



**.1 Heat Exchangers**

- .1 Heat exchangers using Campus Heating Water or any service over 82°C [180°F] shall be brazed plate type (not gasketed, plate-and-frame type).
- .2 Heat exchangers for domestic hot water heating shall be double-wall brazed plate type.
- .3 Heat exchangers for hydronic systems with water temperature 80°C [180°F] or below may be plate and frame or brazed plate type.
- .4 Heat exchangers anticipated to be in year-round service shall be installed as a pair each having 60% of design capacity and each with valves and unions so as to be removable without interfering with the operation of the other. This allows removal for replacement or cleaning. Duplex heat exchangers for domestic hot water heating shall only be considered where interruption of domestic hot water would be very disruptive (e.g. laboratory use, food services use).
- .5 Provide a two-way control valve on the campus mains return from the heat exchanger. Provide a 20 mm (NPS 3/4) heat exchanger by-pass between the campus mains supply and return with a modulating control valve ( $c_v$  between 1.5 and 2.0), a throttling valve and isolation valves.
- .6 The building heating water pumps shall be designed either with duplex pumps or with valves and piping that can provide back-up in the event of failure of any one pump.
- .7 The heating coils should be on a separate heating water circuit from radiation to allow for different scheduled temperature control.
- .8 Provide flexible piping connectors on all piping connections. Standard of acceptance: Flextech Style FB26-TF.
- .9 Provide isolating valve, pressure gauge, thermometer, temperature sensor on each pipe connection.
- .10 Standard of acceptance: Alpha Laval Brazed Plate – Model CB200