



# FLOOR HEATING CONTROLS WIRING INSTRUCTIONS FOR FS and BA MASTER WEATHER COMPENSATION



## FIRST FIX FOR velta WLM CONTROLS

### CONTROL BOXES

#### FS MASTER

If the FS master model control box is used, the following connections between the FS Master control box and the mixing unit are required.

This master should only be used where a mixing valve is required with the use of weather compensation. If the FS Master is used as a network master without a mixing valve, it should not have any room sensors connected.

- As above plus items below
- 2 No. 3 core 230V power cables to connect secondary pump and motorised actuator
- 2 core signal wire to water mixing unit to connect with ETF1899 limit sensor
- 2 core wire to boiler location – to signal boiler (if required)
- 3 core wire to secondary pump (if required)
- 2 core wire from volt free contact for external timer/signal (if required) (Terminal 17/18)

#### BA MASTER

- 230V switch fuse spur to each manifold
- Additional add on units require 230V power supply and linking to the main master controller (requires 4 core data wire).

### OUTDOOR SENSOR WLOC

This sensor can be wired in series with the thermostats or alternatively, can be wired directly back to the sensor control bus in the master, depending on preferred method

Please note that this is only used with the FS Master control box. (1 external sensor per FS Master is required)

### NETWORK

4 core cable between all manifolds, maximum size of cable is 1.0mm solid core or 0.75mm multi strand. Terminations are RJ11/RJ14 connections. Extension box link cable between boxes supplied by others, as shown on network diagram (Connection boxes can be purchased from velta)

Refer to WLM2 installation instructions for set up (See page 5 of WLM2 instructions).

Maximum cable length - 600 metres. Please do not connect these network links to the box terminals until a velta engineer is present to commission.

### SENSORS

Can be wired either in series (daisy chain) or star wired. Refer to figures 4A & 4B of these instructions.

The maximum size of cable for the sensors is 1.0mm solid core or 0.75mm multi strand.

**Do NOT use larger dimension cable, as this will stress the terminals and p.c.b's of the thermostats.**

The thermostat connections are all 2 core, so remember to identify and maintain the + and – continually throughout. Each sensor has loop terminals for incoming and outgoing cables.



Note that if the sensors are run in series (daisy chain), a return cable from the last sensor to the master control box is required.

### **BEAD SENSORS**

These must be connected back to a thermostat (WLTM) only, using terminals 5 & 6 (25m max. cable run). The jumper connection must be made in the thermostat.

### **LIMIT SENSORS**

Jumper connection made = maximum limit – jumper connection removed = minimum limit

### **WIRELESS RECEIVER**

If using wireless control thermostats, please note a receiver is required to each master controller. This is a simple plug and play connection. (Lead supplied).

If there is difficulty in reaching each wireless room sensor, more than one receiver can be used i.e. 1no. to a master & 1no. to an add-on module.

NOTE: Do not place the receiver near to power cables and metal/stud work. In case of communication problems, it may be necessary to move the location of the receiver, or to add an additional receiver.

Communication frequency .....868 MHz

### **HEATING & COOLING**

#### **NOTE: We do not provide automatic change over**

FS cooling kit is required when an FS master is the network master. FS cooling kit contains the following items:

1 x WLAC Heating & Cooling Switch – manual or signal operated This sensor can be wired in series with the thermostats or alternatively, can be wired directly back to the sensor control bus in the master, depending on preferred method

Signal operated from any control provided by others. This is a volt free, make or break connection and will require a 2 core cable maximum size of cable is 1.0mm solid core or 0.75mm multi strand from source. This is connected directly to the WLAC. Please note that that the manual select switch must be heating mode when other supplies signal.

Manual operation this is by use of the select switch on the WLAC. We will require a 2 core power cable from the X Output in the master to heating/cooling source. Please note a K module maybe require if you are operating a separated boiler/chiller.

1 x WLH – Humidity Sensor, This sensor can be wired in series with the thermostats or alternatively, can be wired directly back to the sensor control bus in the master, depending on preferred method

ETF1899A – Flow Sensor is included with the FS master and is connected to flow, same connection as if it was used for heating only. This sensor is wired to the supply sensor, terminals 49/50.

FS Master cannot be used as a network master if it does not control a mixing station unless no other sensors are connected i.e. humidity or room sensors.

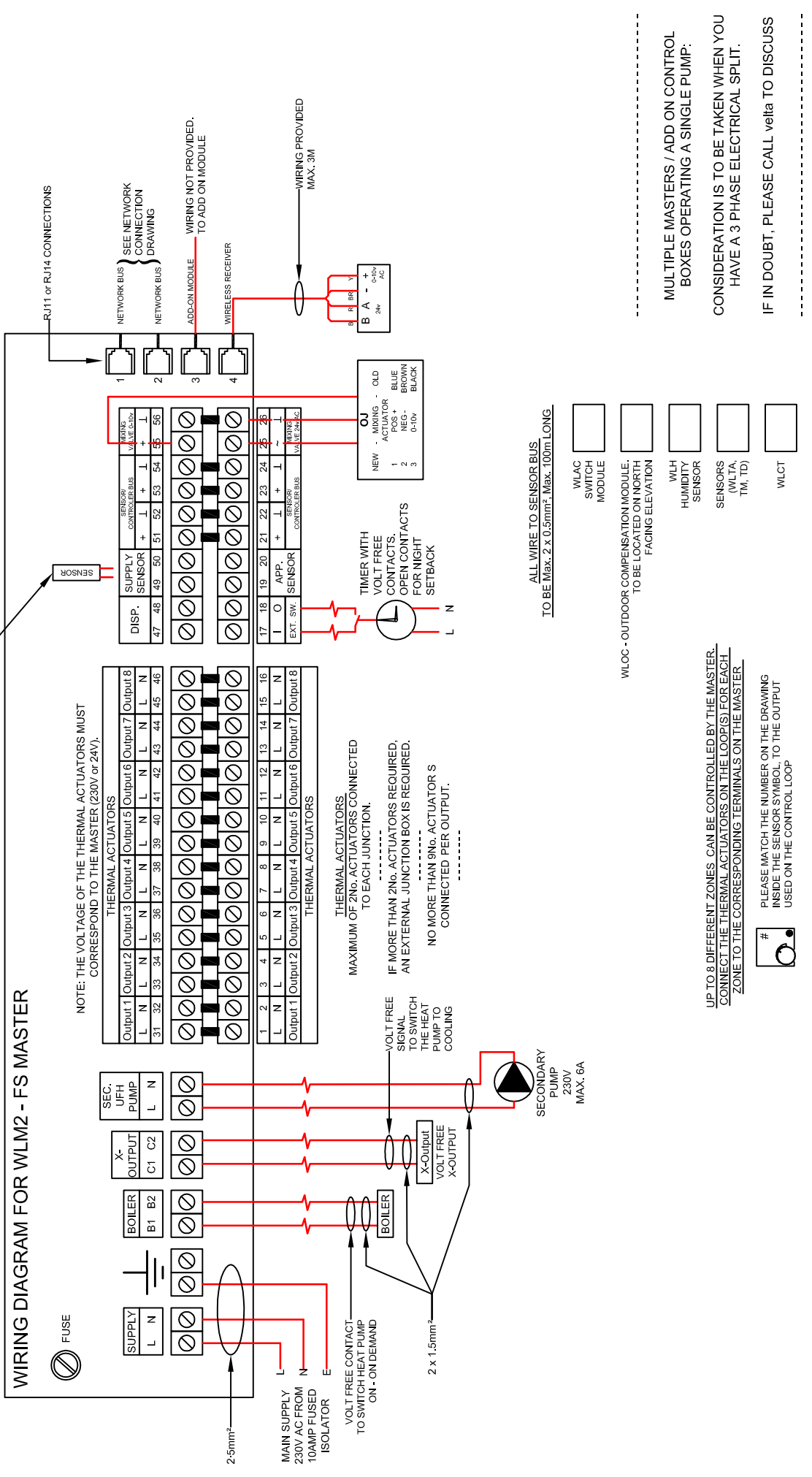


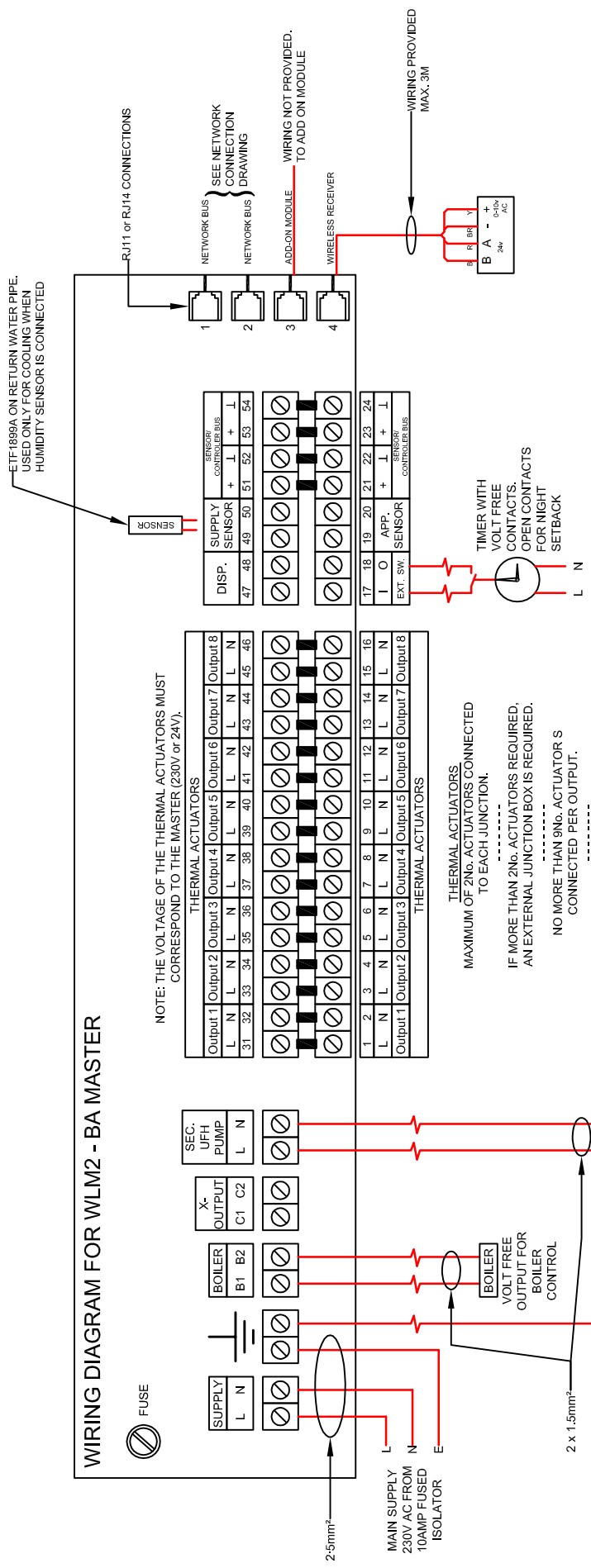
Figure 1.

PLEASE CONTACT velta FOR ALTERNATIVES

MULTIPLE MASTERS / ADD ON CONTROL BOXES OPERATING A SINGLE PUMP:  
CONSIDERATION IS TO BE TAKEN WHEN YOU HAVE A 3 PHASE ELECTRICAL SPLIT.  
IF IN DOUBT, PLEASE CALL velta TO DISCUSS

ALL ELECTRICAL WIRING TO BE CARRIED OUT BY A QUALIFIED ENGINEER, IN ACCORDANCE WITH MANUFACTURERS DOCUMENTS AND LAST I.E.E. REGULATIONS

# WIRING DIAGRAM FOR WLM2 - BA MASTER



NOTE: THE VOLTAGE OF THE THERMAL ACTUATORS MUST CORRESPOND TO THE MASTER (230V or 24V).

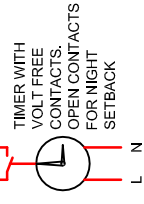
THERMAL ACTUATORS

Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
L N	L N	L N	L N	L N	L N	L N	L N
31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46

THERMAL ACTUATORS

Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
L N	L N	L N	L N	L N	L N	L N	L N
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32

THERMAL ACTUATORS  
MAXIMUM OF 2No. ACTUATORS CONNECTED TO EACH JUNCTION.  
IF MORE THAN 2No. ACTUATORS REQUIRED, AN EXTERNAL JUNCTION BOX IS REQUIRED.  
NO MORE THAN 9No. ACTUATOR S CONNECTED PER OUTPUT.



ALL WIRE TO SENSOR BUS TO BE Max. 2 x 0.5mm<sup>2</sup>, Max. 100m LONG.

- W/LAC SWITCH MODULE
- WLOC - OUTDOOR COMPENSATION MODULE, TO BE LOCATED ON NORTH FACING ELEVATION
- W/LH HUMIDITY SENSOR
- SENSORS (W/LTA, TM, TD)
- W/LCT

UP TO 8 DIFFERENT ZONES CAN BE CONTROLLED BY THE MASTER. CONNECT THE THERMAL ACTUATORS ON THE LOOP(S) FOR EACH ZONE TO THE CORRESPONDING TERMINALS ON THE MASTER.



PLEASE MATCH THE NUMBER ON THE DRAWING INSIDE THE SENSOR SYMBOL TO THE OUTPUT USED ON THE CONTROL LOOP

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Figure 2.

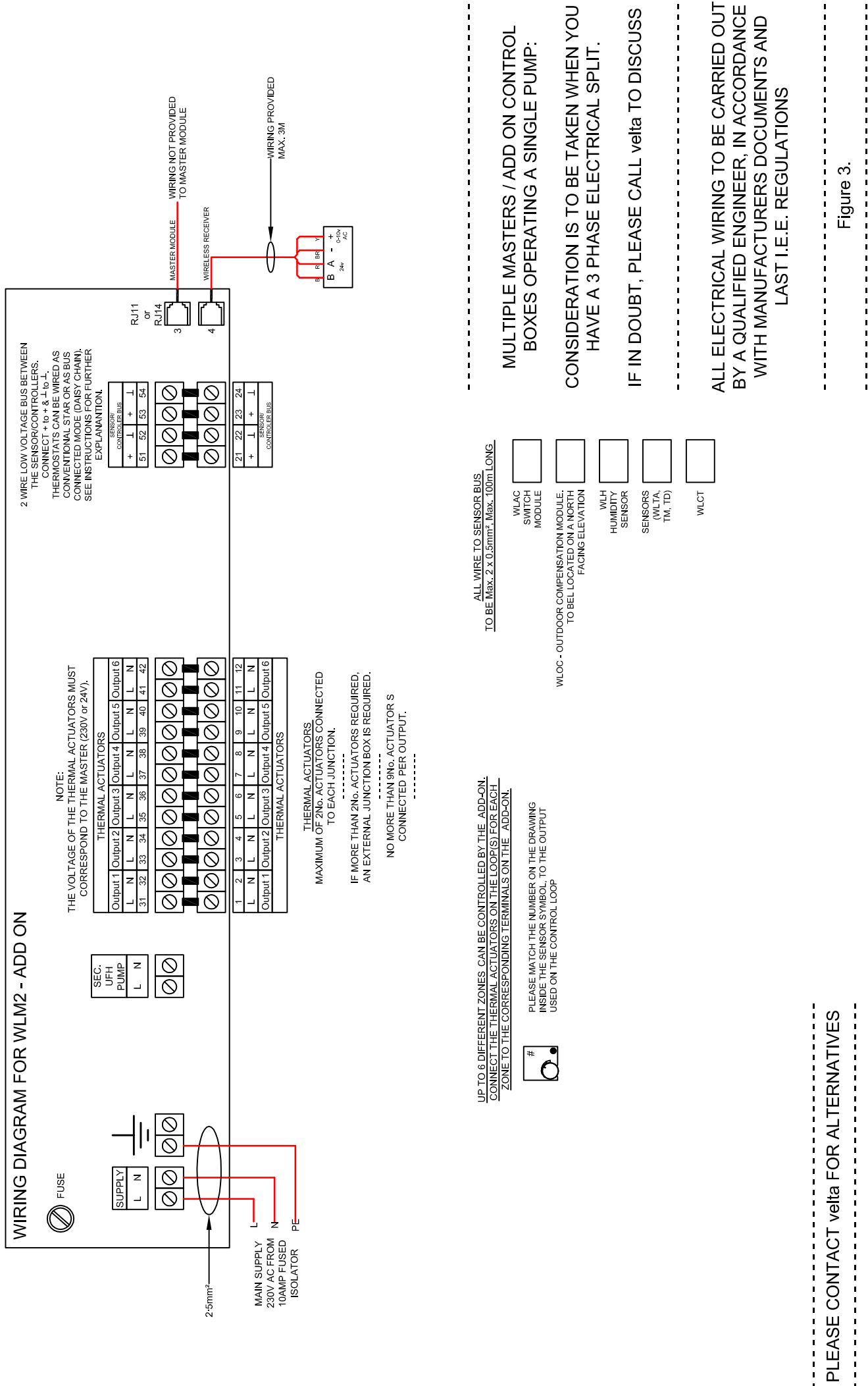
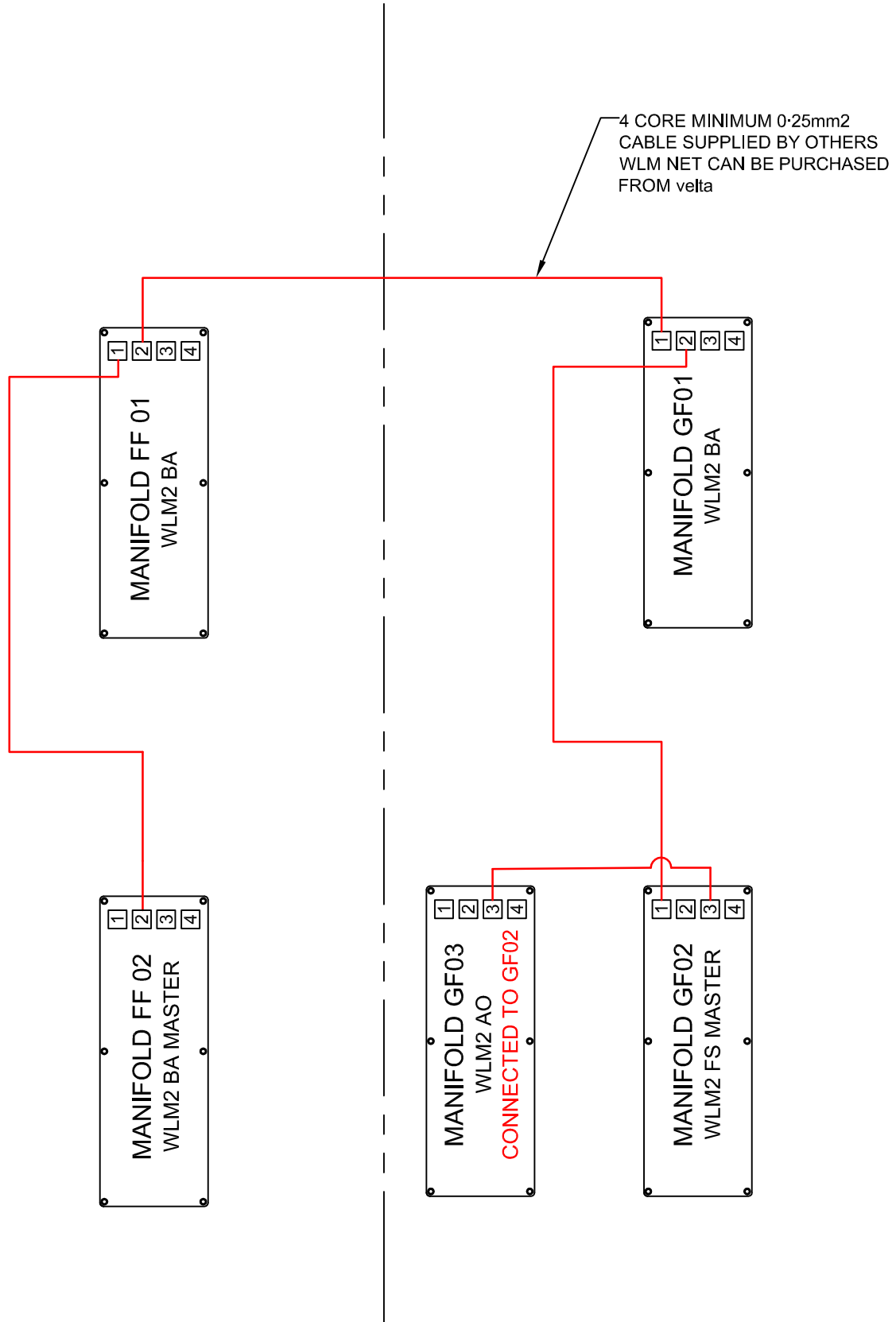


Figure 3.

FIRST FLOOR

GROUND FLOOR



**IMPORTANT NOTE:**

**INTER BOX CONNECTIONS MUST NOT BE MADE UNTIL TIME OF COMMISSIONING.  
FAILURE TO DO SO MAY RESULT IN P.C.B. FAILURE WITHIN THE BOXES**

WLM2 TYPICAL NETWORK CONNECTIONS

Figure 4.

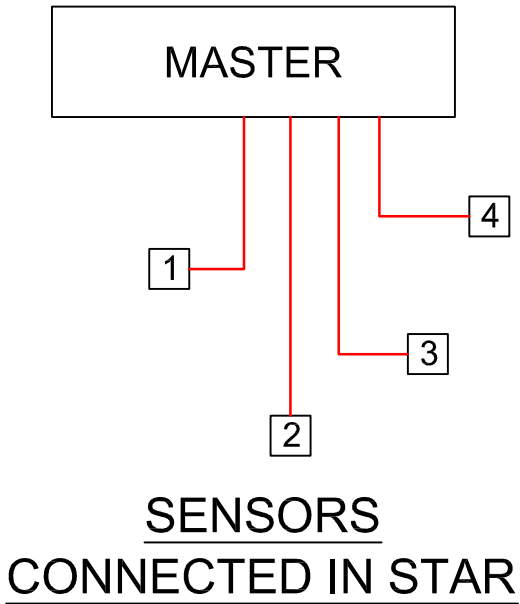


Figure 4a.

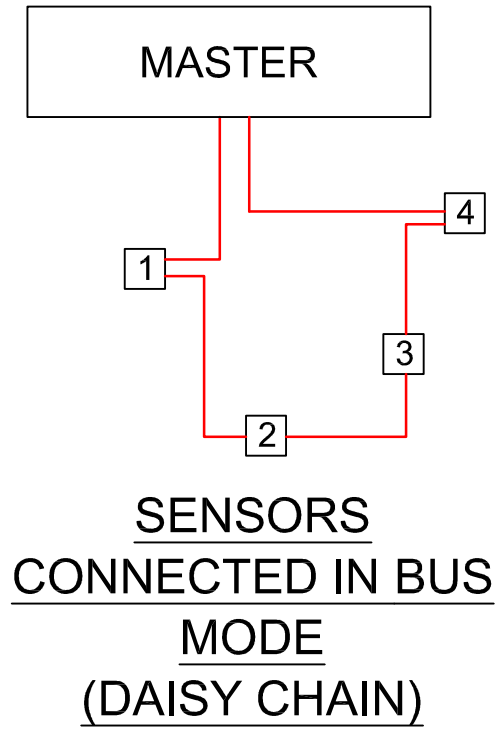


Figure 4b.

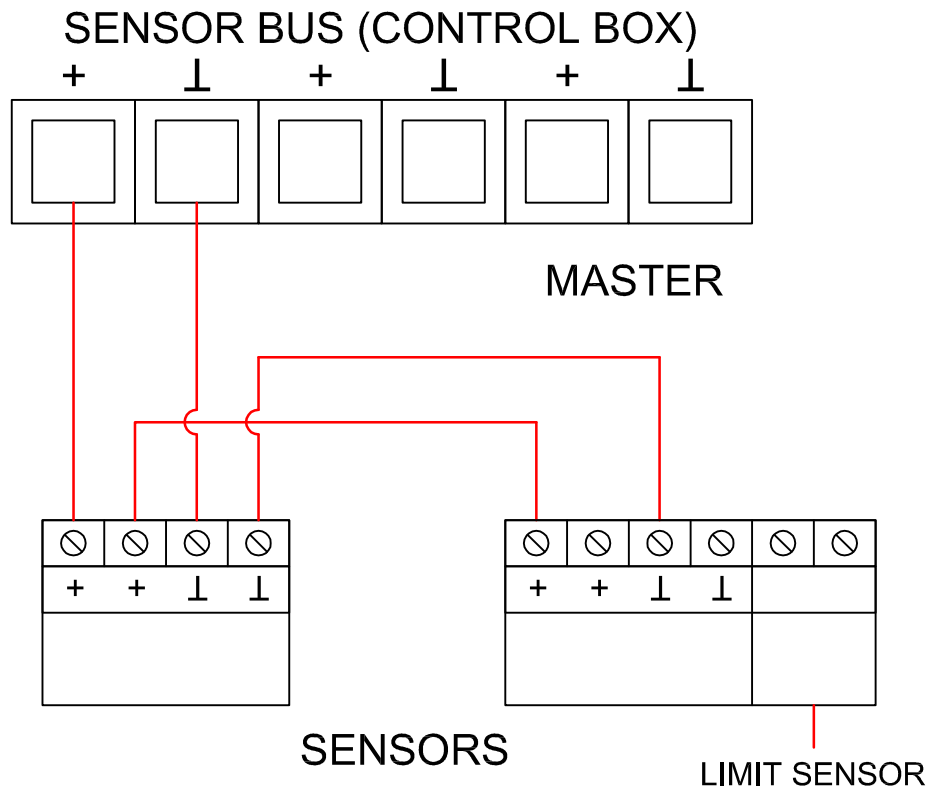
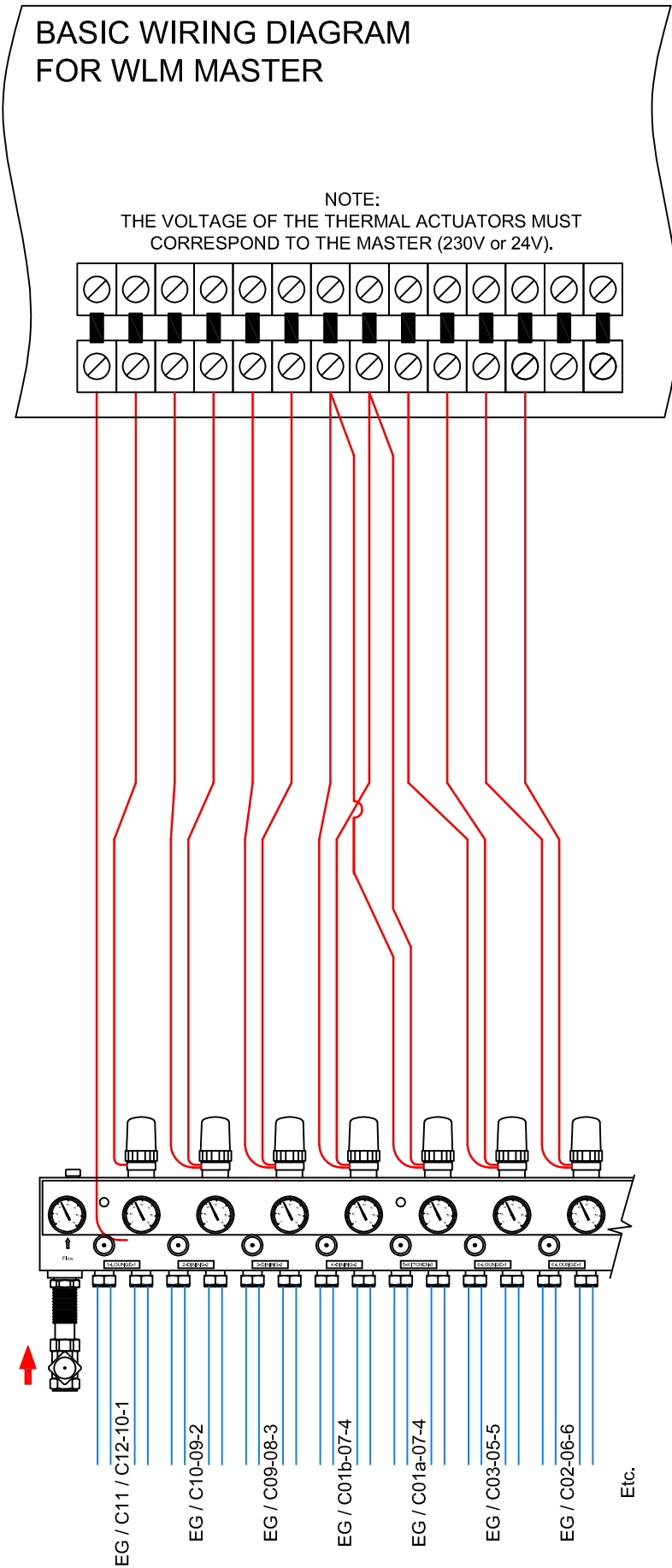


Figure 5.

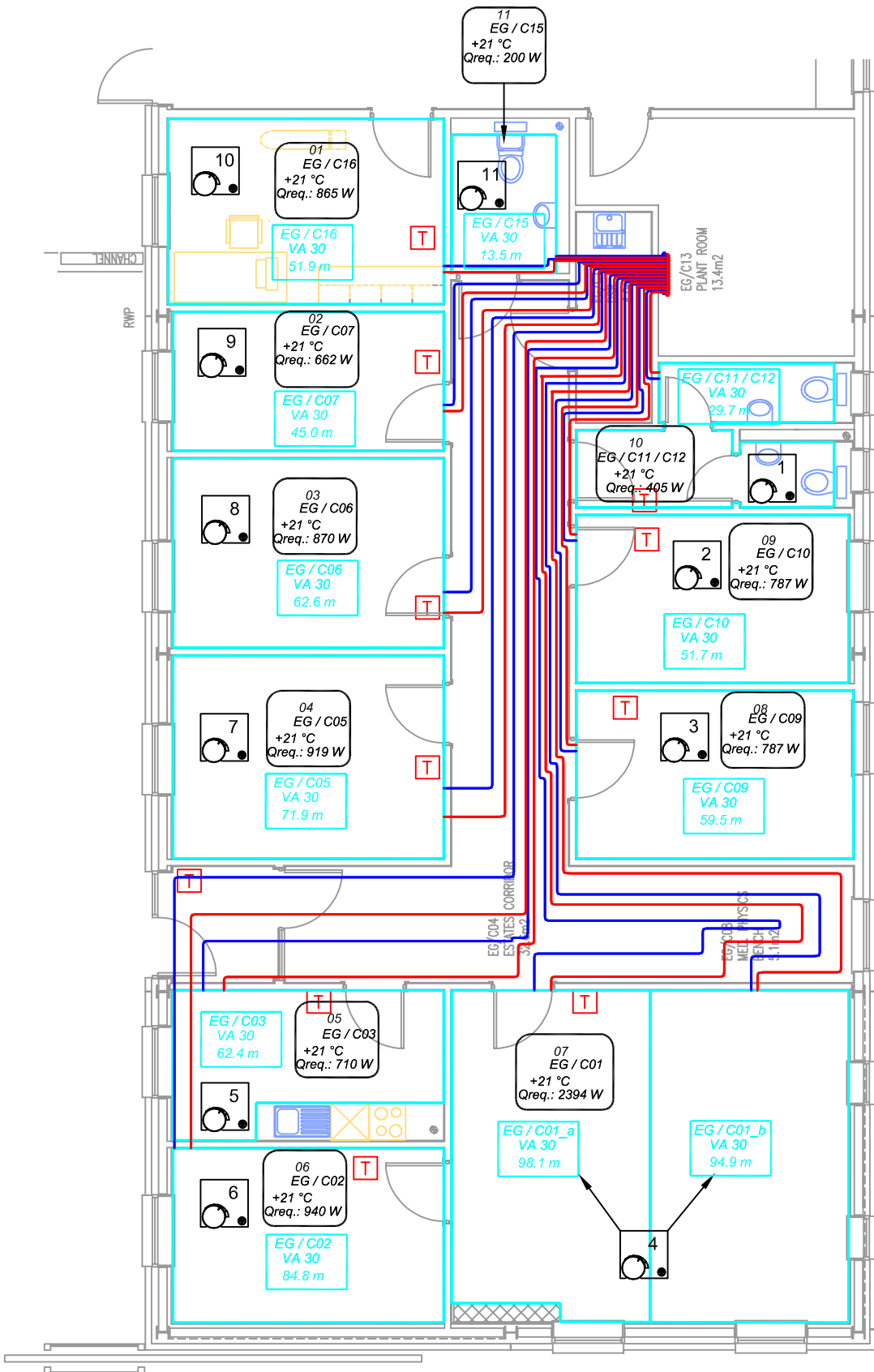


# TYPICAL ACTUATOR to CONTROL BOX WIRING SCHEMATIC (SEE Figure 6b)



**LABEL KEY** (Example - EG / C09-08-3)  
 EG / C09 = CIRCUIT No.  
 08 = ROOM SERVED  
 3 = CONNECTION NUMBER IN  
 CONTROL BOX (No. AS  
 SHOWN ON THERMOSTAT  
 SYMBOL ON Figure 6b).

Figure 6a.



**TYPICAL EXAMPLE** (SEE Figure 6a)

**SEE velta PROJECT SPECIFIC DRAWING FOR RELEVANT LAYOUT.**

Figure 6b.

# velta MANIFOLD & GRUNDFOS PUMPING STATION

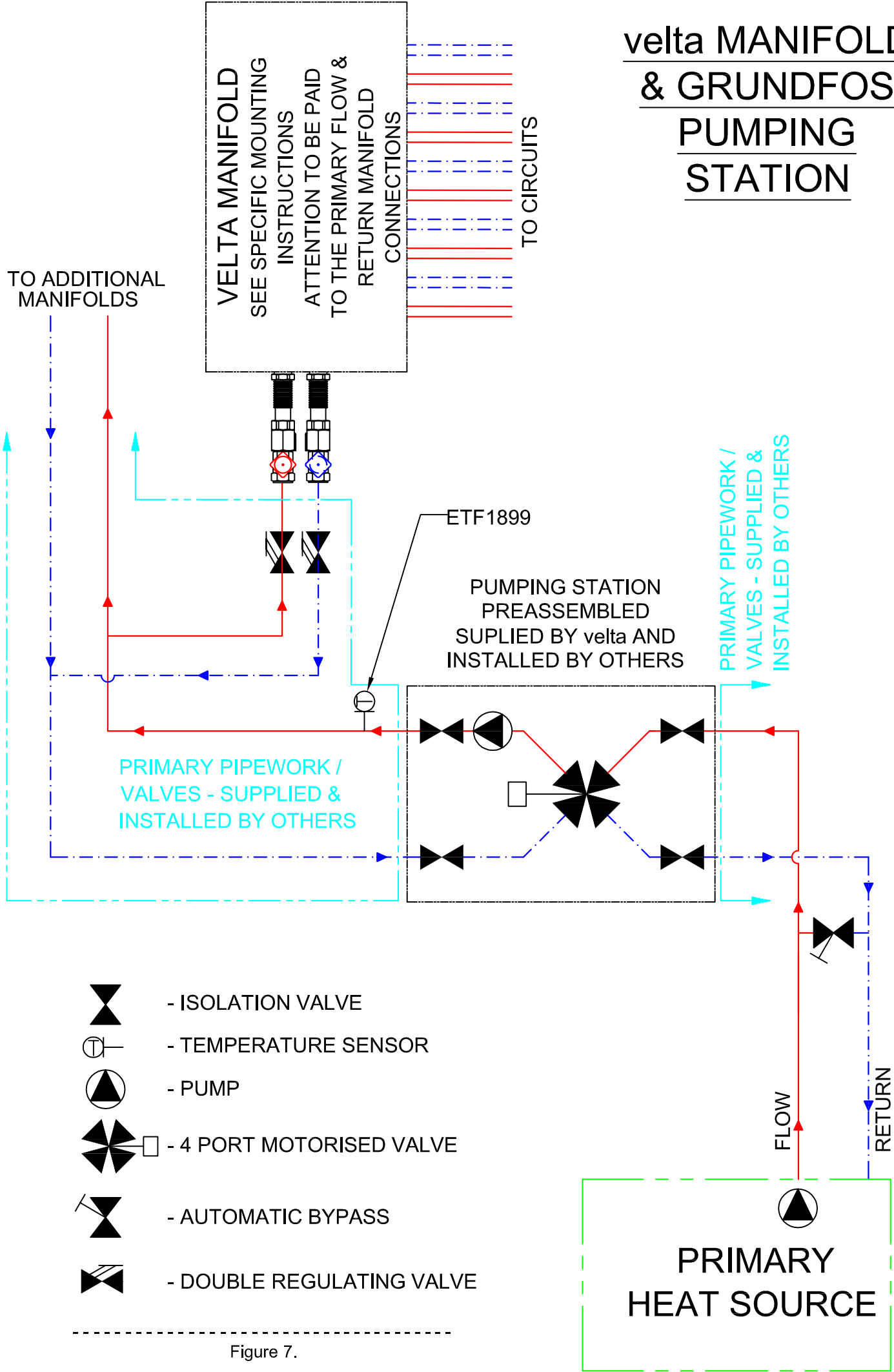


Figure 7.



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