

Advenco Electric Immersion Heaters

Critical Installation Requirements

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1. Immersion Heater Control Philosophy

Immersion heaters are typically supplied with control and overheat stats within the head of the element to fulfil legal requirements for sale. Experience shows that these internal stats are not always the most suitable method of switching the elements and can lead to temperature fluctuations and system failure. Please see the guidance below on best practice for switching the hot water system.

Immersion heaters with a capacity up to 9kW used for backup operation only:

These systems are generally found to be acceptable operating with control and overheat thermostats installed in the head of the element terminal.

Immersion heaters with a capacity up to 9kW used as a primary heat source of an electric water heater:

These systems may be acceptable operating with the control and overheat installed in the head of the element terminal. Consideration should be given to using a separate control and overheat stat for better temperature control and reduced cycling of the contactor.

Immersion heaters with a capacity over 9kW used as a primary or backup heat source:

Experience shows that the inbuilt control stat which is embedded in the element rods responds to a local hot pocket in the area around the stat, and not the average tank temperature. This leads to fast cycling of the immersion heater as the local pocket heats very quickly, causing the stat to respond and turn off the element, after which the heat dissipates to the rest of the tank and the element is quickly reactivated. This cycle repeats and puts excessive wear on the contactor and increases the likelihood that it will fail due to heat buildup.

To avoid this switching, the inbuilt control and overheat stat should be disconnected and an additional pocket mounted control stat should be installed approximately 300mm above the heating element and used to switch the contactor to activate the element. The overheat stat can either be in the top of the tank and set to trip at $\geq 90^{\circ}\text{C}$ to stop all heat sources in the tank, or it can be included with the control stat and reduced in temperature to allow for it not being in the top of the tank and only switch off the heat source it controls on trip as long as every other heat source has an overheat stat too.



1. Immersion Heater Control Philosophy

Multiple immersion heaters, regardless of capacity, used as the primary heat source of an electric water heater:

In these cases experience has shown that it is always best to use a separate control and overheat stats to control the immersion heaters. Treat the tank as two zones, the top zone and the bottom zone, and use a pocket mounted control stat to control each zone. Disregard the internal control and overheat stats. This arrangement is shown on the drawing on page 3 where stat 79b controls the one or two immersions in location 51 and 79a controls the one or two immersions at 52 and the immersion at 50. A single overheat stat at 78 shuts down the complete system. This is the most effective and reliable way to control this system.

Any questions or further information required should be referred to the Adveco Technical department.

2. Installation Instructions

All electrical wiring must be carried out by a qualified person and comply with the current IET Wiring Regulations to BS 7671:2018.

It is recommended that the electrical insulation for each circuit within the immersion heater is tested prior to installation. The minimum insulation reading between live and earth connections should be above 1M Ω .

Consult the relevant immersion heater terminal diagram and data sheet as a reference when making electrical connections to the element. It is recommended that all wires are labelled with the phase and circuit number. Cable ring terminals or ferrules, depending on which is appropriate, should be used on terminal connections.

The immersion heater should be connected with fixed wiring and all cables and components should be correctly sized for the amperage.

It is recommended that the base of the terminal should be held securely (using pliers or another appropriate tool) when tightening or loosening, to ensure that the connection will not shear off if over-tightened.

An all pole isolator with a separation of at least 3mm must be used. All immersion circuits and all control wiring to thermostats must be supplied from one isolator to ensure a single point of isolation. If multiple isolators or electrical supplies are used, a traffolyte label must be permanently fixed to the housing access door informing maintenance personnel that there are multiple points of isolation.

It is recommended that control and overheat thermostat devices each trip a separate switching device. For example, if the control thermostat switches the immersion heater via a contactor, then the overheat thermostat should shut off the immersion by tripping the breaker or another contactor. This protects against an unstoppable immersion heater in the event of a failed control contactor.

These appliances must be earthed. An internal earth connection is contained within the immersion heater terminal enclosure. Note that fuses, contactors, isolators and on/off switches must be supplied separately.

3. Mechanical Installation Diagram

REV.	RELEASE	CHANGES	LP	DATE	CH
0	REVISION BY COMPUTER ONLY	DO NOT SCALE OFF DRAWING		21/06/2022	

ADVECO
ADVECO LIMITED, PONDING WALL
15 PARKWOOD DRIVE, PARKWOOD VIC 3045
0348 008 6840
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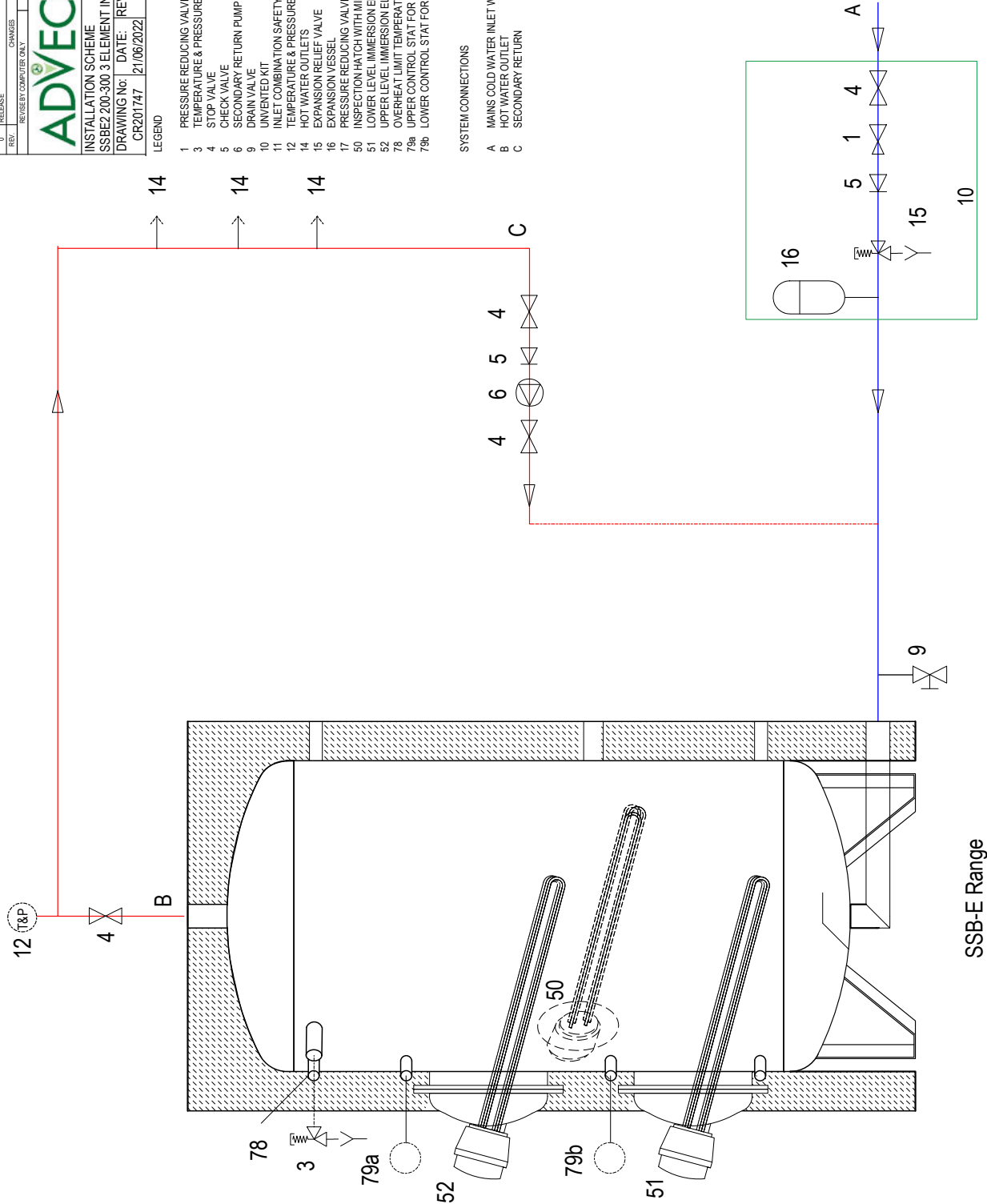
INSTALLATION SCHEME
SSBEZ 200-300 3 ELEMENT INSTALLATION
DRAWING No: CR201747 DATE: 21/06/2022 REVISION: 0 SCALE: N.T.S. SIZE: A2

LEGEND

- 1 PRESSURE REDUCING VALVE
- 3 TEMPERATURE & PRESSURE RELIEF VALVE
- 4 STOP VALVE
- 5 CHECK VALVE
- 6 SECONDARY RETURN PUMP
- 9 DRAIN VALVE
- 10 UNVENTED KIT
- 11 INLET COMBINATION SAFETY
- 12 TEMPERATURE & PRESSURE GAUGE
- 14 HOT WATER OUTLETS
- 15 EXPANSION RELIEF VALVE
- 16 EXPANSION VESSEL
- 17 PRESSURE REDUCING VALVE (OPTIONAL)
- 50 INSPECTION HATCH WITH MID LEVEL ELEMENT
- 51 LOWER LEVEL IMMERSION ELEMENT
- 52 UPPER LEVEL IMMERSION ELEMENT
- 78 OVERHEAT LIMIT TEMPERATURE THERMOSTAT
- 79a UPPER CONTROL STAT FOR 50, 52
- 79b LOWER CONTROL STAT FOR 51

SYSTEM CONNECTIONS

- A MAINS COLD WATER INLET WITH UNVENTED KIT
- B HOT WATER OUTLET
- C SECONDARY RETURN



SSB-E Range

4. Wiring Diagram: SSBE 200-300 with 2 immersion heaters

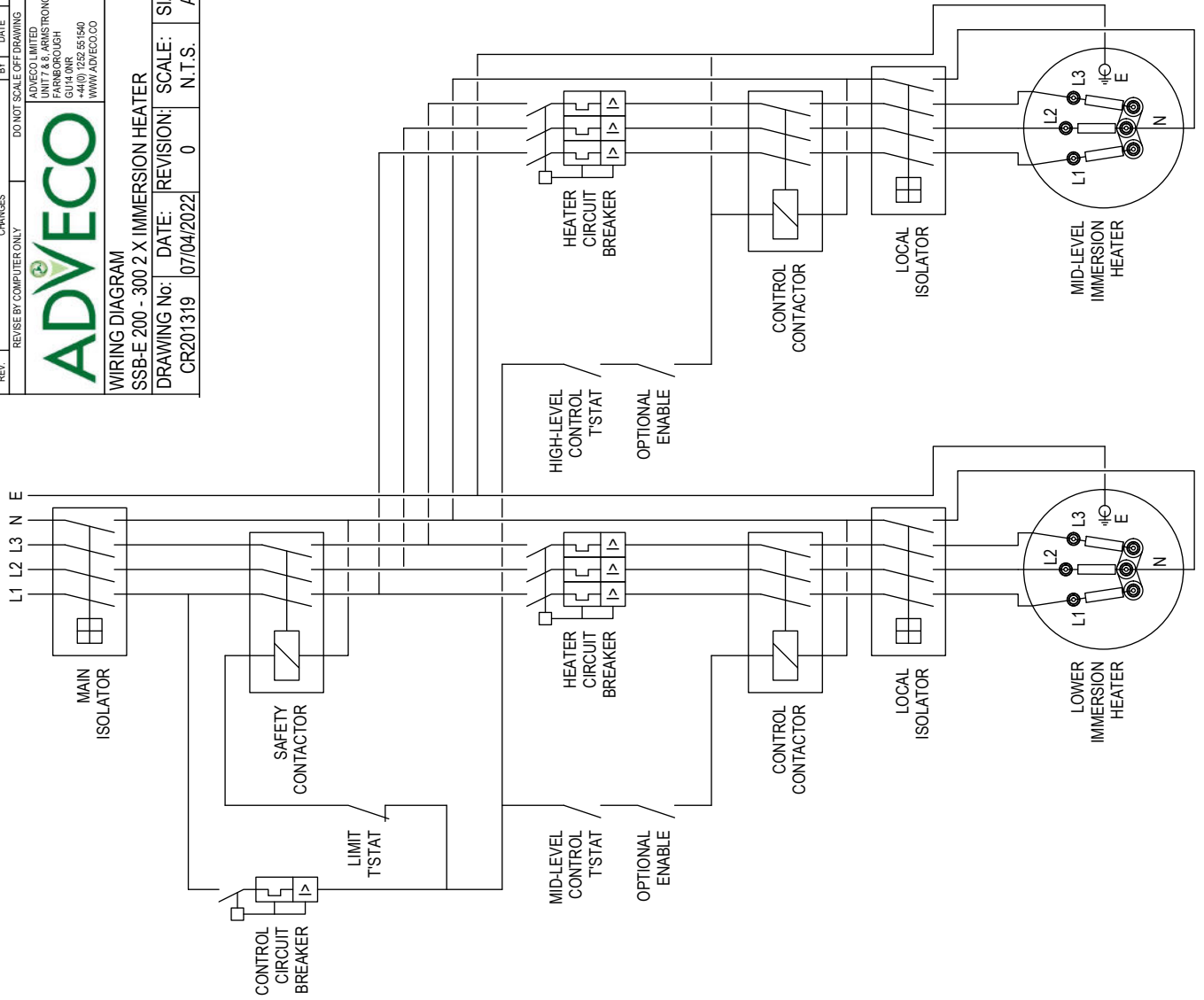
REV.	RELEASE	CHANGES	SB	BY	DATE	CH
0		REVISION BY COMPUTER ONLY	07/04/2022			

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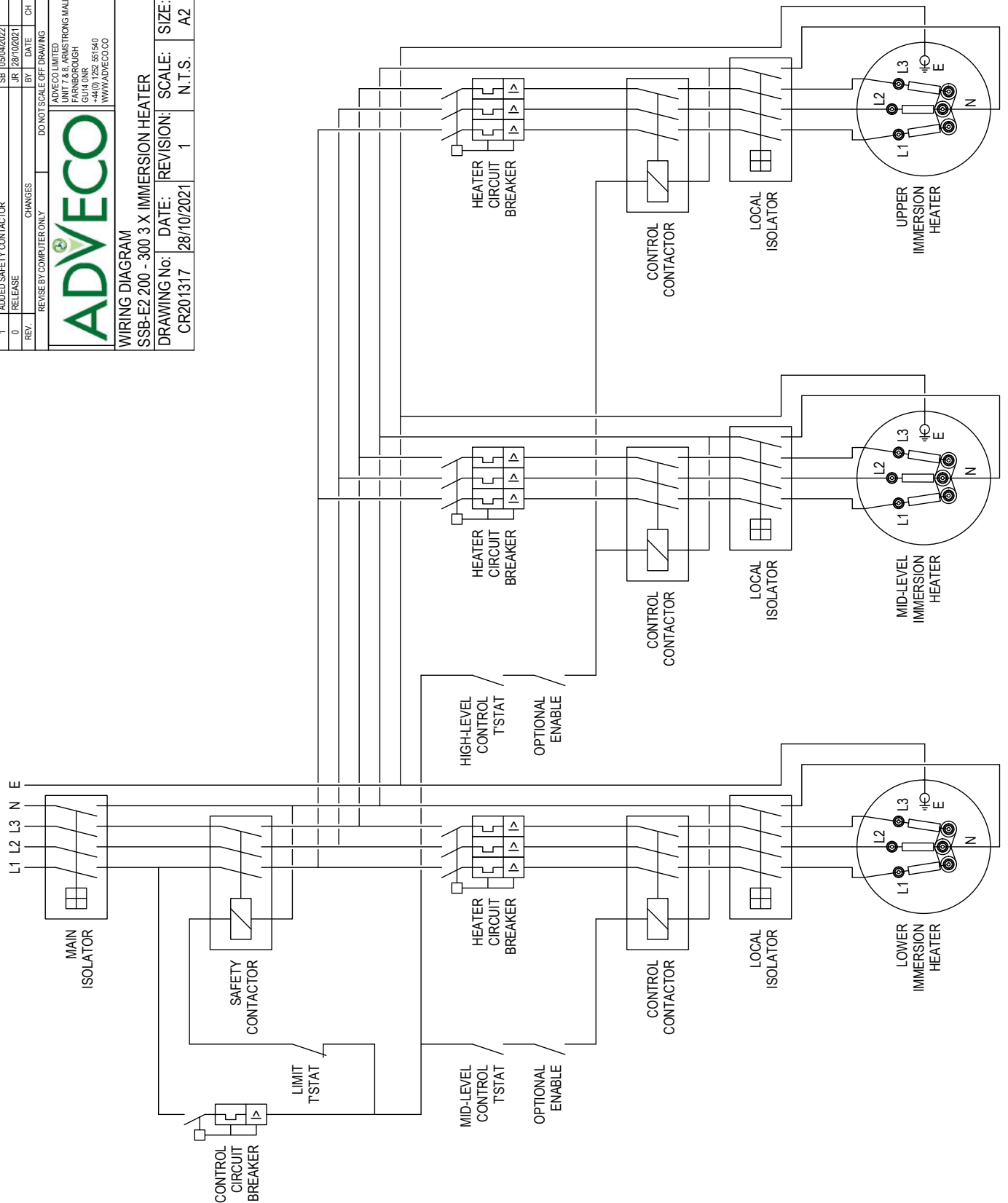
WIRING DIAGRAM
SSB-E 200 - 300 2 X IMMERSION HEATER

DRAWING No: CR201319 DATE: 07/04/2022 REVISION: 0 N.T.S. SCALE: SIZE: A2



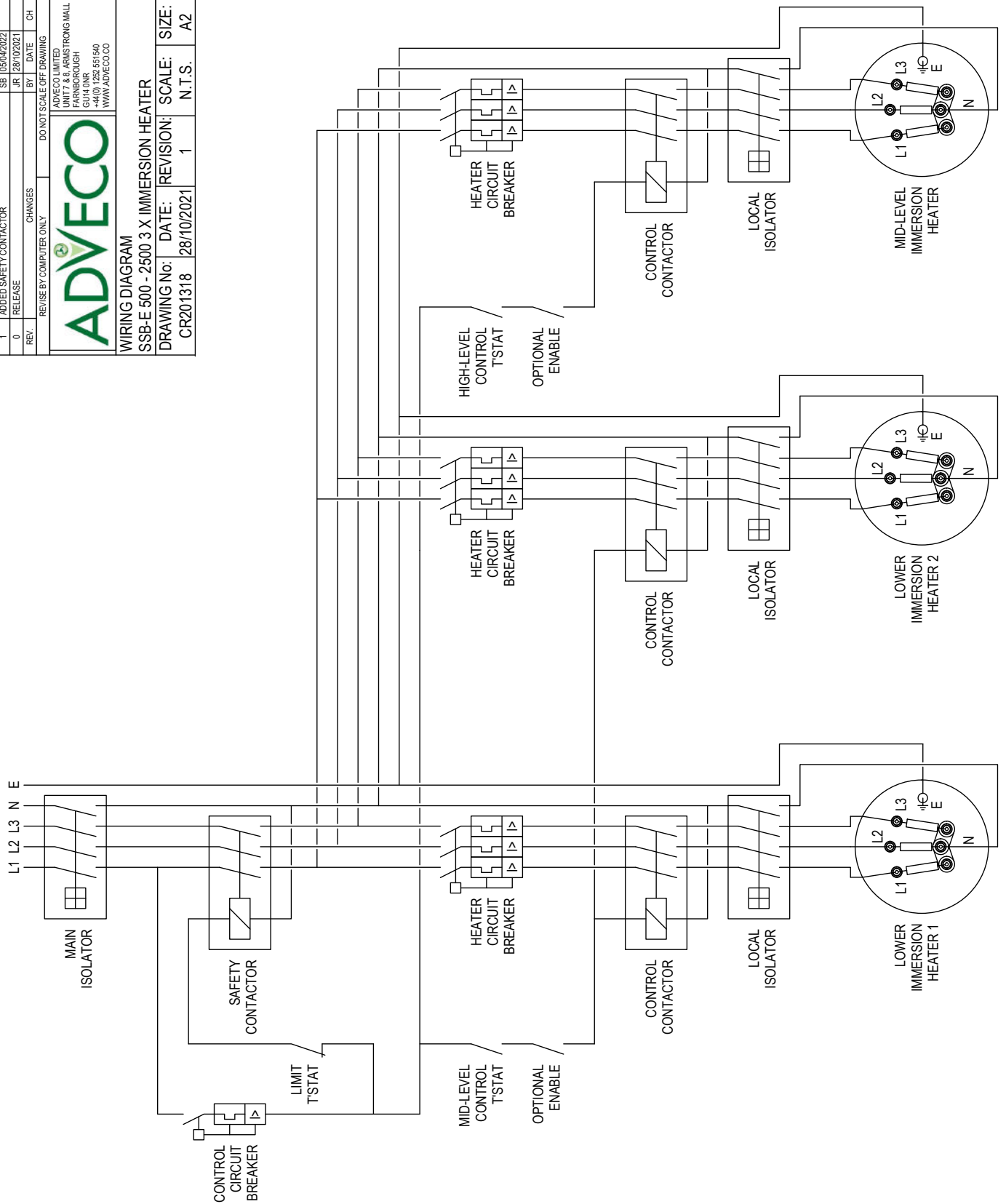
5. Wiring Diagram: SSBE2 200-300 with 3 immersion heaters

1	ADDED SAFETY CONTACTOR	SB	05/04/2022
0	RELEASE	IR	28/10/2021
REV.	CHANGES	BY	DATE
	REVISION	CH	
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ADVECO			
ADVECO LIMITED UNIT 7 & 8, ARMSTRONG MALL 100 WINDROUGH GUYAARD +44(0) 1252 551540 WWW.ADVECO.CO			
WIRING DIAGRAM SSB-E2 200 - 300 3 X IMMERSION HEATER DRAWING No: CR201317 DATE: 28/10/2021 REVISION: 1 SCALE: N.T.S. SIZE: A2			



6. Wiring Diagram: SSBE 500-2500 with 3 immersion heaters

1	ADDED SAFETY CONTACTOR	SB	05/04/2022
0	RELEASE	JR	28/10/2021
REV.	CHANGES	BY	DATE
REVISE BY COMPUTER ONLY			
DO NOT SCALE OFF DRAWING			
ADVECO			
ADVECO LIMITED UNIT 7 & 8, ARMS STRONG MALL 555 BROADBENT ROAD GUILDFORD GU14 0NR +44 (0) 1262 551540 WWW.ADVECO.CO			
WIRING DIAGRAM			
SSB-E 500 - 2500 3 X IMMERSION HEATER			
DRAWING No:	CR201318	DATE:	28/10/2021
REVISION:	1	SCALE:	N.T.S.
SIZE:	A2		



7. Wiring Diagram: SSBE2 500-2500 with 5 immersion heaters

