HWP 77, 96 (c/w EC Motor and UC7 Controller versions)

Ducted Water Cooled R410A Packaged Air Conditioner

Installation & Maintenance

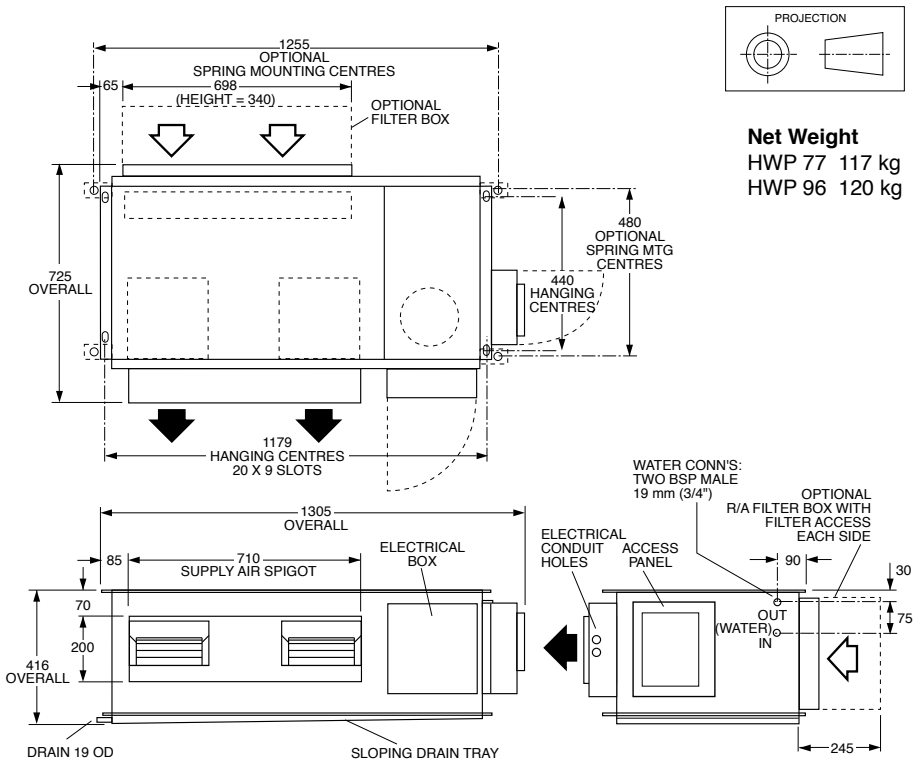
Fig. 1 Nomenclature

e.g. **H W P 7 7 C K S Y D**

Series	Size	Type
H - Hideaway **W** - Water Sourced **P** - Packaged	Divide by 10 to get approx. nominal Capacity in kilowatts	**C** - Cooling only **CE** - Cooling only with electric heat **R** - Reverse cycle **K** - Refrigerant R410A **S** - Single phase power supply **Y** - EC fan motor **T** - Three phase power supply **D** - Integrated Thermostat **N** - Protection board

Fig. 2 Dimensions (mm)

Not to Scale



Net Weight
HWP 77 117 kg
HWP 96 120 kg

GENERAL

HWP - A general designation which applies to all versions (refer fig.1)

These HWP units must be installed in accordance with all national and local safety codes.

OPTIONS

The following items are available as optional extras:

1. Condensate Lift-Pump Kit.
2. Filter Box.

A remote return air temperature sensor is supplied on all models except for HWP 77/96 CEKSYD models. Optional sensors are available; refer page 3.

High pressure hoses (600 mm long) c/w fitting and spring mounts are supplied as standard.

AIR FILTRATION / FILTER BOX (Option)

As air filtration requirements vary, filters are not supplied with the unit. Filters should ideally be installed on the return air side of the unit, no closer than 500 mm from the back of the unit and easily accessible for cleaning. To maximise the efficiency of air flow, the return air filter should be twice the area of the HWP unit's return air spigot/s. If efficiency is less of a concern a Filter Box is available.

The Filter Box is installed by unscrewing the return air spigot and replacing it with the Filter Box's filter-integrated spigot. The filter may be accessed from either side of this spigot. This box adds 245 mm to the overall depth of the unit.

INSTALLATION

Positioning & Mounting

HWP units are designed to be used with simple, short duct layouts. Units should be located as close to the space to be air conditioned as acoustic criteria allows; refer to Fig. 6 for application considerations.

When determining the position of the air conditioner, allow adequate space around the unit to facilitate future servicing and maintenance. Ensure there is enough working space in front of the electrical access panel. Allow adequate clearance for the filter (optional) to be withdrawn to its full length.

It is recommended that the unit be mounted using the spring mount system supplied (Fig.3). This system minimises transfer of vibration into the building structure.

If a more rigid installation can be tolerated, then suspend the unit from four threaded rods using locknuts (not supplied), as shown in Fig. 4.

Mount top of the unit level as it comes with a sloping drain tray. This tray is not reversible, i.e. the drain exit can only be at the opposite end to the compressor.

The unit must be mounted with sufficient height for the condensate drain to be 'U' trapped outside the unit (see figure 5). Alternatively fit a condensate lift-pump.

The drain line must not be piped to a level above the drain tray.

When finally positioned, tighten the lock nuts on the mounting rods to give a firm installation (see Fig. 3).

Condensate Drain
The drain line must be maintained at least 19 mm ID along its full length. A vent pipe is recommended for drain pipes longer than 4 m (refer figure 4). Check drain by pouring water into the drain tray and ensuring that it clears. Failure to adhere to these instructions could cause flooding.

Water Supply & Return
The HWP unit's IN and OUT water connections are male pipe threaded (refer Fig. 1). The two **temperzone** 600 mm flexible high pressure water hoses supplied have female pipe threaded connections at each end. Maximum water pressure for each hose is 1720 kPa (250 psi). The HWP unit alone, excluding hoses, will withstand 4480 kPa (650 psi).

Poor quality water supply must be pre-filtered and it is essential that adequate water treatment is maintained, particularly where open cooling towers are used.

Note: It is required that the water supply system be fitted with a water flow switch and water pump safety interlock. These items prevent the HWP units from going into fail safe lockout status due to a loss of water flow. Failure to install the above items would require the resetting of all HWP units in the system - either by breaking the power supply to each unit or breaking the thermostat control circuit.

HWP✳R units require a minimum water supply temperature of 17°C.

Circuit Balancing Valve
It is recommended that a circuit balancing valve be fitted to maintain water flow at a constant rate. The minimum water flow rates in litres per second (l/s) are as follows:

HWP:	**77**	**96**
Minimium	0.45	0.67

Electrical
The air conditioner should be connected to the appropriate power supply for each model, as specified in the wiring diagram, with neutral and adequate earth. The supply to have an accessible switch to allow isolation of the unit. Wire the heating and cooling room thermostat to the electrical terminals adhering to the wiring diagram supplied with the unit. All wiring to the air conditioner must comply with the wiring regulations of the local electrical authority.

Fig. 3 Spring Mounting

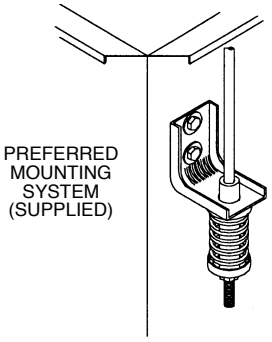


Fig. 4 Solid Mounting

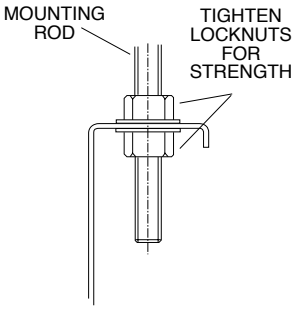
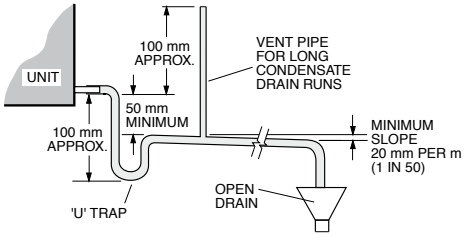


Fig. 5 Condensate Drain



Indoor Fan Speed
The Indoor fan can be switched ON through the thermostat by selecting High, Medium or Low fan speed, or via BMS. This can be done without starting the compressor.

The factory default setting of the maximum fan speed and the fan speed range (High – Low) are specified on the wiring diagram.

If either High speed or Low speed need adjusting, proceed as follows for:

Units supplied with SAT-2 Controller
Use DIP Switches 1 to 5 on the Analogue Level Controller (ALC) board located in the electrical box – refer wiring diagram. DIP switches 1 to 3 determine the maximum fan speed. DIP switches 3 & 4 determine the fan speed range, below the maximum setting.

Units supplied with UC7 Controller
Use the UC7 Controller board to adjust the indoor fan speed:

i. Set DIP switch 5 on the UC7 to ON, then reset the controller by cycling mains power to the unit off and on again.
ii. Ensure the compressor is off and the thermostat or BMS does not request for the compressor to start.
iii. Press and hold down the SW3 push button on the UC7 circuit board until the display shows the letter 'H', then release the push button.
iv. The indoor fan will start and run at the 'High' speed setting (factory default setting is 7.5V). The display will show the value ('7.5') and the indoor fan will run at the selected speed.
v. Each following press on the SW3 push button increases the indoor fan control voltage in steps of 0.5V, up to a maximum of 10.0V. Pressing the push button again when value 10.0 is shown returns the fan control voltage down to the minimum value for 'High' fan speed (3.0V).
vi. When the desired setting for high fan speed is selected then wait for 30 seconds. The controller will save the selected value in its memory and return to normal operation.
vii. To adjust the indoor fan 'Low' speed repeat the above procedure but wait until the display shows the letter 'L' before releasing the push button. The factory default value for low speed is 5.5V.

HWP-CKSYD & HWP-RKSYD models:
Once set, your fan speed range can then be set to: LOW, MED and HIGH (DIP1 switch 1 'OFF') across the selected range.

Air / Water Flow
Refer to HWP 77/96 Data Sheet pamphlets for detailed information on air handling performance and water flow rates.

Unit Protection
Unit protection is incorporated in either:
a.) UC7 Controller, or
b.) SAT-2 Controller,
depending on which HWP model is being installed.

A pump verification relay ensures that water is flowing before the compressor will start. A high pressure lockout protects the unit from low water flow in cooling mode, or fan failure in heating mode. Sensors protect against low air coil temperature and loss of refrigerant. Units include an anti rapid cycle device for compressor protection.

HWP✳R units also have a low refrigerant temp. safety thermostat to protect against icing up of the water within the unit's tube-in-tube heat exchanger.

A non-specific fault LED/ output signal is also included for remote fault indication to building management systems (refer wiring).

For models supplied with UC7 Controller, refer to the label on the unit for operation & fault diagnosic information.

Note: Lockout protection can be reset by switching unit's power supply off and on. Lockout protection will also reset when the thermostat switches, or is switched to the dead zone.

Units Supplied With SAT-2 Thermostat
Any faults detected are displayed on the SAT-2 Wall plaque (refer Table 1). A non-specific fault output signal is also included on SAT-2 Controllers for remote fault indication to building management systems.

Units Supplied With Electric Heat
HWP✳CEKS models supplied with electric heat include both auto (90°C) and manual (120°C) high temp. safety thermostats. If the manual safety t/stat requires resetting, then the auto safety t/stat has failed and needs to be replaced.

Room Thermostat
(Reverse Cycle Models)

The thermostat should be set within the recommended operating range of between 19°C and 30°C. The thermostat should not be used as an on-off switch. Refer to **temperzone** for a list of other approved thermostats.

If your unit is supplied with **temperzone**'s **SAT-2 Thermostat**, refer to page 3 for installation instructions.

COMMISSIONING

1. Check that the thermostat is correctly wired and set at the desired temperature.
2. Check that the air filter (if fitted) is clean.
3. Check that the fan runs freely without vibration.
4. Check condensate drain and safety drain tray for free drainage.

Demonstrate the SAT-2 Wall Control (if supplied) to the owner/user, after having first thoroughly familiarised yourself with the User's Operating Instructions. This page is to remain with the owner/user.

MAINTENANCE

Quarterly

1. Remove lint and dust accumulation from heat exchange air coil. (Note: failure to do this may affect efficiency).
2. Check air filters and vacuum or wash clean as necessary.
3. Check condensate drain for free drainage.
4. Check compressor compartment for oil stains indicating refrigerant leaks.
5. Check quality of water supply.

Six Monthly
Check tightness of electrical connections.

Yearly

1. Remove lint and dust accumulation from heat exchange air coil. (Note: failure to do this may affect efficiency).
2. Replace air filter if damaged to maintain adequate air flow and efficiency.

NOTE
The manufacturer reserves the right to make changes in specifications at any time without notice or obligation. Certified data is available on request.

This pamphlet replaces the previous issue no. 3905 dated 11/13. Indoor fan speed adjustment; wiring revisions.

Units Supplied With Integrated Thermostat (SAT-2 Controller)

Components
The following components are supplied in a box taped inside the supply air spigot:

1. SAT-2 Wall Control plaque, including wall mounting plate.
2. 10 m interface lead (electrical box-to-plaque).
3. User's Operating Instructions booklet.
4. Lithium CR2032 battery (3V).

Optional

1. Remote return air sensor (in box).
2. Remote return air temperature sensor lead; 1.5, 6, 12 or 25 m.
3. 20 m extended interface lead (electrical box-to-plaque).
4. SAT-2 Zone Control PCB.
5. Zone Control 24V transformer.
6. Additional SAT-2 Wall Control plaque.
7. Infra red remote control.

Installation
The SAT-2 Controller PCB is supplied pre-installed in the HWP unit's electrical box.

1. Isolate the HWP unit from power supply, then remove electrical box cover.
2. Remove the SAT-2 box supplied taped inside the supply air spigot.
3. Remove the Wall Control's interface lead from this box and connect to the terminal block (A1/B1/Vcc/GND) on the SAT-2 Controller board. Trace the remaining length of the lead to the Wall Control's intended location. **Note**: Make sure the coloured wires are connected as per the wiring diagram.
4. Remove the Wall Control's backing plate by using a small screw driver to remove the single screw at the bottom edge of the plaque.
5. Install the Lithium battery, supplied loose, positive (+) side up in the Wall Control's battery holder.
6. Check the wall where the Wall Control plaque is to be located is flat before fastening the wall mounting plate. Alternatively, the mounting plate can be screwed to a standard wall socket mounted horizontally.
   Note: Use low profile (mush) headed screws to prevent contact with the PCB board. Fixing the plate to a distorted surface may damage the control.
7. Drill hole in wall to allow cable entry.
8. Connect the interface lead to the the Wall Control board. **Note**: Make sure the coloured wires are consistently connected at each end as per the wiring diagram.
9. Ensure the interface lead is run separately and away from main power supply wires, including the interconnecting cable. When installing cabling, trim any excess length to suit your location.
10. Fill around the interface lead with foam or cover hole with PVC tape to prevent draft from wall cavity affecting control operation. Do not use aluminium duct tape.
11. Secure the Wall Control body to the mounting plate by replacing the locking screw removed earlier.
12. Replace the HWP electrical box cover.

Remote Air Temperature Sensor/s (option)
The air temperature sensor is by default located in the Wall plaque. Optional remote air temperature sensors are available so that the measurement of the room temperature can be taken away from the wall plaque, eg. elsewhere in the room or in the return air duct.

Remote sensor's can be plugged directly into the Controller board (PCB). This board accepts up to four sensors which are designated as 'zones' one to four. The first return air sensor will automatically replace the Wall Control sensor and should be located in the same room as the Wall Control. The Controller will always use the average of the zones selected. Refer to the separate installation instructions supplied with the PCB for further details.

Ensure all remote sensor wires are run separately and away from main power supply wires, including the interconnecting cable.

Fault Detection
Any faults detected are displayed on the SAT-2 Wall plaque (refer Table 1 overleaf). A non-specific fault output signal is also included on SAT-2 Controllers for remote fault indication to building management systems.

Table 1 SAT-2 Controller - Troubleshooting

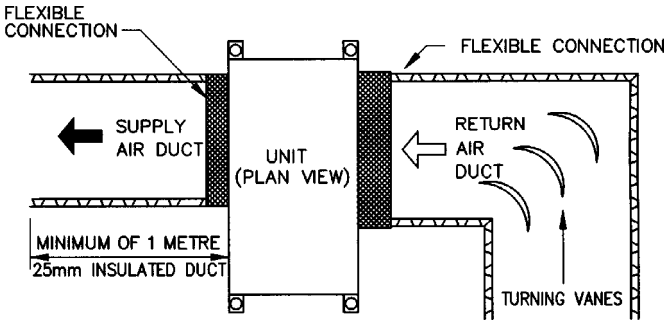
If an fault is detected, an 'ERR' symbol will light up on the Wall plaque display.
The following error codes may be displayed:

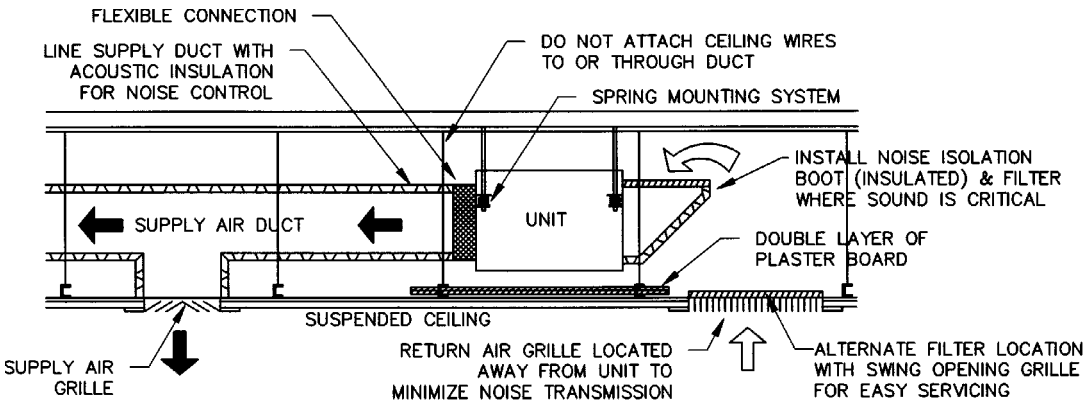
Error Code	Fault	Remarks
1	Room sensor #1 failure	Main board AD3
2	Room sensor #2 failure	Main board AD4
3	Room sensor #3 failure	Main board AD5
4	Room sensor #4 failure	Main board AD6
5	#1 indoor coil sensor failure	Main board AD1
6	#1 LST sensor failure	Main board AD2
7	#1 insufficient refrigerant	
8	#1 compressor overload	
9	#1 low pressure failure	
10	#1 high pressure failure	
11	Room sensor #5 failure	At wallpad B
12	Room sensor #6 failure	At wallpad A
13	All room sensor failure	
14	Float switch failure	
15	#1 Low safety thermostat failure	
16	Communication failure	
17	Hydronic pump switch failure	
18	#2 insufficient refrigerant	
19	#2 compressor overload	
20	#2 Low safety thermostat failure	
21	Discharge sensor 1 failure	
22	Discharge sensor 2 failure	
23	Discharge temp 1 failure	
24	Discharge temp 2 failure	

Fig. 6 Application Considerations

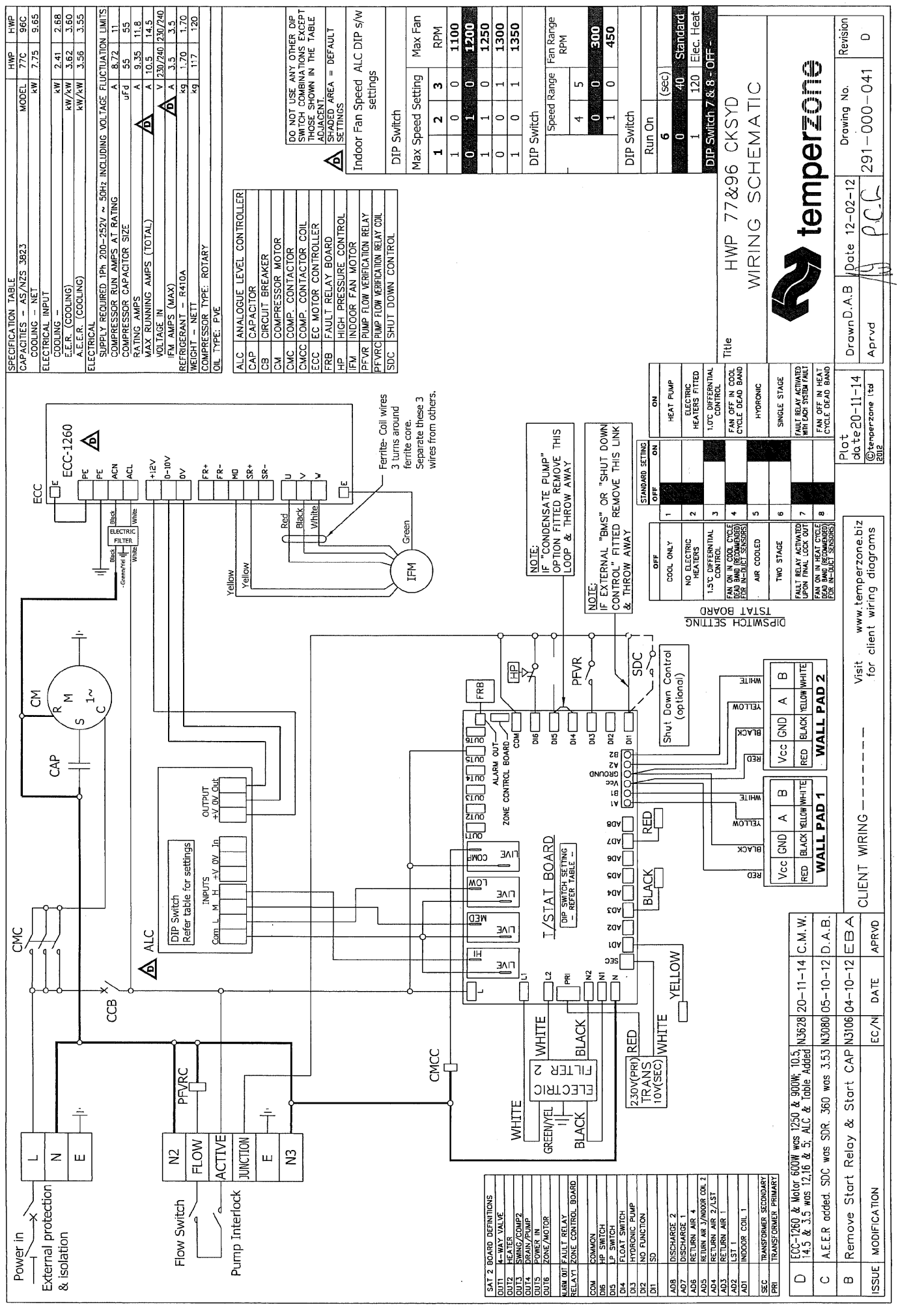
Recommendations for Noise Isolation:

1. Avoid installing units, with non-ducted return air, directly above spaces where noise is critical.
2. Use flexible connections between unit and rigid ducting.
3. Use generously sized acoustically lined ducts.
4. If generous duct size is not possible, use turning vanes on bends to reduce air turbulence (regenerated noise).
5. Use 90° bends in ducting to significantly assist in noise reduction.

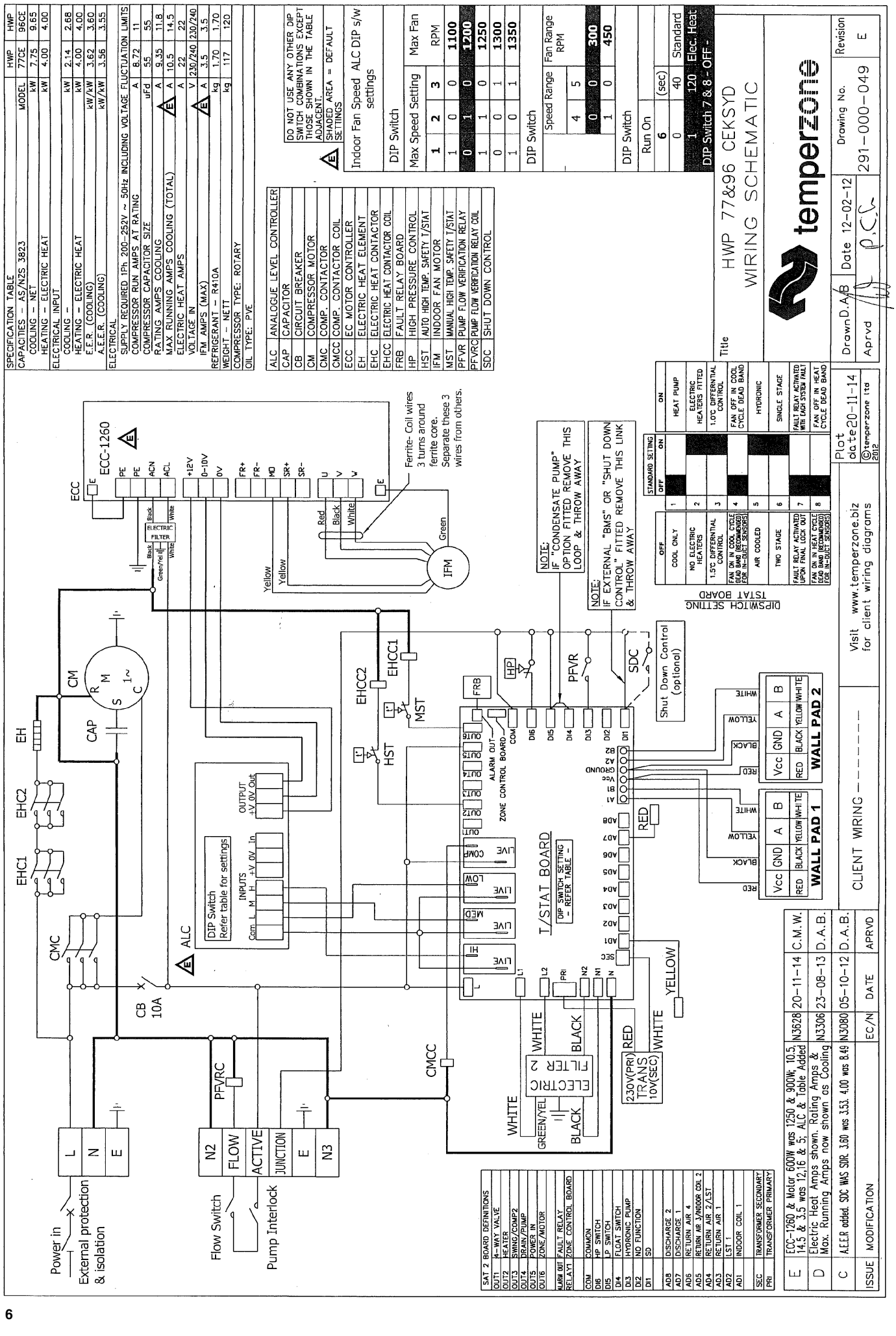




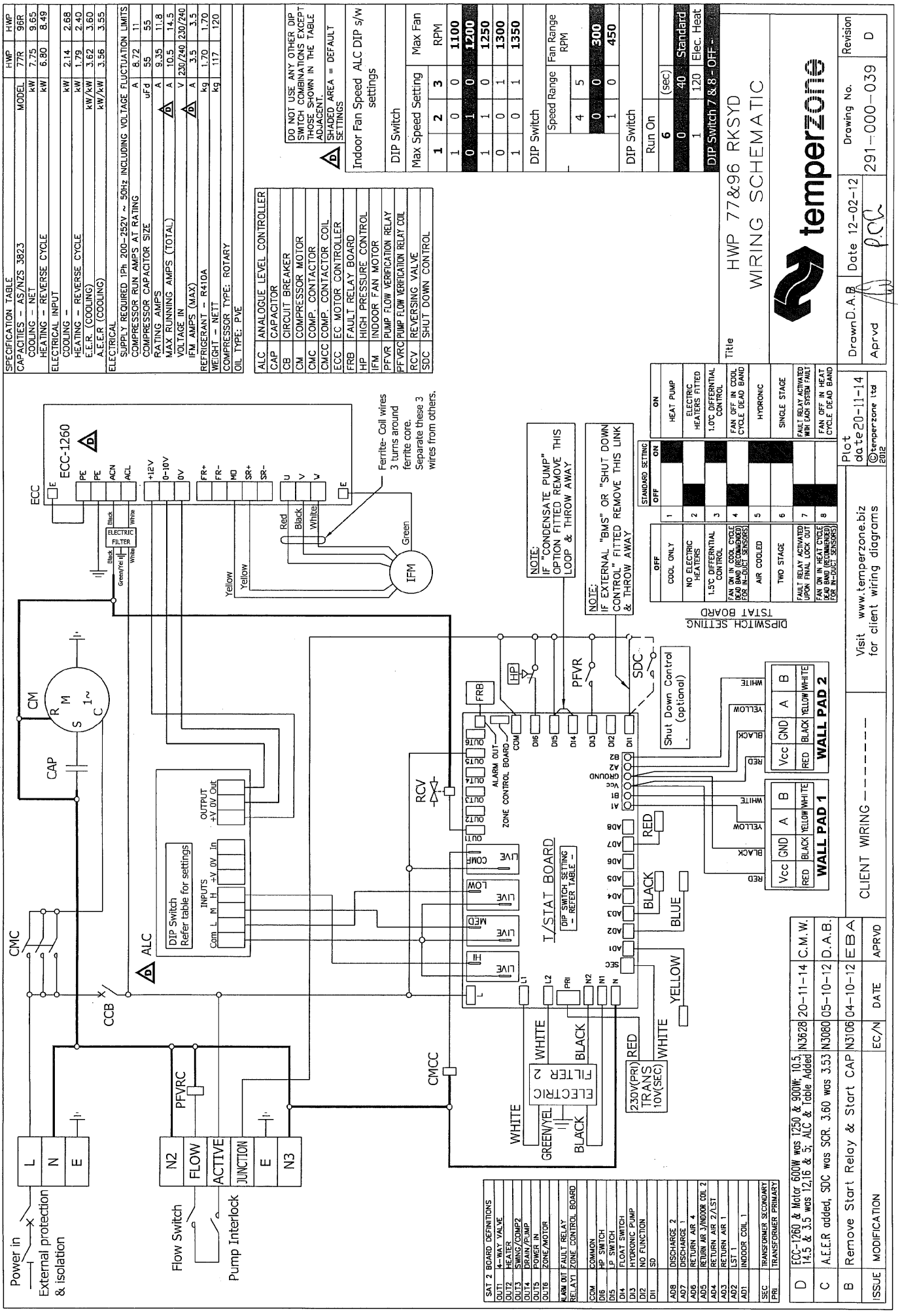
HWP 77/96 CKSYD



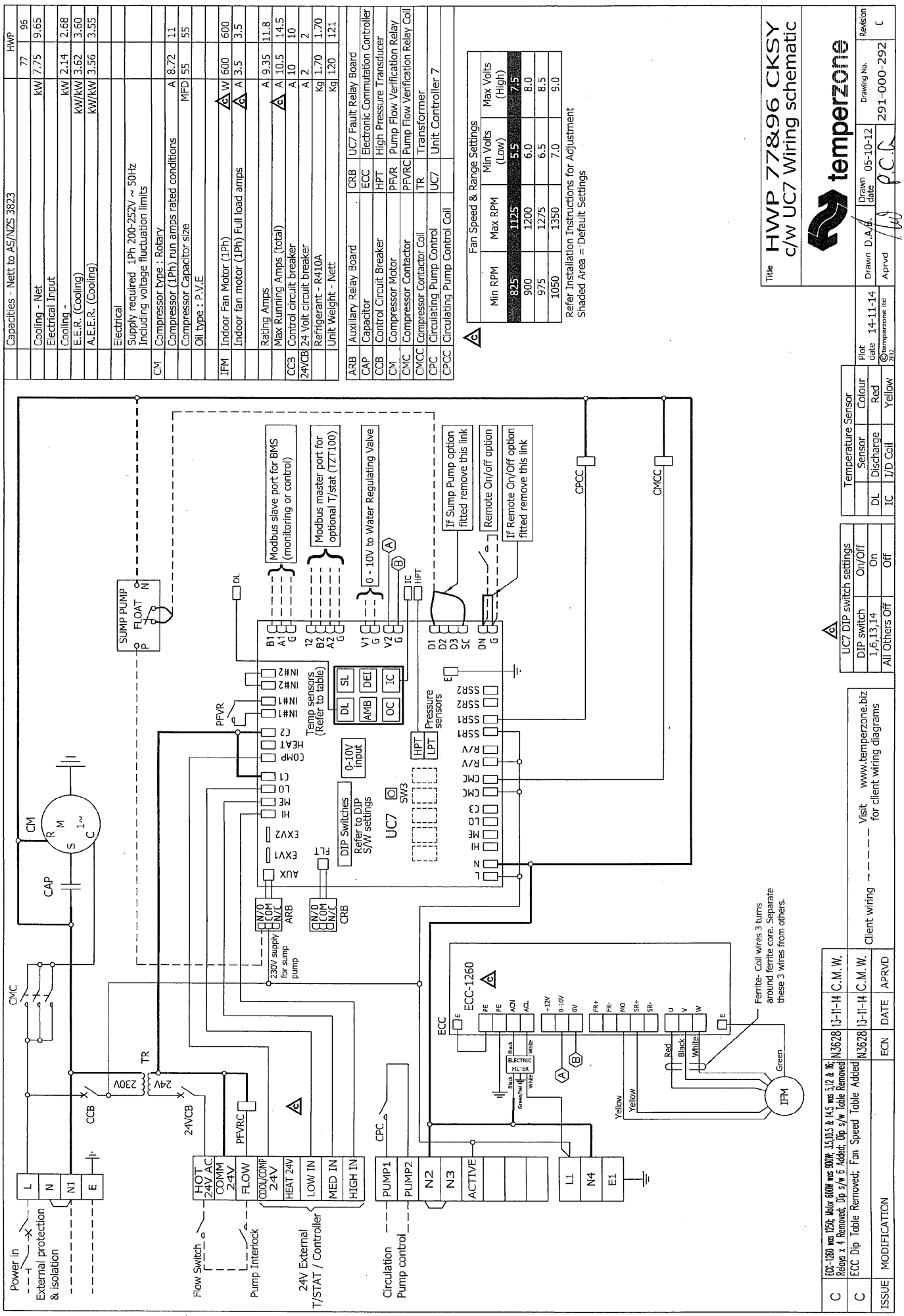
HWP 77/96 CEKSYD



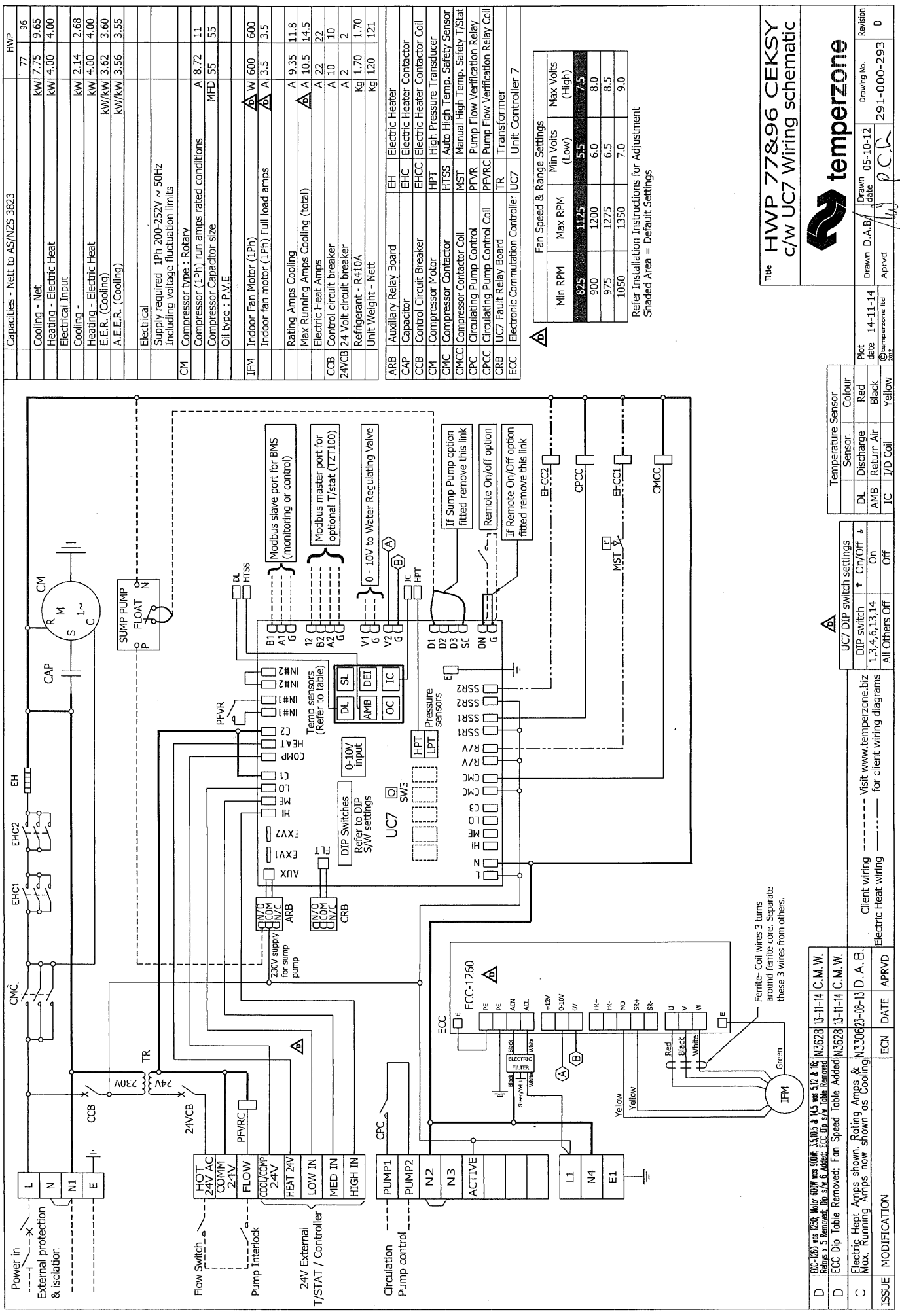
HWP 77/96 RKSYD



HWP 77/96 CKSY



HWP 77/96 CEKSY



HWP 77/96 RKSY