
P500 P500-A P500-A-WS P500-AS P500-AS-WS

Pass Through Warewasher

(YR2020 WK11)

Engineers Manual



CLASSEQ

Dear User,

This engineer's manual is for the Classeq Pass-through Warewasher range. It is intended to provide all the essential information required to diagnose any faults that may occur throughout the life of this product. This manual includes a description and diagram of the different systems available within the Pass Through range, information on the functions and capabilities, contingencies and alternate modes of operation, and step by step procedures for system access and use.

TABLE OF CONTENT

1.	INTRODUCTION	4	9.	CONTROL UNIT	23
1.1	Installation and commissioning	4	9.1	Inputs and Outputs	23
1.2	Service and repairs	4	9.2	Board Setup	24
1.3	Modification	4	10.	WASH PERFORMANCE	25
2.	SAFETY	4	10.1	Recommended chemicals	25
2.1	Symbols Used in this Manual	4	10.2	Recommended chemical dosing	25
2.2	Danger Warnings	4	10.3	Recommended Temperatures	25
2.3	Warnings	4	10.4	Troubleshooting	25
2.4	Cautions	4	11.	CABLE REPAIR KITS	27
3.	TOOLS LIST	4	11.1	Available Cable Kits List	27
4.	WATER SYSTEM	5		27	
4.1	Water ways	5	11.2	Cable Kit Information	27
4.2	Water ways legend	5	11.3	Cable Kit Diagram	27
4.3	P500 (Pressurised)	6	12.	QUICK REFERENCE	28
4.4	P500-A (Standard Air-break)	6	13.	MACHINE RATING	29
4.5	P500-A-WS (Standard Water Softener)	7	13.1	Element Ratings	29
4.6	P500-AS (AS Air Break)	7	13.2	Mains Cable Types	29
4.7	P500-AS-WS (AS Water Softener)	8	13.3	Mains Cable Specification	29
4.8	Water Softener Unit	8	14.	WIRING DIAGRAMS	30
5.	MACHINE SPECIFICATIONS	9	14.1	Std	30
5.1	Systems matrix	9	14.2	AS	31
5.2	Mechanical specifications/ site requirements	9	14.3	No Neutral	32
5.3	Electrical Components Specification	9	15.	USEFUL CONTACT DETAILS	33
5.4	Pump wiring	10	16.	NOTES	34
5.5	External Chemical Pump Signals	10			
5.6	Terminal Block Layout	11			
5.7	Terminal Block Configurations	11			
5.8	Contacting Wiring	12			
6.	LOGIC	14			
6.1	Indicator Logic	14			
6.2	Fill and Heat	14			
6.3	Wash and Rinse	15			
6.4	Drain	15			
6.5	Chemical Dosing	15			
6.6	Water Softener Unit	16			
7.	COMMISSIONING	17			
7.1	Commissioning/ Service Interface	17			
7.2	Commissioning Mode	17			
7.3	Setting Chemical Dosage	17			
7.4	Priming Chemicals	17			
7.5	Setting Water Hardness (if fitted)	17			
8.	SERVICE MODE	19			
8.1	Accessing Service Mode	19			
8.2	Program Value	19			
8.3	Heat Interlock Settings	19			
8.4	Reset to Factory Settings	20			
8.5	Statistics	20			
8.6	Loads	20			
8.7	Errors	21			

1. Introduction

Prior to reading this manual it is essential that you are familiar with the contents and subject matter covered by the "*Installation and Operation manual*".

1.1 Installation and commissioning

Installation and commissioning instructions are detailed in the "*Installation and Operation manual*" and should always be followed. Incorrect installation may invalidate any warranties.

1.2 Service and repairs

Repairs to the machine should only be carried out by a *Classeq* approved/trained technician using genuine *Classeq* parts. Failure to do so may invalidate any warranties.

1.3 Modification

Classeq reserves the right to modify the machine or the contents of this manual without notice.

2. Safety

2.1 Symbols Used in this Manual

The following symbols are used in this Manual:



DANGER!

Warning against potential serious or fatal injuries to persons if the described precautionary measures are not taken.



Warning!

Warning against potential minor injuries to persons or potential material damage if the described precautionary measures are not taken.



Caution

Warning against defects in or destruction of the product if the described precautionary measures are not taken.



Recycling instructions.



This symbol refers to a chapter with more detailed information

2.2 Danger Warnings



Unless the machine has been isolated from the supply there will always be potential for mains voltage to any components in the machine.

2.3 Warnings



DO NOT run the machine if there is no salt in the salt reservoir, as this will allow lime scale to build up, also any lime scale will invalidate your warranty.



DO NOT add any chemicals, such as detergent or rinse aid to the reservoir. These will cause damage to the machine.

2.4 Cautions



Only use granulated salt (*max. grain size 5 – 7 mm*). Salt tablets are not suitable.



If the reservoir cap is not properly secured, water and/or chemicals can leak in or out of the unit causing damage to the machine.



Repairs to the machine should only be done with the mains supply isolated.



Any changes made to P30 will not be saved if power to the machine is disrupted before completely exiting service mode.

3. Tools List

The below list of tools will allow access to all components within the machine:

Tool group	Description
Spanner/nut runner/ratchet	5.5mm
	7mm
	8mm
	13mm
Hex key	2mm
	3mm
	4mm
Posi screw driver	No. 2
	No. 3
Electrical testing	Ammeter (A)
	Capacitance meter (μF)
	Resistance meter (Ω)
	Continuity (\rightarrow)

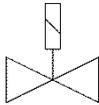
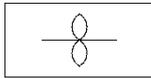
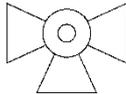
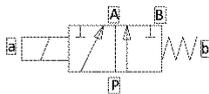
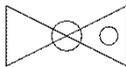
4. Water System

4.1 Water ways

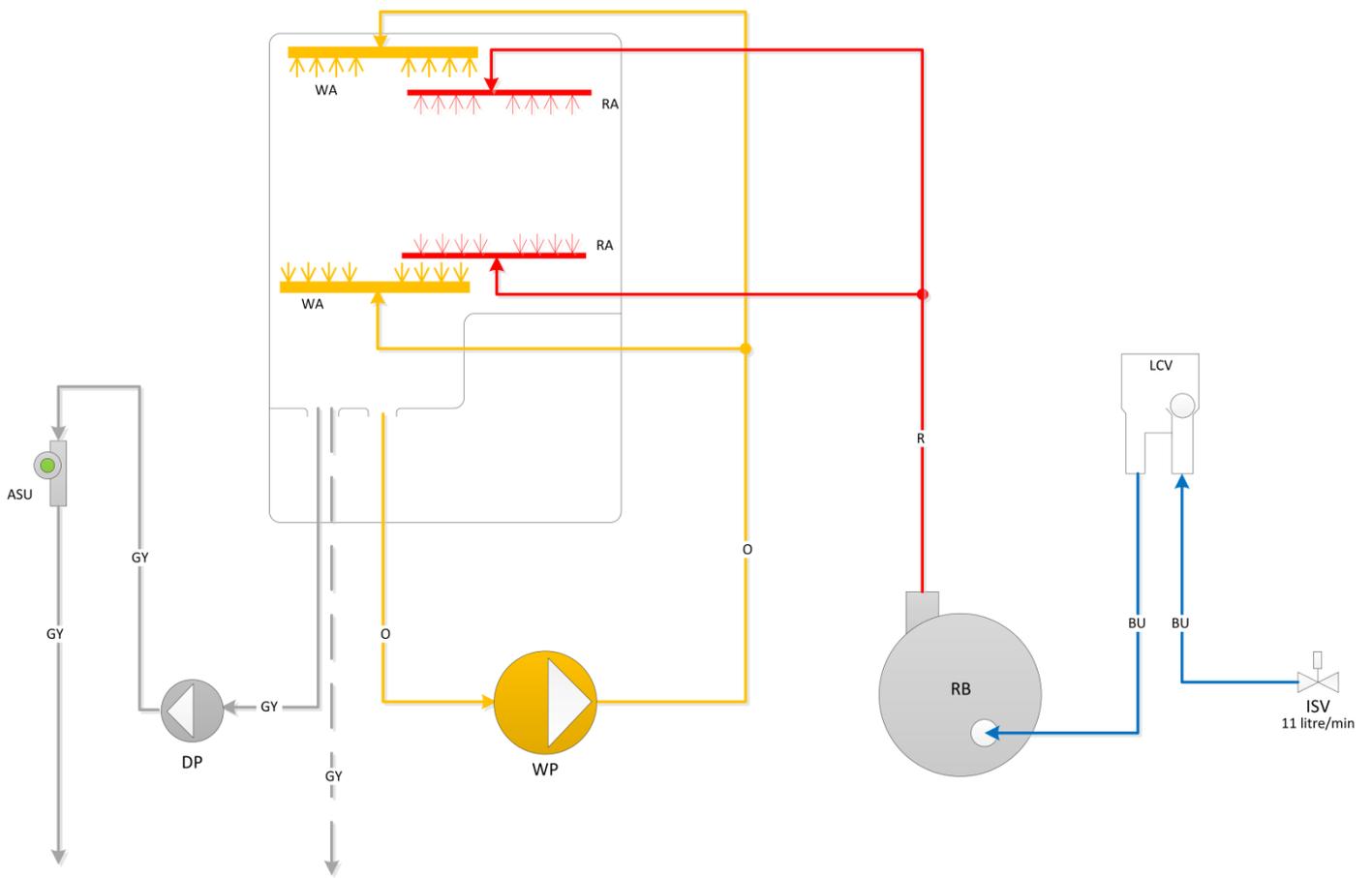
Detailed within this section are the water ways and system details for each of the Pass Through Warewashers.

Models	Description
P500	Pressurised System
P500-A	Standard Air Break System
P500-A-WS	Standard Water Softener System
P500-AS	AS Air Break System
P500-AS-WS	AS Water Softener System

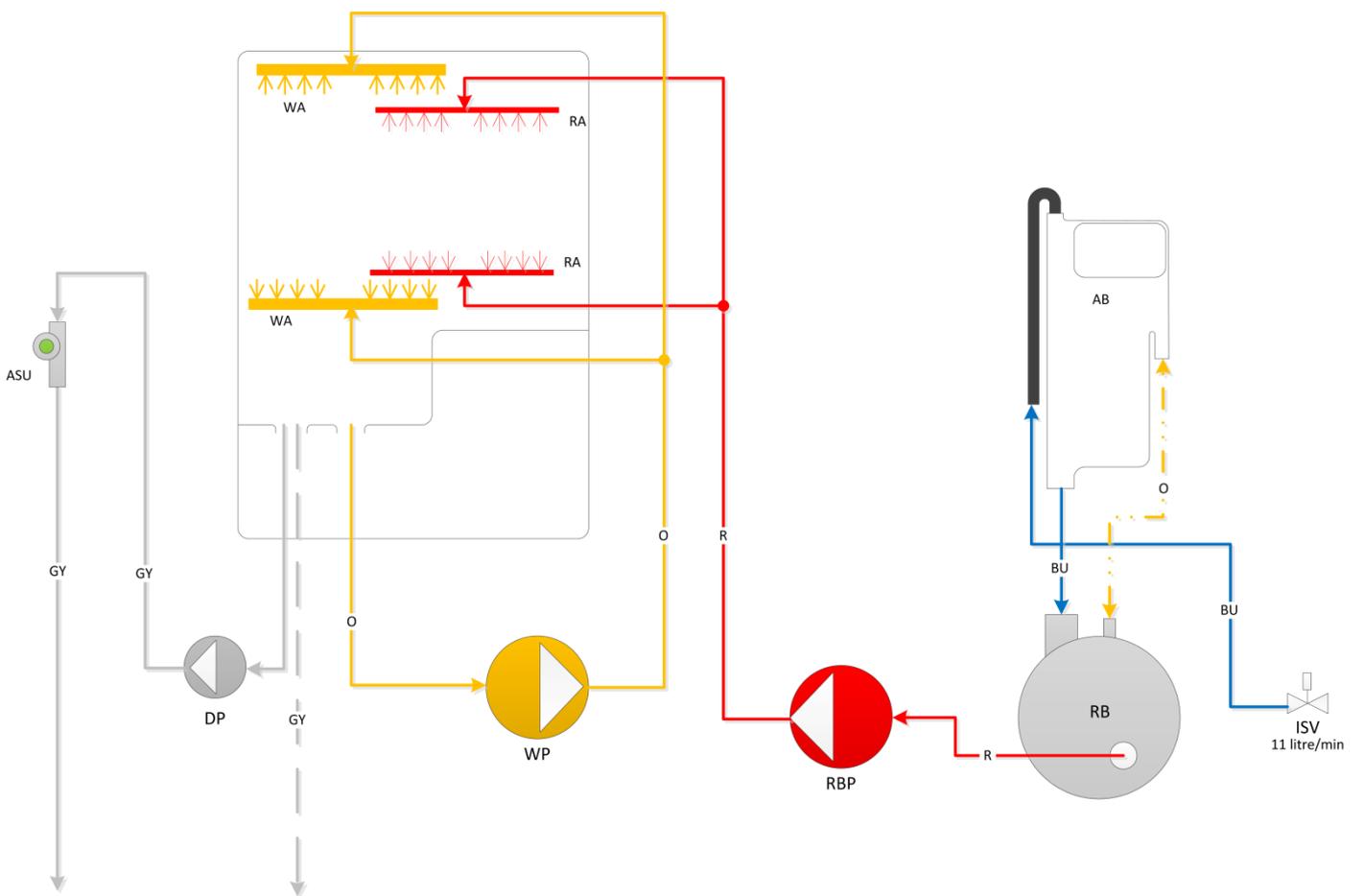
4.2 Water ways legend

Key	Description
ISV	Inlet solenoid valve
LCV	Lateral check valve
AB	WRAS approved type AB air gap
RB	Rinse tank
RBP	Rinse booster pump
WP	Wash pump
DP	Drain pump
RA	Rinse arm
WA	Wash arm
WSU	Water softener unit
NRV	Non-return valve
ASU	Anti-syphon unit
SR	Salt reservoir
Res	Resin chamber
	Solenoid valve
	Paddle sensor
	Ball valve
	Air gap
	Switching valve
	Non return ball valve
BU 	Incoming water
GR 	Softened water
R 	Rinse water
O 	Wash water
GY 	Waste water – Pumped drain
GY 	Waste water – Gravity drain
P 	Waste water – Water softener
O 	Breather

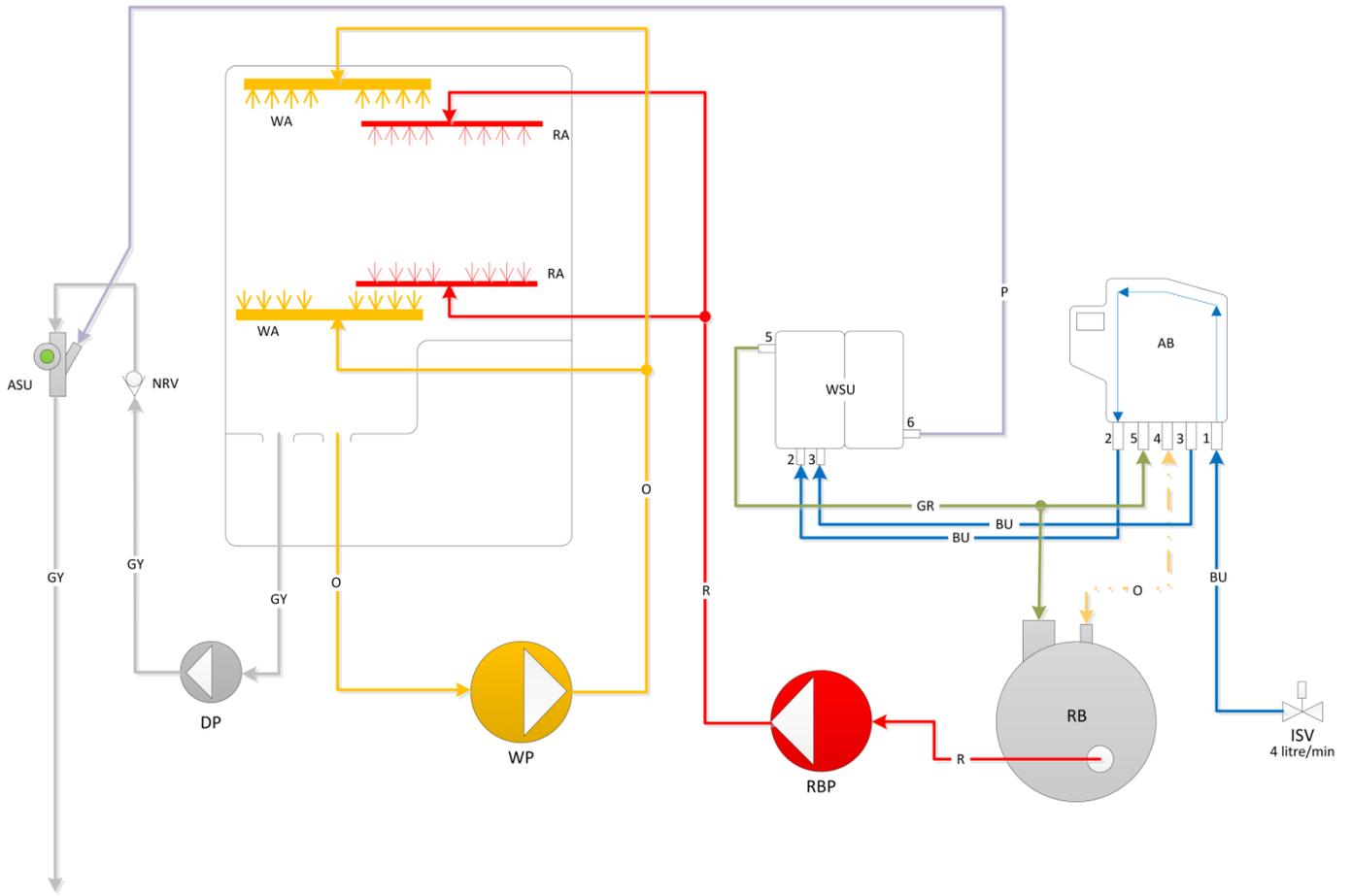
4.3 P500 (Pressurised)



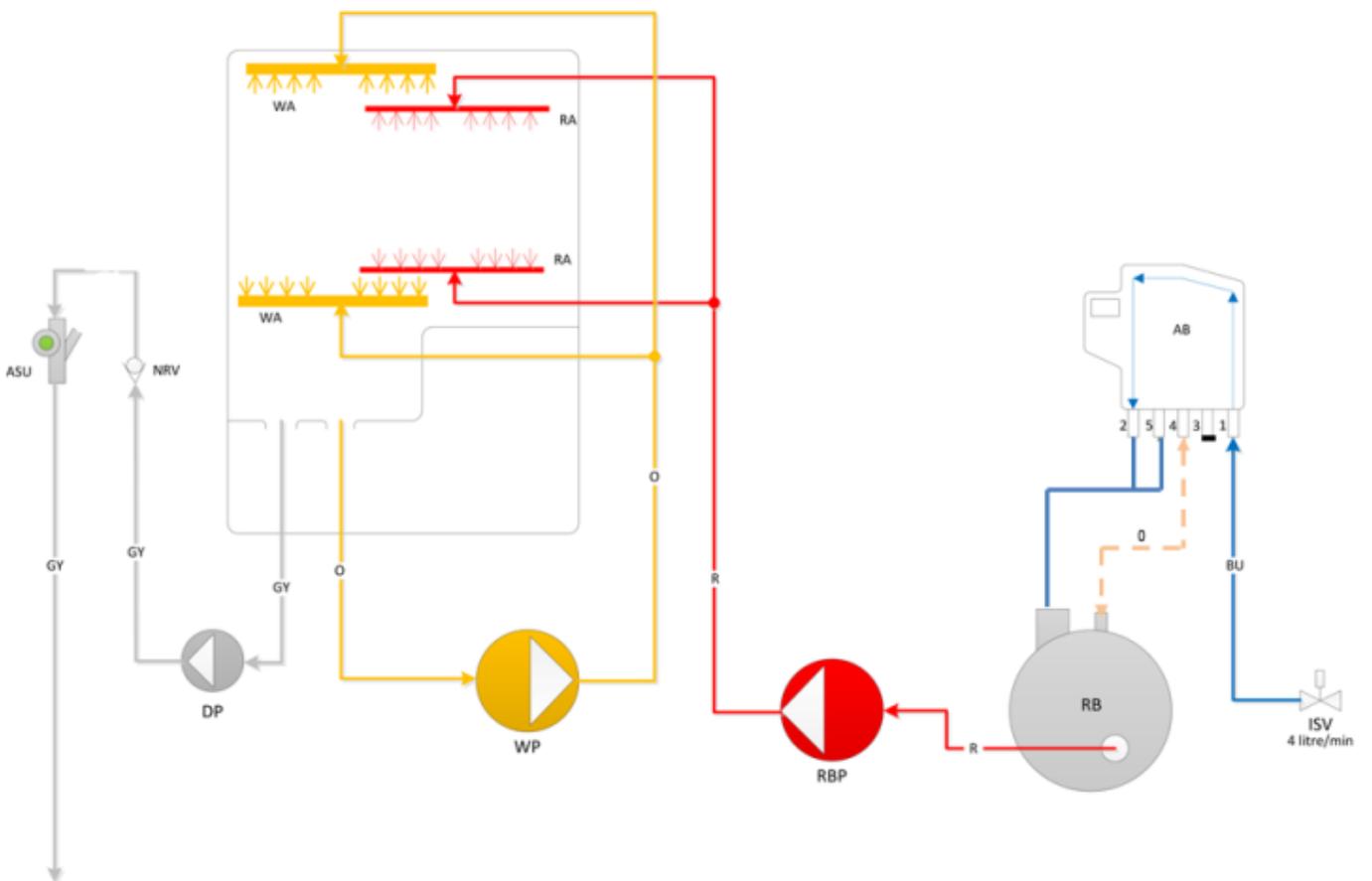
4.4 P500-A (Standard Air-break)



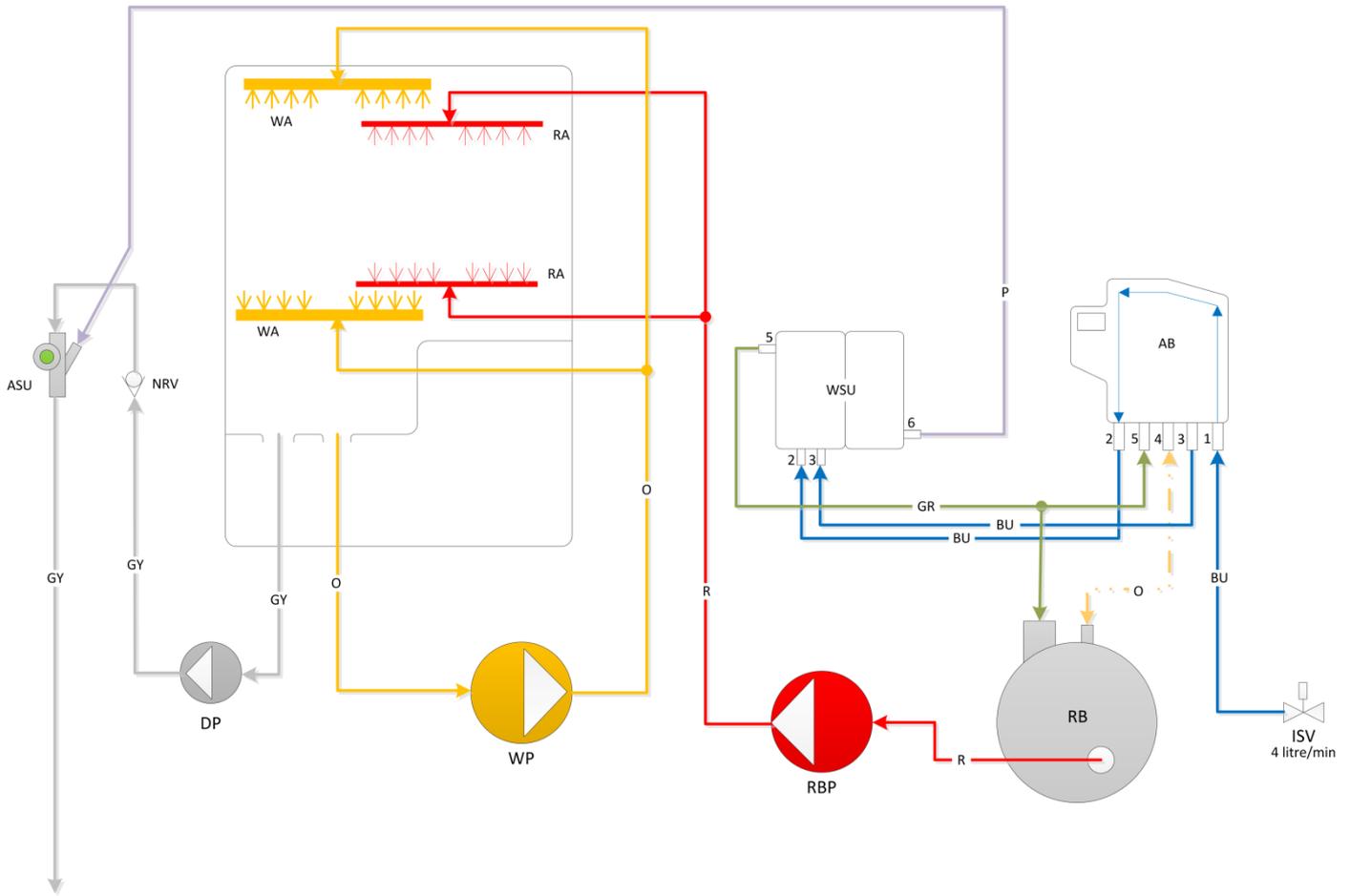
4.5 P500-A-WS (Standard Water Softener)



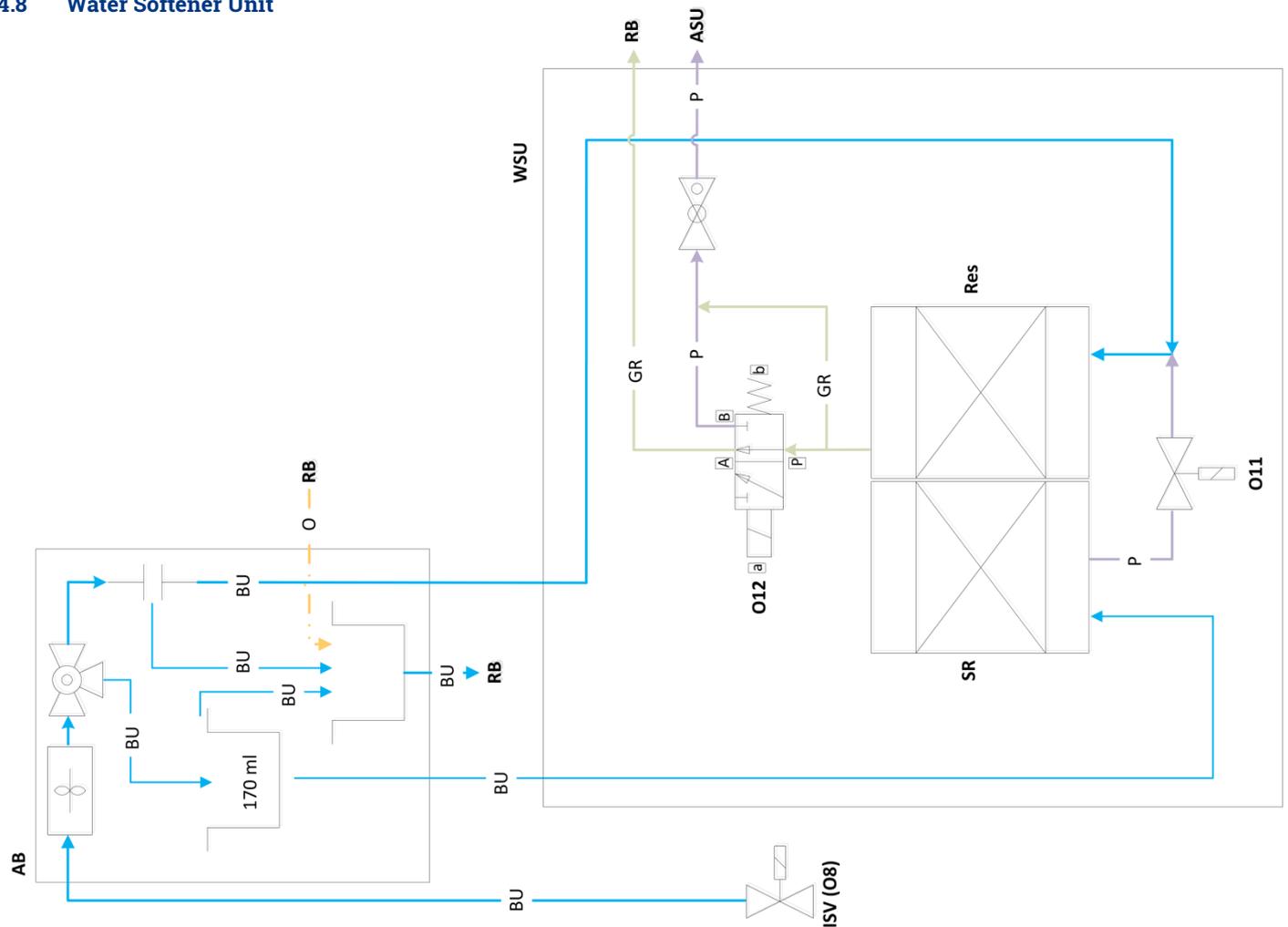
4.6 P500-AS (AS Air Break)



4.7 P500-AS-WS (AS Water Softener)



4.8 Water Softener Unit



5. Machine Specifications

5.1 Systems matrix

Below is a table describing the various electrical arrangements available for the different machine types.

Type	30A 1N~	12A 3N~	16A 3N~	22A 3N~	17A *3~
P500	●	◐	◐	○	●
P500 A	●	◐	◐	○	◐
P500 AS	○	○	○	●	○

- - Standard
- ◐ - Optional
- - Not available

Below is a table describing the various system specifications available for the different machine types.

Type	Rinse pump	WRAS approved air gap	Inbuilt Water softener	Drain pump
P500	○	○	○	●
P500 A	●	●	◐	●
P500 AS	●	●	◐	●

5.2 Mechanical specifications/ site requirements

For details on machine dimensions and site requirements refer to the **"Installation and Operation manual"** for the machine.

5.3 Electrical Components Specification

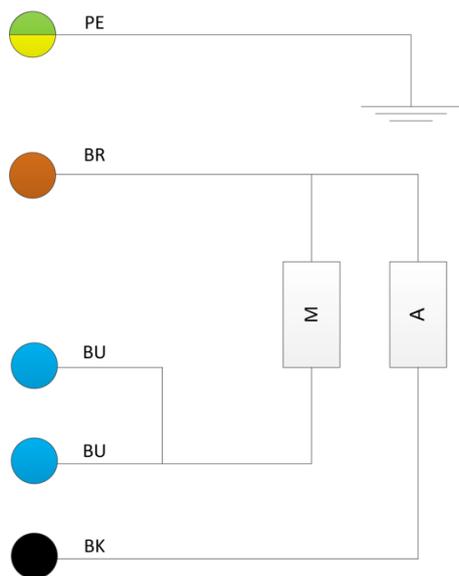
The table below indicates the electrical components in the machines and their electrical specifications

Component		Voltage range (V)	Frequency (Hz)	Current (A)	Power (W)	Resistance (Ω)
Inlet solenoid		220-240	50/60	0.026	6	4110
Rinse element	6000	220-240	50/60	8.68 /leg 20.09 Total	3 x 2000	27.5 / leg
	8640			12.52 / leg 37.57 Total	3 x 2880	21 / leg
Rinse pump		220-240	50	0.7	190	M - 32.2 A - 43.3
		220-240	60	0.66	146	M - 26.78 A - 34.8
Wash element		220-240	50/60	5.87 /leg	4000	39.18 / leg
Wash pump		220-240	50	2.55	580	M - 9.52 A - 18.97
		220-240	60	2.42	550	M - 8.06 A - 16.11
Drain pump		220-240	50	0.2	30	145.1
		208-240	60	0.15	32	76
Contactors		220-240	50/60	0.27	60	n/a
Detergent pump		220-240	50/60	0.03	8	3180
Rinse aid pump		220-240	50/60	0.03	8	3180

5.4 Pump wiring

5.4.1 Windings

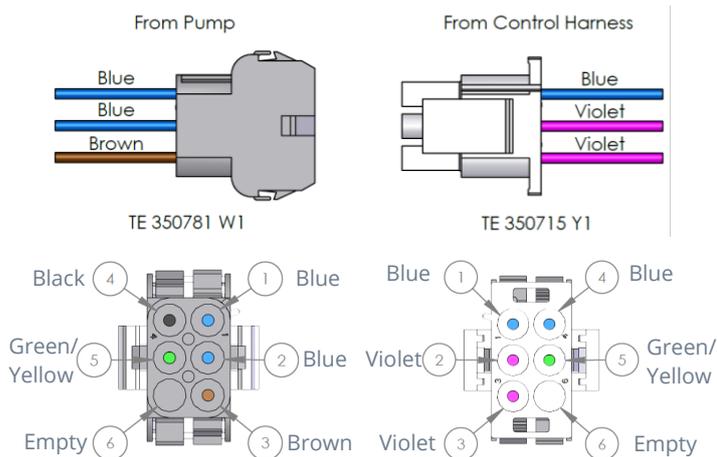
The windings of the wash and rinse pumps are wired to the plug as below:



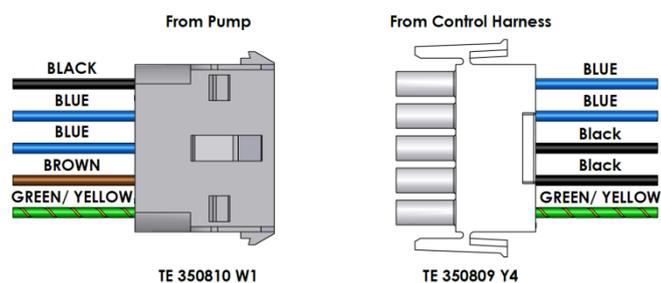
Winding legend

Key	Description
M	Main winding
A	Auxiliary winding
PE	Earth wire (Green and Yellow)
BU	Blue wire
BK	Black wire

5.4.2 Rinse Pump Connector

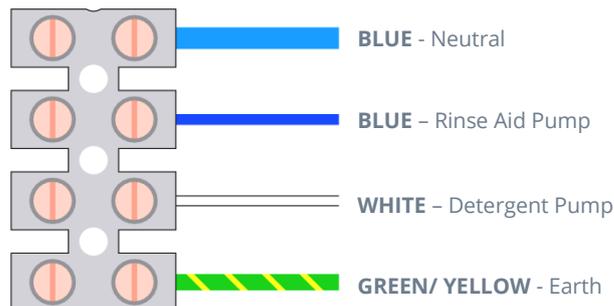


5.4.3 Wash Pump Connector



5.5 External Chemical Pump Signals

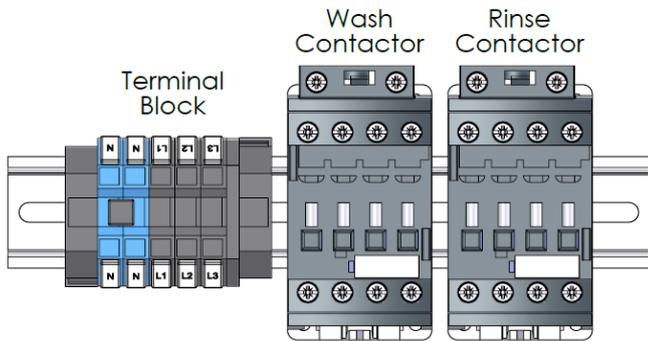
The external chemical signals terminal block is located on the centre rail next to the heating contactors inside the machine.



The signals provided are triggered by the dosing rates set in the 'Commissioning Menu' (▶ 7.3). The dosing rates stated in the Menu may differ depending on the pump flow rate.

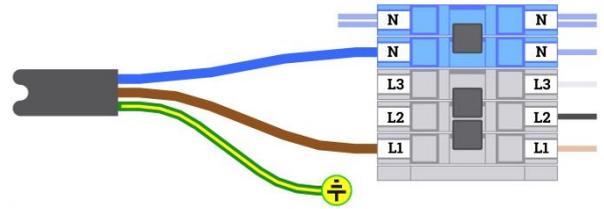
5.6 Terminal Block Layout

5.6.1 P500, P500-A & P500-A-WS

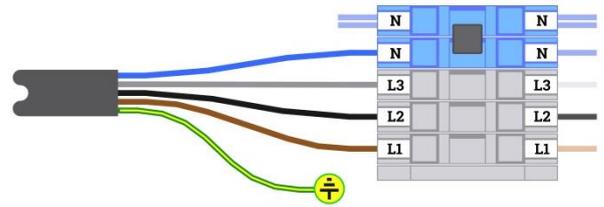


5.7 Terminal Block Configurations

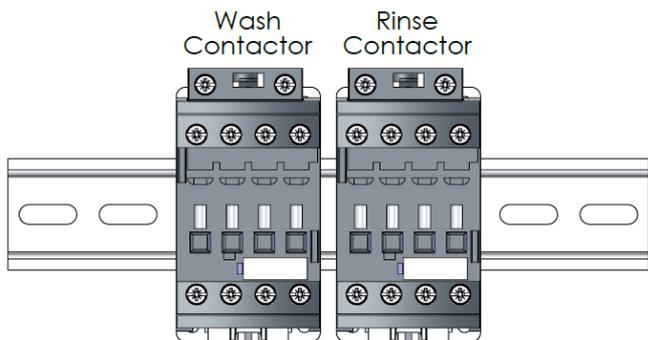
5.7.1 1Phase 30Amp



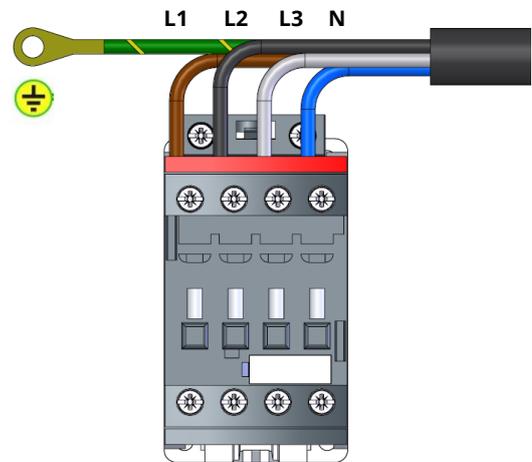
5.7.2 3Phase 12Amp / 16Amp



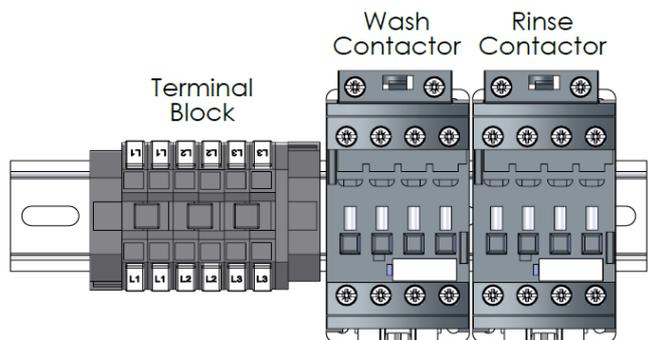
5.6.2 P500-AS & P500-AS-WS



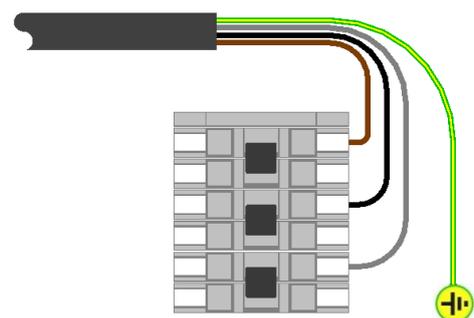
5.7.3 3Phase 22Amp



5.6.3 P500, P500-A & P500-A-WS (No Neutral)

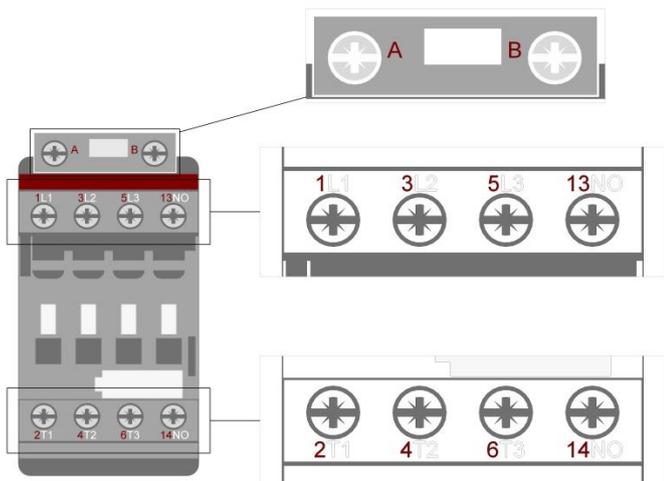


5.7.4 3Phase 17Amp (No Neutral)



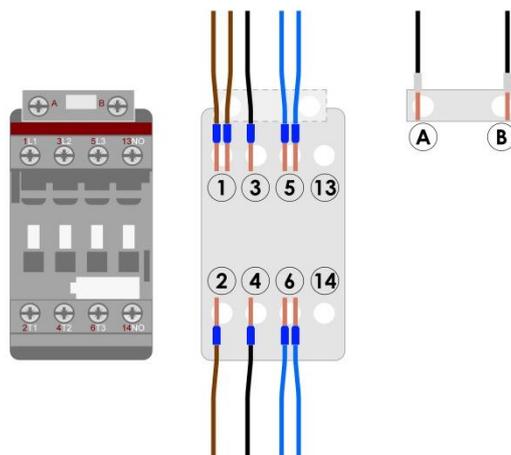
5.8 Contactor Wiring

The contactors on the both heating elements are labelled as below;



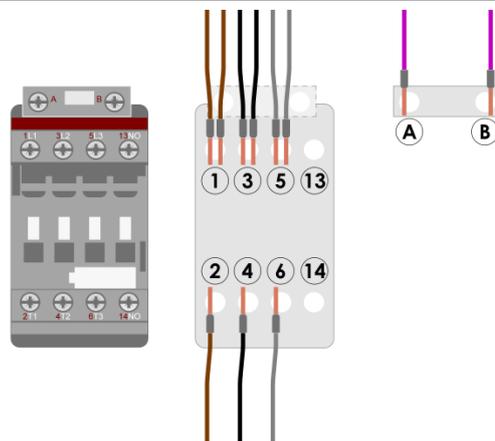
5.8.1 P500, P500-A & P500-A-WS

Wash Contactor



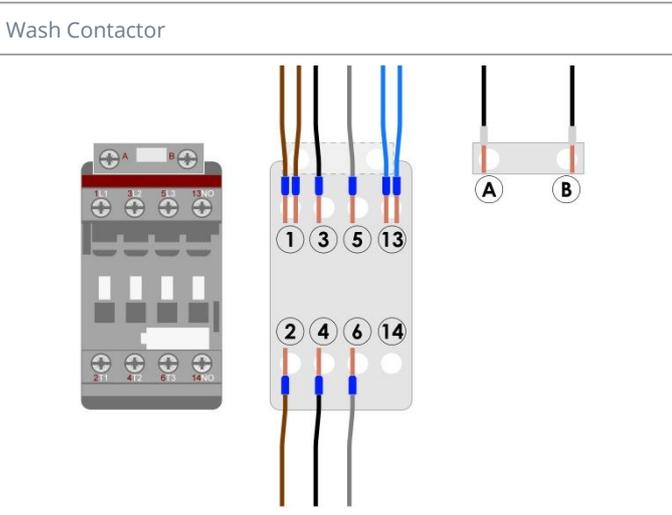
Position	1	3	5	13	A
Wire Colour	2x Brown	1x Black	2x Blue	None	1x Black
Crimp Colour	2x Blue	1x Blue	2x Blue	None	1x White
Position	2	4	6	14	B
Crimp Colour	1x Blue	1x Blue	2x Blue	None	1x White
Wire Colour	1x Brown	1x Black	2x Blue	None	1x Black

Rinse Contactor



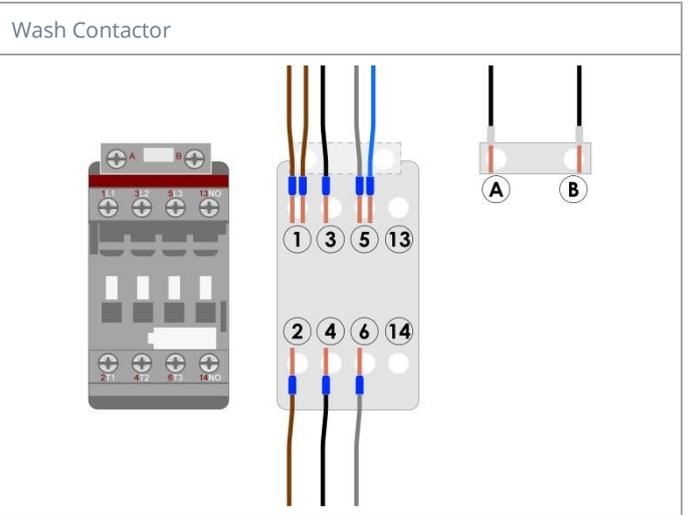
Position	1	3	5	13	A
Wire Colour	2x Brown	2x Black	2x Grey	None	1x Purple
Crimp Colour	2x Grey	2x Grey	2x Grey	None	1x White
Position	2	4	6	14	B
Crimp Colour	1x Grey	1x Grey	1x Grey	None	1x White
Wire Colour	1x Brown	1x Black	1x Grey	None	1x Purple

5.8.2 P500-AS & P500-AS-WS



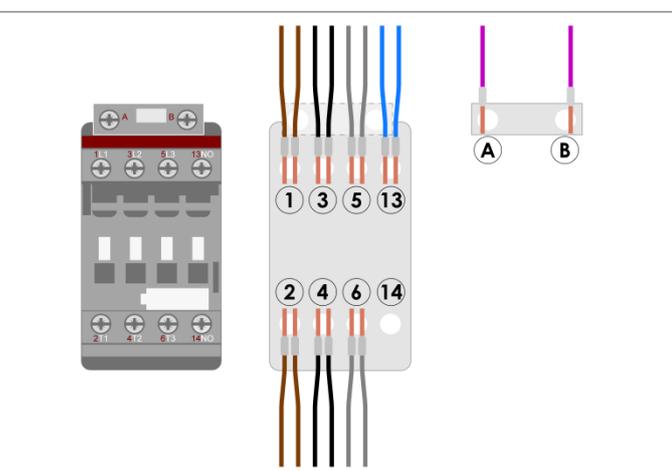
Position	1	3	5	13	A
Wire Colour	2x Brown	1x Black	2x Blue	2x Blue	1x Black
Crimp Colour	2x Blue	1x Blue	2x Blue	2x Blue	1x White
Position	2	4	6	14	B
Crimp Colour	1x Blue	1x Blue	1x Blue	None	1x White
Wire Colour	1x Brown	1x Black	1x Grey	None	1x Black

5.8.3 P500,P500-A & P500-A-WS (No Neutral)



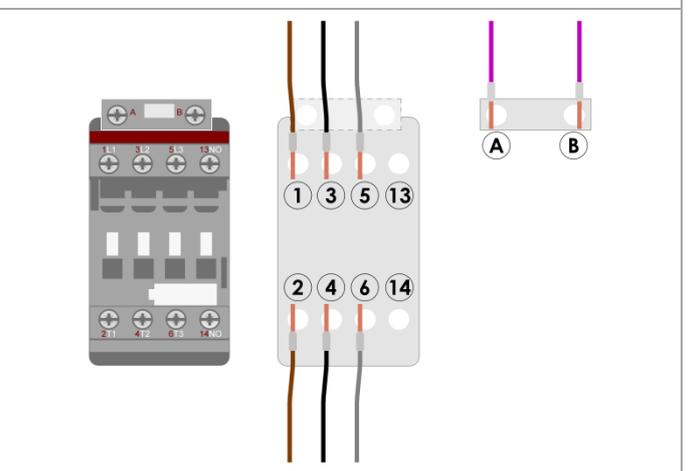
Position	1	3	5	13	A
Wire Colour	2x Brown	1x Black	1x Grey 1x Blue	None	1x Black
Crimp Colour	2x Blue	1x Blue	2x Blue	None	1x White
Position	2	4	6	14	B
Crimp Colour	1x Blue	1x Blue	1x Blue	None	1x White
Wire Colour	1x Brown	1x Black	1x Grey	None	1x Black

Rinse Contactor



Position	1	3	5	13	A
Wire Colour	2x Brown	2x Black	2x Grey	2x Blue	1x Purple
Crimp Colour	2x Grey	2x Grey	2x Grey	2x Grey	1x White
Position	2	4	6	14	B
Crimp Colour	2x Grey	2x Grey	2x Grey	None	1x White
Wire Colour	2x Brown	2x Black	2x Grey	None	1x Purple

Rinse Contactor



Position	1	3	5	13	A
Wire Colour	1x Brown	1x Black	1x Grey	None	1x Purple
Crimp Colour	1x Grey	1x Grey	1x Grey	None	1x White
Position	2	4	6	14	B
Crimp Colour	1x Grey	1x Grey	1x Grey	None	1x White
Wire Colour	1x Brown	1x Black	1x Grey	None	1x Purple

6. Logic

6.1 Indicator Logic



Item	Description
1	Heating indicator
2	Cycle indicator

6.1.1 Heating Indicator

This will illuminate **GREEN** only when following condition is achieved:

- Wash tank water level full
- Rinse tank water level full

Refer (► 8.2) for more options.

If one of these has not been achieved the indicator will flash **AMBER** to indicate that the machine has not achieved these.

6.1.2 Cycle Indicator

This will illuminate **BLUE** when a cycle has been requested. The cycle will then start when the above interlock requirements have been achieved. This will also flash **BLUE** during the drain process.

In certain serious error conditions (► 8.5) this indicator will illuminate **RED** and the machine will turn off.

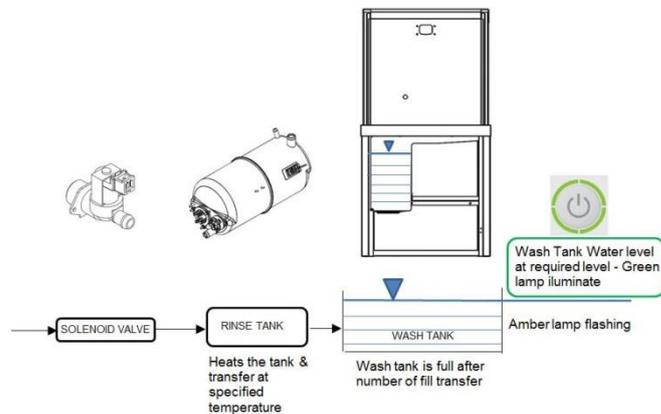
6.2 Fill and Heat

6.2.1 Pressurized Fill and Heat

Pressurised machines fill and rinse using the solenoid valve and site water pressure. These machines will fill in the following manner:

- 1) Activate solenoid valve until the wash air pressure sensor reads a minimum level.
- 2) Heat the rinse tank to a specified transfer temperature; this is lower than the rinse temperature to ensure that the wash tank is not too hot after the fill cycle.
- 3) Activate the solenoid valve to transfer water through the rinse tank to the wash tank for a specified time.
- 4) Repeat steps 1 to 3 until the wash tank is full.
- 5) Once wash tank water level is achieved, **GREEN** lamp should illuminate.
- 6) In the background machine will continue to heat until the rinse boiler and wash tank have both reached the specified temperatures.

The following flow diagram shows a representation of this.

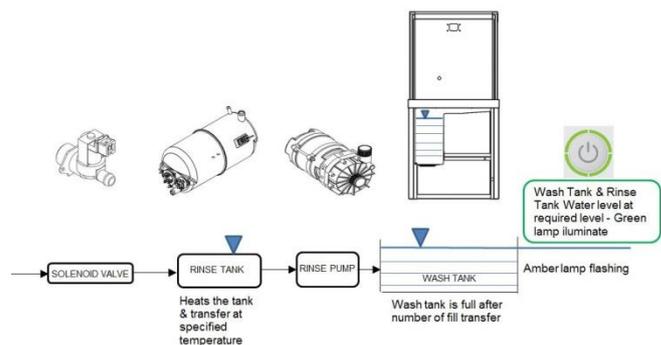


6.2.2 Unpressurized Fill and Heat

Unpressurised (air gap) machines fill and rinse using a rinse booster pump; this means that the rinse is not reliant on the incoming water pressure. These machines fill in the following manner:

- 1) Activate solenoid valve to fill rinse tank.
- 2) When rinse tank has reached the minimum level it will start to heat to a specified transfer temperature; this is lower than the rinse temperature to ensure that the wash tank is not too hot after the fill cycle.
- 3) Activate the rinse booster pump to transfer water for a specified time.
- 4) Repeat steps 1 to 3 until the wash tank is full.
- 5) Once the wash tank has reached a minimum level this will begin to heat if required while the rinse tank is refilling.
- 6) On machines with water softeners fitted the machine will calculate the volume of water that has passed through the unit and activate the regeneration process as required.
- 7) Once wash tank water level and Rinse tank water level is achieved, **GREEN** lamp will illuminate.
- 8) In the background machine will continue to heat until the rinse boiler and wash tank have both reached the specified temperatures.

Below is a flow diagram to represent this.

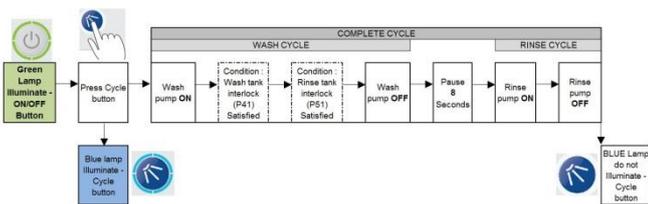


6.3 Wash and Rinse

If a cycle is requested when the machine is in standby the wash and rinse, process on all machines, follow the below procedure:

- 1) **BLUE** lamp is illuminate on cycle indicator.
- 2) Starts the wash cycle with wash pump activated. Soft start runs for first 6 seconds.
- 3) Once the wash tank and rinse tank has achieved the interlock temperature (P41&P51) and the wash time has elapsed, Wash pump will be deactivated. If the interlock temperature are not satisfied during wash cycle time than it will extend the wash cycle till it has achieved it.
- 4) There is a pause of 8 seconds to allow the wash tank water to drip down back in wash tank.
- 5) Completes the rinse cycle for the specified time (P60) with activation and deactivation of Rinse pump.
- 6) There is a short pause after the rinse to allow water to drip down then the Cycle indicator will turn off.

Below is a flow diagram to represent this.



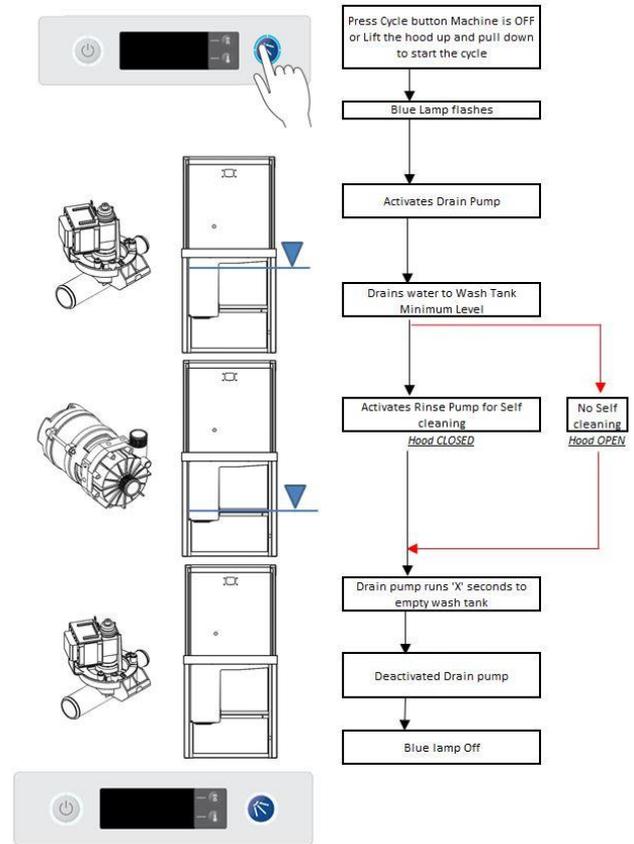
Refer (► 8.1) & (► 8.2) for more information on Parameters P41 & P51 and interlock options. Please note if condition for either P41 or P51 not met during specific wash cycle time than it will extend the wash cycle time till it satisfies the conditions.

6.4 Drain

The drain of the machine functions in two ways:

1. It monitors the water level in the wash tank and drains away any excess water at any time.
2. If the machine is turned off and the drain cycle is selected, this function will follow the below process:
 - a. Start draining the machine. **BLUE** lamp flashes to indicate drain cycle.
 - b. Once the water reaches the minimum level in the wash tank an "Assisted clean" function will transfer water from the rinse boiler in the same fashion as it fills while continuing to drain (If the door is open at this time the "Assisted clean" will be cancelled).
 - c. Once the wash tank reaches a minimum level again it activates a timer to drain out the remaining water.

Drain flow diagram to represent this.



6.5 Chemical Dosing

The machine doses chemical at two different stages:

1. While filling the machine:
 - a. The detergent is dosed into the wash tank with each transfer. At the end of the fill the rinse aid is dosed into the rinse tank.
2. While cycling the machine:
 - a. When a cycle is selected the detergent will dose into the wash tank. This will not occur on the first cycle after filling the machine.
 - b. After each cycle the rinse aid is dosed into the rinse boiler for the amount of water used.

6.6 Water Softener Unit

On machines with the integral water softener fitted the machine will monitor the amount of water passing through the resin of the softener unit and regenerate at intervals required by the water hardness setting.

The regeneration process passes salt water into the resin, allows a contact period for the salt to 'scrub' the resin then flushes this salt water out the waste.



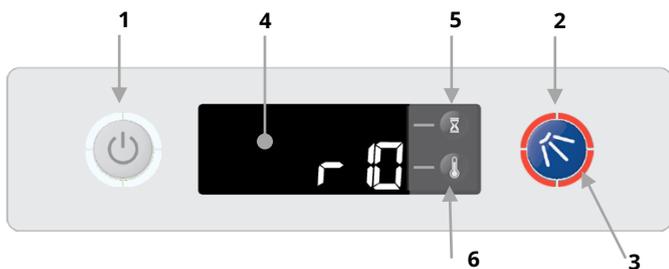
Re-fill salt indicator will flash to indicate water softener needs salt re-filling. For Salt specification and unit installation refer to operation manual for more information.

Below is the timing for this function of the water softener unit.

Function	Rinse until resin exhausted	Pause	Salt to resin	Pause	Pressurise	Regen (Contact)	Pause	Flush	Pause
Time		3s	25s	3s	1.5s	20s	3s	20s	3s
ISV (O8)									
WS salt valve (O11)									
WS waste valve (O12)									

7. Commissioning

7.1 Commissioning/ Service Interface



Item	Description
1	Exit button
2	Enter button
3	Cycle indicator
4	Display
5	Up button
6	Down button

7.2 Commissioning Mode

With the machine turned on at the mains electrical supply but off at the display, press and hold the Exit (1) and Enter (2) buttons for 3sec. the DISPLAY (4) will show the first menu item and the cycle indicator (3) will illuminate red.

If no buttons have been pressed for a period of time the machine will cancel this mode and return to the off state.

Below is the complete menu list.

Display	Description	Units
r**	Rinse aid setting (e.g. 15 = 1.5ml/L)	0.1 x ml/L
rP0	Rinse aid prime	0 = Off 1 = On
d**	Detergent setting (e.g. 33 = 3.3ml/L)	0.1 x ml/L
dP0	Detergent prime	0 = Off 1 = On
h**	Water softener setting (if fitted)	°dH

** Refers to the setting of the chemical dosing. For example the default setting for rinse aid is 0.5ml of chemical per litre of water this will be displayed as 'r05' the default setting for detergent is 3ml of chemical per litre of water this will be displayed as 'd30'

7.3 Setting Chemical Dosage

1. Enter commissioning mode (▶7.2).
2. Using the UP and DOWN keys (5 & 6), scroll to the rinse aid setting menu item (r**) and press ENTER (2).
3. The display will flash.
4. Use the UP and DOWN keys (5 & 6) to scroll to the required setting and press ENTER (2).
5. Using the UP and DOWN keys (5 & 6), scroll to the

- detergent setting menu item (d**) and press ENTER (2).
6. The display will flash.
7. Use the UP and DOWN keys (5 & 6) to scroll to the required setting and press ENTER (2).
8. Press EXIT (1) until you are out of commissioning mode.

7.4 Priming Chemicals

Before the machine can be used the chemical tubes will need to be filled with chemicals, in order to do this you will need to follow the below instructions to prime the chemical pumps.

1. Enter commissioning mode (▶7.2).
2. Using the UP and DOWN keys (5 & 6), scroll to the rinse aid prime menu item (rP0) and press ENTER (2)
3. The display will flash and will change to rP1.
4. This will continually run the rinse aid pump for a maximum of 12 minutes and draw chemicals into the machine. When the chemicals have reached the back of the machine press ENTER (2) again to stop the pump.
5. The display will stop flashing and return to rP0.
6. Using the UP and DOWN keys (5 & 6), scroll to the detergent prime menu item (dP0) and press ENTER (2)
7. The display will flash and will change to dP1.
8. This will continually run the detergent pump for a maximum of 2 minutes and draw chemicals into the machine. When the chemicals have reached the back of the machine press ENTER (2) again to stop the pump.
9. The display will stop flashing and return to dP0.
10. Press EXIT (1) until you are out of commissioning mode.

7.5 Setting Water Hardness (if fitted)

7.5.1 Commissioning the Water Softener Unit

To commission the water softener unit follow the instructions below:

1. Lift the hood up.
2. Remove the basket ramp.
3. Open the salt reservoir cap at the front right hand corner of the wash tank.
4. Fill the reservoir with fresh water.
5. Using the salt funnel supplied fill the reservoir with approximately 1.5kg of granulated salt.
6. Wipe away any excess or spilt salt from the cabinet and the reservoir opening.
7. Refit the cap to the reservoir, ensure that the cap is fitted flat and secure.



 Warning	<p>DO NOT run the machine if there is no salt in the salt reservoir, as this will allow lime scale to build up, also any lime scale will invalidate your warranty.</p> <p>DO NOT add any chemicals, such as detergent or rinse aid to the reservoir. These will cause damage to the machine.</p>
 Caution	<p>Only use granulated salt (<i>max. grain size 5 – 7 mm</i>). Salt tablets are not suitable.</p> <p>If the reservoir cap is not properly secured, water and/or chemicals can leak in or out of the unit causing damage to the machine.</p>

7.5.2 Setting Water Softener

Check the water hardness of your water supply (°d). Once you have this data follow the steps below.

1. Enter commissioning mode (► 7.2)
2. Using the UP and DOWN keys (5 & 6), scroll to the water hardness menu item (h**) and press ENTER (2).
3. The display will flash.
4. Use the UP and DOWN keys (5 & 6) to scroll to the setting you require and press ENTER (2).
5. Press EXIT (1) until you are out of commissioning mode.

7.5.3 Hardness Settings

Water softener setting	°dH	°e / °clark	°fH	ppm	Water volume	No of cycles
h00	Deactivated					
h01	1	1.3	1.8	18	48.1 L	16
h02	2	2.5	3.6	36	45.7 L	15
h03	3	3.8	5.4	54	43.4 L	14
h04	4	5.0	7.2	71	41.2 L	14
h05	5	6.3	9.0	89	39.0 L	13
h06	6	7.5	10.7	107	36.9 L	12
h07	7	8.8	12.5	125	34.9 L	12
h08	8	10.0	14.3	143	32.9 L	11
h09	9	11.3	16.1	161	31.0 L	10
h10	10	12.5	17.9	179	29.2 L	10
h11	11	13.8	19.7	196	27.4 L	9
h12	12	15.0	21.5	214	25.7 L	9
h13	13	16.3	23.3	232	24.1 L	8
h14	14	17.5	25.1	250	22.5 L	7
h15	15	18.8	26.9	268	21.0 L	7
h16	16	20.0	28.6	286	19.5 L	7
h17	17	21.3	30.4	303	18.2 L	6
h18	18	22.5	32.2	321	16.9 L	6
h19	19	23.8	34.0	339	15.9 L	5
h20	20	25.0	35.8	357	14.4 L	5
h21	21	26.3	37.6	375	13.3 L	4
h22	22	27.5	39.4	393	12.3 L	4
h23	23	28.8	41.2	411	11.3 L	4
h24	24	30.0	43.0	428	10.4 L	3
h25	25	31.3	44.8	446	9.6 L	3
h26	26	32.5	46.5	464	8.8 L	3
h27	27	33.8	48.3	482	8.1 L	3
h28	28	35.0	50.1	500	7.4 L	2
h29	29	36.3	51.9	518	6.8 L	2
h30	30	37.5	53.7	536	6.3 L	2

8. Service Mode

8.1 Accessing Service Mode

With the machine turned on at the mains electrical supply but off at the display, press and hold the Exit (1) and Enter (2) buttons for 6sec. the DISPLAY (4) will show the first menu item and the cycle indicator (3) will illuminate red.

If no buttons have been pressed for a period of time the machine will cancel this mode and return to the off state.

Below is the complete menu list.

Display	Description
P	Program values
L	Loads
E	Errors
S	Statistics

8.2 Program Value

The program values menu feeds back the reading that the sensors are receiving at the given time. Below is a list of the program values available. Below is a list of Programmes that can be activated, via the UP and DOWN keys (5 & 6). To select a particular programme press ENTER (2)

Display	Description	Value
P01	Display wash temperature	***
P02	Display wash level	***
P03	Display rinse temperature	***
P04	Display rinse level	***
P05	Display water flow rate (e.g. 40 = 4.0L/min)	dl/min
P06	Display salt float switch status	0 = Full 1 = Empty
P10	Display door switch status	0 = Open 1 = Closed
P30	Display model type	****
P40	Wash tank target temperature	°C
P41	Wash tank Interlock temperature	°C
P50	Rinse tank target temperature	°C
P51	Rinse tank Interlock temperature	°C
P60	Rinse time	Sec

*** Refers to a value that will be displayed at the time of checking.

**** Refers to a specific model number (►9.2).

P04 will display '- -' on pressurised machines.

P05 and P06 will only display if an integral water softener is fitted.

P40, P41, P50, P51 and P60 have predetermined upper and lower limits. CLASSEQ recommends the default values are maintained for correct operation of the machine.

8.3 Heat Interlock Settings

Default machine setting is GREEN for faster recovery time. However if site required high hygienic and intense wash result then select the RED (Temperature based) option. During servicing the machine, if no Interlock is required then select the BLACK (No Interlock active) option.

Please remember to change back to the default settings after servicing.

Display	Description	GREEN (Default Setting)	BLACK (No Interlock)	RED (Full Interlock)	ORANGE (Wash Interlock)
P40	Wash tank target temperature	55°C	55°C	55°C	55°C
P41	Wash tank Interlock temperature	0°C	0°C	55°C	55°C
P50	Rinse tank target temperature	82°C	82°C	82°C	82°C
P51	Rinse tank Interlock temperature	55°C	0°C	82°C	0°C

Range		Logic
P40	30°C to 75°C	P41 ≤ P40
P41	30°C to P40 value °C	
P50	55°C to 85°C	P51 ≤ P50
P51	55°C to P50 value °C	

Note	
P41	0°C = Wash Tank Interlock temperature OFF
P51	0°C = Rinse Tank Interlock temperature OFF

8.4 Reset to Factory Settings

- 1) Go to Parameter P30 (Display model type) and note down the Number.
- 2) Change to different number by scrolling UP and DOWN key (5 & 6).
- 3) Press ENTER (2) to select new P30 value.
- 4) Press EXIT (1) Button to come out of the service mode.
- 5) Go back to Parameter P30 and change the value back to noted Number on STEP 1.
- 6) Press ENTER (2) button to select the value.
- 7) Press EXIT (1) button to come out of the service mode.

MACHINE BASE SETS	
P30	Model
100	P500
101	P500 A
102	P500 AS
103	P500 A WS
104	P500 AS WS



Caution

Any changes made to P30 will not be saved if power to the machine is disrupted before completely exiting service mode.

8.5 Statistics

The statistics menu provides data on various aspects of the machine. Below is a list of the statistics that can be viewed.

Display	Description	Units
S00	Total number of completed wash cycles	
S01	Total run time (Power connected)	Hours
S02	Total active time (Machine ON)	Hours
S03	Total water usage	Litres
S04	Drain pump failures	
S20	Total number of regenerations	
S21	Total number of cycles without salt	

On gravity drain machines S04 may be regularly triggered.

S20 and S21 are only active in machines with integral water softener fitted.

8.6 Loads

The loads menu allows activation of specific loads within the machine in order to test their function. Some loads have safety criteria that need to be achieved before the load can be activated, if the component does not activate when the load is activated first check the continuity or resistance of the component through the harness.

Below is a list of loads that can be activated, via the UP and DOWN keys (5 & 6), and their required criteria. Each of the loads has a safety timeout applied to reduce the risk of wear on the components.

Display	Description	Value	Safety criteria
L00	Wash pump	0 = Off 1 = On	Wash water level above minimum level and door closed.
L01	Wash pump + soft start	0 = Off 1 = On	Wash water level above minimum level and door closed.
L02	Wash tank heat element	0 = Off 1 = On	Wash water level above minimum level.
L03	Detergent pump	0 = Off 1 = On	
L04	Rinse pump	0 = Off 1 = On	
L05	Rinse aid pump	0 = Off 1 = On	
L06	Wash tank heat element - Spare	0 = Off 1 = On	Wash water level above minimum level.
L07	Rinse tank heat element	0 = Off 1 = On	Rinse water level above minimum level and door closed.
L08	Inlet solenoid valve	0 = Off 1 = On	
L09	Drain pump	0 = Off 1 = On	
L11	WS Salt valve	0 = Off 1 = On	
L12	WS Waste valve	0 = Off 1 = On	
L13	WS Waste valve + inlet valve	0 = Off 1 = On	

L04 will display '- -' on pressurised machines.

L11 and L12 will display if an integral water softener is fitted.

8.7 Errors

The errors menu feeds back the last 40 errors on the machine in order to help identify the fault. Use the UP (5) and DOWN (6) keys to cycle through the list, the list does not roll over and will always start on the most recent error. Below is a list of error codes and their possible cause. These are given as an aid only; all other possible causes of faults should be investigated before repair is carried out.

Errors E01, 03, 12, 13, 18, 19 are displayed on the facia when the fault is active.

Items in **BOLD** will cause the machine to enter error mode; this will turn off the machine and illuminate the cycle indicator (3) red.

E12 – Number of cycles will differ depending on machine.

For E22 see “Board setup” (►9.2).

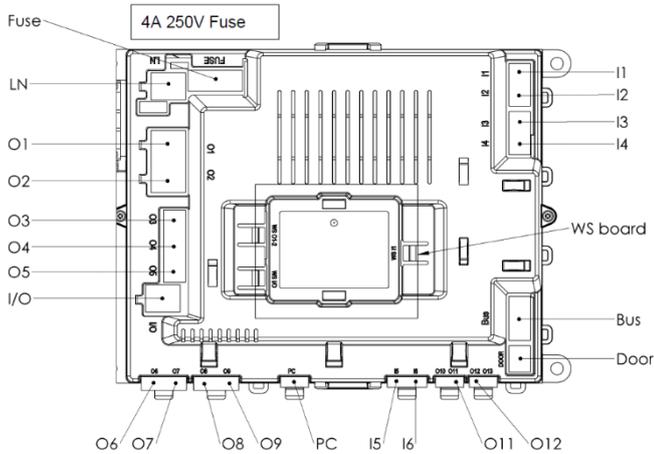
Display	Title	Description	Possible cause
nnn	New day	Displays each time the machine is switched on.	
E01	Wash tank pressure sensor	Invalid signal from the wash pressure sensor.	Wash tank pressure sensor faulty or disconnected.
E02	Wash tank temperature sensor	Invalid signal from the wash temperature sensor.	Wash tank temperature sensor faulty.
E03	Rinse tank pressure sensor	Invalid signal from the rinse pressure sensor.	Rinse tank pressure sensor faulty or disconnected.
E04	Rinse tank temperature sensor	Invalid signal from the rinse temperature sensor.	Rinse tank temperature sensor faulty.
E05	Wash water level unchanged during cycle.	Wash tank level not changed after soft start, repeated 3 times before error logged.	Wash pump blocked. Wash arm blocked. Wash pump capacitor failed. Wash pump failed. Board output relay failed.
E06	Rinse water level unchanged during rinse.	Rinse tank level not changed when starting the rinse pump.	Rinse arm blocked. Rinse pump blocked. Rinse pump capacitor failed. Rinse pump failed. Board output relay failed.
E07	Rinse tank temperature not achieved.	Rinse tank has not reached the target temperature within 60 minutes.	Rinse tank over heat thermostat tripped. Rinse tank heating element failed. Rinse tank element contactor failed. Board output relay failed.
E08	Wash tank temperature not achieved.	Wash tank has not reached the target temperature within 60 minutes.	Wash tank over heat thermostat tripped. Wash tank heating element failed. Board output relay failed.
E09	Wash water level unchanged during soft start.	Wash tank level not changed during soft start.	Wash pump blocked. Wash arm blocked. Wash pump capacitor failed. Wash pump failed. Board triac failed.

E10	Salt missing	Only in machines with water softener fitted. Salt level in reservoir is low for 30 seconds.	No salt in reservoir. Salt reed switch failed.
E11	Display communication failure	No signal from the user interface unit.	User interface not correctly connected. User interface failed.
E12	Wash tank fill	Wash tank has not filled within the required number of transfers.	Drain plug not inserted. Machine leaking. Very low water pressure (pressurised machines).
E13	Rinse tank fill timeout	Rinse tank has not filled within 5 minutes.	Water supply not connected or turned on. Very low water pressure. Solenoid valve failed.
E14	Door switch	Door switch has not changed position for the past 20 cycles	Door switch failed.
E15	Paddle flow sensor	Only in machines with water softener fitted. Paddle sensor in air gap is not responding during the fill stage.	No water supply. Paddle sensor failed. See P05 to assist.
E16	Wash tank overflow	Wash tank has reached the flood risk level.	Site drain blocked. Machine waste hose blocked or kinked. Solenoid failed open. Drain pump failed.
E17	Filter mesh blocked	Water level in wash tank has been reduced to below minimum required level during a wash cycle.	Wash arms blocked. Wash pump blocked. Wash filters blocked. Container in wash tank collecting water.
E18	Rinse tank temperature exceeded	Rinse tank temperature has exceeded the safety limit.	Rinse tank temperature sensor disconnected. Rinse element relay fused. Main board relay fused. Rinse element wired incorrectly.
E19	Wash tank temperature exceeded	Wash tank temperature has exceeded the safety limit.	Wash tank temperature sensor disconnected. Main board relay fused. Wash element wired incorrectly.
E20	Power interruption	Power to machine has been interrupted.	Machine isolated from power supply. Power failure.
E21	EEPROM Error	EEPROM failed	Main board failed
E22	Invalid machine type	Incorrect machine type set	Machine type 0. Main board has not been configured.

9. Control Unit

9.1 Inputs and Outputs

9.1.1 Main Board



Inputs

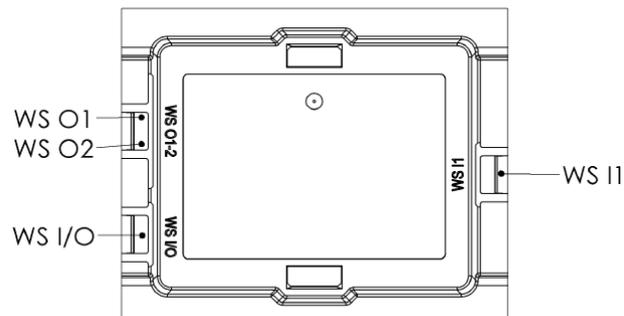
Label	Device
I1	Wash temperature sensor
I2	Wash pressure sensor
I3	Rinse temperature sensor
I4	Rinse pressure sensor
I5	Water softener float switch
I6	Water softener paddle wheel
Bus	User interface
Door	Door reed switch
PC	Production test port
LN	Mains power from terminal block

Outputs

Label	Load
O1	Wash pump
O2	Not Used
O3	Rinse aid pump
O4	Rinse booster pump
O5	Detergent pump
O6	Wash contactor
O7	Rinse contactor
O8	Inlet solenoid valve
O9	Drain pump
O10	Not used
O11	WS board
O12	WS board
O13	Not used
I/O	WS board power

 DANGER!	Unless the machine has been isolated from the supply there will always be potential for mains voltage to any components in the machine.
 Caution	Repairs to the machine should only be done with the mains supply isolated.

9.1.2 Water Softener Board (if fitted)



Inputs

Label	Device
WS I1	Main board O11 and O12
WS I/O	Power from main board

Outputs

Label	Load
WS O1	Water softener salt valve
WS O2	Water softener waste valve

9.2 Board Setup

In the event of changing a control board the new board will need to be configured to the machine. The board will initially be set to Base set 0 and will give an error E22 and enter error mode if attempted to be turned on. In order to change the base set of the machine follow the instructions below:

Step	Instruction
1	Enter service mode (► 8.1).
2	Enter the "Program values" menu.
3	Scroll to P30 using the UP and DOWN (5 and 6) keys and enter. The DISPLAY (4) will start to flash.
4	Use the UP and DOWN keys (5 and 6) to select the correct base set for the machine.
5	Press ENTER to select (2).
6	Press EXIT (1) until completely out of the service mode.

Machine Base Sets

P30	Model
111	P500
111	P500 A
112	P500 AS
113	P500 A WS
114	P500 AS WS

	<p>Any changes made to P30 will not be saved if power to the machine is disrupted before completely exiting service mode.</p>
Caution	

10. Wash Performance

The most important factors of a warewasher to generate good wash results are; mechanics, time, chemical and temperature. Only when these four factors are well balanced a good wash result can be achieved. Below you will find a list of recommendations and a troubleshooting guide to help you achieve this;

10.1 Recommended chemicals

Code	Description
B12N	Universal – Rinse Aid
F320	Universal Dishwasher – Detergent
F26	Universal Glasswasher - Detergent
F8000	All-purpose hygienic - Detergent
C10	Descaler and tarnish remover

10.2 Recommended chemical dosing

	Detergent	Rinse Aid
Setting	3.0 ml/Ltr	0.5 ml/ Ltr
Range	0.0 – 9.9 ml/Ltr	0.0 – 9.9 ml/Ltr

Note

To adjust these settings see ‘Section 7.3 - Setting Chemical Dosage’

10.3 Recommended Temperatures

	Glasswasher	Dishwasher
Wash	55°C	55°C*
Rinse	70°C	82°C*

* All P500 models are pre-set with dishwasher recommended temperatures

Note

To adjust these settings see ‘Section 8.3 - Heat Interlock Settings’.

10.4 Troubleshooting

	Problem	Possible Cause	Possible Solution
GENERAL	POOR WASH RESULTS	Dirty machine	Ensure the machine is cleaned regularly. This includes primary and secondary filters, wash arms, rinse arms and all cabinet surfaces and apertures.
		Blocked / stiff wash and rinse nozzles	
		Insufficient pre-wash	Do not tip beer or food waste into the machine. The proteins within the waste can neutralise the chemicals used to clean, resulting in wash performance issues. Only pre-wash wares using cold water as hot water can bake any proteins on making them very difficult to clean.
		Basket loaded incorrectly/ wrong basket type	Do not overload baskets and follow the loading instructions in 'Installation & operation manual'. Always ensure a suitable basket is used.
		Incorrect temperature settings	Ensure the machine has the suitable temperature settings.
		Incorrect chemical dosing	Ensure the machine has the suitable chemical settings.
		Detergent and rinse aid feeds crossed	Check that the detergent and rinse aid feeds are connected correctly.
		Poor Water Quality (Hard Water)	Ensure the water softener is filled with salt when required. If this is not maintained then this allows the machine to run with hard water, increasing the risk of lime scale build up. When hard water is used the detergent will not work as effectively. It can also restrict the flow of water through the wash and rinse arms reducing the efficacy.
Incorrect cycle selected	Different wash cycles are available. A longer program may be required for wares that are heavily soiled.		

	Problem	Possible Cause	Possible Solution
GLASSWASHER	CLOUDY GLASSES	Poor water quality, Hard water with high mineral content	Improve water quality by fitting water softener unit
	ETCHING ON GLASSES	High temperatures, Aggressive chemicals,	Adjust Temperatures, Change chemicals / dosage rates,
	POOR HEAD RETENTION (BEER)	Excessive rinse aid, Poor quality rinse aid, Excessive detergent, Fats in wash water,	Adjust Rinse Aid Dosing, Ensure rinse aid is of good quality, Adjust Detergent Dosing, Increase pre-rinse to remove any fats from coffee cups/ glasses, Check rinse pressure, booster pump may be required
	WHITE SPOTS & SHREAKS ON GLASSES	Oily film on glass from towel drying, Poor rinse pressure, Insufficient/ poor quality rinse aid Insufficient/ poor quality detergent	Do not towel dry glasses, Check rinse pressure, booster pump may be required Check rinse aid and dosing rate Check detergent and dosing rate
	GLASS BREAKAGES	Temperatures too high	Recommended 70°C for glass washing
		Incorrect basket used	Use suitable basket
DIRTY GLASSES	Dirty machine, No pre-wash, Poor quality damaged glasses, Insufficient/ poor quality rinse aid Insufficient/ poor quality detergent	Clean machine regularly, Leave the door open overnight to allow machine to dry out, Renovate/ replace glasses, Check chemicals and dosing rates,	
DISHWASHER	FOAMING	Low temperatures	Check temperatures
		Incorrect detergent	Check correct chemicals are being used
		Incorrect dosing of detergent or rinse aid.	Check dosing of chemicals
	TEA STAINING	Low temperatures	Check temperatures
		Incorrect cycle selected	Check dosing of chemicals
		Incorrect detergent and/ or dosing	Check correct chemicals are being used
			<i>Recommended Chemical – F8000</i>
	CONDENSATION ON WARES	Normally a dirty glass.	Check temperatures
		Can be caused by towel drying.	Check dosing of chemicals
		Incorrect detergent levels.	Check correct chemicals are being used
		Low temperatures.	
	BLUE FILM ON WARES	Excessive rinse aid.	Check temperatures
Hard water (lime scale).		Check dosing of chemicals	
High temperatures		Check correct chemicals are being used	

11. Cable Repair Kits

11.1 Available Cable Kits List

Detailed below are the spares cable kits available for the machine:

Item	Description	Part number
1	KIT MACRO-MODULE PLUG SIZE 2,5 6-P	30002484
2	KIT MACRO-MODULE PLUG SIZE 2,5 4-P	30002482
3	KIT MACRO-MODULE PLUG SIZE 2,5 3-P	30000198
4	KIT MACRO-MODULE PLUG SIZE 2,5 2-P	30000197
5	Module Plug (Size 5,0 / 4Pole) Type A	30014137
6	Module Plug (Size 5,0 / 4Pole) Type B	30014138
7	Module Plug (Size 5,0 / 6Pole)	30014140
8	ZSE Water Softener Harness Kit	30014124
9	MACRO-MODULE PLUG5, 2-POLE	3112091
10	Marco Module Plug5, 5Pole	30002002
11	6.0kW Element Wire Kit	30013685
12	2.6kW Element Wire Kit	30013686

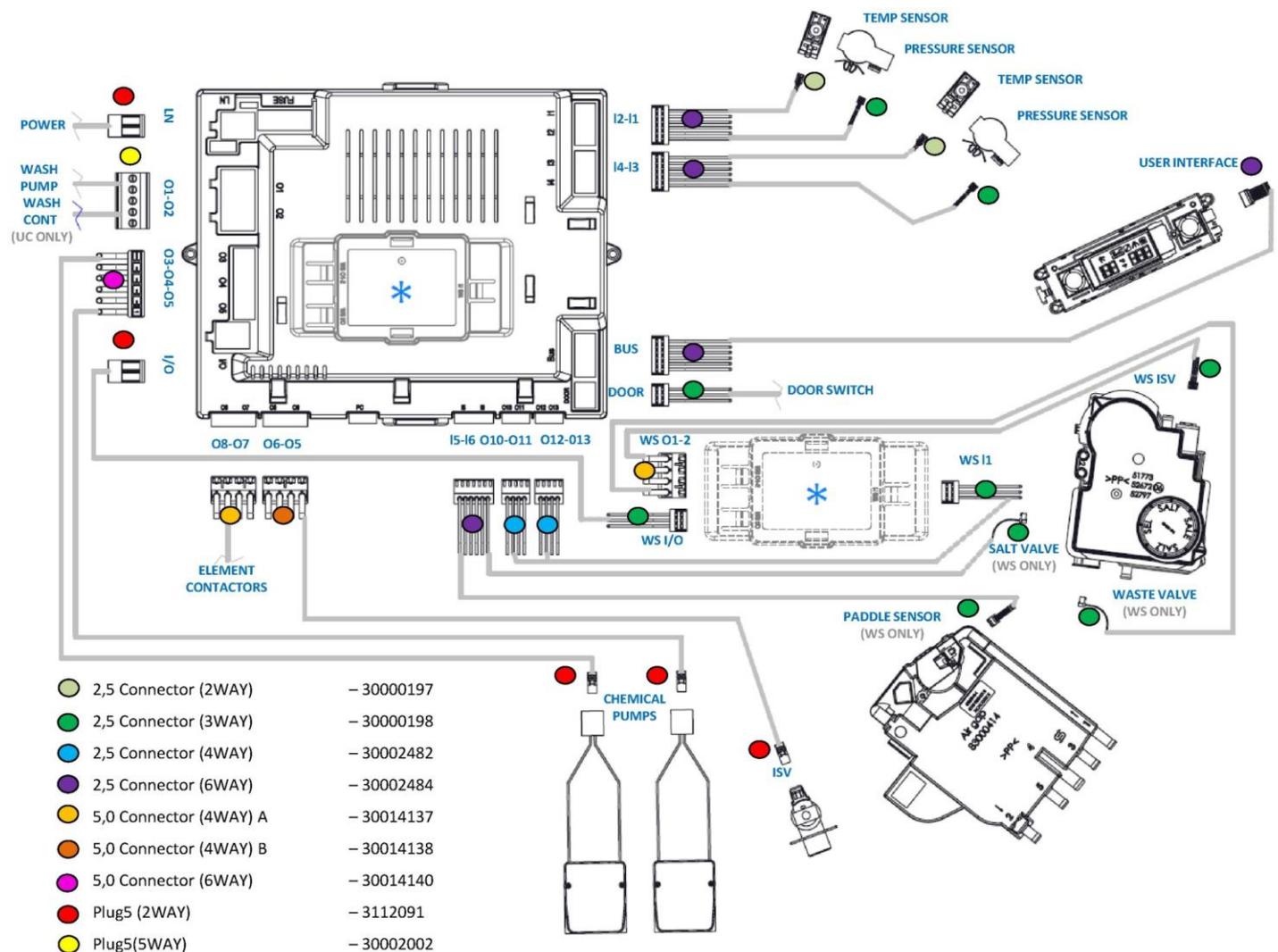
11.2 Cable Kit Information

Items 1-11 are to be used to repair any damaged connections on the control harness connecting to the main ZSE board or the internal components. The kit consists of a replacement connector with a length of cable connected to a terminal block. This allows the damaged connector to be removed and replaced easily. A reference diagram is shown in 'section 10.3'.

Items 11-12 are available to repair the heating circuit in situations where the element crimps or wires have been damaged. Included in these kits are a full set of wires from the terminal block to the element.

11.3 Cable Kit Diagram

Detailed below is a colour coded diagram showing the connector locations and the connector kits required for each location.

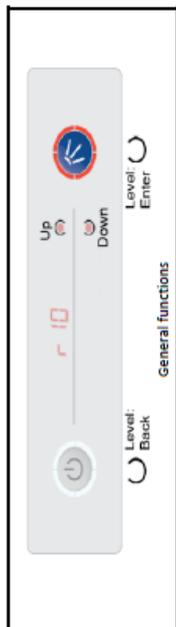


12. Quick Reference

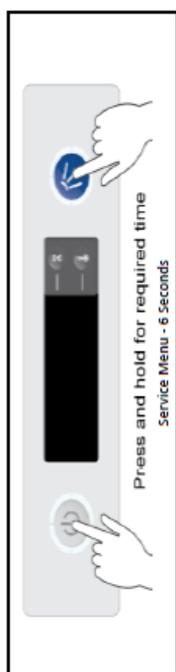
Refer to Engineers manual for further details



Display	Description	Units
r**	Rinse aid setting (e.g. 15 = 1.5ml/L)	0.1 x ml/L
rP0	Rinse aid prime	0=Off 1=On
d**	Detergent setting (e.g. 33 = 3.3ml/L)	0.1 x ml/L
dP0	Detergent prime	0=Off 1=On
h**	Water softener setting (if fitted)	*dH



Important notice
Changes ONLY saved when menu exited



Display	Description
P	Program values
L	Loads
E	Errors
S	Statistics

Display	Description	Value
P01	Display wash temperature	***
P02	Display wash level	***
P03	Display rinse temperature	***
P04	Display rinse level	***
P05	Display water flow rate (e.g. 40 = 4.0L/min)	dl/min
P06	Display salt float switch status	0=Full 1=Empty
P10	Display door switch status	0=Open 1=Closed
P20	Display model type	*****
P40	Wash tank target temperature	°C
P41	Wash tank interlock temperature	°C
P50	Rinse tank target temperature	°C
P51	Rinse tank interlock	°C
P60	Rinse Time	Sec

Display	Description	Value
L00	Wash pump	0=Off 1=On
L01	Wash pump + soft start	0=Off 1=On
L02	Wash tank heat element	0=Off 1=On
L03	Detergent pump	0=Off 1=On
L04	Rinse pump	0=Off 1=On
L05	Rinse aid pump	0=Off 1=On
L06	Wash tank heat element - Spare	0=Off 1=On
L07	Rinse tank heat element	0=Off 1=On
L08	Inlet solenoid valve	0=Off 1=On
L09	Drain pump	0=Off 1=On
L11	WS Salt valve	0=Off 1=On
L12	WS Waste valve	0=Off 1=On
L13	WS Waste valve + inlet valve	0=Off 1=On

Document Number: 10021365 Revision: D Date: 19/03/2020

Display	Title
n:n	New day
E01	Wash tank pressure sensor
E02	Wash tank temperature sensor
E03	Rinse tank pressure sensor
E04	Rinse tank temperature sensor
E05	Wash water level unchanged during cycle.
E06	Rinse water level unchanged during rinse.
E07	Rinse tank temperature not achieved.
E08	Wash tank temperature not achieved.
E09	Wash water level unchanged during soft start.
E10	Salt missing
E11	Display communication failure
E12	Wash tank fill
E13	Rinse tank fill timeout
E14	Door switch
E15	Paddle flow sensor
E16	Wash tank overflow
E17	Filter mesh blocked
E18	Rinse tank temperature exceeded
E19	Wash tank temperature exceeded
E20	Power interruption
E21	EEPROM Error
E22	Invalid machine type

BOLD - the machine will enter error mode; this will turn off the machine and illuminate the cycle indicator red.

Items marked with backgrounds are only present in machines with water softeners fitted.
BOLD - Safety interlock applies

Display	Description	Units
S00	Total number of completed wash cycles	Hours
S01	Total run time (Power connected)	Hours
S02	Total active time (Machine ON)	Hours
S03	Total water usage	Litres
S04	Drain pump failures	
S20	Total number of regenerations	
S21	Total number of cycles without salt	

Base set	Description	Type
1	G350	UC
2	G400	UC
3	G400 Duo	UC
4	G400 Duo W5	UC
5	D400	UC
6	D400 Duo	UC
7	D400 Duo W5	UC
8	G500	UC
9	G500 Duo	UC
10	G500 Duo W5	UC
11	D500	UC
12	D500 Duo	UC
13	D500 Duo W5	UC
100	P500	PT
101	P500-A	PT
102	P500-A5	PT
103	P500-A-W5	PT
104	P500-A5-W5	PT
110	P500 (New Steelwork wk11 v2020)	PT
111	P500-A (New Steelwork wk11 v2020)	PT
112	P500-A5 (New Steelwork wk11 v2020)	PT
113	P500-A-W5 (New Steelwork wk11 v2020)	PT
114	P500-A5-W5 (New Steelwork wk11 v2020)	PT

13. Machine Rating

13.1 Element Ratings

RINSE ELEMENT	6.0 kW (30011827) 6 Legs	8.64 kW (30013219) 6 Legs	2 x 6.0 kW (30011827) 6 Legs
30A / 220-240V / 1N~50Hz	YES	NO	NO
12A / 380-415V / 3N~50Hz	YES	NO	NO
16A / 380-415V / 3N~50Hz	NO	YES	NO
22A / 380-415V / 3N~50Hz	NO	NO	YES
17A / 190-210V / 3~60Hz	YES	NO	NO

13.2 Mains Cable Types

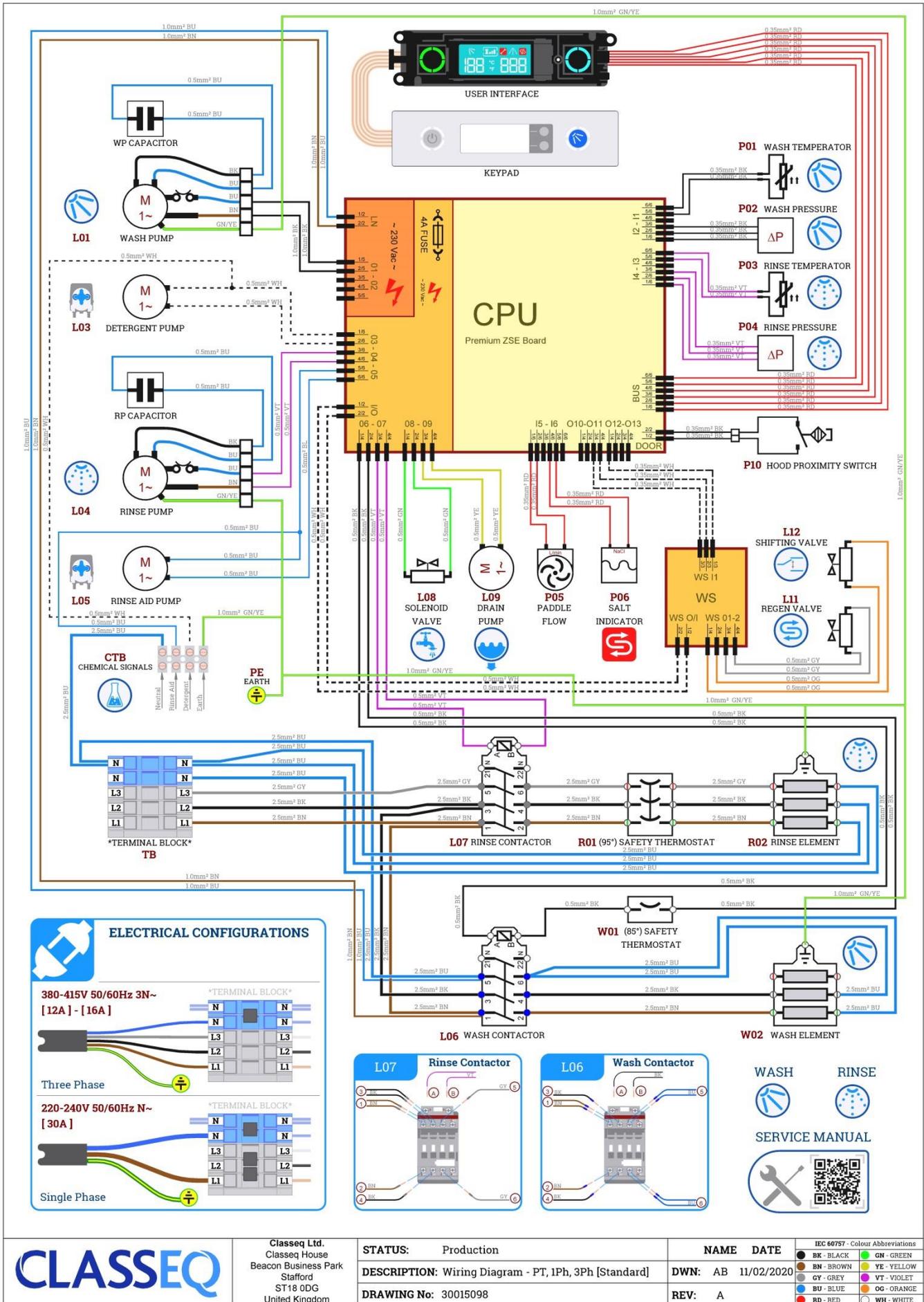
Machine rating (Volts / Phase / Amps)	Cable type
220-240V / 1N~/30A	H07RN-f 3G 4.0
380-415V / 3N~/12A	H07RN-f 5G 2.5
380-415V / 3N~/17A	H07RN-f 5G 2.5
380-415V / 3N~/22A	H07RN-f 5G 4
200-230V / 3~/17A	H07RN-f 4G 2.5

13.3 Mains Cable Specification

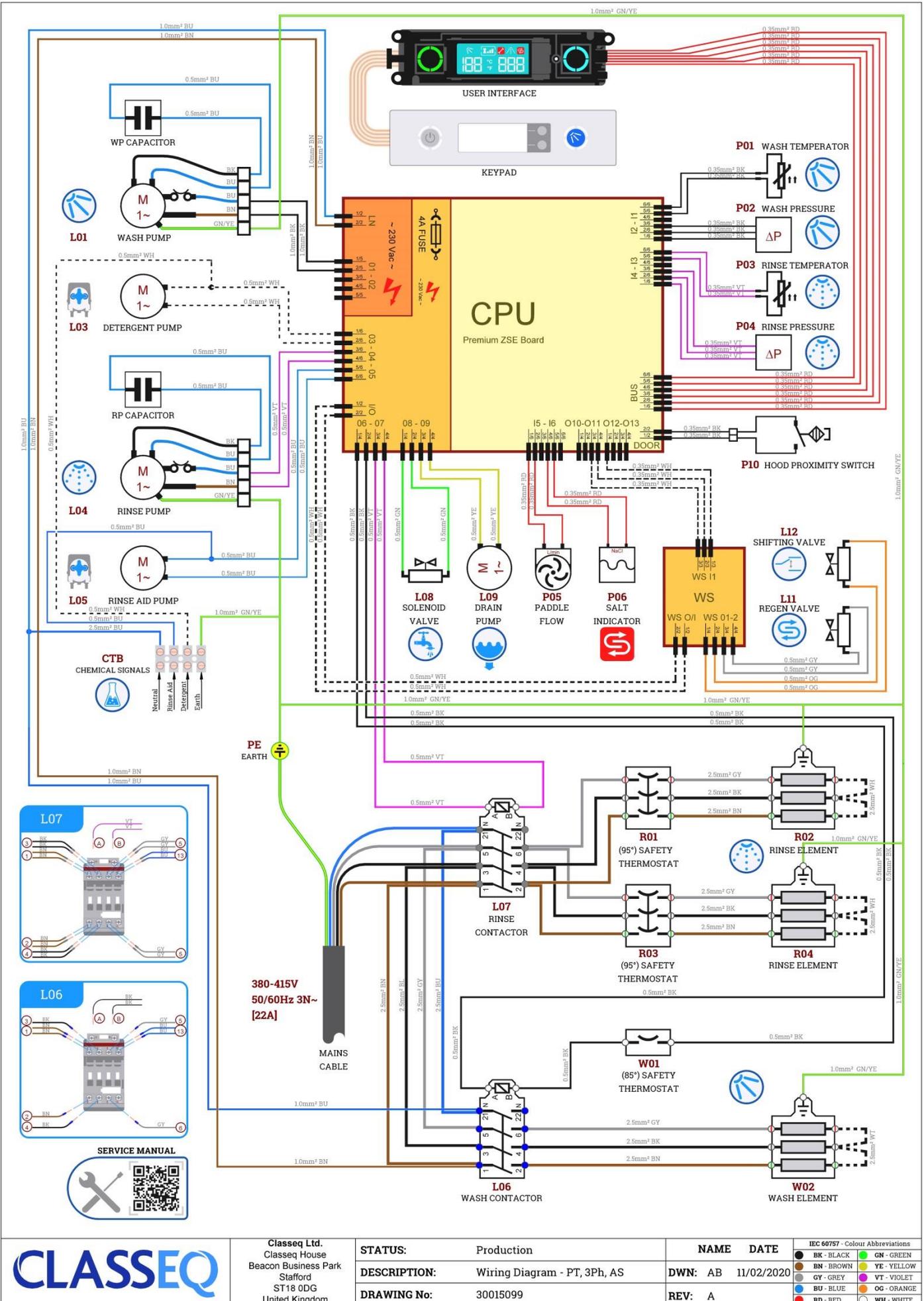
Temp. rating	Length of cable	Conforms to
80°C min.	3m	IEC 60335-2-58 & IEC 60227 types 56 & 57

14. Wiring Diagrams

14.1 Std



14.2 AS

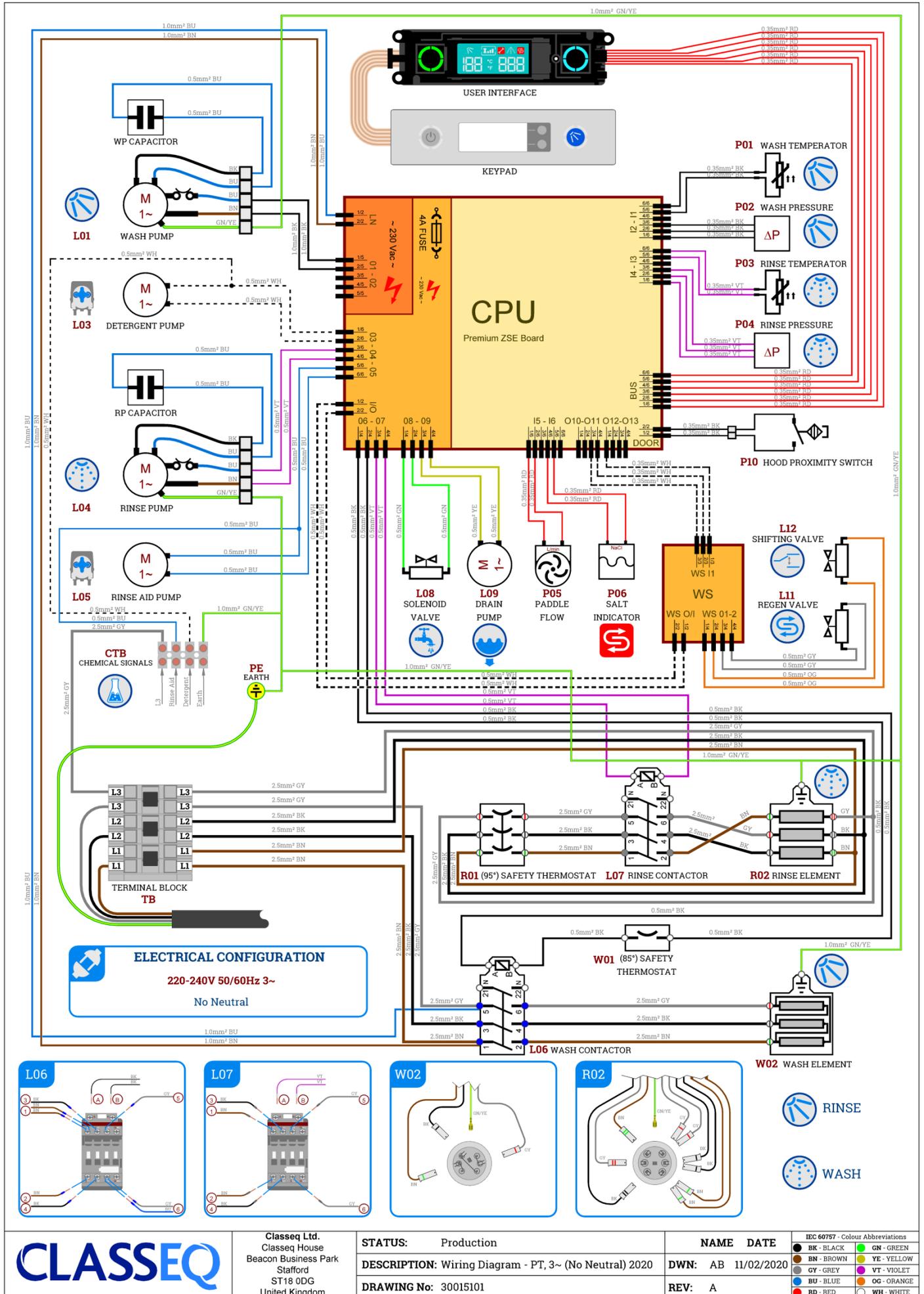


Classeq Ltd.
Classeq House
Beacon Business Park
Stafford
ST18 0DG
United Kingdom

STATUS:	Production
DESCRIPTION:	Wiring Diagram - PT, 3Ph, AS
DRAWING No:	30015099

NAME	DATE
DWN: AB	11/02/2020
REV:	A

14.3 No Neutral



15. Useful Contact Details

Classeq Ltd

Classeq House
Beacon Business Park
Beacon Way
Stafford
ST18 0DG

Sales and Switchboard

tel: +44 (0)844 225 9249

email: sales@classeq.co.uk

Service

tel: +44 (0)844 225 9245

email: service@classeq.co.uk

Technical

tel: +44 (0)844 225 0700

email: technical@classeq.co.uk

Two columns of horizontal lines for writing.