



# WARDEN WA5

Cell Fixture  
Control System

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- Water only control, or
- Power/lighting/water control
- Warden high level control
- BMS interface



**MACDONALD  
INDUSTRIES LIMITED**

Warden cell water control systems have been installed in prisons for over 15 years, having been developed to provide solutions to the changing needs of correctional facilities in ensuring water use minimisation and security administration.

Warden is primarily a cell water control product, providing limitation of use for:

- Showers
- WC flushing
- Basin faucets

Warden controllers use reliable piezo electric switch technology to activate low voltage solenoid valves and not only limit flow rates to plumbing fixtures but also restrict how often they can be used.

There are three main components to Warden:

1. Electronic control module
2. Piezo electric switch plate
3. Solenoid valves providing water to the fixture

To complete the Warden system specify quality plumbing fittings such as:

- Security grade WCs
- Low flow, non ligature shower heads
- Quality thermostatic mixing valves
- Non ligature basin outlets



Warden WA5-WTR2 Control Module



Warden 3 button Piezo Switch Plate

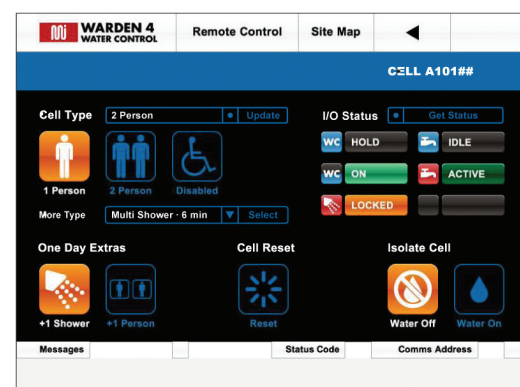
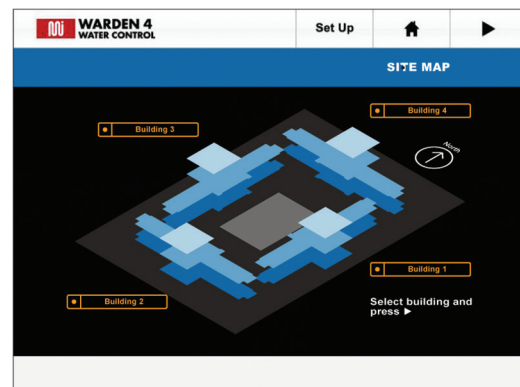
Now a new level of control is available with Warden, with the introduction of Warden WA5.

WA5 is a new generation Warden control system, developed from the ground up to have the potential to not only control water usage but also to become a power and lighting distribution system. With WA5 the consultant can specify;

- WA5-WTR1** Single cell water only control
- WA5-WTR2** Two cell water only control
- WA5-PLW1** Single cell power/lighting/water control
- WA5-PLW2** Two cell power/lighting/water control

Any of these systems is capable of being connected to Warden's standalone High Level Interface (HLI) giving the staff the ability to isolate water, power and lighting separately or as one, to each or all of the cells under their control.

Details on the functionality of each type of Warden controller should be assessed on the following pages.



Screen shots from Warden HLI

Warden WA5 is a continuation of the Warden development of Warden 4 offering the possibility of High Level Interface control.

WA5 gives simple plug and play connectivity for solenoid valves and piezo electric switches. Being low voltage (12Vdc output), WA5 can be easily installed by a plumber without the need for highly technical staff. All that is required is a 230Vac 10A GPO supply socket adjacent to the installation point. The new WA5 controller has a built in power supply all neatly packed inside the water resistant enclosure box.

Each Input has a matching Output connection. Plug the piezo switch into WA5 and the solenoid valve that is to be controlled from that switch is plugged into the corresponding Output socket.

WA5 is available in either a single or dual cell configuration, minimising space and cabling requirements.

Warden WA5 is a standalone product, able to control water use in cells independently. If required it can also form part of a system design using a dedicated PC to isolate cells or groups of cells, monitor usage, or perform limited diagnostics on the Warden system. For details on Warden High Level Interface (HLI) refer to separate information or discuss with your Warden distributor.

## Warden can control water use in:

### Showers

- Limiting the length of shower run time
- Delaying subsequent use
- Counting the number of showers per day

### WC Flushing

- Counting the use per day
- Delaying subsequent use
- Providing optional half and full flushing

### Hot and Cold water to basins

- Counting the use per day
- Delaying subsequent use
- Providing lockouts of one when the other is in use

By combining intelligent and practical limitations of fixture use and reliable, proven fixture selection, water use can be minimised.

The above options are not compulsory and Warden can be programmed to suit virtually any preference.

## WARDEN WA5-WTR1

WA5-WTR1 is a single cell water only controller.

Designed to be installed within the plumbing services duct directly behind the fixtures it serves, WA5-WTR1 will control up to 6 solenoid valves from up to 8 input switches. Multiple input switches allow options on multiple temperature shower control, or dual flush WCs. Discuss with your Warden distributor for the ideal installation.

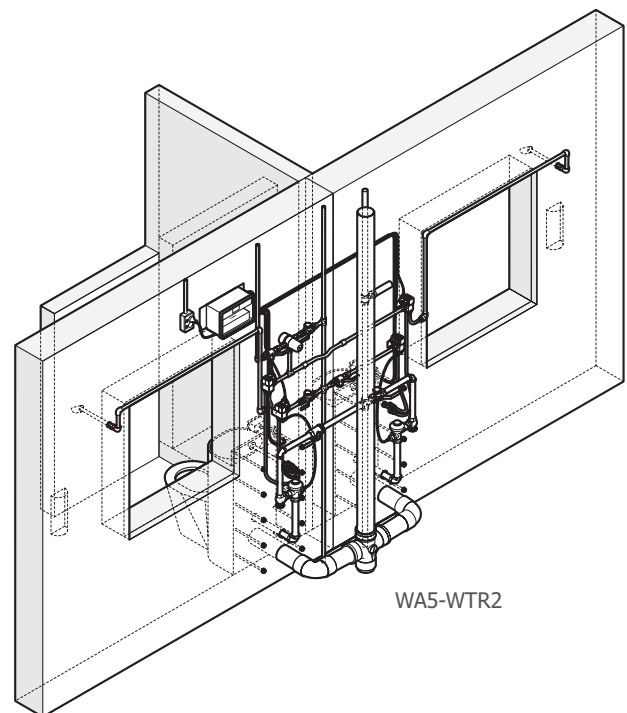
Refer to Specification sheet on Page 5 for details on WC flushing, showers and basin spout options.

## WARDEN WA5-WTR2

WA5-WTR2 is a two cell water only controller.

WA5-WTR2 is the same as the WA5-WTR1 variation but built for two cells that are serviced from the same duct space.

Refer to Specification sheet on Page 5 for details on WC flushing, showers and basin spout options





# WARDEN WA5 CELL WATER CONTROL

## PLUMBING FITTINGS

Warden WA5-WTR2, shown in the isometric drawing (Page 3) is capable of controlling water use to 2 cells located adjacent to each other, using a common duct space. Where cells are widely separated, use WA5-W1 model.

Pipe layout and fittings used will depend on clients requirements. Variations in specification may include:

- potable/non potable flushing water supply
- single/dual flush capable
- single/multi temperature control for shower

Piping schematic shown right, is indicative of a "typical" 2 cell installation and should be adjusted to suit the preferred client specification.

Warden WA5 can be supplied with the following options:

### WC Flushing

- Zurn mains pressure flushing valves 6L
- Zurn Non Potable flushing valves 6L
- Either of the above with 6L single or 6/3L dual flush
- Cistern tank (6L single or 6/3L dual flush) where pipe sizing does not allow for flushing valves

### Basin Control

- Single temperature
- Dual temperature
- Warden bubbler which can provide drinking outlet if required
- Anti-Ligature basin spout

### Shower Control

- Low flow 6 or 9L/min flow rate shower heads, ref DE712 000 or DE709 000
- Disabled access slide rail showers using 900mm grab bars as slide rails, ref DEFIT900

Refer to Page 5 for component details or refer to your Warden distributor.

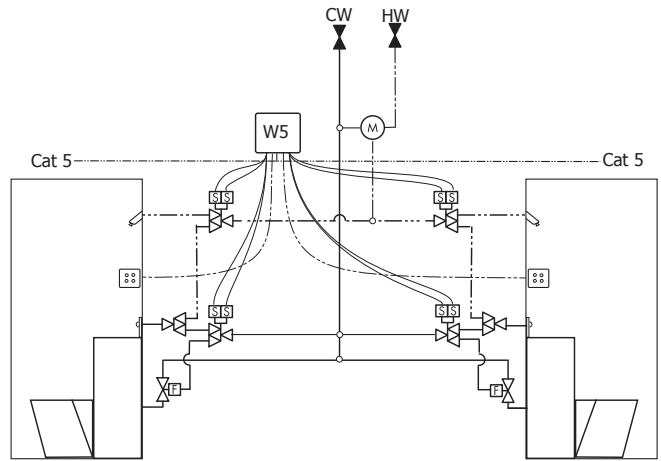
## PIEZO SWITCH PLATES

Each piezo switch plate is made to order depending on the cell layout and clients specification.

In general terms plates are 120 x 120mm and are riveted to an inwall mounting box (Clipsal 164/2 or similar by others) once Warden has been commissioned. The plates can have anything from 1 - 4 piezo switches mounted on them and are etched to suit the button layout. 5 or 6 button plates use the Clipsal 164/3 inwall box. All boxes (supplied by others) should be cast into walls with fixings positioned top and bottom of the box.

Piezo switch plates are made from 1.6mm Type 304 stainless steel. Piezo switches are coloured 18mm anodised aluminium to suit application.

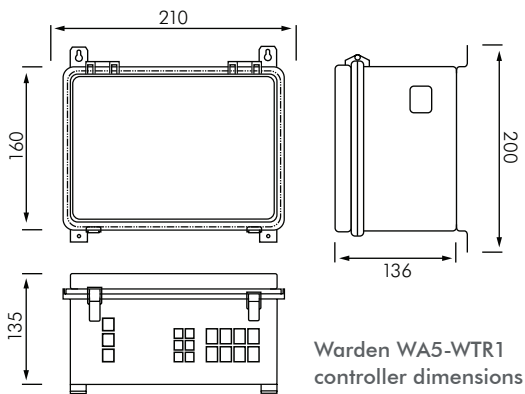
All wiring to switch boxes should pass through conduit where passing through a wall.



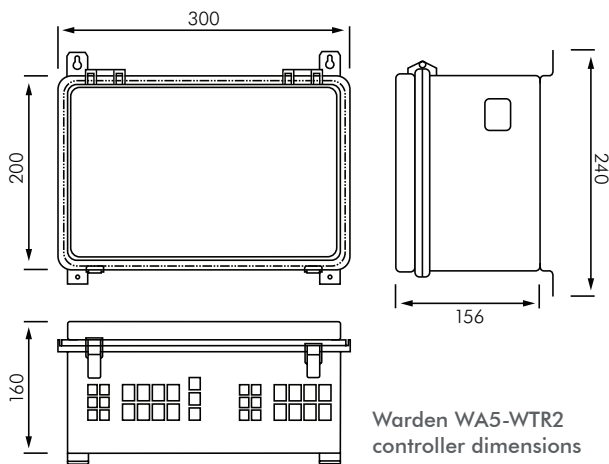
- Delabie 200000 Pre-mix
- Thermostatic mixer
- Flushing Valve
- 2 port solenoid valve
- W5 WA5-W2 controller
- Piezo switch plate
- Isolating valve

Wiring looms for Warden WA5 are available in 1, 2, 4 and 8m lengths for both the piezo switch and solenoid cables. Longer lengths available on special request. Lengths greater than 2m should be run in conduit to ease installation and limit damage potential. All cables should be neatly tied to adjacent pipework to help prevent accidental "pulling".

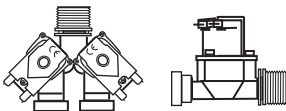




Warden WA5-WTR1 controller dimensions



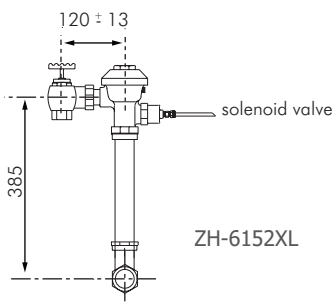
Warden WA5-WTR2 controller dimensions



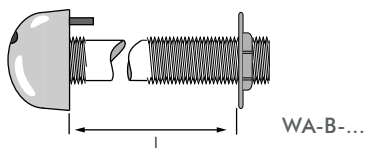
Manifolded solenoid valve



Piezo switch cable



ZH-6152XL



WA-B-...

All plumbing fittings are supplied loose and are fitted by plumber on site using good work practice and according to local regulations.

## SPECIFICATION

### WA5 Control Module

Warden WA5 is a standalone electronic water control system for use in high security applications such as prison, court or police cells. The WA5 control module includes a 230VAC/12VDC power supply, Warden cell control PCBs and High Level Interface (HLI) connectors contained within a water resistant plastic enclosure box.

Warden WA5 control modules should be mounted in a dry, accessible position within the duct space adjacent to a 230V AC 10A GPO supply socket. Always mount above solenoid valves. The power lead supplied with each Warden controller is 0.6m as standard but special lengths are available on request. Installer should position the control module to ensure piezo/solenoid leads requested (see below) are sufficiently long to reach, without stretching leads or leaving unnecessary "loops" of cable unsupplied.

Warden WA5 can be supplied in

- **Single cell format**

WA5-WTR1 8I/6O

Power: 100-230Vac 47-63Hz 1.0A current draw

- **Dual cell format**

WA5-WTR2 16I/12O

Power: 100-230Vac 47-63Hz 1.5A current draw

### Solenoid Valves

Solenoid valves provide water to the necessary fittings and are usually provided as a "set" to suit the clients requirements. In some cases single valves are used and in other "manifolded" valves are used. Refer to your Warden distributor for the best advice.

### Cables

There are two types of cables:

#### PIEZO

WA4-PI-1	1m
WA4-PI-2	2m
WA4-PI-4	4m
WA4-PI-8	8m

#### SOLENOID

WA4-SV-1	1m
WA4-SV-2	2m
WA4-SV-4	4m
WA4-SV-8	8m

Each Warden controller must include the appropriate fitting to enable correct cell installation. Options are as follows:

### WC Flushing

ZH-6152XL - Mains pressure Zurn flushing valve

ZH-6152L - Non Potable Zurn flushing valve

CM-CIST6 - Electronic 6L cistern tank

### Basin Control

WA-B-100 - Through wall bubbler to suit 30 - 130mm walls

WA-B-150 - Through wall bubbler to suit 130 - 180mm walls

WA-B-200 - Through wall bubbler to suit 180 - 250mm walls

DE942 200 - Through wall spout to suit 30 - 230mm walls

DE200000 - Premix allows MW and CW to connect bubbler

(see schematic Page 4)

### Shower

DE712 000 - vandal resistant anti ligature shower head 6L/min.

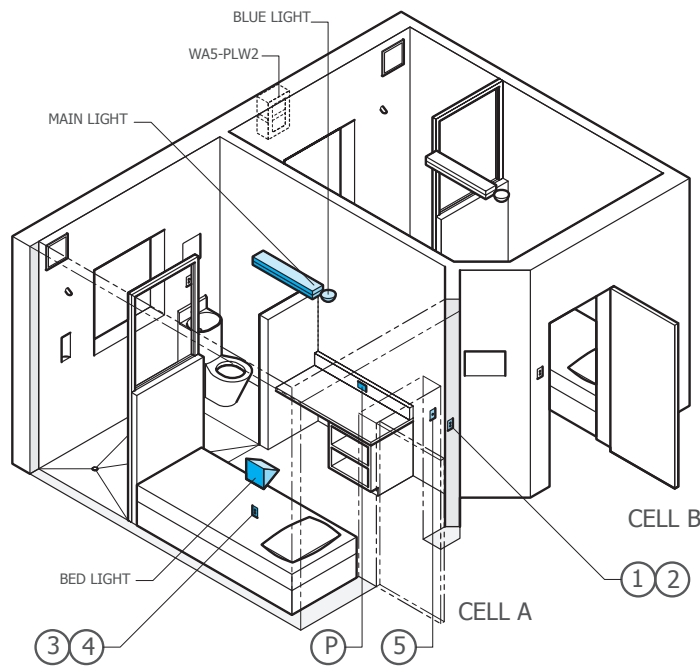
Screws into wingback in wall

DE712 200 - As above but through wall to suit up to 200mm wall

DE709 000 - As per DE712 000

DE709 200 - As per DE712 200

DEFIT900 - Disabled compliant slide rail set including wall connector, 900mm x 32mm slide rail, 1500mm hose and shower head



- P 2 x 230V POWER SOCKETS
- 1 EXTERIOR SWITCH MAIN LIGHT
- 2 SWITCH BLUE LIGHT
- 3 SWITCH BED LIGHT 1
- 4 SWITCH BED LIGHT 2
- 5 INTERIOR SWITCH MAIN LIGHT

Traditionally power and lighting has had limited control at security level. Often multiple cells are supplied off the same circuit and any fault results in multiple cells being affected. By bringing power and lighting within Warden control, individual cells can be controlled from the Warden High Level Interface screen, giving staff the ability to:

- Isolate cell power and/or lights should dangerous situations occur
- Isolate power should the inmate refuse to limit cell radio or TV use or noise levels
- Turn lights off at specific times if required

Warden WA5-PLW has lighting and power protection (RCBOs) to ensure the most determined inmate will cause only immediate circuit isolation. Although power points have, as standard, 10A circuit breakers, lower current rated 6A RCBOs can be fitted on power point supply to prevent misuse of power sockets.

The Warden WA5-PLW control system uses extra low voltage 2 core cables to switch lights, allowing high voltage supply to be taken away from switches. It also enables either piezo or toggle switches to be used, depending on the clients preference. Toggle switches can be rocker or momentary. Check (blue) lights are timed to ensure they always switch off after the prisoner has been checked.

Cell block wiring design can vary depending on the size and run length of cabling, need for essential and non-essential power, or separate supply for power and lighting for logistical reasons. Direct comparisons can therefore be difficult, however in general terms, Warden WA5-PLW will reduce cabling.

Where wiring design requires a separate supply for essential and non-essential services in the cell, Warden WA5-PLW, when installed with Warden High Level Interface (HLI), only requires a single power supply cable. As it can provide immediate isolation of specified fittings within the cell on activation of power generators, thus giving the reduced power draw needed during this time. On re-introduction of mains power Warden HLI can stagger cell start up if required.

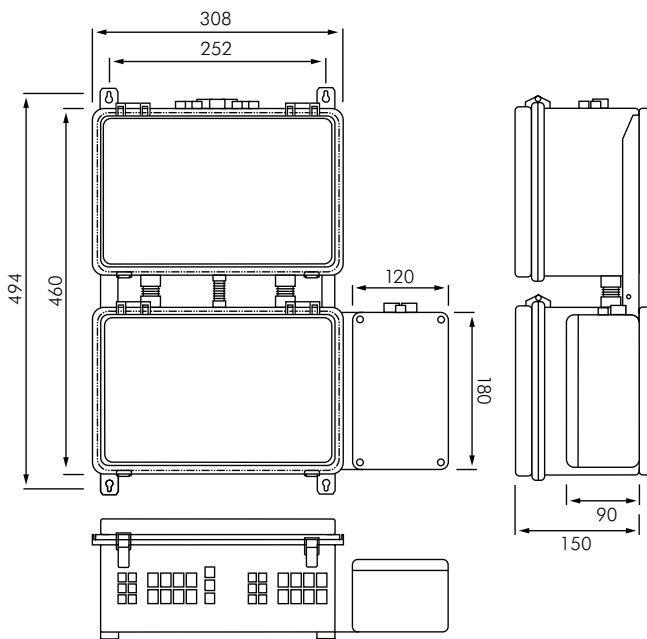
As with Warden cell water controls, power and lighting can be isolated on a cell by cell or cell block by cell block basis, at the staff base. High level control wiring (Cat5 daisy chained from one controller to the next) for Warden water control will also control power and lighting - no need for additional control cabling.

The all new Warden WA5-PLW controller, takes an entirely different approach to cell security, with the option of including cell power and lighting control. This has distinct advantages for the building owner.

## WARDEN WA5-PLW

A single control system providing each cell with the following features:

- Full cell water fixture control as per Warden WA5-WTR1
- 230V power sockets - limited to 500 watts
- Up to 2 x cell bunk lights
- 1 x main cell light with internal/external switches
- 1 x external check (blue) light switch
- RCBO lighting and power circuit protection
- Low voltage light switch cables
- Allows staff to isolate power circuits if inmate has stereo or TV outside allowable hours or noise levels
- Reduced cabling requirement especially if essential and non-essential design is required
- Ability to reduce consumption to essential power supplies during power failure and re-instate in a staged manner when required



## WARDEN WA5-PLW1

WA5-PLW1 is a single cell power/lighting/water controller.

Designed to be installed within the plumbing services duct directly behind the fixtures it serves, WA5-PLW1 will control water supplies as per WA5-WTR1 but also provide power supply to:

- 230V power circuits (10A max loading\*\*)
- 230V main light with up to 2 x switches
- 2 x 230V bed head lights each with 1 x switch each
- 1 x check (blue) light with 1 x switch

## WARDEN WA5-PLW2

WA5-PLW2 is a two cell power/lighting/water controller.

WA5-PLW2 is the same as the PLW1 variation but built for two cells that are serviced from the same duct space.

**\*\*NOTE: Power limiter is fitted to power control circuit as standard, limiting power to 500W to prevent misuse of power socket. Can be supplied without power limiter on request.**

Whilst the isometric drawing on Page 6 shows a typical cell, there are always variations to cell design and Warden is flexible enough to cope with these. Each light can be configured to suit the layout and the clients requirements. Light switches can be a conventional toggle switch (rocker or momentary) or can be piezo electric. Switches can be all the same type or a mixture if preferred.

In many cases there is a main cell light which is controlled from a switch inside the door, however a secondary switch is also located outside the cell so officers can turn off these lights without having to open doors.

Mounted with the outside switch is the check "blue" light switch. This would normally be a piezo switch that turns on the blue light for a short period of time allowing the staff to complete safety checks at night without disturbing the inmate.

Health & Safety requirements often demand bedhead lights are always available for inmates to use. Where High Level Interface is installed, it can be configured so that cell light isolation does not affect these lights.

All wiring from Warden WA5-PLW controller to the light switches is low voltage, using standard 2 core cable.

Where more than two persons are occupying a single cell, other lighting configurations are possible.



WA5-PLW2  
Power, Lighting & Water  
2 cell Control Module

WA5-PLW2 consists of two enclosure boxes of the same size. The top box contains all mains power connectors, 230V relay boards, supply protection equipment and conduit adaptors. The bottom box is the WA5-WTR2 water control. Rather than an external cable plugging into this box, mains power is supplied via conduit from the box above. Each box is interconnected with short conduit couplings. If space requirements demand, they can be separated (additional costs may apply).



Piezo light switch plate



# WARDEN POWER, LIGHTING & WATER CONTROL

## SPECIFICATION

### Warden WA5-PLW

Warden WA5-PLW is a power distribution board combined with Warden electronic water control system for use in high security applications such as prison, court or police cells. WA5-PLW is contained within water resistant plastic enclosure boxes containing:

- Power distribution board allowing
  - 230Vac GPO power circuits (10.0A max per cell)
  - 230Vac lighting circuits (5A max. per cell)
  - 230Vac supply to Warden water control
- Warden WA5-W low voltage (12Vdc) water control and high level interface connection.

Warden WA5-PLW controllers should be mounted in a dry, accessible position within the duct space.

Always mount above solenoid valves. Installer should position water controller to ensure piezo/solenoid leads requested (see Page 5) are sufficiently long to reach without stretching leads or leaving unnecessary "loops" of cable unsupported. Power distribution board box may be mounted remote subject to consultation with supplier. Extended cabling and conduit will be required.

Warden WA5-PLW can be supplied in:-

- **Single cell format**  
**WA5-PLW1** Power: 100-230Vac 47-63Hz  
 16.0A max current draw
- **Dual cell format**  
**WA5-PLW2** Power: 100-230Vac 47-63Hz  
 31.5A max current draw

Cabling for water controls as per information on Page 5.

Low voltage 0.5mm<sup>2</sup> cabling to light switches from Warden controller, in lengths to suit contract, supplied installed and terminated by electrician. Low voltage cables must be installed in conduit to allow for later maintenance if required.

All high voltage cables supplied and fitted by registered electrician according to local regulations and good work practice.

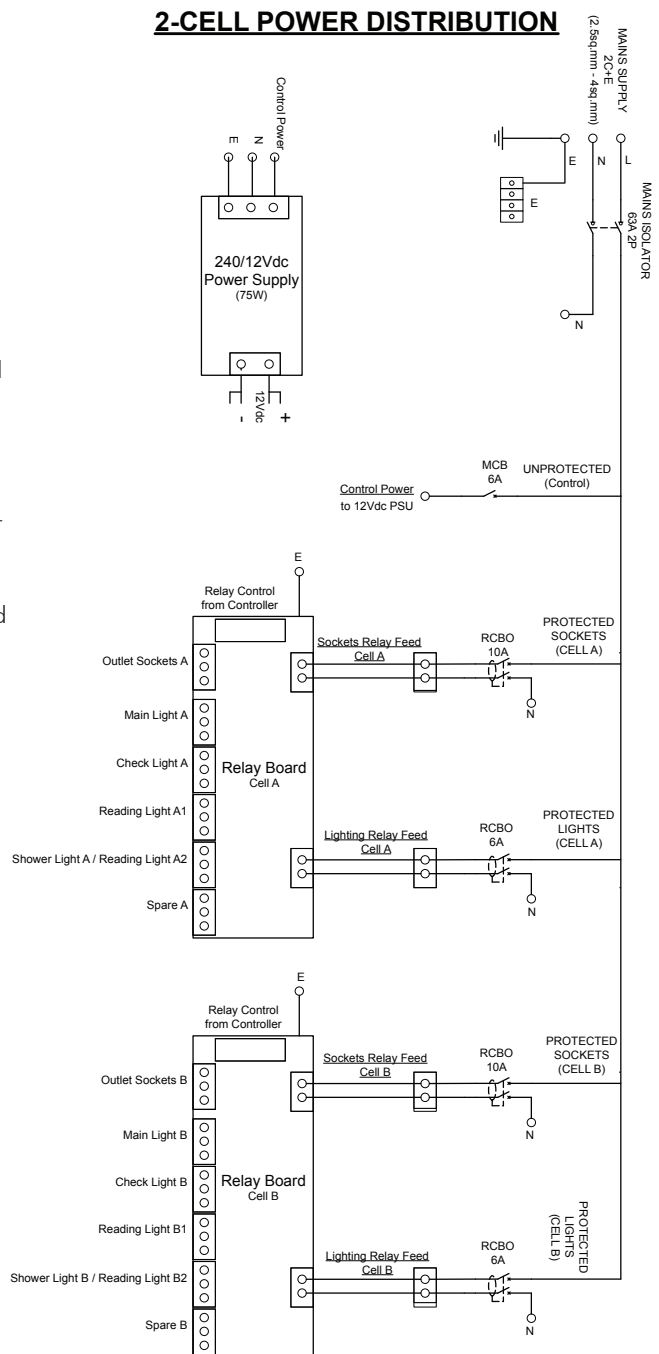
## High Level Interface

Warden High Level Interface uses industry standard 100/10 baseT wiring principles (daisy chain) to connect each Warden WA5 controller back to a MODBUS ethernet gateway. This allows WA5 controllers to be linked back to a local or central computer using standard ethernet networking hardware.

Where Warden HLI is installed it can be linked to the site BMS to enable specific functionality of Warden. For instance if there was a major power failure and generator power was required, the BMS could instruct Warden HLI to limit fixture use within each cell.

Refer to separate information and to your Warden distributor for further details.

## 2-CELL POWER DISTRIBUTION



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