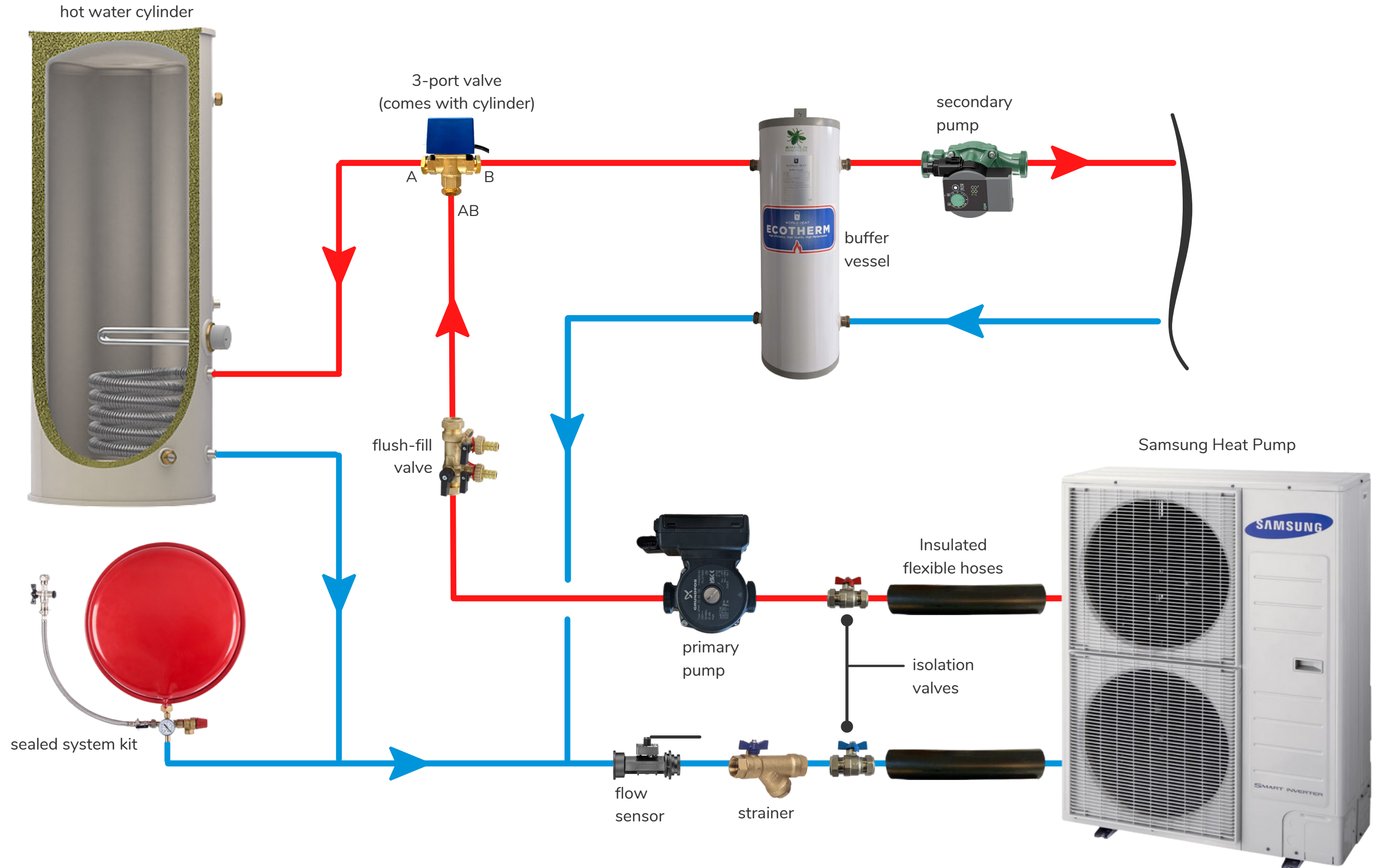


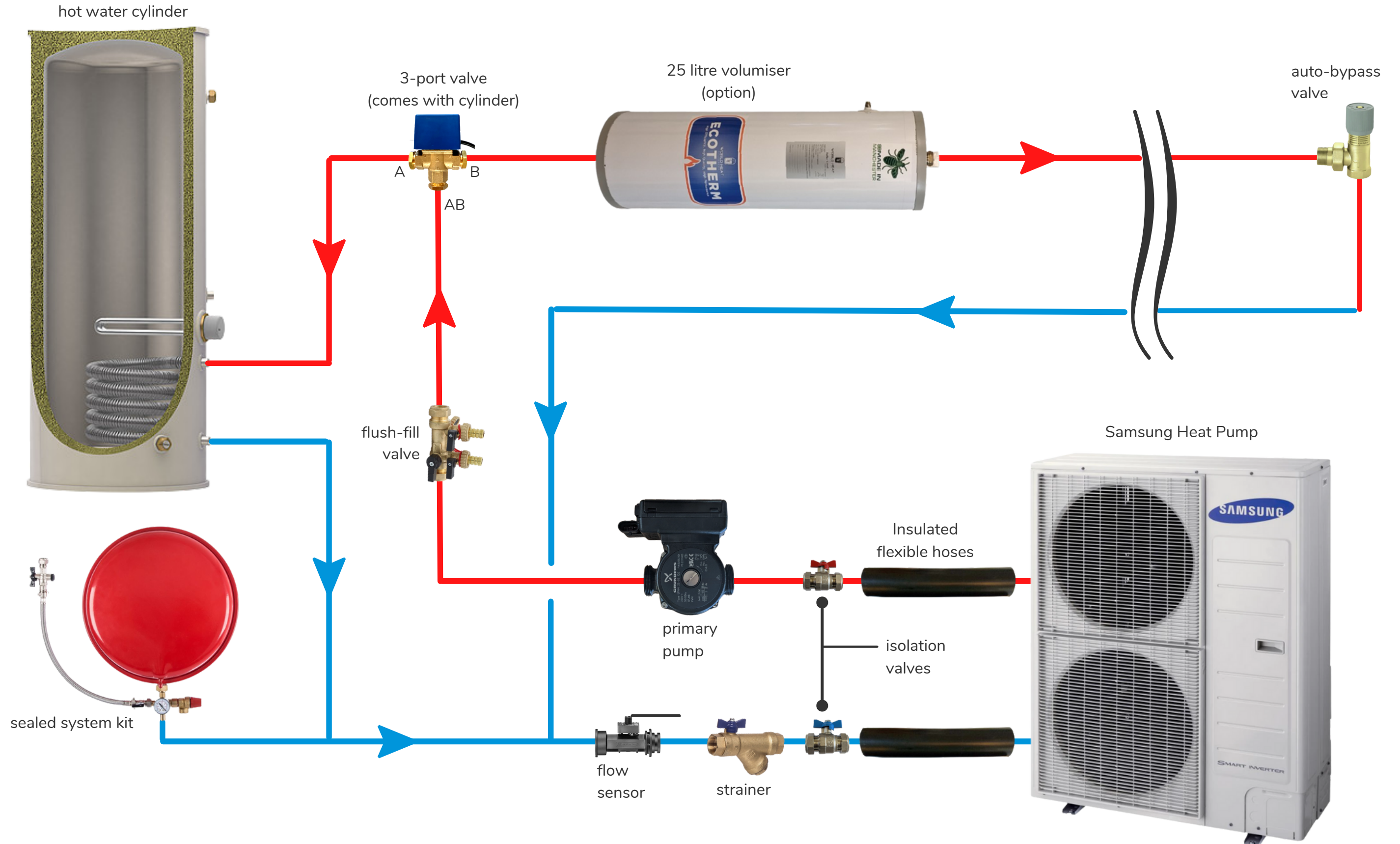
# Mechanical Schematic

**SAMSUNG**



# Mechanical Schematic

SAMSUNG



# Pumps and Buffers

With Samsung heat pump we sell Grundfos OEM pumps as the primary pumps. These pumps take an external speed control signal from the Samsung board to optimise pump flow-rate for heat pump performance. We sell 2 sizes for different systems.

# SAMSUNG



### Grundfos UPM3

The Grundfos UPM3 pumps we sell have a 60W motor and 7.5m nominal head. When you're using a buffer they are good for 5 and 8kW heat pumps and often for 12kW heat pumps with shorter pipe runs. They will be powerful enough for some direct systems with volumisers and bypass valves, but you need to calculate to make sure.



The minimum circulating water content of the system is 30 litres for Samsung 5 and 8kW heat pumps and 50 litres for the 12 and 16kW models.

To make it simple to always meet these requirements we can sell you a kit with a 25 litre buffer for the smaller heat pumps and a 50 litre buffer for the larger heat pumps.



### Grundfos UPM3M

The Grundfos UPM3M pumps we sell have a 100W motor and 9.5m nominal head. When you're using a buffer they are good for 16kW heat pumps and sometimes for 12kW heat pumps with longer pipe runs. They will be powerful enough for many direct systems with volumisers and bypass valves, but you need to calculate to make sure.



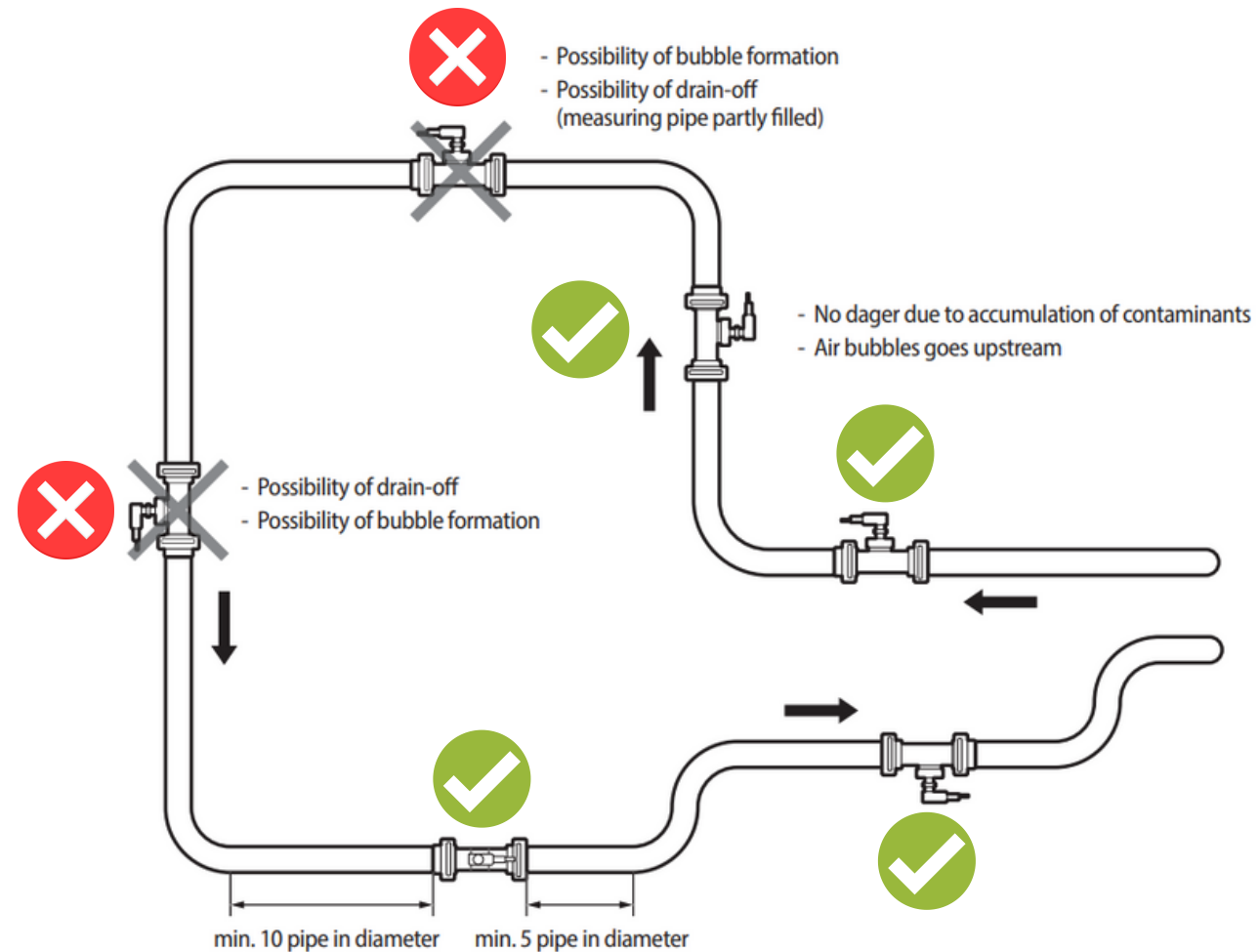
# Component notes

# SAMSUNG



### flow sensor

The Samsung flow sensor comes in the Samsung control kit box with connecting pieces. The required flow direction is indicated on the sensor. It must be on a pipe that has the same flow as the heat pump and it must be installed in accordance with the diagram to the right. The cable also connects with the cable pointing in the direction of flow.



### 3-port valve

If you buy a World Heat cylinder from Midsummer it gets sent out with a Mut Meccanica 3-port valve in the box. We selected these for their very low pressure drop and to give you a 2-pole auxillary switch. You wire the live and neutral from the board as indicated on the wiring diagram, you can wire the live via the high limit stat on the cylinder if you are doing a hybrid installation. Port A is for the cylinder, port B is for the heating.



### Strainer

We usually send you a strainer with isolation valve and a separate blue handled isolation valve in the kit. The intention is that you install them as close as possible to one another so the minimum amount of fluid is lost when you clear out the strainer.



### Flush-fill valve

We supply a flush-fill valve in the kit to make it easier to flush, fill and drain the system, it needs to be installed on the primary pipework. Best not to flush through the heat pump though - make a U-loop of pipe to put in the system in place of the heat pump or install a flushing bypass before the heat pump isolation valves.

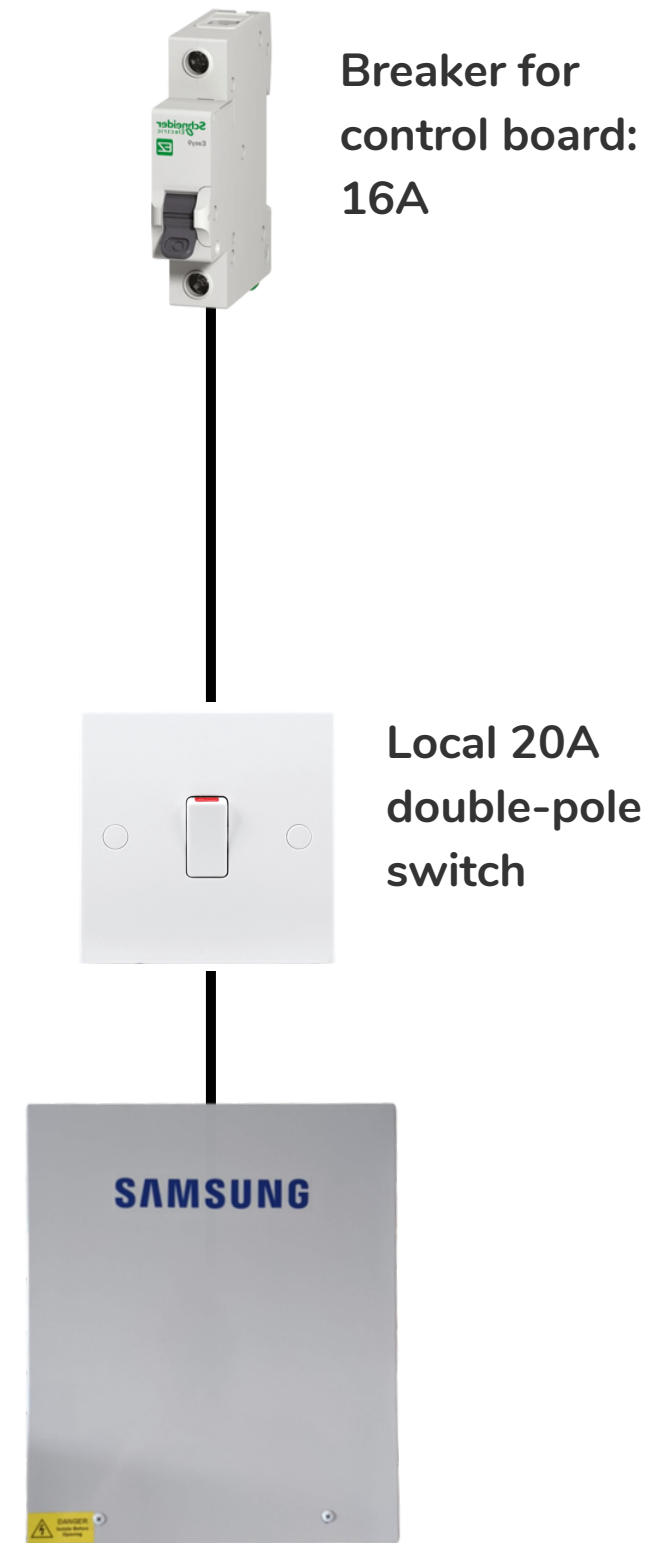
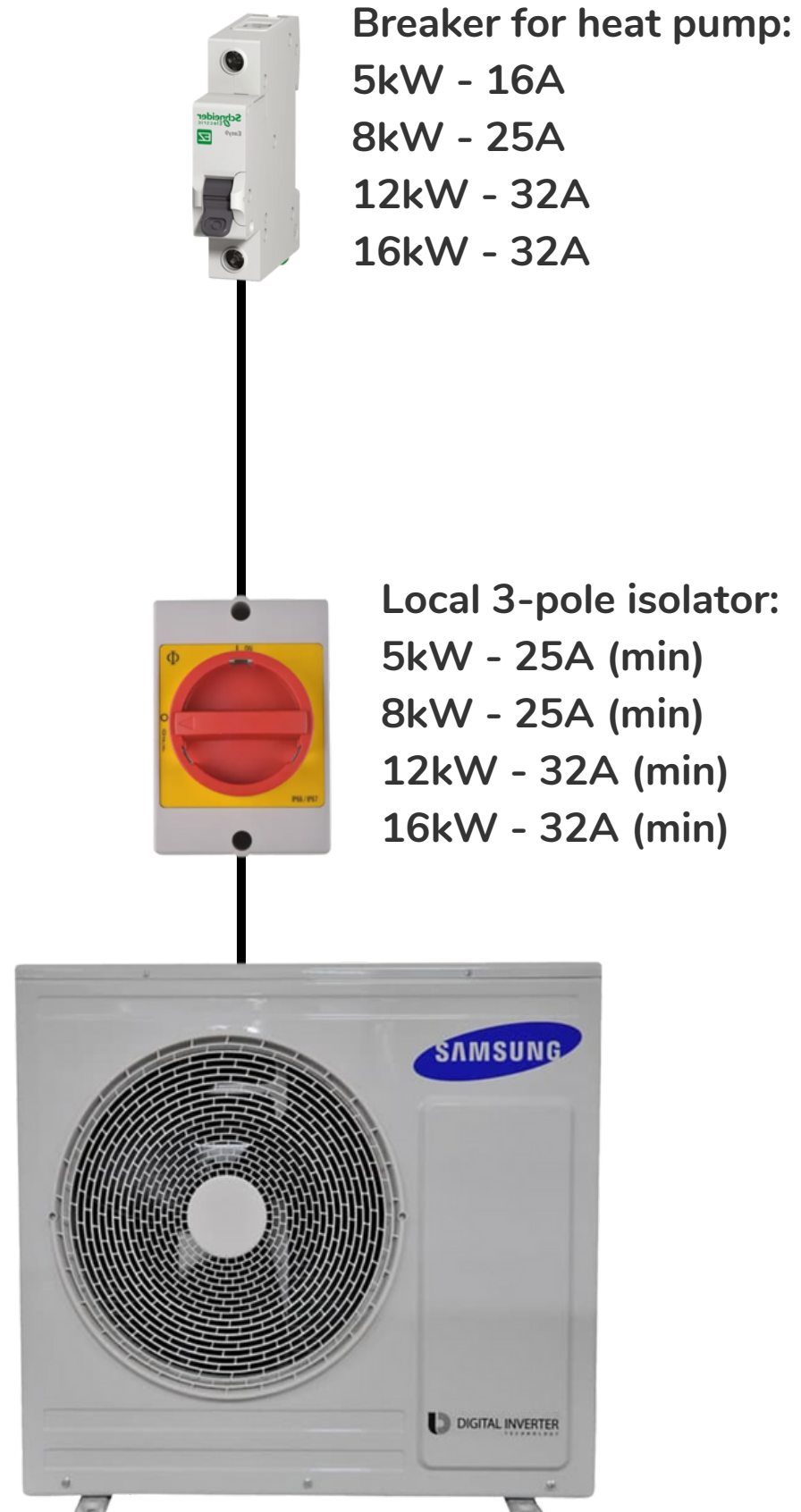


### Sealed system kit

For convenience we offer 18 litre compact sealed system kit with . This is normally much more volume than you would really need for most system. If you have a very large system it is worth checking the expansion vessel sizing.

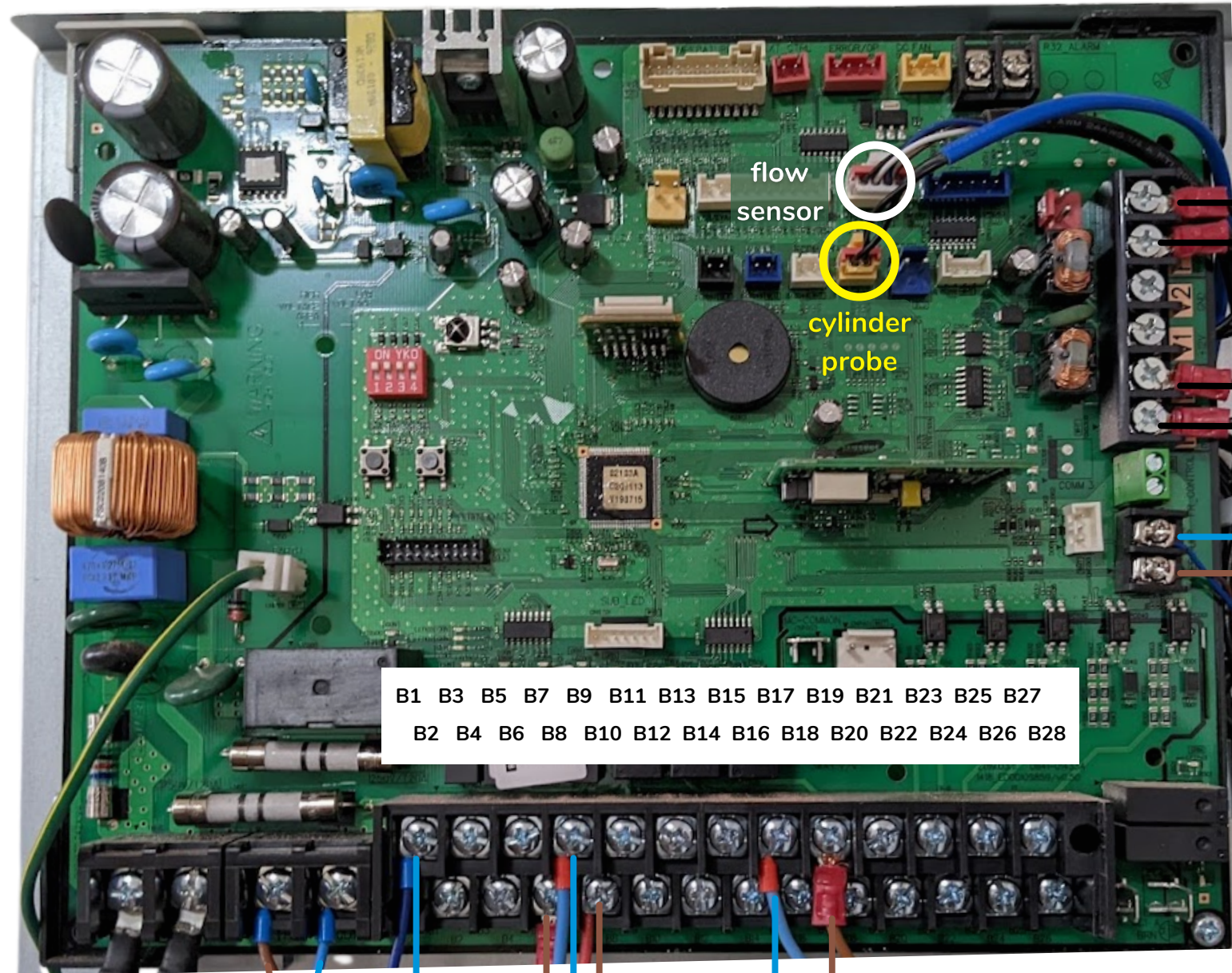
# Main Power Diagram

**SAMSUNG**





# Wiring Diagram



LCD stat  
F3, F4



heat pump  
F1, F2

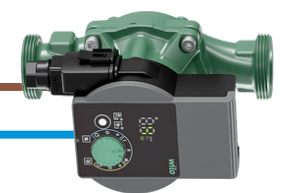
These cables to be screened.  
e.g. 1mm<sup>2</sup> CY cable



incoming power A1, A2



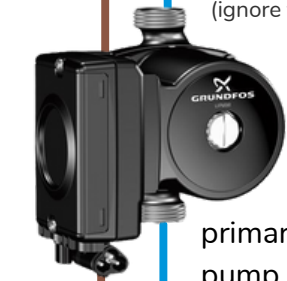
immersion  
heater  
A3, A4



secondary  
pump  
B7, B8



3-port valve  
B15, B17



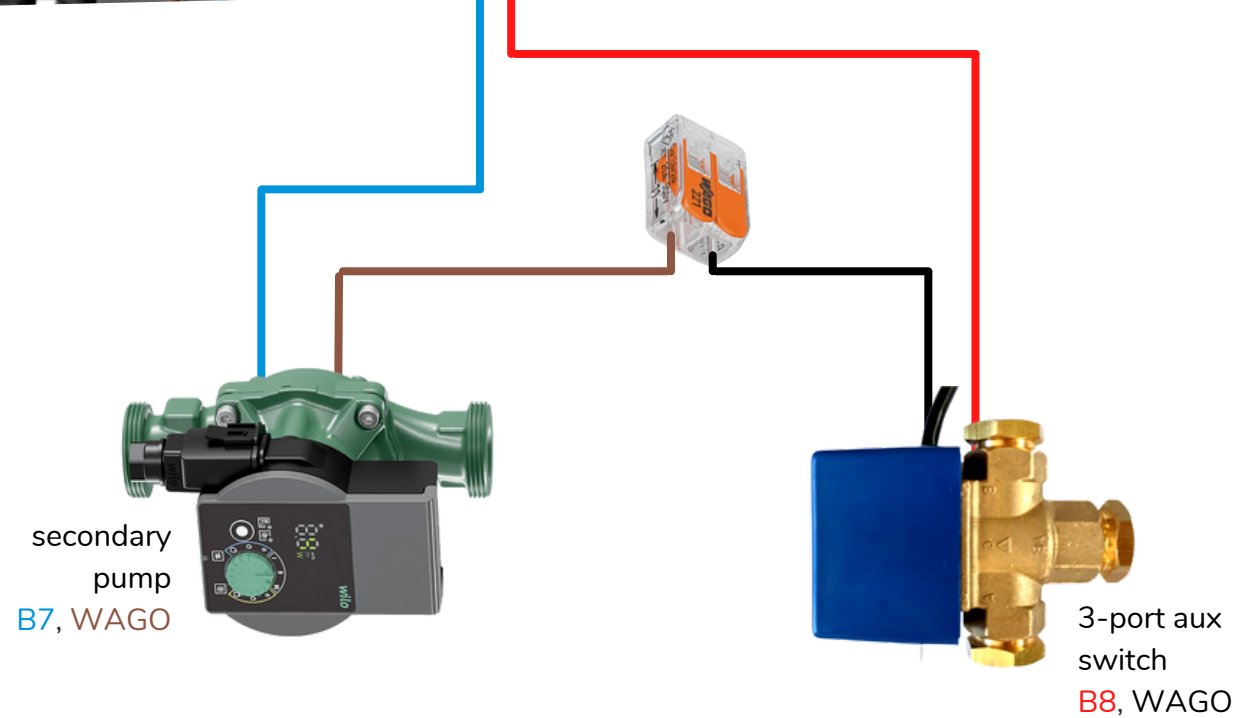
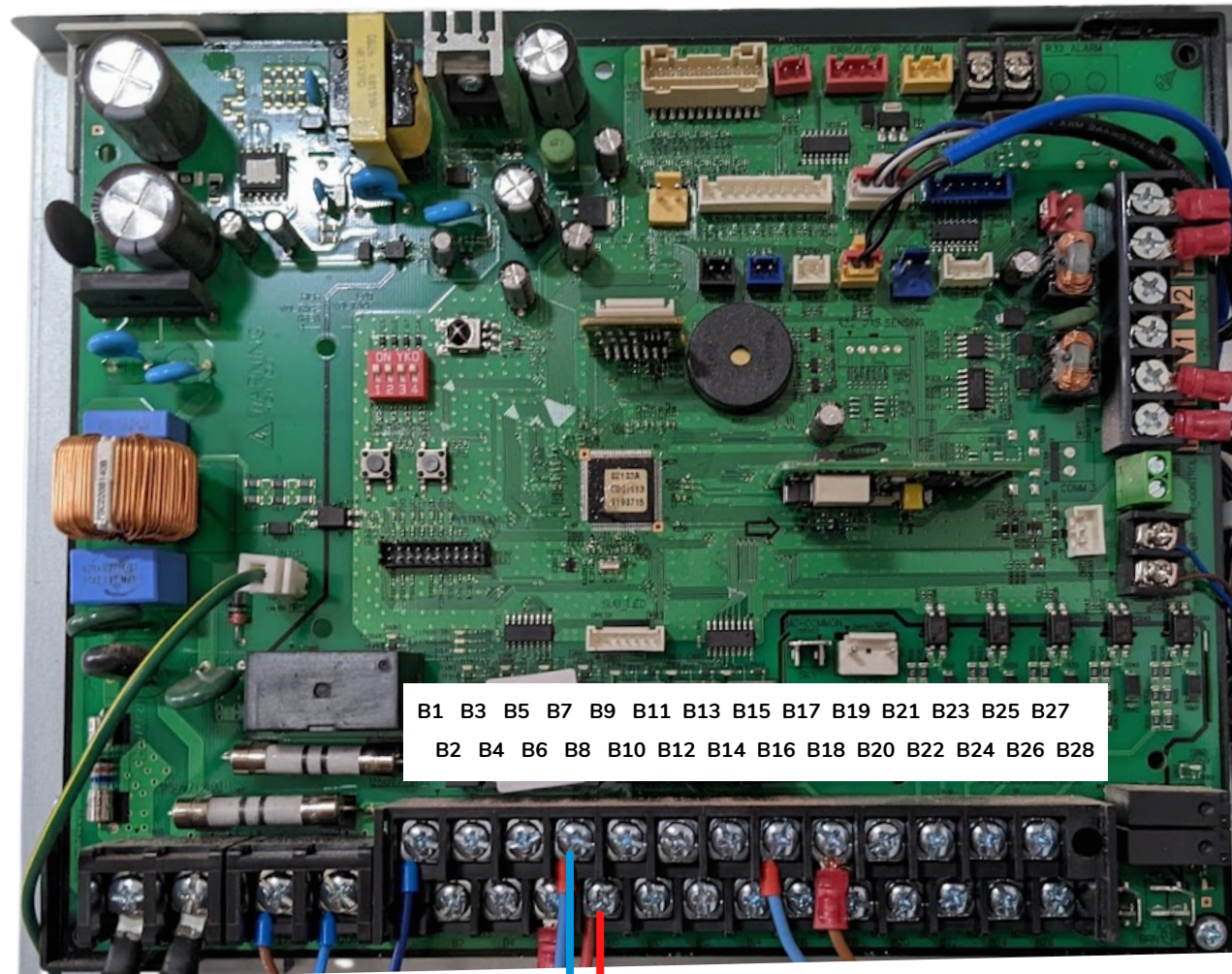
primary  
pump speed control  
top, bottom  
(ignore the black cable)

primary  
pump power  
B1, B6

B1 B3 B5 B7 B9 B11 B13 B15 B17 B19 B21 B23 B25 B27  
B2 B4 B6 B8 B10 B12 B14 B16 B18 B20 B22 B24 B26 B28



# Secondary pump option



## secondary pump

On the previous page the wiring diagram shows the secondary pump wired directly on to B7 and B8. If you do this the secondary pump runs any time the heat pump is running - in heating mode and in hot water mode.

What's good about that is:

- in heating season it continues to circulate the hot water from the buffer when the heat pump is doing a hot water run.
- it's simple to wire and robust.

What's bad about that is:

- in summer the secondary pump runs during each hot water cycle and this uses a few pounds worth of electricity each year.
- if the aux switch breaks, the secondary pump stops running.

You can wire the secondary pump up via the auxiliary switch in the 3-port valve as show on this page and then the secondary pump will only run when the heat pump is on and in heating mode.

## Set the time

Where you go to set the time on the controller is:  
**User Mode** then **Wired remote controller** then you can set the **Current Time**.

## Accessing service mode

To get into service mode for testing and setting up the heat pump you need to press and hold **up and down** for 5 seconds. The controller will then ask you to enter the PIN which is **0 2 0 2**

## Check the flow-rate

Enter Service Mode, go to **Indoor Zone Option** then **Indoor Zone Status Information** and it will show a value for **flow sensor** in litres per minute.

## Samsung Thermostat

The heat pump control is a bit more clever when you use the Samsung controller as the thermostat. This is the ideal option if you can wire

To use the Samsung LCD controller as the thermostat enter service mode and go to:

### Indoor Zone Option

and set

### Standard Temperature to Indoor

Now the controller is set up to act as the thermostat with the temperature setting via the Samsung LCD.

## External Thermostat

If you need to use an external, 3rd party thermostat with a Samsung heat pump this needs to be wired up as shown below. Permanent live is **B20**, switched live is **B22**.



Then set the heat pump to use it as the signal to heat or not by setting **FSV 2091** - External Thermostat Application #1 (Floor) to **Use(Signal ON/OFF) or WL Interlink OFF(Water Pump3)**.

## Heating - Weather Compensation

Samsung's name for weather compensation is "water law". You need to set up the water law before the heat pump will perform weather compensation properly. On a Samsung you set a warm weather point and a cold weather point and then the unit interpolates between them to provide the flow temperature asked for.

To do this you need to enter service mode, "Field Setting Value" and input the settings.

### 20\*\* Water Law

#### 201\* Outdoor Temp. for Water Law (Heat)

Low = 20°C

High = -3°C

#### 202\* Water Out Temp. for WL1 Heat (WL1-Floor)

Low target value

25°C

High target value

50°C

Note: the two numbers inside the green boxes are the design condition, in this case shown as flow temp of 50°C at air temp of -3°C but you should use the temperatures you have designed to.

## Hot water settings (FSV)

**3011** - Domestic Hot Water Tank - **Use(Hysteresis Thermo ON/OFF state)**

**3025** - Max DHW Operation Time - you want to give your heat pump a decent chance of heating the water up in one go here, but not let the house get cold while you do it. If it's a well insulated house you can set this time fairly long, if it's a poorly insulated house you can set it shorter. **90 minutes** is a reasonable starting point for most cases.

**3032** - Delay time - This is how long the heat pump tries to do the hot water using the heat pump before it kicks in the immersion heater to help. You don't really want this to happen often so set this to **60 minutes**.

**3042** - This is the day that the legionella cycle happens. Best idea is to set it mid-week probably **Tuesday** or **Wednesday**.

**3043** - Legionella start time - Set this to a time where the water should already be hot anyway to minimise the energy used for this cycle, maybe **4am**.

**3044** - Target temp - This is how hot the heat pump goes in legionella cycle - **60°C** is a good setpoint normally. If the occupants are older you might want to go for 65°C to be extra safe.

