Bivalent system

Space heating with an auxiliary boiler (alternating operation)

Space heating application by either the Daikin indoor unit or by an auxiliary boiler connected in the system. The decision whether either the E(D/B)* unit or the boiler will operate can be achieved by an auxiliary contact or an E(D/B)* indoor controlled contact.

This auxiliary contact can e.g. be an outdoor temperature thermostat, an electricity tariff contact, a manually operated contact, etc.

The E(D/B)* unit controlled contact (also called 'permission signal for the auxiliary boiler') is determined by the outdoor temperature (thermistor located at the unit).

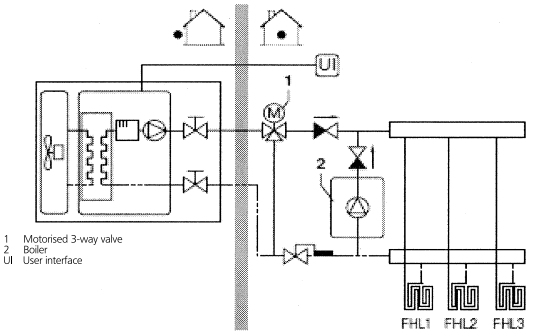
Bivalent operation is only possible for space heating operation, not for domestic water heating operation.

Domestic hot water in such an application is always provided by the domestic hot water tank which is connected to the Daikin unit.

The auxiliary boiler can be integrated in the pipework and in the field wiring according to the illustrations below.

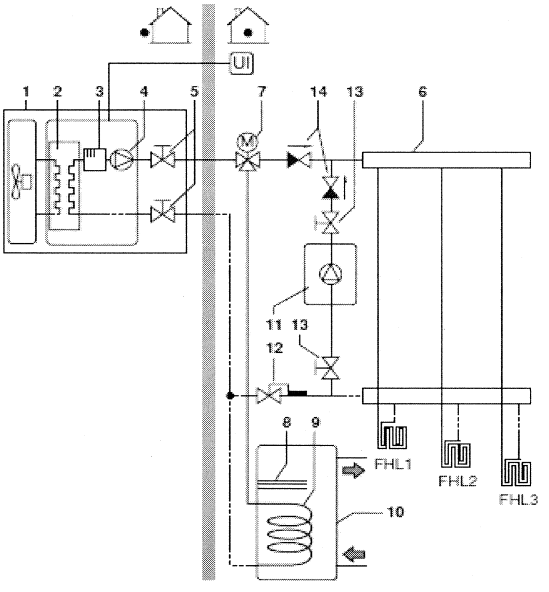
CAUTION

- Be sure that the boiler and the integration of the boiler in the system is in accordance with the applicable legislation.
- Always install a 3-way valve, even if no domestic hot water tank is installed. This to ensure that the freeze protection function can operate when the boiler is active.



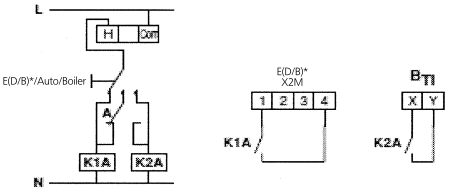
1 Motorised 3-way valve
2 Boiler
UI User interface

- Daikin can not be put responsible for incorrect or unsafe situations in the boiler system.



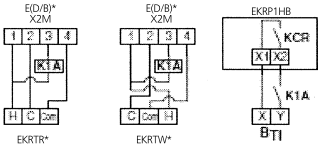
1 Unit
2 Heat exchanger
3 Backup heater [1]
4 Pump
5 Shut-off valve
6 Collector (field supply)
7 Motorised 3-way valve (delivered with the domestic hot water tank)
8 Booster heater [2]
9 Heat exchanger coil
10 Domestic hot water tank (optional)
11 Boiler (field supply)
12 Aquastat valve (field supply)
13 Shut-off valve (field supply)
14 Non-return valve (field supply)
FHL1..3 Floor heating loop (field supply)
UI User interface

Field wiring configuration A



BTI Boiler thermostat input
A Auxillary contact (normal closed)
H Heating demand room thermostat (Optional)
Com Common room thermostat (Optional)
E(D/B)* Unit
auto Automatic
boiler Boiler
K1A Auxillary relay for activation of E(D/B)* unit (Field supply)
K2A Auxiliary relay for activation of boiler (Field supply)

Field wiring configuration B



BTI Boiler thermostat input
C Cooling demand room thermostat
H Heating demand room thermostat (Optional)
Com Common room thermostat (Optional)
K1A Auxillary relay for activation of E(D/B)* unit (Field supply)
KCR Permission signal for the auxillary boiler
E(D/B)* Unit

Operation

- **Configuration A**
  When the room thermostat requests heating, either the E(D/B)* unit or the boiler starts operating, depending on the position of the auxillary contact (A).
- **Configuration B**
  When the room thermostat requests heating, either the E(D/B)* unit or the boiler starts operating, depending on the outdoor temperature (status of 'permission signal for auxillary boiler').
  When the permission is given towards the boiler, the space heating operation by the E(D/B)* unit will be automatically switched off.
  For more details see field setting [C-02-C-04]

Notice

- **Configuration A**
  Make sure that auxiliary contact (A) has sufficient differential or time delay so as to avoid frequent changeover between the E(D/B)* unit and the boiler. If the auxiliary contact (A) is an outdoor temperature thermostat, make sure to install the thermostat in the shade, so that it is not influenced or tuned ON/OFF by the sun.
  Configuration B
  Make sure that the bivalent hysteresis [C-04] has sufficient differential to avoid frequent changeover between the E(D/B)* unit and the boiler. As the outdoor temperature is measured via the unit's air thermistor, make sure to install the unit in the shade, so that it is not influenced by the sun. Frequent switching may cause corrosion of the boiler in an early stage. Contact the manufacturer of the boiler.
- During heating operation of the E(D/B)* unit, the unit will operate so as to achieve the target leaving water temperature as set on the user interface. When weather dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature. During heating operation of the boiler, the boiler will operate so as to achieve the target leaving water temperature as set on the boiler controller. Never set the target leaving water temperature setpoint on the boiler controller above 55°C.
- Make sure to only have 1 expansion vessel in the water circuit. An expansion vessel is already premounted in the Daikin unit.

Notice

Make sure to configure the DIP switch SS2-3 on the PCB of the E(D/B)* switch box correctly.
For configuration B: Make sure to configure the field setting [C-02, C-03 and C-04] correctly.

Notice

Make sure return water to the E(D/B)* heat exchanger never exceeds 55°C.
For this reason, never put the target leaving water temperature set point on the boiler controller above 55°C and install an aquastat [a] valve in the return water flow of the E(D/B)* unit.
Make sure that the non-return valves (field supply) are correctly installed in the system.
Make sure that the room thermostat EKRTR or EKRTW are not frequently turned ON/OFF.
Daikin shall not be held liable fo any damage resulting from failure to observe this rule.

a The aquastat valve must be set for 55°C and must operate to close the return water flow to the unit when the measured temperature exceeds 55°C. When the temperature drops to a lower level, the aquastat valve must operate to open the return water flow to E(D/B)* unit again.

Information

Manual permission towards the E(D/B)* unit on the boiler. In case only the E(D/B)* unit should operate in space heating mode, disable the bivalent operation via setting [C-02].
In case only the boiler should operate in space heating mode, increase the bivalent ON temperature [C-03] to 25°C.