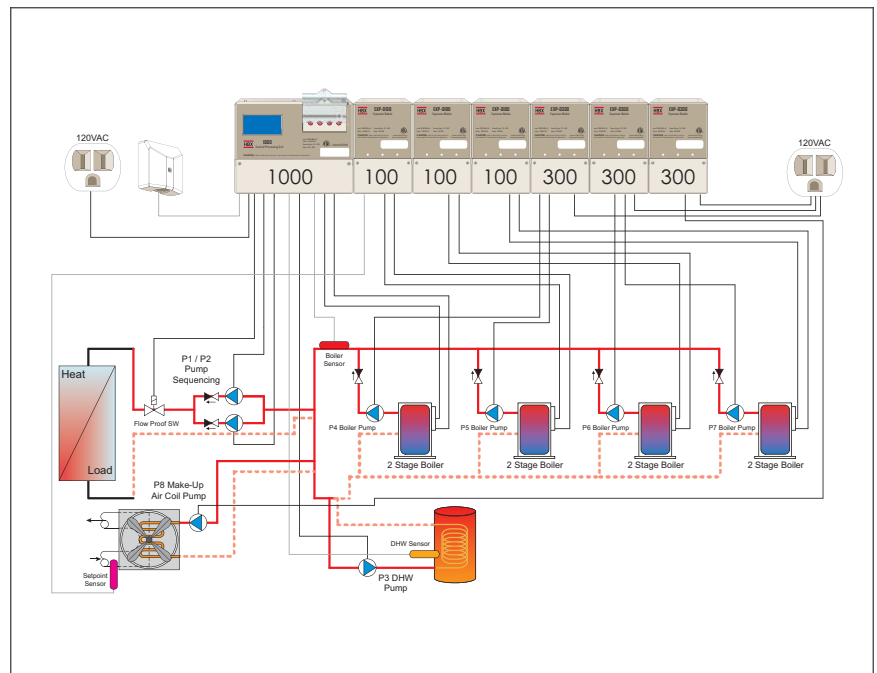


MECHANICAL

Control Type:
Staging Utilized

Pump Legend:

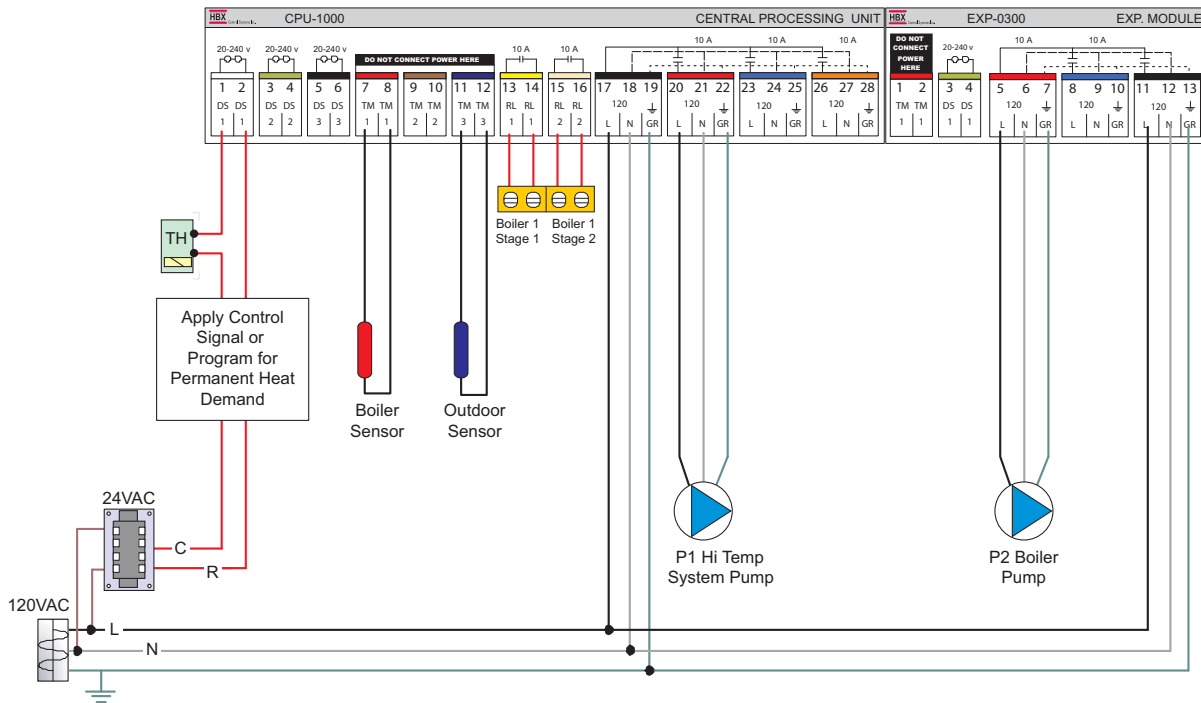
- P1-P2 - Setup as Sequencing
- P3 - DHW Pump
- P4-P7 - Boiler Pumps
- P8 - Make-up air (coil pump)



STAGING CONTROL STG 1000-15

- 2 stage (Hi/Lo) boiler control
- Boiler pump controlled by EXP-0300 & 1 hi-temp system pump

ELECTRICAL

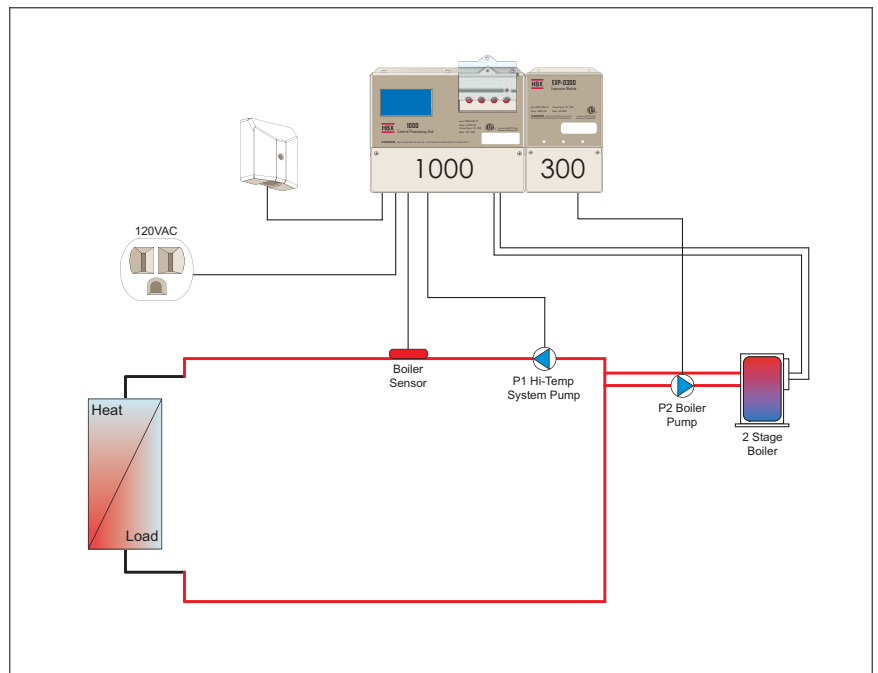


MECHANICAL

Control Type:
Staging Utilized

Pump Legend:

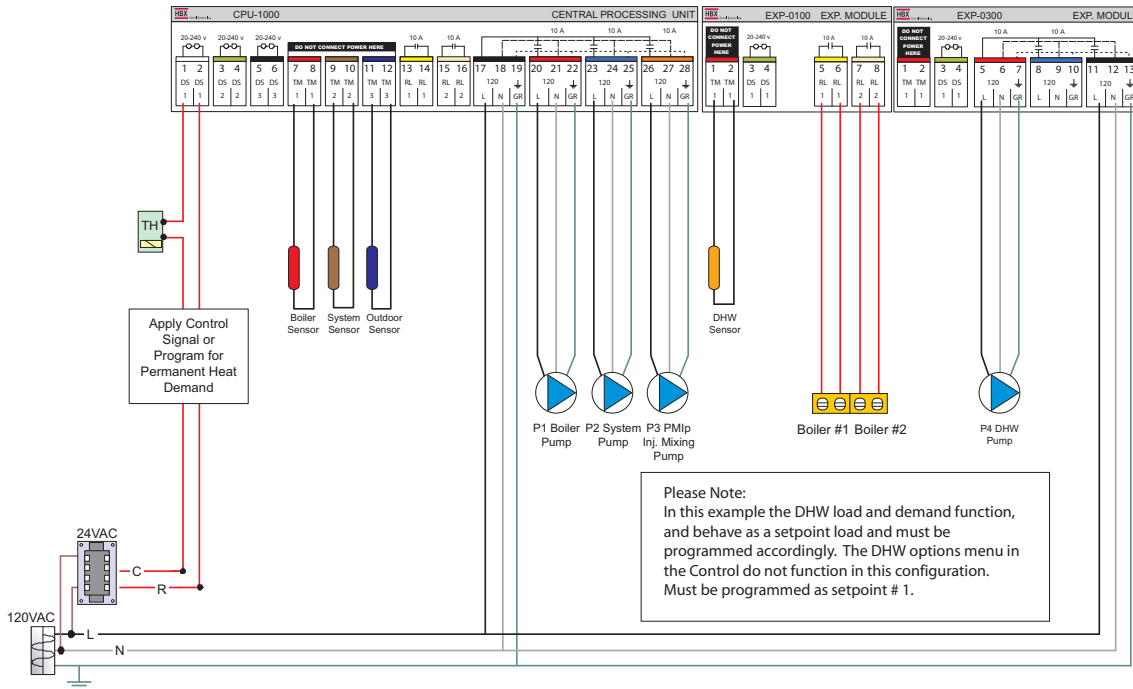
- P1 - Hi-Temp System Pump
- P2 - Boiler Pump



MIXING CONTROL MIX 1000-09

- 2 stage boiler, mixing control
- Using PMIp
- Supplying DHW via DHW pump, using 1x EXP-0100 and EXP-0300

ELECTRICAL

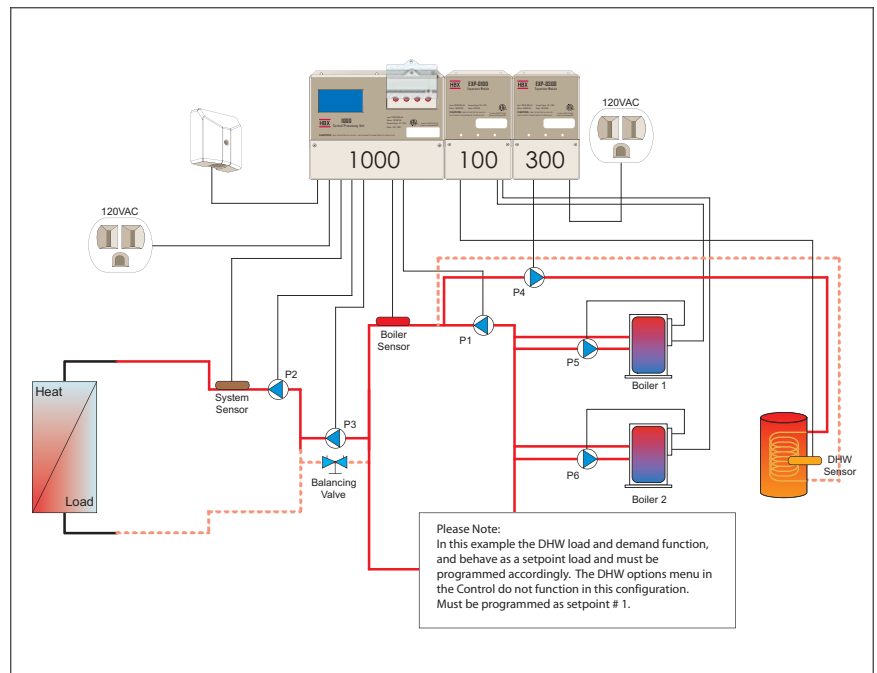


MECHANICAL

Control Type:
Mixing Utilized

Pump Legend:

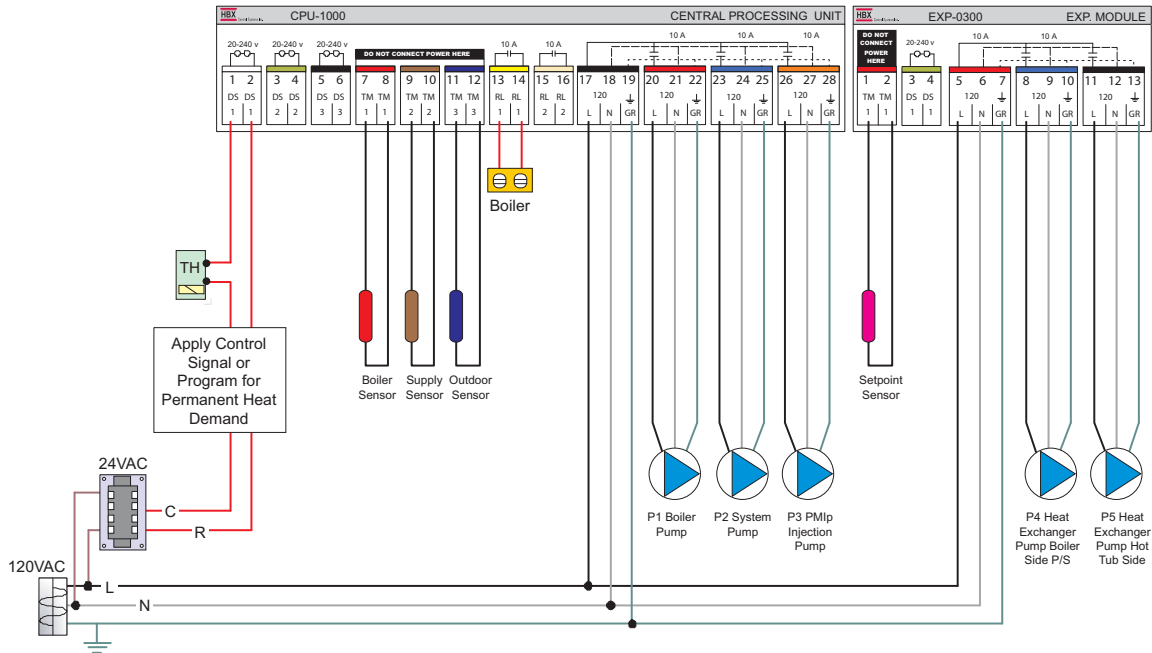
- P1 - Boiler Pump
- P2 - System Pump
- P3 - PMIp Inj. Mixing Pump
- P4 - DHW Pump
- P5-P6 - Boiler Pumps



MIXING CONTROL MIX 1000-20

- Single stage mixing control running 1 mixed loop and 1 setpoint load via a plate heat exchanger
- Mixed injection using PMIp(pump injection), 1 boiler pump, and 1 lo-temp system pump
- Setpoint load for a hot tub requires the use of 1 EXP-0300 which also controls 2 pumps(P4 and P5) for both the left and right side of the heat exchanger

ELECTRICAL

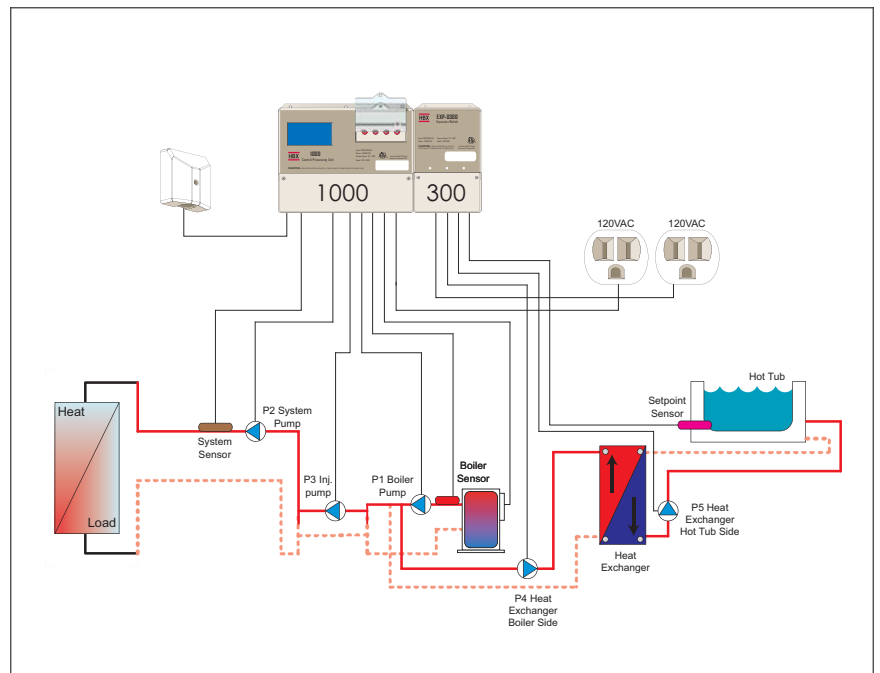


MECHANICAL

Control Type:
Mixing Utilized

Pump Legend:

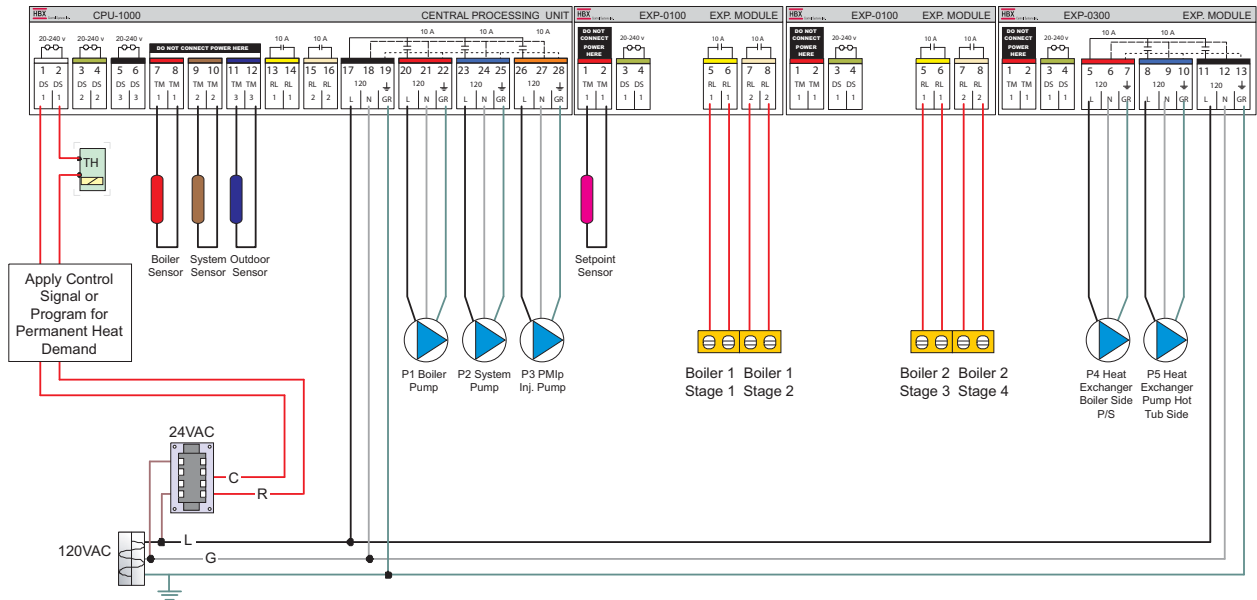
- P1 - Boiler Pump
- P2 - System Pump
- P3 - Injection Pump
- P4 - Heat Exchanger Boiler Side
- P5 - Heat Exchanger Hot Tub Side



MIXING CONTROL MIX 1000-21

- 4 stage boiler
- Mixing with 1 boiler system pump, 1 mixed system pump and PMIp injection
- Additional setpoint load for hot tub or pool using EXP-0300 running 2 extra pumps
- 2 x EXP-0100 to stage boilers

ELECTRICAL

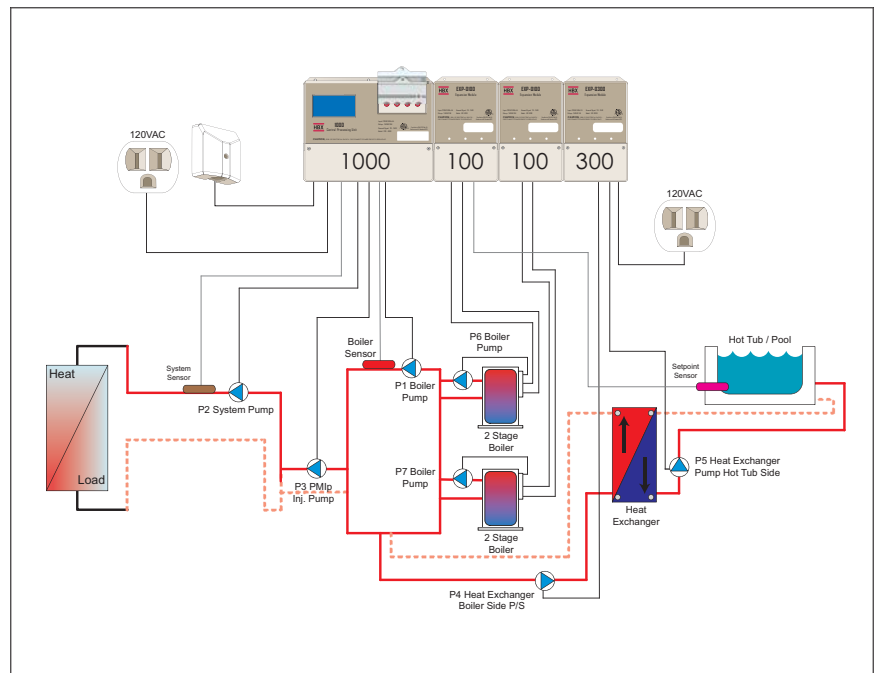


MECHANICAL

Control Type:
Mixing Utilized

Pump Legend:

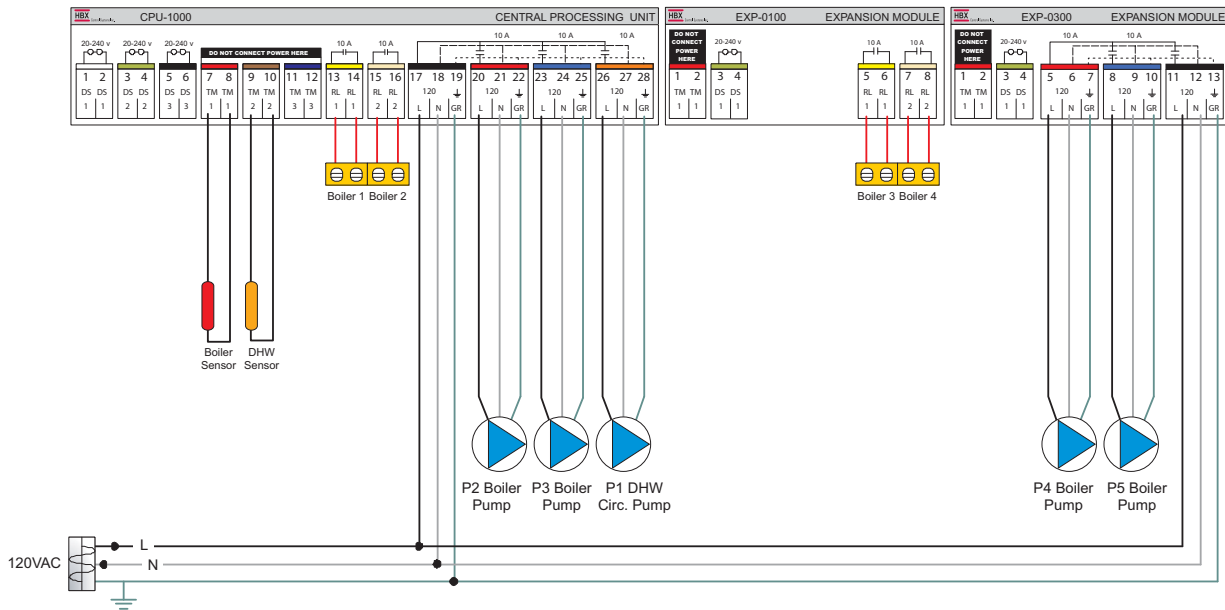
- P1 - Boiler Pump
- P2 - System Pump
- P3 - PMIp Injection Pump
- P4 - Heat Exchanger Boiler Side P/S
- P5 - Heat Exchanger Pump Hot Tub Side
- P6-P7 - Boiler Pumps



DOMESTIC HOT WATER CONTROL DHW 1000-03

- DHW control, 4 stage boiler control
- Boiler pumps controlled by EXP-0300, programmed as 1 pump/boiler
- 1 DHW circ. pump, using 1 x EXP-0100
- Single stage boilers

ELECTRICAL

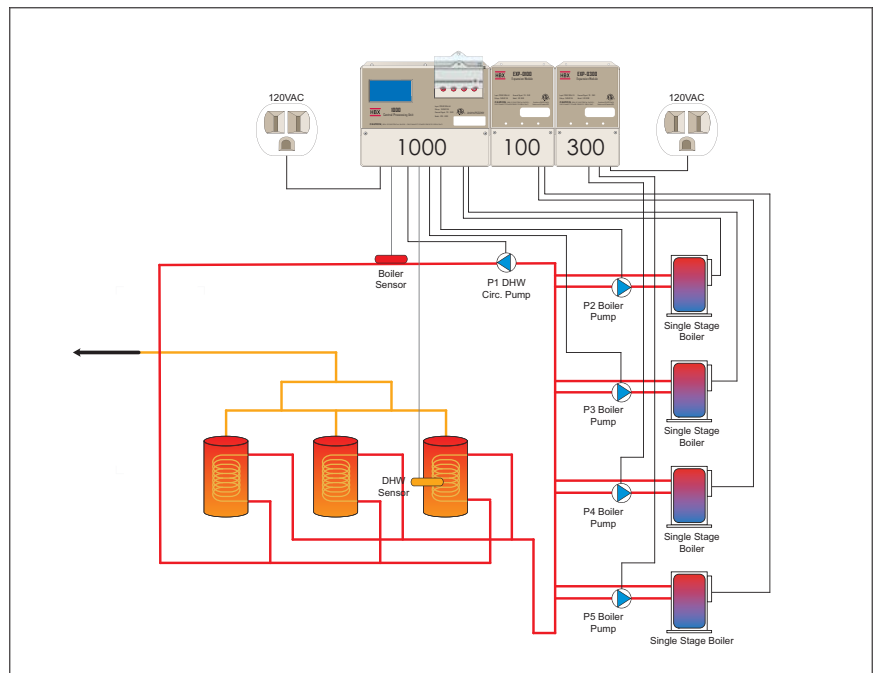


MECHANICAL

Control Type:
DHW Utilized

Pump Legend:

- P1 - DHW Circ. Pump
- P2-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.

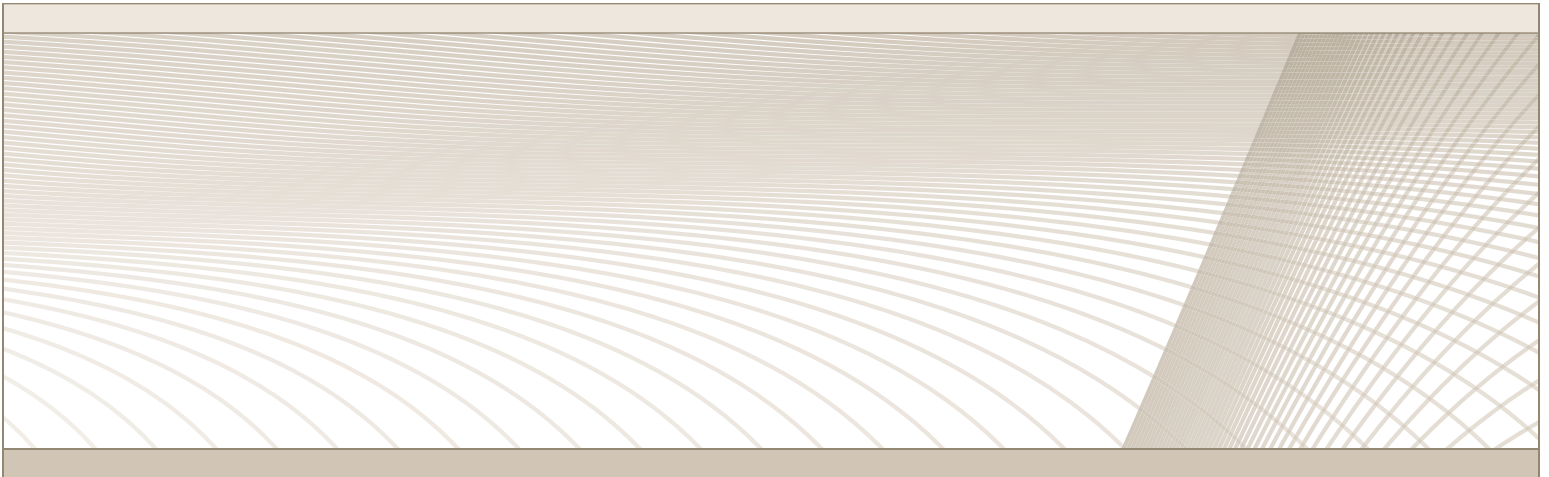
To the extent this Limited Warranty Statement is inconsistent with local law, this statement shall be deemed modified to be consistent with such local law. Under such local law, certain disclaimers and limitations of this statement may not apply to the purchaser. For example, some states in the United 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.

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